Report of the Expert Committee Constituted for Comprehensive Review of the Deep Sea Fishing Policy and Guidelines

सत्यमेव जयते

Submitted to

Department of Animal Husbandry, Dairying & Fisheries

Ministry of Agriculture

Government of India

Krishi Bhawan

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Contents

Acronyms		**3**
Acknowledgements		**6**
Executive Summary		**8**
Introduction		**14**
ToR-1:	**Review of Comprehensive Marine Fishing Policy of 2004**	**17**
TOR-2:	**To review existing Guidelines for deep-sea fishing in the EEZ**	**24**
TOR-3:	**To Suggest Full Exploitation of Catch Potential in the Indian Exclusive Economic Zone and International Waters**	**41**
ToR-4:	**To examine status of compliance of regional and global requirements of management and regulation of marine fisheries including CCRF and proposed FAO Guidelines on Flag State Responsibilities**	**78**
Appendix-1:	*Order constituting the Expert Committee for Comprehensive Review of Deep-Sea fishing Policy and Guidelines*	**107**
Appendix-2:	*Minutes of the Meeting of the Expert Committee*	**109**
Appendix-3:	*Definition of Territorial Waters, Exclusive Economic Zone, Contiguous Areas, etc. (as per UNCLOS)*	**129**
Appendix-4:	*Abstract of Fishing Vessels Traffic Pattern Study by the Indian Coast Guard: 15 January to 14 February 2010*	**130**
Appendix-5:	*Geo-physical differences between the east coast and west coast of India and correlation of depth with distance*	**132**
Appendix-6:	*The Tuna Fishery in Maldives*	**134**
Appendix-7:	*Fishing fleet structure in Lakshadweep*	**137**
Appendix-8:	*Valuation of deep sea fishery resources of India - Indicative estimates*	**138**

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Acronyms

ABNJ	Areas Beyond National Jurisdiction
ANI	Andaman and Nicobar Islands
APFIC	Asia-Pacific Fishery Commission
BOBP-IGO	Bay of Bengal Programme Inter-Governmental Organisation
CBD	Convention on Biological Diversity
CCEA	Cabinet Committee on Economic Affairs
CCRF	Code of Conduct for responsible Fisheries
CIFNET	Central Institute of Fisheries Nautical and Engineering Training
CITES	Convention on Trade in Endangered Species
CMFP, 2004	Comprehensive Marine Fishing Policy of 2004
CMFRI	Central Marine Fisheries Research Institute
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CPUE	Catch per unit effort
DAH&D	Department of Animal Husbandry & Dairying
DAHD&F	Department on Animal Husbandry, Dairying and Fisheries
DG	Director General
DoF	Department of Fisheries
DSFVs	Deep Sea Fishing Vessels
EAFM	Ecosystem Approach to Fisheries Management
EC	Inter-Ministerial Empowered Committee
ECB	External Commercial Borrowing
EEZ	Exclusive Economic Zone
EXIM	Export-Import
FADs	Fish Aggregating Devices
FAO	Food and Agriculture Organization of United Nations
FEMA	Foreign Exchange Management Act
FIMSUL	Fisheries Management for Sustainable Livelihoods
FOB	Free On Board
FSI	Fishery Survey of India
FYP	Five-Year Plan
GDP	Gross Domestic Product
GPS	Global Positioning System
GRT	Gross Register Tonnage
ICG	Indian Coast Guard
ILO	International Labour Organization
INFOFISH	Intergovernmental Organization for Marketing Information and Technical Advisory Services for Fishery Products in the Asia and Pacific Region
IOTC	Indian Ocean Tuna Commission
IPOA	International Plans of Action
IQF	Individual Quick Freezing
IUCN	International Union for Conservation of Nature
IUU	Illegal, Unreported and Unregulated

JV	Joint Venture
LOI	Letter of Intent
LOP	Letter of Permission
LOR	Letter of Registration
MCS	Monitoring, Control and Surveillance
MFVs	Mechanized Fishing Vessels
MHA	Ministry of Home Affairs
MIFCO	Maldives Industrial Fisheries Company
MoCI	Ministry of Commerce and Industry
MoD	Ministry of Defence
MoES	Ministry of Earth Sciences
MoFPI	Ministry of Food Processing Industries
MD	Mercantile Marine Department
MMT	Million Metric Tonne
MoA	Ministry of Agriculture
MoEF	Ministry of Environment and Forests
MPEDA	Marine Products Export Development Authority
MSY	Maximum Sustainable Yield
MZI	Maritime Zones of India (Regulation of Fishing by Foreign Vessels) Act, 1981
NACA	Network of Aquaculture Centres in Asia and the Pacific
NEAMA	National Environment Assessment and Monitoring Authority
NEBOB	North-eastern Bay of Bengal
NM	Nautical miles (1 NM = 1,852 meters)
NMFC	National Marine Fisheries Census
NWAS	North-western Arabian Sea
OAL	Length overall
OBM	Outboard motors
RFBs	Regional Fisheries Bodies
SCICI	Shipping Credit and Investment Company of India Limited
SDFC	Shipping Development Fund Committee
SEBOB	South-eastern Bay of Bengal
SIL	Special import license
SWAS	South-western Arabian Sea
ToR	Terms of Reference
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNCLOS	United Nations Convention on Law of the Sea
UNFSA	United Nations Fish Stocks Agreement
UT	Union Territory
VHF	Very high frequency
VMS	Vessel Monitoring System
VTS	Vessel Tracking System

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It has been a great honour and privilege for me to carry out this assignment. In conclusion I do hope that the Ministry of Agriculture will find the recommendations contained in this report useful and set up a mechanism to implement them for sustainable development of the deep sea fishing in the country.

……August 2014
New Delhi

Dr B Meenakumari
Deputy Director General (Fisheries), ICAR

Executive Summary

It is for the first time in the history of Indian fisheries that the Hon'ble Prime Minister of India voiced the need for 'Blue Revolution' in the country. Speaking at the Eighty-sixth Foundation Day and Award Ceremony of the Indian Council of Agricultural Research in New Delhi on 29 July 2014, the Hon'ble Prime Minister, Shri Narendra Modiji called upon the practitioners of fisheries and aquaculture to usher in 'Blue Revolution' by sustainable exploitation of the fisheries wealth from the marine and other aquatic resources of the country. Referring to the contributions of green revolution and white revolution in the developmental history of India, the Hon'ble Prime Minister said that it is time now to usher in blue revolution, as depicted in the blue colour of the iconic Ashok Chakra. His Excellency further said that the global market for fisheries is huge and India needs to tap its marine wealth for improving the lives and livelihoods of fishers and their families.

The Hon'ble Prime Minister's appeal for 'Blue Revolution' also reinforces the 'Blue Growth Initiative (BGI)' voiced at the 2012 Rio+20 meet held at Rio de Janeiro City, Mexico. The BGI, part of the document entitled, 'The future we want' adopted by the global community at Rio+20 talks about sustainable harvests from the marine resources to feed the World's growing population. The document largely reaffirms previous action plans like Agenda 21 and calls for the urgent need to return ocean stocks to sustainable levels and calls on countries to develop and implement science-based management plans.

The constitution of this Expert Committee for 'Comprehensive Review of the Deep Sea Fishing Policy and Guidelines' has been very timely on two accounts. First, production from the near-shore waters in the Indian Exclusive Economic Zone (EEZ) has reached a plateau, with minimal scope for further hikes in production. This places an urgent need for sustainable exploitation of resources in the near-shore waters to ensure that fisheries of the commercial species do not collapse and the surplus effort from the coastal water is taken off shore to exploit the resources of the deep sea. Second, the Comprehensive Marine Fishing Policy, 2004 (CMFP, 2004) having completed a decade of its existence, is in urgent need of review so as to make it topical and conform to the present-day needs of the sector. Along with the Policy, the Guidelines that have been supporting the deep sea fishing activities also need revamping so that the deep sea resources, especially tuna and tuna-like species, are optimally harvested from the Indian EEZ.

It is in this context and based on the Terms of Reference (TORs) given to the Expert Committee constituted for the purpose, this report has been prepared. Presented in four main chapters, one each dealing with the four TORs, the report has carried out an objective review of the CMFP, 2004. The review has critically examined the process used for formulation of the CMFP, 2004; its contents and reach; and its effectiveness in bringing the desired changes in the sector. While presenting the critique, shortcomings have been brought out keeping in mind that such omissions and gaps would be addressed while preparing the second edition of the policy on marine fisheries in the country. The critique, while appreciating the contributions of the Policy in providing a framework and thereafter the guidelines for deep sea fishing in the Indian EEZ, has not been able to focus much on other aspects of the sector. It can also be said that after introduction of fishing vessels under the deferred payment provisions of the 2000 EXIM Policy of the Ministry of Commerce and Industry, the deep sea activities have received much focus, leaving coastal fisheries to its own fate. The policy also has other inherent weaknesses, such as the lack of an implementation plan, timelines and budgetary support to make things happen at the ground level. The Expert Committee has suggested that any fresh attempt to prepare a comprehensive policy for marine fisheries sector in India may consider the suggestions made in the chapter on TOR-1.

The Expert Committee under TOR-2 reviewed the existing guidelines on deep sea fisheries. Beginning from the attempts to harness the deep sea resources in the early 1970s, the Indian fisheries sector has gone through a series of concerted efforts to sustainably exploit the fisheries resources, the most recent being the deployment of fishing vessels under the Letter of Permit (LOP) scheme. Some of the other important issues that stem from the provisions contained in the Guidelines/Public Notices and their actual implementation relate to the matters that can be put collectively under Monitoring, Control and Surveillance (MCS). The Committee is of the view that a sound MCS regime can improve fisheries management and help in reducing Illegal, Unreported and Unregulated fishing arising from domestic or foreign fishing fleets. In this regard, the Expert Committee also draws the attention of the Government of India to the Report of the Working Group on 'Development and Management of Fisheries and Aquaculture' for the Twelfth Five-Year Plan Period (2012- 2017). The Working Group has laid focus on MCS and *inter alia* has suggested the following activities for consideration of the Government;

- Setting up of an MCS Division in the Department of Animal Husbandry, Dairying & Fisheries (DAHD&F), Ministry of Agriculture and a similar Division in each of the Department of Fisheries of the coastal States/UT Administrations;
- Issue of biometric cards to marine fishers and creation of a national fishermen database;
- Mandatory registration and licensing of all fishing vessels including artisanal vessels;
- Implementation of color coding for all fishing boats;
- Fitment of distress alert transmitters, GPS and other safety devices, including automatic identification system for tracking and regulating fishing vessels;
- Registration and licensing of boat building yards and development of a centralized data base;
- Setting up of harbor based MCS units, which would also include representatives of fishermen and their associations; and
- Awareness campaign, outreach and educational programmes and capacity building at all levels.

The Expert Committee under TOR-3 has examined the need for full utilization of the catch potential of the EEZ and international waters. The committee is of the view that development of deep sea fishery industry is of concern to the entire marine fisheries sector in the country because it would have considerable impact on the management of near-shore fisheries; shore-based infrastructure utilisation and post-harvest activities, both for domestic markets and export; and contributions to the food and nutritional security of the growing population. Exploitation of off-shore resources in the EEZ will have to be reconsidered in terms of not only the resources available in the EEZ but also in terms of infrastructure, human capacity development and a comprehensive and implementable set of rules and regulations with a strong MCS regime in place, availability of scientific and technical information on the commercial fisheries resources and the best fishing methods with which to target them, etc.

After declaration of the EEZ in 1976, the oceanic resources available to India are estimated at 2.02 million sq. km, comprising 0.86 million sq. km (42.6 % of the total) on the west coast, 0.56 million sq. km (27.7%) on the east coast and 0.60 million sq. km (29.7%) around the Andaman and Nicobar Islands. The continental shelf area amounts to 530 000 sq. km of which 71 percent area is available in the Arabian Sea (west coast) and the remaining 29 percent in the Bay of Bengal (east coast). With the absolute right on the EEZ, India has also acquired the responsibility to conserve, develop and optimally exploit the marine living resources within this area. The Committee has also considered the latest resource potential of the Indian EEZ, which is estimated at 4.41 million metric tonnes and in this context has made a thorough review of the existing potential and present levels of harvest

from different depth zones in the EEZ. Based on this review, the following recommendations are made towards full exploitation of the catch potential in the Indian EEZ and from international waters:

- Sustainable exploitation of fisheries resources in the Indian EEZ should be the primary condition for any utilization plan of Indian EEZ. Restoration of resources not only cost but often impossible.
- Requirements of coastal States should be taken into consideration and a holistic plan should be developed incorporating production targets of the coastal States. At the same time, coastal States also need to appreciate that while the larger EEZ (beyond 12 nautical miles) is a common resource for them, expansionary production strategies and isolated production decisions will lead to destruction of this common resource. Therefore, the Union Government and the State Governments must act together to agree upon management policies and measure for sustainable exploitation of the resources. .
- Waters up to 200 meters depth are optimally exploited and in case of some species also over-exploited. Thus, there is no scope for expansion of fishing effort in this zone. Exploitation of resources in waters between 200 to 500 meters is now beginning, as small fishing boats (mainly in the 15 – 20 meter size ranges) are targeting the resources in this area. It is recommended that this depth zone may largely be kept as a buffer zone to augment the resources in both the near-shore waters as well as in the off-shore areas. Subsequently, this zone could also be utilized to diversify existing fishing fleet for targeting resources such squids, etc. and reducing pressure on near-shore waters in the future.
- Waters beyond 500 meter depth are not optimally exploited and there is considerable scope of expansion in this zone, mainly for tuna and tuna-like species. Resource-specific fishing vessels may be introduced in this area. Based on the resource potential of tuna and tuna like resources and other commercial species such as squids, it is recommended that a fleet size of 1178 DSFVs may be considered for deployment in the Indian EEZ. This includes the existing DSFVs and the additional numbers of 270 vessels (240 tuna long liners, 15 purse seiners and 15 squid jiggers).
- As India is presently lacking in adequate expertise or resources to exploit water beyond 500 meters, hence technology transfer through acquisition of foreign fishing vessels and, or, joint ventures/leasing, etc. may be considered for this area till the domestic capacity is fully developed.
- In the technologies proposed for introduction, squid jigging has been considered as a means of diversification and exploitation of the squid fisheries for increasing production from the offshore waters. In this regard, technology infusion is necessary to locate the major squid fishery grounds as also demonstration of technology for which test fishing may be considered.
- Keeping in view the developments in exploitation of the resources in waters beyond 12 nautical miles, there is an urgent need to enact a comprehensive legislation for regulation of Indian fishing fleet in the EEZ.
- Trained manpower on board DSFVs is a critical requirement. In the absence of trained domestic crew that can work on such DSFVs, engagement of foreign crew onboard DSFVs is inevitable till the requisite skill is developed in the country. However, such engagements are becoming almost impossible due to the stringent conditions imposed by the Ministry of Home Affairs (MHA). In this regard, conditions such as minimum salary of USD 25 000 per annum, fixed percentage of foreign crew onboard DSFVs and their phasing out norms; grant of security clearance, etc. need to be reconsidered and liberalized to make fishing operations attractive and feasible.
- Besides the above mentioned conditions, considerable time is also being taken in grant of security clearance to foreign crew, which not only results in loss of fishing days during peak fishing seasons

and consequent economic loss to the sector, but also creates uncertainty for the operators in planning their fishing operations. This aspect also needs re-consideration by MHA and security clearances should be granted in a time bound manner so that the operators could plan their operations for the fishing season.

- Capacity building of the Indian crew has been one of the important requirements of fishing in the deep sea. Therefore, to create level-playing field, the domestic fleet of DSFVs may also be allowed to engage one or two foreign crew so that they can provide the guidance and build the capacity of the Indian operators wherever skill/training is required.

- On the issue of human resource development for the deep sea fishing sector and availability of certified personnel to man DSFVs, it is also highly recommended that the Central Institute of Fisheries Nautical and Engineering Training (CIFNET), Kochi design appropriate courses for different category of operators and conduct such training programmes. Such programmes may be subsidized to provide incentives to the fishers to participate.

- The present Guidelines regulating the fishing areas of LOP vessels have designated certain areas as prohibited for fishing. These areas were earmarked during the 1980's. Therefore, the Government may consider assessing the impact of these prohibited areas in conservation of fish stocks and take decisions on their continuity as prohibited areas or otherwise.

- The present Guidelines permit seven types of fishing methods, *viz.* (i) long lining for tuna, (ii) tuna purse seining, (iii) squid jigging and squid hand lining, (iv) mid-water pelagic trawling, (v) trap fishing, (vi) hook and line fishing, and (vii) pole and line fishing. In view of the changing fisheries composition, present levels of exploitation, resource potential, etc., the Government may consider re-looking at the permitted fishing methods as also the category-wise fleet size deployment.

- In the same vein, the industry is also of the view that the spawning seasons of tuna species such (yellow fin and big eye) do not coincide with the period of the 'uniform ban on fishing' implemented by the Government of India every year. The industry has requested for a review of this ban period for the DSFVs and suggested that such vessels may be exempted from the purview of the ban.

- The Government should consider setting up of Fish Aggregating Devices (FADs) in selected places to make tuna (skipjack) fishing more remunerative.

- Following the submission of Coast Guard to this Expert Committee, reporting mechanisms and compliance matters such as regular reporting of position during operation, submission of voyage report, crew compliance etc. should be improved and MCS measures including VMS should be put in place for better monitoring of the DSFVs. Reporting mechanisms of mid-sea transshipment of catch should be reviewed further in order to plug the loopholes, if any, on alleged under-reporting of catches. The Industry has also suggested that the requirements of daily reporting should not be insisted upon when the vessel is not fishing.

- Presently, multiple agencies are involved in regulating the activities of the DSFVs. These include the DAHD&F & FSI (Ministry of Agriculture); DG Shipping, MMDs, Port Authorities (Ministry of Shipping); MPEDA and DGFT (Ministry of Commerce); Coast Guard (Ministry of Defense); RBI, Customs (Ministry of Finance); Department of Telecommunication and Ministry of Home Affairs. Entrepreneurs often face difficulties in following the procedures of multiple agencies. There is a need to simplify the procedures and if need be a single window clearance procedure should be adopted.

- Based on the available resource potential and the price that tuna fisheries commands, it is estimated that the tuna and tuna like resources in the Indian EEZ are valued at approximately INR 3000 crores or US $ 500 million. In the absence of the Indian fleet unable to harvest this

resource, the migratory stocks of tuna and tuna like species are being caught by the fishing fleet of the neighboring tuna fishing nations such as Maldives, Sri Lanka, Thailand and Indonesia. This in other words could be termed as a net loss of revenue to the Indian fisheries sector.

- Exploitation of the off-shore resources in the EEZ will have to be reconsidered in terms of not only the resources available in the EEZ but also in terms of infrastructure, a comprehensive and implementable set of rules and regulations, availability of scientific and technical information on the commercial fisheries resources and the best fishing methods with which to target them, etc. Such requirements may be considered by the Government.

In the concluding part of the report, the Expert Committee has examined the status of compliance of regional and global requirements of management and regulation of marine fisheries including CCRF and proposed FAO Guidelines of Flag State responsibilities (TOR-4). The Committee is of the view that Indian fisheries is now set in a globalized world. The global agenda on fisheries is guided by a set of binding and non-binding instruments that concern both fisheries and environmental aspects. India being a signatory to such instruments and agreements needs to implement the provisions of such instruments and agreements to meet its international obligations and make fisheries sustainable. As non-compliance of the provisions of such instruments/agreements will affect the fisheries sector and in turn the livelihoods of fishermen, it is in the interest of the sector that the DAHD&F take the lead and ensure that such provisions are implemented in a timer-bound manner and in true letter and spirit.

In this regard the Expert Committee strongly recommends strengthening of the fisheries institutions, especially those under the fold of DAHD&F, Ministry of Agriculture, in terms of manpower, human resource development and wherewithal.

The Indian Sub-continent is surrounded on the west by the Arabian Sea and on the east by the Bay of Bengal. Together, the two seas form part of the upper Indian Ocean. On the west coast, India shares its maritime boundaries with Pakistan and the Maldives, while on the east coast the boundaries are shared with Sri Lanka, Bangladesh, Myanmar, Thailand and Indonesia. Both the Arabian Sea and the Bay of Bengal harbor migratory as well as straddling fish stocks such as tuna and tuna like species, sharks and mackerels. In recent years, small pelagics like sardines are also extending their geographical range and moving between the EEZs of neighbouring countries like India and Bangladesh. Such a situation necessitates strong regional cooperation in management and sustainable exploitation of the resources, including conservation of species/stocks wherever necessary. Further, cooperation in safety and security of fishermen is also necessary as the upper Indian Ocean, especially the Bay of Bengal, has high number of adverse weather events and every year many fishers lose their lives or suffer extreme hardships.

Professor Arvid Pardo, the Maltese diplomat and scholar, while guiding the debate on the United Nations Convention on Law of the Sea in the late fifties and sixties had convincingly succeeded in having the global community agreeing to the Oceans as the 'common heritage of mankind'. His dreams are now seeing greater acceptance than ever before with sustainable practices and precautionary approaches being mainstreamed into the activities of the fisheries sector. India is no exception and this Expert Committee hopes that with the consideration of the recommendations, India will be able to optimally exploit its fisheries resources in the EEZ as also ensure that the resources are sustained and inter-generational equity is not compromised. Such an approach would also ensure realization of the 'Blue Revolution' from the Indian seas.

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Introduction

The Department of Animal Husbandry, Dairying and Fisheries (DAHD&F), Ministry of Agriculture, Government of India vide their Order No.21001/7/2009-FY(Ind) dated 01 August 2013 constituted an Expert Committee for Comprehensive Review of Deep Fishing Policy and Guidelines (hereinafter referred to as Expert Committee) with the following Terms of Reference (TORs):

I) *To undertake review of Comprehensive Marine Fishing Policy of 2004 and to suggest a new Policy;*

II) *To review existing Guidelines for deep-sea fishing in EEZ;*

III) *To suggest full exploitation of catch potential in EEZ and international waters;*

IV) *To examine status of compliance of regional and global requirements of management and regulation of marine fisheries including CCRF and proposed FAO Guidelines of Flag State responsibilities.*

The Expert Committee was set up under the chairpersonship of the Dr B Meenkumari, Deputy Director General (Fisheries), Indian Council of Agricultural Research, New Delhi with members drawn from the Central Marine Fisheries Research Institute (CMFRI), Kochi (Dr Pratibha Rohit, Principal Scientist representing the Institute); Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO), Chennai (Dr Yugraj Singh Yadava, Director representing the Organization); Central Institute of Fisheries Technology (CIFT), Kochi (Dr Leela Edwin, Principal Scientist representing the Institute); Directorate General of Shipping, Mumbai (Mr S G Bhandare, Deputy Director General, Shipping representing the Directorate General); Coast Guard Headquarters, New Delhi (DIG A A Hebbar, Director (F&E) representing the Coast Guard); and Marine Products Export Development Authority (MPEDA), Kochi (Shri K J Antony, Joint Director representing MPEDA). Fisheries Development Commissioner, DAHD&F (Shri Vishnu Bhat) served as the member-secretary of the Expert Committee. The Expert Committee was assisted by Dr Sanjay Pandey, Fisheries Research and Investigation Officer, DAHD&F in sourcing documents required for the work of the Committee as also in compiling the Proceedings of the meetings that held on four occasions.

Besides the above mentioned members, the Expert Committee also invited representatives from other Fisheries Institutes such as the Fishery Survey of India (FSI), Mumbai (attended by Shri Premchand, Director General, FSI) and the Central Institute of Fisheries Nautical and Engineering Training (CIFNET), Kochi (attended by Shri R C Sinha, Director, CIFNET); and the Industry (representing the Andaman Deep Sea Fisheries Association, Chennai; All India Association of Deep Sea Fisheries, Visakhapatnam and the Indian Fishermen Association, Chennai). Dr Raja Sekhar Vundru, Joint Secretary (Fisheries), DAHD&F also attended the First Meeting of the Expert Committee. A copy of the order constituting the Expert Committee by the Government of India is place as ***Appendix 1***.

The Expert Committee met on four occasions. The First, Third and Fourth Meetings of the Expert Committee were held in Krishi Bhawan, New Delhi and the Second Meeting was convened in Chennai at the Central Institute of Brackishwater Aquaculture. The Industry representatives were invited to present their views at the Second Meeting of the Expert Committee. The Proceedings of the four Meetings are placed at ***Appendix 2***.

The Expert Committee reviewed large number of documents/reports/data sets relevant to the four TORs assigned to it. Such documents largely pertained to the reports of the committees set up in the past by the Government of India and their outcomes. This review also included perusal of the various binding and non-binding international instruments relevant to the fisheries and

environmental (especially bio-diversity) sectors and India's position with respect to the implementation of the provisions contained in such instruments. The Expert Committee immensely benefitted from the reports and findings submitted to it by the members, largely drawn from the work of their respective organizations. The inputs received from the Industry representatives were also very constructive and useful.

The report is presented in four main chapters- one chapter each for the four TORs. While each TOR is independently dealt with in the chapter, there some cross references to other chapters, mainly to avoid repetitions. The other supporting chapters of the report include an Executive Summary and Introduction in the beginning and seven annexures placed at the end. The annexures inter alia also include the proceedings of the four meetings held by the Expert Committee.

While the Expert Committee has taken utmost care in presenting factual information in support of the recommendations made in this report, there could be some references/data that may not conform to the scrutiny of the DAHD&F or the other Ministries/Departments of the Government of India or the coastal States and Union Territories. Such differences could also arise from the interpretation of primary data/information and or due to inconsistencies in data/information accessed from different sources. At times such differences are also due to variations in the scales used and or the period of information (*e.g.* calendar year versus financial year).

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Little Flower

ToR-1: Review of Comprehensive Marine Fishing Policy of 2004

1.0 Introduction

The Comprehensive Marine Fishing Policy of 2004 (CMFP, 2004) which was accepted in November 2004 is a standalone policy for marine fisheries sector of India. The objectives of the policy are: (1) to augment marine fish production of the country up to the sustainable level in a responsible manner so as to boost export of sea food from the country and also to increase per capita fish protein intake of the masses; (2) to ensure socio-economic security of the artisanal fishermen whose livelihood solely depends on this vocation; and (3) to ensure sustainable development of marine fisheries with due concern for ecological integrity and bio–diversity. From the objectives, the focal areas of the CMFP, 2004 can be identified as follows:

- *Augmenting marine fish production of the country;*
- *Ensuring responsible fishing practices for sustainability;*
- *Boosting export of sea food from the country;*
- *Increasing per capita fish protein intake;*
- *Ensure socio-economic security of the artisanal fishermen;*
- *Ensuring sustainable development of marine fisheries; and*
- *Accounting for ecological integrity and bio–diversity.*

Sustainable harvest of marine fisheries resources is one of the key areas of the CMFP, 2004. It advocates ensuring regulated access to fisheries resources. The Policy has clubbed fisheries activity into: (1) subsistence fishing; (2) small-scale fishing; and (3) industrial fishing and prescribed differential policy support to these sectors. In case of subsistence and small-scale fisheries, the Policy recommends demarcation of exclusive areas for their operation. However, since their areas of operation are within the territorial waters, the Policy suggested that "efforts would be made to harmonize the demarcation of reserved areas to the maximum extent possible so that a uniform pattern is followed in all coastal States/UT's." The Policy also seems to prescribe transformation of non-motorized craft to motorization with a cap of 50 percent; transformation of small-mechanized craft to multi-day fishing and opening up the deep sea fishery for joint ventures and proposed extension of suitable incentives to deep sea fishing vessels (>20 meter overall length-OAL) as in other export oriented agri-ventures. The Policy also calls for assessment of fleet capacity and holds that the principle of Code of Conduct for Responsible Fishing Operations should be incorporated into every component activity.

In case of post-harvest operations, the Policy has prescribed adaptation of international standards so as to minimize post-harvest losses and ensure full utilization of the catch. In terms of resource management, the Policy advocates a set of measures, which can be clubbed as time-gear regulation; regulating entry and improving Monitoring, Control and Surveillance (MCS) and resource enhancement measures, such as setting up of Fish Aggregating Devices (FADs) and open sea cage culture.

Ensuring welfare of the fishermen is a major driving factor in the Policy. It recommends reclassification of fishers and proposes that 'artisanal fisheries deploying outboard motors (OBMs) and small-mechanized boats up to 12 meter OAL should be treated at par with agriculture while small-scale fisheries involving mechanized boats less than 20 meter OAL would be treated at par with small-scale industries. Fishing vessels above 20 m and fishing activity involving mother ships or

factory vessels should be treated as industrial activity. The admissibility and extent of concessions for each category should be re-determined accordingly. Full time/occasional fishermen whose households do not own a boat should be treated at par with landless labourer and should qualify for special care and protection. Revitalizing cooperatives and extending their reach is also a major policy objective along with rationalization of ongoing welfare schemes on housing, saving-cum-relief and insurance.

To address environmental issues, the Policy proposes a community-driven approach including awareness building, restoration of critical habitats such as mangroves as well as review of Coastal Regulation Zone Notification. The Policy has also proposed close-coordination with environmental agencies.

The Policy further emphasizes on the need of development of infrastructure, especially as a key requirement for industrial fishing. It advocates formulating fisheries infrastructure blueprint based on which development can takes place and also encourages entry of private players in developing infrastructure in the fisheries sector.

The CMFP, 2004 holds that an enabling legal framework is an essential pre-requisite for proper management and control of fisheries sector. It suggests reviewing the existing legal framework for regulating fishing operations, introduction of additional legal instruments in areas such as operation and regulation of Indian flag vessels in the Exclusive Economic Zone (EEZ), introduction of new fishing units, ensuring conservation of resources, limited access fishery, fishery harbour management, etc., conflict resolution, ratification of agreed international instruments and better participation in Regional Fisheries Bodies (RFBs).

Finally, the Policy has also highlighted the special requirements of the fisheries sector in the two Island groups, *viz.*, the Andaman and Nicobar Islands and the Lakshadweep Islands. The policy outlines an array of measures including development of shore-based infrastructure, improved fishing vessels and human resources development to boost fisheries development in the Islands.

2.0 Review of the CMFP, 2004

The following paragraphs provide a critical review of the CMFP, 2004, which includes the views of the EC as also the reviews made by some other fisheries organizations and experts.

1) The CMFP, 2004 is meant to be an overarching policy for the marine fisheries sector as the name suggests. However, in essence, it remains a policy for the extra-territorial waters (*i.e.* the waters between 12-200 nautical miles), which are under the jurisdiction of the Union Government. A clear-cut endorsement of the Policy by the coastal States/Union Territories (UT) is not seen. Since its release in 2004, very few steps have been taken to implement the policy, although some of the Central Sector and Centrally Sponsored Schemes have supported the coastal States/Union Territories and other agencies in progressing the recommendations.

2) In hindsight it is seen that the process to adopt the Policy was inadequate. While an Expert Committee was constituted and the said Committee also consulted stakeholders, but not to the extent that is required for one of the most diverse and vibrant production sectors of the World *i.e.* coastal and marine fisheries. Further, the process also does not outline how various conflicting issues, within the sector and with other primary sectors, were resolved and whether they were resolved with agreement of the stakeholders. Thus in other words it could be said that while the Policy has laid adequate emphasis on adapting the 1995 Code of Conduct for Responsible Fisheries (CCRF) of the Food and Agriculture Organization (FAO) of the United Nations, one of the

fundamental premises of the CCRF, that is ensuring stakeholder participation in the decision making process and ensuring voice of the marginal groups, is not reflected properly.

3) A 'policy' should be understood to mean a set of coherent decisions with common long-term purpose(s) affecting or relevant to the fisheries sector. Usually policies are also developed towards implementing provisions of the relevant legislation. A policy, however, could also lay down guidelines for preparation of legislation and in this sense there can be a policy that precedes and a policy that succeeds or follows fisheries legislation. However, the CMFP, 2004 does not satisfy both these conditions. Although it mentions the need for a legal instrument in the extra-territorial waters (those under the jurisdiction of the Union Government), the importance of the same in the overall policy context is not highlighted; neither a guidance given on the modalities for preparing the said legal instrument. It may not be out of place to state here that a legislation to regulate wholly Indian-owned fishing vessels in the 12 – 200 nautical mile zone of the Indian EEZ is immediately required to regulate fishing by such vessels.

4) The comprehensiveness of the Policy is further limited by overlooking gender-related issues, especially on the role of women in fisheries sector. Women constitute almost 50 percent of the workforce in the marine fisheries sector and play an important role in post-harvest operations, including retail marketing. Through such retail fishing activities, they are also a major support to the families in the marine fisheries sector.

5) Traditional fishers form one of the most important constituents of marine fisheries sector. The Policy does not provide adequate importance to this group of fishers. For long, the rights of traditional fishers are a hotly debated issue in global and national scenario with emphasis on protecting their rights in the coastal and marine resource exploitation.

6) The Policy does not speak of a time-frame for implementation of the recommendations, making this aspect as open-ended. A definite time-frame with measurable indicators for monitoring and evaluation would have been useful in assessing the implementation and utility of the recommendations.

7) The Policy should have clearly defined the terms used for various actions. To cite examples drawn from the Policy text, the use of words such as 'conservation and sustainable use' and 'management and conservation of fisheries' has broad connotations. Unless properly defined, such directives could be construed in different ways by different user groups of the coastal and marine resources. Similarly, a 'foreign fishing vessel' should have been defined in such a manner so as to exclude Illegal, Unreported and Unregulated (IUU) fishing vessel. The other words that needed more clarity include 'Flag State responsibility'; 'Indian fishing vessels'; 'ownership'; etc.

8) Some of the objectives stated in the Policy, seem to contradict each other. For example augmenting fish production and ensuring sustainability can be conflicting if not implemented properly. To further drive home the point, Objective 1 of the Policy highlights the need of (i) augmenting production, (ii) boosting export and (iii) increasing per capita consumption against the condition of responsible fisheries. Therefore, there is a need to prioritize objectives or introduce conditionalities that may overtly support sustainable fishing practices and help in achieving the objectives.

9) The objective 1 of the Policy to 'increase per capita fish protein intake of the masses' is noble and keeping in view the health advantages that fish provides *vis-à-vis* other animal protein sources is well recognized. However, in the Indian context where a significant size of the population

is vegetarian, such an objective needs to be well qualified in its purport and subsequent action. Further, such a policy statement is also construed as changing the diet of the population, which is not a set area of work for fisheries managers. However, increasing availability of fish and fish product is an ideal objective for a policy of this nature and will also serve the end purpose of increasing per capita availability of fish.

10) The Policy suggests detailed guidelines on harvesting of marine fisheries resources (Art. 3). The fisheries activity is divided into (1) subsistence fishing; (2) small-scale fishing; and (3) industrial fishing. However, definitions are not provided for each sector and they remain ambiguous. Especially in latter part of the Art. 3, discussions move to the use of technology, such as mechanized, motorized and non-motorized. In the absence of any definition, it is difficult to link these technologies (motorized, mechanized) with the above three sectors. In many parts of the coastline, the motorized sector, strictly speaking is engaging in commercial fishing and pure subsistence fishing hardly exists. Implications of different types of fishing following the classification of FAO[1] is given below:

- **Industrial fisheries:** Capital-intensive fisheries using relatively large vessels with a high degree of mechanization and that normally have advanced fish finding and navigational equipment. Such fisheries have a high production capacity and the catch per unit effort is normally relatively high. In some areas of the world, the term "industrial fisheries" is synonymous with fisheries for species that are used for reduction to fishmeal and fish oil (*e.g.* the trawl fishery for sandeel in the North Sea or the Peruvian purse-seine fishery for anchoveta).
- **Small-scale fisheries:** Labour-intensive fisheries using relatively small crafts (if any) and little capital and equipment per person-on-board. Most often family-owned. May be commercial or for subsistence (see below). Usually low fuel consumption. Often equated with artisanal fisheries.
- **Artisanal fisheries:** Typically traditional fisheries involving fishing households (as opposed to commercial companies), using relatively small amount of capital, relatively small fishing vessels, making short fishing trips, close to shore, mainly for local consumption. In practice, definition varies between countries, *e.g.* from hand-collection on the beach or a one-person canoe in poor developing countries to more than 20 meters trawlers, seiners, or long-liners over 20 meters in developed countries. Artisanal fisheries can be subsistence or commercial fisheries, providing for local consumption or export. Such categories are also referred to as small-scale fisheries, though they may not be always using relatively low level technology.
- **Commercial fisheries:** Fisheries undertaken for profit and with the objective to sell the harvest on the market, through auction halls, direct contracts, or other forms of trade.
- **Subsistence fisheries:** A fishery where the fish caught are shared and consumed directly by the families and kin of the fishers rather than being bought by intermediaries and sold at the next larger market. Pure subsistence fisheries are rare as part of the products are often sold or exchanged for other goods or services
- **Traditional fisheries:** Fisheries established long ago, usually by specific communities that have developed customary patterns of rules and operations. Traditional fisheries reflect cultural traits and attitudes and may be strongly influenced by religious practices or social customs. Knowledge is transmitted between generations by word of mouth. They are usually small-scale and/or artisanal.

11) An important aim of the Policy is conflict resolution. However, the Policy has unintentionally set a debate by setting an arbitrary cap for motorization of 50 percent fishing fleet

[1] ***Fisheries and Aquaculture topics. Types of fisheries. Topics Fact Sheets. Text by Andrew Smith. In: FAO Fisheries and Aquaculture Department [online]. Rome. Updated 27 May 2005. [Cited 27 May 2014].*** ***http://www.fao.org/fishery/topic/12306/en***

without indicating any socially and economically justifiable criterion. As such the Policy has not prescribed any criterion for choosing 'A' over 'B' for motorization. Therefore, if implemented it is likely to create tension in a society, which at present is nearly homogenous.

12) The policy also suggests treatment of different fishing activities at par with their agricultural/industrial equivalent without giving proper justification and also without reflecting how such measures will affect the fisheries, especially in terms of meeting the working conditions, industry is subjected too.

13) The policy prescribes that CCRF is to be followed. However, CCRF is a global instrument prepared for a global audience. There is a need to adapt the CCRF for specific requirements of a country. The Policy does not facilitate such a process for adaptation of the CCRF to the Indian conditions in general and different coastal States in particular. This is important as India has sub-continental dimensions with a highly conspicuous diversity in the fisheries sector.

14) In a globalized World, especially when fish and fish products are one of the most important traded commodities, fulfillment of India's global and regional commitments is very important. The Policy is unclear about addressing these commitments. However, this aspect is not being further discussed here as it has been elaborated under ToR-4 of this Report.

15) The Policy also does not suggest clear guidelines for setting up of Monitoring, control and Surveillance (MCS) mechanism. With a very large fishing fleet comprising variety of fishing craft operating under different conditions, implementation of MCS poses huge challenges. It also overlooks safety requirements and working conditions of the fishers, especially with the view that deep sea fishing is being promoted that may require larger number of man days when the fishers would be out at sea. Further, the east coast of India and the Andaman and Nicobar Islands are set on the Bay of Bengal, which is a hotbed of adverse weather events. And fishers and their families face the maximum brunt of such adverse events year after year.

16) While resource management has all the right provisions, it fails short in assigning responsibilities to different stakeholders in the sector. It is understood that a whole range of institutions from coastal State Governments (DoF), Central Government (DAHD&F), scientific bodies, Coast Guard will be involved in the exercise. However, no coordinating mechanism has been outlined for their working in tandem and handling a highly diverse production sector. The very pivotal role of fishers themselves as the prime users of the resources is inadequately reflected in the Policy. The use of co-management of resources is very strongly supported now, which makes the role of the fishers very prominent.

17) More importantly, the Policy overlooks the developmental initiatives of most of the coastal States who are now pursuing an expansionary production policy and promoting their fishing vessels to move offshore. The territorial waters, which are in the jurisdiction of the coastal States have been progressively over-harvested making it necessary for the States to move the effort further offshore. However, this is a short-sighted approach and in the absence of a regulatory framework for the extra-territorial waters, such as move may lead to 'tragedy of the commons'.

18) The Policy does not address the concerns for rationalizing the subsidy regime but rather encourages it. While some subsidies, especially in the field of creating infrastructure that may provide safe landing and berthing facilities to the fishing vessels and also reduce spoilage of the catch, are useful and need to be provides. Other subsidies, especially towards assistance in buying craft are often being criticized for their increasing fishing effort beyond sustainable limits.

19) The Policy has been rather weak on highlighting the need for improved governance/management of the sector. One of the growing concerns in this regard is the increasing focus of the Department of Fisheries on welfare related activities, relegating their core function of management to the background. It is also agreed that since fishers come from the marginalized sections of the society, there is a need for extra social security support. However, this function could also be achieved playing a coordinating role in getting them benefits of comparable schemes of other relevant Ministries/Departments, such as the Rural Development and Panchayat Raj. It is time to understand the limits of an organization and that it possibly cannot meet all the needs of the fishers. Fishers have also in different consultations (*e.g.* during FIMSUL Project in Tamil Nadu and Puducherry) expressed the need for the Department to play a more technical role rather focusing its prime attention on welfare schemes/programme.

20) To sum up, such a policy needs both 'what to do' and 'how to do' sections with clear responsibility structures and time-frame. The Policy should also be backed by appropriate legislative support. In the absence of these four corner stones, the CMFP, 2004 has largely remained confined to paper.

The second part of this TOR has directed the Expert Committee to suggest a new policy. The Expert Committee deliberated on this and concluded that the present constitution of the EC as also the time-frame given to the Committee was inadequate to suggest a new policy. Formulation of a new policy would require more broad-based constitutions to ensure that the interests of all groups/stakeholders of the sector are addressed. Similarly, a larger time-frame would accommodate consultations with the community and other groups of stakeholders that have interests in the sector. As such the Expert Committee requests the DHAD&F to consider setting up of a separate committee for the purpose.

3.0 Conclusion

After two decades the global community once again met in Rio de Janeiro City, Mexico to discuss a global agenda on ……The global meet, termed as Rio+20 concluded with an important commitment from the global community in the form of a consensus document called 'The future we want'. On matters relating to oceans and their wealth, Rio+20 also emerged with the 'Blue growth initiative' that has subsequently triggered many actions across the world. It is suggested that any attempt to revise the CMFP, 2004 should also consider the outcomes of these important global meets so that the national agenda on marine sea fisheries in general and deep sea fisheries in particular deep sea fisheries gels well with the regional and global agenda on development of sustainable fishing practices.

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LOTILE FLOWER

TOR-2: To review existing guidelines for deep-sea fishing in EEZ

1.0 Introduction

The first attempt for ushering economic liberalization in India was made in 1966. Though this attempt was reversed in 1967, but in a way it did see the emergence of 'Green Revolution'. The second thrust on opening of the economy was made in 1985, which also did not last long and failed to make much impact. However, the third attempt made in mid-1991 made a breakthrough and is often referred to as the watershed period in the Indian economic reforms. In the Indian marine fisheries sector, the seeds of modernization were sown in early seventies when a significant attempt was made to introduce the trawling fleet. In 1976, the enactment of the Territorial Waters, Continental Shelf, Exclusive Economic Zone and other Maritime Zones Act, 1976 (Territorial Waters Act, 1976)[2] also provided impetus to the country as this Act enabled India to declare its Exclusive Economic Zone (EEZ) extending to 200 nautical miles (nm) and thereby giving sovereign rights for exploration, exploitation and utilization of marine living resources in the sea around India.

Recognizing that India lacked traditional entrepreneurship in the deep sea fisheries sector, which is highly capital intensive and risk prone, the Government provided policy support for the development of deep sea fisheries sector by setting up the Shipping Development Fund Committee (SDFC), which was entrusted with the task of extending soft loans to the deep sea fishing sector. Loans were provided to the extent of 95 percent of the cost of the vessel and the debt equity ratio was 6:1. Since 1975, a number of Indian companies acquired deep sea fishing vessels (DSFVs), all trawlers, and operated them on the east coast from Visakhapatnam as the base of operation. The rich shrimp fishing grounds of 'Sandheads' in the upper Bay of Bengal region provided the right incentive to deployment of such vessels by the entrepreneurs in the area. The fleet strength of these shrimp trawlers continued to rise[3] and their operations were economically viable till a point was reached when high profits invited more players in the field than were sustainable on the basis of available resources. This period could also be referred to as the beginning of the exploitation of the fisheries from the deep sea resources of the Indian EEZ and the emergence of a deep sea fleet in the country.

The second major initiative taken by the Government of India was to introduce the Charter Policy of 1981, which was subsequently revised in 1986. It was found that the requisite technology for exploiting the deep sea resources was not available in India and it was necessary to expose the Indian entrepreneurs to the latest developments in the field. The 1981 and 1986 policies were governed by the provisions of the Maritime Zones of India (Regulation of Fishing by Foreign Vessels) Act, 1981 (MZI Act, 1981)[4] and rules framed there under. The 1981 Act facilitated acquisition and operation of foreign fishing vessels in the Indian EEZ. The objectives of the Charter Policies were as follows:

(i) Technology transfer,

(ii) Training of Indian crew,

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[2] ***The Territorial Waters, Continental Shelf, Exclusive Economic Zone and other Maritime Zones Act, 1976 is administered by the Ministry of External Affairs, Government of India.***

[3] ***By 1990, approximately 150 numbers of double-rig trawlers of 20 m and over were based at Vishakhapatnam (twice the number in 1980), making voyages of 30-50 days in the 'Sandheads' area (BOBP, 1991).***

[4] ***The Maritime Zones of India (Regulation of Fishing by Foreign Vessels) Act, 1981 is under the administrative control of the Ministry of Agriculture (Department of Animal Husbandry, Dairying and Fisheries), Government of India.***

(iii) Enabling Indian entrepreneurs to acquire deep sea fishing vessels,

(iv) To establish the availability and abundance of fishery resources in the Indian EEZ,

(v) To assess suitable craft and gear for economic operations, and

(vi) To establish foreign markets for Indian fishery products.

Based upon the experience of the functioning of the 1981 Charter Policy, some changes were made in the Charter Policy in 1986. These changes *inter alia* included revision in the period of charter, and permission for only specialized and resource-specific vessels. Under the 1986 Charter Policy, Letters of Intent were issued to 97 companies for 258 vessels. Out of this, permits were issued to 45 companies for chartering 92 vessels.

In 1987 another major development took place in respect of the financing of the deep sea fishing sector. Originally, the SDFC had financed acquisition of DSFVs by providing soft loans. Till its abolition in 1987, the SDFC had financed 85 deep sea fishing companies for acquisition of 156 vessels. After its abolition in 1987, the Shipping Credit and Investment Company of India Limited (SCICI) took up the financing of acquisition of vessels for deep sea fishing. The SCICI sanctioned an amount of Rs.73.06 crores for acquisition of 36 vessels.

Coinciding with the 1991 economic reforms, the Government of India also adopted in 1992 the New Deep Sea Fishing Policy, which included joint ventures, leasing and test fishing[5]. This policy, also the third major initiative in the history of deep sea fishing in India (after introduction of the Mexican trawlers in 1972 and the 1981 and 1986 policy of introducing charter vessels) included initiatives for exploitation and utilization of deep sea fishery resources within 200 nautical miles EEZ. The accent of this policy was on increasing fish production and acquisition of DSFVs by the entrepreneurs through joint ventures and lease arrangement in tie up with foreign collaborators. Apart from exploitation of the resources, the policy permitted entrepreneurs to enter into foreign collaboration for setting up 100 percent export-oriented units for production of value added marine products in the country.

Till the end of 1991, this Policy permitted 09 companies to enter into foreign collaboration for import and leasing of 21 DSFVs for operation in the Indian waters. For the first time in the country one company was also permitted to conduct test fishing in tuna purse seining with foreign collaboration. Experienced deep sea fishing companies from Thailand, DPR Korea, South Korea, Japan, Denmark, the Philippines and Russia showed interest for collaboration with Indian companies under the 1991 Policy. Apart from exploitation of resources, five companies were permitted to enter into foreign collaboration to set up 100 percent Export Oriented Unit for production of value-added marine products. Most of these companies proposed to set up IQF plant (Individual Quick Freezing) and quick freezing plant for shrimp and fish. Acquisition of DSFVs was rather slow during the year 1991 mainly in view of poor shrimp catch, fall in international prices of shrimp, high cost of inputs for operation of DSFVs and agitation of a section of crew of DSFVs in Visakhapatnam. In 1991 the total number of DSFVs was 180 as compared to 172 during 1990. In order to study the problems of deep sea fishing industry, a study was also initiated with the assistance of the Food and Agriculture Organization (FAO) of the United Nations on deep sea fishing industry.

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[5] ***Beginning 1989 the subject of deep sea fishing along with the Fishery Survey of India was transferred to the newly created Ministry of Food Processing Industries (MFPI). The subject remained with the MFPI until mid-1987 when it was transferred back to the Ministry of Agriculture.***

Starting from 1993 onwards, the foreign fishing fleet operating under the above-mentioned policies in the Indian EEZ started inviting considerable amount of criticism leading to agitation by the National Fishworkers' Forum and the National Fisheries Action Committee. These DSFVs were alleged to fish in near-shore waters, often within the territorial waters, causing much damage to the resources as also the livelihoods of small-scale fishermen. This resulted in the setting up of a Committee[6] by the Ministry of Food Processing Industries (MFPI) in February 1995 under the chairmanship of Shri P Murari, former Secretary to the Government of India and was popularly referred to as 'Murari Committee'. One of the tasks assigned to the Committee was to ascertain whether the operation of vessels under the new deep sea fishing policy or under charter had affected the livelihoods of traditional fishermen and the marine ecology adversely and to suggest measures for protecting the interests of traditional fishermen and reducing the areas of conflict between traditional fishermen and deep sea fishing vessels.

This Committee submitted its report to the Government in February, 1996. The recommendations of the Committee were examined at the inter-ministerial level and thereafter the Cabinet Committee on Economic Affairs (CCEA) accepted 21 recommendations of Committee. Based on the acceptance of the recommendations, the New Deep Sea Fishing Policy of 1991 was rescinded and no new permit, extension or renewal of the permits under the above policies was given. This decision of the Government also brought to an end the third phase of the country's attempt to exploit the deep sea fisheries resource through foreign fishing vessels and other similar arrangements.

2.0 Chronological development of deep sea fishery in India post-1996

This part of the chapter deals with the developments that took place in the deep sea fishing sector post-1996. After acceptance of the recommendations of the Murari Committee by the CCEA, no new initiative was undertaken by the Government of India until the year 2000-2001 when the EXIM (Export-Import) policy of the Government of India (Ministry of Commerce and Industry) permitted import of fishing vessels through the special import license (SIL) route. Further, in the EXIM Policy, no Guideline/approval of the line Ministries (in this case the Ministry of Agriculture, Government of India) was required. Taking advantage of this policy, in 2001, some entrepreneurs imported DSFVs and started operating in the Indian EEZ. However, these fishing operations were carried out without the approval of the Ministry of Agriculture (Department of Animal Husbandry & Dairying; DAH&D)[7]. A total of 11 Indian Companies imported 32 DSFVs on deferred payment basis during that year and started operations after registration with the Mercantile Marine Department (MMD) and on obtaining foreign crew clearances from Ministry of Home Affairs (MHA).

Although initially these acquisitions and their operation in the Indian EEZ were termed illegal by the Ministry of Agriculture, but accepting the fact that the Indian deep sea fishing industry was not fully equipped in terms of technology and finances to take up the venture by itself, the Ministry of Agriculture agreed to the continuation of fishing operations by the vessels brought under the EXIM Policy. Further, to regularize and monitor the vessels that were brought into the country under the

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[6] ***The Committee to Review Deep Sea Fishing Policy was set up in February 1995 under the chairmanship of Shri P Murari, the former Secretary to the Government of India. The Committee was thrice re-constituted and finally had a membership of 41 members, including 16 Members of Parliament. The other members were drawn from the concerned Ministries/ Department in the Government of India, Secretaries In-charge Fisheries of the coastal States and representative of fishermen associations and the deep sea fishing industry. The Committee submitted its Report to the Government in February 1996.***

[7] ***The DAH&D was later re-christened as the Department of Animal Husbandry, Dairying and Fisheries or the DAHD&F.***

said Policy, in June 2002, the first batch of Letter of Permissions (LOPs) was also issued to 11 companies for operating 32 vessels.

In the next step of regulatory actions, the Government of India issued the first set of Guidelines on 01 November 2002. These guidelines, with the purport of ensuring proper conduct of the DSFVs in the Indian EEZ, qualified the resource-specific fishing methods ((i) long lining for tuna, (ii) tuna purse seining, (iii) squid jigging and squid hand lining, (iv) mid-water pelagic trawling, (v) trap fishing) that were allowed under the LOP, and also outlined 21 dos and don'ts for the proper conduct and smooth operation of such fishing vessels. The Guidelines also defined deep sea fishing (fishing activities beyond 12 nautical miles from the shore line *i.e.* the Territorial Waters) and deep sea fishing vessels (fishing vessels of 20 meter overall length and above).

The Government of India vide its order dated 06 September 2004 marginally amended the 2002 Guidelines by incorporating two additional resource-specific fishing methods, *viz.*, (i) hook and line fishing and (ii) pole and line fishing.

The fisheries sector, since the planned development began in the country, has been largely guided by the policies outlined in the working papers prepared for the Planning Commission at the beginning of each Five-Year Plan period. However, keeping in mind the issues before the deep sea fishing sector and also the growing chasm between the small-scale and deep sea fishing operators, the Government set up a Committee to prepare a comprehensive policy for marine fisheries sector as a whole. Thus in October 2004 the Government released the long overdue first Comprehensive Marine Fishing Policy (CMFP, 2004)[8]. This policy, looking at the sector comprehensively, provided over-arching guidance for the development of the sector in the mainland as also in the two groups of Islands. The CMFP, 2004 *inter alia* underscored the need for stringent management measures and to promote exploitation of the resources in the deep sea.

As per the decision of the CCEA on the CMFP, 2004, an Inter-Ministerial Empowered Committee (in all subsequent references referred to as the EC) was constituted in November 2004. The EC was primarily tasked to consider proposals of the Indian entrepreneurs for deep sea fishing by acquisition through construction/import of DSFVs for issuance of LOP and to prescribe norms for joint venture, development of post-harvest technologies and human resource development in the sector. The EC was also tasked to make recommendations on various issues related to development of marine fisheries in India and also to advice the Government on implementation of CMFP, 2004.

In pursuance of the directives of the CCEA on the CMFP, 2004 and on the recommendations of the EC, the Government of India in May 2005 issued a Public Notice relating to operation of DSFVs. Some of the significant aspects of the Public Notice included the total number of resource-specific vessels that could be allowed for operation in the EEZ during the next five years; processing fee and paid up capital and equity component. On the total number of resource-specific vessels that could be permitted, the Public Notice stated that 725 vessels could be permitted, which also included 500 numbers of fishing vessels using the pole and line fishing method. The number of DSFVs to be allowed for fishing in the Indian EEZ was worked out in consultation with the premier research institutions such as the Central Marine Fisheries Research Institute (CMFRI), Kochi and the Fishery Survey of India (FSI), Mumbai.

The 2002 Guidelines (as amended in September 2004) were further amended in May 2006 by including monofilament longliners of 15- 20 meter OAL. There was no other major change in these

[8] The CMFP, 2004 has been separately reviewed under TOR-1 of the present document.

new Guidelines. Further, in December 2006, as a follow-up on implementation of the actions of the CMFP, 2004 and based on the recommendations of the EC, the Government issued another Public Notice, whereby operation of DSVFs of 20 meter OAL and above were also permitted under Joint Venture. However, in this category only tuna long liners, squid jiggers, purse seiners and pole and line fishing vessels were permitted, which continued to be regulated by the total number of fishing vessels permitted under the Public Notice issued in May 2005.

In view of the number of issues that had emerged in operation of the deep sea policies and also the Guidelines, the Government constituted an Expert Group[9] in August 2008 for 'Reviewing the Deep Sea Fishing Guidelines in the Indian EEZ'. The Expert Group submitted its report to the Government in October 2008 and was considered by the EC at its 11th meeting held on 16.4.2009, and also in its subsequent meetings. The Report submitted to the Government stated that the Guidelines on deep sea fishing in vogue were either not properly complied with by the LOP operators or could not be effectively implemented due to various reasons. The Report suggested that many provisions of the Guidelines such as vessel registration, mid-sea transhipment, deferred payment for the cost of the vessels, phasing out of foreign crew, capacity building of Indian crew and compliance to international obligations needed revision. The Report also provided a revised version of the Guidelines for consideration of the Government. The Report while retaining the total number of DSFVs to those approved by the Government earlier, suggested that the policy of LOP may not be continued beyond 2012. The recommendations *inter alia* also suggested increase in the number of Indian crew (from the prevailing 25 % percent to 50 %), need for training of Indian crew, instalment of Vessel Monitoring System (VMS) in the vessels, setting up of a single window system for granting approvals and enactment of a comprehensive fisheries legislation for effective control and compliance for regulated and responsible fishing in the Indian EEZ.

Based on the recommendations contained in the CMFP, 2004 and subsequently in the 2008 Expert Group set up by the Government, the Marine Fisheries (Regulation & Management) Bill was prepared by the Government in June, 2009 and circulated to the concerned Ministries/Departments, Scientific Institutions, coastal States/UT Government, NGOs, Fishermen Associations, etc. for their comments. In January 2010, the Government also convened a National Consultation involving Fishermen Associations/NGOs and concerned coastal State Governments under the chairmanship of the then Agriculture Minister to discuss the draft Bill. Subsequently, in February 2010 a second consultation was organized involving Ministers-In-charge of Fisheries of all the coastal States/UTs and selected fishermen associations/NGOs to discuss the provisions of the draft Bill and also the comments received in the earlier consultation. The draft Bill after revision was then submitted to the Ministry of Law & Justice for vetting before its submission to the Cabinet[10].

Another significant development took place in July 2011 when the EC constituted a Sub-committee to suggest streamlining of the procedures for LOP vessels. The TORs of the said Sub-committee included (i) simplification of procedures for issuing LOP/LOR/LOI, (ii) requirement of radio license, (iii) issues relating to surrender of LOP and Bank guarantee, (iv) verification of credentials of

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[9] ***The Expert Group was constituted in August 2008 under the chairmanship of Dr S Ayyappan, the then Deputy Director General (Fisheries), Indian council of Agricultural Research, New Delhi. The Group comprised 16 members (including the chair) drawn from the concerned Ministries/Department of the Central Government and representatives of the Association of Deep Sea Fisheries and Fishing trawlers and Allied Industries Owners Welfare Associations. The TORS given to the Expert Group inter alia included review of the then Guidelines for operation of DSFVs in the Indian EEZ; prescribe revised Guidelines; review the level of compliance of the deep sea sector with various regional and global requirements with respect to fisheries governance and advice the Government on draft Maritime Zone of India Act for Regulation of Fishing and Fisheries by Indian Vessels.***

[10] ***The said Bill finally could not be passed by the Parliament and with the dissolution of the 15th Lok Sabha on 18 May 2014, the Bill now stands lapsed.***

foreign companies, (v) requirement for LOPs for vessels converted under the scheme of Marine Products export development authority (MPEDA), and (vi) suggestion from the Director General, Shipping (DG, Shipping) regarding acquisition of DSFVs by Indian Companies on deferred payment basis. The Sub-committee submitted its report to the EC on 22 November 2011 and the said report was considered by the EC at its 16th and 17th meetings held on 28.02.2012 and 18.09.2012 respectively.

Based on the recommendations of the Sub-Committee, the Government issued a Public Notice and Guidelines on 18 January 2013. This Public Notice/Guidelines expanded/added some new stipulations, particularly in respect of crew, reporting, mid-sea transhipments, payment of instalments, Bank guarantee and compliance with the requirements of the Indian Ocean Tuna Commission (IOTC)[11].

Subsequently on 01 August 2013, the Government constituted an Expert Committee (the present one) for Comprehensive Review of Deep sea Policy and Guidelines with the specific TORs to (i) undertake review of the Comprehensive Marine Fishing Policy of 2004 and to suggest a new policy; (ii) review existing guidelines for deep-sea fishing in the EEZ; (iii) suggest full exploitation of catch, potential in EEZ and in international waters; and (iv) examine the status of compliance of regional and global requirements of management and regulation of marine fisheries including CCRF (Code of Conduct for Responsible Fisheries) and proposed FAO Guidelines on Flag State responsibilities. The report of the Expert Committee is in the process of consideration of the Government of India.

3.0 Review of the existing guidelines for deep sea fishing in India

Besides shrimp farming in the coastal areas of the country, fishing rights and responsibilities in the deep sea fishing sector have been the most debated subject in the Indian fisheries sector since the mid-nineties. Shrimp farming was embroiled in a Public Interest Litigation culminating in a very harsh judgment by the Supreme Court in December 1996[12]. Although the deep sea fishing matters did not reach the Apex Court but invited strong reaction from a large section of the coastal fishers and their associations leading to setting up of a National-level Committee and subsequent rescinding of the licenses given to the deep sea operators in 1996. Many deep sea operators aggrieved by the decision of the Government filed cases against the Government in the High Courts as also some of the fisher associations filed cases seeking remedy from the courts on matters of closed season, jurisdiction of the coastal States in waters beyond 12 nautical miles, etc. The outcomes of these cases are not elaborated here but it may be relevant to state that in all the cases, the Higher Courts ruled in favour of the Union Government, setting at rest many misgivings and erroneous notions on the powers of the Central government, etc.

Various user groups have different opinions on the modalities of harnessing the marine fisheries wealth, especially from the deeper waters. Presently, deep-sea fishing can be seen as a sector with diminishing fleet strength of vessels above 20 meter OAL. The majority of vessels above 20 meter OAL belong to the category of LOP vessels, which have been procured by the Indian entrepreneurs under the deferred payment scheme. On the contrary, the number of fishing vessels below 20 meter OAL in the extra-territorial waters (> 12 nautical miles) has swelled in the last decade and more and more such vessels are now increasing their range of operations, endurance and also their operational efficiencies to fish for longer periods in the deeper waters.

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[11] ***India is a founding member of the IOTC, which is a Regional Fisheries Management Organization set up under Article XIV of the Constitution of the food and agriculture organization of the United Nations.***

[12] **In *S Jagannathan vs Union of India* (WP 561/1994).**

Traditionally, the Indian fishing community is 'coastal' in character and has engaged in near-shore fishing. With the advent of mechanization and increasing pressure in the coastal waters, the fishers have gradually started moving off shore, but are yet to assume the true attributes of a deep sea fishing community. Poor entrepreneurship in deep sea fishing, lack of endurance, use of old and outdated technologies, absence of R & D inputs in modernization of the fishing fleet are some of the hurdles yet to be crossed by the marine fisheries sector to make India a true deep sea fishing nation.

As mentioned in the early part of this chapter, in the past, the Government of India allowed fishing by foreign vessels through charter, leasing, test fishing and joint venture arrangements. These policies were initiated in the early eighties and continued until the mid-nineties. Indian entrepreneurs tied up with fishing companies from the south-east and far-east Asian countries for exploitation of the deep-sea resources. However, none of them succeeded due to one or the other flaws in the policy and or poor enforcement of the regulations under which such deployments were made. Finally, strong opposition from the small-scale fishers and other sections of the society compelled the Government to withdraw the policies in compliance of the decision of the Cabinet Committee on Economic Affairs (CCEA) in September 1996. While rescinding the earlier policies, the CCEA's directions on the future conduct of deep sea fishing policies *inter alia* stated the following:

(i) not to issue fresh permits for foreign flag vessels under any of the earlier schemes of charter, leasing, etc;

(ii) not to extend validity of the existing permits upon their expiry;

(iii) to consider permitting de facto Indian fishing vessels for specific fishing in the EEZ; and

(iv) to allow joint venture in deep sea fishing with minimum of 51 percent Indian equity.

Based on the decisions of the CCEA, between September 1996 and 2000, all permits for foreign flag vessels were exhausted and no renewals took place.

3.1 Background

To bring out a clear picture of how the fourth phase of deep fishing began in the country and even at the cost of repition, it may be useful to begin this part of the report with a brief description of the introduction of DSFVs under the 2000-2001 EXIM Policy of the Ministry of Commerce & Industry. Using the Special Import License (SIL) route, many entrepreneurs started fishing operations in the EEZ with imported vessels. Since the EXIM Policy did not stipulate any guideline or approval of the nodal Ministry (the Ministry of Agriculture in this case), and since this development was not in accordance with the 1996 decisions of the CCEA on the recommendations of the Murari Committee, inter-ministerial consultations were held and it was decided that fishing in the EEZ had to be in accordance with the directives of the CCEA and with the consent of the nodal Ministry *i.e.* the Ministry of Agriculture. The Government also decided that since the Comprehensive Marine Fishing Policy was under finalization at that time, it would be expedient on part of the Ministry of Agriculture to allow deep sea fishing in accordance with the 1996 directives of the CCEA on the subject of deep sea fishing.

Accordingly, the first set of Guidelines allowing fishing operations in the EEZ were issued on 01 November 2002. These Guidelines also regulated the fishing operations of 32 deep sea fishing vessels imported by the Indian entrepreneurs under the EXIM Policy of 2000-2001. Since then, in the absence of any legal instrument, regulation of fishing activities of vessels flying Indian flag in the EEZ is governed by the Executive Orders (and Guidelines) issued by the Government of India (Ministry of Agriculture) from time to time. The following paragraphs provide a review of these

Executive Orders (and Guidelines) and a critique on their usefulness on meeting the larger objectives of sustainable exploitation of the marine resources in the Indian EEZ.

The first set of Guidelines issued in 2002 defined five key words (Deep Sea Fishing, Deep Sea Fishing Vessels, Operator, EEZ, CCRF); permitted five fishing methods ((i) long lining for tuna, (ii) tuna purse seining, (iii) squid jigging and squid hand lining, (iv) mid-water pelagic trawling, (v) trap fishing); designated areas of operation and also prohibited areas; and stipulated set of conditions that *inter alia* included reporting of position, crew list, mid-sea transfer of catch and bunkering, assignment of foreign crew, mandatory fitting of Vessel Monitoring System (VMS), base ports and right to inspect the vessel. In September 2004, these Guidelines were first amended, introducing two more fishing methods (Hook and line fishing and Pole and line fishing). The other conditions remained unchanged. The Guidelines and the Public Notices inviting proposals for deep-sea fishing prescribed the following main conditions:

a) An Indian company would be permitted a maximum of 4 vessels;
b) On any application considered complete in every respect, the Empowered Committee would recommend issue of Letter of Intent (LOI) to facilitate the entrepreneur to acquire the vessels through import, etc;
c) The LOI is to be converted into Letter of Permission (LOP) within a period of six months after completing due formalities;
d) The vessel will be registered with Mercantile Marine Department (MMD)/Director General (DG) Shipping and fly the Indian flag;
e) At least 10 percent of the down payment is to be made in respect of each vessel allowing suppliers' credit for the balance amount;
f) The companies will furnish a schedule of payment of the balance amount towards cost of each vessel and proof for payment thereafter in the form of banker's document. Apart from this the company should have a minimum capital of Rs. 10 lakhs to be eligible for LOP for 2 vessels and for every additional vessels a maximum of 4 vessels an additional paid up capital of Rs. 5 lakhs per vessel would be required;
g) An application processing fee of Rs. 10,000/ per vessel will be levied by the Department;
h) The companies will be allowed to operate with 75 percent of foreign fishing crew during the first year of operation and subsequently to phase out the foreign crew at the rate of 25 percent every year (based on Industry's representation citing acute shortage of trained Indian crew for substitution of foreign crew, the requirement of 25 percent replacement every year was reduced to 15 percent);
i) All foreign nationals as crew will be screened as per the guidelines provided by the Ministry of Home Affairs (MHA) and cleared by them before the list is endorsed to the Coast Guard and DG, Shipping;
j) The LOPs also included conditions such as conduct of fishing operations, and submission of reports to the Coast Guard with respect to the vessel's position and to the Fishery Survey of India for providing catch data;
k) The vessels will be inspected/cleared by the Coast Guard before commencement of the initial voyage and also after each time the vessels return to the EEZ;
l) The vessels will be allowed to avail mid-sea bunkering and mid-sea transhipment as per norms laid down by the Reserve Bank of India/Custom, etc.; and
m) The Companies will be allowed buy-back arrangement for the catches and also to adjust the sale proceeds towards instalments of the cost of the vessel.

Apart from above, at the instance of the Inter-Ministerial EC on Marine Fisheries, it was also decided that:

i) *Transhipment and mid-sea bunkering should take place within the customs waters;*

ii) *Prior permission before leaving Indian waters should be obtained; and*

iii) *Renewal of crew clearance should be used as a check point for verification of compliance of the vessels with respect to (a) payment of instalment towards vessel cost, (b) submission of voyage report, (c) phasing out of foreign crew and (d) submission of full particulars of the vessel in respect of tuna long liners as prescribed by Indian Tuna Ocean Commission.*

Since the initial Guidelines issued in November 2002 and its first amended version (of September 2004) defined DSFVs as vessels of 20 meter OAL and above, the vessels of less than 20 m OAL were ineligible for grant of permission (LOPs) for fishing in the EEZ. However, in May 2006 this definition of DSFVs was revised to accommodate vessels of 15-20 meter OAL, mainly the monofilament long liners of 15-20 meter OAL, which were converted from trawlers under a scheme of the MPEDA. As per these Guidelines, the revised definition of DSFVs read as "*any fishing vessel registered under Merchant Shipping Act, 1954 (MS Act, 1954) as capable of engaging in deep-sea fishing with 15 meter overall length and above*". Following this revision, vessels of 15 meter OAL and above were also permitted for deep-sea fishing after obtaining the Letter of Registration (LOR) issued by the Ministry of Agriculture. However, such vessels were not permitted to do mid-sea transhipments. Besides, the rights for mid-sea transhipment were also not available for vessels that were acquired through Joint Ventures (JV). The additional conditions placed on the JV vessels included onshore facility for processing and ceiling of aggregate tonnage of 400 GRT per company.

The vessel owners to whom LOP/LOR were issued were required to comply with the conditions such as maintaining the desired ratio of Indian/foreign crew on board, submission of voyage reports to Fishery Survey of India (FSI), Mumbai, adhering to mid-sea transhipment guidelines of the Reserve Bank of India (RBI), mid-sea bunkering norms of the Department of Customs, license requirements for installing/operating wireless equipment on board and other such conditions as mentioned in the Deep Sea Fishing Guidelines. Besides, the vessel owners were also required to meet requirements as laid by MPEDA and DG Shipping relating to registration and inspection of fishing vessels, etc.

The DSFV vessel operators made representations citing various problems *viz*., delay in according foreign crew clearance and their phasing out, repayment of installment towards vessel cost, difficulties faced at Ports, registration of vessels with MPEDA, reporting of fish catches, transshipment within Customs Waters, procedures for leaving the EEZ, registration/deregistration by DG Shipping, registration with IOTC, concessional duty for tuna fishing gear and equipment and duty free fuel for tuna fishing operations, etc. The EC at its seventh meeting held on 10.9.2007 considered the above mentioned issues and decided to constitute a Sub-Committee to look into the issues[13].

The Sub-Committee submitted its report to the EC at its 9th meeting held on 11.7.2008. Since the Sub-Committee could not agree on many issues which were part of its TORs, the EC directed constitution of an 'Expert Group' and also suggested that the recommendations/findings of the Sub-Committee may be considered by the Expert Group while considering revision of the Guidelines.

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[13] This Sub-committee was constituted under the chairmanship of the then Fisheries Development Commissioner (Mr M K R Nair).

The Expert Group was constituted in August 2008 and it submitted its report to the Ministry of Agriculture in October 2008. The Expert Group recommended that the policy of LOP should continue till an indigenous fleet is developed but not beyond 2012. The EC considered the report of the Expert Group and agreed to some of the recommendations such as revalidation of marine fishery potential, norms relating to phasing out of foreign crew and extending the validity of provisional registration of DSFVs. However, decision on other recommendations was deferred by the EC since many recommendations were linked with the proposed 'Marine Fisheries (Regulation and Management) Bill', which was being drafted at that time.

Let us take a pause at this stage and recap the journey of the deep sea fishing policies and guidelines so far. It is seen that since November 2002 when the first set of Guidelines were issued, many revisions took place, although the actual deviations from the original Guidelines were few. For instance, the LOR was introduced in May 2006 to accommodate vessels of 15-20 meter OAL and additional conditions for joint venture proposals were added in December 2006. Accordingly, there were two separate 'Public Notices' inviting applications for permits. While the May 2005 Public Notice was for acquisition of vessels on outright and deferred payment basis, the other Public Notice issued in December 2006 was for acquisition of vessels through Joint Venture. These two Public Notices differed marginally- one meant only for JV proposals, and the other also included provisions for JV proposal, with a proviso of ceiling of aggregate tonnage of 400 GRT per company and limiting the maximum number of JV proposals to 25 percent of the notified capacity.
It was also felt in various quarters that the existing system of grant of LOPs involved multiple approvals and cumbersome procedures. For example, the Ministry of Agriculture frames the Guidelines, grants LOPs and subsequently provides the voyage clearances; the MMD/DG, Shipping grants registration to vessels; the Department of Telecommunication provides license for communication equipment; the MPEDA registers the vessels for the purpose of export of fishes; the MHA clears the foreign crew on the vessels; the RBI and the Customs approve the mid-sea transhipment of fish catch; and finally the Coast Guard monitors the compliance of the TORs of LOPs during operation of the vessels in the Indian EEZ. Therefore, a need was felt to streamline and simplify the procedures to make it easy for the operators to comply with the requirements. Such streamlining was also required for effective implementation of the deep sea fishing guidelines by the Ministry of Agriculture and achieving its primary objective of sustainable exploitation of the deep sea resources.

In view of the issues mentioned in the foregoing para, the EC in July 2011 constituted a Sub-Committee with the mandate of suggesting measures for streamlining procedures for grant of LOP and other clearances, requirements for radio licence, issues relating to surrender of LOP and bank guarantee, verification of credentials of foreign companies, requirement of LOP vessels converted under the scheme of MPEDA and suggestions from DG, Shipping regarding acquisition of DSFVs by Indian companies on deferred payment basis. In its report submitted to the EC, the Sub-committee noted that the nomenclature 'Letter of Registration (LOR)' was misleading as the Ministry of Agriculture was not providing registration to any vessel but only granted permission to fish in the EEZ. The Sub-committee also opined that the LORs were introduced to accommodate the mechanised vessels (mainly trawlers) converted into tuna long-liners under a scheme administered by the MPEDA. These vessels range between 15-20 meter OAL and being less than 20 meter OAL are not registered by the MMDs. Besides, the definition of the DSFVs as per the original Guidelines of the Ministry of Agriculture include vessels of 20 meter OAL and above. Further, the Sub-committee also opined that globally vessels less than 20 meter OAL rarely qualify to be a DSFV. In the case of IOTC also, the Commission only includes vessels of 24 meter OAL and above in its database. In the Indian context too, the MMDs register vessels of 20 meter OAL

and above and Rules stipulate mandatory requirement for communication and safety equipment on board a fishing vessel of 20 meter OAL and above.

The Sub-Committee also noted an anomaly in the Government's policy on mid-sea transhipment of catch being allowed to LOP vessels but denied to the LOR vessels. The Sub-Committee was of the view that due to such restrictions almost no applications seeking LOR or acquisition of vessels through JV mode were received.
The Sub-Committee while reviewing the number of valid LOPs, noted that the fleet plan for the EEZ allowed operation of 725 vessels comprising 500 pole & line vessel, 110 tuna long-liners, 72 pelagic/mid-water trawlers, 18 purse seiners, 15 squid jiggers and 10 trap & hook-line vessels. The Sub-Committee further noted that as on 31st October 2011 there were only 81 valid LOPs, implying that only about 11 percent of the fleet plan was being utilized. Of these 81 valid LOPs, 74 vessels were either tuna long-liners or mid-water trawlers. There were no applications for pole and line vessels. The Sub-Committee also expressed their concern on many applications submitted by non-serious applicants, which was corroborated by the fact that only about 60 percent of the LOIs issued were converted into LOPs, the rest failing to meet the requirements of the LOI issued to them.

The Sub-Committee further expressed its concern on the lack of mechanism to trace the whereabouts of the surrendered LOPs and raised the possibility of External Commercial Borrowing (ECB) norms of the RBI/Foreign Exchange Management Act (FEMA) violations in such cases as some of these acquired vessels were sent back/sold to the foreign suppliers.

The Sub-Committee submitted its report on 22.11.2011, which was considered and endorsed by the EC at its 17th meeting held on 18.9.2012. The recommendations made by the Sub-Committee were accepted with minor modifications. The main deviations from earlier Guidelines as suggested by the Sub-committee and agreed by the EC are as below:

	Earlier Procedure	**Major changes as accepted by EC**
1	Letter of Intent (LOI) valid for six months and extendable without any limit.	Provisional LOP valid for one year during which the entrepreneur has to bring the vessel and get it registered with MMD. Provisional LOP cannot be extended beyond one year.
2	Letter of Registration (LOR) for vessels of 15-20 meter OAL without mid-sea transhipment permission.	LOR removed.
3	Letter of Permission (LOP) valid permanently.	LOP to be issued for a period of five years and can be extendable for a stretch of 5 years at a time for as many times. LOP *inter alia* will be issued on production of proof of making payment of first instalments, MMD registration and a bank guarantee. Extensions for LOP will be granted on submission of proof of making full payment, no major violations reported and vessel's sea worthiness certificate from DG, Shipping.
4	Deep Sea Fishing Vessel (Definition) 20 meter OAL and above for LOP; 15-20 meter OAL for LOR.	20 meter OAL and above.
5	Joint Venture proposals: ➢ Mandatory requirement of onshore processing plant; ➢ No mid-sea transhipment permission;	JV proposals to be treated at par with other mode of prescribed acquisitions namely, deferred payment and on outright purchase basis. No mandatory requirement for processing plant.

	➢ JV proposals subject to maximum of 25% of the notified capacity; and ➢ 400 GRT limit per company.	Mid-sea transhipment permitted. No ceiling of 25 percent of notified fleet plan; and 400 GRT limit removed.
6	Ceiling on number of vessels: ➢ A company cannot apply for more than 4 vessels.	A company may be permitted to acquire any number of vessels of types other than tuna long-liner/mid-water pelagic trawlers (TLLs/MWPTs). However, in case of full payment made by the entrepreneur for first 04 vessels, additional 04 vessels including TLLS/MWPTs may also be permitted.
7	Two Public Notices: ➢ Issued in 2005 ➢ Issued in 2006	Single Public Notice [issued on 18.01.2013]
8	Deep Sea fishing Guidelines: ➢ Issued in 2002 ➢ Modified in 2004 ➢ Issued for LOR in 2006	Single set of Guidelines [issued on 18.01.2013]
9	Contains requirements specific to other agencies like MPEDA (reporting of catch exported, MPEDA registration, etc.)	Requirements specific to other agencies not directly related to fishing have been de-linked from LOP. These requirements will be monitored separately by the agency/department concerned.
10	Period of single voyage is 90 days.	Extended to 120 days.

The 'New Guidelines' and 'Public Notice' as suggested by Sub-committee were issued on 18.01.2013, and all earlier directives in deep-sea fishing sector (*viz.*, Guidelines of 2002, 2004, 2006 and Public Notice of 2005 & 2006) were rescinded. The Guidelines issued on 18.01.2013 follow the earlier definition of DSFVs as vessels of 20 meter and above.

3.2 Analysis of the Guidelines

The Indian EEZ is an open access realm for Indian nationals and presently the space is shared by the domestic fleet and also those permitted under the LOP/Joint Venture. The domestic fleet also includes the LOR vessels, which have been converted to tuna longliners from mechanized fishing vessels, mainly trawlers. The domestic fleet (other than the LOR vessels) operates in a legal vacuum, with no license or regulatory mechanism. This situation has arisen because the proposed Bill on Marine Fishing (Regulation and Management) of Fisheries in the EEZ is yet to see the light of the day.

Confronted with dwindling catches in the coastal waters, the Indian fishing fleet is now moving offshore. This situation is very well corroborated by the ICG Study[14]. Many coastal State Governments are also supporting such move through diversification of the existing mechanized fishing vessels, mainly trawlers into resource specific fishing vessels for long-lining, etc.[15] for harnessing the resources available in the EEZ. However, this development and the fact that entrepreneurs need to be supported to bring in large DSFVs to optimally exploit the deep-sea resources need a balanced approach. The first and foremost requirement in this regard is the enactment of the afore-mentioned legislation, which will not only regulate the Indian fishing fleet in the EEZ but also create a level-playing field between the domestic operators and those bringing vessels through the LOP/Joint Venture route.

[14] ***More details on the finding of the study conducted by the Coast Guard are presented under TOR-3 of this Report.***

[15] ***The Government of Tamil Nadu has engaged a consulting firm to prepare a feasibility report on moving a section of its fleet to fish in offshore waters and implementation of mother vessel concept to benefit the deep sea fishing operators.***

Coming to our critique on the several Policy Notes/Guidelines released by the Government since 2002, it is seen that due to various reasons, including multiplicity of approvals and operational problems, the number of LOPs issued since the initiation of the policy of granting LOP in 2002 has never been more than 15 percent of the total allowable fleet of 725 vessels for the EEZ. Further, most of the LOPs have been acquired for only a certain category of fishing vessels (*e.g.* tuna longliners and mid-water trawlers). The average catch of the LOP vessels since 2004 has been 1240 tonnes which is negligible as compared to the total potential of oceanic resources estimated at 216 500 lakh tonnes. While 40 vessels have been fully acquired since inception of the Policy, most of these vessels have never been in operation in the Indian EEZ at a given time. It has also been brought to the notice of the Government that some of these fully owned vessels with permanent registration are stationed at foreign ports. Further, doubts have been raised on the existing practice of mid-sea transhipment and under-reporting of fish catch. Due to mid-sea transhipments, the catch of the LOP vessels is not adequately reflected in the country's total export. The MPEDA has observed that the unit value realized by LOP vessels for their catch is too low for want of any value addition on the fish.

Capacity building of the Indian crew has been one of the important conditions on which the earlier charter/lease/joint venture vessels and now the LOP vessels have been brought into the country. By prescribing a minimum percentage of domestic crew on board these vessels, it was felt that the Indian crew would acquire the necessary skills and gain competence to engage domestically in harnessing of the deep sea resources, especially tuna and tuna-like species. While most vessels did comply with the conditions, but transfer of skills and capacity building hardly took place. Result- we do not have any significant number of crew that have worked on these vessels and can now take up deep sea fishing through the domestic vessels. On the contrary, in certain coastal areas, traditional communities have been engaging in deep sea fishing for ages and have the technical skills and endurance to take up deep sea fishing. In this regard, the example of Toothoor fishermen and the upcoming fishers from Nagapattinam (Tamil Nadu) and Visakhapatnam (Seemandhra) is worth mentioning. A section of the deep sea industry is also of the view that it would be more productive if the domestic deep sea fleet is allowed to engage one or two foreign crew so that they can provide the guidance and build the capacity of the Indian operators wherever skill/training is required.

On the issue of human resource development for the deep sea fishing sector and availability of certified personnel to man deep sea fishing vessels, there has been a long-standing requirement of the Central Institute of Fisheries Nautical and Engineering Training (CIFNET), Kochi designing appropriate courses for different category of operators and conducting such training programmes. However, this has not happened and CIFNET continues to implement the two long duration vocational courses (Vessel Navigator Course and Marine Fitter Course) and the Bachelor of Fisheries Science in Nautical Science. All these programmes largely aim at providing manpower to the merchant shipping fleet and not the fisheries sector. However, in mid-2013, CIFNET also issued an advertisement inviting applications for short-term training programme (03 months duration) on 'Deep Sea Fishing and Navigation' for providing skilled manpower to the LOP fishing vessels and in the process reducing dependence on foreign fishing crew. This course was initiated under a Memorandum of Understanding signed between the CIFNET and the All India Association of Deep Sea Fisheries, Chennai. However, the progress under this initiative is not yet known.

The engagement of foreign fishing vessels through the charter/leasing/joint venture/LOP route has also been conceived with the idea of providing raw material to the Indian processing industry so that the processing capacity set up in the country can be productively utilized. However, on the contrary,

permission to allow mid-sea transfers deprives the domestic processing sector, which is now importing raw material to meet their requirements.

It is seen that during the first revision of the original Guidelines (of November 2002) in September 2004, two additional fishing methods were introduced, *viz.*, hook and line fishing and pole and line fishing. Subsequently, in the Public Notice issued on 17 May 2005, the first fleet plan was also announced. This fleet plan provided optimum number of fishing vessels to be deployed under each category of approved fishing methods as outlined in the September 2004 Guidelines. It is assumed that the May 2005 fleet plan continues to be valid, although there is no mention of the fleet plan in either the 18 January 2013 Guidelines or the Public Notice of the same date.

The fleet plan in vogue provides the following details in terms of the category of permitted fishing methods and the total number of vessels that can deployed under each category:

Sl. No.	Category of fishing vessel	Numbers permitted
1.	Tuna long liners	110
2.	Purse seiners	18
3.	Trap/Hook and line vessels	10
4.	Squid jiggers	15
5.	Pelagic/Mid-water trawlers	72
6.	Pole and line	500
7.	**Total**	**725**

A closer perusal of the fleet plan and the LOPs issued so far shows that all the permissions have been issued in the category of tuna long liners/hook and line vessels and pelagic/mid-water trawlers, in which the maximum numbers are of tuna long liners. The other three categories of fishing methods have not received much attention. In this regard, specific mention is made here of the pole and line vessels, for which 500 numbers have been earmarked in the fleet plan. It is very difficult to comprehend why such a large number has been earmarked for a fishing practice, which is very traditional, confined to areas where skipjack tuna is reported to be available in fairly large shoals and not practiced by more than half a dozen fishing communities world-wide. In India, pole and line fishing methods is only in vogue in the Lakshadweep group of Islands where this method is practiced traditionally and the technique passed on from generation to generation. The Lakshadweep group of Islands abound in skipjack tuna and the lagoons and shallow waters around the Islands/atolls harbour the bait fish, which is essential for attracting skipjack while using pole and line method. In no other parts of the country, including the Andaman group of Islands such situation prevails so as to attract entrepreneurs to apply for LOP under this category of fishing method. Further, on account of security considerations and also the strong objections from the fishing community in the Lakshadweep group of Islands, it will be very difficult to permit deployment of such effort through the LOP route. Surprisingly, these issues do not seem to have been highlighted so far, since the number of 500 pole and line vessels continue to be shown in all fleet plans attached to the Guidelines/Public Notices issued in the past (except the most recent one).

While on the subject of fishing methods, it has been suggested during the course of the meetings of this Committee that the Government should consider setting up of Fish Aggregating Devices (FADs) in selected places to make tuna (skipjack) fishing more remunerative. Further, it has also been suggested not to allow trawling in any form.

Some of the other important issues that stem from the provisions contained in the Guidelines/ Public Notices and their actual implementation relate to the matters that can be put collectively under Monitoring, Control and Surveillance (MCS). A sound MCS regime can improve fisheries

management and help in reducing Illegal, Unreported and Unregulated fishing arising from domestic or foreign fishing fleets. Following the submissions of the Coast Guard to this Expert Committee, it is seen that most of the compliance matters such as regular reporting of position, submission of voyage report, crew compliance, etc are not being complied with. Some of the conditions such as installation of VMS have also not materialized, making the monitoring of such vessels difficult. Another issue of concern is the poor reporting of data from the LOP vessels. The available data is sketchy and in all probability does not reflect the actual catch landed by the LOP vessels.

In this regard, the Expert Committee also draws the attention of the DAHD&F to the Report of the Working Group on 'Development and Management of Fisheries and Aquaculture' for the Twelfth Five-Year Plan Period (2012- 2017). The working group has laid focus on MCS and suggested the following activities for consideration of the Government;

- Setting up of an MCS Division in the Department of Animal Husbandry, Dairying & Fisheries (DAHD&F), Ministry of Agriculture;
- Setting up of an MCS Division in Department of Fisheries of States/UT Administrations;
- Issue of biometric cards to marine fishers;
- Development of national fishermen database;
- Mandatory registration and licensing of all fishing vessels including artisanal vessels;
- Implementation of color coding for all fishing boats;
- Fitment of distress alert transmitters, GPS and other safety devices;
- Fitment of automatic identification system for tracking and regulating fishing vessels;
- Registration and licensing of boat building yards and development of a centralized data base;
- Setting up of harbor based MCS units;
- Setting up of fishermen MCS committees at Fishing Harbors (FHs), Fishing Landing Centers (FLCs) and fishing villages;
- Awareness campaign, outreach and educational programmes and capacity building at all levels; and
- Data compilation processing and dissemination.

While some of the activities suggested by the Working Group are in progress, but most others need to be considered for implementation by the DAHD&F during the Twelfth Five-Year Plan period.

In the present Expert Committee's interactions with the representatives of the deep sea fishing industry, many stipulations that are restricting the operations of LOP vessels were highlighted. The representatives were of the view that the requirements posed by the MHA, especially with regard to the engagement of foreign fishing crew were very stringent, making it difficult for them to engage the desired crew. As fishing operations in the deep sea are largely dependent on the skills and efficiency of the crew, engagement of foreign fishing crew is indispensable and the MHA's requirements need to be re-considered.

The need for ensuring sustainability while permitting operation of DSFVs in the Indian EEZ is of paramount concern as also the fact that their (DSFVs) operations do not collide with the interest of other stake-holders. Compliance of the Code of Conduct for Responsible Fisheries (CCRF) and other such international rules and regulations in the management of fish stock in the EEZ as well as national legislations/rules, *viz.* Wildlife (Protection Act), 1972; Merchant Shipping Act, 1958, etc. have also to be ensured by DSFVs in order to satisfy the various requirements as also to ensure proper conduct of fishing operations in the EEZ by all vessels flying Indian flag.

4.0 Conclusion

Concluding this critique on the existing guidelines on deep sea fishing in the EEZ, it may said that the development of deep sea fishery industry is of concern to the entire marine fisheries sector in the country because it would have considerable impact on the management of near-shore fisheries; shore-based infrastructure utilisation and post-harvest activities, both for domestic markets and export; and contributions to the food and nutritional security of the growing population. Exploitation of off-shore resources in the EEZ will have to be reconsidered in terms of not only the resources available in the EEZ but also in terms of infrastructure, a comprehensive and implementable set of rules and regulations with a strong MCS regime in place, availability of scientific and technical information on the commercial fisheries resources and the best fishing methods with which to target them, etc.

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TOR- 3: To Suggest Full Exploitation of Catch Potential in the Indian Exclusive Economic Zone and International Waters

1.0 Introduction

The fisheries sector occupies a very important place in the socio-economic development of India. The potential of the fisheries sector in general and the marine fisheries sector in particular was recognized quite early in the Indian development planning and since then a considerable amount of public effort has been channelized into the sector for developing it as a vehicle of growth. Apart from the prime consideration of securing food and nutritional requirements of the population, the fisheries sector plays an important role in trade and commerce and in the process promotes creation of millions of livelihoods for people who are often living at the margin.

Starting from a purely traditional activity in the fifties, fisheries have now transformed to commercial enterprises. The sector contributed Indian Rupees (₹) 57 369 crores[16] to the GDP (at current prices) during 2010-2011, which is 0.79 per cent of the total GDP and 4.39 percent of the GDP from agriculture, forestry and fishing at current prices. The fisheries sector has also been one of the major contributors of foreign exchange earnings and generated revenue worth ₹ 12 901.46 crores in 2010-11[17] through export of marine products.

Marine fisheries hold a special position in the development experience of the fisheries sector in India. Owing to the long coastline of the country and a set of skilled operators, marine fisheries made rapid progress contributing to the bulk of fisheries production in India. However, since 1990s the share of marine capture fisheries in total production has declined from about 60 percent in the early 1990s to about 40 percent in 2000s, due to significant increase from aquaculture. Despite these intra-sectoral changes in the last two decades, marine fisheries is still a major production system, especially in terms of livelihoods in remote and far-flung coastal areas of the country, creation of opportunities in a number of ancillary areas and most importantly for the variety and uniqueness of its products that have world-wide demand (Figure 1).

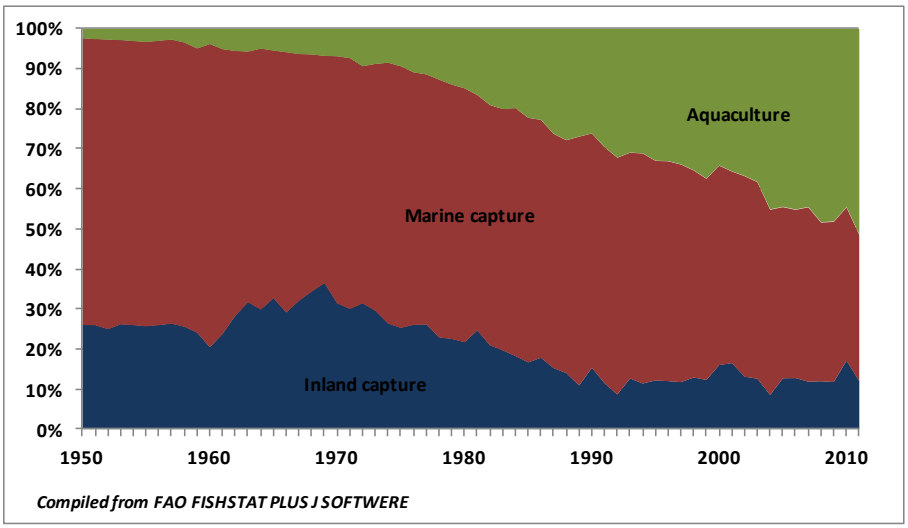

Figure 1: Sectoral composition of fisheries production in India

[16] *1 crore = 10 000 000.*

[17] *This has increased to ₹ 18 856.26 crores in 2012-13.*

As a renewable natural resource, marine fisheries have limits to growth. Technically, a fish stock can be harvested to a limit where it still retains the capacity for breeding and replenishing the population. Apart from fishing mortality and other anthropogenic shocks, fish stocks are also subjected to various natural shocks and mortalities. Further, as compared to terrestrial resources, fish stocks are under water and not visible. This makes our knowledge and information on fish biology, status of stocks and other population parameters imperfect and, therefore, estimates are based on fish landings, surveys and other indirect methods such as productivity estimates. To compensate this gap in information, it is often necessary to have precautionary limits that can balance any action, which is contrary to the tenets of sustainable exploitation. Depending on the state of science, information and knowledge, such precautionary limits can be readjusted.

In the Indian context, as mentioned above, traditionally fisheries has been a low-tech activity. Therefore, in the initial Five-Year Plan periods, focus was on technical development and in the process mechanization and motorization of fishing craft was facilitated. Status of stocks was not a concern to begin with, as subsequent to declaration of its Exclusive Economic Zone (EEZ) in 1976, India owned a vast body of national waters largely unexplored. However, with increasing number of fishers and also their fishing efficiency, fishing effort has increased to a point of caution. This concern stems from two factors, first the effort is still largely concentrated in near-shore waters and second, if the trend continues many stocks in the near shore waters are likely to be over-exploited and may collapse in the near future.

Following the decadal exercises, in 2010, the Ministry of Agriculture revalidated the potential of marine fisheries adjusting the yield to an upper limit of 4.41 million metric tonnes (mmt) from the previous estimate of 4.39 mmt. However, at the same time in terms of volume, this potential yield has almost been fully utilized from the near shore waters (up to about 200 metre depth range). In terms of revenue, the high value species occurring in deeper waters are left under-exploited. In other words, it could also be said that in both biological and economic terms, the country is losing rent[18] from fisheries resources, especially from the offshore waters, where tuna and tuna-like species form an important resource.

Therefore, exploiting full potential of marine resources is a pre-condition for ensuring flow of sustainable benefits for the country and the people dependent on it. As of now there are policies to facilitate full exploitation of the marine fisheries sector. However, as the sector is quite dynamic, there is a need to stream line policies and programmes to take advantage of the present sum of technical knowledge and state of resources. In this background, the objective of the proposed TOR is to make an assessment on how the country can best utilize this opportunity while ensuring sustainability of the marine fisheries resources. The following part of the report makes an attempt to fulfil the objectives of this TOR.

1.1 Marine fisheries resources (physical)

After declaration of the EEZ in 1976, the oceanic resources available to India are estimated at 2.02 million sq. km, comprising 0.86 million sq. km (42.6 % of the total) on the west coast, 0.56 million

[18] In economics terms, rent is a surplus value after all costs and normal returns have been accounted for, i.e. the difference between the price at which an output from a resource can be sold and its respective extraction and production costs, including normal return. This concept is usually termed economic rent but when referring to rent in natural resources such as coastal space or minerals, it is commonly called resource rent. It can also be conceptualized as abnormal or supernormal profit. In practice, identifying and measuring (or collecting) resource rent is not straightforward. At any point in time, rent depends on the availability of information, market conditions, technology and the system of property rights used to govern access to and management of resources. Source: http://en.wikipedia.org/wiki/Resource_rent

sq. km (27.7%) on the east coast and 0.60 million sq. km (29.7%) around the Andaman and Nicobar Islands (***Figure 2***). The continental shelf area amounts to 530 000 sq. km of which 71 percent area is available in the Arabian Sea (west coast) and the remaining 29 percent in the Bay of Bengal (east coast). With the absolute right on the EEZ, India has also acquired the responsibility to conserve, develop and optimally exploit the marine living resources within this area.

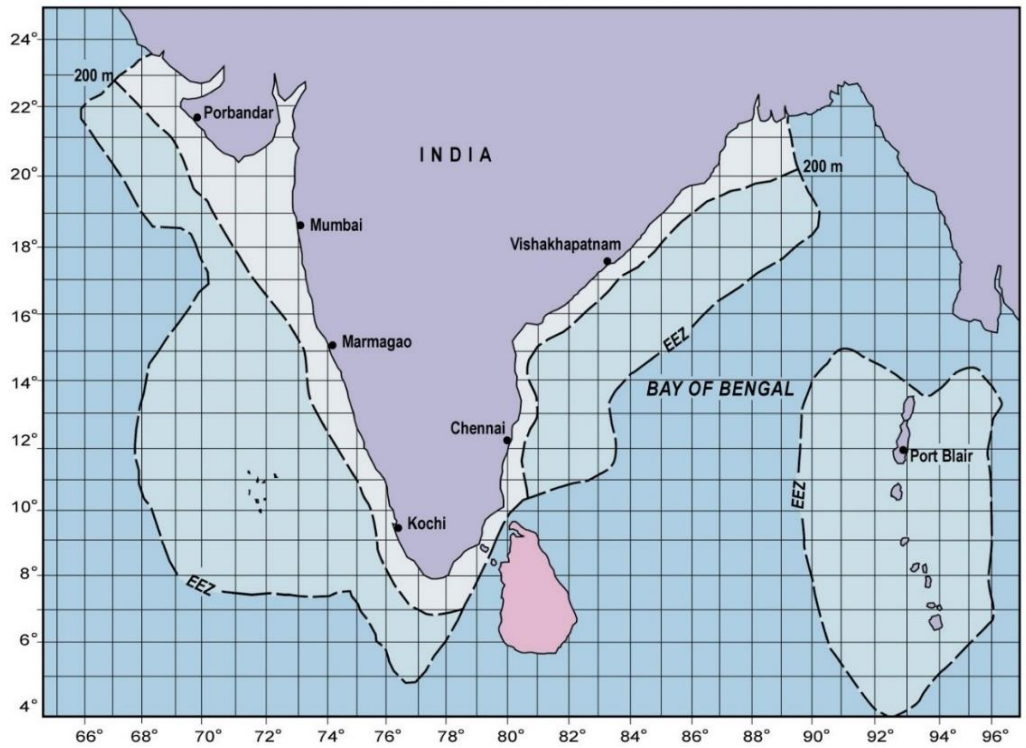

Figure 2: Exclusive Economic Zone of India

The country has a long coastline of 8 118 km and an equally large area under estuaries, backwaters, lagoons, etc, which is highly amenable for developing capture as well as culture fisheries. Marine fisheries activities are spread in approximately 1 376 fish landing centres and 3 322 fishing villages located along the coastline on the mainland and the two island territories of Lakshadweep and the Andaman & Nicobar Islands.

1.2 Some historical references to development of marine fisheries sector in India

Although fish is an integral part of the Indian culture and mythology, there was no significant effort to develop fisheries till India gained independence in 1947. The first attempt to do so was through the planning exercise (Five-Year Plans) initiated in post-Independent India. The First Five-Year Plan (FYP) (1951-56), which focused on increasing growth, identified agricultural sector as the primary driver and hence fisheries sector also gained focus in the form of technology diffusion through mechanization of indigenous fishing craft. During the same time the Central Fisheries Research Institute was also established to develop home-grown technology to support fisheries sector. Subsequently, in the Second FYP focus was more on industrial development but the activities initiated during the First FYP continued. During the Fourth FYP, emphasis was again on increasing agricultural growth. During this Plan period, the potential of fisheries sector in earning foreign exchange was revalidated, leading to the establishment of the Marine Products Export

Development Authority (MPEDA)[19] in 1972. The role envisaged for MPEDA under the statute is comprehensive - covering fisheries of all kinds, increasing exports, specifying standards, processing, marketing, extension and training in various aspects of the industry.

However, an important landmark event in the Indian fisheries experience was during the Fifth FYP (1974-79), when the Government took a more holistic view of the marine fisheries sector. During this period India also declared its EEZ of 200 nautical miles gaining exclusive access to the marine area of 2.02 million square kilometers. In this backdrop, development of deep sea fishery featured prominently in the Fifth FYP. To cite an example, it was suggested that *'A special Trawler Development Fund will be created in order to help, in particular, smaller entrepreneurs and cooperatives to purchase and operate trawlers for marine fisheries.[20]'* Among other programmes, the Fifth FYP also spelt out the importance of increasing fish production to meet the protein requirements in the Indian diet; improvement of socio-economic conditions of fishermen; and realization of enhanced foreign exchange earnings through export of selected marine products. Focus was also on developing fisheries infrastructure, especially fishing harbours and related infrastructure. This also led to development of line industries such as boat building, net making and marine diesel engine manufacture[21].

A marked shift in the FYP's approach to fisheries development was observed from the Ninth FYP (1997-2002) onwards. Although, the sector was identified as having high growth potential, emphasis was also laid on conservation of resources. The approach paper to the Ninth FYP asserted that 'Natural resources are a patrimony of the nation and it would not be desirable to excessively deplete the natural resource endowments of the country and thereby expose future generations to vulnerabilities over which they may have no control.'

1.3 Objectives of marine fisheries development in the 12th Five Year Plan

The Twelfth FYP (2012-17) was launched with the objective of 'Faster, sustainable and more inclusive growth'. It lays emphasis on *in situ* conservation and sustainable use of biodiversity to enhance livelihood security, promotion and evaluation of ecosystem services in the national planning process. This includes the study of the economics of ecosystem and biodiversity; abatement of marine pollution and prevention of traffic in marine resources. It has proposed that a multi-disciplinary autonomous body namely 'National Environment Assessment and Monitoring Authority (NEAMA)' will be set up for strengthening the processes for grant of environmental clearances and monitoring thereof. The NEAMA is also envisaged to grant clearances under the Environment (Protection) Act, 1986, including the coastal zone regulations and marine fisheries regulations. It also proposes to implement central schemes for better implementation of the Rules under the Marine Fishing Regulation Act by the Union and State Governments.

The report of the Working Group on 'Development and Management of Fisheries and Aquaculture' during the Twelfth FYP, while accepting the present situation of over-exploitation of the coastal resources, has highlighted on the need for increased effort in offshore waters. To achieve this, the report has suggested up-gradation of the fleet as well as skills and capacities of the fishers and incentives to promote diversified fishing in offshore waters; use of Fish Aggregating Devices (FADs) and Artificial Reefs (ARs) for stock enhancement; improved infrastructure; and promotion of mariculture to increase production. Further, to bring discipline and orderliness in the sector and

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[19] ***MPEDA was set up under the Marine Products Export Development Authority Act of 1972 (No 13 of 1972). The Act is administered by the Ministry of Commerce, Government of India.***

[20] ***http://planningcommission.nic.in/plans/planrel/fiveyr/5th/5planch5.html (Art 5.20).***

[21] ***Silas, E G (1977)*** **Indian fisheries 1947 - 1977.** ***Technical Report. CMFRI, Kochi (Pp 2).***

regulate the activities, the report has suggested implementation of Monitoring, Control and Surveillance (MCS) so that the growth can be achieved in a sustainable manner.

Summing up, the developmental approaches to the fisheries sector in general have remained 'production-driven'. This is logical given the low production and localized nature of fisheries during the early years. However, with marine fisheries having grown in leaps and bounds during the last four decades, a greater emphasis is now required on conservation as well as good governance of the sector.

2.0 State of marine fisheries in India

2.1 Trend in marine fish production

The marine fisheries production broke out of its inertia during the early 1970s with technological innovations and increasing pace of mechanization and motorization of the fishing fleet. Result- it found itself into a high growth trajectory during the 1980s. However, this growth trajectory did not last very long and during the 1990s production seemed to have flattened. It was believed that the volume of the catch was approaching the potential from known fishing grounds and the sector was maturing. However, from mid-2000 onwards, the sector seems to have again catapulted into a higher growth path, which is still continuing (Figure 3). This development could be attributed to various factors, such as the encouragement provided to the sector in terms of assistance to go deeper, increasing mechanization and efficiency gained and also climate-related factors, which have led to expansion of some fisheries such as oil sardines in both volume of landings as well as geographical spread along the Indian coastline.

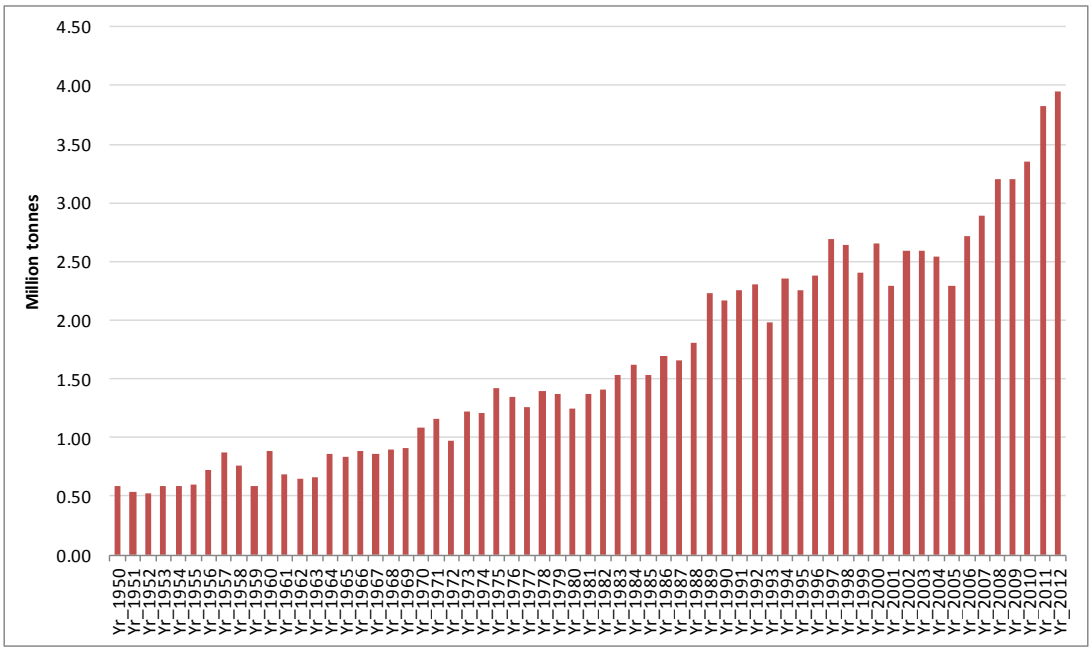

Figure 3: Growth of marine fish production in India- 1950 - 2012
(Source: CMFRI[22])

[22] ***The data used for analysis is compiled from CMFRI website, except for 2012 which is taken from CMFRI Annual Report. It may also be noted that as CMFRI does not report catch from oceanic fishery, therefore, the total catch of some oceanic species such as tuna is likely to be higher than reported here.***

An analysis of the marine fisheries production during the last five years (2008-12) shows increase in production from 3.22 million tonnes in 2008 to 3.94 million tonnes in 2012, at a growth rate of 4.56 percent per year. If this trend continues in the coming period, the production is likely to reach 5 million tonnes in another 5-6 years. In terms of catch composition, pelagic species contributed majority of the catch (average 54% during the last five years), followed by demersal (27%) and shellfishes (19%). In terms of trends in production, demersal and pelagic fisheries observed above average growth of 5.79 percent and 5.32 percent respectively during the last five years, while growth of shellfish fishery remained nearly constant (Table 1)

Table 1: Contribution of different fisheries in total marine fisheries production, 2008-12

Year	2008	2009	2010	2011	2012	Growth (%)
Pelagic fin fishes	16,85,001	16,68,987	18,39,008	21,33,268	21,33,347	5.32
Demersal fin fishes	8,66,311	9,17,708	8,63,093	9,91,988	11,17,226	5.79
Shell fishes	6,63,930	6,18,758	6,44,557	6,94,950	6,98,365	1.04
Total	***32,15,242***	***32,05,453***	***33,46,658***	***38,20,206***	***39,48,938***	***4.56***

Source: Compiled and calculated from Annual Reports of CMFRI, Kochi

In terms of individual fisheries, clupeids constituted the largest fishery in India with an average production of 0.96 million tonnes during the last five years, followed by crustaceans, perches, mackerels and croakers. In terms of growth, silverbellies have emerged as the fastest growing fisheries during the said period along with barracudas and ribbon fishes. Although most of the fisheries are experiencing a positive growth, some fisheries such as mullets and pomfrets are declining while that of crustaceans is nearly static (Table 2).

Table 2: Species-wise composition of marine fish landing in India, 2008-12

#	Species Groups	Production (in tonnes): 2008-12			Growth (%)
		2012	Total Production	Average production	
1.	***Clupeids***	***11,41,737***	***48,03,380***	***9,60,676***	***5.79***
2.	Crustaceans	4,99,824	24,83,357	4,96,671	0.46
3.	Perches	3,41,318	13,07,385	2,61,477	7.21
4.	Mackerels	1,70,410	10,61,219	2,12,244	1.45
5.	Croakers	2,14,438	10,05,102	2,01,020	3.59
6.	Carangids	2,16,447	9,38,899	1,87,780	9.11
7.	Ribbon fishes	2,36,541	9,33,359	1,86,672	12.54
8.	Molluscs	1,98,542	8,33,018	1,66,604	3.21
9.	Bombay duck	1,15,296	5,56,554	1,11,311	1.97
10.	Eel & catfishes	1,03,106	5,26,339	1,05,268	-0.01
11.	***Silver bellies***	***1,40,843***	***4,37,762***	***87,552***	***20.21***
12.	Tunnies	81,375	3,51,687	70,337	0.43
13.	Lizard fishes	70,004	2,95,638	59,128	6.70
14.	Pomfrets	47,303	2,65,404	53,081	-1.80
15.	Flatfishes	63,264	2,57,896	51,579	12.04
16.	Seer fishes	56,170	2,56,250	51,250	-0.25
17.	Elasmobranchs	52,602	2,52,876	50,575	1.71
18.	Goatfishes	31,014	1,47,061	29,412	7.88
19.	Barracudas	33,929	1,26,416	25,283	15.45
20.	Threadfins	12,588	52,362	10,472	5.17
21.	Big-jawed jumper	8,298	52,091	10,418	-0.76
22.	Billfishes	6,216	39,877	7,975	0.54
23.	Mullets	5,932	37,639	7,528	-5.89

24.	***Half beaks & full beaks***	***4,096***	***26,393***	***5,279***	***-7.49***
25.	Flying fishes	2,157	6,845	1,369	7.67
26.	Unicorn cod	1,081	3,355	671	7.47

In terms of sectoral contributions, the mechanized sector contributes about 78 percent of the landings and motorized sector contributes the balance 20 percent. The contribution of the mechanized sector is increasing. In 2009, the mechanized sector reported 74 percent of the landings while the motorized sector contributed 22 percent. This highlights the fact that the increasing production is a result of efficiency gained in the mechanized sector.

However, the reported data is landing data, which is lower than the volume of catch. The catch data and landing data varies significantly depending on the type of fisheries. Generally, non-motorized traditional sector has the least amount of discards, while the mechanized trawlers and gillnetter have larger amount of discards. A study on low value by-catches (LVB) and discards mounted by the Central Marine Fisheries Research Institute (CMFRI), Kochi during 2007-12 found that in Mumbai the average rate of discard was to the tune of 188 kg per haul with a range of 100 to 250 kg per haul, which is about 56 percent of the total catch. The multiday trawlers especially, discard a considerable volume of LVB during the first part of their voyage. The rate of discards is also reported to be high in key fishing centers such as Visakhapatnam and Mangalore (Table 3).

Table 3: Fish discarded by trawlers in different landing centres

Place/Year	2009	2010	2011	2012
Veraval	2,269	2,269	2,269	2,269
Mangalore	14,837	11,776	7,359	11,324
Calicut	1,794	3,347	1,957	2,366
Chennai	193	193	193	193
Visakhapatnam	15,040	40,089	27,565	27,565
Total	36,142	59,684	41,354	45,729

As mentioned earlier, discard is more among trawlers and multi-day vessels. As per the National Marine Fisheries Census (NMFC), 2010, conducted by the CMFRI for the mainland and the fishery survey of India, Mumbai for the two groups of Islands, trawlers constitute about 50 percent of the mechanized fishing fleet and about 18 percent of the total fishing fleet. Also considering the existing landing pattern of different categories of fishing vessels, it is assumed that about 5 percent of the total catch is discarded at the national level.

In addition, catch from oceanic waters for species like tuna (and tuna like species) is not included here. In 2008, about 92 139 tonnes of tuna was caught in coastal fishery while about 2 839 tonnes of tuna was caught in oceanic waters. In 2010, about 53 000 tonnes of tuna was caught in coastal fishery while about 24 000 tonnes of tuna was caught in oceanic fishery as per the reports submitted to the Indian Ocean Tuna Commission (IOTC) by the Ministry of Agriculture, Government of India in 2011.

Therefore, incorporating the fish discarded (and also those consumed on-board fishing vessels or self-consumed) at 5 percent level of the total landings and including production from oceanic fisheries, the present total marine fisheries catch is estimated at 4.17 million tonnes (Figure 4).

2.2 Fishing crafts

The marine fishing fleet[23] comprises about 1 99 141 fishing craft of which 52 982 (26 %) are traditional and 73 410 (37 %) motorized traditional crafts. The mechanized fishing vessels (MFVs) comprise 72 749 vessels – 37 percent of the total (Table 4). As compared to the west coast, concentration of traditional craft (including motorized) is more on the east coast (about 62 % of the total). In the case of MFVs, the trend is reverse (about 58 % of the total). The scale of mechanization is also reflected in the total fish landings of the two coasts.

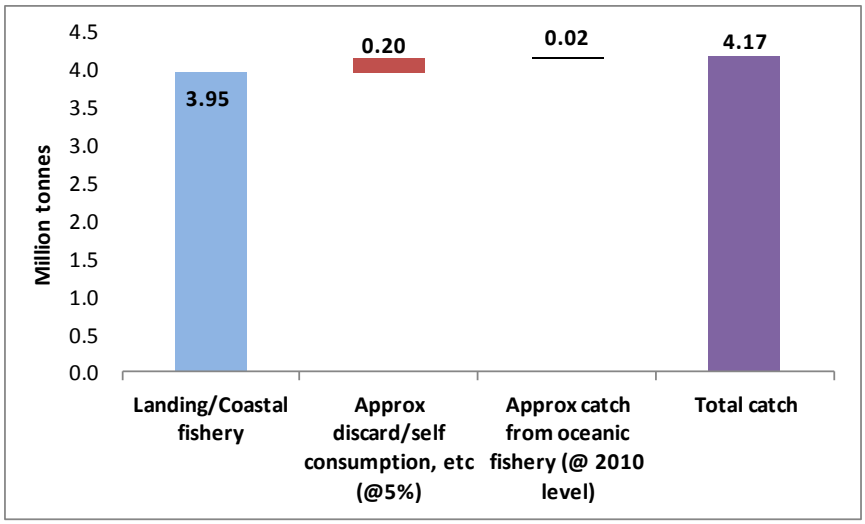

Figure 4: Approximate catch from Indian waters in 2012

Table 4: State-wise detail of fishing vessels in India (NMFC, 2010)

#	State/Union Territory	Existing fishing fleet			
		Traditional	Motorized	Mechanized	Total
1	Andhra Pradesh	17 837	10 737	3 167	31 741
2	Goa	227	1 297	1 142	2 666
3	Gujarat	1 884	8 238	18 278	28 400
4	Karnataka	2 862	7 518	3 643	14 023
5	Kerala	5 884	11 175	4 722	21 781
6	Maharashtra	2 783	1 563	13 016	17 362
7	Odisha	4 656	3 922	2 248	10 826
8	Tamil Nadu	10 436	24 942	10 692	46 070
9	West Bengal	3 066	-	14 282	17 348
10	Andaman & Nicobar Islands	1 637	1 491	61	3 189
11	Daman and Diu	321	359	1000	1 680
12	Lakshadweep	727	606	129	1 462

[23] ***Source: National Marine Fisheries Census, 2010, Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture, Government of India.***

13	Puducherry	662	1 562	369	2 593
	Total	**52 982**	**73 410**	**72 749**	**1 99 141**

The Government of India has also undertaken a nation-wide on-line registration programme of fishing crafts for creation of a database known as 'ReALCraft". The data available from ReALCraft shows that as of now 194 460 fishing vessels have been registered. The registered fleet comprises 50 298 (25.87%) non-motorized fishing vessels; 92 906 (47.78%) motorized fishing vessels and 51 256 (26.36) mechanized fishing vessels (Table 5).

Table 5: Number of registered fishing craft in the marine fisheries sector

#	Name of State	Total applications entered (RealCraft) as of March 2014			
		Non-motorized	Motorized	Mechanized	Total
1	Goa	354	0	2,360	2,714
2	Orissa	6,305	5,739	1,735	13,779
3	Andhra Pradesh	14,190	11,213	1,585	26,988
4	Andaman and Nicobar	1,898	1,882	108	3,888
5	Puducherry	1,227	1,479	765	3,471
6	Karnataka	7,439	6,508	2,869	16,816
7	Daman & Diu	0	285	1,381	1,666
8	Lakshadweep	235	1,072	5	1,312
9	West Bengal	4,594	4,218	1,814	10,626
10	Kerala	1,869	25,021	3,798	30,688
11	Maharashtra	7,135	0	16,030	23,165
12	Gujarat	101	9,797	13,133	23,031
13	Tamil Nadu	4,951	25,692	5,673	36,316
14	**Total**	**50,298**	**92,906**	**51,256**	**1,94,460**
15	**Share**	25.87	47.78	26.36	100.00
16	***West Coast***	***17,133***	***42,683***	***39,576***	***99,392***
17	***East Coast***	***33,165***	***50,223***	***11,680***	***95,068***

Source: ReALCraft Database, DAHD&F

At the end of the First FYP (1951-1956), there were 863 MFVs operating along the Indian coast. Presently, the number is 72 749. At the national level, the mechanized sector contributes about 78 percent of the landing. In 1969 it was a mere 20 percent. With the advent of mechanization, use of traditional harvesting gear like bag net, cast net, small meshed gill net has declined and more efficient gear like purse seines have become popular. As seen by the number of traditional craft and small-mechanized vessels, the major fishing activities are still concentrated in marine waters within 0 to 100 meter depth zone.

2.3 Fisher population

The NMFC, 2010 conducted by CMFRI, Kochi (for mainland coastal States/UTs) and the FSI, Mumbai (for the two Island groups) has estimated that the marine fisheries sector provides employment to about 0.9 million fishers in active fishing and to about 0.7 million fishers in various other fishing operations. The number of people involved in marine fisheries related activities include nearly 0.2 million in fish marketing, 0.1 million in repair of fisheries requisites, around 0.2 million in

fish processing and 0.1 million in other ancillary activities. In all, an estimated 3.51 million people depend on marine fisheries for their livelihoods in India.

Compared with the previous NMFC undertaken in 1980, it is seen that marine fisher population has nearly doubled from 1.87 million in 1980 to 3.51 million in 2005 and further to 4.06 million in 2010.

Among those engaged in active marine fishing, majority (80%) are in full-time fishing. Fishing as a full time profession is relatively popular in the west coast States/UTs (Gujarat, Goa, Daman & Diu, Maharashtra, Karnataka, Lakshadweep and Kerala) where 84 percent of active fishers are engaged in full-time fishing as compared to the east coast States (West Bengal, Orissa, Andhra Pradesh, Puducherry, Andaman & Nicobar Islands and Tamil Nadu), where 78 percent fishers engage in full-time fishing. This is also supported by the fact that fishing operations are more capital-intensive in the west coast States than in the east coast States. Further, this also implies that fishing as a livelihood option is more remunerative and profitable in the west coast States/UTs.

2.4 Fish exports

In early 1970s, when marine fisheries was still in the artisanal state in terms of technology, the Government put forward the constitution of MPEDA, with the objective of providing necessary incentives to fisheries trade, which at that stage was minimal. Owing to this and other export promotion incentives, export of marine products increased from a meagre 15 732 tonnes in 1961-62 to a record 928 215 tonnes in 2012-13. In relative terms, it has increased from about 1.79 percent of the total landings to 28.56 percent of the total landings. Apart from the quantitative growth, there is also improvement in the product basket with addition of commercially important species such as tuna, squids, etc. This growth trajectory has also led to the creation of a large processing capacity in accordance with global standards, which can further fuel the export of fish and fisheries products from India. In the long run, as domestic demand and preference for processed fish increases, this processing capacity will be of much use.

In terms of export earnings, frozen shrimp continue to be the largest export item (54% in value), followed by frozen fish (17%), cuttlefish (10%), squid (7%), dried items (2%), etc. Japan, USA and European Union were the major buyers of Indian marine products. The exports are now taking place through 18 sea ports in the country. The maximum exports (about 29.10%) are from Pipavav Port in Gujarat, followed by Jawahar Lal Nehru Port in Maharashtra (22.40%) and Kochi Port in Kerala (17.4%).

2.5 Fisheries potential

Pursuant to the declaration of the Indian EEZ in 1976, estimation of potential yield became a necessary condition for sustainable management of fisheries. The United Nations Convention on Law of the Sea of 1982 (UNCLOS, 1982), which provides a validation for declaration of EEZ also came with the rider that while doing so (declaring EEZ), the coastal nations should ensure sustainability of the resources. Since India's ratification to the UNCLOS, 1982, various scientific studies have been carried out to estimate the fisheries potential in the marine waters of the country. In this regard the first attempt was made in 1980 and thereafter the potential is being regularly revalidated through decadal exercises, the latest being conducted during 2010. While these estimates are *prima facie* comparable, there are also some changes from time to time. The 2010 Expert Committee tasked with the revalidation work noted that between the latest and the past potential estimates, there are some significant changes, such as increase in depth of fishing operations and fishing area and also likely impacts of climate change, especially on pelagic species.

Following the 2010 revalidation, the potential yield from the Indian EEZ has been revised upward to by 12 percent. The increase is largely due to a substantial increase of 27 percent in estimated potential yield of pelagic resources. On the other hand, there is a decline in the potential yield of oceanic resources by 11 percent (Table 6).

Table 6: Change in potential yield from the Indian EEZ

Realm	2010	2000	Change (%)
Pelagic	21,28,424	16,73,545	27.18
Demersal	20,66,763	20,17,071	2.46
Oceanic	2,16,500	2,43,800	-11.20
Total	44,11,687	39,34,416	12.13

In the current estimates, the harvestable potential of marine fishery resources in the EEZ has been estimated at about 4.41 million tonnes (mt)[24]. An estimation of the depth-wise potential shows that about 87 percent of the resources (3.82 mt) are available in 0-100 meter depth; about 6 percent (0.25 mt) in 100-200 meter depth zone and about 3 percent in 200-500 (0.11 mt) meter depth zone. The resources in depths beyond 500 meter have been estimated at 0.216 mt, which is about 5 percent of the total resources (Table 7). The oceanic resources are largely composed of tuna and tuna like species, deep sea lobsters, etc.

Table 7: Potential Yield in Indian EEZ

Depth (m)	Resource	Potential yield (Tonnes)	Share (%)
0-100	Demersal	18,25,115	41.37
	Pelagic	19,96,393	45.25
	Total	***38,21,508***	***86.62***
100-200	Demersal	2,05,104	4.65
	Pelagic	53,935	1.22
	Total	***2,59,039***	***5.87***
200-500	Demersal	98,205	2.23
	Pelagic	16,435	0.37
	Total	***1,14,640***	***2.60***
> 500	Oceanic	2,16,500	4.91
0 - 500+	**Total**	**44,11,687**	**100.00**

Looking at the potential of both the Arabian sea and the Bay of Bengal, it is seen that the South-east Arabian Sea (SEAS) has a potential yield of about 1.70 million tonnes (mt) comprising demersal fishery resources of about 0.42 mt and pelagic fishery resources of about 1.28 mt; the North-east Arabian Sea (NEAS) has a potential of about 1.25 mt comprising demersal fishery resources of about 0.21 mt and pelagic fishery resources of about 1.04 mt; the Northern Bay of Bengal (NBOB) has a potential of about 0.61 mt comprising demersal fishery resources of about 0.07mt and pelagic fishery resources of about 0.54 mt; the Southern Bay of Bengal (SBOB) has a potential of about 0.36 mt comprising demersal fishery resources of about 0.12 mt and pelagic fishery resources of about 0.24 mt and the Andaman Seas has a potential of 0.40 mt comprising demersal fishery resources of about 0.04 mt and pelagic fishery resources of about 0.36 mt (Figures 5 & 6[25]).

[24] ***The potential has been revalidated to 4.41 MT in year 2010. The estimate of 3.93 MT was worked out by a Working Group in 2000.***

[25] ***The estimate of depth-wise potential presented earlier and region-wise potential were arrived at following different approaches. Although they are comparable, they are not equal.***

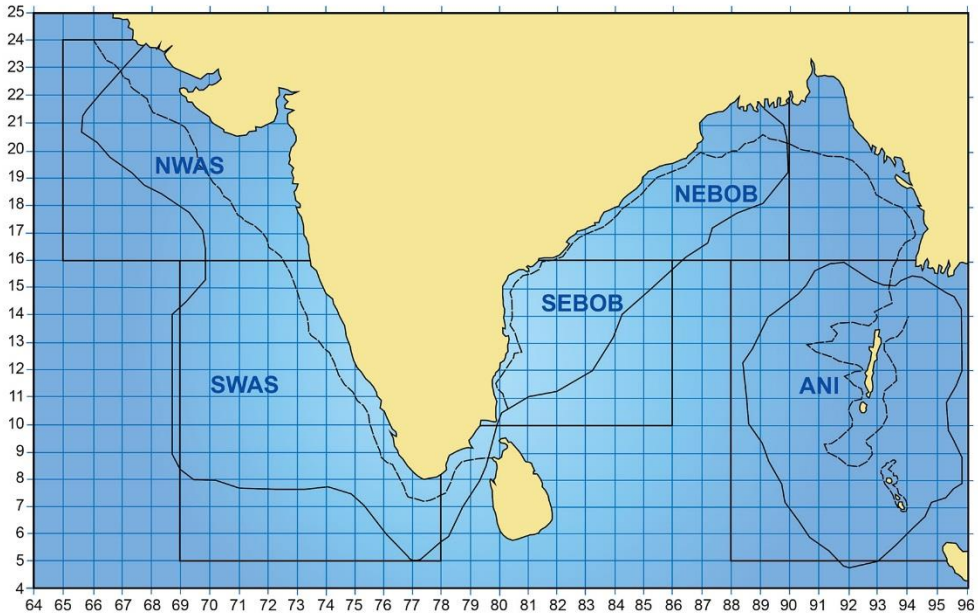

Figure 5: Marine production zones of the Indian seas

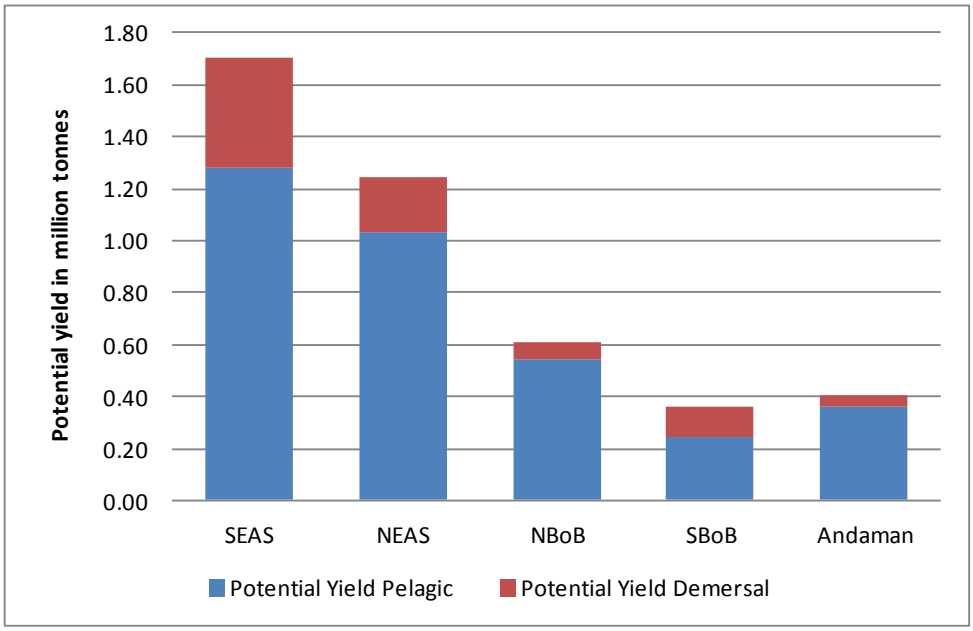

Figure 6: Summary of the potential yield in different seas of the Indian EEZ

In terms of species-wise potential, perches (ribbonfish, threadfin breams, etc) and clupeids (oil sardine, etc) and crustaceans (shrimps, etc) comprise 47 percent of the resource potential. These resources are concentrated in waters up to 100 meters. Elasmobranches and tunas constitute about 12 percent of the potential and are the main oceanic resources (Figure 7).

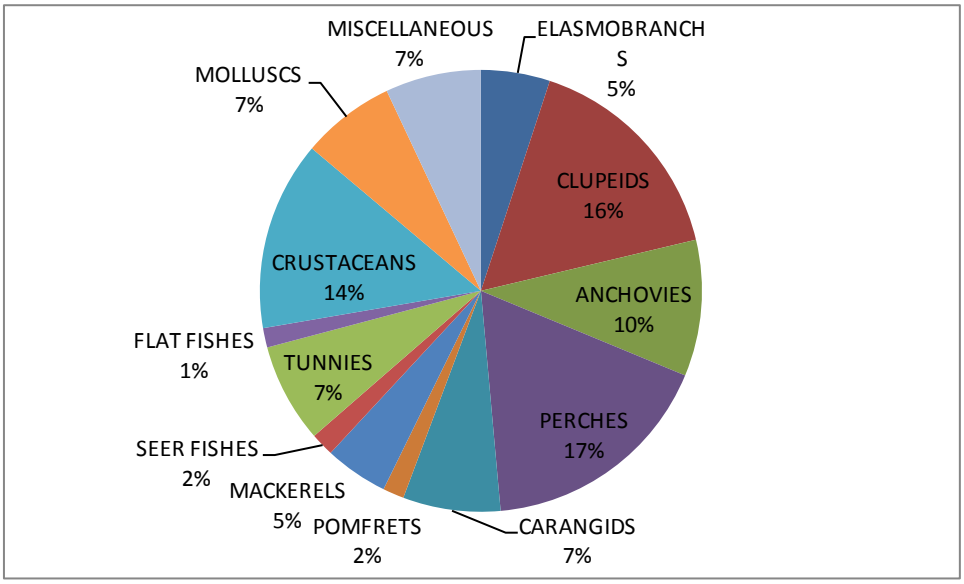

Figure 7: Species-wise composition of fisheries potential

2.6 Major oceanic resources and scope of their exploitation

Based on the report of the 2010 Revalidation Committee, the total potential of oceanic waters is estimated at 216 500 tonnes, including yellowfin tuna (37%) and skipjack tuna (46%). Other major species include bigeye tuna, billfishes, sharks, barracuda, dolphin fish, wahoo, etc., and comprise about 17 percent of the total (Figure 8).

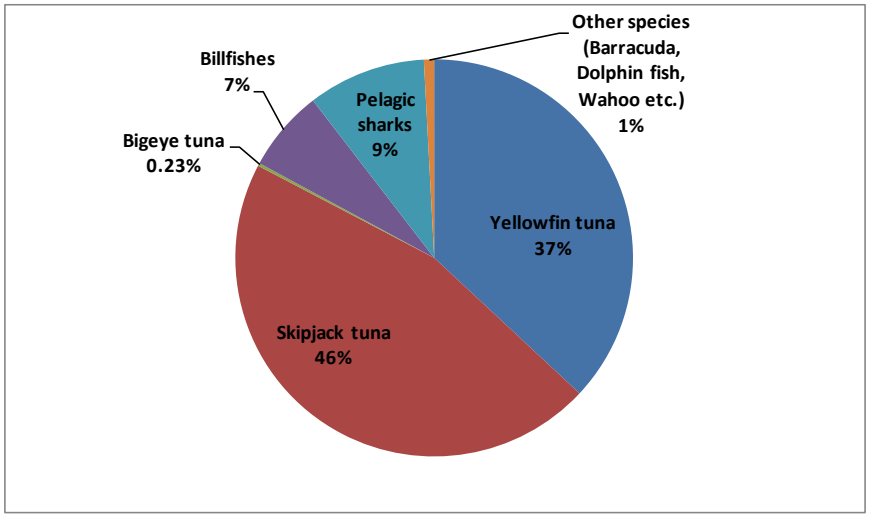

Figure 8: Composition of oceanic resources

From the species composition it is clear that the primary objective of exploring oceanic fishery should be to exploit quality yellowfin tuna resources and complement this with skipjack tuna and other resources such as bigeye tuna and billfishes.

Status of yellowfin and skipjack tuna stocks[26]

India is still a small player in global tuna fisheries. Except the Lakshadweep group of Islands, there is hardly any organized tuna fishery in India. Synonymous with tuna fishing, the Lakshadweep Islands abound in skipjack followed by yellow fin. Fish aggregating devices such as 'payao' were introduced in Lakshadweep for increasing tuna catch and have performed well. Similarly, the Lakshadweep Administration is introducing larger fishing vessels (12 and 17 meters overall length) for increasing tuna catches from its waters. Baitfish fishing also forms an important component of the pole and line tuna fishing of Lakshadweep and could become a constraint in future if not managed sustainably. The Lakshadweep tuna largely goes for local consumption, canning at the canning plant located in Minicoy Island and for preparation of *masmin*[27], a delicacy in the Islands and in some parts of southern India. Small quantities of *masmin* are also exported to Sri Lanka. In the past, sizeable portion of Sri Lanka's *masmin* (known as *umbalakada* in the Island nation) requirements were met by the Lakshadweep tuna. However, the Maldivian dry tuna (also known as Maldive fish) has now taken over and Sri Lanka imports this product from the Maldives, primarily due to its good qualities and also the fact that it is prepared under better hygienic conditions than their counterparts in Lakshadweep.

In the Bay of Bengal, the Andaman and Nicobar Islands offer some of the best tuna fishing grounds in the Indian EEZ. However, due to lack of capacity and weak forward and backward linkages prevailing in the Islands, tuna resources from the Andaman and Nicobar waters have largely remained unexploited. Since the oceanic tunas are migratory in nature, the tunas that could have been caught by the Indian fleet in the Andaman and Nicobar waters mostly get harvested in the EEZs of the neighbouring countries or in the high seas by the fleet of the distant water fishing nations.

Simultaneously, the small-scale fishing sector, especially off the coast of Visakhapatnam and in some coastal districts of southern Tamil Nadu has also ventured into tuna fishing. These initiatives include the targeting of skipjack and yellow fin tunas (particularly in Vishakapatnam) using troll line, hand line, gill nets and hook and line. In southern Tamil Nadu (Nagapattinam area), large floating devices are being developed to aggregate tuna and tuna-like species. Tuna fishing on the east coast is seasonal and takes place for about 7-8 months (August –March). Further, in Nagapattinam and other fishing centres located on Palk Bay, fishers are also seriously considering converting their trawlers into long liners and moving offshore for fishing tuna and tuna-like species.

In the indigenous expertise on offshore fishing for tuna and tuna-like species, the Toothoor-based (in Kaniyakumari district of Tamil Nadu) artisanal fishermen deserve particular mention. The Toothoor deep sea fishermen are not only fishing in different areas of the Indian EEZ (mostly in the Arabian sea), but also in areas beyond national jurisdiction (or ABNJ). Since 2006 onwards, MPEDA has also initiated conversion of trawlers into tuna long liners and most of such conversions have taken place in southern districts of Tamil Nadu. More details on the Toothoor fishermen and MPEDA's initiative are provided later in this chapter.

In terms of potential of tuna fishery in the Indian Ocean, IOTC has estimated the maximum sustainable yield (MSY) for yellowfin tuna at 344 000 tonnes with a range between 290 000 tonnes and 453 000 tonnes. The IOTC has further advised (in 2012) that the annual catch of yellowfin tuna should not exceed 300 000 tonnes to ensure that stock biomass levels can sustain production at

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[26] ***Based on IOTC Report available from http://www.iotc.org/science/status-summary-species-tuna-and-tuna-species-under-iotc-mandate-well-other-species-impacted-iotc***

[27] ***Sun-dried dry tuna after cooking and smoking.***

MSY level. Incidentally, the average catch from the India Ocean during 2008-12 is 317 505 tonnes, which exceeds this limit. However, the stock is not overfished or subject to overfishing as per the 2013 estimates of IOTC.

In the case of skipjack tuna, the MSY is estimated at 478 190 tonnes and the average catch during 2008-12 has been estimated at 400 980 tonnes. Therefore, the stock is in good status and there is scope for further exploitation, albeit limited.

In case of India, the total production for yellowfin tuna has increased from 16 349 tonnes in 2008 to 25 357 tonnes in 2012. However, in case of skipjack tuna, production has declined marginally from 22 060 tonnes in 2008 to 20 574 tonnes in 2012. In total, on an average, during 2008-12, India has exploited 39 000 tonnes of yellowfin and skipjack tuna from its waters against a potential of 179 000 tonnes (80 000 tonne yellowfin tuna + 99 000 tonnes skipjack tuna). In other words, India is presently harvesting about 1/5th of the potential and the balance can be optimally harvested using a judicious mix of technology, infrastructure and human resource development (Table 8).

At current local market prices, these tuna resources alone (yellowfin and skipkack) are valued at 1394 crores[28] or US D 232 million. If big eye, bill fishes and other tuna like resources are added, this value goes up to INR 1790 crores or about US D 300 million. It is also estimated that if proper post-harvest care is taken, the value of the Indian tuna resources can go up to US D 500 million. Therefore, a large amount of rent is being lost every year due to under exploitation and or poor post-harvest care of the oceanic resources from the country's EEZ.

Table 8: Production of yellowfin and skipjack tuna in India

Species/Year	2008	2009	2010	2011	2012	Average	Max catch	Annual Growth (%)
Yellowfin tuna	16,349	15,842	21,215	22,343	25,357	20,221	25,357	7.48
Skipjack tuna	22,060	15,591	17,805	16,698	20,574	18,546	22,060	-0.29
Total	**38,410**	**31,433**	**39,020**	**39,041**	**45,931**	**38,767**	**47,417**	**3.44**

Source: IOTC[29]

Scope of shark fishery

India has a fishable potential of 20 800 tonnes of pelagic sharks in the oceanic waters. Shark fishery might seem to be lucrative in the short run, but it has a dubious long-term future in respect of trade, given the growing international campaign against shark fishery. From ecological perspectives also, unless it can be ensured that sharks caught are fully utilized and not just finned, it is not recommended to promote targeted shark fishery. Shark is also a major by-catch in tuna longlining and increase in fishing effort in tuna longlining will create additional pressure on shark stocks, unless the operators adhere to practices that minimize by-catch such as those of sharks. Therefore, any targeted shark fishery will further complicate the scenario.

Oceanic sharks are mostly large growing apex predators. They have low fecundities and stock replenishment takes time. They play a vital role in the food web and population balance. Many shark species have been over-harvested and conservation agencies such as the IUCN (International Union for Conservation of Nature), CITES (Convention on Trade in Endangered Species) and CMS

[28] Please see Appendix 8 for a detailed note on valuation of the tuna resources.

[29] IOTC compiles the data from report submitted by contracting parties (here liaison officer from the Government of India). However, in case data is not reported, statistical methods are used to fill the gap. Since no foreign fishing fleet is operating in India, total catch reported from Indian waters is considered as national catch.

(Convention on the Conservation of Migratory Species of Wild Animals)[30] have been strongly voicing the need for full moratorium on shark fishing. The IOTC, which also includes sharks under its mandate is discussing several resolutions on protection of shark species in the IOTC waters[31]. In the country itself, the Ministry of Environment and Forests[32] has issued an advisory on 'shark fins attached policy', which warrants that fins should be attached to the shark at the time of landing. While the advisory is not specific about mid-sea transhipment, it is understandable that the policy is applicable in case of mid-sea transhipment also.

However, fishing vessels engaged in mid-sea transhipment have been accused by local fisher communities and non-governmental organisations for engaging in shark fining and throwing the carcass at sea. The process, although inhumane, is otherwise lucrative, as shark meat commands little market price and by discarding the meat these vessels can save space. Therefore, in the absence of an observer programme or proper monitoring, India should abide by its international commitment and should not promote shark fishing without necessary scientific and logistical backing.

2.7 Present fishing pattern and deep sea fishing in India

The differences in resource abundance and composition of fishing fleet are also reflected in the fishing pattern in the country. In 2012, Kerala landed the largest volume of fish (0.84 million metric tonne or mt). All maritime States and Union Territories (UTs), except West Bengal and Odisha witnessed an increase in production during 2012 compared to the previous year. Comparing region-wise landings, SWAS region (Southwest Arabian Sea) comprising Kerala, Karnataka and Goa contributed maximum with 1.39 mt (35.1%) followed by NWAS region (Northwest Arabian Sea) which includes Gujarat, Maharashtra and UT of Daman and Diu with 1.15 mt (29.2%). On the east coast, the SEBOB region (Southeast Bay of Bengal) covering Andhra Pradesh, Tamil Nadu and UT of Puducherry contributed 1.01 mt (25.5%) while the NEBOB region (Northeast Bay of Bengal) comprising West Bengal and Odisha landed 0.4 mt (10.2%). The region-wise pattern of landings also favourably correlates with the potential identified for these regions. About 200 different types of species are harvested every year using more than 35 different types of craft-gear combinations. Mechanized trawl nets operated throughout the coast are by far the largest contributors with over 50 percent of landing. However, mechanized ring seines, popular along the Kerala coast, especially for oil sardine fishery, are the most efficient fishing gear with a catch per unit effort (CPUE) of 1 264 kg per hour as compared to 48 kg per hour for trawl nets. Non-mechanized gear employed by the artisanal fishers on the other hand landed about 2.63 percent of the catch on an average during 2008-12 (Table 9)

Table 9: Average gear-wise contribution in marine fish landings (2008-12)[33]

Sector	Gear Name	Landings (%)	CPUE (Kg/hour)
Mechanized	Mechanized Trawlnet	50.68	48
	Mechanized Dolnet	6.71	58
	Gillnet	5.48	17

[30] ***Appendix 1 of CMS includes the great white shark (Carcharodon carcharias).***

[31] ***In the 18th Session of the IOTC to be held from 01 – 05 June 2014 in Colombo, Sri Lanka, the contracting parties have included five agenda items on scientific and management framework for conservation of shark species.***

[32] ***The Ministry of Environment and Forests has recently been renamed as the Ministry of Environment, Forests and Climate Change.***

[33] ***Adopted from: Sathianandan, T V (2013)*** **Status of Marine Fisheries Resources in India – An Overview.** ***In: ICAR funded Short Course on "ICT -oriented Strategic Extension for Responsible Fisheries Management, 05-25 November, 2013, Kochi.***

	Purse seine	5.88	411
	Ring seine	6.28	1264
	Bagnet	1.03	65
	Hooks and lines	0.14	11
	Others	0.74	26
Outboard	Gillnet	8.79	13
	Ring seine	7.45	462
	Hooks and lines	1.68	14
	Bag net	1.06	38
	Boat seine	0.43	68
	Purse seine	0.40	268
	Others	0.63	17
Non-motorized	Non-motorized gear	2.63	15
Total		***100***	***175***

In terms of deployment of fishing effort, fishing is still largely concentrated up to 200 meters of depth. This is also the water which is most productive. As can be seen from Table 9 above, the gear that are usually employed in near-shore waters are catching more fish. As mentioned earlier, while motorized and non-motorized sectors undertake single day fishing, medium and larger mechanized vessels often undertake multi-day fishing. This is also supported by a 2010 surveillance study conducted by the Indian Coast Guard (ICG) to understand the fishing traffic pattern. Such a study undertaken for the first time in the country, comprised 10 679 reports collected over a period of 30 days to determine the pattern. Both aerial surveillance and at sea monitoring methods were used to collect the information. The ICG Study found that the larger mechanized trawlers (14 – 19 meter OAL) undertook fishing for 7 to 12 days and on an average fished around 20 -70 meters of depth or maximum up to 80 nautical miles (nm) from the coastline. Trawlers below 14 meter OAL carried out fishing at an average distance of 24 nm for 2 to 3 days. The non-motorized and motorized sectors undertook day long fishing up to maximum distance of 36 nm from the coast line (Table 10). The details of the study of ICG are placed in ***Appendix 3*** and a detailed note on difference in area of operation between east and west coast is given in ***Appendix 4.***

Table 10: Fishing vessel traffic pattern in 2010

Type of craft	Limits (NM)	Depth of operation (meter)	Duration (Hrs)	Approx. Number
Non-motorized	2 - 5		8	**50 298**
OBM	12		12	**92 906**
FRP Vallams (Kerala, Tamil Nadu, Andhra Pradesh)	8- 36		18 – 24	
IBM <14M	24		48 - 72	
IBM 14-19 M	45-80	20-70	84 - 288	

The National Marine Fisheries Censuses (NMFCs) carried out by the CMFRI, Kochi in the years 1980, 2005 and 2010 show marked increase in fishing effort in the country both in terms of personnel engaged and number of fishing craft. While in absolute terms, there is a decline in number of fishing crafts between 2005 and 2010, the fishing vessels have increased in size and capacity and hence the trend in increasing fishing effort is likely to continue. For example, in Tuticorin fishery harbour, Tamil Nadu, the record of fishing vessels shows that vessels are increasing both in terms of size and their engine power enabling them to venture deeper into the waters (Table 11).

Table 11: Increasing Fishing Effort in India: Tuticorin Fishery Harbour, Tamil Nadu

Year	Number of registered fishing vessels	Length (m)	Breadth (M)	Engine Power (HP)	Draft (Feet)
1998	2	14.4	4.9	123	2.5
2012	14	19.8	6.4	366	3.4
Change (14 years in %)	600	38	31	198	36

Source: Compiled from CMFRI Annual Report, 2012

Fishing scenario in the EEZ and beyond (ABNJ)

The deep sea fishing fleet in India can be broadly categorized under four heads. The first comprises fishing trawlers converted to tuna long liners under a scheme implemented by the MPEDA. The second category includes the vessels of 20 meter OAL and above brought through the Letter of Permission (LOPs) issued by the Department of Animal Husbandry, Dairying and Fisheries (DAHD&F), Ministry of Agriculture. The deep sea going fishing vessels of Thoothoor in Kanyakumari district form the third category. These vessels also have a collective called the Association of Deep Sea Going Artisanal Fishermen (ADSGAF). The fourth category of vessels are from Visakhapatnam and they also fish in the deeper waters off the coast of Andhra Pradesh.

The following paragraphs provide more details on the present effort deployed in the offshore waters both by the indigenous fishing vessels as also the vessels operating under the LOP scheme.

Toothoor fishing vessels

The present size of the deep sea going fleet of Thoothoor is 588 (December 2012). These fishing vessels are mostly within the length of 12-14 meters and 16-18 meters, although some vessels are also in the length range of 18 – 22 meters (Table 12). They operate around Okha and Veraval in Gujarat; Mumbai and Ratnagiri in Maharashtra; Karwar and Manglore in Karnataka; Cochin and Quilon in Kerala; and Kanyakumari in Tamil Nadu. Occasionally, some of them also fish in the Bay of Bengal. Besides, the Toothoor fishermen are also being engaged by boats of other States fishing in the deep sea (Table 13).

Table 12: Size-wise details of deep sea fishing boats from Thoothoor (2012)

Size	Hull			Total
Length (m)	**FRP**	**Steel**	**Wooden**	
10--12	0	0	15	15
12--14	2	0	117	119
14--16	1	4	272	277
16--18	3	13	107	123
18--20	2	31	13	46
20--22	0	7	1	8
Total	**8**	**55**	**525**	**588**

Table 13: Operation of artisanal deep sea going fishing vessels

State	Important centres	Area of operation (from shore)	Important fishing grounds
Gujarat	Okha	40-60 nm	
	Veraval	40-60 nm	

Maharastra	Mumbai	35-450 nm from shore (70-75 hrs travel)	*Bombay parappu* (90 nm EW & 20 nm NS)
	Ratnagiri	35-450 nm from shore (70-75 hrs travel)	*Ratnagiri Thitta (Ratnagiri bank)* 12 fathom height from the sea bed; about 60 nm from the shore (35 nm EW & 15 nm NS).
Goa	Goa	35-450 nm	*Goa parappu* 150 fathom depth 8 nm EW, 30 NS
Karnataka	Karwar	50-500 nm	*Manjapara –Kasaragod to Karwar* 60-65 nm from shore; nearly 25 nm circumference; Bank (thitta) nearly 15 nm Cir Kora nearly 15 nm, 7 nm circumference; most productive area
	Mangalore	50-500 nm	Manjapara –Kasaragod to Karwar 60-65 nm from shore; nearly 25 nm circumference.
Kerala	Kochi	60-500 nm beyond Lakshadweep islands	
	Kollam	60-500 nm	Quilon Bank; 35-68 nm Kollam – Alappuzha; 50 nm.
Tamil Nadu	Kanyakumari	40-70 nm	Wadge Bank Muttom-Manapad (60 nm); 10-15 nm EW; 70 nm from the shore.

Fishing vessels of >20 meter OAL introduced through LOP

Objectives of issuing LOPs: The policy of issuing LOP, which is in consonance with the CMFP, 2004 aims at building indigenous capacity of Deep Sea Fishing Vessels (DSFVs), and to build technical expertise for deep sea fisheries so as to enable Indian entrepreneurs sustainably exploit the deep sea fishery resources. The Guidelines allow acquisition of DSFVs on deferred payment basis but with obligation that the entrepreneurs will pay the entire installments towards the cost of vessels within 05 years period. Indian entrepreneurs are importing resource specific DSFVs from other countries like, Thailand, Taiwan, etc. which are capable of doing commercial fishing not only in the EEZ but also in the high seas.

These vessels are equipped with modern technology and specialized gear and can perform voyages of longer duration, *i.e.*, for months at a stretch. They also have specialized skills for locating fishing grounds, gear operations, fish handling and onboard processing. Besides, these vessels operate with staff that have high endurance level, as the vessels stay out sea continuously for months together. The LOP scheme was introduced keeping in mind that the Indian fishing fleet, except those from Thoothoor, lacks sound expertise in deep-sea fishing as also the endurance to stay out at sea for longer durations. Accordingly, the scheme also has provisions to engage foreign crew to work on the vessels.

As per the terms and conditions prescribed for the LOP vessels, initially (2002 – 2006), the entrepreneurs were required to replace the foreign crew by trained Indian crew @25 percent per annum so that over a period of 05 years, the vessels could be owned as well manned 100 percent by Indians. However, as the Industry represented about the shortage of trained manpower in the

domestic sector to man modern DSFVs and expressed difficulties to comply with the phasing out norms for foreign crew, the Inter-Ministerial Empowered Committee on Marine Fisheries (EC) on 18.7.2006, recommended phasing out of foreign crew @15 percent per annum, instead of 25 percent. However, on continued representations from Industry regarding difficulties to comply with phasing out norms due to shortage of trained Indian crew, the EC on 11.9.2008, allowed the DSFVs to operate with a minimum 25 percent Indian crew without any further conditions relating to phasing out of foreign crew. However, at the same time, it was also decided that the Central Institute for Fisheries Nautical Engineering and Training (CIFNET), Kochi will start a training programme for Indian crew to overcome this shortage.

Presently, 70 vessels are having valid LOPs against the permissible fleet size of 725 vessels. In fact, the number of LOPs issued has not been more than 120 since the initiation of the policy in 2002, which shows a lukewarm response from private players to the Scheme (Table 14). The entrepreneurs have cited a number of reasons for lack of response, ranging from unfavourable terms and conditions including employment visa problem for foreign crew, crew clearances, number of approvals to be sought from multiple agencies, daily reporting procedures, etc. The representatives are of the view that such conditions do not create conducive environment for procurement of DSFVs through the LOP route.

Table 14: Present status of industrial fishing vessels

S.No	Category	Maximum nos. to be permitted	No. of valid LOPs as on date	Balance nos. of vessels that could be permitted
1.	Tuna Long Liners	110	61	49
2.	Purse Seiners	18	-	18
3.	Trap/Hook & Line vessels	10	03	07
4.	Squid Jiggers	15	-	15
5.	Pelagic/Mid-water Trawlers	72	10	62
6.	Pole & Line	500	-	500
7.	***Total***	***725***	***70***	***651***

The analysis of catch reported by the industrial fishing vessels for the period 2005-11 to FSI, Mumbai (Table 15) shows that tunas, marlins, sail fishes and sword fishes are the major fisheries targeted by LOP vessels. However, it appears that the reported exploitation by industrial vessels is negligible compared to their total exploitation. More importantly, the catch data from LOP fishing vessels is showing significant variations in the 6 years period (2005-11) indicating possibly different time spans of actual engagement. However, this may also be due to poor reporting of data or incomplete datasets received by the FSI.

Table 15: Major fisheries targeted by LOP Fishing vessels and their trend (in kg)

Year/Spp	2005	2006	2007	2008	2009	2010	2011	Total
Tuna	22 810	1 44 395	3 41 700	28 967	10 350	4 92 908	3 34 254	**13 75 384**
Marlin	3 105	27 967	66 240	6 190	3 775	2 24 782	2 43 163	**5 75 222**
Sword fish	4 565	27 335	1 22 295	9 615	4 045	2 07 437	80 185	**4 55 477**
Sailfish	2 815	18 405	93 965	9 745	4 165	2 06 239	2 38 390	**5 73 724**
Grouper						99 650		**99 650**
Barracuda						27 900		**27 900**

Emperor						29 620		**29 620**
Spanish Mackerel						280		**280**
Yellowfin Tuna							2 81 410	**2 81 410**
Sharks							7 274	**7 274**
Albacore							120	**120**
Total (Kgs)	**33 295**	**2 18 102**	**6 24 200**	**54 517**	**22 335**	**12 88 816**	**11 84 796**	**34 26 061**

During the 10th FYP (2002-2007), under the Centrally Sponsored Scheme on Development of Marine Fisheries, Infrastructure and Post-harvest Operations, the DAHD&F has been providing subsidy of Rs.1.5 million per vessel for conversion of existing trawlers above 20 m LOA for tuna longline fishing. On the other hand, MPEDA has started implementing a scheme for assisting the conversion of existing fishing vessels to tuna long liners for augmenting production of oceanic tuna in 2006. Under these schemes 235 fishing vessels were converted into long liner. The following table (Table 16) presents the structure of tuna long lining fleet in India. The data is pertaining to the year 2009 National Report submitted to the IOTC.

Table 16: Structure of tuna long lining fleet in India (as of 2008)

OAL	Converted vessels		Industrial vessels	Artisanal vessels (Thoothoor)	Mini trawlers (Andhra)	Total
	MPEDA	MoA				
12.0 – 15.9	147	0	0	411	0	558
16.0 – 19.9	66	0	0	123	0	189
20.0 – 23.9	11	9	21	54	0	95
24.0 – 39.9	1	1	4	0	0	6
40.0 – 59.9	0	0	27	0	0	27
Unspecified	0	0	8	0	25	33
Total	**225**	**10**	**60**	**588**	**25**	**908**

Fishing Fleet Structure in Lakshadweep

Lakshadweep has 103 pole and line mechanized fishing vessels, 13 gillnetter, 8 liners and 369 inboard engine fishing vessels, 240 motorized fishing vessels and 727 non-motorized fishing vessels. Lakshadweep, which has comparable ethnicity and natural bounty as that of Maldives, a leading tuna fishing nation, has rather lukewarm development (see *Appendix 5)* for a detailed note on fisheries development in Maldives). Comparison between 2005 and 2010 NMFC shows there is a 39 percent decline in the number of marine fishing vessels. While, there was a decline in mainland India also, but in case of mainland, the decline is likely due to consolidation of fishing assets, as evident from increasing size and number of mechanized vessels. However, in case of Lakshadweep, between 2005-2010, the number of mechanized fishing vessels also seem to have declined (For a detailed note on composition of fishing fleet in Lakshadweep refers to *Appendix 6*).

Tuna fisheries, mainly skipjack tuna fishery constitute the mainstay of fisheries in Lakshadweep. The marine fisheries production in Lakshadweep has increased from 11400 tonnes in 2007 to 17 495 tonnes in 2008 and then declined to 12 090 tonnes in 2010 (FSI, 2010). Skipjack tuna now comprise about 70 percent of total landings. The landing of skipjack tuna has increased from 4 871 in 2007 to 8745 tonnes in 2010. In 2010, about 1082 tonnes of yellowfin tuna also landed in Lakshadweep.

3.0 Fisheries Governance structure in India

Mandate and authority: Entry 57 of List 1 of Seventh Schedule of the Constitution of India specifies *Fishing and Fisheries beyond Territorial Waters* as Union Subject, whereas Entry 21 of List II speaks of Fisheries as a State Subject. Reading both the Entries together, it follows that control and regulation

of fishing and fisheries within territorial waters is the exclusive province of the State, whereas beyond the territorial waters, it is the exclusive domain of the Union. The Union Government acts as a facilitator and coordinator responsible for policy formulation, carrying out fishery research and channelling funding support to the states in line with the national priorities and the commitments made to the State/UT Governments. The Ministry of Agriculture (DAHD&F) within the purview of its allocated business helps the coastal States and the UTs in development of fisheries within the territorial waters, besides attending to the requirements of the sector in the EEZ. Therefore, management of fishery exploitation in the EEZ requires close coordination between the Union and the States.

3.1 Allocation of business between Union and the States

As defined by the Indian constitution, both the Union and the State Government agencies manage fisheries activities. While at the Union-level, the DAHD&F in the Ministry of Agriculture is the focal point, in the State/UTs, it is the Department of Fisheries (DoF). Other Union Ministries/ Departments like the Ministry of Commerce and Industry (MoCI), Ministry of Earth Sciences (MoES), Ministry of Food Processing Industries (MoFPI), Ministry of Environment and Forests (MoEF) play important role in various aspect of fisheries resources management. At the national level, the Ministry of Defence (MoD) through the Coast Guard (ICG) is also associated with the management of fisheries in the EEZ.

Role of Union Government: The Fisheries Division in the DAHD&F acts as the focal point for fisheries development and management in the country. It formulates strategies for national development plans for the sector and issues policy guidelines for fisheries development and management. It also provides technical and financial assistance for fisheries development and management to various States/UTs. The financial assistance is over and above the budgetary support provided to the States by the Planning Commission.

To promote export of fish and fish products, the Government of India established the MPEDA under the MoCI in 1972. While the processing aspect fall under the MoFPI, the control of marine biodiversity and marine pollution falls under the jurisdiction of MoEF and the MoES.

Role of the State Governments: The State/UT Governments are the principle custodians of fisheries in their respective jurisdictions (land as well as the territorial waters). In the marine sector, they are responsible for fisheries development and management with the main objectives of planning and development of infrastructure facilities for landing and berthing of fishing craft, creating suitable marketing facilities, implementation of various fisheries development programmes *viz.*, channelising financial assistance for purchase of fishing implements, implementation of socio-economic programmes and interactions with the Government of India and other agencies for technical and financial assistance. Each State/ UT has a DoF, which functions as its main implementation agency for fisheries and aquaculture development programmes.

Table 17 below gives a brief overview of institutional structure for marine fisheries management in India.

Table 17: Institutional setting for marine fisheries development in India

Item	Agency/ Ministry/ Department
	Ministry of Agriculture /DAHDF, Indian Council of Agricultural Research Fisheries Survey of India, National Fisheries Development Board Ministry of Earth Sciences (MoES)

· Monitoring of fishing by foreign vessels (List I) · Prevention of marine pollution by ships · Protection of endangered species (Wildlife Protection Act, 1972)	Ministry of Defence / Coast Guard
	Ministry of Food Processing Industries/ Ministry of Commerce & Industry (MoCI) - MPEDA
	MoCI - MPEDA Export Inspection Council Ministry of External Affairs
	MoES
	Ministry of Shipping, Road Transport and Highways/, Ministry of Agriculture, State Governments
· Fisheries in territorial waters (List II)	State Governments /
	Ministry of Environment and Forests (MoEF) MoES
	Ministry of Agriculture/ MoCI, MPEDA

3.2 Coastal state's policies and thrusts in marine fisheries

3.2.1 Union Government

The Union Government formulated the Comprehensive Marine Fishing Policy (CMFP) in 2004 to ensure that marine fisheries in India were sustainable and globally competitive so that Indian producers stood to gain in the international market. The Government also considered the fact that after the declaration of the EEZ in 1976, immense opportunities were available for exploration, exploitation and utilization of marine living resources in the 2.20 million sq. km area. The Government further realized that most of the deep sea fishery resources were available beyond the conventional fishing limits and fishing capability of the indigenous craft and such resources could be gainfully exploited only if upgraded and sophisticated vessels of adequate size and capabilities were inducted into the fishery.

The CMFP, 2004 also considered bringing the traditional and coastal fishermen into focus along with stakeholders in the deep-sea sector so as to create a level-playing field and achieving harmonized development of marine fishery, both in the territorial and extra territorial waters of the country. Thus the Policy was framed with the larger objectives of (1) augmenting marine fish production of the country up to the sustainable levels in a responsible manner so as to boost export of sea food from the country and also to increase per capita fish protein intake of the masses, (2) ensuring socio-economic security of the artisanal fishermen whose livelihoods solely depends on this vocation and (3) ensuring sustainable development of marine fisheries with due concern for ecological integrity and bio–diversity.

The Policy also underscored the need for a departure from the open access concept in the territorial waters, putting in place stringent management regimes and promoting exploitation in the deep sea and oceanic waters for reducing fishing pressure in the traditional fishing areas.

A detailed analysis of the policy is presented under TOR-1 of this report.

3.2.2 State/Union Territory

The policies of the coastal State/UT Governments have been traced through their vision and mission and annual schemes of the Department of Fisheries (DoF). An examination of the existing schemes, policy documents and mission statements shows that on their part the coastal States and UTs have been following an expansionary fisheries policy. Modelled in line with the policies and schemes of the Union Government, the State Governments are also aiming at increasing

[34] ***Concurrent List***

production, ensuring social development of fisher population and gradually increasing their presence in the deep sea.

While such symbiotic relationship is ensuring better implementation of the governmental schemes, lack of any functional coordination amongst the States and the Union also implies that beyond the territorial waters they are competing with each other. While lately, the States are also initiating schemes on management and conservation of marine fisheries, such schemes are still limited to maintaining basic tasks of monitoring such as licensing. In addition, such measures are limited to territorial waters where the Marine Fishing Regulation Acts (MFRAs) of the States/UTs are applicable.

In Kerala, the largest contributor to national marine fisheries, the DoF[35] is aiming at sustainable utilization of fishery resources with emphasis on augmentation of production, increasing productivity and creation of livelihoods. The maximum sustainable yield (MSY) up to 200 meter of depth was estimated at 7 95 300 tonnes in 1989 by an Expert Committee. Against this MSY, the current level of landing has increased from 6 08 281 tonnes in 2010 to 7 43 122 tonnes in 2011 and further to 8 39 185 tonnes in 2012. These statistics clearly imply that the State is fully exploiting its resources within 200 meter depth zone and the remaining production is being harvested from depths beyond 200 meters. In terms of schemes, the State is implementing various central sector schemes aiming at social development as well as augmentation of fisheries production (*e.g.* motorization). On management side, the State has a scheme on management and conservation of coastal resources. Under this scheme funds are provided for meeting the expenses of enforcement of Kerala Marine fishing Regulation Act, 1980, communication expenses in five fisheries stations, maintenance of wireless communication network, Matsya Vigyan Kendras and registration and licensing of fishing vessels and sea ranching for replenishment of depleting stock of commercially important species of shrimp.

In case of Gujarat, another important State from the marine fisheries point of view, the mission[36] of the DoF includes: introduction of above 20 meter overall length new generation vessels for deep sea fishery exploration; up gradation of hygienic condition in Fisheries Terminal Divisions to promote fish exports; enhancement of cold storages; establishment of Fish Processing Parks with essential extensive services like cold storages, processing units, PCR laboratories, vessel related services to attract the fishing vessels which prefer or compel, to move outside the State due to lack of above referred facilities at present; and introduction of modern equipment like Global Positioning System (GPS) navigator, Fish Finder, VHF radio sets, lifesaving equipment, etc.

On the east coast, the marine fisheries policy of Tamil Nadu[37] also calls for redistribution of fishing effort from inshore to offshore "to exploit the under-utilized fishery resources and to reduce fishing pressure in the inshore areas". The policy also calls for augmenting aquatic resource production in the inshore areas by adopting conservation measures, stock enhancement and establishing of artificial reefs, etc., along the coast. The State at present is implementing about 22 schemes in the marine fisheries sector - a majority of them are Central Sector and Centrally Sponsored schemes aimed at socio-economic welfare of fishers, such as saving-cum-relief, housing, group insurance, etc. However, Tamil Nadu has also instituted new schemes to provide subsidy to fishers at 50 percent for acquiring tuna long liners. Further, the DoF has also proposed commissioning two fish processing parks in Nagapattinam and Cuddalore districts, which will provide forward linkages to

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[35] ***http://www.fisheries.kerala.gov.in/***

[36] ***http://agri.gujarat.gov.in/hods/cf_rti.htm***

[37] ***http://www.fisheries.tn.gov.in/marine-main.html***

the proposed development of deep sea fishing capacity of the State. A consultancy has also been assigned to a leading private sector agency for preparing a blue print for deep sea fishing, including use of mother vessels for supporting a fleet of small fishing boats in the deep sea. In addition, the ongoing motorization scheme of traditional crafts in Tamil Nadu is likely to increase fishing effort in inshore waters that would substantiate the need for distribution of total fishing effort in offshore waters.

Of the other east coast States, West Bengal is also aiming at developing its fisheries further by increasing its capacity to venture deeper in to the sea. During the 12th FYP, the DoF, West Bengal has proposed to commission one fishing harbour with state- of- the- art facilities for deep-sea fishing and five more minor fishing harbours/fish landing centers in the coastal areas of the State; infrastructure for setting up of wireless communication network in the marine sector and development of offshore marine fisheries industry in public-private partnership model.

Summing up, the coastal States/UTs are *de facto* enjoying unconditional access to waters beyond territorial seas (12 nm) and these waters are being considered as an integral part of their strategy for marine fisheries development. However, *de jure* the Union Government has the rights to regulate fishing in waters beyond 12 nm. Therefore, in the present circumstances, the waters beyond the territorial limits are being exploited both by fishing vessels authorized by the Union Government such as those under the LOP and by the fishing fleet registered and licensed by the coastal States/UTs.

Notwithstanding the demarcation of areas in the marine waters between the coastal States and the Union, the Expert Committee is of the view that the Union Government being the principle trustee of land and water territories under the sovereign control of India, has a much larger role to play than merely going by the 'Allocation of Business' between the States and the Center. Unlike terra firma where territorial demarcations and the resources within territories are clearly divisible and visible, it is not so in the marine areas, where everything is under water and not visible to the naked eye. Further, most of the fish species (barring sedentary demersal varieties) undertake local or short to long-range migrations and move between the territories of one State to the other or between the territorial waters and outside in the EEZ. Thus, while maritime boundaries can be drawn between two adjacent coastal States or between the States and Union at the 12 nautical mile distance from the baseline, movement of fish cannot be restrained and no resources can be assigned to one State or the Union. In other words they are 'common property resource' to be harnessed by all the States/UTs, without causing damage to the stocks or the environment in which they are caught. In such situations and for sustainable exploitation of the resources, it is paramount for the Union (in this case represented by the DAHD&F) to play the key role in regulating effort *vis-à-vis* resource potential and also stipulating various measures for management, conservation and sustainable exploitation of the resources. It may also be appropriate to mention here that in such a governance structure, the Union has prime responsibility of resolving conflicts between two or more States, as was done in the late seventies through a Model Bill on marine fisheries, which paved the way for the States/UTs to enact their Marine Fishing Regulation Act.

3.3 National laws governing marine fisheries

The Indian Parliament enacted the Territorial Sea, Continental Shelf, Exclusive Economic Zone and other Maritime Zones Acts in 1976, which paved the way for establishment of a 200 nautical mile (nm) EEZ effect from January 15, 1997. Since then, India has also enacted a number of other laws and regulations which have bearing on the sustainable exploitation of the marine fisheries resources in the Indian EEZ, including the Indian Coast Guard Act, 1978; the Maritime Zones of India

(Regulation of Fishing by Foreign Vessels), Act, 1981 and the related Rules of August, 1982; the Environment Protection Act, 1986, etc. The other Union legislation, which has important bearing on the fisheries sector include the Merchant Shipping Act, 1958, the Marine Products Export Development Authority Act, 1972; the Wildlife (Protection) Act, 1972 and the Biological Diversity Act, 2002. However, there is still no law to regulate the Indian-owned fishing vessels operating in the EEZ.

The provisions under the Wildlife (Protection) Act, 1972 have been used to set up marine parks/ sanctuaries along the coastline in India. While the larger objectives have been towards protection/ conservation of fauna and flora, in some cases these reserves have infringed on the livelihoods of the traditional fishers. The salient features of the Union legislation having bearing on marine fisheries sector in India given in Table 18.

Table 18: Summary of major acts enacted by the Union Government relating to Indian maritime zone

Name of the Act	Main objective	Follow ups	Main implementing agency	Fisheries management	Gaps
The Merchant Shipping Act, 1958	To foster the development and ensure the efficient maintenance of an Indian mercantile marine.	• Registration • Setting up of National Shipping Board	Ministry of Shipping, Road Transport and Highways	• Defining a fishing vessel which acted as the base for later acts. • Registration procedure. • Provision for data collection	• Fisheries are not a part of its larger objectives; therefore no mandate for conservation and sustainable management of the resources.
The MPEDA Act, 1972	To promote export of fisheries product.	• Collection of information on fish production, etc.	Ministry of Commerce and Industry	• Undefined area • Licensing • Basic focus on controlling of fish export and quality control in respect of exported fish and export promotion.	• Artisanal fishing is not considered. • Enforcement mechanism is weak.
The Wildlife (Protection) Act, 1972	To protect wildlife	• Sanctuaries	Ministry of Environment & Forests	• Restriction on hunting of several mammals, fish, coral, sponge, turtle, etc.	• No in-built provision for conservation of overexploited species. Inclusion of any species threatened to be inserted via notification/ amendment.
The Territorial Waters, Continental Shelf, Exclusive Economic Zone and other Maritime Zones Act, 1976	To establish sovereignty over Indian maritime zone.	• To ensure national security. • To facilitate exploitation and other economic uses of Indian maritime zone.	Ministry of External Affairs	• Licensing • Establishment and division of maritime zones into 4 areas.	• No provision for input control. Any number of fishing vessel can operate.
The Coast Guard Act, 1978	To establish the Coast Guard.	• National security. • Protection of national interest. • Safety at sea	Ministry of Defence	• Establishment of control and surveillance measures. • Establishment of sea rescue measures.	• The facilities are not commensurate with the area of the EEZ.

Maritime Zones of India (Regulation of Fishing by Foreign Vessels) Act, 1981	To control activities of foreign fishing vessels within Indian maritime zone.	• Basis for joint ventures and chartered vessels. Base for bilateral/ multilateral fishing access agreements.	Ministry of Agriculture	• Permit fishing by foreign vessels through licensing.	• Ignoring of sustainability criterion. • Absence of stringent rules for IUU fishing.
The Biological Diversity Act, 2002	To protect biological diversity of India	National and State Biodiversity Boards	Ministry of Environment & Forests	• Permit fishing for commonly traded fish. • Encourages conservation. • Provision to declare a fish stock threatened if it is overexploited.	• Inclusion of too many stakeholders (Union and state Governments, NBA, users, etc) to reach a decision in timely manner. • EIA is not must for a sensitive project.

Marine Fishing Regulation Acts of the coastal States/ Union Territories: The Marine Fishing Regulation Act of the coastal States/UTs in India was conceived in response to the growing conflicts in the coastal waters during the late seventies. To reduce the conflicts and also allow for regulation of fisheries in the territorial waters, the Ministry of Agriculture formulated a Model bill, which was circulated to the coastal States/UTs in 1979. Based on the Model Bill all the coastal States/UTs have enacted the Marine Fishing Regulation Act (MFRA) and the rules and regulations there under. Goa (then a UT), Karnataka and Kerala were the first States to enact their MFRA in 1980. The UT of Puducherry is the last to enact the MFRA in 2008. The MFRAs have provisions for regulating fishing and conservation measures in the territorial waters. These include regulation of mesh size to avoid catching of juvenile fish, maximum-minimum fish sizes, regulation of gear to avoid over-exploitation of certain species, reservation of zones for various fishing sectors to provide exclusive rights to traditional fishermen to fish unhindered in near shore areas and also for declaration of closed seasons during fish breeding period to avoid catching of young juvenile fish. The other important aspects include vessel movement control, vessel inspection, registration and license and colour coding.

The MFRAs of the maritime States/UT Governments and the deep sea fishing schemes as provided under the Maritime Zones of India (Regulation of Foreign Fishing Vessels) Act, 1981 of the Government of India provide for prohibition of fishing by mechanized fishing vessels in the areas earmarked for the traditional and small-motorized crafts. Presently, the only control exercised by the Union Government with relation to fishing in the EEZ is the closure of fishing for a certain period. This closure coincides with the closure enforced by the coastal State/UTs for fishing in their territorial waters and is done through 'Executive Orders'[38].

[38] ***The Executive order of the Union Government was also challenged by a Maharashtra Fisher Association asserting that in the absence of a Union legislation for the EEZ, the Union Government could not place restrictions on fishing in the EEZ. However, this contention was not upheld by the Court. In the judgment of the High Court of Judicature at Bombay (Civil Appellate Jurisdiction) in Writ Petition No 2668 of 2001, the order stated that "the law is well settled and the executive power of the State is co-extensive with its legislative power. Entry 57 of List 1 of the Seventh Schedule confers legislative competence on the Parliament to legislate on the subject. When a law is enacted or rules framed, the Government is bound to act in accordance with such enacted legislation or rules. In the absence of enacted legislation, or rules or regulations governing the subject, the executive power of the Union Government can certainly be exercised. Such executive action must be judged on the same touch stone as any legislation passed by the Parliament".***

3.4 International laws governing marine fisheries and oceans

Since the final acceptance of the United Nations Convention on Law of the Sea in 1982, many landmark international instrument, both binding and non-binding have been signed by the global community. These instruments cover fisheries and environment and are playing a vital role maintaining the man-environment balance. Today, our understanding on the needs of conservation and sustainable exploitation of the natural resources is much better than what it was a couple of decades back. A detailed description of the important international instruments that India has signed/acceded to and the need for their implementation in letter and spirit is provided under TOR-4 of this report.

4.0 Full exploitation of Indian EEZ

4.1 Scope for expansion of fisheries production

Based on the above analysis, the following conclusions are drawn for exploitation of the EEZ at varying depths.

Depth (M)	Potential Tonne)	State of exploitation	Recommendation
0 - 100	3,821,508	**Ecology:** Over-exploited or likely to be over-exploited (see Figure 8). **Economics:** Most productive and high value zone. This zone is very important for artisanal and small motorized fisheries, which are technically not fit to go beyond this zone. **Management:** nearly completely under the jurisdiction of the coastal States.	Manage fishing effort. Ensure no further increase in fishing effort and siphon off any excess fishing effort, especially from mechanized vessels to deeper waters.
100 - 200	2,59,039	**Ecology:** This depth zone is nearly **the** same as the previous depth zone in terms of species composition. However, availability declines drastically. This zone is also likely to be over-exploited or being fully-exploited (see Figure 8). **Economics:** Less valuable than previous zone and mostly accessed by mechanized fishing fleet. **Management:** Nearly completely under the jurisdiction of the Central Government.	India is catching a sizeable percent of its potential (41 70 589 tonnes against 44 11 687 tonnes). The effort is mostly concentrated waters up to 200 meters. Manage fishing effort. Ensure no further increase in fishing effort and reallocate fishing effort from mechanized vessels to this water.
200-500	114 640 (Squids: 2998 tonnes)	**Ecology:** This depth zone shares both the characteristics of near shore and oceanic waters in terms of species composition and is likely to provide refugia to some species. Presently, it is not fully-exploited (see Figure 8). However, efforts are increasing in this water. **Economics:** Less valuable than previous zone and mostly accessed by mechanized and industrial (LoP) fishing fleet. **Management:** Under jurisdiction of the Central Government.	Create a buffer zone from 200-500 meters Water from 0 to 500 meter can be treated as a contiguous zone where species distribution and richness is nearly similar, although diminishing as depth increases (Figure 9). Since, fisheries is presently mostly concentrated till 200 meters, the water in the depth range of 200-500 meters can also act as a buffer zone. The buffer zone of 200-500 meters of

			water will in future, be able to accommodate any structural change in the fishing fleet including development of deep sea going fishing vessels under various Central and State Government Schemes. In terms of new fishery, squids are a valuable resource in this depth zone and only squid jigging may be encouraged subject to strict monitoring.
Oceanic waters	216 500	**Ecology:** Not fully-exploited (see Figure 8). **Economics:** Highly valuable tuna and billfishes are available in this water. Valued at current regional and national market prices, the resources are worth between INR 1790 to 3319 crores. A note on valuation is annexed to this report (***Annex 5)***. **Management:** Completely under jurisdiction of the Central Government.	Deep sea ecology is least understood and monitoring fishing in this water is equally difficult. Therefore, a precautionary approach is needed. A separate species-wise recommendation is presented in the following table. However, in summary, tuna fishery can be developed in this water.

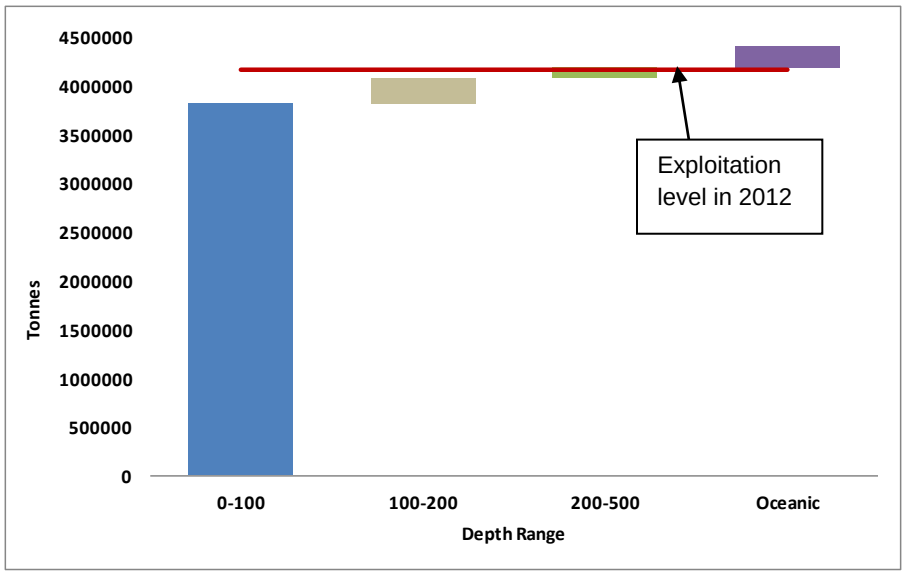

Figure 9: Depth-wise potential and current level (2012) of catch in the Indian EEZ

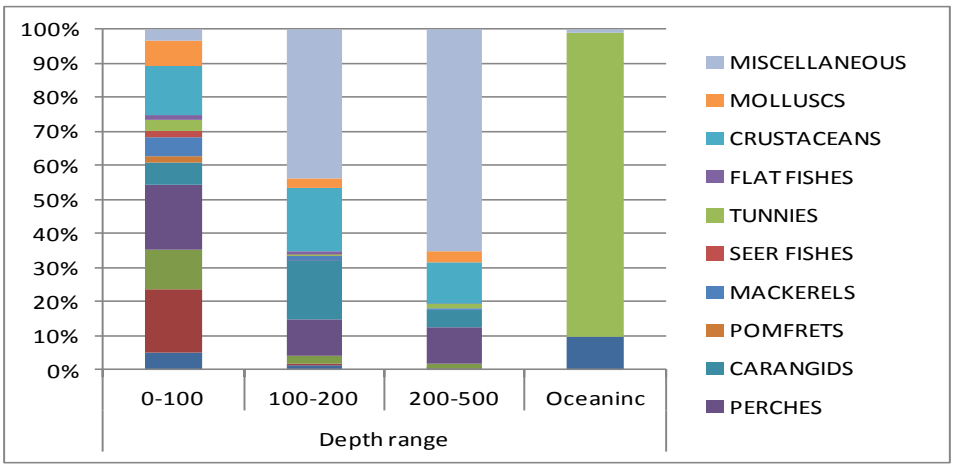

Figure 10: Visual map of species distribution in different depth range in the Indian EEZ

Therefore, a significant untapped potential seems to be exist in oceanic waters. However, a precautionary approach is required to exploit these resources both from the ecological and economic perspectives. Ecologically, deep water species like tuna are top predators, migratory and slow-growing in nature. Among others, they are closely monitored by the IOTC, to which India is a contracting party. Therefore, while developing this fishery, decisions of the IOTC that are binding in nature, should be taken into account.

In addition, some oceanic species like yellow fin tuna and skipjack tuna are also reported in coastal fishery. For example, in year 2010, 9 289 tonnes of yellow fin tuna was landed in coastal fishery and in year 2012, 14 696 tonnes of yellow fin tuna was landed by coastal fishery (CMFRI). It is unclear that the tuna caught in coastal fishery is part of the same stock caught in shallow waters on their migratory path or whether fishing vessels have ventured deeper into the EEZ than expected and caught these fishes.

From economic perspective, oceanic fishery is costly and the products need careful handling to get proper price. Therefore, without adequate backward and forward linkages, exploring into oceanic fishery is unlikely to provide much benefit to the operators.

4.2 Determining the number of fishing vessels for full harvest of deep sea resources

While determining the number of fishing vessels, this Committee has followed the same approach adopted by the earlier Committees, which is dividing the total potential yield by average per day catch from oceanic waters. However, it may also be pointed out that for optimizing fishing effort, this method is inadequate. It does not take care of the business model of the fishing vessels; neither can it ensure full and sustainable exploitation of the stock. To determine fleet size carefully, adequate information is needed on composition of fishing fleet and their skills (*e.g.* hooking rate), seasonality of stocks, discard rate, etc. Based on this information, a fleet plan can be developed by a suitable optimization model.

However, constrained by such information, the fleet plan can be developed in a phased manner. Effort in phase I should be on filling up information gaps to work out optimal fleet plan. In terms of productivity, the figures assumed earlier are presented in the Table below (Table 19). On careful

examination of the existing deployment of fishing vessels and total landing, it seems that productivity is much lower.

Table 19: Voyage days and productivity considered by earlier Committees for estimation of fishing vessels

Vessel type	Approx. voyage days	Daily catch (tonnes)	Average Catch per day (in tonnes)
Long-liner	200	3 – 4	3.5
Purse-seiner	100	17 - 18	17.5
Pole & Line vessel	200	0.5 – 1.5	1

Estimating actual average productivity

The existing oceanic fishing fleet of 908 vessels comprises 235 converted liners (MPEDA and MoA schemes), 60 >20 meter vessels (LoP), 588 artisanal vessels (Thoothoor) and 25 mini trawlers engaged in long lining. On an average these fishing vessels are landing between 9 – 40 tonnes of tuna and tuna like species per trip per year. In comparison, Sri Lanka has 3 346 offshore fishing vessels, which landed 129 840 tonnes of fish in 2010[39] (39 tonnes per vessels per year). On the other hand, the 926 mechanized masdhonis (pole and line vessels) in Maldives made 139 622 trips and landed 116 940 tonnes of tuna and tuna like species (44% skipjacks and 38% yellowfin tuna) in 2012[40]. That is about 0.84 tonnes of tuna and tuna like fishes per day.

In case of India, analysis of productivity of the marine fishing fleet shows that vessels are catching between 0.14 tonnes (pole and line) to 0.33 tonnes (mini trawlers) per day. In case of industrial vessels in 2010, the total catch was estimated at 1991 tonnes. On an average, 30 DSFVs were actively engaged in operations at a given time in EEZ. That is on an average, each vessel landed 66 tonnes. Assuming that they fished for 200 days, the industrial vessels have caught 0.32 tonnes of fish per day, which is at par with the catch landed by converted liners and mini trawlers[41] (Table 20).

Table 20: Estimated productivity of oceanic fishing fleet

Gear	Vessels type	Number	Total landing (2012) (tonne)	Average landing per vessels per year (tonne)	Average fishing days per vessel per year	Daily average catch per vessel (tonne)
Longlining	Mini Trawlers*	25	1000	40	120	0.33
	Artisanal fishers	588	42336	72	200	0.36
	Converted liners*	150	3750	25	80	0.31
	LOP vessels	30	1991	66	200	0.32
Pole & Line	Pole & Line	365	9978	27	200	0.13
All type		***1158***	***59055***	***46***	***160***	***0.29***

**** Data is pertaining to Andhra Pradesh for 2012. Reported by CMFRI. Exact number of converted liners under MPEDA and MoA schemes is 235 as per 2010 Indian Report to IOTC.***

+ Exact volume of landing by artisanal (Thoothoor) fishers is not available. CMFRI reported that they makes about 8 trips per year lasting a month (about 25 days) and lands 9 tonnes of fish per trip.

 # Figures are from India's report to IOTC in 2010.

[39] ***Ministry of Fisheries and Aquatic Resources Development, Government of Sri Lanka.***

[40] ***Basic Fisheries Statistics 2012, Ministry of Fisheries and Agriculture, Government of Maldives.***

[41] ***At the time of writing this report, voyage days and catch data for industrial vessels were not available. Hence, actual per day catch could not be worked out. However, in 2010 total catch from industrial vessels was 1991 tonnes. That is on an average, each vessel has landed 33 tonnes. Assuming they fished for 200 days, the industrial vessels have caught 0.17 tonnes of fish per day! This indicates under-performance (or under-reporting?) and beat the basic objective of issuing LoP.***

Based on this, the following conclusions are drawn:

1.0 Existing sectoral composition of catch, which is likely to be followed and taken into consideration from precautionary perspective:

Species	Total catch	Coastal	Oceanic
Yellowfin tuna	20174	9289	15815
Skipjack tuna	17804	12875	4929

2.0 Factors worked out for different sectors based on Point 1.

Species	Total catch	Coastal	Oceanic
Yellowfin tuna	1	0.46	0.78
Skipjack tuna	1	0.72	0.28

3.0 Estimated potential based on the factors for sectoral composition (point 2)

Species	Total catch	Coastal	Oceanic
Yellowfin tuna+ billfishes and other tunas ***excluding sharks***	96700	44525	75806
Skipjack tuna	99000	71592	27408

To estimate the acceptable tuna longlining fleet, we have considered average daily catch of 0.30 tonnes (Table 20). The average voyage days is considered as 220 days. In case of purse seiners, figures considered by earlier committees have been taken into account due to data inadequacy.

Assuming a productivity of 0.30 tonnes per day and 220 voyage days per year for tuna long liners and assuming a productivity of 18 tonnes per day and 100 voyage days per year for purse seiners, the total fleet size is estimated as:

Vessel type	Target catch (tonnes)	Average yearly catch per vessel (tonnes)	Total numbers of vessels needed	Total number of vessels operating*	Additional number of vessels that can be introduced
Tuna long liner for yellowfin tuna and bill fishes	75806	66	1148	908	240
Purse seiners for skipjack tuna	27408	1800	15	0	15

**** 60 Industrial + 235 converted liners under MPEDA and MoA schemes + 588 artisanal+25 Mini trawlers from Andhra Pradesh.***

Other resources

Resource type	Fishable Potential (tonnes)	Vessel type	Average daily catch (tonnes)	Average days of fishing per year	Additional number of fishing vessels that can be introduced (col. 4/ (Col.7XCol.8))
1	2	6	7	8	9
Oceanic sharks	20800	Not recommended. Shark is also a major by-catch in tuna longlining.			
Coastal pelagic#	Not recommended.				
Oceanic squids & Cuttle fish#	59,200	Squid Jigger	-	-	70
Deep Sea lobsters#	1,100	Trap/Hook & Line	-	-	70

 # Based on estimates of earlier Committees.

5.0 The way forward

While India embarked on a journey to exploit its deep sea resources decades ago, the sector is yet to fully flourish. The approach to develop deep sea fisheries remain largely technological in nature with emphasis on technology diffusion (*e.g.* LoP Vessels) and development of infrastructure such as deep sea fishing port, etc. However, software part of developing deep sea fishery remains ignored.

Firstly, due to rich inshore water, fishers traditionally do not have the urge or need to go for deeper waters.

Secondly, as far as domestic market is concerned, existing supply of fish seems to be adequate to meet the market demand. This can be gauged from the near-stable prices of fish at wholesale and retailing points. This can be compared with recent demand supply mismatches of certain agricultural commodities, sky-rocketing their price.

Thirdly, fishers in general are yet to be fully integrated with export market and better remuneration due to higher revenue realization. This can be compared with the development of deep sea fisheries in Thoothoor, who were initially traditional shark fishers catering to a niche market profitably. Later with changing market conditions and changing availability of sharks, they adopted to other types of deep sea fisheries, including tuna.

Resultantly, at national level there is a shortage of skilled manpower for deep sea fisheries in India. Therefore, addressing only the hardware requirements will not address the issue completely and there is a need to match hardware with software requirements.

In terms of full exploitation of fisheries resources, the key point is to consider the catch data and not the landing data. Studies on determining the rate of discards and ghost fishing are important in this respect. However, considering the available information, it seems that effort must be managed in waters up to 500 meters.

In this regard, the Revalidation Committee of 2010 worked out the optimal fleet size at State level. The analysis carried out by the said Committee shows that there is nearly double the capacity in Indian waters (Figure 10). However, considering the fact that livelihoods is dependent on the sector, it is not possible to reduce fishing effort by reducing the number of crafts.

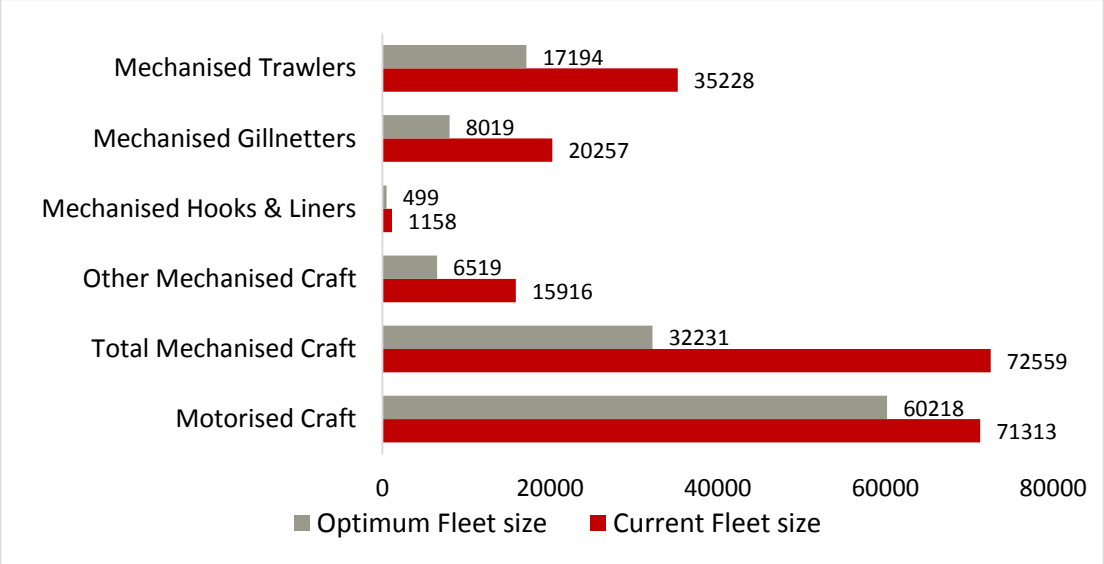

Figure 5: Present and estimated optimum fleet size for marine fisheries of India
Source: Optimum fleet size - GOI (2011); Current fleet size - CMFRI (2012)

Therefore, effort should be made to curb the entry of more craft in the fisheries. This could be done by setting conditions on boat design and manpower requirement of new fishing vessels and which over time can be extended to existing fishing vessels.

Based on above analysis, the following recommendations are proposed to enable the Government of India to devise suitable policies and programmes towards full exploitation of the catch potential in the Indian EEZ and from international waters:

- Sustainable exploitation of fisheries resources in the Indian EEZ should be the primary condition for any utilization plan of Indian EEZ. Restoration of resources not only cost but often impossible.
- Requirements of coastal States should be taken into consideration and a holistic plan should be developed incorporating production targets of the coastal States. At the same time, coastal States also need to appreciate that while the larger EEZ (beyond 12 nautical miles) is a common resource for them, expansionary production strategies and isolated production decisions will lead to destruction of this common resource. Therefore, the Union Government and the State Governments must act together to agree upon management policies and measure for sustainable exploitation of the resources. .
- Waters up to 200 meters depth are optimally exploited and in case of some species also over-exploited. Thus, there is no scope for expansion of fishing effort in this zone. Exploitation of resources in waters between 200 to 500 meters is now beginning, as small fishing boats (mainly in the 15 – 20 meter size ranges) are targeting the resources in this area. It is recommended that this depth zone may largely be kept as a buffer zone to augment the resources in both the near-shore waters as well as in the off-shore areas. Subsequently, this zone could also be utilized to diversify existing fishing fleet for targeting resources such squids, etc. and reducing pressure on near-shore waters in the future.
- Waters beyond 500 meter depth are not optimally exploited and there is considerable scope of expansion in this zone, mainly for tuna and tuna-like species. Resource-specific fishing vessels may be introduced in this area. Based on the resource potential of tuna and tuna like resources and

other commercial species such as squids, it is recommended that a fleet size of 1178 DSFVs may be considered for deployment in the Indian EEZ. This includes the existing DSFVs and the additional numbers of 270 vessels (240 tuna long liners, 15 purse seiners and 15 squid jiggers).

- As India is presently lacking in adequate expertise or resources to exploit water beyond 500 meters, hence technology transfer through acquisition of foreign fishing vessels and, or, joint ventures/leasing, etc. may be considered for this area till the domestic capacity is fully developed.
- In the technologies proposed for introduction, squid jigging has been considered as a means of diversification and exploitation of the squid fisheries for increasing production from the offshore waters. In this regard, technology infusion is necessary to locate the major squid fishery grounds as also demonstration of technology for which test fishing may be considered.
- Keeping in view the developments in exploitation of the resources in waters beyond 12 nautical miles, there is an urgent need to enact a comprehensive legislation for regulation of Indian fishing fleet in the EEZ.
- Trained manpower on board DSFVs is a critical requirement. In the absence of trained domestic crew that can work on such DSFVs, engagement of foreign crew onboard DSFVs is inevitable till the requisite skill is developed in the country. However, such engagements are becoming almost impossible due to the stringent conditions imposed by the Ministry of Home Affairs (MHA). In this regard, conditions such as minimum salary of USD 25 000 per annum, fixed percentage of foreign crew onboard DSFVs and their phasing out norms; grant of security clearance, etc. need to be reconsidered and liberalized to make fishing operations attractive and feasible.
- Besides the above mentioned conditions, considerable time is also being taken in grant of security clearance to foreign crew, which not only results in loss of fishing days during peak fishing seasons and consequent economic loss to the sector, but also creates uncertainty for the operators in planning their fishing operations. This aspect also needs re-consideration by MHA and security clearances should be granted in a time bound manner so that the operators could plan their operations for the fishing season.
- Capacity building of the Indian crew has been one of the important requirements of fishing in the deep sea. Therefore, to create level-playing field, the domestic fleet of DSFVs may also be allowed to engage one or two foreign crew so that they can provide the guidance and build the capacity of the Indian operators wherever skill/training is required.
- On the issue of human resource development for the deep sea fishing sector and availability of certified personnel to man DSFVs, it is also highly recommended that the Central Institute of Fisheries Nautical and Engineering Training (CIFNET), Kochi design appropriate courses for different category of operators and conduct such training programmes. Such programmes may be subsidized to provide incentives to the fishers to participate.
- The present Guidelines regulating the fishing areas of LOP vessels have designated certain areas as prohibited for fishing. These areas were earmarked during the 1980's. Therefore, the Government may consider assessing the impact of these prohibited areas in conservation of fish stocks and take decisions on their continuity as prohibited areas or otherwise.
- The present Guidelines permit seven types of fishing methods, *viz.* (i) long lining for tuna, (ii) tuna purse seining, (iii) squid jigging and squid hand lining, (iv) mid-water pelagic trawling, (v) trap fishing, (vi) hook and line fishing, and (vii) pole and line fishing. In view of the changing fisheries composition, present levels of exploitation, resource potential, etc., the Government may consider re-looking at the permitted fishing methods as also the category-wise fleet size deployment.
- In the same vein, the industry is also of the view that the spawning seasons of tuna species such (yellow fin and big eye) do not coincide with the period of the 'uniform ban on fishing'

implemented by the Government of India every year. The industry has requested for a review of this ban period for the DSFVs and suggested that such vessels may be exempted from the purview of the ban.

- The Government should consider setting up of Fish Aggregating Devices (FADs) in selected places to make tuna (skipjack) fishing more remunerative.

- Following the submission of Coast Guard to this Expert Committee, reporting mechanisms and compliance matters such as regular reporting of position during operation, submission of voyage report, crew compliance etc. should be improved and MCS measures including VMS should be put in place for better monitoring of the DSFVs. Reporting mechanisms of mid-sea transshipment of catch should be reviewed further in order to plug the loopholes, if any, on alleged under-reporting of catches. The Industry has also suggested that the requirements of daily reporting should not be insisted upon when the vessel is not fishing.

- Presently, multiple agencies are involved in regulating the activities of the DSFVs. These include the DAHD&F & FSI (Ministry of Agriculture); DG Shipping, MMDs, Port Authorities (Ministry of Shipping); MPEDA and DGFT (Ministry of Commerce); Coast Guard (Ministry of Defense); RBI, Customs (Ministry of Finance); Department of Telecommunication and Ministry of Home Affairs. Entrepreneurs often face difficulties in following the procedures of multiple agencies. There is a need to simplify the procedures and if need be a single window clearance procedure should be adopted.

- Based on the available resource potential and the price that tuna fisheries commands, it is estimated that the tuna and tuna like resources in the Indian EEZ are valued at approximately INR 3000 crores or US $ 500 million. In the absence of the Indian fleet unable to harvest this resource, the migratory stocks of tuna and tuna like species are being caught by the fishing fleet of the neighboring tuna fishing nations such as Maldives, Sri Lanka, Thailand and Indonesia. This in other words could be termed as a net loss of revenue to the Indian fisheries sector.

- Exploitation of the off-shore resources in the EEZ will have to be reconsidered in terms of not only the resources available in the EEZ but also in terms of infrastructure, a comprehensive and implementable set of rules and regulations, availability of scientific and technical information on the commercial fisheries resources and the best fishing methods with which to target them, etc. Such requirements may be considered by the Government.

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ToR-4: To examine status of compliance of regional and global requirements of management and regulation of marine fisheries including CCRF and proposed FAO Guidelines on Flag State Responsibilities[42]

1.0 Introduction

The Indian culture beautifully enshrines the importance of environment. This is manifested in different local customs and beliefs and also very eloquently stated in the country's national song, '*Vande Mataram*'.

"Vande Mataram!
Sujalam, suphalam, malayaja shitalam,
Shasyashyamalam, Mataram!
Vande Mataram! [43]**"**

India's concern for environment and sustainable development is also adequately reflected in various policy documents and the country's policies and programmes are well-integrated with the ongoing international processes in ensuring sustainable development. However, in balancing exploitation and conservation of natural resources, India faces the challenges of ensuring continuity of livelihoods of people on a day-to-day basis as large section of people who are primarily dependent on natural resources are not economically well-off and they often find it difficult to abstain from extraction for a longer period of time. Notwithstanding these challenges, India has so far ratified major international agreements and arrangements and has also undertaken significant measures for their successful implementation (***Table 1***).

At the international level, concerns for fisheries governance can be partially attributed to post-World War-II negotiations when countries felt the need for setting up a global platform to address various issues. Resultantly, the **United Nations** (**UN**) was established on 24 October 1945 to promote international co-operation. During the same time, the Food and Agriculture Organization (FAO) was also established (16 October 1945 in Quebec City, Canada) within the UN framework to help eliminate hunger, food insecurity and malnutrition.

Parallel to these developments, the War also contributed to the improvements in ship building technology and emergence of industrial fishing. The oceans, open to all, became a ground for competing fishing fleets for valuable fisheries resources, especially in the Atlantic. At the same time (1950), the World also witnessed collapse of the Norwegian and Icelandic fisheries. With improved system of data collection, communication, science and reporting the developments helped in promoting a wide-ranging debate on the pattern of uses of the world's oceans.

To carry forward this debate, in 1956, the United Nations held its first Conference on the Law of the Sea (UNCLOS-I) at Geneva, Switzerland. Although not successful, it produced the 'Convention

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[42] ***The purport of this TOR is to examine the status of compliance of regional and global requirements of management and regulation of marine fishing, including CCRF and proposed FAO Guidelines on Flag State responsibilities. However, such examination would require thorough perusal/interactions with the concerned Ministries/Departments in both the Central and State Governments to get the full picture of the status of compliance. Given the time at the disposal of this Expert Committee, it is not possible to do so. However, based on our information we have tried to meet the requirements of the TOR.***

[43] ***http://knowindia.gov.in/knowindia/national_symbols.php?id=12***

on Fishing and Conservation of Living Resources of the High Seas', designed to solve through international cooperation the problems involved in the conservation of living resources of the high seas. After three rounds of discussions in 1956, 1960 and 1967, and with concerted efforts of Arvid Pardo[44] in convincing the participants to consider seas as the '***common heritage of mankind***', the UNCLOS-III finally came to a fruitful outcome in 1982. Of the many landmark agreements in UNCLOS-III, the most outstanding relates to the defining of national rights and assigning duty of the states in sea waters up to 200 nautical miles (nm).

This landmark agreement brought in most fisheries within the confines of national jurisdiction, although there are important fisheries that operate on the high seas, and there are many transboundary resources with geographic distributions in more than one Exclusive Economic Zones (EEZ), or straddling an EEZ and the high seas. In all fairness it can be said that the foundation or the prime instrument for international fisheries management is the UNCLOS, which has now been ratified or acceded to by 166 parties (as of 29 October 2013)[45].

In the developmental path of the global fisheries, the early 1990s could perhaps be considered as the second milestone after UNCLOS. This period generated considerable debate on key fisheries issues and the international community accepted that the fishing effort and capacity of harvesting operations in many key fisheries of the world had far exceeded both the reproductive capacities of such resources as well as the management tools being used by governments and international organizations to regulate those fisheries to achieve sustainability. The debates also recognized that unresolved jurisdictional disputes between states over certain valuable fish stocks were producing heightened conflict and inhibiting effective conservation and unless there was coordinated effort at the earliest the fisheries in the future may be doomed.

The 1992 Conference on Responsible Fishing held in Cancún, Mexico and the 1992 United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Mexico generated considerable debate on sustainability of the world's fisheries and paved the way for many international agreements and accords, which now represent milestones in the history of global fisheries. The discussions in these global events facilitated the enforcement of the 1982 UNCLOS in 1994 and later (in October 1995) a much elaborated but voluntary 'Code of Conduct of Responsible Fisheries (CCRF)' of the FAO of the United Nations (FAO) was agreed by the global community. At the same time a number of regional fisheries management organizations also took steps to control fisheries in their respective regions more effectively. In the Indian context, mention may be made of the Indian Ocean Tuna Commission that was established in 1995 to mange the fisheries of tuna and tuna-like species in the Indian Ocean.

The following paragraphs describe the salient features of some of the important international instruments[46] and agreements (both binding and non-binding) to which India is signatory and have profound bearing on the development of Indian fisheries in general and marine fisheries in particular. A snapshot of such instruments in given in Table 1 (on next page).

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[44] ***Arvid Pardo (February 12, 1914 – June 19, 1999) was a Maltese diplomat, scholar, and university professor. He is known as the 'Father of the Law of the Sea Conference'.***

[45] ***India ratified the agreement on 29 June 1995.***

[46] ***The international instruments also include Voluntary Guidelines and Codes.***

Table 21: India's international obligations under some of the important instruments relating to both fisheries and environment

Instrument	Accession, Acceptance Ratification	Entry Into Force
International Convention for the Regulation of Whaling (Washington DC, 1946)	Adherence 09 March 1981	09 March 1981
Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington DC, 1963)	Ratified 20 July 1976	18 October 1976
Convention on Wetlands (Ramsar, Iran, 1971)	01 February 1982	01 February 1982
Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1973	20 July 1976	01 July 1975
The Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 1979)	1 November 1983	1November 1983
Convention on the Conservation of Antarctic Marine Living Resources (Canberra, 1980)	Acceptance 17 June 1985	17 July 1985
United Nations Convention on the Law of the Sea (Montego Bay, 1982)	29 June 1995	29 July 1995
Convention on Biological Diversity (Rio de Janeiro, 1982)	Ratification 18 February 1994	18 February 1994
Global Plan of Action for the Protection of the Marine Environment from Land-Based Activities (Declaration, Washington DC, 1995)	23 November 1995	23 November 1995
Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (New York, 1995)	Accession 19 August 2003	19 August 2003

2.0 International non-voluntary (binding) and voluntary instruments (non-binding)

2.1 Non-voluntary (Binding) instruments

The 1982 U N Convention on the Law of the Sea (UNCLOS):

The UNCLOS, 1982 which came into force on November 16, 1994, elaborates a comprehensive regime for governance of the oceans, covering all aspects of ocean space from delimitation to environmental control, scientific research, fishing and other economic and commercial activities, technology and the settlement of disputes relating to ocean matters. It contains general provisions for the governance of ocean fisheries and provides a base for developing more specific rules in subsequent international instruments and agenda of the United Nations General Assembly (UNGA) from time to time.

The declaration of EEZ by nations (UNCLOS, Art.55-75) could be termed as the most significant innovation in relation to governance of marine fisheries resources during the second half of the twentieth century. By the time that the Convention was agreed in 1982, more than 80 coastal states had declared their EEZ, mostly of 200 nm. Within this zone the coastal state enjoys 'sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources,

whether living or non-living' (Art.56). The 1982 Convention reaffirms the traditional rights of all nations for their nationals and vessels to fish on the high seas but makes this right subject to a number of important, though general, additional conditions. The 1982 Convention further authorizes each coastal state to enforce its fishery laws within its EEZ against any vessel that may be fishing there. Fishing vessels on the high seas, generally speaking, remain under the exclusive jurisdiction of the flag state (that is, the state in which the vessel is registered), although the flag state may consent to have enforcement action taken by another state.

In exchange, coastal states have the responsibility to determine the allowable catch of living resources in its EEZ, protect such resources against over-exploitation, take measures to reduce by-catch, promote optimum utilization of such resources, determine its capacity to harvest such resources, and give other states access to any surplus resources in its EEZ. Beyond the EEZs lie the remaining high seas, which, if all coastal states claim EEZs out to 200 nm, would still cover more than 21 percent of the earth's surface and approximately 70 percent of all ocean area.

In the early 1990s a consensus among states developed that the general provisions of the 1982 Convention requiring co-operation between states in the conservation and management of high seas fisheries resources (Art. 117-120) needed strengthening. Subsequently, this led to two agreements: the first one dealing with fishing fleet and the second with fish stocks that cross between the EEZs of one or more coastal states and into the adjacent high-seas areas (Straddling fish stocks) and highly migratory fish stocks that migrate extensively across the high seas and through the EEZs of many coastal states. For example the anadromous fish species, Hilsa (*Tenualosa ilisha*) is a straddling fish stock and tuna and swordfish are highly migratory fish stock that frequent Indian waters.

United Nations General Assembly Resolution 46/215[47]:

Following concerns about the impact of large-scale driftnets on the high seas, notably in the Pacific, the issue of driftnet fishing was pursued in the UNGA, leading to a series of Resolutions and Decisions; Resolutions 44/225 and 46/215 represent the two most important of these Resolutions.

On 22 December 1989, the UNGA, expressing concerns on the use and impact of high seas driftnets, adopted by consensus, Resolution 44/225, which recommended the following measures: (a) moratorium on all large-scale pelagic driftnet fishing on the high seas by 30 June 1992, subject to a proviso that it would not be imposed in a region or, if implemented, could be lifted, should effective conservation and management measures be taken to prevent the 'unacceptable impact' of such fishing practices and to ensure the conservation of the living marine resources of that region; (b) immediate action to reduce large-scale pelagic driftnet fishing activities in the South Pacific, leading to the cessation of such activities by 1 July 1991. This was designed only to be an interim measure, until appropriate conservation and management arrangements in the region were entered into by the parties concerned; and (c) immediate cessation of any further expansion of large-scale pelagic driftnet fishing on the high seas in the North Pacific and all the other high seas outside the Pacific Ocean, with the understanding that this measure will be reviewed subject to the same conditions described in (a) above.

The UNGA Resolution 46/215 was the third in the series and adopted on 20 December 1991. It built upon the measures contained in Resolution 44/225 and proposed on the basis that States had not been able to demonstrate that driftnets could be used without 'unacceptable impacts', that the moratorium should be implemented, and a revised timetable was set. It said that beginning 01 January 1992, fishing effort in existing large-scale pelagic high seas drift-net fisheries should be

[47] http://www.intfish.net/treaties/summaries/3304.htm

reduced so as to achieve, by 30 June 1992, a 50 percent reduction in fishing effort and the moratorium fully implemented by 31 December 1992.

The Convention on Biological Diversity (CBD)[48]:

The CBD was ratified in 1995, as a follow up to UNCED. Its major objectives are the conservation of biological diversity, the sustainable use of its components and fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

The CBD shares a number of key objectives related to sustainable use, conservation and equity with the FAO's 1975 Code of Conduct for Responsible Fisheries (CCRF). Resultantly, their implementation is complimentary. However, the CBD is legally binding. Thus although the CCRF is voluntary, ratification of CBD has implicitly given a legal backing and necessity for the States to implement the CCRF at the earliest.

At the Tenth Conference of Parties (COP) of the CBD held in Nagoya, Japan in October 2010, the COP adopted the Strategic Plan for Biodiversity 2011-2020, with a set of 20 Targets (under five Strategic Goals) , also now popularly referred to as Aichi Targets. Of these 20 targets the following two targets are of much relevance to the fisheries sector:

> ***Target 6:*** *By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.*
>
> ***Target 11:*** *By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.*

The COP-11 held in Hyderabad, India and the CBD Executive Secretary made strong calls to Parties, partners and other stakeholders to take urgent action towards achieving the Aichi Biodiversity Targets. At the same COP, India also assumed the mantle of a 'Biodiversity Champion' urging the other Parties to also do the same.

In addition to above, two internationally accepted work plans drafted under the CBD directly relate to fisheries; the Jakarta Mandate on marine and coastal ecosystems and the work plan on inland water ecosystems. Both of these work plans of the CBD contain elements on the conservation of aquatic biodiversity and the habitats that support them, the sustainable use of aquatic resources, the management of alien (introduced) species and genotypes, integrated areas management, the use of 'precautionary approach' and an ecosystem approach to development and risk assessment (Malawi Principles[49]).

The Malawi Principles proposed 12 guiding tenets towards an ecosystem approach to conservation and sustainable use of biological diversity. These principles are:

- *Management objectives are a matter of societal choice;*

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[48] ***In India, the Ministry of Environment & Forests governs this international instrument.***

[49] ***In a Workshop on the Ecosystem Approach (Lilongwe, Malawi, 26-28 January 1998), whose report was presented at the Fourth Meeting of the Conference of the Parties to the CBD (Bratislava, Slovakia, 4-15 May 1998, UNEP/CBD/ COP/4/Inf.9), twelve principles/characteristics of the ecosystem approach to biodiversity management were identified.***

- *Management should be decentralized to the lowest appropriate level;*
- *Ecosystem managers should consider the effects of their activities on adjacent and other ecosystems;*
- *There is a need to understand the ecosystem in an economic context;*
- *A key feature of the approach includes conservation of ecosystem structure and functioning;*
- *Ecosystems must be managed within the limits of their functioning;*
- *The ecosystem approach should be undertaken at the appropriate scale;*
- *Objectives for ecosystem management should be set for the long-term;*
- *Management must realize that change is inevitable;*
- *There must be a balance between conservation and use;*
- *All forms of relevant information should be considered, including scientific and indigenous and local knowledge, innovations and practices; and*
- *All relevant sectors of society and scientific disciplines should be involved.*

The 1993 FAO Compliance Agreement:

The Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (the Compliance Agreement) was adopted by the FAO in 1993. The agreement has two primary objectives: (i) to impose upon all states whose fishing vessels operate on the high seas an array of obligations designed to make the activities of those vessels consistent with conservation and management needs; and (ii) to increase the transparency of all high-seas fishing operations through the collection and dissemination of data about high-seas fishing vessels and their activities. The agreement makes it harder for fishing vessels to avoid complying with international fisheries management measures by 're-flagging' to a country that does not require its vessels to comply. The FAO CCRF also has reference to the Compliance Agreement, making the voluntary Code to also comply with non-voluntary instruments such as the Compliance Agreement.

The 1995 United Nations Fish Stocks Agreement:

The Agreement for the Implementation of the Provisions of the UNCLOS, 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (or simply known as UN Fish Stocks Agreement) was adopted in 1995. It strengthened the application of UNCLOS. The Agreement proclaims the right of all countries to fish on the high seas, but it also establishes a general obligation to cooperate in the conservation and management of straddling fish stocks and highly migratory fish stocks. It states that firstly all states have a duty to ensure that their nationals comply with conservation measures adopted for high seas stocks (UNCLOS, 1982, Art.117). Secondly, on the high seas, states have jurisdiction over vessels flying their flag (UNLOS, 1982, Art. 90-98). The important provisions in the Agreement are as follows:

- *elaborates general principles concerning conservation and management of straddling fish stocks and highly migratory fish stocks;*
- *applies the concept of the precautionary approach to the conservation and management of these stocks;*
- *emphasizes the special role of regional fisheries management organizations in the conservation and management of straddling fish stocks and highly migratory fish stocks;*
- *elaborates upon the obligation of states to cooperate in the conservation and management of straddling fish stocks and highly migratory fish stocks. This includes a duty upon States not to authorize vessels to fish for such fish stocks unless the State is party to, or co-operates with, any sub-regional or regional fisheries management organization or arrangement established and which has competence to establish conservation and management measures for the stock concerned;*
- *elaborates upon the obligations of states with respect to vessels flying their flag on the high seas;*
- *introduces innovative enforcement provisions for the high seas; and*

- *introduces provisions with respect to the requirements of developing states.*

The 1995 UN Fish Stocks Agreement is binding only upon those States that are Party to it. The Agreement is in force from 11 December 2001. Presently, 74 countries have ratified the Agreement. India ratified the Agreement on 19 August 2003.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)[50]:

CITES is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. CITES was drafted as a result of a resolution adopted in 1963 at a meeting of members of IUCN (The World Conservation Union). The text of the Convention was finally agreed at a meeting of representatives of 80 countries in Washington DC., USA, on 03 March 1973, and on 1 July 1975 CITES entered in force. Although CITES is legally binding on the Parties – in other words they have to implement the Convention – it does not take the place of national laws. Rather it provides a framework to be respected by each Party, which has to adopt its own domestic legislation to ensure that CITES is implemented at the national level. Presently, about 92 fish and mammals are covered in CITES. In view of full or over exploitation of many fish stock there are proposal to further enhancing the list.

The Convention on the Conservation of Migratory Species of Wild Animals[51,52]:

The Convention on the Conservation of Migratory Species of Wild Animals (also known as CMS or Bonn Convention) aims to conserve terrestrial, marine and avian migratory species throughout their range. It is an inter-governmental treaty**,** concluded under the aegis of the United Nations Environment Programme, concerned with the conservation of wildlife and habitats on a global scale. The Convention was signed in 1979 in Bonn (hence the name) and entered into force in 1983. The CMS acts as a framework Convention. The Agreements may range from legally binding treaties (called Agreements) to less formal instruments, such as Memoranda of Understanding (MoU), and can be adapted to the requirements of particular regions. The development of models tailored according to the conservation needs throughout the migratory range is a unique aspect of CMS.

Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia[53]:

The MoU on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia was adopted in July 2000, and is the second such MoU to be concluded under the auspices of CMS. The MoU was further developed at an additional session in Manila, Philippines in June 2001, when the Conservation and Management Plan - the parts of the MoU containing the substantive measures to be implemented - was finalized and adopted.

The objectives of the MoU are to establish a framework through which States can conserve and replenish depleted marine turtle populations and manage the wide range of threats to marine turtles, including habitat destruction, direct harvesting and trade, fisheries by-catch, pollution and other man-induced sources of mortality. The MoU recognizes the need to address these problems in the context of the socio-economic development of the States concerned, and to take account of other relevant instruments and organizations. The detailed measures to be implemented by the signatories to the MoU are set out in the Conservation and Management Plan. This Plan, which was revised in

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[50] ***Like CBD, the Ministry of Environment & Forests, Government of India also governs this international instrument.***

[51] ***http://www.cms.int/about/intro.htm***

[52] ***The Ministry of Environment & Forests also governs this agreement.***

[53] ***http://www.intfish.net/treaties/summaries/3610.htm***

2004, contains 24 general programme areas, which are placed within the following six general objectives:

- *Reduction of direct and indirect causes of marine turtle mortality;*
- *Protection, conservation and rehabilitation of marine turtle habitats;*
- *Improving the understanding of marine turtle ecology and populations through research, monitoring and information exchange;*
- *Increasing public awareness of the threats to marine turtles and their habitats, and enhance public participation in conservation activities;*
- *Enhancing national, regional and international cooperation; and*
- *Promoting the implementation of the MoU including the Conservation and Management Plan itself.*

This MoU has significant bearing on fisheries livelihoods, as many areas along the coastline on the east coast of India have been prohibited for fishing to safe guard turtle migrations, especially the *Olive ridley* turtles, which have mass nesting grounds on the Odisha coastline. Further, to reduce the accidental mortality of turtles, the trawlers are also required to use turtle excluder devices on the trawl nets.

Port State Measures[54]:

Illegal, unreported and unregulated (IUU) fishing is an issue of grave concern for the global fishing community. IUU fishing undermines efforts to conserve and manage fish stocks in a sustainable manner. As a tool to combat IUU fishing, the importance of enhanced port state control has increasingly gained ground throughout the last decennium. The growing reliance on port states to combat non-sustainable fishing practices stems to a great extent from the failure of flag states to effectively control fishing operations carried out by vessels flying their flag.

In 2001, FAO Members developed within the framework of the 1995 FAO CCRF, an International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (IPOA-IUU). The IPOA-IUU has served as a catalyst to consolidate efforts at all levels to combat the continuing destruction caused by IUU fishing. The IPOA-IUU has adopted a holistic approach, which includes actions and measures to be taken by all States, flag States, coastal States and, importantly, port States. Besides FAO CCRF, Port State Measures (PSM) have also been agreed in other international instruments also such as the 1993 FAO Compliance Agreement and the 1995 UN Fish Stocks Agreement.

After four years of the endorsement of the IPOA-IUU, the FAO Committee on Fisheries (COFI) endorsed the 2005 FAO Model Scheme on PSM to Combat IUU Fishing. As a comprehensive voluntary instrument, it provided a minimum standard for harmonized actions and measures to be taken by port States in respect of foreign fishing vessels, and has already served as the basis for national measures and for schemes of some regional fishery management organizations. The international community clearly and unambiguously welcomed the FAO Model Scheme, but almost immediately called for a legally-binding instrument to be developed, based on the IPOA-IUU and the FAO Model Scheme. This sentiment was expressed in many fora within and outside the UN system, including through the UNGA Resolutions on Sustainable Fisheries of 2005 and 2006.

At its Twenty-seventh Session in 2007, the FAO COFI acknowledged the urgent need to develop a new legally binding instrument on Port State Measures. Following the procedures of an Expert

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[54] ***This binding agreement has been concluded within the framework of FAO, under Article XIV of the FAO Constitution.***

Consultation and then a Technical Consultation to finalize the instrument's text and after an intense round of negotiations extending from June 2008 to August 2009, the FAO Conference on 22 November 2009 approved the Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing. Immediately following its approval, the Agreement was opened for signature for one year. The Agreement due to enter into force 30 days after the date of the deposit of the twenty-fifth instrument of ratification, acceptance, approval or accession with the Depositary, the Director-General of FAO has so far been acceded to by five member states.

The PSM requirements establish set of conditions or requirements that foreign fishing vessels must comply with or are subjected to as a condition(s0 for use of ports within the port state. National PSM would typically include requirements related to prior notification of port entry, use of designated ports, restrictions on port entry and landing/transhipment of fish, restrictions on supplies and services, documentation requirements and port inspections, as well as related measures, such as IUU vessel listing, trade-related measures and sanctions. Many of these measures have in recent years seen their inclusion and development in international instruments.

The Agreement aims to prevent illegally caught fish from entering international markets through ports. Under the terms of the treaty, foreign vessels will provide advance notice and request permission for port entry, countries will conduct regular inspections in accordance with universal minimum standards, offending vessels will be denied use of port or certain port services and information sharing networks will be created.

2.2 Voluntary (non-binding) instruments

Beginning early nineties, fisheries management took a paradigm shift from a near total reliance on 'hard laws' for regulating fisheries in sovereign-states' territorial waters to the adoption of 'soft' global voluntary codes of conduct, market incentives and partnerships between fisherfolk and governments. The following paragraphs describe some of voluntary instruments and plans of action that have important bearings on sustainable development of marine fisheries in India.

The 1992 Earth Summit:

The 1992 United Nations 'Conference on Environment and Development (UNCED), informally known as the Earth Summit was held in Rio de Janeiro, Mexico to rethink economic development and find ways to halt the destruction of irreplaceable natural resources and pollution of the planet Earth. The Summit resulted in five documents of which the following four documents have important bearing on framing the governance of fisheries:

- *Rio Declaration on Environment and Development;*
- *Agenda 21;*
- *Convention on Biological Diversity; and*
- *Framework Convention on Climate Change.*

The Rio Declaration laid down a set of principles to ensure sustainable development of the planet Earth. The Declaration put the humanitarian approach at the centre of concern for sustainable development and acknowledged the sovereign rights of states to exploit their own resources pursuant to their environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction. The Declaration further asserts that in order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it. The Declaration also calls for cooperation among the countries to conserve, protect and restore the health and integrity of the

Earth's ecosystem. One of the major achievements of the Declaration is to assert the role of citizens as partner in designing the development process and focusing on mainstreaming women and marginalized indigenous communities in the development process.
Agenda 21 addressed the pressing problems of the early 1990s and aimed at preparing the world for the challenges of the following century. It reflected a global consensus and political commitment at the highest level on development and environment co-operation. The programme areas in Agenda 21 are described in terms of the basis for action, objectives, activities and means of implementation. Agenda 21 is subdivided in 4 sections and 40 Chapters, most of which in one or the other way are relevant for marine fisheries.

Section I: Social and economic dimensions (Chapters 2 to 8) addresses the international co-operation needed for sustainable development, combating poverty, changing consumption patterns, understanding demographic dynamics and sustainability as well as improving human health, human settlements, and decision making. While not referring explicitly to fisheries, these chapters deal with issues of relevance to sustainable development of fisheries.

Section II: Conservation and management of resources for development dealt in this section are of more direct relevance to fisheries. Chapter 9, Protection of the atmosphere, is relevant in relation to exhausts, fumes and ozone-depletion gases used for refrigeration on fishing vessels or in land-based plants. Chapter 15 is on Conservation of biological diversity and is important for fisheries. Chapter 17, Protection of the oceans, all kinds of seas, including enclosed and semi-enclosed seas, and coastal areas and their protection, rational use and development of their living resources, is obviously central to marine fisheries and aquaculture and deals with (a) integrated management and sustainable development of coastal areas, including EEZ; (b) marine environmental protection; (c) sustainable use and conservation of marine living resources of the high seas; (d) sustainable use and conservation of marine living resources under national jurisdiction; (e) addressing critical uncertainties for the management of the marine environment and climate change; (f) strengthening international, including regional co-operation and co-ordination; and (g) sustainable development of small islands.

Section III: This section deals with strengthening the improvement of governance needed for an effective transition to more sustainable fisheries, particularly concerning women, indigenous people, NGOs, local authorities, trade unions, industry, and the scientific community.

Section IV: Means of implementation addresses one of the major issues of Agenda 21 including financial resources, technology transfer, science for sustainable development, education, public awareness and training, capacity building in developing countries, international institutions, international legal instruments, and information for decision-making. While the chapters in this section do not refer to fisheries in particular they reflect practically all the issues addressed in trying to rationalize fisheries sector during the last decade.

Ten years after UNCED, the world's leaders met at the World Summit for Sustainable Development (WSSD) in Johannesburg, South Africa, to review progress achieved in meeting the goals of UNCED. WSSD produced a new Plan of Implementation, which includes several commitments related to international fisheries. The most significant of these commitments is a call to rebuild depleted fish stocks on an urgent basis and no later than 2015.

Subsequently, the Rio+20 or Earth Summit 2012 held in Rio de Janeiro from 13 – 22 June 2012 was the third international conference on sustainable development aimed at reconciling the economic and environmental goals of the global community. The ten day mega-summit, which culminated in a three-day high-level UN conference, was organized by the UN Department of Economic and Social

Affairs and included participation from 192 UN member states — including 57 Heads of State and 31 Heads of Government, private sector companies, NGOs and other groups. Rio+20 sought to secure affirmations for the political commitments made at past Earth Summits and set the global environmental agenda for the next 20 years by assessing progress towards the goals set forth in Agenda 21 and implementation gaps therein, and discussing new and emerging issues. The primary result of the conference was the non-binding document, "The Future We Want," a 49 page work paper. The 192 governments in attendance renewed their political commitment to sustainable development and declared their commitment to the promotion of a sustainable future. The document largely reaffirms previous action plans like Agenda 21. The document calls the urgent need to return ocean stocks to sustainable levels and calls on countries to develop and implement science-based management plans.

The Kyoto Declaration and Plan of Action[55]:

The Kyoto Declaration and Plan of Action was adopted at the International Conference on the Sustainable Contribution of Fisheries to Food Security, held in Kyoto, Japan from 4-9 December 1995. Attended by 522 participants from 95 States, 11 inter-governmental organizations and 9 non-governmental organizations, the Conference addressed the increasing demand for fishery products and culminated in adoption of a set of immediate actions to be taken by States, either directly or in cooperation with other States, or through cooperation with FAO and other appropriate international organizations. These included the following actions:

- *to assess and monitor the present and future levels of global, regional and national production, supply and demand of fish and fishery products and their effects on food security, employment, consumption, income, trade and sustainability of production;*
- *to enhance sub-regional and regional cooperation;*
- *to conduct integrated assessments of fisheries in order to evaluate opportunities and strengthen the scientific basis for multi-species and ecosystem management;*
- *to take various measures to reduce excess fishing capacity;*
- *to develop, promote and facilitate the exchange of information on various matters;*
- *to promote allocation of human and financial resources for an international program to investigate the effectiveness of multi-species management of commercial fishery resources;*
- *to take various action in relation to fish and other sea life which are incidentally caught and discarded;*
- *to promote the exchange of information amongst research institutes and other relevant entities and to strengthen coordination of national and international research programs; and*
- *to provide and coordinate technical and financial assistance programs for developing countries.*

The FAO 1995 Code of Conduct for Responsible Fisheries or the CCRF:

The 19th Session of the FAO Committee on Fisheries (COFI), held in March 1991, recommended that FAO should develop the concept of responsible fisheries and elaborate a Code of Conduct toward this end. Subsequently, the FAO-CCRF or popularly known as the 'Code' was developed and finally adopted as a blueprint for the management of fisheries on 31 October 1995 at the 28th Session of the FAO Conference in Rome.

The Code is today the most significant of the non-binding agreements in the global fisheries sector. It is global in scope and is directed toward members and non-members of FAO, fishing entities, organizations of all kinds, fishers, people engaged in the processing and marketing of fish and fishery products – in short everyone concerned with conservation of fishery resources and

[55] ***http://www.intfish.net/treaties/summaries/3306.htm***

management and development of fisheries. The Code is voluntary, but certain parts of the Code reflect and include major articles and provisions from a number of global UN conventions and agreements, as mentioned earlier. The Code sets forth principles and standards applicable to the conservation, management and development of all fisheries. It also covers the capture, processing and trade of fish and fishery products, fishing operations, aquaculture, fisheries research and the integration of fisheries into coastal area management.

The CCRF addresses six key themes: Fisheries management, fishing operations, aquaculture development, integration of fisheries into coastal area management, post-harvest practices and trade, and fisheries research. In total, there are 19 general principles and 210 standards in the Code. While a precautionary approach is integral to all themes, it is applied particularly to fisheries management, as detailed in Article 7.5. Paragraph 7.5.1 includes a statement to the effect that: "*States should apply the precautionary approach widely to conservation, management, and exploitation of living aquatic resources in order to protect them and preserve the aquatic environment*." Among the objectives of the Code are:

(i) to establish principles for responsible fishing and fisheries activities, taking into account all their relevant biological, technological, economic, social, environmental and commercial aspects;

(ii) to establish principles and criteria for the elaboration and implementation of national policies for responsible conservation of fisheries resources and fisheries management and development;

(iii) to serve as an instrument of reference to help states establish or improve the legal and institutional framework required for the exercise of responsible fisheries and to formulate and implement appropriate measures;

(iv) to provide guidance that may be used where appropriate in the formulation and implementation of international agreements and other legal instruments, both binding and voluntary;

(v) to facilitate and promote technical, financial and other cooperation in conservation of fisheries resources and fisheries management and development;

(vi) to promote the contribution of fisheries to food security and food quality, giving priority to the nutritional needs of local communities;

(vii) to promote protection of living aquatic resources and their environments and coastal areas;

(viii) to promote the trade of fish and fishery products in conformity with relevant international rules and to avoid the use of measures that constitute hidden barriers to such trade;

(ix) to promote research on fisheries as well as on associated ecosystems and relevant environmental factors; and

(x) to provide standards of conduct for all persons involved in the fisheries sector.

In 1999, FAO also adopted three non-binding instruments, known as International Plans of Action (IPOAs), to address three specific problems in ocean fisheries and promote implementation of the Code. The IPOA on the 'Management of Fishing Capacity' commits the international community to address this problem and sets standards for bringing fishing capacity in line with sustainable fishing. The second IPOA concerns the 'Conservation and Management of Sharks' while the third deals with the problem of 'Seabird By-catch in long line Fisheries'. A final IPOA, adopted by FAO in 2001, concerns the growing incidence of 'Illegal, Unreported and Unregulated Fishing'.

These non-binding agreements are referred to as 'soft tools of governance', and are useful instruments for achieving responsible governance of fisheries. An important aspect of the Code and the IPOAs is that they apply to fisheries within national jurisdictions, in addition to fisheries on the high seas.

The Code is although a voluntary, non-binding agreement, but it contains sections that are similar to those in several binding agreements such as; The Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (the 1993 Compliance Agreement), and the Agreement for the Implementation of the Provisions of the UNCLOS relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (the 1995 UN Straddling Stocks Agreement). The Compliance Agreement was adopted at the FAO Conference at the 27th session in November 1993 and is considered to be an integral part of the Code. As mentioned earlier, the Code also draws references to conservation of biodiversity and thus brings in the compliance to the provisions of the Convention as agreed to by the parties. India in recent years has become a key player in promoting the provisions of the CBD.

The key messages in the CCRF are summarized as follows:

- Countries should have clear and well-organized fishing policies in order to manage their fisheries, developed with the cooperation of all groups that have an interest in fisheries.
- The best scientific information should be used also taking into account traditional fishing practices and knowledge where it is appropriate to do so.
- New regional fishery organizations to be established or existing organizations to be strengthened.
- It is important that fishing industries at all levels operate within a clear fisheries management and legal framework.
- Fishing and fish processing are conducted in ways that minimize negative impacts on the environment, reduce waste, and preserve the quality of fish caught.
- All people and organisations concerned with fishing, especially the traditional fisher community should be encouraged to share their views and opinions on fishing issues.
- Education and training for fishers to enable them getting involved in developing and implementing policies to ensure sustainable fisheries now and in the future.
- The size of the fishing fleet should not be too large for the natural supply of fish.
- Gear should also minimize the catching of non-target or by-catch fish or those that are endangered. Fishing gear and fishing methods that are not selective or which cause high levels of waste should be phased out.
- The crafts used or the fishing methods should not cause major pollution.
- Important fish habitats such as wetlands, mangroves, reefs and lagoons should be protected from destruction and pollution.
- Where natural disasters harm fisheries resources, countries should be prepared to take emergency conservation and management measures when necessary.
- Harbours and landing places should be safe havens for fishing vessels and managed well.
- Fishing vessels which fish beyond the countries boundaries should be doing so within a common frame work and principles.
- Aquaculture development should conserve genetic diversity and minimize negative effects of farmed fish on wild fish populations, while increasing supplies of fish for human consumption. There should not be any negative effect on environment natural resources and the socio- economic setup.
- When deciding how coastal resources (for example, water, land, etc.) should be used or accessed, the people, including fishers, who live in the area, and their ways of living, should be considered, and their opinions taken into account in the planning process.

- Fisheries development should be well integrated into coastal area management and should not conflict with interests of other resource users and other resource users should also not affect fisheries or poor fisher's lives.
- Should ensure that fish and fishery products are safe and healthy, and methods of processing, transporting and storing fish should be environmentally sound.
- Fishers, environmental organizations and consumer groups should be consulted as countries periodically formulate and review their trade laws and regulations.
- It is important that international trade does not involve fish taken from depleted stocks or that have other serious environmental impacts.

International Plan of Action for the Management of Fishing Capacity[56]

The International Plan of Action for the Management of Fishing Capacity (IPOA-Capacity) is a voluntary instrument elaborated within the framework of the CCRF. It was adopted at the 23rd Session of FAO's Committee on Fisheries in February 1999. The IPOA-Capacity is directed at States and Regional Fisheries Organizations (RFOs) with the objectives of achieving worldwide an efficient, equitable and transparent management of fishing capacity. The IPOA-Capacity applies both to fleets and vessels operating in waters under national jurisdiction and fleets and vessels operating on the high seas. This fulfilment of the IPOA-Capacity was to be achieved by 2003 and in case not later than 2005.

The IPOA-Capacity specifies that when confronted with an overcapacity problem (where capacity is undermining achievement of long-term sustainability outcomes), States and Regional Fisheries Organizations (RFOs) should endeavour to limit at present level and progressively reduce the fishing capacity applied to affected fisheries. In other cases, the IPOA-Capacity calls for States and RFOs to exercise caution to avoid growth in capacity undermining long-term sustainability. The IPOA-Capacity calls for States and RFOs to monitor and assess fishing capacity and, in particular, also calls for States to establish compatible national records of fishing vessels and to support the establishment by FAO of an international record of vessels operating on the high seas (in accordance with the FAO Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas). The management of fishing capacity on the basis of national and regional plans is to be achieved in three phases: (i) assessment and diagnosis; (ii) adoption of management measures; and (iii) periodic adjustment of such assessment and diagnosed measures, as appropriate. However, the objectives of the IPOA-Capacity are yet to be realized.

International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing[57]***:***

The IPOA to prevent, deter and eliminate illegal, unreported and unregulated fishing (IPOA-IUU) was adopted at the 24th Session of the FAO's Committee on Fisheries in March 2001. The IPOA-IUU, like the other IPOAs, is a voluntary instrument and is designed to be a practical and action oriented "toolbox" of measures to deal with IUU fishing. The IPOA has as its objectives the prevention, deterrence and elimination of all elements of IUU fishing, both in waters under national jurisdiction and those beyond, by providing all States with comprehensive, effective and transparent measures by which to act, either directly or through appropriate regional fisheries organizations. The IPOA is based on four main sections or areas of action: Flag State responsibilities; coastal State measures; Port State measures; and internationally agreed market-related measures. In addition, there

[56] ***http://www.intfish.net/treaties/summaries/3311.htm***

[57] ***http://www.intfish.net/treaties/summaries/3312.htm***

are sections dealing with, *inter alia*, general obligations on all States, the role of RFOs, the position of developing States, research and the role of FAO. The IPOA also sets out a number of provisions applying to all States, including provisions dealing with State control over nationals; sanctions; and various provisions relating to monitoring, control and surveillance (MCS).

The International Plan of Action for the Conservation and Management of Sharks[58]:

The International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks) includes all chondrichthyan (sharks, skates, rays & chimaera) fisheries, from both target and non-target fisheries, whether they be industrial, artisanal or traditional fisheries or fishing programmes designed to reduce risk of shark attack on humans. It was authorized by the FAO Committee on Fisheries in 1999 and is part of the CCRF. The IPOA-Sharks was adopted because of the continuing widespread concern over the increase of shark fishing and the consequences that it has for populations of shark species in the world's oceans.

The overall objective of the IPOA-Sharks is to ensure the conservation and management of sharks and their long-term sustainable use. There are three guiding principles associated with meeting this objective:

- ***Participation:*** *States that contribute to fishing mortality on a species or stock should participate in its management.*
- ***Sustaining stocks:*** *Management and conservation strategies should aim to keep total fishing mortality for each stock within sustainable levels by applying the precautionary approach (a response to uncertainty in the face of risks to the environment. It involves acting to avoid serious or irreversible potential harm, despite lack of scientific certainty as to the likelihood, magnitude, or causation of that harm).*
- ***Nutritional and socio-economic considerations:*** *Management and conservation objectives and strategies should recognize that in some low-income food-deficit regions and/or countries, shark catches are a traditional and important source of food, employment and/or income. Such catches should be managed on a sustainable basis to provide a continued source of food, employment and income to local communities.*

The aim of the Shark Plan is to:

- *Ensure that shark catches from directed and non-directed fisheries are sustainable;*
- *Assess threats to shark populations, determine and protect critical habitats and implement harvesting strategies consistent with the principles of biological sustainability and rational long-term economic use;*
- *Identify and provide special attention, in particular to vulnerable or threatened shark stocks;*
- *Improve and develop frameworks for establishing and coordinating effective consultation involving all stakeholders in research, management and educational initiatives within and between States;*
- *Minimize by-catch (unutilized incidental catches of sharks);*
- *Contribute to the protection of biodiversity and ecosystem structure and function;*
- *Minimize waste and discards from shark catches in accordance with article 7.2.2.(g) of the Code of Conduct for Responsible Fisheries (for example, requiring the retention of sharks from which fins are removed);*
- *Encourage full use of dead sharks;*
- *Facilitate improved species-specific catch and landings data and monitoring of shark catches; and*
- *Facilitate the identification and reporting of species-specific biological and trade data.*

International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries:

The objective of the International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries (IPOA-SEABIRDS) is to reduce the incidental catch of seabirds in longline

[58] ***http://www.eulasmo.org/v.asp?level2=6489&depth=2&level3=6489&level2id=6489&rootid=6463&nextlevel=6489***

fisheries where this occurs. It is voluntary and has been elaborated within the framework of the CCRF as envisaged by Article 2 (d). However, all concerned States are encouraged to implement it. Seabirds are being incidentally caught in various commercial longline fisheries in the world, and concerns are arising about the impacts of this incidental catch. Key longline fisheries in which incidental catch of seabirds are known to occur are: tuna, swordfish and billfish in some particular parts of oceans; Patagonian toothfish in the Southern Ocean, and halibut, black cod, Pacific cod, Greenland halibut, cod, haddock, tusk and ling in the northern oceans (Pacific and Atlantic). In implementing the IPOA-SEABIRDS, States should carry out a set of activities. This should be done as appropriate in conjunction with relevant international organizations. The exact configuration of this set of activities will be based on an assessment of the incidental catch of seabirds in longline fisheries.

If a problem exists, States should adopt a National Plan of Action for reducing the incidental catch of seabirds in longline fisheries (NPOA-SEABIRDS). The NPOA-SEABIRDS is a plan that a State designs, implements and monitors to reduce the incidental catch of seabirds in longline fisheries. The NPOA-SEABIRDS should prescribe appropriate mitigation methods; contain plans to develop the most practical and effective seabird deterrent device and undertake specific research to evaluate the effectiveness of mitigation measures used in the longline fisheries, where this problem occurs and prescribe means to raise awareness among fishers, fishing associations and other relevant groups about the need to reduce the incidental catch of seabirds in longline fisheries. FAO will support development and implementation of NPOA-SEABIRDS through specific, in-country technical assistance projects.

Rome Consensus on World Fisheries[59]:

On 14-15 March 1995 a Ministerial Meeting on Fisheries was held in Rome at the invitation of the Director-General of FAO to review the state of world fisheries and the FAO follow-up to the United Nations Conference on Environment and Development (UNCED). The meeting unanimously adopted the Consensus on World Fisheries, which urged that governments and international organizations take prompt action to:

- *reduce fishing to sustainable levels;*
- *reduce by-catches, fish discards and post-harvest losses;*
- *review the capacity of fishing fleets and where necessary reduce these fleets;*
- *strengthen and support regional, sub-regional and national fisheries organizations and arrangements;*
- *keep under review the effectiveness of conservation and management measures;*
- *continue and, when possible, increase technical, financial, and other assistance to developing countries;*
- *develop ecologically sound aquaculture as an important contributor to overall food security;*
- *strengthen fisheries research and increase cooperation among research institutions;*
- *increase consultation on fisheries with the private sector and non-governmental organizations; and*
- *effectively implement the relevant rules of international laws on fisheries.*

FAO Voluntary Guidelines on Small-scale Fisheries[60]:

The 29th Session of the FAO Committee on Fisheries (COFI) held in February 2011 recommended that an international instrument on small-scale fisheries be developed. This was based on the increasing recognition of small-scale fisheries as a principal contributor to poverty alleviation and food security and the guidance provided by a number of global and regional conferences and

[59] http://www.intfish.net/treaties/summaries/3307.htm

[60] ftp.fao.org/FI/DOCUMENT/ssf/SSF_guidelines/TC/2014/2e.pdf

consultative meetings exploring how to better bring together responsible fisheries and social development in coastal and inland fishing communities.

After considerable debate at the Thirtieth Session of COFI held in 2012, and following standard procedures of taking the draft guidelines thorough Expert and Technical Consultations, member-states at the Thirty-first Session of COFI endorsed the Voluntary Guidelines for Securing Sustainable Small-scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines). This is the first ever negotiated instrument devoted entirely to small-scale fisheries. The objectives of these Guidelines are:

- *to enhance the contributions of small-scale fisheries to global food security and nutrition and to support the progressive realization of the right to adequate food;*
- *to contribute to the equitable development of small-scale fishing communities and poverty eradication and to improve the socio-economic situation of fishers and fish workers within the context of sustainable fisheries management;*
- *to achieve the sustainable utilization, prudent and responsible management and conservation of fisheries resources consistent with the Code of Conduct for Responsible Fisheries (the Code) and related instruments;*
- *to promote the contribution of small-scale fisheries to an economically, socially and environmentally sustainable future for the planet and its people;*
- *to provide guidance that could be considered by States and stakeholders for the development and implementation of ecosystem friendly and participatory policies, strategies and legal frameworks for the enhancement of responsible and sustainable small-scale fisheries; and*
- *to enhance public awareness and promote the advancement of knowledge on the culture, role, contribution and potential of small-scale fisheries, considering ancestral and traditional knowledge, and their related constraints and opportunities.*

The SSF Guidelines are voluntary. They focus on the needs of developing countries and are relevant to small-scale fisheries in marine and inland waters, covering fishing as well as related post-harvest and upstream activities. The SSF Guidelines support initiatives for poverty alleviation and equitable social and economic development, for improving governance of fisheries and promoting sustainable resource use. They take into account a wide range of important principles, including equality, non-discrimination, participation, accountability and universal human rights. In particular, they stress on the importance of respecting and realizing human rights and dignity, and on the need for gender equality, as well as encouraging countries to ensure small-scale fishers are represented in decision-making processes that affect their livelihoods.

The objectives of the SSF Guidelines are expected to be achieved through the promotion of a human rights-based approach, by empowering small-scale fishing communities, including both men and women, to participate in decision-making processes, and to assume responsibilities for sustainable use of fishery resources, and placing emphasis on the needs of developing countries and for the benefit of vulnerable and marginalized groups. The SSF Guidelines also draw heavily from the 2012 FAO Voluntary Guidelines on the 'Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security[61], to promote secure tenure rights and equitable access to land, fisheries and forests as a means of eradicating hunger and poverty, supporting sustainable development and enhancing the environment. They were officially endorsed by the Committee on World Food Security on 11 May 2012. Since then implementation has been encouraged by G20, Rio+ 20, UNGA and the Francophone Assembly of Parliamentarians.

[61] ***http://www.fao.org/docrep/016/i2801e/i2801e.pdf***

Future implementation of the SSF Guidelines should be based on participation and partnerships, with implementation anchored at the national and local levels within a framework of regional and international collaboration, awareness raising, policy support and capacity development. This will require support to and collaboration with many different actors including governments, development agencies and international financing institutions, NGOs, academia, civil society and the private sector. The FAO will also be conducting expert meetings/workshop to further work on the implementation modalities of the Voluntary Guidelines in the member-states.

Flag State Responsibilities:

At the Thirty-first Meeting of the FAO Committee on Fisheries, member-states endorsed the Voluntary Guidelines for Flag State Performance that would hold states more accountable for the activities of fishing vessels flying their flags. The guidelines spell out a range of actions that countries could take to ensure that vessels registered under their flags do not conduct IUU fishing, one of the greatest threats to sustainable fisheries and related livelihoods. Although the guidelines are voluntary, their endorsement by FAO members is a public signal by countries of their intent to adhere to a shared set of standards for flag state performance. Together with the FAO's 2009 Agreement on Port State Measures, which works to prevent entry into ports by IUU fishing vessels, these guidelines would provide a potent tool to combat IUU fishing in the coming decades.

A flag state refers to any country – whether coastal or land-locked – that registers a fishing vessel and authorizes it to fly its flag. As per the guidelines the Flag states are required to maintain a record of their registered vessels together with information on their authorization to fish, such as the species they may fish for and the type of gear they may use.

The Voluntary Guidelines, among other things, will promote greater cooperation and information exchange between countries, so that flag states are in a position to refuse to register vessels that have previously been reported for IUU fishing, or that are already registered with another flag state. They also provide recommendations on how countries could encourage compliance and take action against non-compliance by vessels, as well as on how to enhance international cooperation to assist developing countries to fulfil their flag state responsibilities.

The guidelines draw on existing international maritime law as well as international instruments such as the 1993 FAO Compliance Agreement, the 1995 FAO Code of Conduct for Responsible Fisheries, the 2001 FAO IPOA to Prevent, Deter and Eliminate IUU fishing. Some of the important provisions of this instrument are as follows:

- If the vessel is fishing in waters under the jurisdiction of the Flag State, the responsibility of the Flag State is exclusive. Generally speaking, no other State has the right or responsibility to control the fishing activities of the vessel.
- If the vessel is fishing on the high seas, the Flag State has traditionally had exclusive responsibility for controlling the fishing activities of the vessel. However, a number of recent international agreements have given States other than the Flag State certain rights to take action with respect to fishing vessels on the high seas, primarily to help prevent, deter and eliminate IUU fishing.
- If the vessel is fishing in waters under the jurisdiction of a State other than the Flag State (or is in the port of a State other than the Flag State), the coastal (or port) State has rights and responsibilities with respect to the fishing activities of the vessel. In such situations, however, the Flag State also continues to have responsibilities with respect to those fishing activities, including the responsibility to ensure that the vessel does not conduct unauthorized fishing in waters under the jurisdiction of another State.

Safety and health of fishers at Sea: the ILO requirements[62]:

Marine fisheries have the distinction of being one of the most hazardous occupations in the world. The working conditions of fishers are long under scrutiny both by the national and international organizations and labour right activists. However, little has been done to improve their working conditions, especially in developing countries like India where poor, unorganized labour compete against a monopolistic set of boat owners.

Recently, 'The Work in Fishing Convention (WFC), 2007', adopted in Geneva at the 96th ILO (International Labour Organization) Conference (ILC) prescribed new standards and updated old ones for living and working conditions on board fishing vessels, such as: reasonable accommodation and food, including repatriation, recruitment, medical care at sea, occupational safety and health, social security protection, and compliance and enforcement. The Convention is hoped to protect fishers against inhuman working and living conditions.

The Convention's provisions would apply to: (a) fishing vessels of length 24 m and above; (b) fishing vessels that normally remain at sea for more than seven days; or (c) fishing vessels that undertake distant-water fishing operations.

Regarding safety of the fishers at the sea, the Convention specifies the following:

- *The fishing vessel owner has the overall responsibility to ensure that the skipper is provided with the necessary resources and facilities to comply with the obligations of this Convention; and*
- *The skipper has the responsibility for the safety of the fishers on board and the safe operation of the vessel.*

The existing Indian laws (*e.g.* Merchant Shipping Act, 1958) although provide for manning and equipment but responsibility of owner to ensure the safety of fishing vessels is not clearly established. Further, the Convention has provisions regarding minimum age of the fishers, skill, health, working hours, etc. The summary of these provisions are given below:

Criterion	Provisions
Minimum age (Art. 9)	The minimum age for work on board a fishing vessel shall be 16 years. However, the competent authority may authorize a minimum age of 15 for persons who are no longer subject to compulsory schooling as provided by national legislation, and who are engaged in vocational training in fishing. The minimum age for assignment to activities on board fishing vessels, which by their nature or the circumstances in which they are carried out are likely to jeopardize the health, safety or morals of young persons, shall not be less than 18 years.
Medical examination (Art. 10-12)	Medical examination will be carried out by competent and independent authority as per the national law. The medical certificate of a fisher shall state, at a minimum, that: (a) the hearing and sight of the fisher concerned are satisfactory for the fisher's duties on the vessel; and (b) the fisher is not suffering from any medical condition likely to be aggravated by service at sea or to render the fisher unfit for such service or to endanger the safety or health of other persons on board.
Conditions of service (Art 13-15)	The owners of fishing vessels need to ensure that their vessels are sufficiently and safely manned for the safe navigation and operation of the vessel and under the control of a competent skipper; and the fishers are given regular periods of rest of sufficient length to ensure safety and health. The prescribe minimum hours of rest are not less than ten hours in any 24-hour period; and 77 hours in any seven-day period unless there is an emergency. The vessels are also required to submit a crew list before voyage to a designated authority. The fishers and the owners should also have a legally binding work agreement specifying nature of job, wage, working hours, etc.

[62] ***ILO matters are largely handled by the Ministry of Labour and Employment (MoLE), Government of India. For fisheries related issues, the MoLE interacts with the Ministry of Agriculture as also with the fisheries associations and other civil society organizations.***

The other provisions of the Convention are regarding repatriation of fishers, their accommodation and food on board, and their occupational, health and social security. The Convention holds that fishers should be given free food and water and standard accommodation as per the national legislation.

Though India was a party to the adoption of the Convention at the 96th Conference of the ILO it is yet to ratify the Convention. The Convention is unique in the sense that it introduces the concept of 'progressive implementation', which allows the government to ratify the convention on the basis that they commit to work towards all of its provisions, and that this may be a gradual process.

4.0 Regional Instruments and Regional Cooperation

India is member of various regional fisheries bodies including the Asia-Pacific Fishery Commission (APFIC); Network of Aquaculture Centres in Asia and the Pacific (NACA); Intergovernmental Organization for Marketing Information and Technical Advisory Services for Fishery Products in the Asia and Pacific Region (INFOFISH); Indian Ocean Tuna Commission (IOTC) and the Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO) (Table 2). Besides, it is also member of other regional bodies that deal with environment (*e.g.* South Asian Cooperative Environment Programme, International Union for Conservation of Nature) and Trade (Bay of Bengal Initiative for Multi-Sectoral Technical Economic Cooperation- BIMSTEC). Even economic and geopolitical set-ups such as South Asian Association for Regional Cooperation or SAARC has undertaken initiatives in both fisheries and environment related matters form time to time. The following table provides a snap-shot of India's membership in regional fisheries organizations:

Table 22: India's membership in Regional Fisheries Organization

Regional Fishery Body	Date of Signing	Entry into force
Agreement for the Establishment of the Asia-Pacific Fishery Commission (Baguio, 1948)	Acceptance 09 November 1948	09 November 1948
Agreement for the Establishment of the Network of Aquaculture Centres in Asia and the Pacific (Bangkok, 1988)	Accession 04 July 1992	04 July 1992
Agreement for the Establishment of the Intergovernmental Organization for Marketing Information and Technical Advisory Services for Fishery Products in the Asia and Pacific Region (INFOFISH) (Kuala Lumpur, 1985)	Accession 19 September 1986	03 March 1987
Agreement for the Establishment of the Indian Ocean Tuna Commission (1993)	Acceptance 13 March 1995	27 March 1996
Agreement for the Establishment of the Bay of Bengal Programme Inter-Governmental Organisation (Chennai, 2003)	Acceptance 26 April 2003	26 April 2003

Most of the regional organizations to which India is party (APFIC, BOBP-IGO, NACA) are advisory in nature and as such their roles and functions are limited to policy advocacy and capacity building. However, other organizations like the Indian Ocean Tuna Commission (IOTC) have management and regulatory mandates, making the decisions of the Commission binding on the member-states. The following paragraphs, therefore, describe in more detail the objectives and functions of IOTC and also some of the important resolutions adopted by the Commission for compliance by its member-states.

The Indian Ocean Tuna Commission (IOTC): The Agreement for the Establishment of the IOTC was concluded under Article XIV of the FAO Constitution. It was approved by the FAO Council at its Hundred and Fifth Session in November 1993. The Agreement came into force upon accession of the tenth member in March 1996. The Financial Regulations were adopted at the First Special Session of IOTC in Rome, Italy from 21-24 March 1997 and the Rules of Procedure were adopted at the Second Session held in Victoria, Seychelles from 22-25 September 1997. The objective of the IOTC is to promote cooperation among its members with a view to ensuring, through appropriate management, the conservation and optimum utilization of tuna and tuna-like fishes and encouraging sustainable development of fisheries based on such stocks.

The main functions of the IOTC are:

- *to keep under review the conditions and trends of the stocks and to gather, analyze and disseminate scientific information, catch and effort statistics and other data relevant to the conservation and management of the stocks and to fisheries based on the stocks covered by the Agreement;*
- *to encourage, recommend, and coordinate research and development activities in respect of the stocks and fisheries covered by the Agreement, and such other activities as the Commission may decide appropriate, including activities connected with transfer of technology, training and enhancement, having due regard to the need to ensure the equitable participation of Members of the Commission in the fisheries and the special interests and needs of Members in the region that are developing countries;*
- *to adopt on the basis of scientific evidence, conservation and management measures, to ensure the conservation of the stocks covered by the Agreement and to promote the objective of their optimum utilization throughout the Area;*
- *to keep under review the economic and social aspects of the fisheries based on the stocks covered by the Agreement bearing in mind, in particular, the interests of developing coastal states.*

India is a founding member of the IOTC and presently 27 countries are members of the Commission. Membership of IOTC is open to Indian Ocean coastal countries and to countries or regional economic integration organizations which are members of the UN or one of its specialized agencies and are fishing for tuna in this ocean.

The IOTC has set up a Scientific Committee, Compliance Committee and a number of working parties that address specific topics such neritic tunas, tropical tunas, billfishes, etc. IOTC also implements a regional observer programme for on-board monitoring of the tuna catches. At the time of writing this report, IOTC had about 63 resolutions in force. These resolutions are addressing the following basic aspects of fisheries management. A detailed list of IOTC resolution is also given in Table 3.

- Applying precautionary approach and best science;
- Format for monitoring, control and surveillance (MCS) including vessel monitoring, observer programme, responsibilities of the flag states and port state measures.
- Management of fishing capacity and reduction of by-catch;
- Curbing illegal fishing;
- Conservation of threatened species such as whale sharks, and
- Adopting market related measures in support of IOTC's objectives.

India is regularly reporting to IOTC. While progress has been made in implementing many of the IOTC's resolution, the country still needs to pay attention to the following:

- Species identification and collection of robust fisheries data;
- Introducing observer programme;
- Preparation of a complete list of vessels fishing in the EEZ and targeting tuna and tuna like fisheries (including registration, estimation of gross tonnage, etc.); and
- Operationalizing vessel monitoring system.

Table 23: Important resolutions and recommendations of IOTC and compliance requirements by member-countries

#	Resolution / Recommendation	Required Action by CPCs / Indian response
1.	**Resolution 99/01** Management of fishing capacity and reduction of the catch of juvenile bigeye tuna.	Submission of list of vessels fishing for tropical tunas in the IOTC area.
2.	**Resolution 99/02** Actions against fishing activities by large-scale flag of convenience (FOC) longline vessels.	Ensure that large-scale tuna longline vessels under the country's registry do not engage in IUU fishing activities and should refuse landing and transhipment by FOC vessels which are engaged in fishing activities diminishing the effectiveness of measures adopted by IOTC.
3.	**Resolution 00/01** Compliance with mandatory statistical requirements for IOTC members and requesting cooperation with non-contracting parties.	Submission of the mandatory data requirements to the Commission regularly.
4.	**Resolution 00/02** Survey of predation of longline caught fish.	Collecting data on depredation in the longline caught fish.
5.	**Resolution 01/02** Relating to control of fishing activities.	The vessels are required to carry certificates including: License, permit or authorisation to fish and terms and conditions attached to the license, permit of authorisation; vessel name; port in which registered and the number(s) under which registered; international call sign; names and addresses of owner(s) and where relevant, the charter; overall length and engine power, these documents are to be verified on a regular basis and at least every year.
6.	**Resolution 01/03** Establishing a scheme to promote compliance by non-contracting party vessels with resolutions established by IOTC.	Assistance of the Indian Coast Guard, Indian navy, research institutes having ocean going vessels, etc. need to be sought to find any vessel believed to conduct fishing contrary to IOTC conservation or management measures. MPEDA and Indian Coast Guard need to be entrusted to monitor the landings and mid-sea transshipment of catch.
7.	**Resolution 01/06** IOTC bigeye tuna statistical document programme.	Export of bigeye tuna must accompany bigeye tuna statistical document or IOTC bigeye tuna re-export certificate validated by a government official in the prescribed format. Sample forms of these documents are to be submitted to the Executive Secretary of IOTC.
8.	**Recommendation 02/07** Concerning measures to prevent the laundering of catches by IUU large-scale tuna longline fishing vessels.	CPCs must ensure that licensed large-scale tuna longline fishing vessels have a prior authorization of at sea or in port transshipment and obtain the validated statistical document, whenever possible, prior to the transshipment of their tuna and tuna-like species subject to the statistical document programme. It should also ensure that transshipments are consistent with the reported catch amount of each vessel in validating the statistical document and require the reporting of transshipment.
9.	**Resolution 03/01** Limitation of fishing capacity of contracting parties and cooperating non-	Fleet Development Plan is to be submitted to the Commission with top priority.

	contracting parties.	
10.	**Resolution 03/03** Amendment of the forms of the IOTC statistical documents.	The bigeye tuna statistical documents submitted along with bigeye tuna exported/imported should be in renewed format.
11.	**Resolution 05/01** Conservation and management measures for bigeye tuna.	Fleet development plan is to be submitted at the earliest.
12.	**Resolution 05/03** Establishment of an IOTC programme of inspection in port.	1. Port inspection programmes to be framed so as to inspect documents, fishing gear and catch on board fishing vessels, when such vessels are voluntarily in the ports or at its offshore terminals. Inspections have to be carried out so that the vessel suffers the minimum interference and inconvenience and that degradation of the quality of the fish is avoided. 2. List of foreign vessels which have landed in ports tuna and tuna like species caught in the IOTC area in the preceding year has to be submitted to the Commission before 1st of July.
13.	**Resolution 05/05** Conservation of sharks caught in association with fisheries managed by IOTC	Ensure that the tuna fishing vessels should not have on board fins that total more than 5 percent of the weight of sharks on board, up to the first point of landing.
14.	**Recommendation 05/07** Management standard for the tuna fishing vessels.	While issuing the licenses to authorized fishing vessels, ensure that minimum management measures as per the format provided are met with. An annual report on the measures taken in this regard is to be submitted to the Commission in the given format.
15.	**Recommendation 05/08** On sea turtles.	No obligatory action to be taken. But, the Commission encourages implementing the guidelines and the necessary measures for vessels fishing for tuna and tuna-like species in the IOTC area, to mitigate the impact of fishing operations on sea turtles.
16.	**Recommendation 05/09** Incidental mortality of seabirds.	Since the sea bird bycatch is reported mainly in the area south of 15° S latitude, and since there are no reports of Indian tuna vessels fishing in these areas, no action is warranted on this recommendation.
17.	**Resolution 06/03** Establishing a vessel monitoring system programme.	1. Satellite based vessel monitoring system (VMS) for all vessels greater than 15 meters in length overall registered on the IOTC record of vessels which operate in the IOTC area and which fish on the high seas (outside the fisheries jurisdiction of any coastal state) for species covered by the IOTC Agreement of 1 July 2007. 2. Until 1 July 2008, tuna fishing vessels larger than 15 m LOA, which are not yet equipped with VMS shall report to fisheries monitoring center (agency to be identified) at least daily by email, facsimile, telex, telephone message or radio. Such reports must include, *inter alia*, information required in paragraph 3 when transmitting the report, to their competent authorities, as well as: A. The geographic position at the beginning of the fishing operation; B. The geographic position at the end of the fishing operation. 3. If a member is are not in a position to fulfill the obligations as outlined in this resolution it has to report to the IOTC Secretariat (i) the systems and infrastructure and capabilities existing with respect to the implementation this resolution, and (ii) the hindrances for implementation of such a system and (iii) requirements for implementation. 4. A report on the progress and implementation of its VMS programme to be furnished to the Commission by 30 June each

		year for which the VMS must be made mandatory for tuna vessels.
18.	**Resolution 07/02** Concerning the establishment of an IOTC record of vessels authorized to operate in the IOTC area.	Members have to submit, to the IOTC by 1 July 2003 for the vessels larger than 24 meters in length overall, and in case of vessels less than 24 m, those operating in waters outside the EEZ of the flag state, and that are authorized to fish for tuna and tuna-like species in the IOTC area. Members have to notify, any deletion from and/or any modification of the IOTC record at any time such changes occur.
19.	**Resolution 07/03** Catch by fishing vessels in the IOTC area.	Log books (electronic or bound) must be made mandatory for the vessels over 24 meters length and those less than 24 meters if they fish outside the EEZ.
20.	**Resolution 07/04** Registration and exchange of information on vessels fishing for tunas and swordfish in the IOTC area.	A list of tuna fishing vessels greater than 24 m LOA and vessels of less than 24 m LOA that have fished for tropical tunas, albacore and swordfish outside of our EEZ during the previous year shuld be submitted to the Commission.
21.	**Resolution 08/01** Mandatory statistical requirements for IOTC members and cooperating non-contracting parties.	The nominal catch, catch and effort and size data to be furnished to the Commission by 30th June every year. Fishery Survey of India (FSI) is regularly furnishing the nominal catch and 5° grid catch and effort data with regard to the exploratory survey by FSI to the Commission. LoP vessel data, received by FSI is compiled and nominal catch is reported since the data reported is not geo-referred, in most of the cases. Further, the data furnished is not complete since all the boat owners are not submitting the data in time. With regard to the coastal fisheries data, data received from CMFRI (not geo-referred, only area-wise) for the previous year and the data received from the Fisheries Department of the UT of Lakshadweep and A&N Islands is compiled and submitted to the Commission.
22.	**Resolution 08/02** On establishing a programme for transhipment by large-scale fishing vessels.	Transhipments may be allowed under the conditions suggested by the IOTC. Observer programme may be implemented at the earliest.
23.	**Resolution 08/03** Reducing the incidental bycatch of seabirds in longline fisheries.	Since the sea bird bycatch in the longline fishery of Indian ocean is reported mainly from the area south of 15°s, no action is required from countries like India.
24.	**Resolution 08/04** Recording of catch by longline fishing vessels in the IOTC area.	Log books with all the details have to be made mandatory for all the tuna fishing vessels.
25.	**Resolution 09/02** Implementation of a limitation of fishing capacity of contracting parties and cooperating non-contracting parties.	Policy on limitation of fishing capacity to be formulated. It seems that the IOTC proposes to limit the number of vessels to the level of the year 2006 (for tropical tunas) and the year 2007 for swordfish and albacore.
26.	**Resolution 09/03** Establishing a list of vessels presumed to have carried out illegal, unregulated and unreported fishing in the IOTC area.	Member are required to forward names of IOTC authorized vessels to the relevant authority in the country who can report if they find any vessel other than those appearing in the IOTC list fishing for tuna and allied fishing in the Indian ocean area. It is also essential to make sure that the mandatory statistical data is being furnished by all the vessels to the concerned agencies, so as to avoid the inclusion of such vessels in IOTC list
27.	**Resolution 09/04** On a regional observer scheme.	Members have to ensure that at least 5 percent of the number of operations/sets for each gear type by the tuna fleet fishing in the IOTC area of 24 meters overall length and over, and under 24 meters if they fish outside their EEZs is covered by observer scheme. For vessels less than 24 meters if they fish outside their EEZ, the above mentioned coverage should has to be achieved progressively by January 2013.
28.	**Resolution 09/05**	Banning of gill nets longer than 2.5 km in oceanic waters may

	To prohibit the use of large-scale driftnets on the high seas in the IOTC area of competence.	be considered.
29.	**Resolution 09/06** On marine turtles.	The data on bycatch of sea turtles on board survey vessels of FSI are analysed and presented regularly in the IOTC working party on bycatch. We may address letters to all the tuna fishing vessels requesting to furnish the data on bycatch/incidental catch of sea turtles. It may be made mandatory for the longliners to carry the equipments for appropriate handling, including resuscitation or prompt release of all bycaught or incidentally caught sea turtles like line cutters, scoop nets, etc. Use of turtle friendly gears like circle hooks etc are to be encouraged.
Note: Those resolutions superseded by subsequent resolutions are not mentioned in the list		

Adopted from the Report of the Working Group for Revalidating the Potential of Fishery Resources in the Indian EEZ, 2011.

Regional cooperation in fisheries:

The Indian Sub-continent is surrounded on the west by the Arabian Sea and on the east by the Bay of Bengal. Together, the two seas form part of the upper Indian Ocean. On the west coast, India shares its maritime boundaries with Pakistan and the Maldives, while on the east coast the boundaries are shared with Sri Lanka, Bangladesh, Myanmar, Thailand and Indonesia. Both the Arabian Sea and the Bay of Bengal harbor migratory as well as straddling fish stocks such as tuna and tuna like species, sharks and mackerels. In recent years, small pelagics like sardines are also extending their geographical range and moving between the EEZs of neighbouring countries like India and Bangladesh. Further, within the large marine ecosystems of the Bay of Bengal and the Arabian Sea, sub-ecosystems such as the Sunderbans Mangrove Ecosystem (India and Bangladesh) and the Gulf of Mannar and Palk Bay (India and Sri Lanka) also exist. These sub-ecosystems are ecologically sensitive marine biospheres and their ecological and biological integrity can be best preserved through mutual cooperation. Besides, India also shares some of the richest fishing ground with its neighbours and this again warrants mutual support and strong regional cooperation in management and sustainable exploitation of the resources, including conservation of species/stocks wherever necessary. This also takes us to the issue of cooperation in safety and security of fishermen as the upper Indian Ocean, especially the Bay of Bengal, has high number of adverse weather events and every year many fishers lose their lives or suffer extreme hardships. India has (or is developing) Memorandum of Understanding (MoUs) in fisheries sector with most of its neighbours and the MOUs could be a good basis for regional cooperation in management of tranboundary fish stocks as also shared ecosystems.

6.0 Way forward

Fisheries is now firmly set in a globalized world. Being one of the prime food commodities traded in the global market, fisheries sector is receiving attention from various angles. This attention is also important from the point of view that a larger quantity of the world's fish production comes from the developing nations, Asian countries being the prime among them. On the other hand, the trading partners are largely placed in the developed world. In this scenario, International instruments, both binding and non-binding are assuming more and more significance as non-implementation of the provisions of such instruments is also bringing in trade restrictions, that can eventually harm the interests of the small producers in the developing countries.

As elaborated in the earlier paragraphs, instruments emanating from the biodiversity and environment arenas also have significant relevance to fisheries sector. In the given situation, it is

essential for the fisheries sector to work closely with environment sector, so as to ensure proper compliance to the agreed provisions in biodiversity and environment-related international instruments. This would contribute to improved sustainability in the sector, which is presently lacking on account of various reasons, including over capacity, IUU fishing, post-harvest losses, etc. As the provisions contained in the binding and non-binding international instruments normally draw strength from each other, it is essential that these instruments are considered holistically and not in isolation. It is also an accepted fact that proper understanding and subsequent implementation of such instruments is not only time-consuming but also requires coordination with the concerned Ministries and Departments in the Central Government and more importantly with the Department of Fisheries of the States/Union Territories. Therefore, it may be necessary for the DAHD&F, Ministry of Agriculture to set up a dedicated cell in the Fisheries Division to work on the coordination aspects and progress the implementation of the provisions of the instruments.

Further, with the allocation of business in matters related to fish and fisheries split between the Union and the States, a greater coordination is required with the States/UT in respect of these international instruments. It is also seen that the States/UTs mostly set their policies in isolation, which at times also deviates from the larger policies of the Union Government. Therefore, policy setting needs harmonization, especially when the actions impinge on the provisions of the international instruments.

Finally, implementation of the provisions of these instruments at the national-level will involve multiple tasks that would *inter alia* include stakeholder meetings/workshops and expert/technical consultations; commissioning of studies and specialized data collection; setting up of committees for detailed examination of the provisions, etc; amendments to the existing laws or formulating new laws to facilitate implementation of the instruments, etc. It is needless to say that all these actions will require money and, therefore, provision of funds in the regular budget of the DAHD&F needs to be ensured.

The Table 4 below summarizes some important provisions of the international binding and non-binding instruments that needs to be addressed. The provisions in **bold face** need more attention to ensure sustainable fisheries in the Indian EEZ.

Table 24: Important provisions of international binding and non-binding instruments those needs to be addressed

International Instrument	Important provisions
United Nations Convention on the Law of the Sea, 1982	• **The coastal State will take proper conservation and management measures;** • **The coastal State may take such measures, including boarding, inspection, arrest and judicial proceedings, as may be necessary to ensure compliance;** • **Coastal States and States fishing on the high seas shall adopt measures to ensure long-term sustainability of straddling fish stocks and highly migratory fish stocks;** • **The coastal State will establish appropriate cooperative mechanisms for MCS;** • The coastal State shall determine the allowable catch of the living resources in its EEZ; • The coastal State may include licensing, and fixing quota for domestic vessels and other foreign vessels; • **The coastal State will take proper conservation and management**

	measures based on best scientific evidences.
UN Fish Stocks Agreement, 1995	• **Adoption of measures to ensure long-term sustainability of straddling fish stocks and highly migratory fish stocks;** • Prevention or elimination of overfishing and excess fishing capacity to the level of sustainable limits; • **Taking into account the interests of artisanal and subsistence fishers;** • **Establishment of a national record of fishing vessels;** • **Marking of fishing vessels and fishing gear for identification as per international norms;** • Recording and timely reporting of vessel position, catch of target and non-target species, fishing effort and other relevant fisheries data; • Verification of the catch of target and non-target species; • Implementation of national inspection schemes; • Implementation of national observer programmes; • Development and implementation of vessel monitoring systems.
UN Convention on Biological Diversity, 1995	• **Protect ecosystems;** • **Manage living modified organisms;** • **Environmental impact assessment;** • Monitor components of bio-diversity; • **Precautionary approach;** • Ecosystem approach; • Aichi Targets; • All forms of relevant information should be considered, including scientific and indigenous and local knowledge, innovations and practices.
The FAO Code of Conduct for Responsible Fisheries and International Plan of Actions related to marine fisheries, 1995	• **States should ensure compliance with and enforcement of conservation and management measures;** • Establishing effective mechanisms to monitor and control the activities of fishing vessels and fishing support vessels; • **Maintaining a record, updated at regular intervals, on all authorizations to fish issued by them.** • Reduce fishing to sustainable levels; • **Reduce by-catches, fish discards and post-harvest losses;** • Review the capacity of fishing fleets and where necessary reduce these fleets; • **Strengthening and support regional, sub-regional and national fisheries organizations;** • Periodic review of the effectiveness of conservation and management measures; • strengthen fisheries research and increase cooperation among research institutions; • **Consultation on fisheries with the private sector and non-governmental organizations;** • **Effectively implement the relevant rules of international law on fisheries.**
The Kyoto Declaration and Plan of Action, 1995	• **Assess and monitor the present and future levels of global, regional and national production;** • **Enhance sub-regional and regional cooperation;**

	• Take measures to reduce excess fishing capacity; • Take actions in relation to fish and other sea life which are incidentally caught and discarded.
Safety and health of fishers at Sea: the ILO requirements	• **Fixation of minimum age for work on board a fishing vessel;** • **Ensuring navigational training for skipper and crew.** • **Medical fitness especially for skippers.** • **Validation of workplace safety such as adequate provision of life-saving appliances on-board fishing vessel and fitness of the fishing vessels.** • **Demarcation of area of operation of fishing vessels based on their design.**

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Appendix-1

No.21001/7/2009-FY (Ind)
Government of India
Ministry of Agriculture
Department of Animal Husbandry, Dairying & Fisheries

Krishi Bhawan, New Delhi
Dated 01st August, 2013.

ORDER

Subject:-Constitution of Expert Committee for Comprehensive review of Deep-Sea fishing Policy and Guidelines.

It has been decided with the approval of competent authority to set up an Expert Committee for comprehensive review of deep-sea fishing Policy and Guidelines.

2. The composition of the Committee will be:-

1.	Deputy Director General (Fisheries), ICAR	Chairperson
2.	Director, CMFRI (ICAR), Kochi	Member
3.	Director, BOBP-IGO, Chennai	Member
4.	Director, CIFT (ICAR), Kochi	Member
5.	Representative from DG, Shipping, Mumbai	Member
6.	Representative from Coast Guard H. Qtrs	Member
7.	Representative from MPEDA, Kochi	Member
8.	Fisheries Development Commissioner, DAHDF	Member-Secretary

3. Terms of Reference of the committee would be as follows:

i) To undertake review of Comprehensive Marine Fishing Policy of 2004 and to suggest a new Policy,
ii) To review existing Guidelines for deep-sea fishing in EEZ,
iii) To suggest full exploitation of catch potential in EEZ and international waters,
iv) To examine status of compliance of regional and global requirements of management and regulation of marine fisheries including CCRF and proposed FAO Guidelines on Flag State responsibilities.

4. Duration: The Committee would meet as often as required, and can consult with the stakeholders before submitting its report. The report is to be submitted within three months, i.e., before 31st October, 2013.

5. TA/DA will be admissible to non-official participants as per applicable rules.

(Yoginder Kumar)
Under Secretary to the Government of India

Distribution:- To all the members.

Copy to:-
1. DG, ICAR, New Delhi
2. PPS to Secretary, DADF
3. PS to JS (Fy), DADF

FEDCOM

Appendix-2

Expert Committee for Comprehensive Review of Deep-sea Fishing Policy and Guidelines

Minutes of the First Meeting

Venue: Krishi Bhawan, New Delhi **Date: 26.09.2013**

The First Meeting of the Expert Committee for 'Comprehensive Review of Deep-sea Fishing Policy and Guidelines' was held under the chairpersonship of Dr B Meena Kumari, Deputy Director General (Fisheries), Indian council of Agricultural Research (ICAR) on 26.09.2013 at 1100 hrs. in the ICAR Committee Room No. 112, Krishi Bhawan, New Delhi. The List of participants is annexed. The Committee was informed that Director, Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO); representative from the Office of the Director General, Shipping and special invitee from Centre for Marine Living Resources (CMLRE) have expressed their inability to attend the meeting due to their pre-occupation with other works.

2.0 Dr Meena Kumari, chairperson welcomed the members and after a round of introduction of the members initiated the discussions.

3.0 Shri B Vishnu Bhat, Fisheries Development Commissioner & Member-Secretary of the Committee welcomed the participants and briefly outlined the background, constitution and 'Terms of Reference' of the Committee. He also underscored the importance of the work of this Committee and the outcomes for the development of deep-sea fishing sector. He explained the Committee about the potential of marine fishery resources as worked out recently by the Working Group for Revalidating the Potential of Fishery Resources in the Indian Exclusive Economic Zone (EEZ) and briefed about the present level of exploitation of the resources *vis-à-vis* the existing fleet plan for the EEZ. He also indicated the need for brevity while preparing the report of the Committee.

4. 0 A 'Compendium on Deep Sea Fisheries in India' prepared by the Department of Animal husbandry, Dairying and Fisheries (DAHD&F) was circulated to the members. The Compendium includes documents on the subject of deep sea fisheries brought out by the DAHD&F form time to time and will be useful for the members to understand the chronological developments in the sector. The Compendium includes the following documents:

(i) Order of constitution of Expert Committee.
(ii) Chronological events taken place in matters related to Deep Sea Fisheries in India.
(iii) Comprehensive Marine Fishing Policy, 2004.
(iv) 'Public Notice' and 'Guidelines' dated 18.01.2013 relating to deep-sea fishing.
(v) Brief on proposed 'Marine Fisheries (Regulation & Management) Bill'.
(vi) Brief on some major International Fisheries Instruments (voluntary and non-voluntary) ratified by India.
(vii) Copy of the MZI Act, 1981.
(viii) Copies of MFRAs of some states, *viz*. Orissa, Karnataka, Tamil Nadu, and Kerala.
(ix) Copy of Report of the Working Group for Revalidating the Potential of Fishery Resources in the Indian EEZ, 2011.

(x) Copy of the Report of the Expert Group for Reviewing the deep-sea fishing Guidelines in the Indian EEZ, 2008.

(xi) Copy of the Report of 'Sub-Committee' to Inter-Ministerial Empowered Committee on Marine Fisheries, 2011.

(xii) Copy of Report and Recommendations of (Murari) Committee to Review Deep Sea Fishing Policy, 1996.

5.0 Dr Sanjay Pandey, Fisheries Research & Investigation Officer, DAHD&F made a brief presentation on the earlier deep-sea fishing policies of the Government of India, *i.e.*, Charter Policy of 1981; Amended Charter Policy of 1986; Leasing, Test Fishing and Joint Venture Policy of 1991; and then recommendations of the Murari Committee, 1996. He also briefed about the objectives of the Comprehensive Marine Fishing Policy, 2004 and current issues, constraints in deep sea fishing sector, which require urgent attention of the Expert Committee for review and further deliberation.

6.0 Shri K J Antony, Joint Director and representative of the Marine Products Export Development Authority (MPEDA) highlighted some of the shortcomings in drawbacks in the existing Letter of Permit (LOP) policy and stated that allegations of dual registration, under-reporting and underpricing of fish catch and violation of the Guidelines are very commonly reported against the LOP vessels. Intervening the comments, chairperson said that it is the mandate of this Committee to consider and review shortfalls in the existing Policy and Guidelines and to come up with recommendations for remedial measures. She also requested the members to look at the present issues of the sector in totality and highlight the problems rather than making allegations.

7.0 DIG A A Hebbar, Director (F & E) representing the Coast Guard explained the Committee about the role and functions of the Coast Guard in Monitoring, Control and Surveillance (MCS) activities. He also explained the mechanisms in place for tracking of fishing vessels through radar and other modern technologies. On the grant of LOP, DIG Hebbar suggested that the current system of granting of 'provisional' registration to LOP holder Deep Sea fishing Vessels (DSFVs) should be reviewed. He explained that many such 'provisionally' registered LOP vessels had already lost their Indian registration, and were no more 'Indian' vessels since their Indian registration, which was 'provisional' and valid for a certain time period had expired. He also pointed out that most of such DSFVs were not in India for considerably long time and their flag-status, activities and whereabouts, etc. were not known. He suggested that a mechanism for granting of permanent registration to DSFVs should be in place to avoid the above situation.

9.0 While discussing the current Guidelines, the Committee noted that the LOPs are granted to fishing vessels of 20 meter and above overall length (OAL), which are capable of doing resource-specific fishing. On the contrary, vessels between 15-20 m OAL are not defined as 'deep-sea fishing vessels', although majority of such intermediate size mechanized vessels are also fishing in the EEZ. It was noted that Mercantile Marine Department (MMD) under the Directorate General of Shipping, Ministry of Shipping grants registration to vessels of 20 m and above OAL whereas vessels below 20 m OAL are registered by the State Government authorities. Presently, fishing vessels irrespective of their sizes are being registered under the Merchant Shipping Act, 1958. The Committee then deliberated upon the policy alternatives for allowing operation of > 20 m OAL vessels in the Indian EEZ and bringing them under the ambit of the Guidelines for Deep-Sea Fishing. However, the committee agreed to have deliberations on this issue in the subsequent meeting(s) of the Committee when a representative from DG Shipping would also be present, and his advice could be sought on the suitability of such vessels with respect to their sea worthiness and compliance to sea safety norms, etc.

10.0 The Committee observed that against the permissible fleet of 725 vessels for the EEZ, only 71 vessels with valid LOPs were in operation in the Indian EEZ as on date. However, out of 71, only four LOP holder DSFVs were active in fishing during the last two years. During the meeting of the Committee, Dr Raja Sekhar Vundru, Joint Secretary (Fisheries) also joined the discussions and expressed his concerns on the negligible exploitation of deep-sea fishing resources and absence of our fishing effort in the Indian EEZ. He said that this situation might cause negative consequences for India in international platforms, such as the Indian Ocean Tuna Commission (IOTC), where possibilities of adopting quota system are being explored based on historical catches by member-states. He also emphasized that while considering review of the Policy, the Committee may also look into the overall scenario in the Indian Ocean region and suggest policy initiatives, which would provide sufficient space to accommodate for future expansions.

11.0 The Committee agreed with the views expressed by the Joint Secretary (Fisheries) and opined that there is an urgent necessity to frame a practical policy, which would facilitate optimum exploitation of the marine fishery resources as also ensure compliance to international and regional fishery instruments, thus paving the way for overall development of the deep-sea fishing sector in the country.

12.0 The Chairperson suggested that Dr Pratibha Rohit, Principal Scientist representing the Central Marine Fisheries Research Institute (CMFRI) may provide a brief report to the Committee on the present status of deep-sea fishery resources and availability of potential resources that could be exploited by the DSFVs.

13.0 The Chair also desired that Dr Leela Edwin, Principal Scientist representing the Central Institute of Fisheries Technology (CIFT) may advise the Committee on improvements in gear and fishing techniques, which can be recommended for technology up-gradation of DSFVs.

14.0 The representative from Coast Guard suggested that the draft Policy Document should be prepared in the format of a concise paper, covering all important aspects and supported by relevant annexures.

15.0 The Committee also agreed for inviting stakeholders during its next meeting and suggested that the second meeting may be convened either in Chennai or Visakhapatnam, which would be convenient for the stakeholders to participate.

16.0 The meeting ended with a vote of thanks to the chair.

Annexure

List of Participants

Sl. No.	Name & Designation	Organisation
1.	B Menakumari, Deputy Director General (Fisheries)	ICAR, New Delhi
2.	Raja Sekhar Vundru, Joint Secretary (Fisheries)	DAHD&F, New Delhi
3.	B Vishnu Bhat, Fisheries Development Commissioner	DAHD&F, New Delhi
4.	A A Hebbar, Deputy Inspector General & Director (F&E)	Coast Guard, New Delhi
5.	Pratibha Rohit, Principal scientist	CMFRI, Kochi
6.	Leela Edwin, Principal Scientist	CIFT, Kochi
7.	K J Antony, Joint Director	MPEDA, Kochi
8.	Sanjay Pandey, Fisheries Research & Investigation Officer	DAHD&F, New Delhi

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Expert Committee for Comprehensive Review of Deep-sea Fishing Policy and Guidelines

Minutes of the Second Meeting

Venue: Central Institute of Brackishwater Aquaculture, Chennai **Date: 31.10.2013**

The Second Meeting of the Expert Committee for Comprehensive Review of Deep-sea Fishing Policy and Guidelines was held under the chairpersonship of Dr B Meena Kumari, Deputy Director General (Fisheries), Indian Council of Agricultural Research (ICAR) on 31.10.2013 at 1100 hrs in Committee Room of the Central Institute of Brackish-water Aquaculture (CIBA), ICAR, Chennai. The List of Participants is annexed.

2.0 Dr Meena Kumari welcomed the members and invitees to the Second Meeting and explained the mandate of the Committee and also the discussions held during the First Meeting of the Committee. She informed that during this meeting, some stakeholders representing larger fishing vessels (mainly longliners above 24 meter Overall Length-OAL) and medium-sized trawlers have also been included for seeking their views. Participation of such stakeholders would help the Committee in making practical recommendations for inclusion in the proposed policy and guidelines.

3.0 After introduction of the participants, Shri B Vishnu Bhat, Fisheries Development Commissioner (FDC) & Member-Secretary initiated the discussions. Welcoming the participants, Mr Bhat outlined the background, constitution and 'Terms of Reference' (TOR) of the Committee. He informed that the First Meeting of the Committee was held in Krishi Bhavan, New Delhi on 26 September 2013. He informed that the country's marine fisheries potential has been estimated at 4.41 million metric tonnes (mmt) by the Revalidation Committee set up by the Government of India and nearly 70 percent of the potential is harvested from within 200m depth zone, leaving further scope for increase only in the deeper waters. He further said that even after the 2004 Deep Sea Fishing Policy, production did not increase as envisaged due to several reasons, which *inter alia* include security clearance of foreign crew by the Ministry of Home Affairs (MHA), lack of skilled manpower for operation of Deep-Sea Fishing Vessels (DSFVs) and lack of endurance among Indian fishers for fishing voyages of longer duration. Hence this Committee was constituted to review the deep sea policy and guidelines to facilitate the Government to initiate suitable measures to exploit the untapped resources. He also stated that this Committee may work out a better policy for the overall development of the marine fishing sector, including sustainable exploitation of the resources in deep sea area of the country.

4.0 Dr Yugraj Singh Yadava, Director, Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO) sought clarification on the scope of the Committee and stated that the 'title' and the 'TOR' of the Committee were contradicting. He stated that both offshore and coastal fisheries were linked together and therefore they may be considered together and not separately. The chair agreed to this suggestion and said that deep sea fisheries cannot be viewed in isolation. On this issue, the Member Secretary clarified that the Committee is mandated to review the Comprehensive Marine Fishing Policy of 2004 and to suggest a new Policy; as well as to examine and review the existing Guidelines on Deep-sea Fishing in the Indian Exclusive Economic Zone (EEZ).

5.0 Shri N Sivaraman, President, Deep Sea Fishing Association of Andamans stated that majority of fishing crafts with length of less than 20 meters OAL are having enough capacity for deep-sea fishing and are very successful in exploiting the large pelagics in the deep waters of the EEZ (*e.g.* the fishing vessels of Toothoor from Kaniyakumari region). However, these vessels are not referred to as DSFVs. They are registered by the State Government and bound by their rules and regulations. On the contrary, the Guidelines of the Ministry of Agriculture dated 18.01.2013 define the DSFVs as vessels of 20 meter OAL and above. He also pointed out that the fishing vessels of <20 m OAL are not being inspected, surveyed and registered by the Mercantile Marine Department (MMD) of the Directorate General (DG) Shipping. Therefore, fishermen prefer to have vessels of <20 meter OAL as they are not bound by the safety, communication, navigation and certified man power stipulations stipulated by the DG Shipping/MMD, which is mandatory for vessels of >20 meter OAL. He suggested that no restrictions should be placed on vessels of any size to operate anywhere in the EEZ and the requirement of certified manpower on board fishing vessels may be relaxed. However, prescribed safety measures have to be strictly imposed. He emphasized that the policy should include vessels of < 20 meter OAL into the category of DSFVs, taking into account their capabilities of deep-sea fishing and safety measures, etc.

6.0 Shri Sivaraman further suggested that the estimated potential of 1.3 mmt for the Andaman region is very conservative, as perhaps the region beyond 200 m depth has not been taken into account. He pointed out that there is very high potential in the Andaman waters and suggested to relook into the estimated potential to get realistic figures. He strongly emphasized that trawling should not be permitted in deep sea and destructive gear such as trawls, ringseines and gill nets may be fully banned and the use of hook and line and hand line may be encouraged. He suggested that infrastructure and logistic facilities needs to be improved in the Andaman & Nicobar Islands.

7.0 Shri Sivaraman also pointed out that the monsoon ban on fishing is not conducive for Indian DSFVs and suggested that the ban should be restricted only to trawl fishing, considering the fact that the Sri Lankan vessels operate and exploit resources round the year. He further informed that presently only 03 wholly Indian operated DSFVs are available; which has been possible after a long wait of three years. The present understanding is that all LOP's are foreign vessels and during the fishing ban they move out of the Indian EEZ. He suggested that an account of all the Indian registered vessels may be taken with details of berthing during non-operational months and LOP vessels should not be allowed to leave the Indian EEZ for longer durations. Otherwise, necessary action should be taken, including cancellation of their permissions. The chair enquired that why there has been a decline in the number of DSFVs and now only 03 vessels were reported to be in operation. Was it due to paucity of resources, trained manpower or imposition of certain impractical conditions? Shri Sivaraman replied that due to lack of proper post-harvest handling and procedures and sufficient chilling units, species such as tuna landed at the Indian Harbours fetched only Rs. 80-100/kg. He highlighted the need for processing plants at Chennai. He also highlighted the fact that the trainees who pass-out from the Central Institute of Fisheries Nautical and Engineering Training (CIFNET), and meant to cater to the needs of the DSFVs were not joining the fishing sector, but move to the Merchant Shipping after getting sea-experience aboard vessels of the Fishery Survey of India (FSI).

8. 0 Accepting the fact that CIFNET training was catering to merchant shipping, rather than the fisheries sector, Member Secretary said that with regard to post-harvest infrastructure facilities, the Central Government had established three 'sashimi grade' tuna processing plants (two by the National Institute for Post-Harvest Technology and Training- NIPHATT, Government of India and one by MATSYAFED, Government of Kerala) but the same were not being adequately utilized.

Mr Sivaraman stated that presently access of facilities at these processing plants is provided only to certain selected/ local persons and through lease/license, which should be avoided. He further suggested that processing units may be handed over to FSI and more R & D work should be facilitated in this area. Shri Antony from the Marine Products Export Promotion Authority (MPEDA) informed that there are enough processing plants located in Cochin, Visakhapatnam and other places, which are presently underutilized. The Committee was of the view that the procedures for giving access for utilization of the processing plants needs to be simplified.

9.0 Industry representatives were of the view that the fishing harbors are *de facto* controlled by local fisher groups, who prevent berthing, operation and landing of catch of vessels coming from other areas/State. This situation is hampering the growth of the sector and discourages entrepreneurs investing in deep-sea sector. The Committee was of the view that permission should be given for changing the place of operation and registration at any port by paying the required fee. Such a system could be akin to the All India Permits available for road transport moving from one state to the other. Facility for landing at any fishing port or landing centre would allow quality fish to be landed with minimum spoilage. The representative also suggested that the entrepreneurs should be invited to attend the meetings of the Empowered Committee so that they could explain their problems and issues and seek solutions.

10.0 Shri N Sreenivas representing the All India Association of Deep Sea Fisheries, Chennai said that the operation of Indian owned DSFVs in the EEZ was based on executive orders and not under any Act. He also pointed out that the Territorial Waters, Continental Shelf, Exclusive Economic Zone and other Maritime Zones Act, 1976 administered by the Ministry of External Affairs (MEA) allows fishing by Indian citizen for fishing in the EEZ and suggested that the Ministry of Agriculture (MoA) should focus only on 'conservation of fisheries' in the EEZ. Dr. Yadava clarified that the 1976 Act is an umbrella Act and does permit fishing by Indian nationals. However, the same Act also speaks of conservation and management of natural resources, living and non-living, by the Union Government. Therefore, the MoA through its proposed law is only devising ways and means for sustainable exploitation of the fisheries resources in the EEZ. He further clarified that 'Executive Orders' issued by the Government have the same sanctity as that of an Act, if they are issued within the approved policies of the Government. This position has also been upheld in an order of the High Court of Bombay in a fisheries related matter.

11.0 Shri Sreenivas stated that import of fishing vessels requires a Letter of Permit (LOP) and it is combined with permission to operate the vessel in the EEZ. He explained that it is difficult to import fishing vessels of <20 meter OAL at present, since Guidelines for import and operation of vessels in the EEZ are only for vessels of >20 meter OAL. He suggested that permission for import of vessel should be de-linked with the LOP. He also explained the shortage of skilled Indian crew for deep-sea fishing, which requires greater endurance and technical expertise in catching and handling of tuna and other similar high value fishes. He pointed out that deep-sea fishing is a risk-prone business, where input: output ratio is not like in other commodities; therefore guidelines should be simplified as far as possible. The involvement of entrepreneurs in review and empowered committees was reiterated so that various problems encountered by them could be properly reflected and addressed.

12.0 Shri T Valsraj also representing the All India Association of Deep Sea Fisheries suggested that there should be enabling provisions for making bi-lateral agreements between entrepreneurs of India and neighbouring countries such as Myanmar, Sri Lanka, Bangladesh, etc. He suggested that there should be separate set of guidelines/provisions for the two categories of vessels, *viz.* (i) those operating without foreign crew; and (ii) those with foreign crew. He also suggested that the

Guidelines should be simpler and irrelevant conditions should be excluded. Further, the LOP vessels need not be registered with MPEDA when they are registered by the MMD/DG Shipping. He said that MPEDA is an export promotion agency and not a registrar of vessels. Responding to this, the MPEDA representative informed that MPEDA registration was done mostly when the vessels required financial assistance from the Authority and also when the fish catch was meant for export. He also informed that registration of LOP vessels by MPEDA was as per a decision of the Sub-Committee of the Empowered Committee. The Committee was of the view that multiple registrations should be avoided and guidelines should be simplified.

13.0 On a query raised by the Committee on the present effort and catch, the Industry representatives suggested that more units could be deployed in deeper waters. However, certain problems, as listed below, need to be looked into before considering introduction of more DSFVs:

- Better information on resource availability in the deeper waters;
- Removal of contradictions in policy directives of different Ministries/Departments;
- Removal of control of local fishers on fishing harbors;
- Provision of trained manpower willing to remain at sea for more than 30 days (present crew engaged in multiday fishing is mostly from trawlers and are not familiar with the operation of long lines and hand lines, the major gears used for exploiting tunas and other pelagic available in the deeper waters) and
- Increased financial support from public financial institutions as deep sea fishing is capital intensive.

14.0 Shri S G Bhandare, DDG (Shipping) informed that there are 139 training institutes that cater to the manpower requirements of merchant shipping in the country. However, CIFNET is the only institute in the country, which is mandated for meeting the requirements of the fisheries sector. It was suggested by the Committee that CIFNET may not be allowed to undertake such courses/degree programmes, etc. that do not benefit the fishing sector. On the contrary, CIFNET should devise programmes of short and medium duration to target fishers and develop their capacities in various fields of marine fisheries, including operation of DSFVs. Such initiatives will help in building suitable cadres of Indian fishermen capable of taking up deep sea fishing and also enhancing their safety at sea. If required, such training programmes could also be linked with the registration/licensing procedures so that boat owners/fishermen would have to mandatorily comply with the training requirements before going out at sea.

15.0 It was informed that fishing for the pelagic species such as tunas in the deep sea may not be constrained by the size of the vessel. In this regard, the Sri Lankan intermediate range of fishing vessels (13 – 17 meter OAL), which fish in distant waters was cited as an example. It was also informed that the fishing techniques deployed by the Indian small-scale long lining vessels are not as efficient as those of the fishermen from Thailand or Taiwan. The latter use large number of hooks (at times up to 4000 hooks) and their catching rates too are also much higher. It would be good if our fishermen are exposed to the Thailand type of long line fishing.

16.0 Shri Dhayalan and Shri P Ravi based in Chennai and representing Fishermen Association highlighted the following issues:

- Establishment of more fishing harbours and fish landing centres (FLCs), and the need for their maintenance and landing of fish catch in hygienic manner.
- Provision of mother vessel/carrier vessel.
- Establishment of cold storage facility at the Chennai airport.

- Inclusion of fishermen as members in committees like the present one.
- Fisheries authorities/Officers should attend to the critical issues concerning fisheries development.
- Diesel subsidy to be provided to all categories of vessels.
- Management of fishing harbours should be entrusted to the Fisher community/ Fisheries Department.

17.0 Dr P Paul Pandian, Executive Director, National Fisheries Development Board (NFDB) informed that the Board is already implementing schemes for development and strengthening of infrastructure and marketing facilities *viz.* upgradation of existing fishing harbours and FLCs; construction of hygienic domestic fish markets/whole sale markets/retail booths; establishment of cold storage facilities; and improvement of onboard fish processing facilities. The Board has provided 100 percent assistance for creation of tuna processing facility at the Visakhapatnam Centre of NIFPHATT. However, the industry has yet to come forward for its utilization. Further, NFDB has also formulated schemes for conversion of fishing vessel for undertaking tuna and perch long lining; provision of mother vessel/carrier vessel; and for providing sea safety and navigation equipment to fishing vessels. Regarding training of fishers/crews for sea fishing, the Board is providing 100 percent financial assistance and funds have already been released to FSI and Fisheries Departments of the State Governments.

18.0 The Committee also deliberated on the criteria to define 'Deep Sea Fishing Vessel' as to whether it should be based on size (OAL) of the vessel, or gear or horsepower of the engine or depth criteria or area of operation (distance from the sea shore) or combination of one or more parameters as mentioned above. It was suggested that while defining 'deep-sea fishing', both depth and distance criteria may be considered.

19.0 DIG A A Hebbar, Director (F&E), Coast Guard mentioned that the practice of issuing temporary (provisional) registration or renewing such temporary registration to LOP vessels was not in accordance with the provisions of Merchant Shipping Act, 1958 (M S Act, 1958). Such temporary registered vessels, which are imported under the deferred payment scheme, once losing their Indian registration (which was provisional/ temporary), also lose their status as Indian flag vessel and are then like any foreign vessel. Further, such vessels remain outside the Indian EEZ or in some foreign ports for longer durations (even for years) and under such circumstances their possibility of flag hopping or IUU fishing cannot be ruled. Members were also of the view that the large fishing vessel capacity in Taiwan is leading to the diversion of many such vessels under the provisions of LOP and deferred payment to fish in the Indian waters.

20.0 Shri Bhandare suggested that in place of permitting deferred payment spread over a period of 05 years for acquiring 3 - 4 vessels by a single party, the Government may consider full payment for a single vessel and the remaining vessels may be acquired in a phased manner over a period of the remaining four years. Following this, at least the vessel acquired on full payment becomes fully Indian owned and permanently registered and any default by the buyers too can be minimized to certain extent.

21.0 Dr Yadava suggested that a detailed write up on the LOPs issued, vessels acquired so far; status of compliance of the Guidelines; resources exploited and manpower developed under the scheme may be prepared for consideration of the Committee. In this regard, Dr Sanjay Pandey, Fisheries Research and Investigation Officer (FRIO), DAHD&F informed that out of the 247 LOPs issued by the Department, as on date 71 DSFVs have valid LOPs and 26 LOP vessels are in possession of permanent registration issued by the MMD. The remaining vessels have provisional

registration, which has already expired. Dr Pandey also informed that most of the LOP vessels were not fishing since the last two years, as they faced problems in getting security clearance for their foreign crew from the MHA. Further, the Government of India's norm of a salary slab of US$ 25,000 per annum for employment of foreigners has not been agreed to by the LOP operators, resulting in their suspension of operations since the last 2½ years. Further, many of the permanently registered LOP vessels are also not in India due to security clearance problems. Prior to this the LOP vessels were furnishing details to FSI on a regular basis.

22.0 It was also informed that as per the catch statistics reported by the LOP vessels to FSI, less than 1 percent of the available resource potential from deep sea was exploited by these vessels. Therefore, this Committee may look into the problems of the deep sea sector and to suggest practical measures for optimum exploitation of the marine resources, especially from the deep-sea. In this regard, the chairperson desired that the Central Marine Fisheries Research Institute (CMFRI) may work out the potential of harvestable stocks available for deep sea based on the Revalidation Report, 2011 and requested FSI to provide catch statistics from deep sea fishing vessels to CMFRI. Dr Yadava reiterated that a comprehensive note on what has happened so far in the deep sea fishing sector would be essential for making practical recommendations.

23.0 DIG Hebbar pointed out that since the last two years, the LOP operators were not reporting daily position of their vessels to the Coast Guard, neither presenting their vessels to the MMD for renewal of registration. He stated that no vessel can remain idle for such a long time without incurring huge losses. He reiterated that the renewal of the LOPs may not be considered since the provisional registration of many of these vessels had already expired. Dr Pandey informed that renewal of LOPs is granted subject to the holding of valid registration by such vessels.

24.0 Dr Yadava informed that many small and intermediate range of fishing vessels from Thoothoor, Nagapattinam and Visakshapatnam were operating in deep sea and exploiting the large pelagics available in the EEZ. The Committee deliberated that if capacity exists with the small-scale fishermen to operate and exploit the deep sea resources, then they could be brought under the ambit of the future deep-sea policy incorporating certain minimum requirements for sea safety and compliance of terms & conditions such as reporting of catch, etc. Shri Bhat suggested that since Sri Lanka has a good small-scale deep sea fleet, we could take lessons from the Sri Lankan fishing vessels. Dr Yadava informed that while this could be quite useful, the subtle differences between the Indian fishing fleet and their counterparts in Sri Lanka may also have to be kept in mind. The Sri Lankan boat building has tremendously improved over the years, which provides them an edge over the Indian boats. Further, most deep sea and distant water fishing fleets of Sri Lanka have back-end tie up with the Industry at home, which provides strong forward and backward linkages, making the operations more remunerative as compared to the Indian fleet that lacks such arrangements.

25.0 Dr Yadava further informed that the Toothoor boat range from 14-22 meter OAL with the larger number of boats being in the range of 14-17 meter OAL. These boats operate at long distances from the shore, at time fishing off the coast of Oman, etc and target deep sea pelagic species. As our fishermen have the capability of operating in deeper waters, the chair observed that such fleet must be encouraged to exploit the resources of our EEZ. The Committee agreed to this proposal and also suggested that if any operator would like to import bigger vessels, he may be permitted as per the prevailing norms.

26.0 The Committee observed that as per the existing practice, vessels of 20 meter OAL and above are registered by the MMD, DG Shipping and are granted LOPs for 'fishing in EEZ' by the DAHD&F. On the other hand fishing vessels of <20 meter OAL are registered and licensed for

'fishing in territorial waters' by the State/Union Territory (UT) Governments under the provisions of their Marine Fishing Regulation Act or the MFRA. While the State/UTs permission is to fish only with the Territorial Waters, it is seen that most of these vessels, especially the mechanized category fish in areas beyond Territorial Waters, *i.e.*, in the EEZ and sometimes even in high seas. In this regard, the Committee suggested that the Central Government may consider bringing out the legislation on regulation of fishing in the EEZ by wholly Indian-owned fishing vessels at the earliest.

27.0 Discussing the variations in the international norms of size-wise categorization of fishing vessels and the norms followed in India, the Committee felt the need for harmonization with the international norms. According to this, all vessels of 24 meter OAL and above may only be considered within the purview of the MMD registration.

28.0 Based on the above, the Committee further proposed the following categorization of fishing vessels for consideration of the Government of India:

1) Traditional boats (non-motorized) of <12 meter OAL – doing fishing only within Territorial Waters for both subsistence and commerce. Such vessels to meet the basic safety and communication requirements;
2) Motorized and mechanized vessels of <12 meter OAL: undertaking small scale fishing mainly within Territorial Waters for commercial purposes, including exports. Such vessels to meet the standard safety, communication and navigation requirements, if fishing outside the Territorial Waters; others to meet the basic requirements.
3) Mechanized small-scale and intermediate range of vessels of >12 to 24 meter OAL- fishing for commerce outside the Territorial Waters and up to the EEZ and beyond. Such vessels to meet full safety, communication and navigation requirements, consistent with those required for vessels >24 meter OAL.
4) Vessels >24 m categorized as industrial deep-sea fishing vessels- Such vessels to fish only outside the Territorial Waters and to fully comply with the MMD stipulations.

29.0 The Committee also suggested that the above classification of fishing vessels, if agreed to by the Government may be considered for inclusion in the proposed 'Marine Fishing (Regulation & Management) Bill', which is presently in a draft stage. It was also suggested that a 'Model Bill' may be drafted for circulation to the coastal States/UTs, to help them in revision of their MFRAs and in the process make them updated and uniform.

30.0 The Committee was informed that the Ministry of Shipping proposes to delegate the powers of survey, inspection and registration of all categories of fishing vessels, irrespective of their length to the coastal State Governments. The Committee expressed its apprehensions on this moves and felt that the Department of Fisheries in the coastal States may presently lack both manpower and wherewithal to shoulder the responsibility of inspecting the vessels, especially the larger ones from the angle of sea safety, navigation and sea worthiness. The Committee opined that as per the international practice, the MMDs are mandated to undertake such work in respect of vessels of >24 meter OAL and, therefore, it may not be advisable to shift the authority to the coastal State Governments. The Committee felt that the Ministry of Agriculture may like to take up this issue with the Ministry of Shipping.

31.0 The Committee observed that the mandate given to it includes not only a policy on deep sea but to undertake a comprehensive review of all aspects of marine fishing. Such a review will essentially cover all aspect of marine fisheries, including compliance with the provisions of all International binding instruments to which India has accessed/ratified and also the commitments to

the non-binding or voluntary instruments. Such a review may further necessitate due stakeholder consultations before the report is submitted to the Government for its consideration and acceptance. In view of the tasks before the Committee, it was agreed to request the Ministry of Agriculture to consider extending the term of the Committee up to 31 January 2014. However, the committee also agreed that the interim report on Item No 2 of the TOR would be submitted to the Government by 15 December 2013.

32.0 The Committee also noted the following suggestions, which came up during the deliberations:

- No fishing zones may be identified and declared by the Government in maritime regions between India-Pakistan, India-Bangladesh and India-Sri Lanka.
- Fishing within 5 nautical miles may be reserved exclusively for mechanized/traditional fishing boats. Such reservation would also be very useful for conservation purposes.
- Resale of DSFVs to be made with the approval of the Government and after payment of customs duty. Further, it should be sold only to another Indian operator.
- CMFRI in consultation with concerned institutions may come up with an operational definition for deep sea fishing.
- Scientific database for fisheries management need to be developed.
- Mechanisms for improved cooperation and coordination amongst the various fisheries institutions of the country should be identified.
- Empowerment and capacity building of fishermen in various aspects of fisheries, including improved understanding of legal requirements, both national and international having bearing on their fishing operations is essential.
- Implementation plan supported by budgetary requirements to be incorporated into the new policy to make it practical and realistic in approach.

33.0 The Chair requested all members to send their inputs to Dr Pandey by 10 Nov 2013 so that the same could be consolidated and circulated to the members before the next meeting. It was also tentatively decided that the third meeting of the Committee may be held during 15-16 November 2013 at CMFRI, Kochi.

34.0 The Meeting ended with a vote of thanks to the chair.

Annexure

List of Participants

Sl. No.	Name & Designation	Organisation
1.	B Menakumari, Deputy Director General (Fisheries)	ICAR, New Delhi
2.	B Vishnu Bhat, Fisheries Development Commissioner	DAHD&F, New Delhi
3.	Prem Chand, Director General	FSI, Mumbai
4.	S G Bhandare, Deputy Director General (Shipping)	D G Shipping, Mumbai
5.	A A Hebbar, Deputy Inspector General & Director (F&E)	Coast Guard, New Delhi
6.	Y S Yadava, Director	BOBP-IGO, Chennai
7.	A Gopalakrishnan, Director	CMFRI, Kochi
8.	Pratibha Rohit, Principal scientist	CMFRI, Kochi
9.	Leela Edwin, Principal Scientist	CIFT, Kochi
10.	K J Antony, Joint Director	MPEDA, Kochi
11.	C Ramachandran, Senior Scientist	CMFRI, Kochi
12.	Paul Pandian, Executive Director	NFDB, Hyderabad
13.	P Ravichandran, Principal Scientist	CIBA, Chennai
14.	M Sivaraman	Andaman Deep Sea Fisheries Association, Chennai
15.	T Valsaraj	All India Association of Deep Sea Fisheries, Visakhapatnam
16.	N Srinivas	All India Association of Deep Sea Fisheries, Chennai
17.	M D Dhayalan	Indian Fishermen Association, Chennai
18.	P Ravi	-do-
19.	Sanjay Pandey, Fisheries Research & Investigation Officer	DAHD&F, New Delhi

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Expert Committee for Comprehensive Review of Deep-sea Fishing Policy and Guidelines

Minutes of the Third Meeting

Venue: Krishi Bhawan, New Delhi **Date: 21.11.2013**

The Third Meeting of the Expert Committee for 'Comprehensive Review of Deep-sea Fishing Policy and Guidelines' was held under the chairpersonship of Dr B Meenakumari, Deputy Director General (Fisheries), Indian Council of Agricultural Research (ICAR) on 21.11.2013 at 1000 hrs in the ICAR-Committee Room, Krishi Bhawan, New Delhi. The list of participants is placed as Annexure. Besides members of the Committee, Director General, Fishery Survey of India (FSI), Mumbai and Director, Central Institute for Fisheries Nautical Engineering and Training (CIFNET), Kochi were also present as special invitees.

2.0 Dr Meenakumari welcomed the participants and stated that the Committee should submit the draft Report by the last week of December, 2013. She requested the Director General, FSI to provide catch statistics of LOP holder deep-sea fishing vessels and also requested that all members/participants should provide their inputs in time to the Committee to expedite finalization of the report.

3.0 It was discussed that as per the orders of constitution of the Committee, the report should have been submitted by31 October, 2013. Therefore, it would be necessary to obtain extension in time for submission of the report by the Committee. Dr Sanjay Pandey, Fisheries Research and Investigation Officer (FRIO), Department of Animal Husbandry, Dairying and Fisheries (DAHD&F) suggested that priority may be given for preparation of an interim report on review of the existing 'deep-sea fishing' policy and guidelines.

4.0 The Committee deliberated on the issue of zonation of fishing areas in the Territorial Waters for better management of resources and to address over-capacity *vis-à-vis* livelihood concerns of traditional fishermen. Dr Y S Yadava, Director, Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO), Chennai opined that the area from 0-5 nautical miles (nm) may be reserved only for traditional fishers, while the area between 5 to 12 nm may be earmarked for motorized fishing vessels. This step would help in conservation of the resources in the near-shore waters and also help moving the extra effort to off-shore waters. While supporting this view, Dr Leela Edwin, Principal Scientist, Central Institute for Fisheries Technology (CIFT), Kochi suggested that the area up to 5 nm could also be used as protected area for cage culture, setting up of Fish Aggregating Devices and artificial reefs. This approach could protect the spawning grounds of many varieties of fin and shell fish species. Dr Edwin also suggested that in this zone only non-motorized (traditional vessels) and motorized boats using up to 10 horse power motor only may be permitted. Accordingly, the larger motorized canoes and mechanized fishing fleet should be moved out of this area and allowed to fish in the deeper waters.

5.0 Discussing the format for preparation of the report, chairperson suggested that a format/outline may be prepared with heads, sub-heads and the proposed contents under each of the

categories. With inputs from the members/special invitees and after deliberations, the Committee worked out a tentative 'Template/Outline of Interim Report' for use while preparing the report.

6.0 With regard to the finalization of the report, the Committee agreed on the following schedule:

- Receipt of inputs from Members on Template of Report- by 15 December, 2013
- Compilation of all inputs, and circulation of Draft Report to Members- by 20 December, 2013
- Forth Meeting of Committee to be convened at Kochi to finalize the Report by- 26-27 December, 2013
- Submission of Interim Report by the Committee- 30 December, 2013

7.0 The Meeting ended with a vote of thanks to the Chair.

List of Participants

Sl. No.	Name & Designation	Organisation
20.	B Menakumari, Deputy Director General (Fisheries)	ICAR, New Delhi
21.	Prem Chand, Director General	FSI, Mumbai
22.	Y S Yadava, Director	BOBP-IGO, Chennai
23.	A Gopalakrishnan, Director	CMFRI, Kochi
24.	A A Hebbar, Deputy Inspector General & Director (F&E)	Coast Guard, New Delhi
25.	Pratibha Rohit, Principal scientist	CMFRI, Kochi
26.	Leela Edwin, Principal Scientist	CIFT, Kochi
27.	R C Sinha, Director	CIFNET, Kochi
28.	K J Antony, Joint Director	MPEDA, Kochi
29.	J E Prabhakar Rao, Senior Executive	NFDB
30.	Sanjay Pandey, Fisheries Research & Investigation Officer	DAHD&F, New Delhi

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Expert Committee for Comprehensive Review of Deep-sea Fishing Policy and Guidelines

Minutes of the Fourth Meeting

Venue: Krishi Bhawan, New Delhi **Date: 13.03.2014**

The Fourth Meeting of the Expert Committee for Comprehensive Review of Deep-sea Fishing Policy and Guidelines was held under the chairpersonship of Dr B Meenakumari, Deputy Director General (Fisheries), Indian Council of Agricultural Research (ICAR) on 13.3.2014 at 1000 hrs in Committee Room, Krishi Bhawan, New Delhi. The list of participants is annexed.

2.0 Shri B Vishnu Bhat, Fisheries Development Commissioner, Department of Animal Husbandry, Dairying and Fisheries (DAHD&F) & Member-Secretary of the Committee welcomed the participants. Shri Bhat informed that as per the 'Terms of Reference' of the Committee, the Report should have been submitted by October, 2013. The matter has been delayed and now there is an urgency for submission of this report.

3.0 The chairperson informed that the inputs received from the members in the format agreed at the Third Meeting have been compiled by Dr Leela Edwin, Principal Scientist, Central Institute of Fisheries Technology (CIFT), Kochi. The draft Report was discussed and commented upon. Dr Y S Yadava, Director, Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO) stated that following main issues of deep-sea fishing sector should be addressed properly and reflected in the report, which *inter alia* could include (i) how to contain the fishing effort, (ii) bringing in orderliness in the system-through strict monitoring, control and surveillance (MCS), (iii) bringing legislative support for the deep sea fisheries sector (outside the Territorial Waters), and (iv) capacity building activities for fisher folk in the marine fisheries sector.

4.0 Dr Sanjay Pandey, Fisheries Research and Investigation Officer (FRIO), DAHD&F informed that the Draft Note for the Cabinet along with proposed 'Marine Fisheries (Regulation & Management) Bill was under consideration in Ministry of Law & Justice. He informed that the Bill has already been concurred from the legal and constitutional angle by the Department of Legal Affairs and is now under consideration with the Legislative Department for its finalization. Dr Yadava stated that with the forthcoming general elections and the dissolution of the 15th Lok Sabha, the Bill would lapse and a *de-novo* exercise may have to be done by the newly elected government.

5.0 Dr Yadava said that the Marine Fisheries Regulation Acts (MFRAs) of many of the maritime States were weakly implemented at the ground-level. As the MFRAs provide important legal support for regulation of fisheries in the Territorial Waters, there is an urgent need for their. In this regard, he suggested that the DAHD&F may consider setting up of a committee to do the revision and the draft revision could facilitate the State Governments in carrying out the revisions. Dr Yadava also emphasized on carrying out a due consultation process for the proposed 'Marine Fisheries (Regulation & Management) Bill', which is now under active consideration of the Government.

6.0 DIG A A Hebbar, Director (F&E), Coast Guard emphasized that 'safety' and 'security' were the two important aspects, which required serious thought. He informed that inputs from the Coast Guard on MCS were already provided to the Committee, which also include recommendations for consideration of the Committee. He suggested that 'color coding' should be made mandatory for the entire Indian fishing fleet and a tamper proof system of reporting should also be established.

7.0 Shri K J Antony, Joint Director, Marine Products Export Development Authority (MPEDA), Kochi informed that a total of 814 trawlers were converted into tuna long liners under MPEDA's scheme. Of the 814 trawlers assisted under this scheme, 774 vessels were from Tamil Nadu. He also highlighted that export of tuna was reportedly increasing from 18,000 metric tonnes (mt) in 2009 to 20,991 mt in 2011 and then 22,297 mt in 2012. Correspondingly, the revenue also increased from Rs. 192.03 crores in 2011 to 284.39 crores in 2012.

8.0 The Committee discussed the format of the Report, which was prepared at the Third Meeting of the Committee held on 21 November, 2013. Dr Yadava suggested that the chapter plan of the Report may be made as per the 'Terms of Reference' given to the Committee and accordingly suggested for modifications in the format of the Report.

9.0 While discussing TOR-1, relating to review of the Comprehensive Marine Fishing Policy, 2004 (CMFP, 2004), the committee felt that there is a need for a revised policy which could also give equal emphasis on implementation part of the policy and suggest assigning responsibilities for management and sustainable exploitation of marine resources. In this regard, the committee also discussed the role of other concerned Ministries/Departments in the Union Government such as the Ministry of Environment and Forests, which is now playing a crucial role in the biodiversity conservation in marine waters. The Committee also felt that while it would be possible for conducting a thorough review of the CMFP, 2004 but preparation of a new policy may not be possible within the given time-frame of the Committee. Further, a new policy would also require extensive stakeholder consultations, which is time consuming and requires elaborate planning. As such the Committee agreed to mention this decision in the report so that the Government could consider setting up of another committee to do the task of preparing the revised CMFP.

10.0 The Committee observed that 'TOR-2' concerned review of the current Guidelines on Deep-sea Policy, which was elaborately deliberated in the first meeting of the Committee and observations of the members were already noted. Further, TOR-3 was also discussed by the Committee and in this regard Dr Yadava pointed out that the near-shore waters are facing the problem of over-capitalization and there is urgent need for modernization of the existing fishing fleet so that the untapped resources in deep-sea could be harvested by the indigenous fleet.

11.0 The chair requested the members to furnish their comments on CMFP, 2004 and inputs on the other TORs to Dr Pandey by 20 March, 2014 so that the same could be considered and compiled in the report. The Committee also decided that Dr Yadava will prepare a draft report and Dr Pandey will assist him in collection and compilation of inputs from the reports of the previous committees and comments from the members of this committee. Shri Bhat, Member Secretary suggested that chairperson may seek some more time for submission of report by the Committee and requested all members to furnish their inputs on the TORs at the earliest.

12.0 The Meeting ended with a vote of thanks to the chair.

List of Participants

Sl. No.	Name & Designation	Organisation
1.	B Menakumari, Deputy Director General (Fisheries)	ICAR, New Delhi
2.	B Vishnu Bhat, Fisheries Development Commissioner	DAHD&F, New Delhi
3.	Yugraj Singh Yadava, Director	BOBP-IGO, Chennai
4.	A A Hebbar, Deputy Inspector General & Director (F&E)	Coast Guard, New Delhi
5.	Pratibha Rohit, Principal scientist	CMFRI, Kochi
6.	Leela Edwin, Principal Scientist	CIFT, Kochi
7.	K J Antony, Joint Director	MPEDA, Kochi
8.	Sanjay Pandey, Fisheries Research & Investigation Officer	DAHD&F, New Delhi

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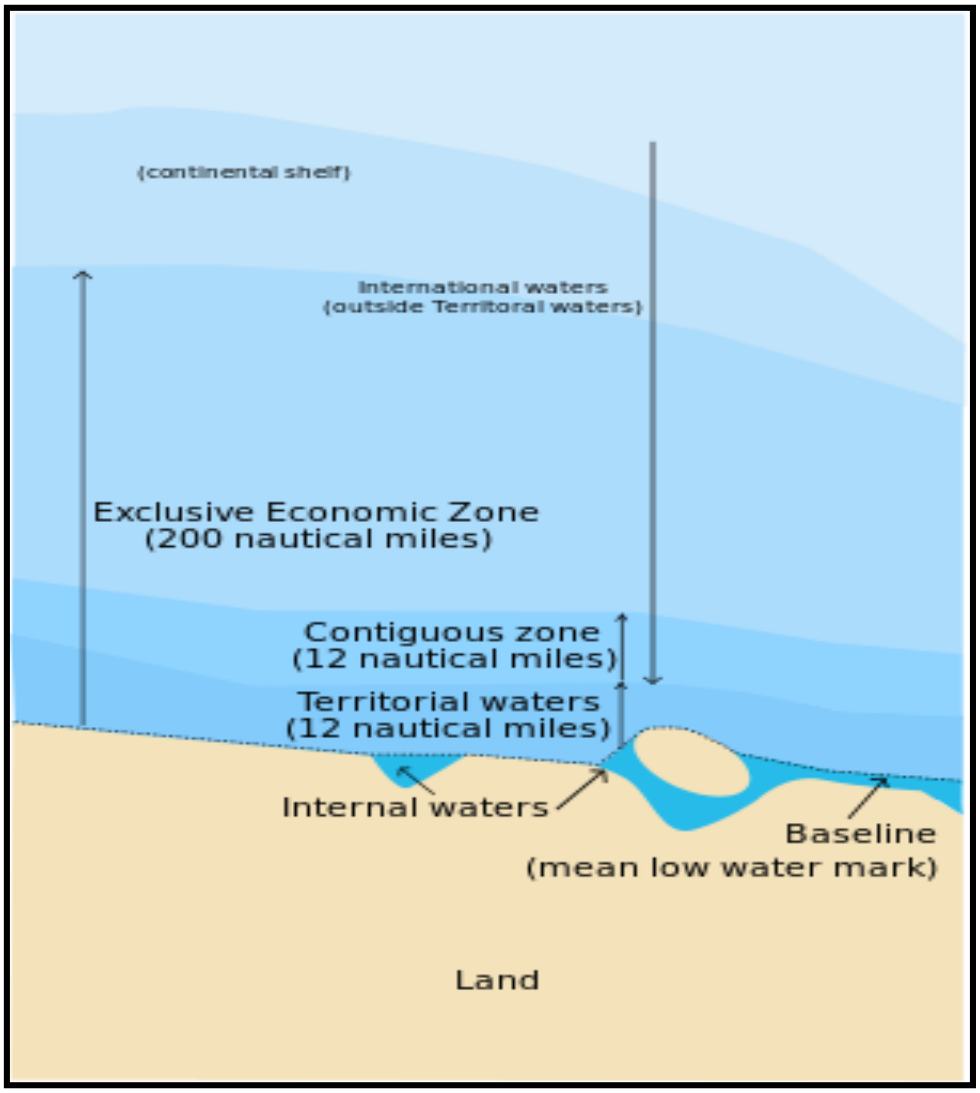
28-Dec-10 10:49 am

Definition of Territorial Waters, Exclusive Economic Zone, Contiguous Areas, etc (as per UNCLOS)

A state's Exclusive Economic Zone (EEZ) starts at the seaward edge of its territorial sea and extends outward to a distance of 200 nautical miles (370.4 km) from the baseline. The EEZ stretches much further into sea than the territorial waters, which end at 12 NM (22 km) from the coastal baseline (if following the rules set out in the UN Convention on the Law of the Sea). Thus, the EEZ includes the contiguous zone. States also have rights to the seabed of what is called the continental shelf up to 350 nautical miles (648 km) from the coastal baseline, beyond the EEZ, but such areas are not part of their EEZ. The legal definition of the continental shelf does not directly correspond to the geological meaning of the term, as it also includes the continental rise and slope, and the entire seabed within the EEZ.



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Appendix-4

INDIAN COAST GUARD
COAST GUARD HEADQUARTERS
NATIONAL STADIUM COMPLEX
NEW DELHI 110 001

Abstract of Fishing Vessels Traffic Pattern Study by the Indian Coast Guard: 15 January to 14 February 2010

1.0 Fishing boats operate from creeks, beaches, islands, rivers besides operating from any organized fish landing centres, ports and fishing harbours. According to the last Census, a total of 2.44 lakh fishing boats were operating in the Indian Territorial Waters and the Exclusive Economic Zone (EEZ). However, none of these boats are tracked and their position known to any fisheries authorities or fisheries association while they are out at sea. No organisation can reasonably provide the exact data of the vessels at sea with respect to the distances at which they operate and the exact time or place to which they return. Neither data is available to provide the fishing vessel concentration in one particular area.

2.0 The Coast Guard undertook a random fishing vessel position at sea survey from 15 January to 14 February 2010. Coast Guard ships and aircrafts reported the position of the fishing vessels as and when they encountered them at sea, based on the following classification:

1) Mechanised fishing boat (MFB Large; 14-19 metres LOA)
2) Mechanised fishing boat (MFB Small; 08-14 metres LOA)
3) Fiber Re-enforced Plastic hull boat with OBM (FRP-O)
4) Fiber Re-enforced Plastic hull boat with Inboard Motor (FRP-I)
5) Traditional Fishing Boats with external power (TRB-P)
6) Traditional Fishing Boats with oar/sails (TRB-O/S)

3.0 A total of 10 679 reports were received from the Coast Guard ships and aircrafts within the 30 day survey period. Positions were plotted on chart and on special software to generate the visual picture of the area of operation of the fishing boats around the Indian coast. Special emphasis was given to reporting of fishing vessels that operated beyond the VHF range from the coastline. The break-up of reports received for various coastal States and island groups is as follows:

Sl. No.	State/ Union Territory	No. of Reports
1.	Gujarat	5 782
2.	Daman	448
3.	Maharashtra	720
4.	Goa	75
5.	Karnataka	102
6.	Kerala	212
7.	Lakshadweep	64
8.	Tamil Nadu	694
9.	Andhra Pradesh	173
10.	Orissa	611
11.	West Bengal	1 736
12.	Andaman & Nicobar Islands	62
13.	**Total**	**10 679**

4.0 From the analysis of the category-wise plot of reports, it was deduced that the large mechanized boats operating from Gujarat and Maharashtra generally operate beyond the VHF range in the north-west coast and these boats are predominantly engaged in trawling operations. The large mechanized boats from Kerala and south Tamil Nadu also open out to more than 24 miles from the South West coast due to the presence of shallow waters conducive for trawling operations. The boats from Andhra Pradesh open out more than 24 miles from the coast due to the conversion of existing trawlers to tuna longliners and the abundance of availability of tuna fish near the Andhra Pradesh coast. The mechanized boats from Orissa and West Bengal also open out more than 24 miles for their respective coastline due to the presence of shallow waters and upwelling phenomenon from rivers such as Mahanadi and Ganges, which is conducive for trawling operations.

5.0 Further, the FRP boats belonging to Kerala, Tamil Nadu and Andhra Pradesh also open out more than 24 miles from the shore. Though the endurance of the FRP vallam is relatively small in comparison to the large mechanized boats, these vallams have the capability to open out to 30 - 40 miles within 2-3 hours and return to shore.

6.0 The summary of the findings of the fishing vessel traffic patterns is as follows:

(a) Traditional boats with oars/sails operate up to a maximum distance of 5 miles in normal sea conditions and up to 2 miles in moderate sea condition. These boats operate up to 8 hours.

(b) Traditional boats with OBMs open out up to 12 miles and these boats also operate up to a maximum of 12 hours.

(c) FRP Vallams from three states *viz*., Kerala (11%), Tamil Nadu (16%) and Andhra Pradesh (12%) open out between 8-36 miles from their respective coast. The maximum operating time of these boats is 18-24 hours. There is no navigational aid onboard but they may have a compass for directions.

(d) Fishing boats from the Lakshadweep Islands and from the Andaman and Nicobar Islands do not engage large fishing boats and they also do not open out more than 24 miles from the shore. However, these boats may move from one Island to the other.

(e) Small mechanized boats up to 14 metres in length operate in all coastal States and their operations are generally restricted to within 24 miles from the coast. These boats may have navigational compass. These vessels operate between 2-5 days.

(f) Large mechanized boats 14-19 meters in length operate predominantly in the States of Gujarat (60%), Maharashtra (34%), Kerala (26%), Tamil Nadu (32%), Andhra Pradesh (24%), Orissa (27%) and West Bengal (31%). These boats generally operate at depths varying from 20 metres to 70 metres. This when translated into distance from shore will admeasure about 80 miles in the West Coast, 55 miles in the South and 45 miles in the North eastern coast. The boats are generally fitted with navigational compass and in certain boats, with GPS. These vessels operate between 7-12 days.

25 March 2014

A A Hebbar
Dy Inspector General & Director (FE)

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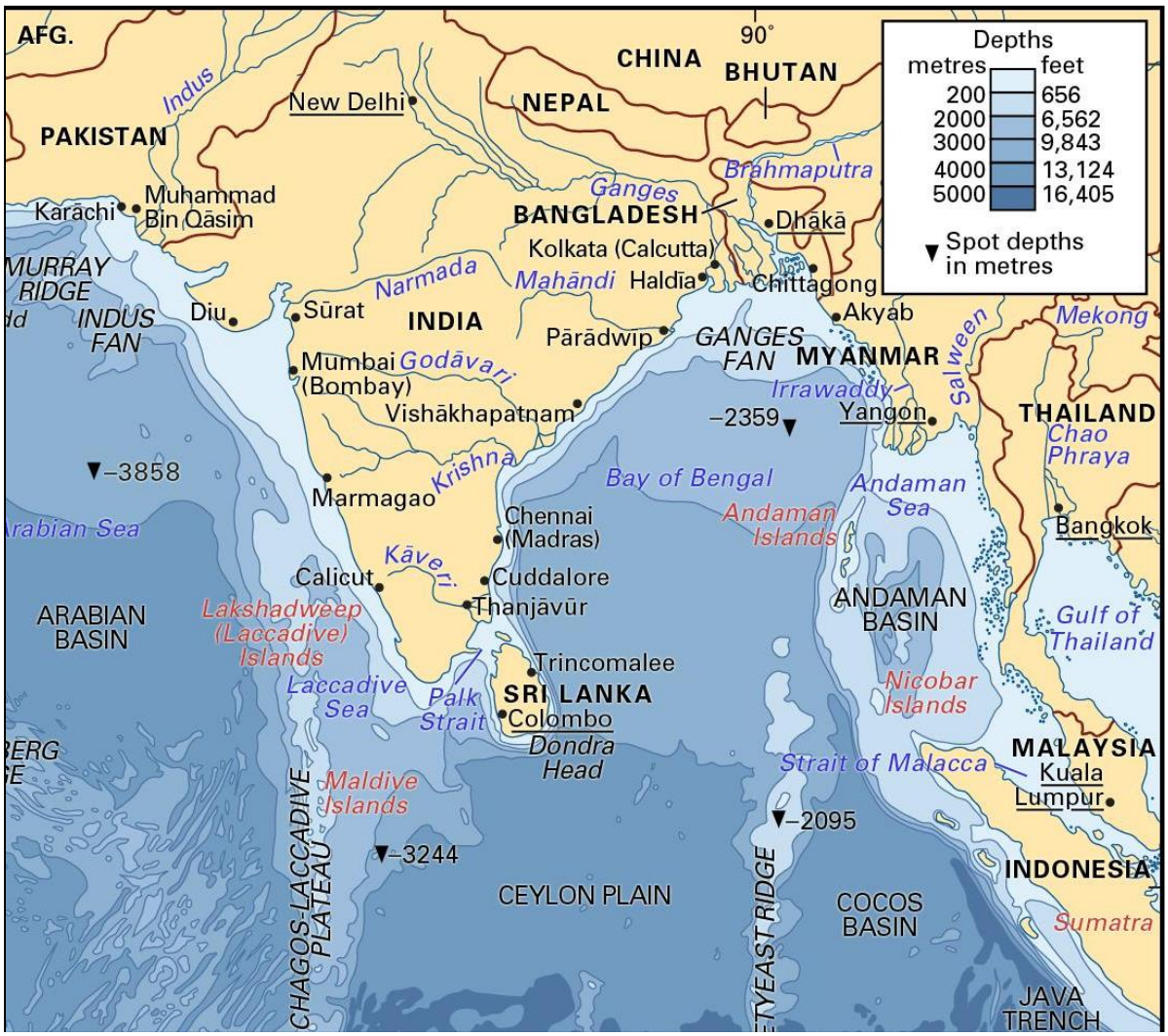
Geo-physical differences between the east coast and west coast of India and correlation of depth with distance

The west and east coasts of India vastly differ in terms of geo-physical and oceanographic characters. The west coast, having natural advantages, leads the marine fisheries production scenario. The west coast has a broader continental shelf. This enables the fishers to venture further into the sea. The continental shelf extends outwards to an average depth of 183 meters. It is widest around 20° North latitude (close to Gujarat and Maharashtra) and stretched to 104 nautical miles (nm). The continental shelf becomes narrower down south and near Kanyakumari it has a width of only 26 nm. The sea floor has deepened very gradually around Malabar-Cochin stretch to a depth of 119 meters but then steeply declined. Comparatively, in the east coast, the continental shelf deepens sharply, except areas around the Palk Bay (Figure). Resultantly, it is difficult for non-motorized and motorized fishing vessels to venture deeper into the sea unlike west coast. Due to this variation in sloping of ocean floor along the coast, roughly, a depth of 70 meters is translated into 80 nm in the west coast, 55 nm in the south and only 45 nm in the north-eastern coast.



References:

Subrahmanyan, R. "Studies on the phytoplankton of the west coast of India." *Proceedings of the Indian Academy of Sciences-Section B*. Vol. 50. No. 4. Springer India, 1959.

"Arabian Sea: depth contours and undersea features".Map. *Encyclopædia Britannica Online*. Web. 19 May. 2014.
http://www.britannica.com/EBchecked/media/1997/The-Arabian-Sea-and-Bay-of-Bengal

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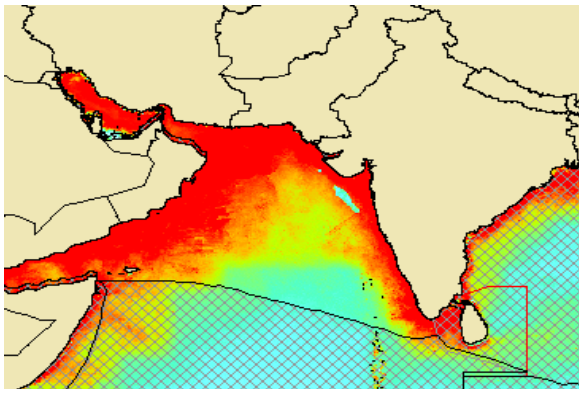
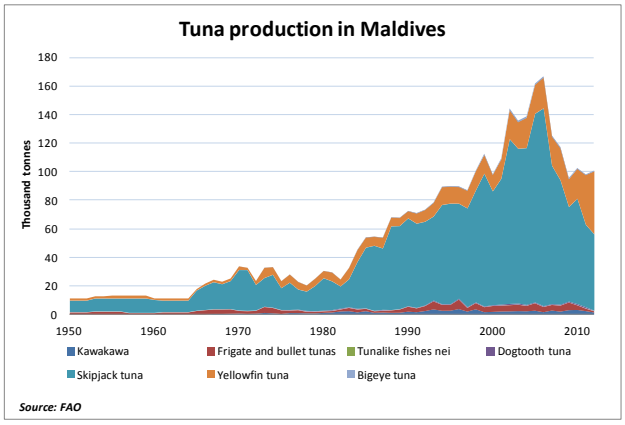
The Tuna Fishery in Maldives

Situated in the western Indian Ocean, the Maldives is a traditional tuna fishing nation. The country has an Exclusive Economic Zone (EEZ) of 916 189 million square km (SeaAroundUs Project) with primary production[63] of 384 mgC·m-^{2}·day^{-1}. Maldives shares the same geographical characteristics as that of the Indian Union Territory of Lakshadweep. This similarity between Maldives and Lakshadweep further extends to the ethnic composition and also in the famous 'pole and line' fishing method.

Map 1: Primary Productivity in Western Indian Ocean



Lakshadweep has a lagoon area of 4 200 sq. km, territorial waters of 20 000 sq. km, EEZ of 40 000 million sq. km and a coastline of about 132 Km. The seas around Lakshadweep are rich in fishery resources and the main fishery resource in the Islands is tuna. The primary productivity in Lakshadweep is on an average higher than Maldives (Map 1). The estimated marine fishery potential resources in the seas around Lakshadweep is about 0.1 million tonnes of tuna and tuna like fishes and about an equal quantity of sharks (which is comparable to marine fisheries production in Maldives). The 'pole and line' fishing is a unique fishing method for catching tuna and is only practiced by the Lakshadweep fishermen in the Indian continent. The present annual production is about 12 000 tonnes, which is hardly 5 percent of the total potential. About 80 percent of the total landings of Lakshadweep comprise skipjack tuna and about 60 percent of the total landings is converted to dried products and the remaining goes for local consumption[64].



Notwithstanding many similarities that Lakshadweep has with the Maldives, in the fisheries sector, Maldives has progressed much faster making its fisheries a highly commercial activity.

On the other hand, fishing in Lakshadweep still remains largely artisanal, without any signs of exploiting the rich tuna resources that abound its

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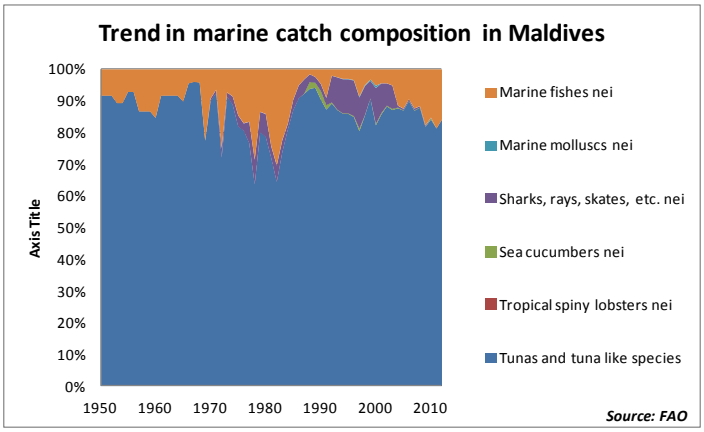
63 ***Primary production (PP) is the fixation of inorganic carbon by living organisms, leading to the formation of organic compounds. Most of the world's PP relies on energy provided by sunlight, i.e., on the process known as photosynthesis, though, in the deep sea, some PP occurs which is based on different chemical processes. While sea grasses, macro-algae and coral reefs contribute significantly to PP in coastal zones, especially in the tropics, the bulk of marine PP is carried out by microscopically small, planktonic algae ('phytoplankton'), which can be seen from space, thanks to their photosynthetic pigments (mainly chlorophyll).***

64 ***http://lakshadweep.nic.in/AnnualPlan_2011_2012_7.htm***

EEZ. The purpose of making this comparative analysis in the report is to reflect on the developments made by the Maldives in the fisheries sector, which can act as a case model for developing fisheries in Lakshadweep.

During the last six decades, tuna production in the Maldives has increased from 11 000 tonnes in 1950 to 167 059 tonnes in 2006. Since 2006, the production declined sharply and fell to 95 680 tonnes in 2009. However, thereafter it has again shown signs of recovery and in 2012 the production increased to 100 907 tonnes. Skipjack tuna constitutes the main stay of fisheries in Maldives and contributes about 75 percent of the total tuna landings. Yellow fin tuna contributes about 15 percent of the total catch, but in recent years, especially since 2006, the share of yellow fin tuna is increasing. There is also a significant change in catch composition and the fisheries is becoming more diversified.



Maldives has four major fishing methods. Pole and line fishing contributes about 75 percent of the total fish production. Other methods are handlining, troll line and long line.

The increasing fisheries production in Maldives has been attributed to mechanisation of vessels, introduction of mechanical pumps for spraying water during pole and line fishing, more frequent use of radio communication between vessels, greater use of binoculars for spotting seabirds and an increase in the number of Fish Aggregating Devices (FADs)[65]. A close inspection of these factors shows that they include a mix of better production technology and improved communication, which reduces the search cost.

The changes in production technology is well-captured in transformation of mas-dhonis, the fishing vessels of Maldives from small sailing vessels fishing in and around an atoll to power driven large fishing vessels. Starting from 1970s, sailing vessels were replaced by 22 hp or 39 hp inboard diesel engines. The second-generation vessels were built for motorization and were strengthened to withstand engine vibrations. Second generation vessels came into existence in the mid-1990s and replaced the old fashioned sailing dhonis with a different hull structure. Subsequently, engines with higher horse power (50-60 hp) became popular, which have now reached up to 600 hp or more. The later generation of fishing vessels exceeded 15.6 m in length and beam of 5.0m, with capacity for storing minimum 6 metric tonnes of fish in ice and a speed of about 9.0 knots. These vessels are equipped with satellite navigators, hydraulic net haulers and other technological equipment. These vessels have also a special compartment for crew accommodation and are used mainly for long trips. Mas-dhoni is used in both the skipjack and yellow fin tuna fishery[66]. Resultantly between 2005 and 2007, the catch per unit of effort (CPUE) has increased from 948 kg to 1 622 kg for mechanized mas-dhonis[67]. FADs also play an important role in Maldivian fisheries. FADs are managed by atoll committees and hence act as *de facto* fishing zones for different atolls.

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[65] ***Sinan, Hussain. "Background report of fishery products The Maldives." Available from http://www.fao.org/fileadmin/user_upload/fisheries/docs/Maldives_Edited_.docx.***

[66] ***Cited from Sinan Hussain.***

[67] ***BOBP-IGO. Report of the National Workshop on Monitoring, Control and Surveillance in Marine Fisheries – Maldives, September 2009, Pages 84.***

In terms of streamlining the production, the Government owned company, Maldives Industrial Fisheries Company (MIFCO) has deployed several collector vessels throughout the country to buy and transport fish from fishers to the company owned cannery and cold storages. In 2003, the Government of Maldives privatized the post-harvest sector to attract more investment. Thereafter, other private companies have also entered into the sector and providing good example of symbiotic relationship between the harvesters and processing companies. This arrangement provides the fishers remunerative prices for their catch, which otherwise would have been difficult for the fishers to market in far-flung island communities.

Earlier, only licensed foreign fishing vessels used to carry out longlining at the fringe of the Maldivian EEZ, while the local fishing vessels mainly engaged in skipjack fishing using pole and line. However, with declining catch and issues in monitoring the movement of these foreign flagged vessels, in 2010 the Government of Maldives cancelled the licenses of foreign fishing vessels and introduced longlining of yellow fin tuna by the national fishing fleet[68]. The domestic fishing vessels engaged in yellowfin tuna can only operate beyond 75 nautical miles, to safeguard the interests of the skipjack fishers.

Maldives has implemented a Vessel Tracking System (VTS) for all vessels licensed to operate in the outer EEZ (the zone between 75 and 200 nautical miles). Established in 1995, the VTS is monitored by the Maldivian Coast Guard on a regular basis. The Coast Guard monitors the movement of licensed fishing vessels in the EEZ. This is done by installing necessary vessel-tracking transponder equipment on board the vessel — mandatory under the Fishing License Agreement between the licensee and the Ministry of Economic Development and Trade.

From a policy perspective, there are three important lessons to learn from Maldivian tuna experience. First, tuna fishing is Maldives has been organized in an effective 'assembly line' of fishing vessels, processers and exporters. Maldivian tuna fishery enjoys a global demand and exporters/processers have effective contract with the fishing vessels. The state-run MIFCO plays an important role in organizing the sector[69]. In comparison, for domestic tuna fishing fleet in India marketing and price realization always remain an issue.

Secondly, Maldivian fishing fleet increased in both number and size during the high expansion period prior to 2006. The race started during early 1970s with motorization. However, recently declining tuna catch and lack of bait fishery is making fishing operation uneconomical. The number of mechanized mas-dhonis engaged per month has declined from 1102 in 2002 to 926 in 2012. At the same time number of fishing days has declined by 33 percent from 209 839 days in 2002 to 139 622 for mechanized mas-dhonis. This implies that there is also a need to consider fishing vessel economics and the associated resources while planning for deep sea fisheries.

Finally, the difference in productivity. During 2012, 984 fishing vessels (mostly mechanized) were engaged in Maldives and 120 000 tonnes of catch was landed. While at the same time in Lakshadweep, 1462 fishing vessels (8% mechanized) were operational and only 7683 tonnes of catch was landed. On conversion to catch/year, the Maldivian dhonis landed on an average 122 tonnes of fish, while the dhonis in Lakshadweep landed only 5 tonnes of catch per year. This shows a clear need of technology up-gradation in Lakshadweep.

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[68] ***http://minivannews.com/environment/cabinet-approves-long-line-fishing-for-maldivian-vessels-5385.***

[69] ***In 2012, the Marine Stewardship Council (MSC) certified the Maldivian pole and line tuna fishing, which now allows Maldivian tuna to be sold with premium in markets abroad.***

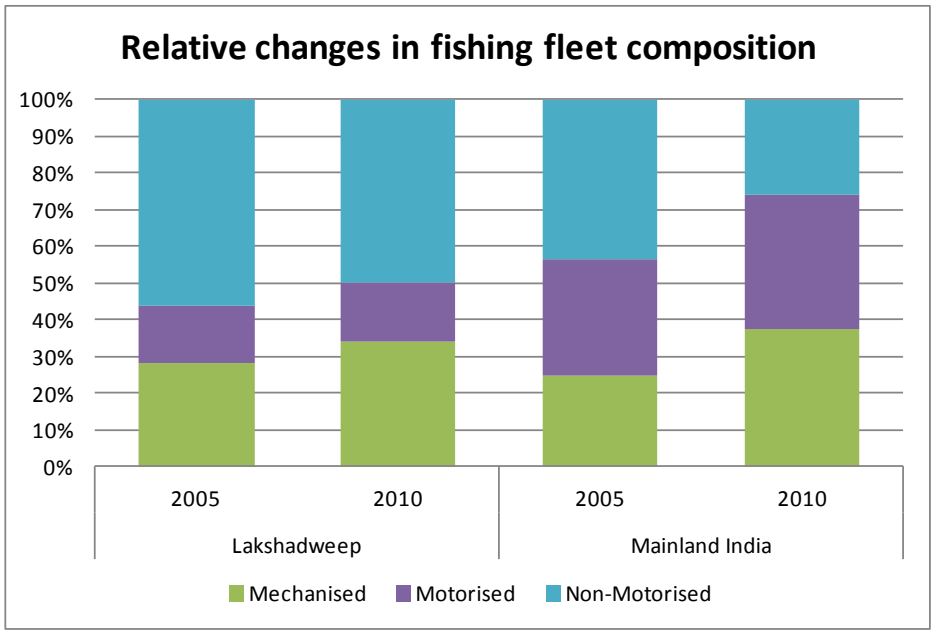
Fishing Fleet Structure in Lakshadweep

The Central Government has been implementing Central Schemes for motorization of traditional crafts and development of mechanization craft in the Union Territory of Lakshadweep. However, the information collected on fishing fleet during the marine fisheries censuses conducted in 2005 and 2010 shows that there is no significant change in relative composition of crafts during 2005 to 2010 in Lakshadweep. However, there has been a marked decline in the number of fishing boats in Lakshadweep from 2005 to 2010. In comparison, the fishing fleet in the mainland has also undergone structural changes between 2005 and 2010, but the differences are more conspicuous in the fleet size than the composition.

Craft/Year	Lakshadweep		Mainland	
	2005	2010	2005	2010
Mechanised	667	495 (-25.79%)*	58 911	72 559 (+18.81%)*
Motorised	376	240 (-36.17%)*	75 591	71 313 (-5.66%)*
Non-Motorised	1 341	727(-45.79%)*	104 270	50 618 (-51.45%)*
Total	2384	1462 (-38.67%)*	238 772	194 490 (-18.55%)*

**** Figures in parentheses denote percentage reduction in number of boats.***

Craft/Year	Lakshadweep		Mainland	
	2005	2010	2005	2010
Mechanised	27.98	33.86	24.67	37.31
Motorised	15.77	16.42	31.66	36.67
Non-Motorised	56.25	49.73	43.67	26.03
Total	100.00	100.00	100.00	100.00



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Valuation of deep sea fishery resources of India - Indicative estimates

Fisheries resources have their intrinsic values. Their contribution to biodiversity and ecosystem is also often immeasurable. From pure commercial perspective, a fish is of value when it is extracted from water. From there to the final consumption point, value of fish usually increases depending on its demand and supply. Therefore, it depends on time, market condition, infrastructure, competition, among other things.

However for simplification, value (V) of fishery resources as measured here shows the amount of revenue that will be generated at the point of first sale that is at landing centre. This is estimated by multiplying price per tonne of fish (P) with potential yield or the maximum sustainable yield (Y) of the fish.

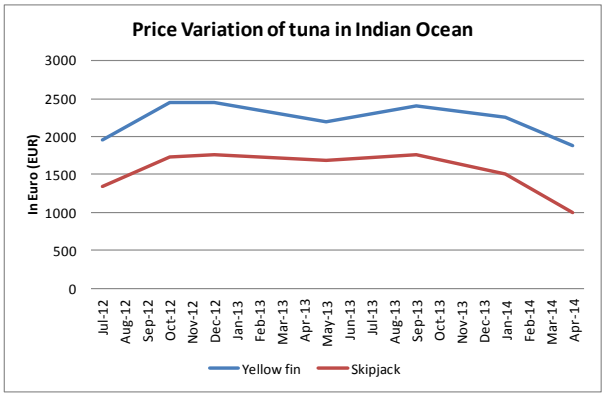
$$V = PY$$

The information on Y is taken from 2010 Revalidation Report. The information on price has been taken from two sources: (1) Globefish Database of the Food and Agriculture Organization of the United Nations (FAO) (can be accessed at http://www.globefish.org/tuna-market-reports.html) and FishWatch database of the Central Marine Fisheries Research Institute (can be accessed at http://www.cmfri.org.in/fishwatch.html). The reason for considering two databases, one global and one national is to estimate the maximum potential revenue based on current global scenario and possible amount of revenue based on local conditions.

Since Globefish reports data on prices for different markets and seas, we have considered price received at the Indian Ocean. This is based on Free On Board[70] (FOB) price received at Seychelles.

Trend in prices of tuna and tuna like species in Indian Ocean

The FOB price of tuna varies depending on season. During the period of analysis (July 2012 to April 2014), yellow fin tuna (YFT) received a price of Maximum EUR 2450 per tonne in December to May 2012-13 and minimum of EUR 1875 in April 2014. During the same period price of skip jack tuna (SJT) varied from maximum EUR 1760 per tonne in December 2012 to minimum EUR 1000 in April 2014.



Therefore, to calculate V we have taken the average price of YFT and SJT during the period. The average price of YFT is EUR 2 226 per tonne and the average price of SJT is EUR 1540 per tonne. This was then converted to INR at the current exchange rate of 1 EUR = INR 83.36 as on 30 April 2014.

[70] ***FOB implies that that the buyer pays for transportation of the goods. That is there is no additional value addition apart from extraction, preservation and transport of consignment to the point of transaction on the part of the fishing vessel.***

In case of price at the national level, daily price data for the period 28 March to 22 April 2014 was considered. The CMFRI data shows that price of YFT varies between INR 90 -120 and price of SJT varies between INR 50-70, depending on size and landing centre. Discussion with fishers in Visakhapatnam also confirms this figures. Therefore, at the national level, price of YFT on an average is taken as INR 100 000 per tonnes while price of SJT is INR 60 000 per tonne. Price of bill fishes is reported as INR 150 000 per tonne and price of pelagic sharks is reported as INR 80 000 per tonne.

Results

The Oceanic waters (beyond 500 meters of depth) can yield 80 000 tonnes of YFT and 14 400 tonnes of bill fishes. The SJT and other fishes are estimated at 122 100 tonnes. Based on this estimate, at international level the value of deep sea resources works out to be INR 3 319 crores per year or US D 553 million[71] (Table 1)

Table 25: Valuation of deep sea resources based on international prices

Oceanic Resource	Potential (t)	Price per tonne at Seychelles	Value (in Crores INR)
YFT & bill fishes	94,400	1,85,559	1,752
SJT, Big Eye Tuna, Pelagic sharks and Other species (Barracuda, Dolphin fish, Wahoo etc.)	1,22,100	1,28,374	1,567
Total	2,16,500	1,56,967	3,319

Table 2 below present the valuation of deep sea resources based on local prices. As can be seen there are considerable difference between two estimates. For all practical purpose, value of resources at local level can be taken as minimum possible revenue if the total potential yield of deep sea resources can be captured. Valuation of resources at international prices on the other hand shows that with right technology and post-harvest practices how much revenue the same resources can generate.

Table 26: Valuation of deep sea resources based on local prices (CMFRI)

Oceanic Resource	Potential (t)	Price per tonne	Value (in Crores INR)
Yellow fin tuna	80,000	1,00,000	800
Skipjack tuna	99,000	60,000	594
Bigeye tuna	500	60,000	3
Billfishes	14,400	1,50,000	216
Pelagic sharks	20,800	80,000	166.4
Other species (Barracuda, Dolphin fish, Wahoo etc.)	1,800	60,000	10.8
Total	**2,16,500**	85,000	1,790

Current level of exploitation and actual revenue

During the last five years (2008-12), India on an average exploited 20 221 tonnes of YFT and 18 546 tonnes of SJT which is translated into a revenue earning of 202 crores for YFT and 111 crores for

[71] ***IUS D = INR 60 approx.***

SJT. That is only by increasing exploitation of deep sea species, an additional revenue of about 600 crores can be tapped for YFT and an additional 483 crores for SJT.

Over time with proper interventions, this can be increased to additional revenue of INR 1 500 crores for YFT and INR 1 400 crores for SJT. This is apart from increasing revenue from other species. In addition, value of finished products, such as sashimi, tuna loin, cooked tuna, etc., increases by on an average about 2 times of price at point of first sale. Therefore, this resource can generate a revenue of about INR 3 000 to 6 000 crores (US D 500 – 1000 million) with proper interventions, which is about 13 to 25 percent of the GDP from marine fisheries sector at current prices.

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