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**Report of the Technical Committee to Review the
Duration of the Ban Period and to Suggest Further
Measures to Strengthen the Conservation and
Management Aspects**



सत्यमेव जयते

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Submitted to

**The Department of Animal Husbandry Dairying and Fisheries
Ministry of Agriculture
New Delhi**

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The FSI convened the first stakeholder consultation in the country for Maharashtra State with the support from the Mumbai Regional Centre (RC) of CMFRI. The FSI also conducted consultations in Lakshadweep, Daman and Andaman and Nicobar Islands. The Director of Fisheries (DoF), Tamil Nadu organised state-wide stakeholder consultations in a systematic manner in the State. He also supported the DoF, Puducherry in convening the stakeholder consultation for Puducherry, as well as at Cuddalore and Viluppuram Districts of Tamil Nadu. The Committee acknowledges their wholehearted support.

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Contents

i.	Acknowledgements	2
ii.	Constitution and Terms of Reference	4
iii.	Abbreviations	6
iv.	Executive Summary	7
v.	Key Recommendations	7
1.	Summary and Recommendation	9
2.	Introduction	14
3.	TOR-1 To assess the impact of fishing ban in view of livelihood issues, fish landings etc. on the available data of coastal states and UTs and review its duration.	18
4.	TOR-2 To suggest ban on purse seine fishing operation in the Indian Coast	33
5.	TOR-3 To suggest further measures for strengthening conservation and management measures in marine fisheries.	38
6.	TOR-4 To suggest measures for strict implementation of the Marine Fishing Regulation Acts (MFRA).	44
7.	References	47
	Appendices	
a.	Notification from the Ministry	50
b.	Questionnaire for stakeholder consultation	52
c.	Spawning periods of major commercial species	54
d.	Summary report of State-level stakeholder consultations	58
e.	Other Suggestions Given By Stakeholders during Nationwide Consultations	70
f.	Minutes of the first meeting of the Committee	74
g.	Minutes of the second meeting of the Committee	84

The Constitution and Terms of Reference

The Technical Committee

Since long time the need for conservation and management of marine fisheries was felt across the fishing industry. Seasonal ban is recognized as an effective means of achieving conservation. However, some differences of opinion prevailed on the extent of application, duration of closure, scientific basis etc. The Department of Animal Husbandry, Dairying and Fisheries (DAHD&F), Ministry of Agriculture, Government of India periodically reviewed the impact of seasonal fishing ban by seeking expert opinion on the subject and made changes in the time and duration of the ban as suggested by the experts.

The previous committee headed by the Director, Central Marine Fisheries Research Institute (CMFRI), Kochi submitted the report in 2010 and recommended 47 days' closure along both east and West Coast, at different times. In the light of several representations from the stakeholders, the Ministry had felt the need for reviewing the situation by seeking expert opinion on the subject. Thus the DAHDF, Ministry of Agriculture, Government of India vide its order No.30035/15/97-Fy (T-1) dated 7th May 2013 constituted a Technical Committee (TC) to review the duration of the Ban Period and to Suggest Further Measures to Strengthen the Conservation and Management Aspects. The Technical Committee consisted of the following nine members:

Dr G Syda Rao (till 31 July 2013) Dr A Gopalakrishnan (From 01 August 2013) Director Central Marine Fisheries Research Institute, Kochi	Chairman
Shri B Vishnu Bhat Fisheries Development Commissioner Representative of DAHDF, MoA, New Delhi	Member
Director of Fisheries Government of Karnataka, Bangalore	Member
Shri C Munianathan Director of Fisheries Government of Tamil Nadu, Chennai	Member
Dr Y S Yadava Director Bay of Bengal Programme-IGO, Chennai	Member
Dr E Vivekanandan Emeritus Scientist Research Centre of CMFRI, Chennai	Member
Dr Leela Edwin Principal Scientist Central Institute of Fisheries Technology,	Member

Kochi (Representing Director, CIFT)

Shri Rambhau Patil
Chairperson
National Fish Workers' Forum (NFF), Mumbai

Member

Dr K Vijayakumaran (till 08 October 2013)
Shri Premchand (from 09 October 2013)
Director General
Fishery Survey of India, Mumbai

Member Convener

Co-option of Members

The following two Scientists from CMFRI were involved in the Committee's work from the beginning and, therefore, they were co-opted as members from the second meeting of the Committee.

Dr P U Zacharia
Principal Scientist and Head, DFD
Central Marine Fisheries Research Institute
Kochi

Dr K Vijayakumaran
Principal Scientist
MRC of Central Marine Fisheries
Research Institute, Chennai

The Terms of Reference (TOR)

The Committee is tasked with the following works:

1. To assess the impact of fishing ban in view of livelihood issues, fish landings etc. on the available data of coastal states and UTs and review its duration.
2. To suggest ban on purse seine fishing operation in the Indian Coast
3. To suggest further measures for strengthening conservation and management measures in marine fisheries.
4. To suggest measures for strict implementation of the Marine Fishing Regulation Acts (MFRA).

The Technical Committee has been directed to assess the issues from all angles and submit its report on or before 31.12.2013 with the suggestions and recommendations, after conducting the stakeholders' consultation. However, due to the change of officials in key positions (both Chairperson and Member Convener) the Committee's work got delayed. Further there was some inordinate delay in the completion of stakeholder consultations in some State/UTs causing overall delay in completion of the work. Accordingly the Chairman requested the DAHDF to extend the time of the Committee further up to 10 March, 2014.

Abbreviations

ABNJ	Area beyond national jurisdiction
A & N	Andaman and Nicobar
AR	Artificial reef
BOBP-IGO	Bay of Bengal Programme-Inter-Governmental Organization
BRD	By-catch reduction device
CIFT	Central Institute of Fisheries Technology
CMFRI	Central Marine Fisheries Research Institute
CPUE	Catch per unit effort
DAHDF	Department of Animal Husbandry, Dairying and Fisheries
DG	Director General
DK	Dakshina Kannada
EEZ	Exclusive Economic Zone
GER	Gross energy requirement
FAO	Food and Agricultural Organization
FRP	Fibre reinforced plastic
FSI	Fishery Survey of India
Hp	Horsepower
HQ	Headquarters
ICG	Indian Coast Guard
LOA	Length overall
MFRA	Marine Fisheries Regulation Act
MoA	Ministry of Agriculture
MPA	Marine protected Area
MSY	Maximum Sustainable Yield
NFF	National Fishworkers' Forum
NGOs	Non-Governmental Organizations
SIC	Scientist-in-Charge
SEETTD	Socio-economic Evaluation and Technology Transfer Division
TED	Turtle excluder device
TN	Tamil Nadu
TOR	Terms of reference
UK	Uttara Kannada
UT	Union Territory
WL(P)	Wildlife (Protection)

Executive Summary

Conservation of fishery resources is a vital aspect of sustainable fisheries management. Seasonal ban on fishing or also referred to as 'closed season' is an important measure of conservation being practiced in the country. The Department of Animal Husbandry, Dairying & Fisheries (DAHD&F), Ministry of Agriculture (MoA), based on the representations received from the stakeholders and after taking expert opinion periodically reviews the time and duration of the ban. The present Technical Committee was constituted to provide expert advice on the duration of the ban period and also suggest other measures for conservation and management of the resources.

The Committee met first in July 2013 and agreed on a strategy and approach to finish the task. Apart from analyzing the available biological information, nation-wide stakeholder consultations were conducted and responses gathered for deciding the appropriate time and duration of the ban. The outputs of the analysis of the two sets of data were synthesized in the background of economic and social considerations and discussed in the second meeting of the Committee held in May 2014.

The biological information revealed prolonged breeding period of most commercially important species. The impact of the ban in terms of better catch was observed for a short period of two months after the ban. Stakeholders preferred a ban of much longer duration than the present ban of 47 days. They also indicated wide range of time preferences for the ban. In this regard, attention also needs to be paid to study the cost-benefit of ban on fishery of a specific resource like *Karikkadi* shrimp.

The proposal for total ban on purse seine was not found reasonable considering the heavy investment already made. Also optimum harvest of a significant biomass of small pelagics could not be efficiently achieved by alternate fishing methods. Instead, strict regulation on purses and ring seines was considered an ideal way out. In addition to adoption of closed season, the need for promoting various other conservation methods such as habitat enhancement and technological interventions was also considered essential. The Marine Fishing Regulation Act (MFRA) promulgated by various the coastal States/Union Territories (UTs) need a revisit to make it topical and meet the needs of the fisheries sector. Similarly, a shift in the orientation of the Department of Fisheries (DoFs) of the coastal States/UTs is required from welfare activities to management and regulation of the resources.

Based on the outcomes of the stakeholder consultations and the deliberations of the Committee, the following key recommendations and general recommendations accrued:

Key recommendations

- The seasonal fishing ban shall continue to be observed in the Indian EEZ from 15 April to 14 June (61 days) along the East Coast and during 01 June to 31 July (61 days) along the West Coast. (For the district of Kanyakumari in Tamil Nadu the State may notify separately that ban period of West Coast shall prevail).

- The ban shall apply to all types of vessels except the traditional non-motorised units using no source of power for catching fish or for propulsion using fossil fuel all along the coast.
- The ban shall apply to purse seiners and ring seiners. Further, their numbers and specifications also need to be strictly regulated.
- The Government shall promote other conservation measures such as habitat enhancement and technological interventions apart from regulating the technical specifications of harvesting units.
- The MFRA promulgated by the coastal States/UTs may be revisited and measures taken for updating them through a consultative process. Steps may also be taken to bring structural and functional changes in the DoF, so that they also discharge their technical responsibilities of sustainably managing the fisheries resources, along with other works such as welfare of fishers, etc.

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SUMMARY AND RECOMMENDATIONS

1.1. Summary

1. The management of tropical multi-species, multi-gear fishery is a complex task. This is due to the inherent dynamics and variability of the fishery in response to the environment and multitude of players. Simplified models preferred by managers seldom reflect real situations and thus are disadvantaged in offering lasting solutions. The cost of generating data for robust models is prohibitively high. However, considering the sustainability of the resources it is imperative to adopt conservation and management measures.
2. Seasonal closure and fishing effort regulation are generally accepted as simple and feasible measures of resource conservation. Catch regulation by quota systems based on MSY is an advanced management intervention, which is practically not possible in the multi-species, multi-gear Indian fishery at the moment. However, effort may be taken towards implementing a few output control measures.
3. A major handicap for implementing regulatory instruments is the capacity gap in the machinery available for implementation. Not recognizing this lacuna is likely to result in failure at implementation level. Therefore, it is important to decide on feasible measures of regulation while making concerted efforts at the capacity upgrade as well as filling the information gaps. Seasonal closure of fisheries has been found to be an ideal tool from of the implementation angle as well as wider acceptability in India.
4. Biological studies have indicated that there is an improvement in the recruitment of some demersal species into the fishery immediately after the ban, which lasts for a short duration of one to two months. On the other hand, no significant difference in catch and catch per unit effort (CPUE) trends was observed before and after introduction of fishing ban for different species/groups of fish along the West Coast. However, there is marginal improvement in catch and CPUE trends after introduction of fishing ban for different species/groups of fish along the East Coast.
5. The increase in catches along the Indian coast in the last two decades is essentially due to increase in efficiency of craft and gear and spatial extension of fishing to offshore regions. Mechanised and motorised boats have shown an incredible tendency to expand their engine power and size in recent times. Their unbridled

expansion is a matter of serious concern and proper regulation of these boats is very important.

6. Almost all tropical species have a prolonged spawning season lasting for 6 to 7 months with one or two peak spawning in a year. As these spawning peaks occur during different months for different species, a common time period covering spawning period of most species could not be identified. Studies showed no indication to suggest that fishing ban has helped recovery of stocks. Seasonal closure of mechanised fishing has certainly helped to keep in check the increasing annual fishing effort apart from giving respite to different habitats. Perhaps a combination of several other regulatory measures would be needed for achieving replenishment of fish stocks.
7. Consultations with stakeholders revealed diverse views of fishers on different issues but a near consensus prevailed on the need for seasonal fishing ban. In general, majority opinion converged on the benefits of ban even while there were concerns about the adverse impact of loss of jobs and livelihoods.
8. Though a general agreement prevailed over the timing of seasonal ban, the duration was felt as inadequate by the majority. Though suggestions ranged from 45 days to more than 100 days, considering the economic loss to the sector and the livelihood issues of fishers, a medium-term of 61 days was felt appropriate.
9. The suggestion for two spells for ban was not agreed because the short spells would jeopardize the schedule of maintenance of vessels as well as movement of migrant workers in some States. Further, about sixty days time is optimum for carrying out the annual maintenance of vessels.
10. Though a majority of stakeholders suggested application of a ban to all types of vessels, considering the livelihood issues, exemption of traditional non-motorised fishermen was felt necessary. The uniform application of ban period was suggested by the majority and therefore the present method of uniform ban for East and West Coast States should be continued. The ban period of West Coast should be from 01 June to 31^t July every year. The ban period for East Coast States should be from 15 April to 14 June every year.
11. Loss of job and livelihoods was a serious concern expressed by majority of the stakeholders. Though most of the fishermen are engaged in maintenance of the vessels and gear, etc. during the ban period, they voiced the need for government support during the period of closure. A minimum package of support should be made available to the fishers during the ban period. It is desirable to maintain as far as possible uniformity of the support package given across different maritime States.
12. The economic loss due to non-harvesting of some species (such as *Karikkadi* off Kollam) that are abundant during monsoon ban period was considered as a loss to

the fishery. However, more studies are required on this fishery to make a good assessment of the losses and also to work out a plan of action in consultation with the local fisher community. Any hurried action to allow exploitation of this species during the ban period, might generate conflicts among fishermen and also lead to further complexity.

13. The inter-state implications of seasonal ban were raised by majority of stakeholders. While local gear/area restrictions are implemented by individual States, the neighbouring States must strictly follow the ban period. Similarly, during the ban period, strict action should be taken against the unauthorized foreign fishing vessels, if found poaching in the Indian EEZ.
14. Based on technological and catch comparisons, it is seen that purse seines and ring seines are a single generic category. Therefore, both the gears need to be treated equally from the conservation point of view. Considering the quantum of investment in purse seines and ring seines and the lack of alternate gears to catch small pelagics, a total ban on purse seine may not be economically advisable. Added to this, the two gears are relatively energy efficient, and leave the low carbon footprint.
15. However, considering the large quantity of juveniles caught by the seines, freezing the number of purse-seiners and ring seiners and strictly imposing gear regulations as mentioned elsewhere in the report must be carried out by the States with immediate effect. Moreover, the seasonal ban should also be applicable to purse seiners and ring seiners as they belong to motorised/mechanised category of craft.
16. Technical specifications for various craft-gear combinations are required for effective conservation and management of resources. As a part of the conservation package, habitat enhancement programmes such as setting up of Marine Protected Areas (MPAs), mangrove restoration and protection and or restoration of coastal water bodies are to be promoted. Technology interventions such as artificial reefs, By-catch Reduction Devices (BRDs), sea ranching, diversified fishing as well as market interventions also must be taken up in a significant way in collaboration with scientific institutions.
17. Such management interventions must be carried out with full community participation. Opportunities to derive synergy from the local community based management systems must also be explored.
18. The MFRA's lack proper implementation, largely because of the weak institutional machinery in the State DoF. The present orientation of the DoF towards welfare activities need to be shifted towards resource management and regulation. Establishment of a dedicated enforcement wing in the DoF would be useful for implementation of the MFRA. Similarly, there is also a need for education of fishers

on sustainable resource management and capacity enhancement of the DoF to undertake fisheries management activities.

19. For the effective implementation of the MFRAs, the Acts should be translated into local languages along with a summary version for the stakeholders, such as fishers. As and when changes are required, the MFRAs should be revised considering changes in the fishery and giving importance to community co-management and EAFM. The entire management system should move towards bottom up approach.

1.2. Recommendations

20. Based on the deliberations and outcomes of the stakeholder consultations, the following recommendations are made:
- I. The seasonal fishing ban shall be observed in the Indian EEZ, but for an extended duration of 61 days instead of the current 47 days.
 - II. The ban shall apply to all types of vessels, including purse seines and ring seines, except the traditional non-motorised units operating in the coastal States/Union Territories.
 - III. The seasonal closure of mechanised as well as motorised fishing may commence from 15 April to 14 June (61 days) along the East Coast.
 - IV. The seasonal closure of mechanised as well as motorised fishing may commence from 01 June to 31 July (61 days) along the West Coast. (For the district of Kanyakumari in Tamil Nadu the State may notify separately that ban period of West Coast shall prevail).
 - V. Poaching by foreign vessels, if any, within the Indian EEZ should be strictly controlled. Bilateral dialogues must be initiated with the neighbouring countries, sharing our maritime boundaries for regional harmonization of such seasonal bans and other mutually enforcing regulations that contribute to the sustainability of the resources.
 - VI. Regulatory measures such as minimum/maximum legal size at capture, mesh size regulations, licensing, regulation of operation of mechanised and motorised boats and capping the number of different categories of boats should be strictly implemented.
 - VII. The MFRAs need revision, keeping in view the topical requirements of Indian fisheries. Such revisions, when undertaken, should be based on a consultative process, involving fisher community and other stakeholders.

- VIII. Community participation in resource management should be promoted through co-management approaches. This would help in reducing the administrative burden on the States and also encourage the community to assume the role of stewards in resource management.

- IX. Local area/gear restrictions may be imposed by maritime States/UTs, in cooperation with the neighbouring States. The issues related to region or location-specific resources (*e.g. Karikkadi*) need scientific assessment and cost-benefits need to be worked out for appropriate policy interventions.

- X. The governments may initiate massive capacity building programmes for the DoF staff and awareness building programmes for fishers to bring in sustainability in resource exploitation. This would also facilitate community engagement in management of the fishery resources.

2

INTRODUCTION

1.1. Background

21. The importance of fisheries as source of protein food as well as livelihoods for millions of coastal people is well documented. The need for sustaining fisheries for food and livelihood security is a concern shared by all countries. However, increasing demand for fishery products and enlarging markets have catalyzed in expansion of the operational area and improving technology in fishing. As a consequence, most of the fish stocks have shown signs of stress as indicated by dwindling catch and reduction in body size.
22. Barring the inherent natural fluctuations, fish stocks are subject to large-scale changes in abundance due to fishing pressure. In 2009, of the 584 fish stocks identified, FAO assessed 395 stocks representing 70 percent of the global catch. Of the stocks assessed, 57.4 percent were estimated to be fully exploited, 29.9 percent overexploited and 12.7 percent non-fully exploited (FAO, 2011). Thus, the need for judicious conservation and management of the resources has become imperative all over the world.
23. In the Indian context, marine wild catches fluctuated between 2.5 and 3 million tonnes during 1997-2007, almost indicating saturation in fishing effort and optimal levels of catch. Thereafter, from 2008 onwards the catch showed an increasing trend without showing any improvement in the catch per unit effort (CPUE).
24. However, qualitative aspects of fishery, especially species and size composition underwent drastic changes during the period. The changed finfish composition indicated predominance of small pelagics in place of demersal and diminishing trend of large predators (Anon, 2011). Some attributed this change to the setting in of a 'fishing down the food web'. The results of stock assessment studied also indicated higher levels of exploitation, warranting concerted efforts in conservation and management of the resources.
25. Spatial and temporal closures were traditionally being practiced in some parts of the country for conservation and management of the resources. However, important initiatives were made in the State of Kerala on the West Coast and in the upper East Coast. In general, a need for conservation and management of marine fisheries was felt by the community and the industry long before the State intervention to apply the measures uniformly along the coast became a regular feature from 1997-98

onwards. The uniform seasonal closure has helped to reduce conflicts between fishermen of neighboring maritime States to a great extent.

26. Even when the need for conservation and management of marine fisheries is felt across the industry, differences of opinion prevail on the extent of application, duration of closure, scientific basis, etc.
27. It is in this context that the DAHD&F, Ministry of Agriculture has periodically taken the expert opinion on the subject by constituting expert technical committees for looking into the impact of seasonal fishing ban and suggesting measures for conservation and management of fishery resources in the Indian EEZ.
28. The previous committee headed by the Director, CMFRI recommended 47 days' closure along both East and West Coasts for mechanized fishing (47 days from April 15th to May 31st along the East Coast and from 15th June to 31st July along West Coast). Thus the mechanized fishing will start on 1st June along the East Coast and from 1st August along the West Coast. Boats with less than 10 hp engine capacity along East Coast and with less than 25 hp along the West Coast and all the non-motorized boats were exempted from the ban. As usual there were representations for and against the ban period as well as inclusion and exclusion of different groups from the purview of ban.
29. Considering the need for a further review of the seasonal closure, the Ministry of Agriculture constituted the present Technical Committee (TC) vide its order dated 7 May 2013 with the following Terms of Reference:
 - To assess the impact of fishing ban in view of livelihood issues, fish landings, etc. on the available data of coastal states and UTs and review its duration.
 - To suggest ban on purse seine fishing operation in the Indian Coast.
 - To suggest further measures for strengthening conservation and management measures in marine fisheries.
 - To suggest measures for strict implementation of the Marine Fishing Regulation Acts (MFRA).
30. The TC has been directed to assess the issues from all angles and submit its report on or before 31.12.2013 with the suggestions and recommendations, after conducting the stakeholders' consultation. However, due to change of officials in key positions (Both Chairperson and Member Convener) the Committee's work got delayed. The Chairman, in this regard, had requested the Ministry of Agriculture to extend the time of the Committee.

1.2. Review of earlier studies and reports

31. Of the various tools of fisheries management, seasonal ban on mechanised fishing has been diligently followed in Kerala since the late eighties and in all the other

coastal States/UTs since the late nineties. A background of the various developments that have taken place in the past is presented in Anon, 2010.

32. The seasonal fishing ban in Kerala has been contested from the beginning by different interest groups in the State, in particular for a specific resource, which is available in abundance only during the ban period. Several committees have been constituted on the issue from time to time and suggest ways for resolving the conflicts.
33. Notable among them were the Babu Paul Committee (1981), Kalawar Committee (1984), Prof Balakrishnan Nair (First) Committee (1989), Prof Balakrishnan Nair (Second) Committee (1991), Dr P S B R James Committee (1993), Dr E G Silas Committee (1994), Prof Balakrishnan Nair (Third) Committee (2000), Prof M J Modayil Committee (2004), and Mr D K Sing Committee (2006), and Dr K S Mohamed Committee (2012).

1.3. Approaches and methods

34. The present Committee held its first meeting on the 12 July 2013 at CMFRI, Kochi and discussed the present status of the fisheries conservation and management in the country, especially in the maritime States that are represented in the Committee. The Committee also deliberated on the approaches and methods to be followed for carrying out the business assigned to it by the Ministry of Agriculture.
35. The Committee noted that the previous expert committee had submitted the report in 2010. Since there was not much addition to the biological database, a fresh analysis to identify the impact on stocks of major commercial species would yield more or less the same results. Therefore, the scope for a fresh biological analysis was ruled out and it was agreed that the results of the previous study could be taken as still valid.
36. However, the committee felt that stakeholder views are likely to change over a period of time and are to be gathered using appropriate methods. It was agreed that nation-wide consultations have to be conducted to elicit stakeholder views on the seasonal fishing ban and other conservation measures. It was agreed that the responsibility for conducting stakeholder consultations in different maritime States and UTs shall be shared by different agencies as follows:

State/ Union Territory	Agency/ Institution Responsible
Tamil Nadu and Puducherry	Department of Fisheries, Government of Tamil Nadu
Andhra Pradesh, Odisha and West	Visakhapatnam Regional Centre (RC) of

Bengal	CMFRI
Gujarat and Maharashtra	Mumbai RC of CMFRI
Karnataka and Goa	Mangalore RC of CMFRI
Kerala	Headquarters/RCs of CMFRI
UTs of Daman, Lakshadweep and Andaman and Nicobar Islands:	Fishery Survey of India

37. It was also agreed that a uniform method shall be adopted for stakeholder consultation and also for analysis of data so that aggregation of response could be possible for drawing State-wise, coast-wise summaries.
38. Accordingly, a standard questionnaire was prepared by Dr K Vijayakumaran, the then Member Convener and circulated for comments among members before finalizing. The questionnaire was translated into local languages for consultation. Stakeholder consultations were conducted as agreed by the committee.
39. The second meeting of the Committee held on 30 May 2014 and reviewed the progress of work done till then. Considering the inordinate delay in completion of the business, the committee decided to fast-track the remaining work. It was decided that the report would address the TORs in that sequence with dedicated chapters dealing with each point.

1.4. Structure of the Report

40. The Committee examined the outputs of the analysis done by CMFRI in connection with the 2010 Committee. It was agreed that since the database remained almost the same, since the submission of the 2010 report, any fresh analysis would not provide any significant inputs to the work of the present TC. It was also agreed that the important findings of the 2010 report could be used as such for the work of the present Committee.
41. Further it was decided that the report could be arranged according to the TORs. The output of the stakeholder consultations and the information collected from other sources would also be organised under the TORs.
42. The section on TOR-1 deals with the biological information as also the views of the stakeholders. The various underlying facts of seasonal ban are dealt under this TOR, including a special section on the Karikkadi shrimp as this species has become an important topic of debate within the present Committee. Information on spawning periods of commercially important fish species and a report of analysis of stakeholder responses of different maritime States and UTs is provided as appendix.

43. The section dealing with TOR-2 is specific to purse seines. To arrive at a considered decision on continuation of purse seines in the country, a detailed analysis has been carried out using available information on the subject.
44. TOR-3 relates to review of the other measures of conservation and management. A wide range of possible conservation and management measures have been discussed under this TOR and presented in the report.
45. The last TOR (TOR-4) has tasked the Committee to come up with suggestions for strict implementation of the MFRA. The outputs of the discussions and the views of the stakeholders are summarized under this TOR.
46. The summary and recommendations drawn from the four chapters dealing with the TORs are consolidated and presented in the opening section of the report, before the introduction. An abridged version is provided in a single page executive summary with key recommendations.
47. Important references cited in the report are provided at the end. Minutes of the meetings, major inputs, communications etc. are provided in the appendix.

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3

TOR-1. To assess the impact of fishing ban in view of livelihood issues, fish landings etc., on the available data of coastal states and UTs and review its duration

3.1. Introduction

48. The conservation of marine wealth is a prerequisite for sustainable resource management. All responsible states have to adopt appropriate measures of conservation based on scientific information. The seasonal fishing ban which has come into existence as an annual feature along both the coasts of India has been revised periodically with expert advice. A three pronged approach has been adopted by this Committee to understand the impact of fishing ban and draw conclusions and recommendations.
49. The Committee first looked into the available scientific information in order to identify the appropriate period of ban. The fundamental requirement for this analysis is the biological data on breeding pattern of commercially important species in time and space. Both published and unpublished information available with the CMFRI has been used for the purpose.
50. The Committee considered the fact that since the decisions on seasonal ban would be directly affecting the livelihoods of people, stakeholders' opinion on various matters pertaining to conservation and management of resources would be valuable. Further, the stakeholder consultations might also throw additional information that may not be presently available to the scientific community.
51. Apart from these two aspects, hidden information on the economics of resource exploitation would be evident only if there is an objective scrutiny of the facts and figures beyond the usual frame. A broader frame of analysis is therefore necessary to understand the individual and national gain/loss on account of various actions on conservation. Often trade-offs have to be suggested based on hidden information, as against dominant stakeholder opinion. A special case study on the *Karikkadi* fishery in Kerala is attempted from this angle (Box-1).

3.2. Biological Basis of Seasonal Ban

52. Previous studies have indicated that there is no significant difference in catch and CPUE trends of different species/groups of fish before and after introduction of fishing ban along the West Coast. However, marginal improvement in catch and CPUE trends of different species/groups of fish after introduction of fishing ban has

been observed along the East Coast. This aspect needs further investigation as the impact of rapid technological changes in fishery cannot be ignored.

53. The increase in the catch along the Indian coast in the last two decades is essentially due to increase in efficiency of craft and gear and spatial extension of fishing to offshore regions. Seasonal closure of mechanised fishing has helped to keep in check the increasing annual fishing effort apart from giving respite to different habitats. Mechanised and motorised boats have shown an incredible tendency to expand their engine power and also size in the recent times. Their unbridled expansion is a matter of serious concern for all and proper regulation of these boats is very important.
54. The major biological objective of seasonal closure of fishery is to protect the spawners during the critical time of breeding. This warrants knowledge on the breeding season of as many species as possible. Information needed for the time-area closure can only be generated with the establishment of dedicated scientific monitoring machinery with necessary infrastructure. Exact prediction of breeding and larval development is possible in discrete single species fisheries, as in the temperate waters.
55. The tropical fishery such as in India is characterized by a great diversity of species, a large number of harvesting units, variety of habitats and ecosystems, and innumerable number of entry points along the long coastline. This complexity creates a situation where establishment of a dedicated scientific team for looking into the breeding of all important species and generating periodic information becomes formidable.
56. Central Marine Fisheries Research Institute has been engaged in biological studies of most of the commercially important species. The Committee discussed about the available information and found that it could be used for the present study with necessary updating. The available information on various species is summarised and provided in the appendix. The summary of information in the following paragraphs has to be taken as indicative as the database is not complete with respect to species, space and time.
57. The database relating to spawning period of marine fishes given in the earlier report (Anon, 2010) was updated for the purpose. The analysis of spawning period of pelagic and demersal fishes revealed that many species have prolonged spawning season. Large number of pelagic species spawns during May-July along the West Coast. Nevertheless, spawning takes place throughout the year for many other pelagics (Fig.3.1.). Many demersal fish and crustaceans spawn during January-March and molluscs during October- November, January and March-April. On the East Coast, pelagic fishes spawn throughout the year, with more species spawning during May-August (Fig.3.2.). The spawning of demersals occurs throughout the year with more species spawning during August-November. In the case of molluscs, more

species spawn during January-April and September-December. The spawning period of a good number of crustacean species falls during August-December.

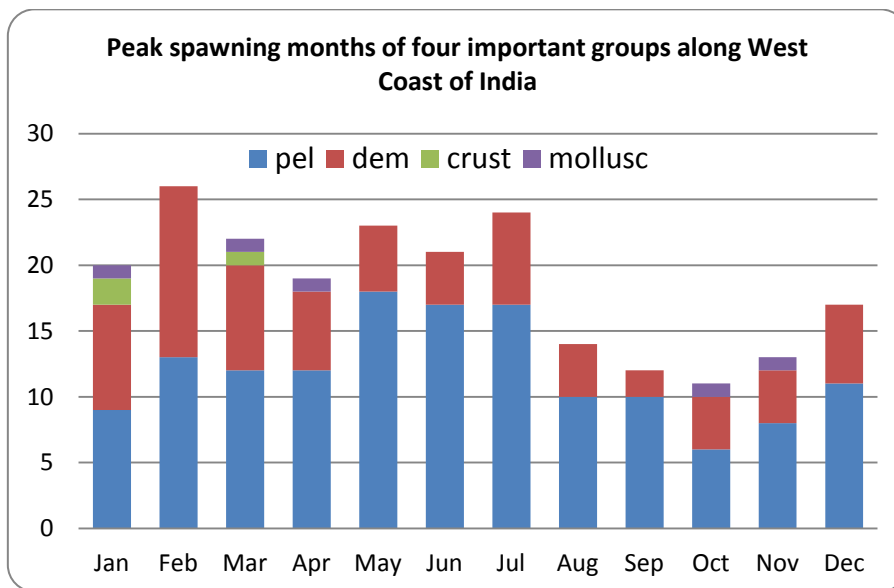


Fig.3.1. Peak spawning months of pelagic, demersal, crustaceans and molluscs along the West Coast of India

58. The Committee noted that tropical species such as those available in Indian waters have a much prolonged spawning season and at any given time there could be several species spawning. Therefore, spawning period alone cannot be taken as criteria for closing fishing season. Further, the closed season coincides with the period of rough weather, and therefore ensures safety of fishermen.

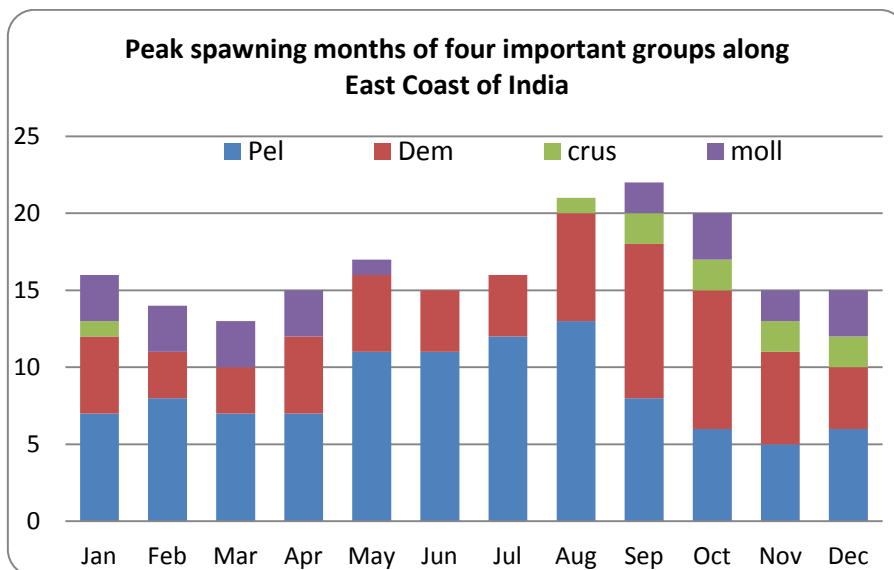


Fig.3.2. Peak spawning months of pelagic, demersal, crustaceans and molluscs along the East Coast of India

59. Anon (2010) while studying the impact of motorised units on the stock of pelagics stated that a substantial quantity of spawning biomass of oil sardine is exploited by the motorised units along the South-west Coast during June-August, necessitating the regulation of the motorised units during these months. However, the percentage of mature mackerel is less in motorised units during monsoon months.

3.3. Stakeholders' Response

60. The Committee recognized the importance of Stakeholders' view on conservation and management of natural resources. This aspect assumes significance because the decisions directly impact the livelihoods of stakeholders. Moreover, the reconstitution of the expert committee itself is primarily based on the representation from the stakeholders.
61. Stakeholder Consultations were carried out under the aegis of CMFRI, Fishery Survey of India and the State Fisheries Departments (Tamil Nadu and Puducherry) as decided in the first meeting of the Committee. The responses obtained from different States were analyzed for preparing State-wise summaries provided in the appendix and a national perspective provided in this section.
62. A standard questionnaire prepared by the Committee, translated into local languages was used for collecting information on key aspects related to fisheries conservation, especially seasonal ban. The mechanism of collection also varied, ranging from postal method to personal interview. In several locations, stakeholder meetings were held and among other things, a wide range of issues were discussed. The procedure adopted for data analysis also was different for different States and UTs as the Committee made deliberate attempt to eliminate bias due to disproportionate representation.
63. Though the use of a standard questionnaire had made the consolidation and comparison easy, the responses were varied and diverse. This is quite natural since the respondent as a rational individual primarily chose options convenient for maximization of his/her personal benefits before broadening the objective to common goods. The Committee has made every attempt to understand the ground truths and balance outcomes to satisfy the general interests of all the stakeholders.
64. *Perception on the Ban:* A fundamental question posed to the respondents was how useful is the existing seasonal fishing ban. Majority of the respondents across the coast expressed that ban is useful for the fishery. However, about 13 percent of the respondents opined that it is not good for fishery and about 15 percent opined it is good for fishery but not good for fishermen (Fig.3.3).

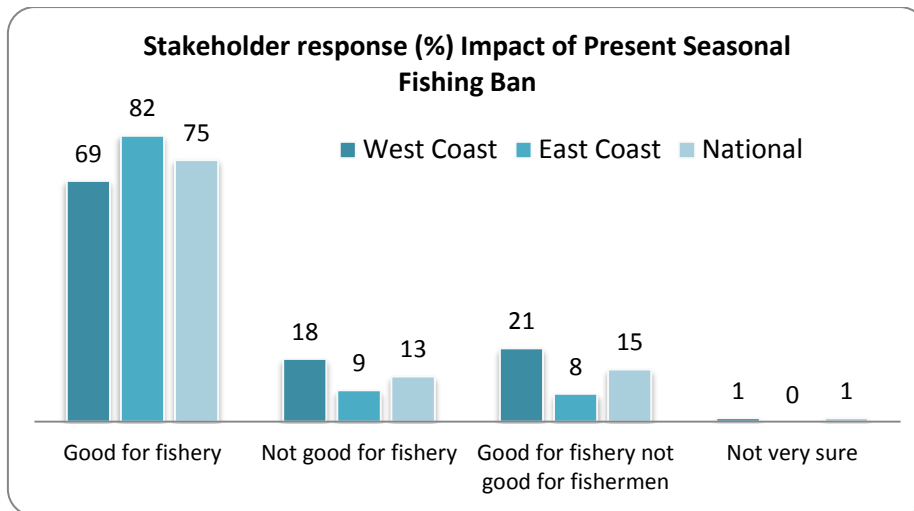


Fig.3.3. Opinion of the stakeholders on impact of the seasonal fishing ban

65. *Good effect of Ban:* About 75 percent of the respondents felt that the present fishing ban allows breeding and growth of young ones, about 26 percent believed that the ban allows stock replenishment and 15 percent of the respondents opined that it ensures safety of fishermen (Fig.3.4.)

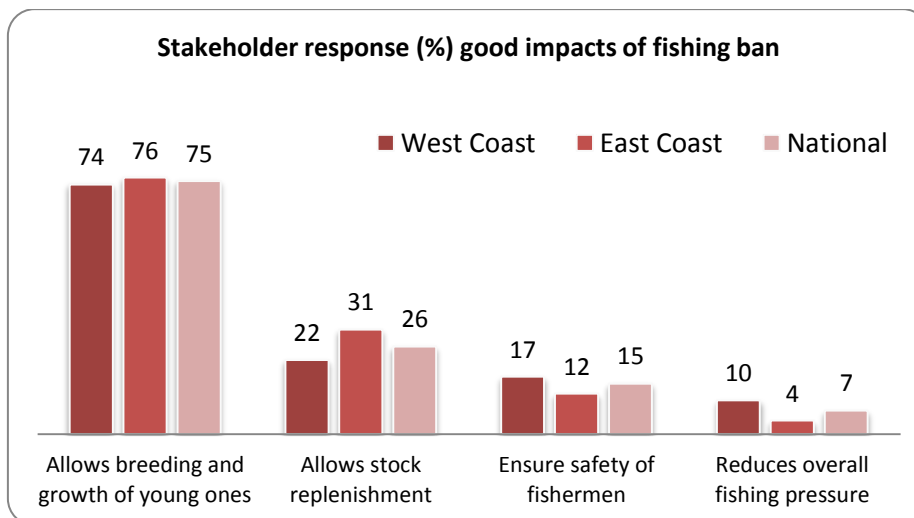


Fig.3.4. Opinion of the stakeholders on impact of present seasonal fishing ban

66. *Adverse effects of ban:* Though the benefit to stock has been acknowledged by majority, fishing ban is perceived to create loss of job and livelihood for fishermen by a significant number of respondents (45%). At least a quarter of respondents felt that the ban does not help in improving catch (Fig.3.5).

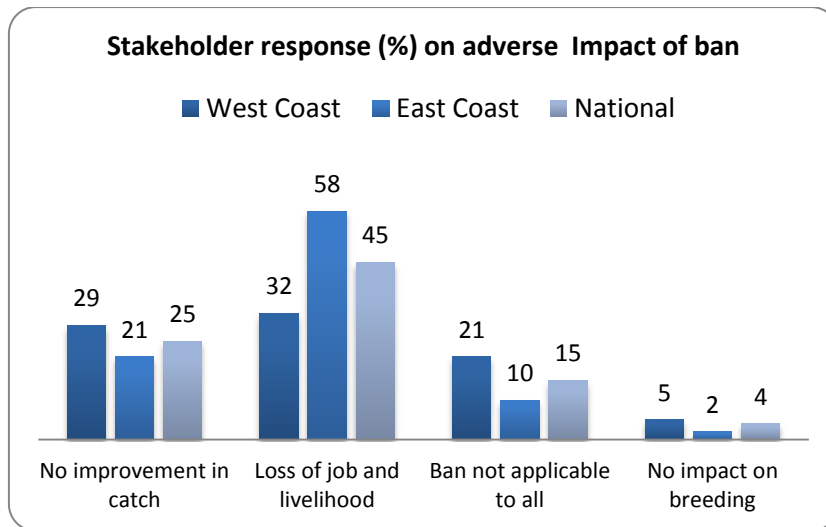


Fig.3.5. Perception of the stakeholders on adverse impact of seasonal fishing ban

67. *Appropriateness of ban period:* About 42 percent of the respondents opined that the period and duration of the ban is appropriate as against 20 percent expressing opposite view. Nearly 22 percent opined that the duration needs to be changed while 10 percent expressed the need for change in the period (Fig.3.6.).

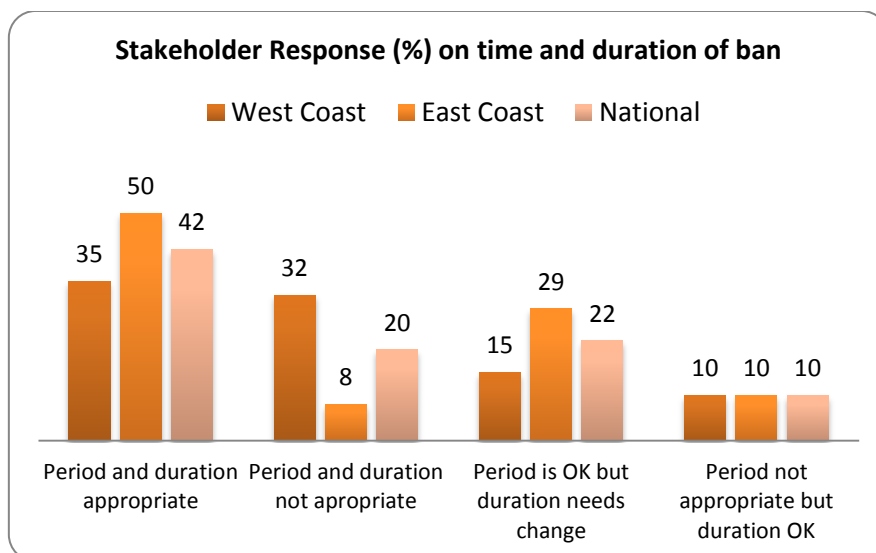


Fig.3.6. Perception of the stakeholders on the appropriateness of ban period

68. *Period of Ban:* Regarding the ban period along the West Coast, the stakeholder view weighed for June-August (41%) while a significant number of respondents (37%), predominantly the respondents from northern states, suggested a prolonged period May-August (Fig.3.7.).

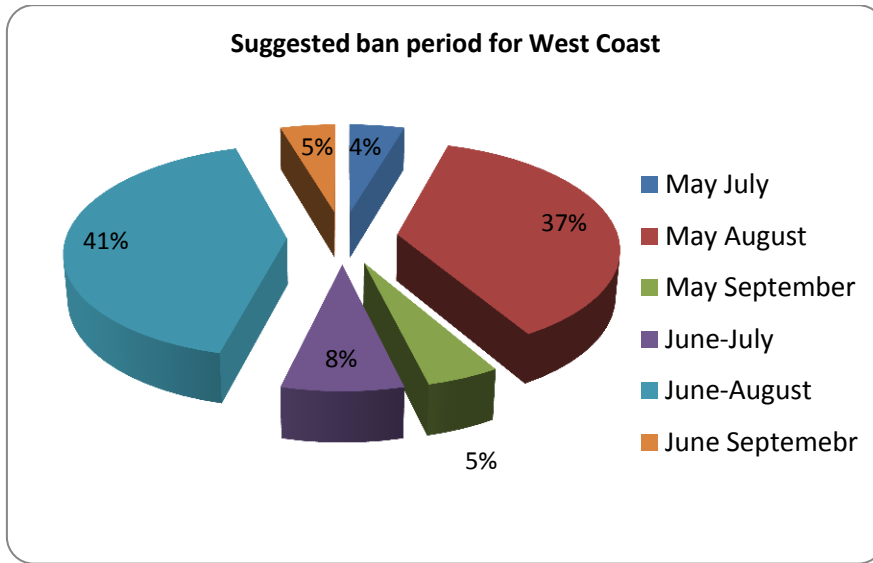


Fig.3.7. Preference of the stakeholders in the West Coast on the different periods of ban

69. Regarding the ban period along the East Coast, the majority (30%) of stakeholders agreed on April-May as the ideal period, while 28 percent preferred April-June, sixteen percent suggested May-June and nine percent advocated for November-December period (Fig.3.8).

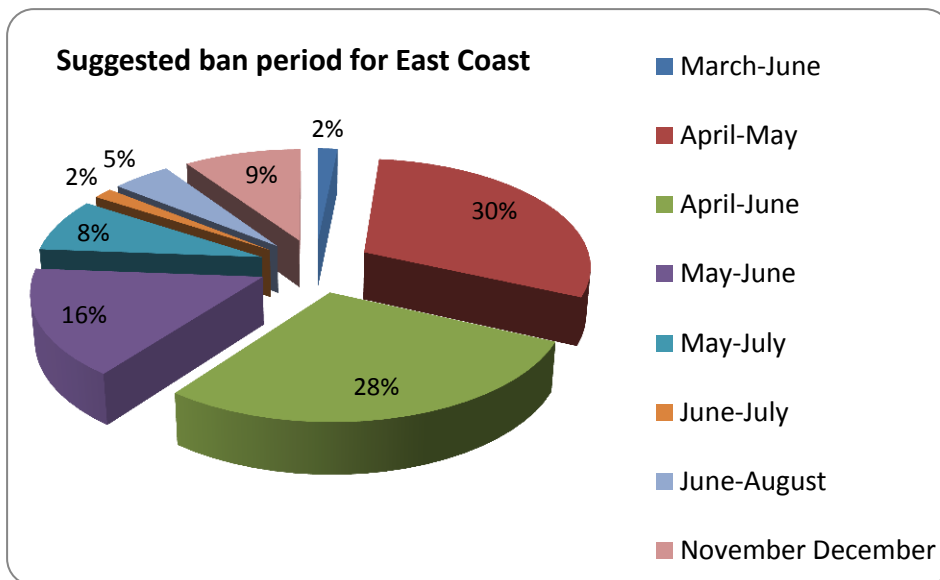


Fig.3.8. Preference of the stakeholders in the East Coast on different periods of ban

70. *Duration of ban:* Along the West Coast, views varied widely on the duration of ban period. However, the majority of those who responded (32%) were of the view that the ban should be for 90 days in one spell while 22 percent each called for 60 and 75

days ban in one spell and 16 percent called for 45 days. A few respondents suggested two spells (Fig.3.9.).

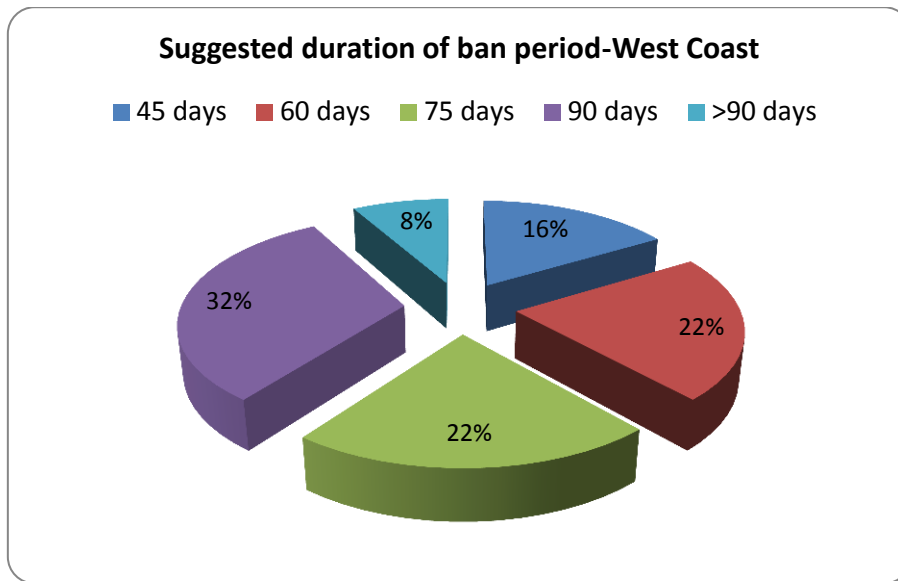


Fig.3.9. Preference of the stakeholders in the East Coast on the different periods of ban

71. Along the East Coast, the range of responses was more or less simple. Majority (49%) were of the view that the ban should be for 60 days in one spell, while 31 percent called for 90 days and 20 percent opting for 45 days ban (Fig.3.10.).

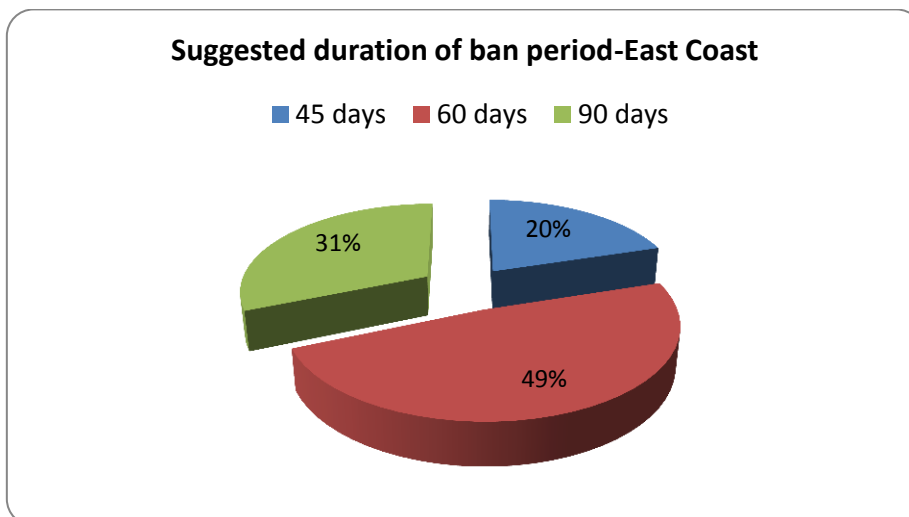


Fig.3.10. Preference of the stakeholders in the East Coast on the different periods of ban

72. *Application of Ban:* Opinion varied on the application of ban to different class of vessels. Nation- wide, majority (44%) suggested that ban should apply to all vessels. This view was supported by overwhelming 51 percent respondents from the West Coast. Along the East Coast, majority (47%) supported the ban to apply only to mechanised boats (Fig.3.11).

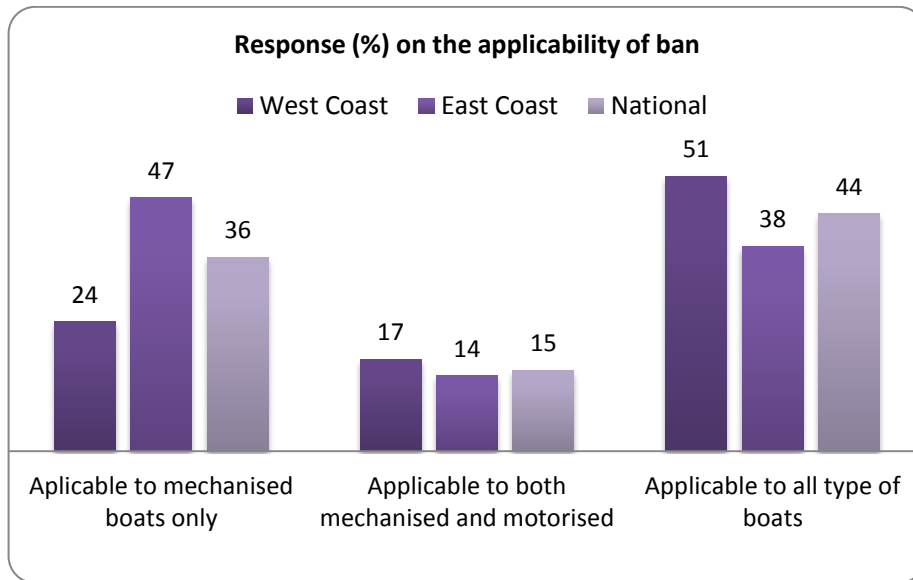


Fig.3.11. Preference of the stakeholders on the application of ban to categories of boats

73. *Spatial application of ban:* Regarding the spatial application of the ban, there was more or less consensus among the stakeholders. The majority of the respondents expressed the view that the ban should be applicable to vessels beyond the territorial waters, should be uniformly applicable to neighbouring states and if possible to neighbouring countries (Fig.3.12).

74. *Local regulations:* The majority of the respondents were of the opinion that there should be regional/local area/gear restriction as may be deemed appropriate to conserve specific resources. These rules should be uniformly applicable to neighbouring maritime states as demanded by the spatial distribution of the species (Fig.3.13).

75. Among other matters that came to the attention of the Committee, the Tamil Nadu Government said that the district of Kanyakumari, in terms of its geographical location, lies on the West Coast, but the State (Tamil Nadu) as such falls on the East Coast. After deliberations the Committee agreed that the ban period of West Coast shall be applicable to the entire coast line of Kanyakumari District starting from Arockiapuram fishing village in the east to Neerodithurai fishing village on the west.

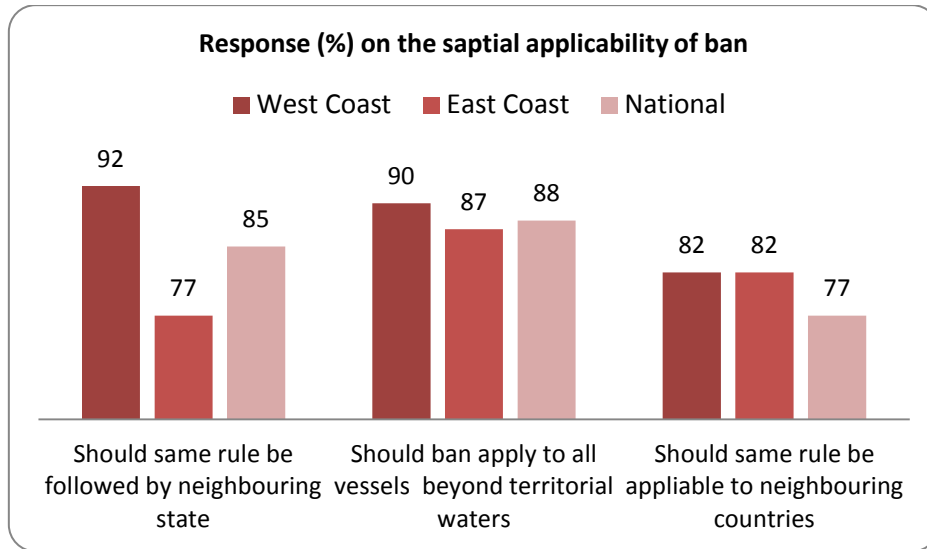


Fig.3.12. Opinion on the spatial application of ban to a region

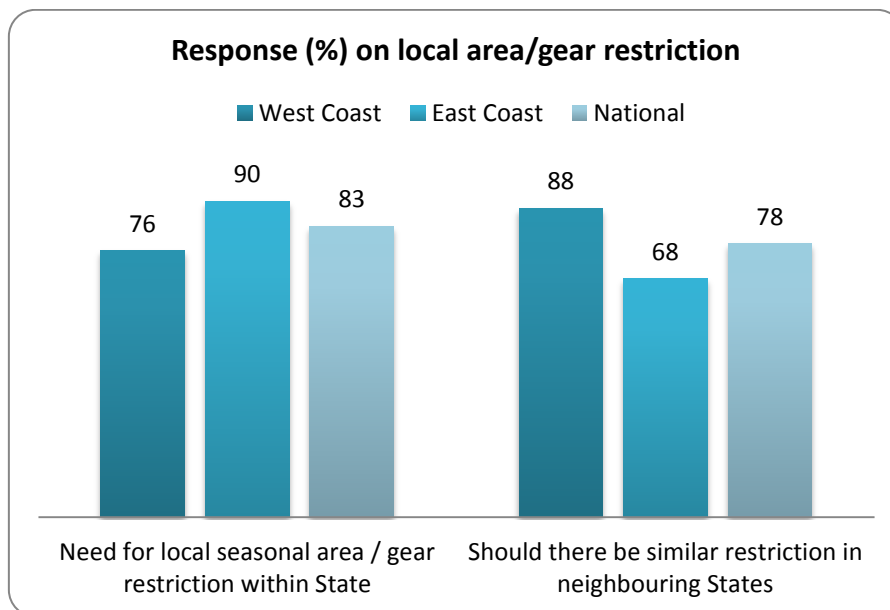


Fig.3.13. Stakeholder opinion on specific local area/gear restriction

76. A couple of questions were asked about the effective implementation of the MFRAs. Most of the respondents stated that there is a need for strict implementation of the Acts. Many respondents also suggested a relook into the Acts for incorporating necessary amendments as the current situation demands. (TOR-4 extensively deals with the MFRAS).

3.4. Impact on livelihoods

77. Fishing is purely an economic activity. The fishermen are rational decision makers with regard to their fishing effort and returns. From the national perspective, fish is a valuable protein and foreign exchange earner. As catching fish is equivalent to earning revenue, not catching fish equals lost income. So while adopting appropriate conservation measures, it is all the more important to ensure that no resource is wasted for whatsoever reasons. It is in the context that the case of *Karikkadi* shrimp is dealt in this report (please refer to Box-1).
78. The Committee critically viewed the majority stakeholder response favouring application of ban to all categories of crafts and gear. Fishing ban adversely affects the livelihood of several fishermen, especially traditional non-motorised fishermen. Therefore, the Committee felt that traditional non-motorised fishermen should be exempted from the ban.
79. Coming to the conservation aspects, the Committee undoubtedly agreed that fishers do need a sustainable stream of revenue to maintain their livelihoods. However, at the ground level, the competing dynamics of the commons is in action, where the fishers have a tendency to catch fish when available. According to a fisher, a fish left uncaught would be caught by his neighbor. The dynamics of the ocean system further aggravate this matter by transporting resources along with the currents.
80. Therefore, an inherent ambiguity exists with regard to the benefits that a fisher is assured to get in future by refraining from catching fish at any given point of time. In other words, there is a disincentive for postponing the present catch for a future uncertain future benefit. In such a situation, the State as the 'trustee of the resources' has to impose measures for conservation and bring in certain control measures as may be deemed appropriate.
81. However, the imposition of the control should not in any way jeopardize the life of ordinary fishers. The Committee noticed significant number (45%) of stakeholders mentioning the issue of loss of job and livelihoods. Therefore, it is felt that until such time when the fishers become economically sound to tide over the ban period, minimum support must be extended to the fishers.
82. In the globalized world, the power of the market is enormous. As long as there is a market for a commodity, its supply will be ensured, legally or otherwise. Interventions at the market-level are necessary for conservations to be more effective. The State and the Central Governments need to pay attention on this aspect in near future in addition to the present measures.

Box-1

**The fishery of Karikkadi –
The case of an underutilized resource**

The fishery of *Parapenaopsis stylifera* (popularly known as *Karikkadi* in Malayalam) had occupied a very important place in the marine fishery of south Kerala. Widely distributed in the Indo-Pacific region, this species is a true marine species with no estuarine phase in the life-cycle. Indeed *P stylifera* is an enigmatic species with not many studies in the recent past. In a recent review article, Rao *et. al* (2012) provided a comprehensive account of the species. Though not large in body size relative to the other commercial species of penaeid prawns (the commercial fishery is supported by 35-145 mm specimen), the abundant supply once supported the local and export markets making it an economically important species.

Historically, prior to the development of trawling, shrimp was not an important species for traditional fishermen who focused on resources like mackerel and sardines. Subsequent to the introduction of trawl and development of export markets, shrimp trawling became the most important fishing along the South-west Coast. The abundance of Karikkadi sustained the supply of raw material to innumerable processing plants and peeling sheds along the Kerala coast. The frozen product *peeled and un-deveined* (PUD) derived out of this species formed a significant item of the export basket.

The fishery for Karikkadi off Kerala exhibited a peculiar spatial feature in distribution during monsoon and non-monsoon months (Suseelan *et. al*, 1989)². During September/October to May most of the shrimp stocks occupy the waters within the 20 m depth contour while they remain mostly in the 20-40 m depth zone during June and in the 40-60 m depth zone during July and August/September. However, during the monsoon period a small portion of the population, predominantly adults in spawning condition, exist very close to the shore within 5 or 6 m depth. Further studies (Suseelan *et. al*, 1998) indicated that the movement of 'Karikkadi' stock extends up to 80 m depth along the Kerala coast, though the catch rates recorded in depths beyond the 50 m line were comparatively poor (0.3 to 18.0 kg/hr).

The economic importance of Karikkadi fishery during monsoon could be further substantiated with some facts and figures. The species is exploited throughout Kerala and forms about 38-50 percent of the prawn landings of the State (Suseelan *et. al*, 1989). Average production for the period 1982-86 was 13,963 tonnes, forming 44.8 percent of the total prawn landings of the State. Shrimp trawlers account for 13,148 tonnes (94.2%). Of this, about 8,103 tonnes (61.6%) was landed during the monsoon period. In an earlier work, George *et. al* (1983) had established that monsoon (June - September period) fishery of Neendakara, mainly of Karikkadi, formed an average of 87.8 percent during 1973 to 1982.

In the pre-trawl ban period, the fishery contributed significantly to the operational economy of the fishing vessel, especially from Kollam-Kochi region. The trawl fishery of the region flourished because the seasonal boon given by the resource was sufficient to compensate loss, if any, during the rest of the year. With the introduction of trawl ban during late eighties, the Karikkadi resource became unavailable for exploitation by the trawl fishermen during the time of its peak abundance.

The trawl boat operators of south Kerala had ever been contesting the scientific basis and economic logic behind the monsoon ban of trawling citing the economic loss due to non-exploitation of Karikkadi shrimp. In fact the various committees constituted by the Government had looked into this issue and had come up with various suggestions. However, the political pressure to impose total ban on trawl prevailed in the State.

During the course of this Committee's stakeholder consultations, representative of the Kerala Trawl Boat Operators Association had reiterated their demand for opening up a

window for exploitation of Karikkadi shrimp during monsoon. They mentioned that that they could get the return on their investment by fishing for Karikkadi shrimp during monsoon alone. They were ready to forego fishing in any other time of the year, in compensation to fishing during monsoon. It would be worthwhile to examine the scientific basis for this demand.

A quick scan of literature would reveal some interesting facts that would be helpful for exploring the possibility of opening up Karikkadi trawl fishery during monsoon. Suseelan *et. al* (1989) concluded their articles with the following important findings:

- As spawning and early life stages of 'Karikkadi' are restricted to the shallow coastal waters within 20 m depth, the existing fishing regulations preventing operation of shrimp trawlers in these areas should be strictly enforced.
- In order to prevent the indiscriminate capture of juvenile prawns less than 70 mm in total length, the present mesh size of the cod-end of trawl nets should be increased to at least 35 mm.
- Operation of 'mini trawl' which has mesh sizes as small as 16 mm and is operated in the shallow coastal waters catching mainly the juvenile prawns (25-60 mm size) should be discouraged.
- During the southwest monsoon period, since 'Karikkadi' is mainly concentrating in the off-shore waters and the trawl catch does not contain an alarming proportion of breeding population, shrimp trawling in the deeper waters beyond the 30 m depth line may be advantageous to the fishery.

Certainly, if the fishery for Karikkadi during monsoon is in the 20-60 m depth zone, whereas adult spawners and juveniles are found in shallower waters, the monsoon trawl ban is not beneficial for the conservation of the species. On the other hand, the traditional (including motorised) gear exploiting the near shore waters could cause some damage to the population. A decade later Suseelan *et. al* (1998) stated in another study:

One of the objections raised against the operation of bottom trawls along the Kerala coast during the monsoon period is the popular notion that monsoon trawling would adversely affect the breeding and early life stages of 'Karikkadi' and eventually lead to its low production in the fishery. The poor representation of spawners in the trawl catches of *Sagar Sampada* during July-August does not lend support to this view.

This species is known to have life span of about 17 - 18 month. George *et. al* (1980) noted that the size of *P. stylifera* in fishery during the different months ranged from 51-109 mm in TL with dominance of specimen in size range of 61-100 mm. Due to paucity of information on the resident time and migration of the species, it is not easy to say that unexploited stocks would be available for capture later in the year or elsewhere. However, the recurrence of the unexploited stock in the fishery is certainly ruled out because of the shorter life span. Therefore, it would be reasonable to presume that there is no biological sanctity in closing the trawl fishery in depths beyond 20 m during monsoon.

However, the tug of war between mechanised trawlers and others in Kerala on this issue is long standing and decisions are often taken on political basis rather than on biological or economic considerations. It is very difficult to come out with a feasible management measure where the resources are optimally exploited and the stakeholders are kept out of conflict. But, submission of inability to resolve this issue would also be a sign of failure of the civil society. Therefore, a tentative line of action is indicated here for the sustainable management of Karikkadi fishery in Kerala.

- Revalidate the resource status by undertaking fresh surveys and research in cooperation with the commercial fishermen. Estimate the quantity of Karikkadi that can be caught annually during the monsoon period.
- Work out the potential economic gain/loss to the economy appropriate to different scenario. Workout the optimum fishing effort and equivalent vessel hours (in terms of fishing power of different classes of vessels) needed to exploit the estimated exploitable quantity.
- Conduct stakeholder consultations and form (Community based) management committees with representation of important groups. Design the monitoring and control mechanism to strictly control the catch and effort of the Karikkadi fishing units.
- Auction the fishing rights to the enterprising fishermen till the required fishing capacity is reached. Issue special licenses and publicise the information. There could be a separate set-up under the DoF to look after this process. Based on the annual catch and other information, the scientist can fix harvestable targets on year-to-year basis.
- This process could generate funds for the State and sustain to some extent the expenses of monitoring control and surveillance. If successful, this practice could also be adopted for implementation in other places, where similar situations exist.
- The basic assumption for this proposal is that the resources belong to the State and their exploitation and management is the primary responsibility of the State. This would serve as a precursor to the right-based fisheries management. The State can also consider alternate methods as deemed appropriate.

□□□

4

TOR -2. To suggest ban on purse seine fishing operations in the Indian Coast

83. While deliberating on TOR-2 (*To suggest ban on purse seine fishing operations in the Indian coast*), the members of the Committee felt that the nomenclature 'purse seine' must be treated as generic for the encircling gear and for all practical purposes should include both 'purse seine' and 'ring seine'. This is to ensure that the gears having similar impact on the resources are treated similarly and the objectives of conservation are not overlooked in the ambiguity created by nomenclature.
84. Even though the ring seines are conventionally categorized as 'traditional motorised craft', the Committee could not find justification to treat it differently from purse seine as far as technical specifications or catch compositions are considered. This fact would become clear while examining some of the facts and figures presented below.

Purse seine

85. Though experimental purse-seining was tried in Indian waters under the aegis of Offshore Fisheries Station (FSI) and the Indo-Norwegian Project from fifties, commercial purse-seiners were introduced along the West Coast during 1977. Karnataka took the lead with about 120 vessels, which by 1979 became 250. Though purse-seiners displaced the traditional *rampan*, in course of time the fishing spread steadily all along the south- West Coast.
86. Currently, there are 1213 purse seiners operating in India of which maximum number is in Maharashtra (435), followed by Karnataka (422), Goa (294) and Kerala (60). Purse seines contributes to the bulk of the fishery of Goa (82%) and about 22.7 percent of Maharashtra and 20.3 percent of Karnataka (CMFRI, 2013).
87. The purse seine vessels are made of wood or steel (11 to 23 m LOA) and equipped with 110-420 hp engines and use fish finding, navigation and communication gadgets. The gear ranges from 450-1500 m in length and 60-100 m in depth. The mesh size of the nets made of polyamide (PA) multifilament generally varies from 18-46 mm. While single-day fishing is practiced in Kerala and Karnataka, multiday operations have been reported from Goa.

Ring Seine

88. The introduction of ring seines, a kind of mini-purse seine, in Kerala during the mid eighties was an important milestone in the post-motorization development in Kerala fisheries. Ring seine fishing is fast spreading to other coastal States/UTs. Classified as a motorised vessel, a ring seiner is made of wood, steel or FRP (12-27 m LOA) and fitted with 98-550 hp engine and gadgets for fish detection, navigation and communication.
89. Two types of ring seines are in operation along the Kerala coast. They are sardine-mackerel ring seine (mesh size: 18-20 mm, length 600-1000 m and depth: 83-100 m) and ring seine for anchovies (mesh size: 8-10 mm, length: 250-500 m, depth: 45-75 m) operated within 50 m depth.
90. The ring seine has become the dominant gear in Kerala. During 2012, total landings in Kerala were estimated to be 6,15,966 t of which 73.4 percent was formed by pelagic species such as oil sardine, mackerel and anchovies, bulk of them caught in ring seines. Since ring seiners were treated as traditional motorised vessels, and excluded from fishing ban, supply of fish was ensured by these vessels in Kerala during the monsoon ban period.

Table 4.1:
Gear specifications and species caught in Purse seines and Ring seines systems

	Purse seines	Ring seines
Mesh size (mm)	18-46	8-20
Head rope length (m)	450-1500	250-1000
Depth of netting (m)	60-100	45-100
Depth of operation (m)	15 – 85	9 – 55
L_{OA} of vessels (m)	11-23	12-27
Major fish varieties caught	Mackerel, sardine, whitebait, carangid, tuna, barracuda, seerfish, catfish, wolf herring, pomfret, sciaenid, tuna, etc.	Sardine, mackerel, white bait, carangid, sciaenid, catfish, etc.

91. The Committee examined the catch and utilization of purse seiners and ring seiners. While bulk of the catch of quality fish is being used for human consumption, a significant portion of the smaller varieties are utilized by fish meal plants. The small meshed seines are capable of catching the juveniles of pelagic fish. According to CMFRI (2012) in the year 2011, a heavy exploitation of young ones and juveniles of sardine was noticed of which 78.5 percent of the landings was contributed by seine

net units. This is perhaps the greatest concern, which presumably might have prompted the thought of banning purse seine.

92. The technical specifications and mode of operation of purse seine and ring seine was examined and the Committee felt the need to treat both the gears in the same class. The Committee also felt that banning purse seine is not advisable at this time as this would be an extreme measure with undesirable consequences. The facts and arguments put forth in the following sections would vindicate the stand taken by the Committee.
93. The Committee noticed that each purse seiner and ring seiner employs around 25-35 crew and support comparatively a larger number of dependent families per boat (the average size of a fisher family is 4.63). Along the West Coast, it has been estimated that around 175 fishers depend on a single purse seiner. If this figure is multiplied with the total number of vessels, around 2,12,275 people are directly depending on the purse-seine fishery and around 1,72,900 people are directly depending on the ring-seine fishery.
94. The Committee looked into the investments in purse seiners and ring seiners and felt that the amount is quite significant (see tables 4.2, 4.3 below). The fact that any investment made in a fishing vessel cannot be put to equally viable alternate use is especially applicable to seiners. Therefore, total ban of purse seine would be equal to sinking the entire investment made by the enterprising fishermen. If the investment is financed by a Bank, it would amount to loss of public fund.

Table-4.2
The state-wise number and investment in purse-seine vessels in India

State	No of purse seine vessels	Investment Rs lakh
Goa	296	12728
Maharashtra	435	13485
Karnataka	422	17935
Kerala	60	1740
Total	1213	45888

Source: Data from SEETTD, CMFRI

Table-4.3
The state-wise number and investment in ring seine vessels in India

State	No of ring seine vessels	Investment Rs lakh
Karnataka	5	155
Kerala	495	15345
Tamil Nadu	306	9486
Andhra Pradesh	182	5642
Total	988	30628

Source: Data from SEETTD, CMFRI

95. The Committee also noted the fact that the purse and ring seiners are energy efficient fishing methods, after gill-netting. There are no better methods for harvesting the schooling pelagic fishes. Unlike trawls, seines do not cause any damage to bottom. The comparative Gross Energy Requirements (GERs) for different fishing methods were reported by Boopendranath and Hameed (2013) as below (Table-4.4.). It could be noticed that the purse seines and ring seines form a class apart in energy efficiency as compared to more energy intensive trawling.

Table-4.4
Gross Energy Requirements (GERs) for different fishing systems

Fishing type		GER.t fish ⁻¹
Gillnetting (Traditional non-motorised)	:	0.61
Stake nets	:	5.19
Purse seining(wooden hull, 156 hp)	:	5.54
Purse seining(steel hull, 156 hp)	:	5.91
Ring seining	:	6.14
Purse seining (wooden hull, 235 hp)	:	6.40
Mini-Trawling	:	20.18
Gillnetting-Mechanised (wooden hull 89 hp)	:	25.18
Trawling (wooden hull, 99-106 hp)	:	31.40
Trawling (steel hull, 99-106 hp)	:	36.97

Source: Boopendranath and Hameed (2013)

96. The Committee also considered various other matters with regard to the impact of seiners in the fishery. It is true that the fishermen gain some economic benefit from catching juveniles. But the juvenile fish landing causes 65-75 percent income reduction in terms of foregone catches. The fishermen, even when aware of the nature of the school they are surrounding, catch the juvenile shoals so as to increase their returns on operational cost. Further, there are no restrictions on landing or the sale of juveniles in the markets where such catches are landed.

97. In fact the low value fish supplies from such fishing units are sustaining the fishmeal plants. Due to increase in demand for fish meal from the expanding poultry, dairy and coastal aquaculture activities, there is a cascading impact on the low value fishery in the country in recent years. Currently, there is virtually no discard from the fishing units and the fish meal plants are generating the demand for all sizes of low value fishes. As a consequence, the resultant reduction in the import of fishmeal by India could be beneficial from the economic point of view for the fish meal plants but not for the fisheries sector (from the ecosystem point of view).

98. On perusal of published information and available facts, the Committee felt that purse seine or ring seine fishery need not be banned in the country. However, recognizing the potential for damaging the stocks, stringent regulatory measures are required for implementation by the states where these units are in operations. Some measures are suggested in the following paragraphs:
99. The seasonal fishing ban shall be applicable to both purse seine and ring seine fishing boats. Since peak spawning period of important pelagic species coincide with monsoon, the ban on fishing by seiners would be helpful to the stock.
100. The number of existing purse/ring seiners should be frozen and no fresh fishing licenses should be issued for such category of fishing methods. Replacements should be permitted with the same specifications as that of the vessels being decommissioned. The other specifications such as Length overall, engine horse power for propulsion and gear dimensions may be limited to those given in the table 4.5.

Table -4.5
Specifications of craft and gear suggested for regulation of purse seine and ring seine.

Specifications	Purse seine(er)	Ring seine(er)
Length overall	15m , 15-20 m, >20 m	<20 m
Horsepower	190 hp, 240 hp, >240 m	<65 m
Mesh size (for sardine/mackerel)	22 mm	22 mm
Mesh size (for anchovies)	12 mm	12 mm
Length of the gear	<1000 m	<250 m
Hung depth of the gear	<100 m	<50 m

101. The legal sizes of major species have to be specified and deterrence such as severe fine has to be imposed on violators. The Committee felt that stringent harbour based control measures need to be introduced for monitoring the capture and trade in juveniles.
102. In order to get better control, fishing gear manufacturing units must be asked to supply/sell webbing of permitted mesh sizes only.
103. The MFRAs Rules and Regulations need to be amended to accommodate the above mentioned regulatory measures. Capacity building activities need to be undertaken for stakeholders at all levels. Similarly, awareness also needs to be created so that the stakeholders are well aware of the dos and don'ts. For moving towards a long-term solution, community based management initiatives should be promoted to allow the community to take up fisheries management and other day-to-day needs of the sector.

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TOR -3. To suggest further measures for strengthening conservation and management measures in marine fisheries

104. Among several fisheries management options available, seasonal closure is an easily implementable and monitorable measure. However, available scientific information (analysed and presented under sections on TOR 1 and TOR 2), stakeholders' perceptions (Annexe D) and outcome from stakeholder consultations (Annexe E) have clearly revealed that seasonal closure alone is not sufficient for sustaining marine fish stocks. From stakeholder consultations held across the maritime states (Annexe E), the following powerful messages have emerged:

- (i) There is an urgent need to address several issues that are stifling the livelihood and growth of the sector. Failure to address the issues pointed out by the stakeholders will seriously end up in conflicts and decimation of resources.
- (ii) Except seasonal closure, no other measure in the MFRA is properly implemented.
- (iii) For sustaining fishery resources and livelihood, the central and state governments should gear up to the next level, and adopt and implement modern fisheries management tools that are applicable to the country.
- (iv) Fishing communities and other stakeholders are not taken into confidence and given opportunity for making policy interventions.
- (v) Fishermen are prepared to comply with a suite of new management measures, if they are convinced with the efficiency and outcome of the measures.

105. In this situation, the Committee feels that this is the opportune time for the governments to strengthen conservation and management measures in the country. To do this, India should revise its strategies for restructuring fisheries to achieve sustainable and equitable exploitation and livelihood with the objectives of achieving ecological well-being and human well-being through good governance. It is important that India should move towards limited access to ensure sustainability. With catches approaching potential yield (or has exceeded the PY for a few resources), further increase in catches should be viewed with caution. There is a need to limit harvest to what fishery resources will sustain in the long run.

106. Fisheries management can be categorized into two major types, namely, input control and output control. Registration of fishing vessels, ban or restriction of selected types of gears, seasonal and spatial closure, mesh size regulation, minimum legal size-at-capture, species protection, MPAs etc are input control measures. Catch quotas, certification, ban on trade on protected species etc are a few output control measures. In Indian fisheries, except ban on trade on protected species, there is no adoption of output control measures. Considering recent advancements and conflicts in Indian marine fisheries, it should be realized that seasonal closure will be effective only if a combination of several input and output control measures are put in place.
107. Fisheries management is an art as well as science. Though the health of the resources and the sustainability of exploitation assume primacy, the livelihood issues of dependent communities, which manifest in the form of traditional rights to resources, is often given overwhelming importance. Very often, management objectives are drawn on political grounds, rather than purely scientific basis. Thus fisheries management requires a delicate balancing process, often deviating from the strict tenets of science.
108. The Committee recognized the complexity of the Indian marine fisheries sector with vast spatial extent and diversity of ecosystems, resources, culture, fishing gear and methods, etc. The Committee also acknowledged that in comparison to the fisheries in most other parts of the world, India had adopted several conservation and management measures and thanks to the resilience of the multispecies fishery, the yield has not declined so far.
109. However, the Committee also felt that there is no room for complacency as stocks collapses could happen abruptly due to fishery dependent and independent factors. The Committee suggested that if appropriate management measures are applied progressively, the cumulative impacts of such actions would ensure health and sustainability of the fishery resources.
110. The Committee reviewed the existing conservation and management measures and agreed that larger interventions at policy level are necessary to lay the framework of conservation and management activities. Some of these frameworks are already laid down by the international regulatory instruments to which India is a signatory.
111. The Committee recognized that larger issues of management of the EEZ spring from the ambiguity created by legal vacuum related to the extra-territorial waters of EEZ. The Committee, while acknowledging the efforts taken by the Ministry in addressing this critical area, felt that still there is scope for wider consultations and appropriate fine tuning of the instruments on the anvil.

112. Another issue at the core of policy environment is that while such frameworks fully recognise the political boundaries of the regulatory environment, the transboundary characteristics of the resources as well as the resultant behavior of the harvesting units have often been overlooked. If the underlying features of the resources are not properly understood and given primacy in the formulation of policies, the failure of policies could not be avoided.
113. The Committee suggested that periodic review of the existing policy is inevitable in a dynamic environment. A relook into the existing 2004 Comprehensive Marine Fisheries Policy and replacement with an updated version would be very timely.
114. Capacity restrictions and technical specifications are part of the regulatory packages, which when introduced with strict deterrence would result in the desired outcome of management. The MFRAs should accommodate the necessary changes to this end.
115. In addition, the Committee felt that interventions are needed at both habitat and also in the use of harvest technology. For habitat enhancement, the following activities were identified.
116. *Marine protected areas (MPA)*: Globally the need for promoting marine protected areas (MPAs) is gaining importance and a number of initiatives are being undertaken by national and international environmental agencies. It has been suggested that at least 10 percent of a country's continental shelf area has to be earmarked as MPA.
117. Currently, there are 31 MPAs (33 sanctuaries and national parks) in India. The extent of MPAs in India as last measured in 2010 was 7815.6 km². This formed 1.67% of the total continental shelf area of 4,68,000 km² which has to be increased to 10%. India has wide range of ecosystems ranging from coral reefs, mangroves, sea weed, sea grass, creeks and tidal flats. It is important to assess the present MPAs are functioning and how to make them more effective.
118. There are a number of issues related to the setting up and subsequent functioning of MPAs in India. There is no clear definition of categories of MPAs in Indian law. Arbitrarily selected sanctuaries and national parks declared under WL (P) Act, 1972 and WL (P) Amendment Act, 1991 are considered as MPAs. Though these are brought under a new heading 'protected area' under WL (P) Amendment Act, 2001, ambiguities exist on the subject, especially at the interface between various ministries such as the Ministry of Environment, Forests and Climate Change (MoEF&CC) and the Ministry of Agriculture (MoA).
119. Poor MPA governance, lack of clarity on roles of various organizations, lack of coordination between different Ministries/Departments –in particular between

MoEF&CC and MoA, as well as State-level Fisheries and Forest Departments are serious issues. People's participation in biodiversity management is also weak. Fisheries occupy a low position in the political and governance agenda. Therefore, fisheries rights are not considered while notifying and declaring protected areas. The ambiguity in definition and classification of MPAs has resulted in a complex set of rules that restrict fishing to smaller confined areas putting end-users to hardship.

120. The Committee felt that the major reasons for the present state of affairs in marine conservation is the lack of close coordination between the concerned Ministries. It could be possible to resolve most of the issues if a permanent inter-ministerial joint-mechanism to deal with overlapping subject of marine biodiversity conservation and fisheries is established.

121. *Mangrove restoration:* Restoration of mangroves has been in the national agenda for a few decades and there are reports that in some areas mangrove coverage has shown improvement over the years. However, considering the extent of damage to mangroves due to reclamation and development of ports, aquaculture farms and other economic activities in different parts of the country, the Committee felt that continued efforts should be made for restoration of mangroves. It could be possible to extend the restoration activities to the abandoned aquaculture farms of the coastal region.

122. *Restoration of coastal water bodies:* Coastal water bodies have become silted, polluted or otherwise vanished over the years in the process of expanding human habitats. The flow of rivers has altered, apart from the quantity of the flow. This has disadvantaged the dynamics of the migratory species and the nursery phase of many commercially important species. The Committee felt that every attempt to restore the estuaries, lakes, rivers, canals and other water bodies would pay rich dividends.

Apart from the activities of habitat enhancement, the following technology based interventions are also suggested.

123. *Artificial Reefs (ARs):* Artificial reefs have been identified as one of the effective methods of habitat enhancement. If properly installed, these structures provide substratum for fauna and flora, shelter for smaller and larger fish species for breeding and support diverse variety of fish and shellfish, which could form part of the fishery for local community. The ARs are also reported to protect the area from destructive trawling, thus indirectly protecting the ecosystem as also the interests of the traditional fishermen. However, there is a greater concern globally that ARs aggregate spawners which are removed efficiently. Therefore ARs would be more effective in MPAs

124. *By-catch reduction devices (BRDs):* These are a set of technical interventions designed to reduce the incidence of capture of non-target species or specimen of

undesired size. The most popular one is the turtle excluder device (TED) for shrimp trawls. There are some other interventions such as diamond mesh, which would ensure escapement of juveniles. The Committee suggested that the State Fisheries Departments should come up with programmes to popularize the use of BRDs.

125. *Sea ranching:* Ranching of species which are vulnerable to exploitation is suggested world over as remediation measure for immediate replenishment of stocks. The Committee considered the high fecundity of most of the commercially important species in our waters and agreed that ranching cannot in any way compensate the natural spawning and development. However, if appropriate technologies are available for some species with low fecundity, ranching would be worth the effort.

126. *Diversified fishing:* The Committee noted that longline fishing for tuna and tuna-like fishes covering the distant waters of the EEZ and area beyond national jurisdiction (ABNJ) is yet to be fully developed. However, the promotional schemes were helpful in multiplication of the small vessels fishing in the EEZ. True diversification for non-conventional resources such as oceanic squids or mid-water trawling for columnar fishes is yet to catch up in the country.

127. While incentive for diversification are designed and implemented, proper mechanism to monitor the catch and the economic availability has to be put in place. This, the Committee felt, would help avoid unwanted investment or overcapacity in any type of fishing.

128. *Market interventions:* The Committee acknowledged that market plays an important role as driver of exploitation of resources. The price war that is driving bluefin tuna to extinction is notorious. There is a lot to be done in the consumer education to prevent unwanted capture and sale of vulnerable species. As mentioned earlier, market interventions can also be used to curb use of illegal and unwanted fishing gear by placing restrictions on their manufacture. Similarly, fishing capacity can also be reduced over a period of time by bringing in standards and specification for setting up of boat yards as also the boat.

129. Most often minimum legal size is prescribed for certain species. Unless the fishing technology itself precludes the capture of such sized fish, accidental or intentional capture cannot be avoided. In such situation the success of the regulations will depend purely on the combined effect of the monitoring system in place as well as the disincentives prescribed for such actions. For the exported species, even if the minimum size for export is prescribed, the non-export portion will end up in domestic markets. The Committee felt that with any measures of size restrictions there must be a vigilant monitoring system in place to ensure effective control.

130. *Community interventions:* There has been a lot of debate on the ideal type of fisheries management. The Committee recognized that in a country like India where there are a large number of fishers scattered all along the long coastline, implementation of regulatory instruments requires robust State machinery. In the absence of such machinery, the best alternative is to evolve a system where the community is held responsible for implementation of the regulations.
131. It is felt that in a democratic system, involvement of community in resource management is more meaningful. Apart from the reduction in administrative cost incurred by the State machinery, self controlling mechanism of the community would be able to negotiate most situations in a consultative manner. In the context of the conflicts of interests of conservation agencies and communities, there seems to be no other alternative which would work to produce lasting results. However, as a pre-requisite, such changes can only be brought about when the community is empowered in terms of knowledge and capacity to handle management of the resources.
132. The Committee recognized that some community based regulations are in vogue in certain parts of the country and have been effective in management of the resources. There have been suggestions from time to time to take advantage of the existing community control mechanisms combined with the administrative controls in a sort of 'plurality' of management regime. The Committee suggests that the next edition of regulatory instruments should specifically incorporate provisions for community involvement in management, as an effective method of implementing the rules and regulations.

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TOR -4. To suggest measures for strict implementation of the Marine Fishing Regulation Acts (MFRA)

133. India inherited a legacy of fisheries regulations from the colonial period. The Indian Fisheries Act of 1897 and provincial adaptations of the same served the larger interests of regulation of fisheries activities, especially the control of destructive methods. After independence, the thrust on fisheries development resulted in mechanization, motorization and overall expansion of fisheries. The competitions and conflicts and multitude of issues in the newly developed scenario have rendered the earlier regulatory instruments inadequate.
134. As recommended by the 10th meeting of the Central Board of Fisheries in 1976, a committee was constituted, which came out with a model Marine Fisheries Regulation Bill in 1978. The Bill was circulated to all maritime states and union territories for enacting suitable legislation for enabling regulation of fisheries in their jurisdiction.
135. The States of Kerala and Goa were the first to respond in 1980 with enactment of the respective Marine Fisheries Regulation Act (MFRA) and relevant Rules. Most of the other maritime States responded at various times during 1980s. However, West Bengal (1993), Andhra Pradesh (1994) Gujarat (2003), Andaman and Nicobar Islands (2003) and Lakshadweep (2004) were late in enacting their MFRA.
136. The MFRA had among other things, provisions for licensing of fishing crafts, fishing gears and accessories. All of them specified areas of fishing operations reserved for traditional crafts and different classes of mechanised crafts. The specifications are in terms of distance or depth or both and vary from state to state.
137. Seasonal closures are being practiced by all the States as per the provisions made in their MFRA. The non-uniformity in the seasonal closure has been a cause of conflict between the fishers of neighbouring states. This problem was more or less sorted out by the central government initiative, which made two ban periods one for the East and another for the West Coast, though some States observe extended period of ban along the West Coast. The summary of the spatial and temporal restrictions prevailing now in different maritime states is given in table 6.1.

Table-6.1

The summary of the spatial and temporal restrictions in different maritime states (adapted from Handbook of Fisheries and Aquaculture, ICAR, New Delhi, 2006)

State/ UT	Spatial restrictions	Temporal restrictions
Gujarat	Artisanal fishery up to 9 km Mechanised fishing > 9 km	10 June-15 August (67 days)
Maharashtra	Artisanal fishing 5-10 fathom Mechanised (>6 cylinder engine) fishing >22 km	July and 1 st fortnight of August
Goa	Artisanal fishery up to 5 km Mechanised fishing > 5km	1 June- 24 July (54 days)
Karnataka	Artisanal fishery up to 6 km or 4 fathom Mechanised fishing (<15m) > 6 km Mechanised fishing (>15m) > 20 km	June July August (90 days)
Kerala	Artisanal fishery up to 10 km Mechanised fishing (<25 GRT) > 10 km Mechanised fishing (>25 GRT) > 23 km	15 June-29 July (45 days)
Tamil Nadu	Artisanal fishery up to 5 km Mechanised fishing > 5 km	16 April-31 May (46 days)
Andhra Pradesh	Artisanal fishery up to 7 km Mechanised fishing (<15m) > 7 km Mechanised fishing (>15m) > 22 km	16 April-31 May (46 days)
Odisha	Artisanal fishery up to 5 km Mechanised fishing (<15m) > 5 km Mechanised fishing (>15m) > 10 km	16 April-31 May (46 days)
West Bengal	Artisanal fishery up to 18 km Mechanised fishing > 18 km	16 April-31 May (46 days)

138. The Committee noticed that differences exist in the MFRAs between neighbouring States, which are a cause of friction between the stakeholders and the regulators. There is a need for harmonization of these MFRAs so as to remove the regional disparities in provisions.

139. A large majority of the Stakeholders expressed a view that MFRAs are to be amended to accommodate the current requirements. The strict implementation of measures such as mesh size, catch restrictions, intensive patrolling by the Coast Guard, etc were suggested by most of them. They also reiterated the necessity of strict implementation and inclusion of punitive clauses in the MFRA for reducing violations.

140. The Committee examined the glaring gaps in implementation of the MFRAs in all the coastal States. The existing machinery of the DoF in all the maritime States is pre-occupied with the welfare activities and the responsibility of regulation and management of fishery is restricted to observance of regional closure. The Committee felt that there is urgent need to shift the focus of the DoF from welfare

to management. The Committee also felt that there should be dedicated team of people in the DoF to implement the provisions of the MFRA.

141. In the process of adopting measures for strict implementation, creation of awareness about the Act, Rules and Regulation is imperative. The Committee felt that the officials of the DoF must undergo refresher courses periodically on the provisions of the MFRA and other concerned instruments. They must also be have sufficient knowledge of the overall fishery regulatory environment as well as the relevant Acts and Rules of the neighbouring maritime States.
142. Another important lacuna noticed by the Committee is the absence of information about the MFRA in the public domain. Soft-copies of the Acts, Rules and Regulations as well as amendments are seldom available in the websites of the DoF. It is also noticed that the MFRA are not being made available in the local languages. Since the target audience is not aware of the provisions in the legislation, their adherence is something quite impossible.
143. The Committee suggested that the MFRA should be made available in English, local languages and Hindi. A simplified version with salient points highlighting the penal provisions must also be prepared and made available at the harbours and to the fishermen associations for facilitating strict compliance.
144. Since MFRA are in place for quite some time, the Committee felt that there is a need for a comprehensive study of the whole set of instruments with a view to locate the strength and weakness and the divergences between the MFRA of the neighbouring States. This exercise also could help in harmonization of the instruments with other Acts of conservation such as Wildlife (Protection) Act, etc.
145. The Committee also felt that there should be flexible mechanisms to make changes in the technical specifications of craft and gear as suggested by research and development organizations from time to time. This implies a continuing dialogue with the research organizations and stakeholders. The process must assume a dynamic iterative nature where feedbacks are incorporated in the subsequent cycle.

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Appendix - a

Notification from the Ministry

A/c.

359/114)
14.05.13.
1(R)

No. 30035/15/97-Fy (T-1)
Government of India
Ministry of Agriculture
(Department of Animal Husbandry, Dairying & Fisheries)

Krishi Bhawan, New Delhi,
Dated: 07th May, 2013

Office Order

In order to conserve and effectively manage the Marine Fishery Resources, Ministry of Agriculture, Department of Animal Husbandry, Dairying and Fisheries has been imposing ban on fishing by all fishing vessels in the Indian Exclusive Economic Zone (EEZ) beyond territorial waters both on the East and West Coasts for 45 days every year. At present, the ban period on the East Coast is from 15th April to 31st May and that on the West Coast is from 15th June to 31st July.

2. The Department had constituted a Technical Committee earlier vide Office Order of even number dated 28-10-2009 for assessing the impact of fishing ban and to review its duration. The Committee submitted its final Report in May 2010 recommending, *inter alia*, the continuance of the ban and its duration uniform on both the coasts. However, since representations are being received from various quarters to increase the ban period in both the coasts, the Competent Authority in the Department has approved re-constitution of the Technical Committee to review the duration of the ban period and to suggest further measures to strengthen the conservation and management aspects.

3. The composition of the Committee and its terms of reference are as follows:-

a. Composition

1) Director, CMFRI, Cochin	-	Chairman
2) Representative of DADF, New Delhi	-	Member
3) Director of Fisheries, Karnataka	-	Member
4) Director of Fisheries, Tamil Nadu	-	Member
5) Dr. Y.S.Yadava, Director, BOBP-IGO, Chennai	-	Member
6) Dr. E.Vivekanandan, Emeritus Scientist, CMFRI, Chennai	-	Member
7) Representative of CIFT, Cochin	-	Member
8) Representative of National Fishworkers' Forum, (NFF)	-	Member
9) Director General, FSI, Mumbai	-	Member Convener

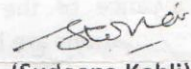
b. Terms of reference:

1) To assess the impact of fishing ban in view of livelihood issues, fish landings etc. on the available data of Coastal States and UTs and review its duration.

No. 30035/15/97-Fy(T-1)

-2-

- 2) To suggest ban on purse seine fishing operation in the Indian coast.
 - 3) To suggest further measures for strengthening conservation and management measures in marine fisheries.
 - 4) To suggest measures for strict implementation of the Marine Fisheries Regulation Acts (MFRA).
4. **Terms and Conditions:**
- i) The Committee may co-opt expert members from any of the Departments/Organizations.
 - ii) TA/DA of the Committee members for their travels for consultation meetings etc. will be borne by the respective Departments/Organizations.
5. The said Committee will assess the issues from all angles and submit its report on or before 31.10.2013 with suggestions and recommendations.


(Sudeepa Kohli)

Under Secretary to the Government of India

Distribution:

1. Director, Central Marine Fisheries Research Institute (ICAR), Kochi.
2. Secretary's Incharge of Fisheries of all Coastal States and UTs.
3. Fisheries Development Commissioner, DAHD&F, New Delhi.
4. Commissioners/Directors of Fisheries of all Coastal States and UTs.
5. Dr. Y.S. Yadava, Director, BOBP-IGO, Chennai.
6. Dr. E. Vivekanandan, Emeritus Scientist, CMFRI, Kochi.
7. Director General, ICAR and Secretary DARE, Krishi Bhawan, New Delhi.
8. DDG (FY), ICAR, KAB-II – IARI Campus, Pusa, New Delhi.
9. Director, Central Institute of Fisheries Technology, (ICAR), Cochin.
10. Chairman, National Fishworkers' Forum, Kolkata, West Bengal.
11. Director General, Fishery Survey of India, Mumbai.
12. Guard file.

Appendix – b

Questionnaire for State-level Stakeholder Consultations for seeking views on the impact and duration for seasonal fishing ban and other conservation measures*

Kindly put $\sqrt{\quad}$ mark in the relevant boxes and provide information in other places

1.	Name of the stakeholder organization/society	
	Address with contact details	
2.	What in your opinion is the impact of the present seasonal fishing ban	Good for fishery [] Not good for fishery [] Good for fishery not good for fishermen [] Not very sure []
2.1	If good for fishery, what are the good impacts	Allows breeding and growth of young ones [] Allows stock replenishment [] Ensure safety of fishermen [] Reduces overall fishing pressure [] Others (Specify)
2.2	If bad for fishery, what are the adverse impacts	No improvement in catch [] Loss of job and livelihood [] Ban not applicable to all [] No impact on breeding [] Others (Specify)
3.	What is your view about the period and duration of the present seasonal fishing ban	The period and duration appropriate [] The period and duration not appropriate [] The period is OK but duration need change [] The period not appropriate but duration OK []
3.1	If period not appropriate what in your opinion would be the appropriate period	From..... to.....for east coast From..... to.....for west coast
3.2	If duration not sufficient what in your opinion would be the duration and spellsDays in.....spell(s) for east coastDays in.....spell(s) for west coast
4.	What is your view should be the coverage or application of ban	Applicable to mechanised boats only [] Applicable to both mechanised and motorised [] Applicable to all types of boats []
4.1	Should the same rule of application be followed by the neighbouring state	Yes, the rule should be uniform [] No, the rule can vary from state to state []
4.2	Should the ban be applicable to all vessels	Yes, the rule should be uniform []

	operating beyond territorial waters	No, the rule can vary from TS to EEZ []
4.3	Should the rule be applicable to neighbouring country for effectiveness	Yes, the rule should be uniform in the region[] No, the rule can applicable only in our EEZ []
5.	Is there any need for local seasonal area/gear restrictions within your maritime state	Yes, there should be local restrictions [] No, there should not be local restrictions []
5.1	Should there be similar restrictions in the neighbouring states	Yes, the restrictions must be uniform [] No, the restrictions may apply to our state only[]
6.	What other conservation measures would you suggest for ensuring health of stock and sustainable fisheries	1. 2. 3.
7.	Do you need to relook into the MFRA and incorporate necessary changes	Yes, the State's MFRA need to be amended [] No, implement the MFRA as it is strictly []
7.1	What are the elements you need to incorporate into the MFRA	1. 2. 3.
7.2	What are your suggestions for strict implementation of MFRA	1. 2. 3.
	Do you have any additional information or suggestions?	

Place:

Date:

Signature:

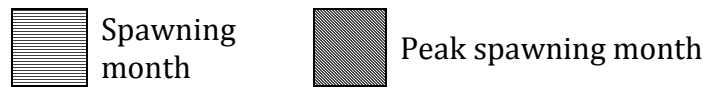
Name:

** As suggested in the first meeting of the Technical Committee to Review the Duration of the Ban Period and to Suggest Further Measures to Strengthen the Conservation and Management Aspects held in CMFRI, Kochi, 12 July 2013.*

□□□

Appendix - c

**Part-A. Spawning season of dominant finfish and shellfish along the EAST COAST
(from different sources)**



Species	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
<i>Anodontostoma chacunda</i>												
<i>Chirocentrus dorab</i>												
<i>Chorinemus lysan</i>												
<i>Coilia spp.</i>												
<i>Cypselurus oligolepis</i>												
<i>Dasyatis imbricatus</i>												
<i>Dussumieria acuta</i>												
<i>Eleutheronema tetradactylum</i>												
<i>Encrasicholina devisi</i>												
<i>Tenualosa ilisha (=Hilsa ilisha)</i>												
<i>Rhynchorhamphus georgii (=Hyporamphus georgii)</i>												
<i>Johnius carutta</i>												
<i>Lactarius lactarius</i>												
<i>Lates calcarifer</i>												
<i>Photopectoralis bindus (=Leiognathus bindus)</i>												
<i>Lethrinus lentjan</i>												
<i>Liza macrolepis</i>												
<i>Loligo duvaucelii</i>												
<i>Mugil cephalus</i>												
<i>Moolgarda cunnesius (=Mugil cunnesius)</i>												
<i>Chelon parsia (=Mugil parsia)</i>												
<i>Moolgarda seheli (=Mugil seheli)</i>												
<i>Chelon macrolepis (=Mugil troschelii)</i>												
<i>Ellochelon vaigiensis (=Mugil vaigiensis)</i>												
<i>Nemipterus japonicas</i>												
<i>Nemipterus mesoprion</i>												
<i>Osteogeneiosus militaris</i>												
<i>Pampus argenteus</i>												
<i>Panulirus homarus homarus</i>												
<i>Pelates quadrilineatus</i>												
<i>Penaeus semisulcatus</i>												
<i>Pristis microdon</i>												
<i>Psammoperca waigiensis</i>												

<i>Psettodes erumei</i>	▨	▨				▨		▨	▨	▨		
<i>Pseudosciaena aeneus</i>	▨	▨	▨		▨	▨						
<i>Pseudosciaena bleekeri</i>		▨	▨	▨	▨							
<i>Rhizoprionodon acutus</i>	▨	▨	▨	▨	▨	▨				▨	▨	▨
<i>Sardinella gibbosa</i>		▨	▨	▨	▨	▨						
<i>Sardinella fimbriata</i>	▨		▨	▨	▨					▨		
<i>Sardinella spp.</i>		▨	▨	▨	▨	▨						
<i>Saurida tumbil</i>			▨							▨		
<i>Saurida undosquamis</i>	▨	▨	▨			▨	▨			▨	▨	▨
<i>Scomberomorus guttatus</i>				▨	▨	▨						
<i>Selaroides leptolepis</i>	▨	▨	▨	▨		▨	▨	▨	▨			
<i>Sepia pharaonis</i>				▨	▨		▨	▨	▨			
<i>Sillago sihama</i>	▨	▨							▨	▨	▨	▨
<i>Plicofollis tenuispinis</i> (= <i>Tachysurus tenuispina</i>)		▨			▨			▨	▨			▨
<i>Netuma thalassina</i> (= <i>Tachysurus thalassinus</i>)		▨	▨	▨	▨			▨				
<i>Terapon jarbua</i>		▨	▨	▨	▨				▨	▨		
<i>Thryssa baelama</i>	▨					▨	▨					▨
<i>Thryssa dussumieri</i> (= <i>Thrissocles dussumieri</i>)		▨	▨	▨	▨	▨	▨	▨	▨			
<i>Thryssa mystax</i> (= <i>Thrissocles mystax</i>)	▨	▨	▨	▨	▨	▨	▨	▨	▨			▨
<i>Lepturacanthus savala</i> (= <i>Trichiurus savala</i>)						▨	▨					
<i>Trichiurus lepturus</i>					▨	▨					▨	▨
<i>Upeneus sulphureus</i>	▨	▨	▨	▨	▨	▨	▨	▨	▨			▨

Part-B. Spawning season of dominant finfish and shell fish along the WEST COAST (from different sources)

Species	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
<i>Anodontostoma chacunda</i>	■	■	■						■	■	■	
<i>Acetes indicus</i>	■	■	■	■	■	■	■	■	■	■	■	■
<i>Alepes djedaba (=Caranx kalla)</i>	■			■	■							■
<i>Coilia dussumieri</i>	■	■	■	■	■	■	■	■	■	■	■	■
<i>Cynoglossus semifasciatus</i>										■		
<i>Cynoglossus semifasciatus</i>	■	■	■	■				■	■	■	■	■
<i>Pastinachus sephen (=Dasyatis sephen)</i>	■	■	■	■	■	■	■	■	■	■	■	■
<i>Decapterus russelli</i>								■				■
<i>Euthynnus affinis</i>				■	■					■	■	
<i>Harpodon nehereus</i>	■	■	■	■	■	■	■	■	■	■	■	■
<i>Johnius dussumieri</i>	■	■				■	■	■	■			
<i>Leiognathus bindus</i>	■	■										■
<i>Loligo duvaucelii</i>	■	■	■	■	■	■	■	■	■	■	■	■
<i>Loligo duvaucelii</i>	■	■	■	■	■							■
<i>Congresox talabonoides (=Muraenesox talbonoides)</i>				■	■				■	■		
<i>Namipterus japonicus</i>	■	■	■	■	■	■	■	■	■	■	■	■
<i>Nematalosa nasus</i>									■	■		
<i>Nemipterus mesoprion</i>									■	■		
<i>Opistopterus tardoore</i>		■	■	■	■	■	■	■				
<i>Otolithes argenteus</i>	■							■	■	■	■	
<i>Otolithes cuvieri</i>	■	■	■	■	■	■	■				■	■
<i>Otolithes ruber</i>							■	■	■	■	■	■
<i>Panulirus homarus homarus</i>	■	■	■	■	■	■	■	■	■	■	■	■
<i>Panulirus polyphagus</i>	■	■	■	■	■	■	■	■	■	■	■	■
<i>Parapenaepsis stylifera</i>	■	■	■	■	■	■	■	■	■	■	■	■
<i>Parastromateus niger</i>							■	■	■	■		
<i>Penaeus semisulcatus</i>	■	■	■	■	■	■	■	■	■	■	■	■
<i>Polydactylus indicus</i>				■	■	■	■			■	■	■
<i>Polydactylus indicus</i>			■	■	■	■	■					
<i>Polynemus heptadactylus</i>			■	■	■	■	■	■	■	■	■	■
<i>Protonibea diacanthus</i>							■	■	■	■	■	■
<i>Psettodes erumei</i>								■	■	■		
<i>Pseudosciaena diacanthus</i>							■	■	■	■		
<i>Rastrelliger kanagurta</i>					■	■	■	■	■			
<i>Rastrelliger kanagurta</i>		■	■	■	■	■	■	■				
<i>Rastrelliger kanagurta</i>		■	■	■	■	■	■	■	■	■	■	■
<i>Rastrelliger kanagurta</i>	■	■	■	■			■	■	■	■	■	■
<i>Rhynchobatus djiddensis</i>							■	■	■	■	■	■
<i>Sardinella fimbriata</i>	■	■	■									

<i>Sardinella fimbriata</i>													
<i>Sardinella fimbriata</i>													
<i>Sardinella longiceps</i>													
<i>Sardinella longiceps</i>													
<i>Sardinella longiceps</i>													
<i>Sardinella longiceps</i>													
<i>Sardinella longiceps</i>													
<i>Sardinella longiceps</i>													
<i>Saurida tumbil</i>													
<i>Saurida tumbil</i>													
<i>Saurida tumbil</i>													
<i>Scoliodon laticaudus</i>													
<i>Sepia pharaonis</i>													
<i>Sepia pharaonis</i>													
<i>Solenocera crassicornis</i>													
<i>Stolephorous bataviensis</i>													
<i>Thryssa mystax</i> (= <i>Thrissocles mystax</i>)													
<i>Trichiurus lepturus</i> (= <i>Trichiurus haumela</i>)													
<i>Trichiurus lepturus</i>													
<i>Trichiurus lepturus</i>													

Appendix - d

D. Summary report of State-level stakeholder consultations

Stakeholders' views on conservation is very important in natural resource management, especially those affecting their livelihoods. In the case of fisheries, the indigenous knowledge of fishermen is as important as scientific knowledge. In a democratic set-up, the decisions are often taken on social and political basis where the majority views are given importance.

It is with this background the Committee decided to consult the stakeholders on their views about the seasonal ban and other conservation measures. Consultations were carried out under the aegis of CMFRI and Fishery Survey of India as decided in the first meeting of the Committee. The response obtained from different States were communicated to the office of the Chairman of this Technical Committee and analyzed for preparing state-wise summaries provided below.

D.1. Gujarat

Methodology: A standard questionnaire provided by the Committee, translated into Gujarati language was used for obtaining basic information on key aspects of interest to the Committee. The officials of the DoF and the staff of Veraval RC of CMFRI carried out consultations with fishers and other stakeholders. Response was obtained from 164 stakeholders representing four different fishing groups.

Analysis: The data was summarised based on the stakeholder categories representing the four gears, namely trawl, gillnet, dolnet and *pagadiya* (a Gujarati term for those fishing without the help of any kind of fishing craft). In order to eliminate bias due to inadequate response/representation, was distributed according to trawl (2.5), gillnet (1.0), dolnet (1.0) and *pagadiya* (0.5). The weighted data was used for summarising the responses and the results are given below.

Results: On the usefulness of seasonal ban, 40 percent felt good for fishery while an equal percentage felt it bad for fishery. However, 44 percent felt it is good for fishery but bad for fishermen. Majority (59%) felt that the ban period helps breeding of fish and growth of young ones, whereas a good number of respondents (19%) felt that it allows stock replenishment and some (10%) felt that it reduces fishing pressure. Nearly fifteen percent opined that ban ensures safety of fishermen.

On the adverse impacts of ban, loss of job and livelihoods was indicated by more than 47 percent of the respondents, whereas about 11 percent opined that there was no improvement in the catch after the ban. Twenty-nine percent of the respondents pointed out that the ban is not uniformly applied to all segments of the fishery.

Regarding the ban period and duration, about 45 percent of the respondents opined that the ban period and duration is appropriate, whereas 25 percent opined that period is appropriate but duration need to be changed and about 12 percent felt that that ban period was inappropriate.

There was a wide range of opinion about the period of ban. May-August was suggested by about 34 percent of the respondents. The other suggestions were - May-July (7%),

May-September (6%), June-August (6%), July-August (6%) and June-July (5%). The modal response (27%) suggested was duration of 91-105. However, a few responses indicated 31-35 days (11%), 46-60 days (9%), 61-75 days (8%), 76-90 days (5%), 106-120 days (6%) and 121-135 days (5%).

The majority (66%), representing all four categories opined for application of ban to all types of boats. However, some representatives (20%) suggested application to only mechanised sector and about 8 percent called for application to both mechanised and motorised sectors.

Majority (84%) of the respondents expressed the view that rules should be followed by all the States uniformly. Nearly 81 percent opined that rules should be uniformly applied to all vessels operating in the EEZ. About the regional application of the rules, 81 percent of the respondents agreed.

Nearly 59 percent of the respondents were of the opinion that there could be regional/local area/gear restriction as may be deemed appropriate to conserve specific resources, which should also be applicable to neighbouring states (78%). Nearly 68 percent of the respondents suggested a review of the MFRA for incorporating necessary changes.

D.2. Maharashtra

Methodology: A standard questionnaire provided by the Committee, translated into Marathi language was used for obtaining basic information on aspects of key interest to the Committee. The stakeholders were provided with the questionnaire by mail and were called for a meeting on 1st October 2013 at Fishery Survey of India HQ Mumbai. The consultation was conducted jointly by FSI and CMFRI Mumbai RC with assistance from the Department of Fisheries, Government of Maharashtra. Nearly 65 representatives attended the meeting and 50 questionnaire responses were obtained.

Analysis: The data was summarised collectively as the cooperative societies had members from all sectors of the fishery. The summary of the responses and the results of analysis are given below.

Results: On the usefulness of the ban, 58 percent felt that the ban is good for fishery while 12 percent felt it as bad for fishery. However, 30 percent felt it good for fishery but bad for fishermen. Majority (62%) felt that the ban period helps the breeding of fish and growth of young ones, whereas a good number of respondents (38%) felt that it allows stock replenishment. Nearly twenty-six percent opined that the ban ensures safety of fishermen.

On the adverse impacts of ban, loss of job and livelihoods were indicated by more than 42 percent of the respondents, whereas about 34 percent opined that there was no improvement in the catch after the ban. Fourteen percent respondents pointed out that the ban is not uniformly applied to all segments of the fishery while 24 percent opined that there is no impact on breeding.

Regarding the ban period and the duration about, 44 percent of the respondents opined that the ban period and duration is appropriate whereas 12 percent opined that period is appropriate but duration need to be changed and about 22 percent felt that ban period is not appropriate. About 24 percent responses indicated both period and duration as inappropriate.

There was a wide range of opinion about the period of the ban. June-August was suggested by about 47 percent of the respondents, whereas May-August was preferred by 38 percent of the respondents. July-August (3%) and August-October (3%) were other suggestions. On the duration of the ban, dominant response (35%) suggested 47 days. However, other responses indicated 60-67 days (18%), 75-85 days (24%) and 90-93 days (21%).

The majority (74%), representing all four categories opined for application of ban to all types of boats, however some representatives (14%) suggested application to only mechanised sector and about 16 percent called for application to both mechanised and motorised sectors.

Majority (90%) of the respondents expressed the view that rules should be followed by all the coastal States uniformly. Nearly 92 percent opined that rules should be uniformly applied to all vessels operating in the EEZ. About the regional application of the rules, 76 percent of the respondents recorded agreement.

Nearly 66 percent of the respondents were against the view that there could be regional/local area/gear restriction as may be deemed appropriate to conserve specific resources. However, 96 percent felt that all restrictions should be applicable to neighbouring States. Nearly 66 percent of the respondents suggested a relook into the MFRA for incorporating necessary changes, while 18 percent advocated strict implementation of MFRA.

D.3. a) Karnataka

Methodology: A standard questionnaire provided by the Committee, translated into Kannada was used for obtaining basic information on key aspects of interest to the Committee. Consultations with fishery stakeholders were carried by CMFRI Mangalore RC. Fifty-five schedules were distributed and response obtained. The questionnaire responses were obtained from D K and Udupi districts.

Analysis: The data analysis was done assuming a single general group. The results are summarised below.

Results: Majority of the fishermen (85%) felt that the ban is good for fishery whereas a few (6%) felt otherwise. A few (7%) felt it was good for fishery but not good for fishermen. About 72 percent of the respondents felt that the ban period helps the breeding of fish and growth of young ones, while about 19 percent felt it replenishes the stock. However, a good number of respondents opined that there was no improvement in the catch (68%) and the ban adversely impacted jobs and livelihood (12%).

About 67 percent of the respondents opined that the ban period and duration is appropriate while some felt that the period, duration or both needs to be changed. The suggestions from the stakeholders about the period and duration converged on June-August and 60 days, though a few suggested 45 days and 90 days.

Regarding coverage and application of the ban, 37 percent respondents suggested that it should be applicable to mechanised boats only and about 50 percent felt that it should be applicable to all types of boats. About nine percent suggested it should be applicable to mechanised and motorised boats only.

Majority (95%) of the respondents expressed the view that the rules should be followed by neighbouring States and should extend beyond territorial waters. About 78 percent

felt that the rule should be uniform in the region and should be applicable, if possible, to neighbouring countries.

The majority of the respondents (87%) were of the opinion that there could be regional/local area/gear restrictions as deemed appropriate to conserve specific resources, which should also be applicable to neighbouring States. Most of the respondents (70%) suggested for review of the MFRA for incorporating necessary changes whereas one fourth of the respondents called for strict implementation of the MFRA.

D.3. b) Uttara Karnataka

Methodology: A standard questionnaire provided by the Committee was used for obtaining basic information on key aspects of interest to the Committee. Consultations with fishery stakeholders were carried by the staff of CMFRI Karwar RC. Seventy-five schedules were distributed and response obtained. The questionnaire responses were obtained only from U K district.

Analysis: The data analysis was done assuming a single general group. The results are summarised below.

Results: Majority of the fishermen (97%) felt that the ban is good for fishery and about 99 percent of the respondents felt that the ban period helps breeding of fish and growth of young ones. However, a good number of respondents opined that there was no improvement in the catch (36%) and the ban adversely impacted jobs and livelihoods (28%).

About 11 percent of the respondents opined that the ban period and duration is appropriate while 32 percent felt that the period and duration needs to be changed. About 16 percent opined that the duration needs change. The suggestions on the period of ban was June - July (13%) and June - August (20%). On the other hand, the durations suggested were 60 days (12%) and 90 days (7 percent).

Regarding coverage and application of the ban, 29 percent respondents suggested that it should be applicable to mechanised boats only and about 37 percent felt that it should be applicable to both mechanised and motorised boats.

All the respondents (100%) expressed the view that the rules should be followed by the neighbouring States and should extend beyond the territorial waters. About 99 percent proposed that it should also be applicable to the neighbouring countries.

The majority of the respondents (95%) were of the opinion that there could be regional/local area/gear restriction as may be deemed appropriate to conserve specific resources, which should be applicable to neighbouring States (84%). Most of the respondents (79%) suggested for relook into the MFRA for incorporating necessary changes.

D.4. Kerala

Methodology: A standard questionnaire provided by the Committee and translated into Malayalam was used for obtaining basic information on key aspects of interest to the Committee. Consultations with fishery stakeholders were carried out by CMFRI (HQ). Fifty stakeholders responded to the questionnaire.

Analysis: There were no discernible categories among stakeholders for segregating the data and, therefore, analysis was done assuming a single general group. The results are summarised below.

Results: Majority of the fishermen (88%) felt that the ban is useful for fishery whereas a few (8%) felt otherwise. About 80 percent of the respondents felt that the ban period helps the breeding of fish and growth of young ones, while about 26 percent felt it replenishes the stock. Many agreed that the ban ensures safety of the fishermen (22%) and also reduces fishing pressure (12%). However, many respondents opined that there was no improvement in the catch (18%) and the ban adversely impacted jobs and livelihood (24%). Some respondents (18%) pointed to the ban being not applicable to all categories.

About 60 percent of the respondents opined that the ban period and duration is appropriate while 20 percent of the respondents felt that the duration needs to be changed and 10 percent suggested change in the period. Only eight percent respondents opined that the period and duration required change.

The suggestions from the stakeholders about the period of the ban varied. Majority (30%) agreed for June-August period while some (10%) suggested June-July. A few respondents also suggested April-May, June-July, June-September and December-February. For duration of the ban 60 days scored maximum response (14%) followed by 90 days (12%).

Regarding coverage and application of the ban, 44 percent respondents suggested that it should be applicable to mechanised boats only and about 32 percent felt that it should be applicable to all types of boats. About 20 percent suggested it should be applicable to mechanised and motorised boats only.

All the respondents expressed the view that the rules should be followed by neighbouring States. Majority felt that the rules should extend beyond territorial waters (86%) and should be applicable, if possible, to neighbouring countries also (90%).

The majority of the respondents (72%) were of the opinion that there could be regional/local area/gear restriction, as may be deemed appropriate to conserve specific resources, which should be applicable to neighbouring States (96%). Most of the respondents (80%) suggested for review of the MFRA for incorporating necessary changes.

D.5 . Tamil Nadu and Puducherry

Methodology: A standard questionnaire provided by the Committee, translated into Tamil language was used for obtaining basic information on key aspects of interest to the Committee's business. The DoF was provided with the required information and inputs for conduct of the stakeholder meetings. Consultations were carried out at strategic locations by the DoF covering the maritime districts of Kanyakumari, Thoothukuddi Ramanathapuram, Pudukkottai, Tanjavur, Thiruvavur, Nagapattinam, Kancheepuram and Thiruvallur. The DoF, Puducherry conducted consultations for Cuddalore and Viluppuram districts as well as in Puducherry.

Analysis: The data was summarised based on the stakeholder categories such as country craft, general, motorised, and mechanised sectors. However, it was observed that the general category consisted of all other three categories and therefore could not be

segregated for weighted analysis. A general analysis was carried out and the results are summarised below.

Results: On the usefulness of fishing ban, 90 percent respondents expressed that the ban is useful for the fishery. However, about 12 percent respondents opined that it is good for fishery but not good for fishermen.

About 89 percent respondents felt that the present fishing ban allows breeding and growth of young ones, whereas 29 percent respondents were of the view that it allows stock replenishment and 12 percent respondents opined that it ensures safety of fishermen.

Though the benefit to stock has been acknowledged by majority, fishing ban is reported to create loss of job and livelihoods for fishermen by a significant number of respondents (71%).

About 51 percent respondents opined that the period and duration of the ban is appropriate as against 14 percent expressing an opposite view. Nearly 24 percent opined that the duration needs to change while 11 percent expressed the need for change in period.

Regarding the ban period along the East Coast, the stakeholders agreed for the period April-June as ideal with 24 percent preferring April-May, seven percent preferring April-June and four percent preferring May-June. Regarding the ban period along the West Coast, the stakeholder view was not sufficient to derive any concrete information.

On the duration of the ban period, there was a wide range of views. However, the majority of those responded (the response was <50%) were of the view that the ban should be for 60 days in one spell (43%) while 23 percent called for 45 days in one spell and 21percent called for 90 days in two spells.

Regarding the application of the ban, the general opinion was for only mechanised boats (55%) with a significant number voting for application to all types of boats (25%) as well as mechanised and motorised boats (20%). The response indicated that the motorised sector and traditional sector called for application of ban only to the mechanised sector while the mechanised sector called for applicability of ban to both mechanised and motorised sectors if not to all types.

The majority of the respondents expressed the view that the ban should be applicable to vessels operating in waters beyond the territorial sea. They also expressed the opinion that the ban should be uniformly applicable to the neighbouring States and if possible also to neighbouring countries.

The respondents were of the opinion that there should be regional/local area/gear restriction as may be deemed appropriate to conserve specific resources which, should also be applicable to the neighbouring states. About one third of the respondents expressed the need for review of the MFRA of the State for incorporating necessary changes.

D.6. Andhra Pradesh

Methodology: A standard questionnaire provided by the Committee, translated into Telugu language was used for obtaining basic information on key aspects of interest to the Committee. The officials of the DoF and CMFRI carried out the consultations with

fisher stakeholders. A stakeholder meeting was held at Visakhapatnam on 6th of February 2014.

Analysis: The data was summarised based on the stakeholder categories such as mechanised, motorised and NGOs. In order to eliminate the bias due to inadequate response/representation, a three point weight was distributed according to economic importance to mechanised (2.1) motorised (0.6) and NGOs (0.3). The weighted data was used for summarising the responses and the results are given below.

Results: There was a predominant (80%) agreement on the usefulness of fishing ban though about one fifth of the respondents opined that it is good for fishery but not good for fishermen. Majority (48%) felt that the ban period helps breeding of fish and growth of young ones, whereas many respondents (41%) felt that it allows stock replenishment and a few (<10%) felt that it reduces fishing pressure.

On the adverse impacts of the ban, loss of livelihoods was indicated by more than 60 percent respondents, whereas about 35 percent opined that there was no improvement in the catch after the ban.

Regarding the ban period and duration about 26 percent respondents opined that the ban period and duration is appropriate whereas 30 percent opined that the period is appropriate but duration needs to be changed and about 33 percent felt that the ban period is not appropriate but duration is appropriate.

There was a wide range of opinion about the period of ban. May-June was suggested by about 51 percent of the respondents. April-June and April-May was suggested by about 16 % of the respondents each. June-July and November-December were other suggestions with equal (6%) vote. Majority of the respondents (60%) suggested 60 days ban while 34 percent were comfortable with the present duration of 45 days ban.

The majority (76%), representing all three categories opined for application of ban to all types of boats. However, some representatives of motorised sector and NGOs (15%) suggested application to only mechanised sector and about 10 percent called for application to both mechanised and motorised sectors .

Majority (67%) respondents expressed the view that rules should be followed by all the States uniformly but about one third opined that rules can vary from State to State. Nearly 92 percent opined that rules should be uniformly applied to all vessels fishing in the EEZ, a few (8%) opined that the rules can vary in territorial and extra-territorial waters. About the regional application of the rules, 67% respondents agreed but about 33 percent expressed the view that the rules need to be applied only to our EEZ.

Nearly 73 percent of the respondents were of the opinion that there could be regional/local area/gear restriction as may be deemed appropriate to conserve specific resources, which should also be applicable to neighbouring States. However, about 27% of the respondents, mainly from the mechanised sector expressed their views against local restrictions. While 38 percent of the respondents suggested a need for review of the MFRA and incorporating necessary changes, 62 percent opined for strict implementation of the MFRA.

D.7. Odisha

Methodology: A standard questionnaire provided by the Committee, translated into Odiya language was used for obtaining basic information on key aspects of interest to

the Committee. The DoF and CMFRI carried out consultations with fisher stakeholders and communicated to the Visakhapatnam RC of CMFRI.

Analysis: The data was summarised for two categories of stakeholders, namely mechanised, and motorised including NGOs. In order to eliminate bias due to inadequate response, a two point weight was distributed according to economic importance to mechanised (1.2) and motorised /NGOs (0.8). The weighted data was used for summarising the information and the results are summarised below.

Results: A general consensus prevailed on the usefulness of fishing ban. About 60 percent felt that the ban is good for fishery, whereas about 40 percent opined that it is not good for fishermen but good for fishery.

About 44 percent opined that the ban period helps the breeding of fish and growth of young ones, whereas about 34 percent were of the view that the ban permits replenishment of stocks. Only 12 percent opined that the ban ensures safety of the fishermen.

Surprisingly, a significant number of respondents of mechanised sector also expressed views like the ban did not result in increased catches after the ban (15%), it created loss of livelihoods (30%) and it is not applicable to all (15%).

The respondents from the motorised sector (40%) were in agreement with the period and duration of the ban whereas the respondents from the mechanised sector (60%) opined that the ban period is appropriate but duration needs to be changed.

Only the mechanised sector gave inputs on the period and duration of the ban. The suggested the period of ban was between April to June (40%) and May-July (20%). Majority of the respondents (40%) suggested 60 days ban, while 20 percent suggested 90 days ban.

The representatives of the mechanised sector (60%) suggested that the ban should be applicable to all types of boats, whereas motorised sector/ NGOs (40%) suggested application to only mechanised and motorised sectors.

All the respondents expressed the view that the ban should be uniformly applicable to neighbouring States. They also expressed the unanimous opinion that the ban should be applicable to vessels beyond the territorial sea. However, about 20 percent of the respondents opined against the application of the rules to neighbouring countries.

All the respondents were of the opinion that there could be local area/gear restriction as may be deemed appropriate to conserve specific resources, which should also be applicable to the neighbouring States. About 40 percent of the respondents suggested a need for review the MFRA for incorporating necessary changes, whereas nearly 60 percent expressed the view that the MFRA should be strictly implemented.

D.8. West Bengal

Methodology: A standard questionnaire provided by the Committee, was used for obtaining basic information on key aspects of interest to the Committee. Consultations with fishery stakeholders were carried out by both the staff of Visakhapatnam RC of CMFRI and officials of the DoF, Government of West Bengal, who communicated the information to the Visakhapatnam RC of CMFRI.

Analysis: The data was summarised based on the stakeholder categories such as mechanised, motorised and NGOs. In order to eliminate the bias due to inadequate response, a three point weight was distributed according to economic importance to mechanised (1.05) motorised (1.5) and NGOs (0.5). The weighted data was used for summarising the response and the results are summarised below.

Results: All the respondents agreed on the usefulness of the fishing ban. Majority felt that the ban period helps the breeding of fish and growth of young ones apart from ensuring safety of the fishermen.

About 60 percent of the respondents opined that the ban period is appropriate but the duration need to be changed whereas about 40 percent of the respondents felt that ban period and duration are not appropriate.

The suggested the period of ban between March to June with majority (70%) agreeing for April-June period while 22 percent preferring March-June. Majority of the respondents (81%) suggested 90 days ban while 18 percent suggested 60 days ban.

The representatives of the mechanised and the motorised sectors (forming 85%) opined for application to all types of boats, whereas NGOs (15%) suggested application to only mechanised and motorised sectors.

All the respondents expressed the view that the ban period should be applicable to vessels beyond the territorial sea. They also expressed the unanimous opinion that the ban should be uniformly applicable to neighbouring States and if possible also to neighbouring countries.

The majority of the respondents (78%) were of the opinion that there could be regional/local area/gear restriction as may be deemed appropriate to conserve specific resources which should be applicable to neighbouring States. However, about 22% of the respondents, mainly from the mechanised and motorised sectors expressed the view that there is no need for local restrictions. All the respondents suggested a need for review of the MFRA.

D.9. Lakshadweep Islands

Methodology: A standard questionnaire provided by the Committee, translated into Malayalam was used for obtaining basic information on key aspects of interest to the Committee. Consultations with fishery stakeholders were carried out by the Fishery Survey of India (FSI) in association with the DoF, UT of Lakshadweep. Eight stakeholders responded to the questionnaire.

Analysis: Since all the respondents were from a single type of fishing, namely pole and line, the data analysis was done assuming a single general group. The results are summarised below.

Results: About 38 percent of fishermen felt that the ban is useful for fishery whereas an equal number was unsure about the outcome. However, about 25 percent felt that it is not good for fishery. About 38 percent of the respondents felt that the ban period helps the breeding of fish and growth of young ones, while an equal percent felt it replenishes the stock. About 25 percent opined that it reduces overall fishing pressure. However, many respondents (50%) opined that the ban ensures safety of fishermen. A good majority (63%) were of the view that the ban adversely impacts jobs and livelihoods.

About 63 percent of the respondents opined that the ban period and duration is appropriate and about 13 percent suggested June-August as the period appropriate for the ban.

Regarding coverage and application of ban, 75 percent respondents suggested that it should be applicable to all types of boats and about 25 percent felt that it should be applicable to mechanised boats only.

All the respondents expressed the view that the rules should be followed by the neighbouring states, should extend beyond territorial waters and should also be applicable to neighbouring countries.

Nearly all the respondents (88%) were of the opinion that there could be regional/local area/gear restriction as may be deemed appropriate to conserve specific resources, which all the respondents opined should be applicable to neighbouring States (100%). Most of the respondents (88%) suggested a need for a review of the MFRA for incorporating necessary changes.

D.10. Andaman & Nicobar Islands

Methodology: A standard questionnaire provided by the Committee, translated into Hindi was used for obtaining basic information on key aspects of interest to the Committee. Consultations with fishery stakeholders were carried by the Port Blair Base of the FSI in association with the DoF of the UT of A & N Islands. Ninety-eight stakeholders responded to the questionnaire.

Analysis: There were no discernible categories among stakeholders for segregating the data. Therefore, analysis was done assuming a single general group. The results are summarised below.

Results: Majority of the fishermen (85%) felt that the ban is useful for the fishery whereas some felt that it is good for fishery but not good for fishermen. About 74 percent respondents felt that the ban period helps the breeding of fish and growth of young ones while about 18 percent felt it replenishes the stock. However, a good number of respondents opined that there was no improvement in the catch (26%) and the ban adversely impacts jobs and livelihoods (31%)

About 91 percent respondents opined that the ban period and duration is appropriate while only 3 percent felt that the duration needs to be changed. There were no suggestions from the stakeholders about the period or duration of the ban.

Regarding coverage and application of the ban, 50 percent respondents suggested that it should be applicable to mechanised boats only and about 32 percent felt that it should be applicable to all types of boats.

Most of the respondents expressed the view that the rules should be followed by the neighbouring States (88%) and the ban should extend beyond territorial waters (89%) and should be applicable, if possible to neighbouring countries (62%).

The majority of the respondents (89%) were of the opinion that there could be regional/local area/gear restriction as may be deemed appropriate to conserve specific

resources which should be applicable to neighbouring States (59%). Most of the respondents (77%) suggested a need to review the MFRA.

D.11. Goa

Methodology: A standard questionnaire provided by the Committee was used for obtaining basic information on key aspects of interest to the Committee. Consultations with fishery stakeholders were carried out by the staff of Karwar Research Centre of CMFRI in association with the DoF, Goa. Twenty-six stakeholders responded to the questionnaire.

Analysis: There were no discernible categories among stakeholders for segregating the data and therefore analysis was done assuming a single general group. The results are summarised below.

Results: All the fishermen (100%) felt that the ban is useful for fishery and it helps the breeding of fish and growth of young ones. At the same time about 73 percent felt that there was no improvement in the catch. Only a few (4%) opined that the ban adversely impacts jobs and livelihoods.

About 65 percent of the respondents opined that the ban period and duration is appropriate. While 19 percent of the respondents felt that the duration needs to be changed, 15 percent felt that the period and duration needs to be changed. About 81 percent suggested June-August as the ideal time for the ban where as 15 percent felt June-July as the ideal time for the ban. Significant number of respondents (31%) expressed the view that the ban should be for 60 days in one go.

Regarding coverage and application of ban, 46 percent respondents suggested that it should be applicable to mechanised and motorised boats only and about 42 percent felt that it should be applicable to all types of boats. Some (12%) also expressed the view that it should be applicable to mechanised boats only.

Majority expressed the view that the rules should be followed by the neighbouring States (100%) and should also extend beyond territorial waters (96%) and if possible it should also be applicable to neighbouring countries (100%).

The majority of the respondents (100%) were of the opinion that there could be regional/local area/gear restrictions as may be deemed appropriate to conserve specific resources which should be applicable to neighbouring States (96%). Most of the respondents (85%) suggested a need for review of the MFRA for incorporating necessary changes.

D.12. Daman

Methodology: A standard questionnaire provided by the Committee was translated into Gujarati language for obtaining the basic information on key aspects of interest to the Committee. Consultations with fishery stakeholders were carried out by the FSI in association with the DoF, Daman. Twenty-two stakeholders responded to the questionnaire.

Analysis: There were no discernible categories among stakeholders for segregating the data and therefore analysis was done assuming a single general group. The results are summarised below.

Results: All the fishermen (100%) felt that the ban is useful for the fishery and the ban period helps the breeding of fish and growth of young ones, it allows for stock replenishment, ensure safety of fishermen and reduces overall fishing pressure. Only a few (9%) opined that the ban adversely impacts jobs and livelihood.

Majority (91%) respondents opined that the ban period and duration is not appropriate. There was unanimous opinion that the ban period should be during May to August and the duration should be for about 90 days at one stretch.

All the respondents unanimously suggested that the ban should be applicable to all types of boats. Majority (95%) opined that the same rules should be followed by the neighbouring State and they should extend beyond territorial waters.

Unanimity prevailed on the need for local seasonal/area/gear restrictions and the application of the same rule by the neighbouring State. Most of the respondents (86%) suggested review of the MFRA for incorporating necessary changes.

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Appendix - e

Other Suggestions Given By Stakeholders during the Nationwide Consultations

The nationwide stakeholder consultations were conducted with the prime objective of elucidating the views of the stakeholders on the seasonal fishing ban and related issues of conservation and fishery regulations. This objective was achieved by getting the responses through a standard questionnaire. The stakeholders were given opportunity to express their views on other matters related to fisheries in the questionnaire. They were also given ample time to present their views orally during the consultation meetings.

Though some of the points mentioned may seem a little out of the context, they were captured and listed hereunder to give a cross-section of the general perceptions, aspirations and feeling in the fisheries sector at the point of time when the consultations were conducted.

Craft and Gear

Capacity restriction on the existing fishing boats was something which most stakeholders agreed and suggested immediate action. Freezing of the present number of vessels was felt a primary requirement. Apart from control of the number of fishing boats, cap on the power of engine and equipments onboard (higher hp Chinese engine became common due to competition and lack of control) are necessary. It was suggested that while issuing a permit to fishing vessels, fishermen representative must be consulted.

Trawling was perceived as an ecologically destructive fishing method by some stakeholders. The fact that bottom fauna gets disturbed during trawling and intensive trawling in the coastal waters adversely affects the bottom habitat was the basis of this perception. Among the various suggestions, restriction on trawlers above 200 hp in the coastal area and banning of trawling in the territorial waters as well as night trawling were important.

There were several suggestions on the operation of pelagic nets and gillnets which were allegedly practicing unscientific fishing. Small meshed pelagic nets were suggested to be banned. There was suggestion for excluding gillnets from the seasonal ban. In Gujarat it was suggested that rafal fishing boats should be permitted to fish up to a specified distance from the shore.

The ambiguity in nomenclature and logic of classification of craft and gear was also questioned by some respondents. Currently, it is difficult to distinguish the traditional boats and motorised boats. Therefore a uniform ban covering all types of vessels was suggested by many. The disparity in cut-off of hp of traditional boats to 10 hp in the East Coast and 25 hp in the West Coast was felt as discrimination.

Double engine traditional fishing boats (gillnets and even trawls with small otter board) are as destructive as the mechanised boats (gillnets/trawls). Traditional motorised boats are catching the ground fish. Tuna is attracted to sardine which is caught by *Surukkuvali* and *Retta madi*. Demersal fishes are being caught by pair trawl and ring seine. Conflicts are to be avoided by banning the ring seine. In Maharashtra certain fishermen demanded ban of purse-seine.

Small mesh size webbing should be banned at manufacturer's level. The mesh size of the fishing gear should be specific and regulated to avoid catching of juvenile fishes. Controls at the net manufacturing stage must be carried out in accordance with the prevailing mesh regulation.

Illegal Fishing

Illegal fishing by Indian and foreign vessels was another concern expressed by several fishermen. Majority demanded banning fishing by foreign fishing vessels, especially of the distant water fishing nations (DWFN). It was reported that vessels of Sri Lanka and other countries are fishing during the ban period. In addition, concerns were expressed on the vessels of one maritime State encroaching into the territorial waters of the neighbouring States. Overall, weakness in the monitoring, control and surveillance (MCS) regime was exposed indicating the need for strengthening the systems.

The LOP scheme also came under severe criticism as it is draining the valuable resources to the benefit of other countries. The security system is also threatened by the presence of foreign crew in fishing vessels in the Indian EEZ, permitted to operate under the LOP. An often asked question was whether the ban is applicable to LOP fishing vessels.

Conservation

Another important general concern was about the capture of spawners and juveniles by different gear. The capture and sale of shrimp seed to farms also was felt bad for the fishery. The need for conserving the soft shelled crustaceans was suggested by a few. There was a demand for taking strict punitive action on those who catch juveniles. The demand for conservation of small fish and juveniles is indirectly pointing towards the incorporation of mesh and gear regulations and amending the existing legal instruments. Placing controls on catching juveniles and reduction of by-catch must be given priority.

Conservation of coastal habitats also figured in the suggestions. Establishment of shelter belts as a part of coastal area development, control of coastal pollution by controlling disposal of waste, prohibition of factories in the coastal area, protecting the coral reefs, protection of the natural habitats such as backwater and other water bodies, and control of aquaculture activities were some important suggestions. It was suggested that creek fishery should be banned and support be given to the dependent people. The sewage and effluent discharge into the estuaries/sea should be strictly banned.

Apart from suggesting adoption of eco-friendly fishing methods, banning of destructive methods (using explosives), prohibition of using mosquito nets for fishing, enhancement by sea ranching of species (one suggestion was to release at least 15 % of the live prawns harvested from culture to sea for stock enhancement) were suggested. Steps should be taken on conservation of endangered sea animals, particularly turtle. Establishment of artificial reefs was also suggested.

Welfare and Support

The welfare and support to fishermen was another matter highlighted by several stakeholders. Among the suggestions that came up included, introduction of novel social security system for fishermen, expanding NREGA to fisheries sector, coverage of support to fish vendors and rehabilitation of fishers during extreme events was noteworthy.

It was stated that, Rs.150 given as daily wage (when market wage rate was Rs.600) is quite insufficient. The respondents preferred getting the compensation in hand instead of the present practice of depositing in the bank. It was stated that often relief is not going to the right people. Relief is also not available to widows, which is an anomaly that has to be rectified. Compensation of Rs.2000/- is not sufficient to support family with children, and increasing it to Rs.4000-10000 (Rs.7000 pm was felt reasonable by a few respondents) was indicated as appropriate. Compensation to the dependents of small boats and catamaran must be given when life is lost at sea. Support to elders must be enhanced from Rs.1105 to Rs.2000.

Simplifying the diesel subsidy scheme by removing various restrictions and enhancing the present ceiling on diesel subsidy were suggested. Relief for the boats, which are laid up was put forth in the form of forgone minimum return on investment. Subsidies on the fishing inputs and capital cost were also demanded by some fishermen. Some respondents were of the view that the present subsidy scheme for vessel is only useful for rich fishermen and demanded introduction of schemes benefitting all boats.

In Maharashtra, fishers demanded that the Government land be made available near coastal zone for fisher co-operative societies to build ice factory so that quality of the fish can be sustained. Prior information on place and time of availability of fish should be made available through PFZ forecast, though PFZ was not recommended during breeding season. Some stakeholders pointed out the need for livelihood diversification, educational support and programmes for creation of awareness about various issues of conservation and management.

Facilities and Infrastructure

Among other facilities demanded, provision of GPS and echosounder at 90% subsidy and establishment of a dedicated channel for *walkie talkie* to give weather warning to fishermen were noteworthy. Some opined that mesh regulation could be enforced only after providing fish-finding gadgets. To ensure quality of the catch all the respondents suggested that a good quality ice boxes should be provided with maximum subsidies.

Construction of more jetties of 300 m length at reasonable distances, establishment of infrastructure such as roads and ice factories, dredging of bar mouth for easy access to sea, dredging harbours, providing navigation light to the harbor, openings of the rivers and restoration of canals, etc. were other suggestions.

Regulation and Governance

There were several points on governance and discrepancies in the regulatory environment flagged by the stakeholders. A comprehensive national policy is felt as the need of the time. The policy of open access has to give way to regulated fishing. Respondents doubted how the fishing ban would help when some fishing gears are excluded from ban. Banned gears (ring seine) should be totally controlled, which requires strengthening the government enforcement machinery. The need for implementation of stipulated spatial demarcation by different classes of vessels as per the MFRAs was also highlighted. Avoiding fishing near shore and obeying the rules of fishing distance would be easy if rules were uniform among neighboring states.

There were numerous suggestions on strict implementation of the regulations by the State DoF. The fundamental requirement is to have the will to implement. There is a need for notification by States on the implementation of regulations in the

territorial waters. Marine Police and Coast Guard must keep an extra vigil on the boats during the rough season. The boats/ fishing vessels from different States entering into the neighbouring fishing area during the ban period should be prohibited. Coast guard patrolling should be strictly carried out during the ban period. GPS should be installed on all fishing boats to identify the area of fishing. Seized fishing vessels should be auctioned only through video recording.

Regarding the ban period, the suggestions varied widely. Majority agreed for 60-62 days (two months) ban. June-July is difficult for fishing operation and West Coast ban period coincides with rough season and breeding season. The deep-sea fishing group felt there is no need for ban on their operations. While some suggested only *Thudipu* (propulsion with oar) should go for fishing during ban. In Maharashtra it was suggested that fishing zone should be divided according to GRT of the vessel and dolnet and gillnet fishing by 1 or 2 cylinder engine boats should be permitted during the ban period.

Along the East Coast, some opined that August–September is the breeding season and ban could also be during October-November/December period which is windy and rainy, resulting in good catch for trawl but not for gillnets. Some suggested even February-March as a good season for ban while they felt April-June as more productive.

Community interventions

There is a need to inculcate self regulation which should be a sort of community intervention. Ban must be applicable to all boats completely under *Oor-kattuppadu* (community control). For strict implementation of MFRA, the views and suggestions from associations involved in marine fishery should be given priority, otherwise the rules are difficult to be implemented properly. Community level (village level) interventions are likely to be very effective.

Cooperation is needed for all conservation activities and the lack of unity among fishermen is evident in conflicts. Fishermen should be included as conservators so that there will not be any tussle between implementing authority and the fishermen. For conservation and management, fishery associations should be included in the government machinery. Village leadership should be promoted. Co-ordinated action by DoF and fishermen is inevitable for conservation of sanctuary area. Whenever the Government sets up any committee for resolving fishing related issues, fishermen consultation is must.

Studies and research

The need for undertaking studies on fish mortality, economics of the fishing to decide the cost and benefit, impact of climate change on fisheries and loss of fishing days were demanded by the fishermen. They also demanded studies on the socio-economic problems of the fishermen in each maritime state.

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Appendix - f

**Minutes of the first Meeting of the
Technical Committee to Review the Duration of the Ban Period and to
Suggest Further Measures to Strengthen the Conservation and Management
Aspects**

CMFRI, Kochi, 12 July 2013, 1000 h

The first meeting of the *Committee to review the duration of the fishing ban period and suggest further measures for conservation and management* was held at CMFRI, Kochi on 12 July 2013 at 1000 hrs. Nine Members and 8 representatives from the Kerala Fishing Trawlers Association attended the meeting (annexure-1). The committee carried out the business as per the agenda (annexure-2) which was circulated well before the meeting by e-mail and revised as per response and attendance.

Dr. G. Syda Rao, Director, CMFRI and Chairman of the Committee, in his opening remarks appreciated the action taken by the Ministry of Agriculture, Department of Animal Husbandry, Dairying and Fisheries in constituting the Committee for reviewing the fishing ban period and suggest conservation measures. He drew the attention of the members to the recommendations of the previous committee which submitted its report to the Government of India during 2010. He observed that many of the recommendations and conclusions made by the earlier committee are still relevant and the present committee can build up on them.

The Chair further briefed on the genesis of fishing ban in India which goes back to several decades when the fishermen from Visakhapatnam adopted a voluntary fishing ban during the lean period coinciding with the summer vacations. He further reminded the members about the need for balancing scientific information on fish species and socio-economic issues of stakeholders while deciding the season and duration fishing ban. Although one of the main objectives of fishing ban is protecting the fishes during their breeding period, the scientific information gathered by the CMFRI indicates that most of our fish species have protracted breeding season and many of them have peak breeding during March-April and September-October. Further, the fishermen and boat operators from Kerala are arguing that the seasonal fishery for *Karikkadi* shrimp (*Parapenaeopsis stylifera*) had been seriously affected due to fishing ban during monsoon months. Similarly, the fishermen from Tamil Nadu are demanding for rescheduling the ban period during March-April, October-November months.

The Chair therefore requested the members to think about rescheduling the fishing ban for taking care of all these issues. He cautioned the scientists and technocrats against blindly emulating fishery management models advocated by European fishery managers which had failed miserably in sustaining many of their fish stocks. The Chair also stressed the importance of alternate

management measures for replenishing the depleted marine resources and enhancing the production by the way of cage culture, mariculture, sea ranching, artificial reefs etc., in which the CMFRI has taken a lead role. He cited the examples of some of the South-east Asian countries which are successfully engaged in these methods in a big way. Our aim should be to enhance fish production, rather than sustain the fishery, he remarked.

Shri Vishnu Bhat, Fisheries Development Commissioner (FDC), MOA, New Delhi, while briefing about the background and circumstance of constituting the Committee, informed that the Government of India had implemented many of the recommendations of the earlier committee. However, there were representations from several State Governments and fishermen associations regarding the operation of purse seines, use of high powered engines in fishing boats etc. In addition, the developments in the international fishery scenario, especially proposal for implementation of quota system for tuna fishery by the Indian Ocean Tuna Commission (IOTC) and decision taken by the Government of Sri Lanka to allow the Chinese fishing vessels to use their ports has motivated the Government of India to have consultation with the stakeholders. The FDC informed the members that the Government of India desires that the Committee has to have more interactions/consultations with all stakeholders including fishermen, boat owners and technocrats working in this field.

He further informed that even though the alternative management measures like installation of artificial reefs, cage/mariculture, sea ranching etc. can be advocated for replenishing the fishery resources, we cannot belittle the importance of fishing ban, which had played a major role in the enhancing the fishery potential of Indian EEZ. The Committee also has to propose alternate livelihood measures for the fishermen affected by the fishing ban, the FDC noted. He informed that the Government had set the deadline for submission of the recommendations of this Committee as 31 October 2013. Since more time is required for consultations, deliberations etc., it may not be easy to meet this deadline and therefore, the Committee may request the Government of India to extend the deadline.

Dr. E. Vivekanandan, CMFRI made a presentation on the findings of the various committees constituted earlier for studying the seasonal fishing ban. It was observed that the annual fishing effort has reduced after implementation of ban which has helped in fish growth and recruitment. However, there are no indications of long-term sustainability of stocks. He cautioned that the spawning period alone cannot be the criterion for fixing the ban period. A combination of several regulatory measures is necessary. Further, the CMFRI is of the opinion that the total ban on purse-seine and ring-seine may lead to underutilization of the resources of small pelagics. Instead, a seasonal ban on these operations may be considered. He further suggested for a longer closure period and seasonal ban on all boats powered with more than 10 HP motor. He reiterated that, opinion of all coastal states has to be sought before submitting the recommendations by the Committee.

Dr. Leela Edwin, CIFT, opined that complete banning of purse seine operations is not advisable. The purse seiners are consuming only one-fourth of the fuel consumed by other types of fishing. Further blanket ban on the purse seine operation may lead to underutilization of small pelagic. She called upon to embark on a new programme on Life Cycle Assessment studies of different gears. The need for standardization of the craft and gear and bringing regulations at the production level is an area to be considered seriously. Dr. Leela Edwin invited the attention of the members to the importance of enforcing of MFRAs especially the provisions for mesh regulations, by-catch reduction devices etc.

Shri. Rambhau Patil, representing National Fish-workers Forum (NFF) highlighted the ill effects of purse seining, which is nowadays done very near to shore. He requested the Committee to recommend regulating the size of purse seine nets and the area of their operation as well as measures to stop exploitation of juvenile fish. He further requested that, the Committee has to convene more and more stakeholder meetings in every state, since the demands and grievances fisherman differ from state to state.

Shri C. Munianathan IAS, Director of Fisheries, Government of Tamil Nadu, made a presentation on the fishery management system adopted by the Government of Tamil Nadu and the developments regarding installation of artificial reefs and FIMSUL project. The peculiar situation in Kanyakumari District, which spread from east to West Coast, with respect to implementation of the current system of ban, was explained. He suggested for recommending uniform fishing ban period for both east and West Coast in Tamil Nadu and imposing of ban period in two spells (15th July to 14th August and 15th October to 14th November) for 30 days each instead of one time ban period for 45 days.

He further stressed the need for banning mechanised fishing vessels and motorised crafts except non motorised traditional crafts during fishing ban period. Enhancing the relief assistance during fishing ban period, ban on permitting foreign fishing vessels in our waters, measures to prevent poaching by neighboring countries are other points to be recommended by the Committee. He further requested the Central Research Institutes to develop protocol for sea ranching programme throughout the country and to undertake resource enhancement programmes such as setting up of artificial reefs all along the coast.

Dr. P. U. Zachariah, CMFRI stated that the major spawning period of pelagics is during March-June and demersals during September-October, a ban of 30 days duration each during these periods will help to protect the spawners. However, the demand from the industry to shift the ban period, just for catching seasonal fishes like *Karikkadi* and nemipterids must be approached with caution. He opined that instead of a common period of ban throughout, a zone-wise regulation may be more practical.

Dr. K. Vijayakumaran, DG, FSI opined that it is very difficult to evolve a seasonal closure accommodating the regional aspirations of the fishers as well as the characteristic features of the resources. The variability in the multi-species fisheries is so great that static models of conservations would be compromising

on several aspects. The prohibitive numbers would not permit adoption of dynamic prediction based measures. The major issues are related to the complexities arising from resource boundaries and political boundaries. There is a need to look into the policy instruments to harmonize these two aspects for any management measure to succeed. Putting micro-level closure periods, though desirable, would be highly impractical. The measures suggested are to be tuned with the state machinery available for implementation. Otherwise the instrument would remain in paper. That is the point where historically a uniform ban had been adopted. These matters have to be considered by the committee while suggesting the recommendations.

As Dr Y S Yadava, Director BOBP-IGO could not attend the meeting he had submitted some inputs for the consideration of the Committee. Copies of the same (Annexure-3) were distributed to all members present and there were no comments or discussions on the matters presented therein.

In addition, a group of representatives from All Kerala Fishing Boat Operators Association were allowed to make oral presentation on their views regarding seasonal ban. They conveyed that the ban during monsoon period deprives the trawl fishing industry from enjoying the fruits of exploiting of seasonal resources such as *karikkadi* shrimp, nemipterids and lizardfish. The peak abundance of these resources coincides with the ban period when trawl, the important method that can exploit these resources, is prohibited. They also mentioned that the revenue earned during the one month *karikkadi* season would be sufficient to compensate the reduced revenue from fishing during the rest of the year. The gist of the presentation is summarized in Annexure-4

The Chairman thanked the fishing industry representatives for their active participation in the deliberations. He further assured the representatives that, they can submit their suggestions and opinions to the Committee at any time. The Committee members requested the boat operators to adopt a self regulation on the control of trawl speed, fishing on juvenile fish, brooders etc.

In his concluding remarks, the Chairman briefed about the CHLORIFFS programme being undertaken by the CMFRI in collaboration with the FSI and SAC. Further, he opined that the suggestions by the Kerala fishermen are very constructive and the Committee has to build upon their views while approaching the fishermen in other states during stakeholder meetings.

The following action points were resolved

Recognizing the need for more time to complete the transactions the Committee agreed for requesting the Government of India to extend the deadline for submission of the Committee report to 31 March 2014. Stakeholder consultations shall be organised in all maritime states for enabling the industry and fishermen to express their views before the Committee. The organization of the state level stake holders meetings will be coordinated by the following institutes/Departments:

State/ Union Territory	Agency/ Institution Responsible
Tamil Nadu and Puducherry	Dept. of Fisheries, Govt. of Tamil Nadu
Andhra Pradesh, Odisha and West Bengal	Visakhapatnam RC of CMFRI
Gujarat and Maharashtra	Mumbai RC of CMFRI
Karnataka and Goa	Mangalore RC of CMFRI
Kerala	Headquarters/RCs of CMFRI
UTs of Daman, Lakshadweep and Andaman and Nicobar Islands:	Fishery Survey of India.

The sister organizations and state departments shall extend all support for the conduct of the stakeholder meetings. The DG, FSI assured to extent all the helps from the Institute to CMFRI for organizing the stake holder meetings.

It was decided that the stakeholder meetings and consultations shall be completed by October 2013 and the next meeting shall be convened immediately after that. The respective institutes shall consolidate the outputs of the consultations and present at the meeting.

It was agreed that representations in writing from stakeholders can be accepted by the office of the Chairman for further discussion in the next meeting.

Further, the members agreed to request the NFDB to fund for organizing the stakeholders meetings in every state in a big way, with maximum participation from the fishing industry and fishermen.

The DG, FSI thanked the MOA for constituting the Committee with highly contemporary and relevant TOR. As the Convener of the Committee, he specially requested FDC to address the issue of travel support to Non-government members and also recommend for providing support for conduct of stakeholder meetings by institutions. Further, he thanked the Director CMFRI for hosting the meeting and all the members and representatives of the fishing industry for their active participation and valuable inputs. He commented on the exemplary leadership Dr Syda Rao was giving the CMFRI and the fisheries sector in the country and wished that his constructive support to the Committee would be available even after his retirement. The meeting came to an end at 1230 hrs.

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Annexure-1

First Meeting of the
Technical Committee to Review the Duration of the Ban Period and to Suggest Further Measures to Strengthen the Conservation and Management Aspects

CMFRI, Kochi, 12 July 2013, 1000 h

List of Participants

	Name Designation and Affiliation	Phone/Mobile No and e-mail id
Members		
1.	Dr G Syda Rao, Director, CMFRI, Kochi	09446344513, gsydarao@gmail.com
2.	Shri B Vishnu Bhat, FDC, DAHDF, MoA, new Delhi	011 23386379,09868203214, bhatbvishnu@gmail.com
3.	Dr E Vivekanandan, Emeritus Scientist, CMFRI, Chennai	09444238648, evivekanandan@hotmail.com
4.	Shri C Munianathan, IAS, Director of Fisheries, Govt. of Tamil Nadu	09445205404
5.	Dr Leela Edwin, Principal Scientist and HoD, CIFT, Kochi	09446095524, leelaedwin@gmail.com
6.	Shri Rambhau Patil, Chairperson, NFF, Mumbai	09892833815, patil.rambhau@gmail.com
7.	Dr K Vijayakumaran, DG, FSI, Mumbai	09448312631, vijayettan@yahoo.com
Special Invitees		
8.	Dr P U Zachariah, Principal Scientist and HoD, CMFRI, Kochi	09495149414, zachariapu@yahoo.com ,
9.	Shri K Rangarajan, Addnl Director, Dept of Fisheries, Tamil Nadu	09444070783, krrajanjdf@gmail.com
10.	Sijo P Varghese, Sr Fishery Scientist, FSI, Kochi	07736437772, varghesefsi@gmail.com
Fisher Representatives		
11.	Joseph Xavier Kalapurakkal	09400947072
12.	P X Stanley	09847044003
13.	P P Gireesh	09895969771
14.	Peter Mathias	09847910931
15.	Aloysius Yohannan	09847355669
16.	Babu Francis	09947250095
17.	Sebastian Antony	09847072835
18.	K Nandakumar	09447988744

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Annexure-2

First meeting of the
Technical Committee to Review the Duration of the Ban Period and to Suggest Further Measures to Strengthen the Conservation and Management Aspects

CMFRI, Kochi, 12 July 2013, 1000 h.

Agenda

1.	Welcome and Introductory remarks by Chair	Dr G Syda Rao, CMFRI	1000
2.	Adoption of the Agenda	Members	1010
3.	Background and circumstance of constituting the committee	Representative of DAHDF	1015
4.	Briefing on the findings of previous Committees	Dr E. Vivekanandan, CMFRI	1025
5.	Comments and concerns of the Maritime States	Representative of Tamil Nadu	1045
6.	Comments and concerns of the stakeholders	Representation by AKFBOA	1055
7.	Views by representative of CIFT	Dr Leela Edwin, CIFT	1105
8.	Views by representative of FSI	Dr K Vijayakumaran, FSI	1125
9.	Views by representative of CMFRI	Dr P U Zacharia, CMFRI	1135
10.	Discussion on the approach and methods	Members	1145
11.	Setting Business rules and time-line, forming subcommittees and assigning tasks, Co-opting members	Members	1215
12.	Any other matter	Members	1230
13.	Summing up by the Chair	Dr G Syda Rao	1240
14.	Vote of thanks	Dr K. Vijayakumaran	1250

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Annexure-3

First Meeting of the Technical Committee to Review the Duration of the Ban Period and to Suggest Further Measures to Strengthen the Conservation and Management Aspects

CMFRI, Kochi, 12 July 2013, 1000 h.

Inputs for consideration of the Technical Committee at its First Meeting¹

The Department of Animal Husbandry, Dairying and Fisheries (DAHD&F), Ministry of Agriculture, Government of India vide its office order dated 07 May 2013 constituted a Technical Committee (TC) to 'Review the duration of the ban period and to suggest further measures to strengthen the conservation and management aspects'. The TC with a membership of 09 members (including the Chairman and Member Convener) is tasked with the following works:

- 1) To assess the impact of fishing ban in view of livelihood issues, fish landings etc. on the available data of coastal states and UTs and review its duration.
- 2) To suggest ban on purse seine fishing operation in the Indian Coast.
- 3) To suggest further measures for strengthening conservation and management measures in marine fisheries.
- 4) To suggest measures for strict implementation of the Marine Fishing Regulation Acts (MFRA).

The TC has been directed to assess the issues from all angles and submit its report on or before 31.10.2013 with suggestions and recommendations.

Being the first meeting of the TC and in the absence of any background document concerning the tentative agenda, the following paragraphs are placed before the TC as inputs for consideration. These inputs have been placed in the same sequence as the Terms of Reference (ToR) in the office order of the DAHD&F.

The main task before the TC is to comprehensively review the ban period and suggest changes, if any to the existing period which is 15 April to 31 May for the East Coast States and 15th June to 31st July for the West Coast States. As the TC might be aware the 'uniform' ban on fishing for the East and West Coast States came into effect in the late nineties (1997-99)². A National-Level Committee was constituted for the purpose and the Committee after obtaining inputs from the Central Marine Fisheries Research Institute (CMFRI) and some coastal States agreed on the monsoon ban period, which was subsequently also agreed by all the coastal States and Union Territories/UTs).

After a gap of 7-8 years (in the year 2005), the CMFRI was asked to review the ban period, its impact on the resources and livelihoods and the institute suggested continuation of the ban period as it was found to be useful for the conservation of the resources and in turn livelihoods were sustained³. In the last couple of years there have been several instances when some States (and also fisher associations) have voiced the need for extending the ban period. In view of these developments it is suggested that TC may consider preparing a structured questionnaire through which the views of all the coastal States/UTs; key fisher organizations and other concerned stakeholders may be invited. The information received through the questionnaire will provide a wider perspective on the impact of the monsoon fishing ban on livelihoods and fisheries and help the TC in arriving at more informed suggestions/ recommendations to the Government. It is suggested that the TC may not consider expanding the Committee by co-opting members. Rather written views may be sought through the proposed questionnaire and other means.

The TC has been directed to advise the Government on ban on purse seine fishing operations in the Indian coast. In this regard the TC may like to be informed that some coastal States have

provisions in their Marine Fishing Regulation Act (MFRA) to ban purse seining⁴, although enforcement of the ban may not be strictly carried out. While considering the pros and cons of the ban on purse seining (or its variant the ring seines), the TC may also consider the fact that in recent years the small pelagic fishery has increased manifold and the increase in purse seine fishery (or the ring seines) is also a product of this change in the species composition. Further, the TC may also like to keep in mind that the DAHD&F vide its order of 18 January 2013 enclosing the 'New Guidelines for Fishing Operations in the Indian Exclusive Economic Zone', has permitted tuna purse seining as a resource –specific fishing practice under the Letter of Permit (LoP) Scheme. Vessels above 20 more OAL are permitted under this Scheme.

In the last two TORs, the TC has been directed to suggest measures for strengthening conservation and management measures in marine fisheries and strict implementation of the MFRAs. As these two TORs are inter-related and lead to sustainable use of the marine fisheries resources, my brief response is that strengthening of the Monitoring, Control and Surveillance (MCS) regime and the promulgation of an Act to regulate fishing in seas beyond Territorial Waters (> 12nm) are pre-requisites for sound fisheries governance and management. Without these two mechanisms in place, it may be difficult to strengthen conservation and management measures in the marine fisheries sector. Mere rhetoric will not carry us too far and there is an urgent need to put good management measures in place.

The DAHD&F may also consider providing the TC with copies of the draft MCS Scheme and the Bill for Regulating Fishing in the EEZ. Finally, on the issue of strengthening conservation and management measures, the TC may like to be informed that another Committee⁵ set up by the DAHD&F under the chairmanship of Joint Secretary (Fisheries) is also tasked to attend to this aspect. Some members of this TC are also on the other Committee.

Notes

- 1 *By Dr Yugraj Singh Yadava, Director, Bay of Bengal Programme Inter-Governmental Organisation, 91, St. Mary's Road, Abhiramapuram, Chennai – 600 018, Tamil Nadu, India. The view expressed here are of the author and not of the Organization to which he is currently affiliated to.*
- 2 *West Coast States/UTs like Daman & Diu, Maharashtra, Goa, Karnataka and Kerala and East Coast State like West Bengal were implementing the monsoon ban on fishing prior to the 'uniform' ban.*
- 3 *The DAHD&F may consider providing copies of the CMFRI Report to the TC.*
- 4 *Purse seining is banned in Tamil Nadu. In Karnataka it is banned up to 10 nm. In Lakshadweep, it is banned in the Territorial Waters.*
- 5 *Committee to Work out the Revised Fleet Plan for the Indian Exclusive Economic Zone.*



Annexure-4

First meeting of the
Technical Committee to Review the Duration of the Ban Period and to Suggest Further Measures to Strengthen the Conservation and Management Aspects

CMFRI, Kochi, 12 July 2013, 1000 h.

Summary of the Oral Presentation by All Kerala Fishing Boat Operators Association

Shri Joseph Xavier Kalapurakkal, General Secretary, All Kerala Fishing Boat Operators Association, invited the attention of the members to difficulties and problems faced by them due to the scheduling of fishing ban. He informed that, the members of his association are not against observing the fishing ban. However, according to him, the present period of fishing ban is totally unscientific, since number of studies by CMFRI has shown that the breeding season of most of the groundfish, which most of the trawlers are aiming for, is during October-November. The fishermen's own experience is that most of the groundfish (especially cephalopods) breeds during the October-November. Further, the present period of fishing ban is adversely affecting the economic security of Kerala boat operators and fishermen as the major chunk (~80%) of their income was from the fishing done during the monsoon season, mainly for the *Karikkadi*, threadfin breams and lizardfish, which are abundant in the inshore waters during monsoon seasons.

Since most of these resources will be moving away from the reach of fishermen after the monsoon season, and as most of these fishes have life span of a year, they are lost forever, he opined. Their Association is not against the present duration (45 days) of fishing ban. However, the total denial of their work opportunity and livelihood for a prolonged period in a single stretch is affecting their socio-economic security, he informed. He therefore pleaded the Committee for recommending the rescheduling of the fishing ban period in two spells, during March-April and October-November. He further requested the Committee to advise the Government on the following issues:

- Measures for avoiding the middlemen of fish trade, who are actually deciding the price of fish which fishermen land;
- Measures for controlling the speed of trawling by appropriately installing speed controllers and other design changes;
- Control the poaching of foreign vessels in Indian waters, especially during ban period and Stop issue of LOP to foreign vessel to operate from India;
- Regulate the Horse Power of fishing boat engines and put a cap on fishing capacity (number of boats) so that only replacement is permitted against damaged/decommissioned boats.

Other representatives of the Association (S/Shri Peter Mathias, Aloysius Yohannan) who spoke later also echoed the grievances and demands made by Shri Xavier. They strongly demanded that the period of fishing ban during monsoon season should be rescheduled. Since during monsoon, most of the fish come to near shore and therefore, the fishermen need to expend minimum fuel, which can add to the economic security of the nation as well as help in reducing the carbon emission, they highlighted. Further, they demanded that the purse seine operations, at least during monsoon seasons should be banned. They highlighted that most of the pelagic fish breed during monsoon season and allowing the purse seiners to operate during monsoon will be detrimental for the pelagic fishery. They observed that if the purse seining/ring seining is not banned during the fishing ban period, the ban will be a just ritual. Further they grieved that they are not getting the diesel subsidy and other incentives announced by the Government for the fishermen and fishing industry.

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Appendix – g

**Minutes of the Second Meeting of the
TECHNICAL COMMITTEE TO REVIEW THE DURATION OF THE BAN PERIOD
AND TO SUGGEST FURTHER MEASURES TO STRENGTHEN THE
CONSERVATION AND MANAGEMENT ASPECTS**

CMFRI, Kochi, 30TH May 2014

The second meeting of the *Committee to review of the duration of the fishing ban and suggest further measures of conservation and management aspects* was held at CMFRI, Kochi on 30th May 2014 at 11:00 h. The following officials were present:

1. Dr. A. Gopalakrishnan, Director, CMFRI, Kochi
2. Dr. Y. S. Yadava, Director, BOBP-IGP, Chennai
3. Shri Premchand, Director General I/C, Fishery Survey of India, Mumbai
4. Dr. Leela Edwin, Principal Scientist & Head, Central Institute of Fisheries Technology, Kochi
5. Shri S. Mohana Pai, Assistant Commissioner (Fy.), DAHDF, New Delhi
6. Dr. P.U. Zacharia, Principal Scientist & Head, Demersal Fisheries Division, CMFRI, Kochi
7. Dr. K. Vijayakumaran, Principal Scientist, Madras Research Centre of CMFRI, Chennai.

Dr Vijayakumaran informed that Shri Munianathan, IAS, Director of Fisheries, Tamil Nadu who arrived the city the previous day to attend the meeting had to return back to Chennai for attending an important meeting called by the Chief Minister. He had conveyed his inability to be present at the meeting and had sent some papers for the Committee's perusal.

The committee adopted the agenda (annexure-1) and approved the minutes of the first meeting of the Committee. Deliberating on the key roles played by Dr. P.U. Zacharia and Dr. K. Vijayakumaran, the Committee formally approved and co-opted them as members.

At the very outset, Dr Gopalakrishnan, Director, CMFRI and Chairman of the Committee welcomed all the members and stated that the Committees business suffered primarily due to the change of officials in key positions (chairman and member secretary) 'immediately after the first meeting. However, he informed that Stakeholder consultations were conducted in almost all the States and a draft report is being prepared by Dr. P.U. Zacharia and Dr. K. Vijayakumaran.

Chairman appreciated the effort of DG, FSI for the contributions made for conducting the Stakeholder consultation in Maharashtra and said that the outcome of the meeting was included in the draft. The Chairman then invited comments from members on the responsibilities of the Committee, business carried out so far and the way forward. He particularly invited comments on how the recommendations of the Committee are going to be implemented if they differs from the State's perspective.

In response Dr. Yadava pointed out that for the first time the Ministry of Agriculture has asked whether any extension of the fishing ban period is required. Therefore, the main task of this Committee is to suggest changes, if any, to be made in the existing ban period. He observed that only Kerala State has set up a committee to look into fishing

ban and related subjects. Since the Union Ministry's orders are meant for uniform application along the entire coastline, thus reducing conflicts between fishers of the neighbouring states, the decisions taken at the Union level should prevail.

Further, Dr Yadava stated that the States normally should abide by the policy decisions made by the Union Government. Supporting this view, Shri Mohana Pai opined that larger policy should be framed by the Government of India and the Union Ministry should stress on the idea that unless the policy decisions on conservation are not uniformly abided by the states, the objectives of conservation of marine ecosystem cannot be achieved.

Dr Vijayakumaran made a presentation on the progress of work and mentioned that except Goa and Puducherry, stakeholder consultations were completed in all the other States and the draft report tabled contain the consolidated information with tentative recommendations. He also showed a tentative structure of the report and requested members to give critical inputs for the preparation of the report.

Further, a consolidated chart showing the spawning period of major commercial species was circulated to generate discussion on the biological basis of conservation. Dr Vijayakumaran also read out the note (recommendations) communicated by Director of Fisheries, Tamil Nadu (Annexure-2) for comments by the members.

An important point emerged during the discussions with the comment made by Dr Yadava that the report should address every aspect of the TOR in dedicated section/chapters. Only item 1 has been addressed under the current draft report and the other three points of TOR are yet to be articulated in the report. This required a total modification of the present draft. The structure of the report by the recent Committee by Kerala was commented as excellent and worth emulating.

Based on the comments and discussions, consensus arrived on the following points related to TOR-1 (*To assess the impact of fishing ban in view of livelihood issues, fish landings etc. on the available data of coastal states and UTs and review its duration*):

There should be a uniform ban and the period should be extended to 61 days. As the fishing sector is engaging workers from different States, two lay-offs are not feasible and the ban should go in one stretch. Further, about sixty daytime is also optimum for carrying out the annual maintenance of vessels. The ban period for West Coast should commence from 1st June and end on 31st July (61 days) every year. The ban period for the East Coast should commence from 15th April and end on 14 June (61 days) every year.

A special sub-section (A box) of the report may focus on the minor change that could be suggested in the ban period for specific class of vessels in Kollam district to exploit *Karikkadi* shrimp species available during monsoon period, with compensatory non-fishing period imposed on such vessels during other periods. The involvement of community in management must be indicated.

Detailed scientific report has to be prepared and important suggestions can be added as Annexures. Relevant points from the old report can also be reproduced. Spawning of fishes can figure as a sub-chapter. The chart tabled at the meeting could be updated with latest names of species.

The State-wise analysis of the responses received from the stakeholders can form an annexure with some linking text in the chapter dealing with TOR 1. The

response sheets from various consultations must be kept as record at the Chairman's office for a reasonable period. This can be conveniently kept as soft (scanned) copies or hard (bound volumes) properly labeled.

Discussion on TOR 2 (*To suggest ban on purse seine fishing operation in the Indian coast*) was critical on the nomenclature of the TOR as ring-seines, the near-equivalent of purse-seines, with more potential to catch pelagics seemed out of purview. The Committee deliberated on the issue and reached a consensus that barring the stake structure and difference in the craft, both purse-seine and ring seine are to be considered as having similar biological impact and, therefore, need to be treated similarly while imposing ban.

The Committee also felt that the sixty-one day ban on mechanised and motorised crafts should apply equally to purse-seine and ring-seine boats. The need of the hour is to strictly impose regulations on mesh and total fishing effort

Dr Leela Edwin expressed a concern that operation of ring-seine during the ban period is ensuring fish supply to local market and considerable livelihood opportunities will be lost if the ban is imposed on ring seine. Dr Yadava mentioned that treating ring seines as traditional motorised gear has created several problems. The Committee after deliberations felt that selective relaxations on any motorised gear would further complicate the matter and create opportunities of conflicts.

It was resolved that a dedicated chapter would be appropriate to deal with the TOR 2 and it should be drafted with inputs from Dr Edwin as well as information from CMFRI. In addition to the background and justifications (such as energy efficiency) on allowing purse-seining and ring-seining, the chapter should focus on the various options of management. The technical specifications of mesh size, gear size, size of engine, size of craft and number of boats and area of operation, resources caught, freezing existing number of ring seines/purse, etc should also be kept in mind.

The third item of the TOR, *to suggest further measures of strengthening conservation and management measures in marine fisheries*, was discussed by the Committee and it was suggested that some concrete suggestions could be made on this topic. Dr Yadava mentioned that the points could overlap with the outputs of two other Committees constituted by the Ministry (A few members are also represented on the other committees currently). It could be desirable to suggest referring to the outputs of the other committees also.

The Committee took up discussions on the fourth item of the TOR, *to suggest measures for strict implementation of Marine Fishing Regulation Act (MFRA)*, in detail and felt that strict implementation of MFRA should be done. The MFRA should be updated periodically and amended as and when issues arise. Further, measures of conservation have to be incorporated for strict implementation. The inputs provided by the stakeholders on MFRA have to be incorporated in the report.

Dr Yadava suggested creation of awareness among the State fisheries officials about the MFRA. He also opined that the punishment clause in the MFRA needs to be relooked into. Further, the MFRA should be available in the language spoken in the coastal State as well as in Hindi to all concerned (Kerala is the only state where the MFRI has been translated into the local language). A simplified version of the Act and rules should be prepared for the information of general public. Regular short-term orientation courses should be conducted for the DoF officials on the Act and, its provisions and implementation aspects. These are the fundamental requirements, he said.

The Committee also felt that the MFRA's must be made available in the local language and in public domain and periodic training and refresher courses must be held for extension officials on provisions and rules of MFRA. The need for strengthening the existing machinery and diverting focus from welfare to regulation was felt as the need of the time. The introduction of log books, token systems and other management measures also came for discussion. Quota system was felt unsuitable for the Indian fisheries.

The Committee also deliberated on the suggestions given by the Director of Fisheries, Tamil Nadu. While the first three points are in tune with the general conclusions of the Committee, the fourth point requiring treatment of Kanyakumari District on par with West Coast was felt reasonable. The Committee felt that this aspect can figure in the recommendation.

In conclusion, the Committee arrived at the timeline for the completion of the tasks. The deadline for preparing the draft report by Chairman was agreed to as 15th June 2014. The draft shall be circulated among the members and comments obtained by 20th June. The final draft after incorporating comments shall be submitted to Joint Secretary (Fisheries), DAHDF by 25th June. The final report should be submitted after approval of the draft.

It was suggested and approved that Dr Vijayakumaran and Dr Zacharia prepare the draft within the stipulated date. If any member has a suggestion for incorporation into this report, they can add and send the soft copy by mail to all the members for information.

The Chair made his concluding remarks stating that the meeting was very productive and hoped that the responsibility entrusted on the Committee shall be completed as agreed. Dr Zacharia said that the meeting was quite useful and deliberations meaningful. He thanked all the members and the Chairman for their presence and active participation. The meeting came to end at 1600 h.

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Annexure 1

Second meeting of the committee to review the duration of the fishing ban period and suggest further measures for conservation and management.

Central Marine Fisheries Research Institute, Kochi 628 018

Friday, the 30 May 2014, 1100 h.

Agenda

1.	Welcome and Introductory remarks by Chair	Dr A Gopalakrishnan	1100
2.	Adoption of the Agenda	Members	1110
3.	Approval of the Minutes of the first meeting	Members	1115
4.	Formal co-option of members	Members	1120
5.	Briefing on the findings of Stakeholder consultations	CMFRI/FSI/ Govt of TN	1135
6.	Presenting the current status report	Representative of CMFRI	1200
7.	Comments and suggestions by members	Members	1210
8.	Remarks by the Chair	Dr A Gopalakrishnan	1230
9.	Any other matter	Members	1240
10.	Summing up	Representative of CMFRI	1250
11.	Vote of thanks	Representative of CMFRI	1300



Notes:

Item 4. Two scientists of CMFRI, Dr P U Zachariah and Dr K Vijayakumaran had been actively involved in the Committee's work and they are to be formally co-opted for recognising their services.

Item 5. Countrywide stakeholder consultations were conducted by CMFRI FSI and Dept of Fisheries.

Annexure 2

Recommendations Suggested by the Director of Fisheries, Tamil Nadu (Communicated to Dr K Vijayakumaran at Kochi)

- Seasonal fishing ban period may be increased from present 45 days to 60 days commencing from 15 April to 14th June every year.
- The seasonal fishing ban may be extended to motorised fishing crafts
- Traditional fishing crafts (non-motorised) may be exempted from the seasonal fishing ban.
- A uniform fishing ban in the entire coast line of Kanyakumari District starting from Arockiapuram fishing village in the East to Neerodithurai fishing village in the west may be imposed along the West Coast ban period, i.e., 1st June to 30th July (60 days) viz. fall in line with Kerala State.

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