



Food and Agriculture
Organization of the
United Nations



सत्यमेव जयते
DEPARTMENT OF
FISHERIES



Pradhan Mantri
Matsya Sampada Yojana
(PMMSY)

Brainstorming Session on India's Preparedness for Adapting to Climate Change in Marine Fisheries

17-18 October 2023 | Mahabalipuram

Organized by



BOBP



NFDB

**Brainstorming Session on
India's Preparedness for Adapting to
Climate Change in
Marine Fisheries**

17-18 October 2023 | Mahabalipuram

Organized by



BOBP



Preparation of Report

This report on “Brainstorming Session on India’s Preparedness for Adapting to Climate Change in Marine Fisheries” is jointly prepared by BOBP-IGO and NFDB.

The Brainstorming Session was conducted alongside the “International Conclave on Mainstreaming Climate Change into International Fisheries Governance and Strengthening of Fisheries Management Measures in the Indo-Pacific Region”.

The designations employed and the presentation of material in this document do not imply the expression of any opinion whatsoever on the part of BOBP-IGO concerning the legal or development status of any country, territory, city or area or of its authorities or concerning the delimitation of its frontiers or boundaries.

Compilation & Editing

Dr. P. Krishnan, *Director, BOBP-IGO, Chennai*

Dr. L. Narasimha Murthy, *Chief Executive i/c, NFDB, Hyderabad*

Dr. Ahana Lakshmi, *Independent Researcher*

Dr. Nitin Verma, *Senior Technical Assistant, DoF, GoI*

Dr. Kishore Davala, *Professor, Nalanda University, Rajgir*

Dr. E. Vivekanandan, *Advisor, BOBP-IGO, Chennai*

Mr. Rajdeep Mukherjee, *Policy Analyst, BOBP-IGO, Chennai*

Dr. M. Sri Hari, *Project Scientist, BOBP-IGO, Chennai*

Preferred Citation

BOBP-IGO., 2023. Brainstorming Session on India’s Preparedness for Adapting to Climate Change in Marine Fisheries – Event Report. Bay of Bengal Programme Inter-Governmental Organisation. 20 pp.

CONTENTS

Overview of the Event	1
Session I: Status of Indian Fisheries with respect to Climate Change and Adaptation Strategies	2
1.1. Lead Talk: Priority areas of research and development for climate-resilient fisheries in the BOB region.	2
1.2. Panel I: Research Advancements in Building Climate Resilience in Fisheries Sector	2
1.2.1. <i>Marine Fisheries</i>	2
1.2.2. <i>Brackishwater Aquaculture</i>	2
1.2.3. <i>Inland Fisheries</i>	3
1.2.4. <i>Fishing Technology</i>	3
1.2.5. <i>Ocean Technology</i>	3
1.3. Panel II: Preparedness of Coastal Communities	4
1.3.1. <i>Building Resilient Coastal Communities: ICZM Experiences</i>	4
1.3.2. <i>Adapting the Communities and Enhancing their livelihoods</i>	4
1.4. Panel III: Development and Application of Technologies for Climate Resilience	4
1.4.1. <i>Ocean Information Services from INCOIS</i>	4
1.4.2. <i>Coastal Vulnerabilities and Protection Strategies</i>	4
1.4.3. <i>Building Evidence-based Adaptation Strategies for Resilience among SSF in India</i>	5
Session II: Knowledge Sharing and Capacity Development for Climate Proofing Marine Fisheries in BOB Region	5
2.1. Lead Talk: Driving Capacity Development in BOB Region for the UN Ocean Decade	5
2.2. Experiences from South Asian Countries	6
2.2.1. <i>Bangladesh</i>	6
2.2.2. <i>India</i>	6
2.2.3. <i>Maldives</i>	6
2.2.4. <i>Sri Lanka</i>	7
Session III: Plenary Session on Climate-Resilient Fisheries Management	7
3.1. Lead Talk: Climate-Resilient Fisheries Management	7
3.2. Summary of Session I	8
3.3. Summary of Session II	8
Recommendations for tackling climate change in Fisheries and Aquaculture Sector	9
Annexures	
Annex I: Agenda	11
Annex II: List of Participants	13



Overview of the Event

Fisher-people are particularly susceptible to the adverse effects of climate change due to their vulnerable location, positioned as they are between the impacts from the landward and seaward sides. This precarious situation poses profound challenges, from shrinking coastal spaces and lost working days to dwindling resources, threatening their very lives and livelihoods. Addressing this requires holistic solutions that blend sustainable resource management, community involvement, technology, and tailored policy frameworks. Recognising the urgency, India is prioritising climate adaptation and resilience building for its coastal communities. This side-event on the lines of the International Conclave on Mainstreaming Climate Change into International Fisheries Governance was to understand India's key initiatives so far and the plans for the way forward to increase the climate resilience of the fisheries sector.

During this session, key initiatives undertaken by the government of India and other agencies were presented to the audience, including global experts, for knowledge exchange as well as to explore their application beyond the frontiers.

Specific objectives of the side event included

- Facilitation of the exchange of knowledge, research findings and best practices
- Fostering dialogue and collaboration among scientists from the region on climate-resilient strategies.

There were three sessions in the side event focusing on different aspects of the sector as follows:

1. Status of Indian Fisheries with respect to climate change and adaptation strategies
 - a. Current status in terms of impact of climate change
 - b. Steps taken to address the identified issues.
 - c. Gaps and limitations in our knowledge and techniques
 - d. Actions needed in the short-term and long-term
2. Knowledge sharing and capacity development for climate proofing marine fisheries in BOB region
 - a. Current mechanisms for knowledge sharing
 - b. Potential ways for improvement
 - c. Ways to develop capacity at different levels
3. Plenary session on climate-resilient fisheries management
 - a. Addressing challenges in risk-based management strategies in data-poor scenarios.
 - b. Developing a decision framework for climate-resilient management.
 - c. Enhancing collaboration and cooperation to tackle climate change.
 - d. Financing climate change adaptation and mitigation possibilities for achieving carbon-neutral fisheries

Session I: Status of Indian Fisheries with respect to Climate Change and Adaptation Strategies

This session was co-chaired by Dr. J.K. Jena, Deputy Director General, ICAR and Dr. E. Vivekanandan, Advisor, BOBP-IGO. The opening remarks by the co-chairs highlighted the need to manage the fury of nature on the one hand and the vulnerability of those residing on the coast on the other. They pointed out that while nature's time scale was of the order of millennia, our adaptation requirements were within decades, and it was difficult to imagine scenarios so much into the future. It was imperative to restrict temperature increase to 1.5° with many impacts already irreversible. As far as fisheries is concerned, adaptation needs to be focused upon much more than mitigation.

1.1. Lead Talk: Priority areas of research and development for climate-resilient fisheries in the BOB region.

The lead talk delivered by Dr. CN Ravishankar, Director of ICAR-Central Institute of Fisheries Education highlighted gaps in knowledge being a major challenge as there is only limited credible and reliable data on the vulnerability and risk assessments in the sector. There was little and limited focus yet on fisheries and aquaculture, and hence, R&D initiatives to address climate change and fisheries need to expand in breadth, depth and scale. There was poor awareness at the community level, and the research focus was still largely on the ecological dimension. Socio-economic aspects were neglected, and research was mostly in silos. He called for the setting up of a National Mission on Climate Resilient Aquaculture and Fisheries (CRAF), closer science-practitioner networks and nurturing a climate resilience community of practice.

1.2. Panel I: Research Advancements in Building Climate Resilience in Fisheries Sector

1.2.1. Marine Fisheries

Dr. Grinson George, Principal Scientist of ICAR-Central Marine Fisheries Research Institute, speaking on Marine Capture Fisheries, said that impacts in the physical environment affected marine resources, which in turn, impacted the livelihood of fishers as well as their safety at sea. He highlighted issues regarding the microbial health of aquatic ecosystems and said that early warning systems and advisories for future mariculture were important. While the emergence of invasive species posed a threat to the native resources, unwanted blooms occurring in increased frequency affected mariculture activities. With climate change, there was a change in species composition resulting in the proliferation of non-commercial and non-conventional species, such as jellyfish, which could be turned into a fisheries advantage. A slew of smart solutions, including Integrated Multi-trophic Aquaculture (IMTA), seaweed farming, mangrove forestation and other adaptation and mitigation measures, would help safeguard fishers. The major gap was in the assessment of multi-species stocks. He also listed the way forward for the next five years, including reducing emissions from capture fisheries, despite India being a low-emission country and application of AI and Satellite Remote Sensing in the estimation/ prediction of marine harvest so that climate-based inter-annual fluctuations can be understood.

1.2.2. Brackishwater Aquaculture

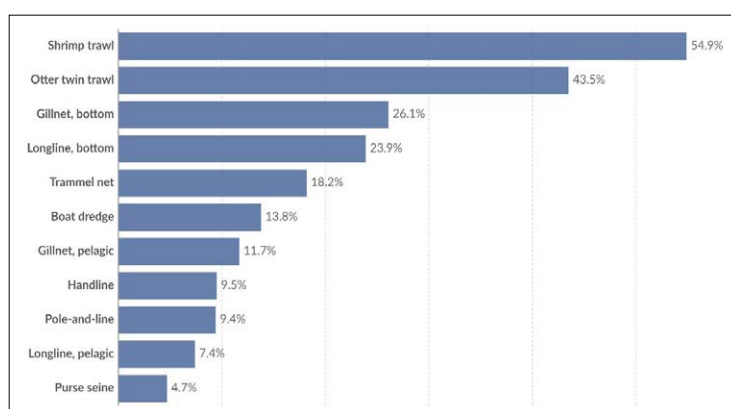
From the Central Institute of Brackishwater Aquaculture, Dr. N. Muralidhar spoke on the richness and diversity of brackish water species and the importance of Brackish Water Aquaculture. Their studies have shown that temperature variations and rainfall fluctuations have physical and economic impacts on aquaculture. Extreme weather resulting in flooding and sudden drop in salinity caused serious impacts, including stock escape. They found that aquaculture farms in the East Coast states were relatively more vulnerable than in the West Coast. Major gaps identified included risk assessment of aquaculture under various scenarios and lack of alternate species for contingency planning. He called for including aquaculture in spatial planning and identified three classes of climate-resilient measures for the sector. At the farmer level, he suggested a common crop calendar and good practices on the farm; at the science and technology level, identification of alternative species and alternate energy sources for aeration requirements which are critical in the sector. At the policy/institutional level, he suggested insurance and a calamity contingency fund apart from capacity building.

1.2.3. Inland Fisheries

Dr. B.K. Das, Director ICAR-Central Inland Fisheries Research Institute highlighted reduced rainfall, increased temperature causing shifts in range distribution and catch composition in addition to invasion of exotics and yield reduction as climate change impacts on Freshwater Fisheries. In the absence of long term data, he called carrying out a stakeholder driven approach, vulnerability assessment of wetlands, ecology and trophic state in a changing climate and carbon sequestration and GHG emissions from wetlands. Adaption and mitigation measures suggested included rebuilding depleting wild fish stocks, improving fisheries governance, diversifying livelihood activities, disaster preparedness and response, fisheries development, and ecosystem-based adaptation, apart from scientific culture-based fisheries, cage and pen culture with resilient species, and adjusting fishing pressure to sustainable levels. Capacity building and climate literacy and sensitisation were important too.

1.2.4. Fishing Technology

Fishing Technology was the topic of the presentation by Dr. George Ninan, Director, ICAR- Central Institute of Fisheries Technology. Describing the status of the sector, he said that technology creep was an issue because though vessel size may be constant, engine power was increasing. Though the Indian marine sector emitted less than the global average – including pre-harvesting and marketing, it had to be brought down. He also spoke about issues of sustainability, especially the need for reduction of bycatch, emphasizing the need to regulate fishing gear, particularly mesh size, dimensions, and net size and called for stricter oversight on energy-intensive fishing methods, such as pair trawling, mini trawling, and bull trawling. Major gaps identified were the lack of mechanisms to determine the location of fishing and in monitoring changes in design of vessels or gear. Suggested measures to increase legal catch and reduce fuel footprint included governing how, where and when fishermen may fish, improving efficiencies and reducing fuel usage, using liquid nitrogen-based refrigeration and conversion of diesel engines to LNG engines.



Share of Fish Catch that is Discarded by Type of Gear Used

1.2.5. Ocean Technology

From the National Institute of Ocean Technology, Dr. G. Dharani said that the Ocean Technologies they worked with included supporting fisheries through design and operation of low temperature thermal desalination plants and the development of underwater unmanned vehicles. He highlighted the importance of ocean observation systems and the role of the Indian Coastal Ocean Radar Network (ICORN). He said that they were developing tools for shallow bathymetry and designing marine algal biotechnology as well as cages for open sea fish culture. The institute was also into the design and deployment of artificial reefs and FAD apart from specialising in niche technologies such as ocean acoustics and marine sensor systems.

1.3. Panel II: Preparedness of Coastal Communities

1.3.1. Building Resilient Coastal Communities: ICZM Experiences

Speaking on ICZM for resilient coastal communities, Dr. Robin R S, of the National Centre for Sustainable Coastal Management highlighted the role of Integrated Coastal Zone Management (ICZM) to identify and respond to coastal vulnerability through appropriate interventions, using the development of an ICZM Plan as well as a Marine Spatial Plan (MSP) for Sagar Island in West Bengal. The process consisted of identification of challenges, vulnerabilities and opportunities through stakeholder consultations. The development of a conflict compatibility matrix helped in overcoming competition for space and resources to identify sustainable solutions.

1.3.2. Adapting the Communities and Enhancing their livelihoods

Dr. S. Velvizhi of the MS Swaminathan Research Foundation spoke described the stakeholder driven approach adopted for developing the fisher friend mobile app for climate smart fishing. The exercise was in three parts. First, the capacity of the fishers was built so that they could use the app, validate the information and provide feedback so that appropriate research interventions could be carried out. So far, 52 versions of the app had been developed in this manner to provide marine advisory services using ICT. She also described the impact of climate change on small-scale fisheries with challenges encompassing a multitude of issues, including occupational uncertainty, disorganized income, equipment damages, housing relocations, psycho-social problems, increased risk and vulnerability.

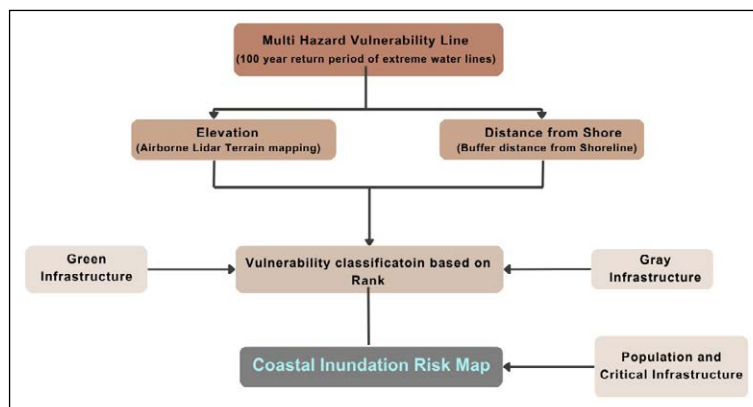
1.4. Panel III: Development and Application of Technologies for Climate Resilience

1.4.1. Ocean Information Services from INCOIS

Dr. Nimith Kumar from the Indian National Centre for Ocean Information Systems (INCOIS) spoke about the bouquet of Ocean Information Services provided to fishing communities, coastal states, IMD, Navy, ports, research institutions and other users. He listed the Essential Climate Variables (ECV) to be monitored in a sustained manner and said that data was constantly generated and made available on the INCOIS website. They provided ocean climate services such as on marine heatwaves and coral bleaching. He also spoke about satellite telemetry in the Indian Ocean region that provided fresh insights into fish habitat.

1.4.2. Coastal Vulnerabilities and Protection Strategies

Coastal Vulnerabilities and Protection Strategies was the focus of Dr. Tune Usha of the National Centre for Coastal Research. Pointing out that resilience of the coastal areas is measured by the information it possesses in helping coastal communities and decision makers make informed choices to assess risk, minimize losses, and protect their livelihood and property. She spoke about their work in the two domains of Understanding Disaster Risk including tools used to study coastal hazards / vulnerability such as remote sensing and GIS followed by field validation and building vulnerability index as well as Aid in Developing mitigation strategies including digital measures such as decision support systems and early warning systems along with green, grey and hybrid infrastructure.



Methodology for Developing Coastal Inundation Risk Map

1.4.3. Building Evidence-based Adaptation Strategies for Resilience among SSF in India

Dr. Ananthan P.S, of the ICAR-Central Institute of Fisheries Education presented significant findings on the development of Evidence-Based Adaptation. He spoke about the development of conceptual frameworks based on census data, namely, the coastal vulnerability index (CVI) and the social and economic vulnerability assessment framework (SEVI) and SEVI specific to marine fisheries (mf-SEVI), developed in Maharashtra and validated in Odisha. They found the overall mf-SEVI value to be 0.41, indicating that India is moderately vulnerable but with higher vulnerability on the east coast compared to the west coast. He said that the dynamics of the Indian fishing communities were changing, and because of the distinct and diverse patterns in vulnerability (sensitivity and adaptive capacity) at the State, District, Block and Village level with different indicators / key drivers gaining prominence, it necessitated location-specific adaptation and mitigations strategies.

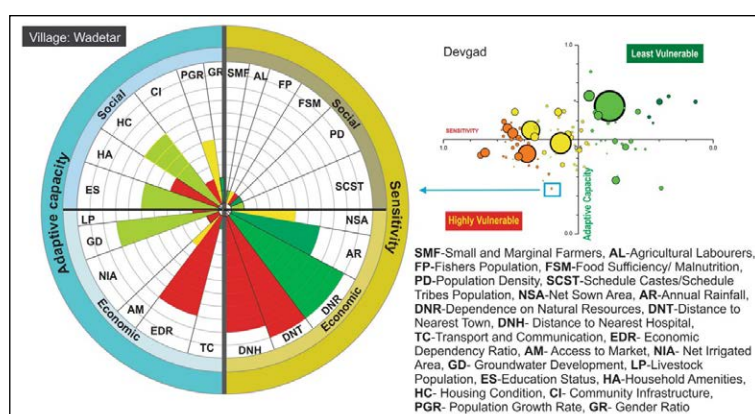


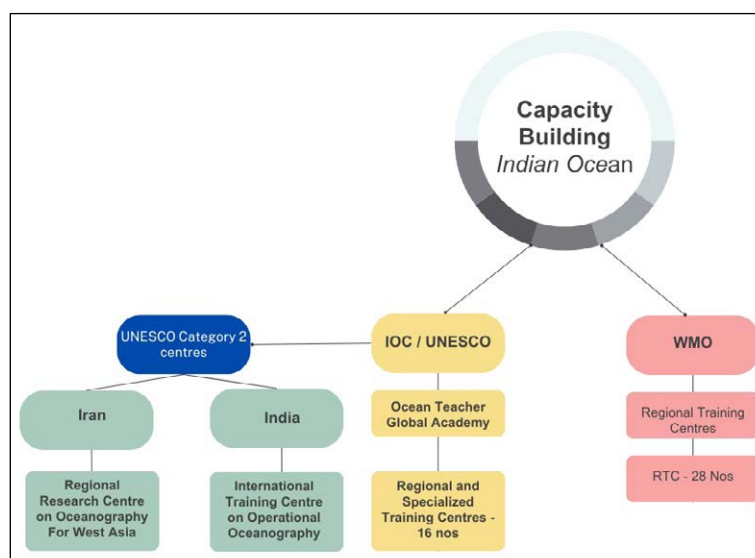
Illustration of Status of Ccontributing Factors for a Representative Village for Intervention Planning

Session II: Knowledge Sharing and Capacity Development for Climate Proofing Marine Fisheries in BOB Region

The session was co-chaired by Dr. G. Sugumar and Dr. Baskaran Manimaran, both former Vice Chancellors of Tamil Nadu Dr J. Jayalalithaa Fisheries University. Dr Sugumaran emphasised the significance of knowledge sharing and capacity development strategies and practices, especially on the value of integrating traditional knowledge with modern practices to create a platform for success stories. He also stressed the importance of advancing climate modelling and climate-proofing measures.

2.1. Lead Talk: Driving Capacity Development in BOB Region for the UN Ocean Decade

The lead talk was given by Dr. Nimit Kumar, Project Scientist at INCOIS, on Driving Capacity Development in the BOBP Region for the UN Ocean Decade (2021-30). He underscored the critical importance of Sustainable Development Goal 14 (Life Below Water) and expressed concern about the slow progress in achieving it, which hampers ocean sustainability. He outlined the unique challenges faced in the Indian Ocean Region, from societal needs to science drivers and operational drivers. He further explained the creation of the Ocean Decade structure and the establishment of Decade Collaborative Centres (DCC). He highlighted India's role in hosting one of the two Category 2 centres of the DCC. He also discussed ongoing projects like BOBLME-1 and BOBLME-2, emphasising the need for academia-industry collaboration to bridge the gap between talent and skill saying that there was a strong and urgent case for ocean literacy, capacity development and collaborative efforts.



Capacity Building Mechanism in Indian Ocean

2.2. Experiences from South Asian Countries

2.2.1. Bangladesh

Mr. Tarapada Chowhan, Senior Fisheries Officer from the Department of Fisheries in Bangladesh, spoke about the eleven major hazards faced by Bangladesh and the impacts, adaptation and risk reduction measures for each hazard with specific reference to fish farmers and aquaculture. He also emphasised building awareness among the fish/shrimp farmers/aquaculture entrepreneurs about the natural phenomena, time/season of hazard/disaster, cluster farming and good aquaculture practices and use of high-value/estuarine brackish water fish species. He said that community-based fisheries management (CBFM) techniques and collaboration among different ministries as well as non-governmental organisations would be implemented to optimize use of water resources and increase fish production.

2.2.2. India

Dr. Grinson George, Principal Scientist at ICAR-CMFRI, India, highlighted the necessity for capacity building programs to address climate resilience. He discussed the development of capacity-building programs at different levels, including strategies implemented at universities and research institutions through specific programs, knowledge exchange, and global cooperation. He called for teaching people how to generate technology rather than giving them free technology. Describing the current mechanism of knowledge sharing in India, he spoke on the pivotal role of higher education institutions in empowering climate studies. He emphasized the importance of the citizen science and also spoke about the various networks of scientists and stakeholders that promoted collaboration.

2.2.3. Maldives

Mr. Adam Manik, DDG (Fisheries), Ministry of Fisheries, Marine Resources and Agriculture, Maldives provided an overview of fisheries and tourism in the Maldives which were the mainstay of the economy. He said that the National Adaptation Programme of Action (NAPA) of the Maldives had identified five adaptation measures including improvement of fish finding and fish harvesting and handling, establishment of aquaculture/mariculture as an alternative to natural breeding to reduce the economic and social impacts of changing tuna abundance, undertaking research and disseminating information on fisheries and climate change, experimenting with new and alternative species and breeding / handling methods for live bait and integrated reef fishery management. He said that a number of areas identified as having rich ecosystems that host various fauna and marine species had been listed as protected.

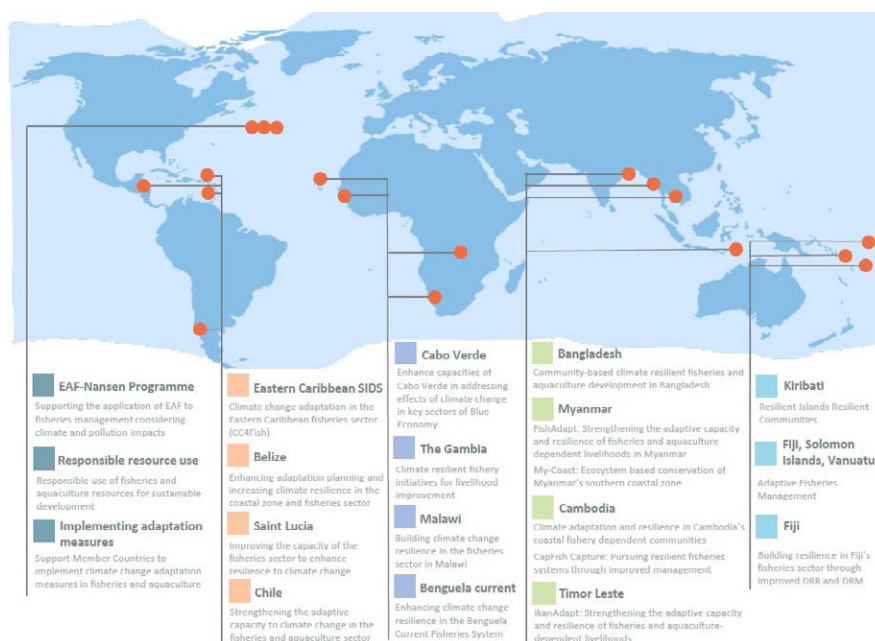
2.2.4 Sri Lanka

Ms. AHS Fareeda, DG (Planning) at the Ministry of Fisheries and Aquatic Resources, Sri Lanka, presented an overview of marine fisheries in Sri Lanka and discussed measures to address climate change impacts. She outlined the objectives of the National Fisheries Aquaculture Policy, including assistance for fishing communities, the establishment of inter-institutional networks, and the promotion of sustainable inland fisheries. She also emphasized the importance of involving communities in disaster management and institutionalizing early warning systems. Ms. Fareeda highlighted several climate policies executed at the national level in Sri Lanka. She emphasized the need to strengthen the enabling environment through policy support, legal and institutional frameworks, and to adopt lower carbon pathways. She stressed the dynamic nature of climate change and the importance of careful handling through collaborative efforts to ensure a win-win situation and prevent adverse effects.

Session III: Plenary Session on Climate-Resilient Fisheries Management

3.1. Lead Talk: Climate-Resilient Fisheries Management

Dr. Tarub Bahri, Fishery Resources Officer and Climate Change Expert, FAO spoke about Climate-Resilient Fisheries Management. She said that FAO's work on climate change occurred in the three areas of strengthening the knowledge base, project developments and implementation, and integrating aquatic food in cross-sectoral, regional and global climate change discussions, including RFBs and UNFCCC. She said that few programmes or projects currently address the changes expected in distribution shifts across jurisdictions, though the IPCC had pointed out that more than 90 % of the excess heat resulting from global warming is stored by the ocean, causing unparalleled re-distribution of resources and productivity changes. She referred to the adaptation toolbox that compiled potential adaptation measures grouped in three categories: institutional adaptation, livelihoods adaptation and risk reduction and resilience and said that adaptation is place and context-specific and should be viewed as an iterative process, and should be well evaluated. She also spoke about a new FAO publication that addressed fisheries and aquaculture in national adaptation plans, not only providing practical guidance to develop sectoral adaptation plans but also to include the sector into broader adaptation plans.



FAO Climate Change Adoption Programme

3.2. Summary of Session I

The presentations focused on the prevailing reality of climate change impacts, which are evident in their widespread and expanding nature, necessitating a comprehensive and mindful research approach. Speakers emphasized a holistic perspective, underlining the urgency of constant adaptation based on feedback in research and development endeavours. To navigate this complex landscape, the generation of data across all relevant dimensions is imperative. Case studies and research findings require meticulous validation, analysis, and effective communication to ensure their reliability and applicability. Recognizing that the youth are the torchbearers of the future, education becomes a pivotal tool in equipping them to grapple with the impacts of climate change. Collaborative research efforts with communities are essential for developing context-specific solutions and fostering a sense of shared responsibility. Additionally, discussions on the economics of adaptation and financing are indispensable to facilitate the implementation of effective strategies in the face of climate change challenges.

3.3. Summary of Session II

The presentations from various South Asian countries underscored a shared commitment to addressing the challenges outlined in Sustainable Development Goal 14 (Life Below Water) while expressing deep concern over the sluggish progress in achieving it. The speakers emphasised an urgent need for ocean literacy, capacity development, and collaborative efforts to bolster sustainability. Practical measures for adaptation and risk reduction were highlighted, including the implementation of community-based fisheries management, awareness campaigns, and the promotion of cluster farming and good aquaculture practices. Additionally, there was a consensus on the necessity for robust capacity-building programs to enhance climate resilience. The importance of citizen science and collaborative networks was underscored as instrumental in fostering effective responses to environmental challenges. In the context of inland fisheries, the objectives of the National Fisheries Aquaculture Policy were outlined, emphasising community assistance and the promotion of sustainable practices. Finally, speakers stressed the imperative to strengthen the enabling environment through policy support and collaborative endeavours to effectively address the multifaceted impacts of climate change on marine ecosystems and fisheries.

Recommendations for tackling climate change in Fisheries and Aquaculture Sector

The brainstorming session provided generous food for thought towards actions to be taken towards tackling climate change in the Fisheries and Aquaculture Sector, especially in India. Key recommendations are as follows:

- **Comprehensive Research Approach:** Advocate for a comprehensive and mindful research approach to continually assess and understand the widespread and evolving impacts of climate change. Encourage a holistic perspective, avoiding research in siloes, in addressing climate change challenges, emphasizing the need for constant adaptation based on feedback in research and development endeavours. Research has to be nimble, based on and relevant to the needs at ground level.
- **Data Generation, Validation and Communication:** Prioritize the generation of data across all relevant dimensions to effectively navigate the complex landscape of climate change impacts. Further, emphasize meticulous validation, analysis, and effective communication of case studies and research findings to stakeholders, ensuring their reliability and applicability in real-world scenarios.
- **Youth Empowerment through Education:** Recognize the youth as crucial stakeholders and implement educational initiatives to equip them with the knowledge and skills necessary to understand and grapple with the impacts of climate change. Highlight the importance of citizen science and the development of collaborative networks in fostering effective responses to environmental challenges.
- **Collaborative Research Efforts:** Promote and support collaborative research efforts with communities to develop context-specific solutions and foster a sense of shared responsibility in addressing climate change challenges.
- **Economics of Adaptation:** Encourage discussions on the economics of adaptation and financing, and effective governance, recognising their indispensability in facilitating the implementation of effective strategies against climate change challenges
- **Ocean Literacy and Capacity Development:** Advocate for urgent action in enhancing ocean literacy, capacity development, and collaborative efforts, particularly in the context of Sustainable Development Goal 14 (Life Below Water). Call for the establishment and support of robust capacity-building programs to enhance climate resilience, with a focus on practical and applicable skills.
- **Adaptation Measures for Fisheries:** Support the implementation of practical measures for adaptation and risk reduction in fisheries, including community-based management, awareness campaigns, and the promotion of sustainable practices.
- **Policy Support:** Develop and implement integrated policy frameworks that address the multifaceted impacts of climate change on marine ecosystems and fisheries. Ensure these policies consider ecological, economic, and social dimensions.



Annex I

Programme Agenda

Side Event

Brainstorming Session on India's Preparedness for Adapting to Climate Change in Marine Fisheries

Venue: Marina Hall I

17 October 2023

Day
1

Session I

1330 - 1630

Status of Indian Fisheries with respect
to Climate Change and Adaptation Strategies

Co-Chairs

Dr. J.K. Jena, *DDG (Fisheries), ICAR*
Dr. E. Vivekanandan, *Advisor, BOBP-IGO*

Session Coordinator

Dr. Ahana Lakshmi, *Former NCSCM Consultant*

Key Discussion Points

Current status in terms of impact of climate change
Steps taken to address the identified issues.
Gaps and limitations in our knowledge and techniques
Actions needed in short term and long-term

1330 – 1340 **Opening & Setting the context by Co-Chairs**

1340 – 1350 **Lead Talk: Priority areas of research and development for climate resilient fisheries in the BOB region**

Dr. C.N. Ravishankar
Director, ICAR-CIFE

1350 – 1440

Panel 1: Research Advancements in Building Climate Resilience in Fisheries Sector (10 min. each)

- (a) **Marine Capture Fisheries**
Dr. Grinson George
Principal Scientist & Head, ICAR-CMFRI
- (b) **Brackishwater Aquaculture**
Dr. N. Muralidhar
Principal Scientist, ICAR-CIBA
- (c) **Inland Fisheries**
Dr. B.K. Das, *Director, ICAR-CIFRI*
- (d) **Fishing Technology**
Dr. George Ninan, *Director, ICAR-CIFT*
- (e) **Ocean Technology**
Dr. G. Dharani,
Scientist G and Group Head, NIOT

1440 – 1450 **Interaction and Q&A: Panellists & Participants**

1450 – 1520

Panel 2: Preparedness of Coastal Communities
(10 min. each)

- (a) **Building Resilient Coastal Communities: ICZM Experiences**
Dr. R.S. Robin
Scientist C, MoEFCC-NCSCM, Chennai
- (b) **Adapting the Communities and Enhancing their livelihoods.**
Dr. S. Velvizhi, *Coordinator, MSSRF, Chennai*

1520 – 1530 **Interaction and Q&A Panellists & Participants**

1530 – 1545 **Tea Break**

1545 – 1615

Panel 3: Development and Application of Technologies for Climate Resilience (10 min. each)

- (a) **Ocean Information Services from INCOIS**
Dr. Nimit Kumar, *Project Scientist, INCOIS*
- (b) **Coastal Vulnerabilities and Protection Strategies**
Dr. Tune Usha, *Scientist G, MoES – NCCR*
- (c) **Building Evidence-based Adaptation Strategies for Resilience among SSF in India**
Dr. P.S. Ananthan
Principal Scientist, ICAR-CIFE

1615 – 1625 **Interactions & Q&A Panellists & Participants**

1625 - 1630 **Closing Remarks by Co-Chairs**

Brainstorming Session on India's Preparedness for Adapting to Climate Change in Marine Fisheries

Venue: Marina Hall I

18 October 2023

Day
2

Session II 0915-1100

Knowledge Sharing and Capacity Development for Climate Proofing Marine Fisheries in BOB Region

Co-Chairs

Dr. G. Sugumar, *Former Vice Chancellor, TNJFU*

Dr. Tune Usha, *Scientist-G, NCCR*

Session Coordinator

Dr. Kishore Davala

Associate Professor, Nalanda University

Key Discussion Points:

- Current mechanisms for knowledge sharing
- Potential ways for improvement
- Ways to develop capacity at different levels

0915 - 0925 **Opening & Setting the context by
Co-Chairs**

0925 - 0940 **Lead Talk: Driving Capacity
Development in BOB Region for
the UN Ocean Decade**

Dr. T. Srinivasa Kumar

Director, INCOIS

0940 - 1040 **Experiences from South Asian
Countries**

(a) Bangladesh **Mr. Tarapada Chowhan**
Senior Fisheries Officer, DoF

(b) India **Dr. Grinson George**
Principal Scientist, ICAR-CMFRI

(c) Maldives **Mr. Adam Manik**
DDG (Fisheries), MoFMRA

(d) Sri Lanka **Ms. AHS Fareeda**
DG (Planning), MoFAR

1040 - 1050 **Interactions & Q&A: Panellists
and Participants**

1050 - 1100 **Closing Remarks by Co-Chairs**

1100 - 1115 **Tea Break**

Session III 1115 - 1300

Plenary Session on Climate-Resilient Fisheries Management

Co-Chairs

Dr. Baskaran Manimaran, *Former Vice Chancellor, TNJFU*

Dr. E. Vivekanandan, *Advisor, BOBP-IGO*

Session Coordinator

Mr. Rajdeep Mukherjee

Policy Analyst, BOBP-IGO

Key Discussion Points:

- Addressing Challenges in Risk-Based Management Strategies in Data-Poor Scenarios.
- Developing a Decision Framework for Climate-Resilient Management.
- Enhancing Collaboration and Cooperation to Tackle Climate Change.
- Financing Climate Change Adaptation and Mitigation Possibilities for Achieving Carbon-neutral Fisheries

1115 - 1125 **Opening & Setting the context
Remarks by Co-Chairs**

1125 - 1140 **Lead Talk: Climate-Resilient Fisheries
Management**

Dr. Tarub Bahri

*Fishery Resources Officer,
Climate Change Expert, FAO*

1140 - 1150 **Summary of Technical Sessions
by Session Coordinators**

Session 1

Dr. Ahana Lakshmi

Former NCSCM Consultant

Session 2

Dr. Kishore Davala

Associate Professor, Nalanda University

1150 - 1250 **Moderated Discussion by Co-Chairs**

Co-chairs will provide their opening remarks and solicit inputs on the key discussion points.

1250 -1300 **Closing Remarks & Way Forward**

Dr. P. Krishnan, *Director, BOBP-IGO*

1300 -1400 **Lunch**

Annex II

List of Participants

Sl.No	Name	Organisation
INDIA		
Department of Fisheries		
1.	Abhilaksh Likhi, IAS	Secretary, DoF, Government of India
2.	Ram Singh, IAS	Personal Secretary to Minister, DoF, Government of India
3.	Neetu Kumari Prasad, IAS	Joint Secretary (Marine), DoF, Government of India
4.	Antony Xavier	Fisheries Development Commissioner, DoF, Government of India
5.	Nilesh Pawar	Deputy Director, DoF, Government of India
6.	Sanjay Pandey	Deputy Commissioner, DoF, Government of India
7.	Tarun Kumar Singh	Assistant Commissioner, DoF, Government of India
8.	Nitin Verma	Senior Technical Assistant, DoF, Government of India
9.	Archit Shukla	Sr. Consultant, DoF, Government of India
10.	L. Narasimhamurthy	Chief Executive i/c, National Fisheries Development Board
11.	Kanchi Bhargavi	Senior Executive, National Fisheries Development Board
12.	Poli Naidu	Sr Technical Officer, National Fisheries Development Board
13.	A. Tiburthius	Zonal Director, Fishery Survey of India
14.	A. John Chembian	Jr. Fisheries Scientist, Fishery Survey of India
15.	Babu	Sr Scientific Assistant, Fishery Survey of India
16.	K. Silambarasan	Jr Scientific Assistant, Fishery Survey of India
17.	Roshan M Peter	Jr Scientific Assistant, Fishery Survey of India
18.	Suresh Kumar	Office Sptndt, Fishery Survey of India
19.	N. Ravishankar	Deputy Director, Central Institute of Coastal Engineering For Fishery
20.	S. Gopalakrishnan	Assistant Director, Central Institute of Coastal Engineering for Fishery
21.	P. Sankara Rao	Director, Coastal Aquaculture Authority
22.	Dipti Kumar Mohapatra	Dy Director of Fisheries, Govt of Odisha
23.	Jagadish Panda	Dy Director of Fisheries, Govt of Odisha
24.	A. D. Sangita	Department of Fisheries, Govt of Gujarat
25.	N. M. Velmurugan	Dy Director of Fisheries, Govt of Tamil Nadu
26.	S. A. Bharatiya	Asst Director of Fisheries, Govt of Tamil Nadu
27.	Noorjahan Beevi	Asst Director of Fisheries, Govt of Tamil Nadu
28.	V. V. R. Babu	Asst Director of Fisheries, Govt of Andhra Pradesh
29.	Deivasigamani	Joint Director of Fisheries, Govt of Pondicherry
30.	Meera saheb	Dy Director of Fisheries, Govt of Pondicherry
National Institutes		
31.	J. K. Jena	DDG, Indian Council of Agricultural Research
32.	Kuldeep K Lal	Director, ICAR-Central Institute of Brackishwater Aquaculture
33.	M. Muralidhar	Principal Sceintist, ICAR-Central Institute of Brackishwater Aquaculture
34.	M. Jayanthi	Principal Sceintist, ICAR-Central Institute of Brackishwater Aquaculture

Sl.No	Name	Organisation
35.	Ashok Kumar Jangam	Scientist (SS), ICAR-Central Institute of Brackishwater Aquaculture
36.	C.N. Ravishankar	Director, ICAR-Central Institute of Fisheries Education
37.	P. S. Ananthan	Principal Scientist, ICAR-Central Institute of Fisheries Education
38.	D. Boomiah	Chief Technical Officer, ICAR-Central Institute of Fisheries Education
39.	V. Vidhya	Scientist, ICAR-Central Institute of Fisheries Education
40.	Chanakya Naidu	Scholar, ICAR-Central Institute of Fisheries Education
41.	Karupati Nagendra	Scholar, ICAR-Central Institute of Fisheries Education
42.	Sumanta De	Scholar, ICAR-Central Institute of Fisheries Education
43.	B. K. Das	Director, ICAR-Central Inland Fisheries Research Institute
44.	P. Misha	Scientist, ICAR-Central Inland Fisheries Research Institute
45.	Lianthumluaia	Scientist, ICAR-Central Inland Fisheries Research Institute
46.	George Ninan	Director, ICAR-Central Institute of Fisheries Technology
47.	Madhu	Principal Scientist, ICAR-Central Institute of Fisheries Technology
48.	Grinson George	Principal Scientist, ICAR-Central Marine Fisheries Research Institute
49.	Narayana Kumar	Principal Scientist, ICAR-Central Marine Fisheries Research Institute
50.	M.V. Ramana Murthy	Director, National Centre for Coastal Research
51.	Uma Sankar Panda	Scientist-F, National Centre for Coastal Research
52.	Tune Usha	Scientist-G, National Centre for Coastal Research
53.	Ramu	Scientist-F, National Centre for Coastal Research
54.	R. Ramesh	Former Director, National Centre for Sustainable Coastal Management
55.	R.S. Robin	Scientist-C, National Centre for Sustainable Coastal Management
56.	Karthik	National Centre for Sustainable Coastal Management
57.	Nimit Kumar	Project Scientist, Indian National Centre for Ocean Information Services
58.	P. Raghavan	Scientist-B, Ministry of Environment and Forests and Climate Change
Universities		
59.	N. Balasubramaniam	Dean, Andhra Pradesh Fisheries University
60.	Madhavan	Professor, Andhra Pradesh Fisheries University
61.	Dhanapal	Dean (Student Affairs), Andhra Pradesh Fisheries University
62.	Tapas Paul	Assistant Professor, Andhra Pradesh Fisheries University
63.	Pragati Pushp	Scholar, Bihar Animal Sciences University
64.	Manish Kumar	Scholar, Bihar Animal Sciences University
65.	Shubam Patidar	Scholar, Barkatullah University
66.	S. T. Balasubramanian	Former Vice-Chancellor, Chettinad Academy of Research and Education
67.	Mini Sekharan	Associate Professor, Cochin University of Science and Technology
68.	S. Sabu	Associate Professor, Cochin University of Science and Technology
69.	P. K. Santhosh Kumar	Associate Professor, Cochin University of Science and Technology
70.	K. M. Mujeeb Rahiman	Associate Professor, Cochin University of Science and Technology
71.	B. Ananthalakshmi	Scholar, Cochin University of Science and Technology
72.	Sruthi Sundar	Scholar, Cochin University of Science and Technology
73.	R. Divya	Scholar, Cochin University of Science and Technology
74.	K.P. Vishnu	Scholar, Cochin University of Science and Technology

Sl.No	Name	Organisation
75.	M.A. Nadiya	Scholar, Cochin University of Science and Technology
76.	Krishna Dayasagar Patil	Scholar, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth
77.	Baskaran Manimaran	Former Vice-Chancellor, Tamil Nadu Dr.J.Jayalalithaa Fisheries University
78.	G. Sugumar	Former Vice-Chancellor, Tamil Nadu Dr.J.Jayalalithaa Fisheries University
79.	Cheryl Antony	Dean, Fisheries College and Research Institute
80.	B. Ahilan	Dean, Fisheries College and Research Institute
81.	Manimekalai	Assistant Professor, Fisheries College and Research Institute
82.	Elakkanai	Assistant Professor, Fisheries College and Research Institute
83.	Hermon Jisha	Assistant Professor, Fisheries College and Research Institute
84.	S. Kesavan	Assistant Professor, Fisheries College and Research Institute
85.	Durai Raja	Assistant Professor, Fisheries College and Research Institute
86.	A. Karuppasamy	Assistant Professor, Fisheries College and Research Institute
87.	T. Ravikumar	Assistant Professor, Fisheries College and Research Institute
88.	R. Velmurugan	Assistant Professor, Fisheries College and Research Institute
89.	Mahendra Kumar	Student, Fisheries College and Research Institute
90.	Antareepa Saikia	Scholar, Guru Angad Dev Veterinary and Animal Sciences University
91.	Krishnaveni	Director, Insitute of Ocean Management
92.	M. Sathish	Research Scholar, Insitute of Ocean Management
93.	Arundel	Research Scholar, Insitute of Ocean Management
94.	G. Sudharson	Research Scholar, Insitute of Ocean Management
95.	Pradeep	Indian Institute of Technology Kharagpur
96.	Fathima Asharaf	Kerala University of Fisheries and Ocean Studies
97.	N.H. Arun Das	Kerala University of Fisheries and Ocean Studies
98.	S. Velvizhi	Principal Scientist, M S Swaminathan Research Foundation
99.	Kishore Davala	Associate Professor, National Maritime Foundation
100.	RK Shrivastava	Research Fellow, National Maritime Foundation
101.	Shalini Iyengar	Intern, National Maritime Foundation
102.	L. Sivaranjani	Prathyusha Engineering College
103.	Sheela Rani	Director, Sathyabama University
104.	Inbakandan	Scientist, Sathyabama University
105.	Jeyaprakash	Scholar, Sathyabama University
106.	Subham	Scholar, Sathyabama University
107.	Brabhusudhan	Scholar, Sathyabama University
108.	R.K. Trivedi	Professor, WBUAFS
109.	Ahana Lakshmi	Independent Consultant
110.	Vinod	Advocate, Supreme Court
Industry and Community Organizations		
111.	Bharath Kumar	Zerocode
112.	Sree Ram Kishore	Zerocode
113.	Elmo	Odaku

Sl.No	Name	Organisation
114.	Vincent Jain	South Indian Federation of Fishermen Societies
115.	K. Ajith	South Indian Federation of Fishermen Societies
116.	K. Vijai	South Indian Federation of Fishermen Societies
117.	M. Manikandan	South Indian Federation of Fishermen Societies
118.	J. Bino	South Indian Federation of Fishermen Societies
BANGLADESH		
119.	Mohammed Mizanur Rahman	Fisheries Officer, Ministry of Fisheries and Livestock
120.	Tarapada Chowhan	Fisheries Officer, Ministry of Fisheries and Livestock
MALDIVES		
121.	Adam Manik	Deputy Director General, Maldives Marine Research Institute
122.	Mariyam Shama	Marine scientist, Maldives Marine Research Institute
SRI LANKA		
123.	N.A.A.P.S. Nissanka	Additional Secretary, Ministry of Fisheries and Aquatic Resources
124.	A.H.S. Fareeda	Director General, Ministry of Fisheries and Aquatic Resources
125.	S. Thanushanth	Scientist, National Aquatic Resources Research and Development Agency
INTERNATIONAL ORGANIZATIONS		
Food and Agriculture Organization of the United Nations		
126.	Piero Mannini	Senior Liaison Officer, Food and Agriculture Organization of the United Nations
127.	Stefania Savorè	Fishery Officer, Food and Agriculture Organization of the United Nations
128.	Xuechan Ma	Fishery Officer, Food and Agriculture Organization of the United Nations
129.	Tarub Bahri	Fishery Resources Officer, Food and Agriculture Organization of the United Nations
130.	Takayuki Hagiwara	FAO Representative in India
131.	Lori Curtis	Consultant, Food and Agriculture Organization of the United Nations
Regional Fishery Bodies		
132.	P. Krishnan	Director, Bay of Bengal Programme, Inter-Governmental Organisation
133.	Rajdeep Mukherjee	Policy Analyst, Bay of Bengal Programme, Inter-Governmental Organisation
134.	E. Vivekanandan	Advisor, Bay of Bengal Programme, Inter-Governmental Organisation
135.	M. Sri Hari	Project Scientist, Bay of Bengal Programme, Inter-Governmental Organisation
136.	Daniel Philip Crear	Species Ecologist, Inter-American Tropical Tuna Commission
137.	Lauren Nelson	Fishery Officer, Indian Ocean Tuna Commission
138.	Darius Campbel	Secretary, North-East Atlantic Fisheries Commission
139.	Yoshikiyo Kondo	Executive Director, North Pacific Anadromous Fish Commission
140.	Isara Chanrachkij	Head, PPMD, Southeast Asian Fisheries Development Center
141.	Sukchai Arnupaphoon	Head, FGOS, Southeast Asian Fisheries Development Center
142.	Supapong Pattarapongpan	Fishery Oceanographer, Southeast Asian Fisheries Development Center
143.	Thierry Clot	Executive Secretary, Southern Indian Ocean Fisheries Agreement
144.	Ahmed Al-Mazourai	Director, Regional Commission for Fisheries
145.	Mitchell Herbert Lennan	Lecturer, University of Aberdeen
145.	Elaine G. Garvilles	Asst Science Manager, Western and Central Pacific Fisheries Commission



**Bay of Bengal Programme
Inter-Governmental Organization**

91, St. Mary's Road, Abhirampuram, Chennai - 600 018. INDIA
www.bobpigo.org