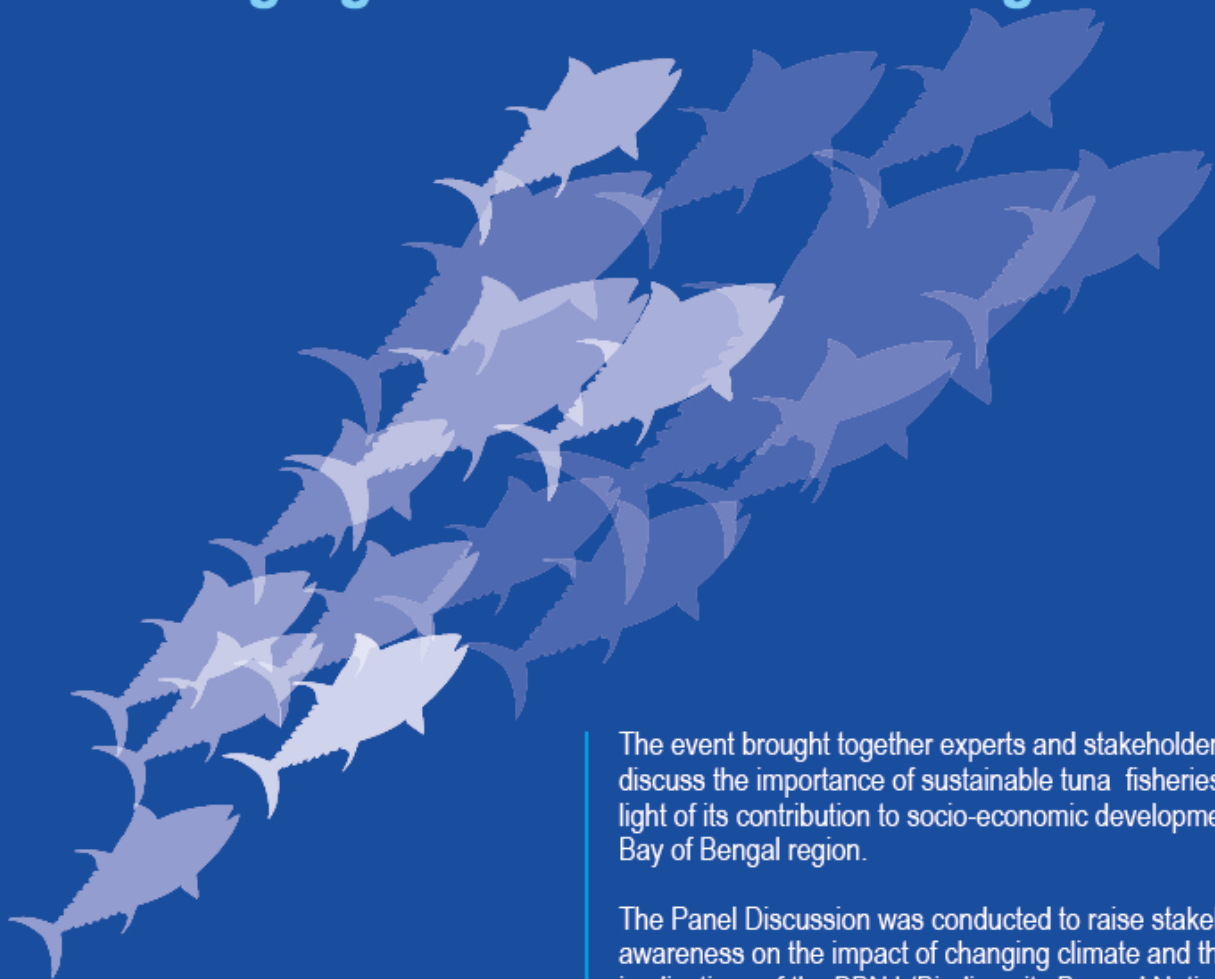




Panel Discussion on

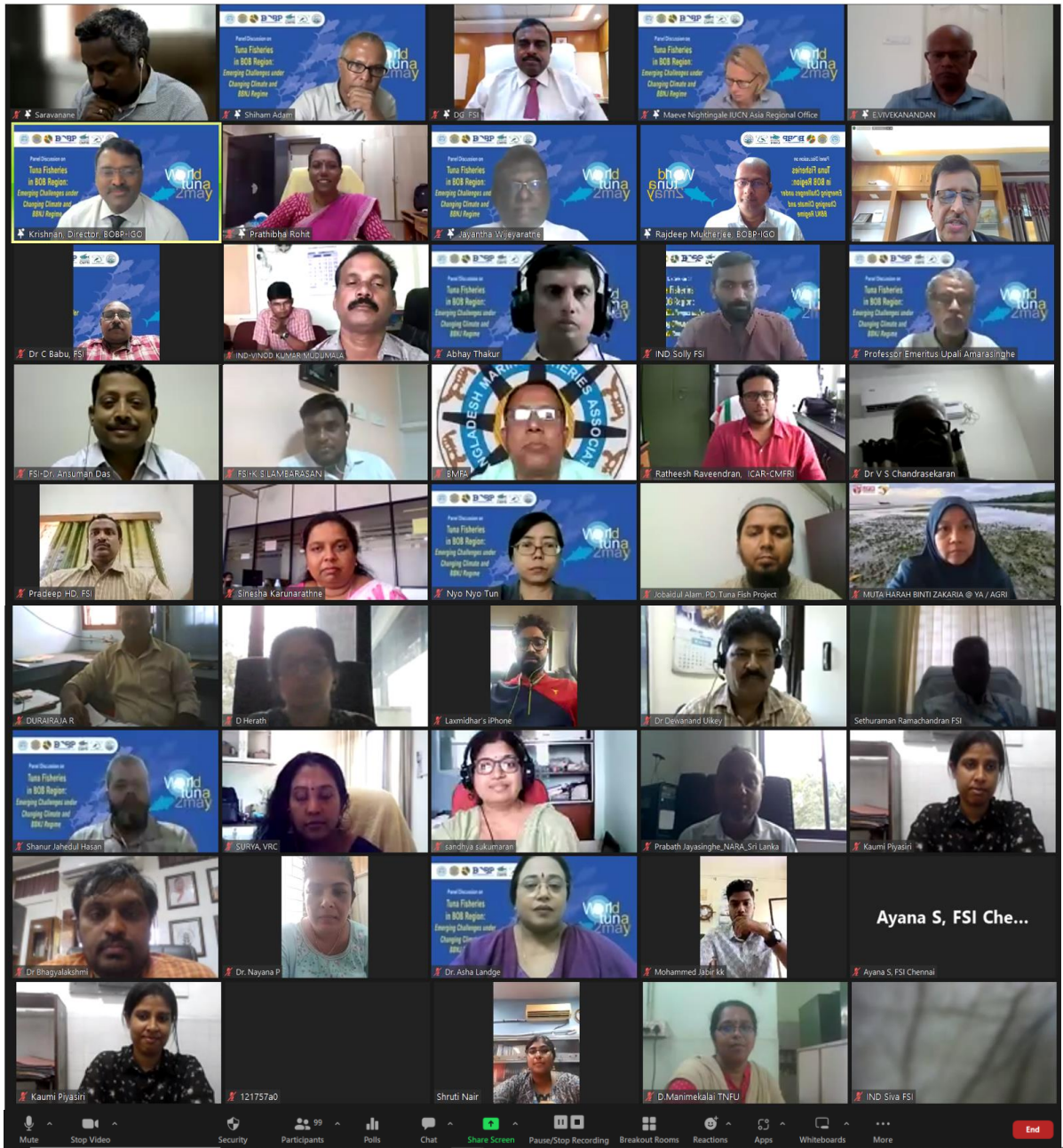
# Tuna Fisheries in BOB Region: *Emerging Challenges under Changing Climate and BBNJ Regime*



The event brought together experts and stakeholders to discuss the importance of sustainable tuna fisheries in the light of its contribution to socio-economic development in the Bay of Bengal region.

The Panel Discussion was conducted to raise stakeholders' awareness on the impact of changing climate and the implications of the BBNJ (Biodiversity Beyond National Jurisdiction) regime on the management of transboundary tuna resources.

This Report presents a gist of deliberations and salient actionable points that emanated during the Panel Discussion.



*A section of the participants when the Panel Discussion was in progress.*

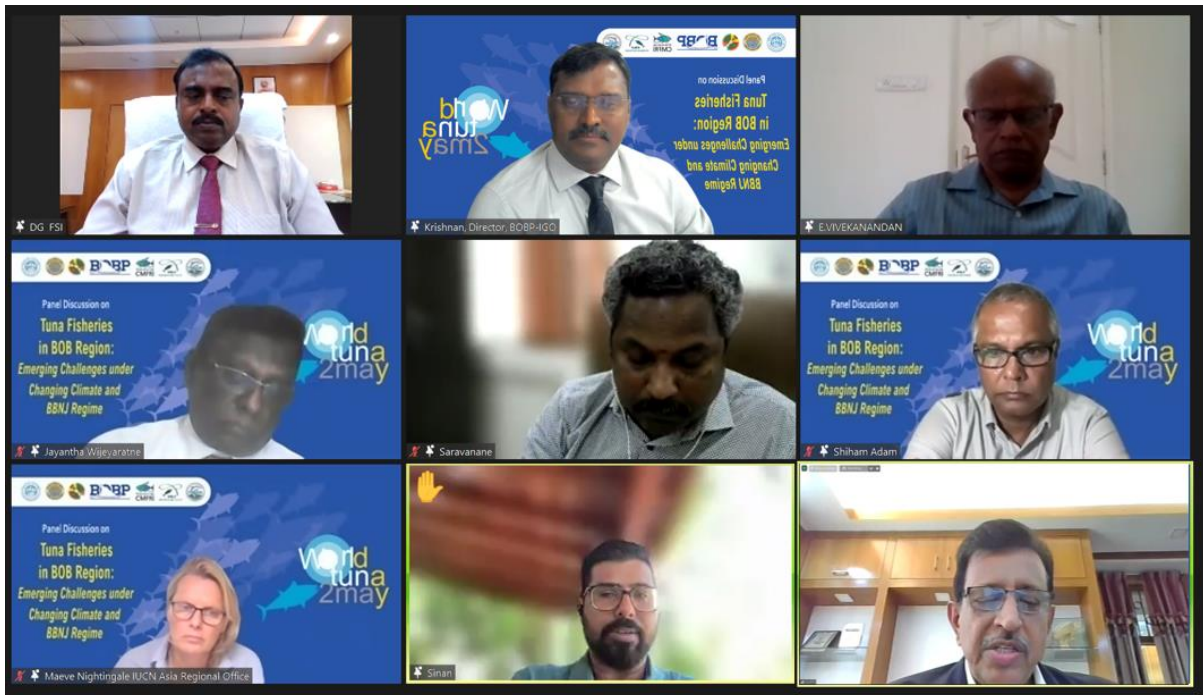
# Report of the Panel Discussion on Tuna Fisheries in the BOB Region: Emerging Challenges Under Changing Climate and BBNJ Regime

02 May 2023, Chennai

## 1. Introduction

An online panel discussion was held on 02 May 2023 to celebrate World Tuna Day. The event, titled "Tuna Fisheries in the BOB Region: Emerging Challenges Under Changing Climate and BBNJ Regime," was organised by the Bay of Bengal Programme Inter-Governmental Organization (BOBP-IGO) in collaboration with Bangladesh Fisheries Research Institute (BFRI), Bangladesh; Fishery Survey of India (FSI) and ICAR-Central Marine Fisheries Research Institute (CMFRI), India; International Pole & Line Foundation (IPNLF), Maldives, and the National Aquatic Resources Research and Development Agency (NARA), Sri Lanka. The event was attended by more than 120 participants from intergovernmental organisations (IGOs), regional fisheries bodies (RFBs), regional scientific communities, non-governmental organizations, researchers and academia.

The discussion aimed at increasing the awareness of sustainable tuna fishing, with a focus on the impact of changing climate and the emerging Biodiversity Beyond National Jurisdiction (BBNJ) regime on managing transboundary tuna resources. The event flyer, presentations and video are available at [www.bobpigo.org](http://www.bobpigo.org).






*A glimpse of the Panellists and Speakers*

## 2. Technical Session

The BOBP-IGO Director, **Dr P. Krishnan**, opened the event by welcoming the panellists, presenters, and attendees and providing the context for the discussion. He noted the importance of the tuna industry for food security and livelihoods in the Bay of Bengal region while also highlighting the threat posed by climate change. He suggested that the BBNJ Agreement, a draft agreement under the United Nations Convention on the Law of the Sea, could help improve conservation measures but emphasised that coastal countries must have the capacity to address climate change and make use of the agreement.

The panellists were then introduced:

PANELISTS	
	<b>Dr. Yahia Mahmud,</b> <i>Director General, Bangladesh Fisheries and Research Institute (BFRI), Bangladesh</i>
	<b>Dr. R. Jeyabaskaran,</b> <i>Director General, Fishery Survey of India (FSI), India</i>
	<b>Dr. Shiham Adam,</b> <i>Director, International Pole &amp; Line Foundation (IPNLF), Maldives</i>
	<b>Dr. M.J.S. Wijeyaratne,</b> <i>Chairman, National Aquatic Resources Research and Development Agency (NARA), Sri Lanka</i>

**Dr. Yahia Mahmud** said that Tuna Fisheries in Bangladesh is still at the scoping stage and the BFRI is currently conducting research on the abundance and occurrence of tuna fisheries resources in the country's EEZ. However, the Government policies are encouraging tuna fisheries development in the country as well as harnessing deep sea fishing capability. Bangladesh is also exploring potential partners to assist the country in developing its tuna fishery in a sustainable manner. To this effect, the country has become a member of the Indian Ocean Tuna Commission (IOTC) and reporting progress to the agency.

**Dr. R. Jeyabaskaran** underscored the significance of the tuna fisheries in the BOB and the Indian Ocean. The fishery sector in the region provides employment and sustenance to a large population, a considerable number of whom live below the poverty line. He said that the BOB is rich in biodiversity, which supports various endangered, threatened, and protected species and there is a need to conserve and manage this. There are ongoing discussions on developing a quota system for tuna fisheries in the Indian Ocean. He called for equitable distribution of economic benefits, while formulating tuna quota allocations. Further, He emphasized the need to factor the nature and dependency of the coastal nations and involve artisanal and small-scale fishing communities in the decision-making process to make it comprehensive.

**Dr. Shiham Adam** underscored the importance of World Tuna Day and said that skipjack tuna, yellowfin tuna, and big eye tuna are the primary contributors to the world's total tuna catch, with 30 per cent of the catch coming from the Indian Ocean. Tuna fishing is the primary livelihood for some of the outermost islands of Maldives, and it accounts for about 90 per cent of the total exports from the

country. The Maldives has a deep-rooted history in tuna fishing, which is embedded in their culture and tradition. However, about 40 per cent of tuna caught in the Indian Ocean catch comes from overfished stocks and there is no effective management in place, which is severely jeopardizing the sustainability quotient of the tuna fisheries. On establishing a quota system in the Indian Ocean, while discussions are going on since 2011, the progress is inadequate and a solution is not in sight. Furthermore, climate change is a significant threat to tuna fisheries, and more research must be conducted in the Indian Ocean.

**Prof. M.J.S. Wijeyaratne** provided an overview of the status of tuna fisheries in Sri Lanka, institutional mechanisms governing them and said that current fishing methods may require modification as fish migrate to deeper waters due to changing climate conditions.

The panel emphasized the importance of establishing regional fisheries management organizations, especially for deep-sea fishing in the Indian Ocean. They also stressed the necessity of creating marine protected areas as an interim measure until such agreements are established.

### 3. Thematic Presentations

Following the introductory remarks from the Panellists, three thematic presentations were made. Dr. E. Vivekanandan, Advisor, BOBP-IGO made a presentation on "Tunas in Warming Oceans: Changing Behaviour and Management Options"; Ms. Maeve Nightingale, Head, IUCN-Asia made a presentation on "BBNJ Agreement: Background and Objectives"; and Dr. N. Saravanane, Scientist, Centre for Marine Living Resources and Ecology (CMLRE) Ministry of Earth Sciences, Govt. of India and Dr. Hussain Sinan, Post-Doctoral Fellow, Dalhousie University, Canada, made a presentation on "Potential Impact of BBNJ Agreement on Tuna Fisheries".

#### 3.1 Tunas in Warming Oceans: Changing Behaviour and Management Options

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**Dr. E. Vivekanandan**

*Dr E. Vivekanandan serves as Scientific Advisor at BOBP-IGO. Formerly, he was Emeritus Scientist in ICAR-CMFRI, Kochi. Dr. Vivekanandan has undertaken extensive studies on the impact of climate change on fisheries in India. He is also known for his contribution to the research on marine fish population dynamics and stock assessment. His other areas of interest are marine ecosystem modelling and marine mammal research.*

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Tunas, as apex predators with a trophic level of 4 or higher, play a vital ecological role by controlling the food web within ecosystems. These highly migratory species face significant temperature variations between oceans. However, the sustainability of tuna fisheries is threatened by multiple factors, including overfishing, bycatch, and the impacts of climate change. Disturbingly, approximately one-third of the seven principal tuna stocks are currently maintained at biologically unsustainable levels due to overwhelming demand. Climate change further compounds the challenges by causing shifts in the geographical distribution of tuna species. Moreover, owing to their widespread distribution, tunas face fishing pressures from numerous countries deploying various fishing practices. Robust management and effective enforcement are necessary to address these issues.

The warming of aquatic systems due to global warming is causing significant changes with projections indicating even more prominent changes in the future. Tuna fisheries are particularly affected by climate change due to the wide distribution of tuna species in various water temperatures. Tunas, with

their high metabolic rates, are sensitive to temperature and oxygen concentrations. Tunas have a unique adaptation system to regulate their body temperature above the ambient water temperature by using an internal counter-current heat exchange system. They encounter substantial temperature differences within short time frames, necessitating a higher body temperature than the surrounding water. The increasing effects of climate change can impact the availability of food and the overall productivity of ecosystems. Climate change pathways, such as global warming, El Niño, La Niña, and IOD events, alter seawater properties, including surface and sub-surface temperatures and thermocline depth. These changes can expand the oxygen minimum zone and lead to ocean stratification, influencing the suitability of tuna habitats and the availability of food resources.

As a response to warming seas, tunas may migrate towards higher latitudes at varying rates in different hemispheres. However, the specific impact of climate change on tuna fisheries in landlocked areas like the Arabian Sea and the Bay of Bengal requires further research. Projections regarding changes in global tuna habitats and biomass have limitations and uncertainties, including potential decreases in ecosystem productivity and tuna body size. Such changes will have a severe impact on fishing knowledge and practices. Further, global studies have also highlighted the increasing risk of conflicts among fisheries users, emphasizing the need for transboundary management and cooperation among states to ensure the sustainability of tuna stocks.

In the Bay of Bengal region, several crucial questions remain unanswered regarding tuna fisheries. These include:

- current status of tuna stocks and their characteristics,
- extent of bycatch in tuna fisheries,
- potential biomass available
- uniqueness of tuna stocks in the Bay of Bengal, and
- impact of climate change on the entire tuna value chain.

To estimate the maximum catch potential of tuna species in this region, it is essential to undertake species distribution modelling under various climate change scenarios, developing indices of thermal sensitivity and habitat suitability.

### **3.2 BBNJ Agreement: Background and Objectives**

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***Maeve Nightingale** is a Senior Programme Officer leading the IUCN Asia Regional Coastal and Marine Programme. Her work focuses specifically on addressing the multiple issues associated with sustainable coastal resource management, including Disaster Risk Reduction and climate change mitigation and adaptation.*

**Ms. Maeve Nightingale**

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High seas are the area beyond 200 nautical miles (370km) which covers nearly half of the planet's surface and 64% of the global ocean surface. There are different international policies and organizations in place to manage the ocean, especially the high seas. The current governance framework for the high seas is fragmented and involves multiple UN organizations, making effective management and conservation difficult.

In 2004, the United Nations General Assembly adopted a resolution calling for the establishment of a legal framework to protect marine biodiversity beyond national jurisdiction (BBNJ). The issue gained momentum, and in 2010, the United Nations General Assembly resolved to start formal discussions on the development of a new international agreement under the United Nations Convention on the Law of the Sea (UNCLOS).

Since then, the United Nations has been working on the development of an international legally binding instrument for the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction. The negotiations involve representatives from governments, intergovernmental organizations, non-governmental organizations, academia, and other stakeholders. The process has been ongoing for many years, with the latest round of negotiations starting in 2018.

Since the inception of the BBNJ process, IUCN has been actively involved in promoting the adoption of an ambitious treaty by providing informed decision-making resources, organizing expert workshops and discussions, and soliciting input from its Membership to develop knowledge and expertise products. There are four key elements like area-based management tools, including marine protected areas, environmental impact assessment and strategic environmental assessment, marine genetic resources, including access and benefit sharing, capacity building and technology transfer. One of the aims of the high seas' treaty is to promote cooperation and coordination in maintaining high seas.

According to article 8.2 of the agreement, fisheries are excluded from the marine genetic resources chapter. BBNJ parties intending to propose an MPA are obliged to collaborate and consult with relevant RFMOs as they develop the MPA proposal. Further, RFMO can provide information on measures which they have implemented to achieve the objectives of BBNJ MPAs. The formal adoption of the BBNJ agreement is expected on 19<sup>th</sup> June 2023 and 60 states need to ratify, for the agreement to enter into force.

### **3.3 Potential Impact of BBNJ Agreement on Tuna Fisheries**

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**Dr. N. Saravanane**

***Dr. N. Saravanane** is Scientist-F at Centre for Marine Living Resources and Ecology (CMLRE), Ministry of Earth Sciences, Govt. of India. He is an expert in “taxonomy and biodiversity informatics”, with more than 25 years of experience in marine living resources research in the country. Dr. Saravanane had been part of the Indian Delegation during the BBNJ negotiation.*



**Dr. Hussain Sinan**

***Dr. Hussain Sinan** is the Director (Fisheries), Ministry of Fisheries, Marine Resources and Agriculture, Government of Maldives and is currently pursuing his Post-Doctoral Fellowship (PDF) at Dalhousie University, Canada. Earlier, he served as the Chair of the Performance Review Panel of the Commission for the Conservation of Southern Bluefin Tuna. Dr. Sinan had been part of the Maldivian Delegation during the BBNJ negotiation.*

UNGA resolution 72/249 states that the negotiating process and its result i.e., the BBNJ treaty and its results should not undermine existing relevant legal instruments and frameworks by global regional and sectoral bodies. Article 8 of the agreement says the provision of the part shall not apply to fish or other living marine resources known to have been taken in fishing and fishing-related activities from ABNJ.

BBNJ agreement does not undermine relevant legal instruments and frameworks and ~~relevant and~~ relevant global, regional, sub-regional and sectoral bodies, that promote coherence and coordination. Article 6 of the agreement also states international cooperation, in which parties shall endeavour to promote, as appropriate the objectives of this agreement, when participating in decision-making.

The BBNJ agreement is likely to have significant implications for the work and function of fishery organizations. However, there are several uncertainties that need to be addressed. Firstly, it is unclear when the agreement will come into force. Additionally, there are concerns regarding how it will affect the management measures that are already in place and implemented by regional organizations. Another important issue is how to handle situations where the measures of regional bodies negatively impact marine diversity but not the species they manage. Furthermore, a state that is part of a regional agreement may play a role in implementing decisions without joining the BBNJ agreement. Finally, there is a possibility that a regional body with relevant competency may not be able to reach a consensus agreement when the same is possible, procedurally with the BBNJ. These are all important issues that need to be addressed to ensure the effective implementation of the BBNJ agreement.

Regarding the establishment of marine protected areas (MPAs), there are two scenarios to consider under the BBNJ agreement. In the first scenario, if an MPA is proposed to be established under the BBNJ agreement, it is unclear what would happen to the existing measures that have already been adopted by regional bodies and frameworks. In the second scenario, it is important to determine the role of regional bodies or agreements when creating measures that overlap with those already established under the BBNJ agreement. These are important questions that need to be addressed to ensure the effective implementation of the BBNJ agreement and the protection of marine biodiversity.





**The following table summarizes the key points made during the thematic presentations.**

Scope	Observation
Importance and value of tuna fisheries	Tunas have high ecological importance as apex predators with a trophic level of 4+ and account for 20% of the value of all marine capture fisheries, with a production of 7.8 million tonnes and an end value of USD 41 billion dollars.
Threats to sustainable tuna fisheries	Issues such as unsustainable fishing, bycatch, and climate change pose a significant threat to the sustainability of tuna fisheries. Due to overwhelming demand, 1/3rd of the 7 principal tuna species is at biologically unsustainable levels. Climate change is causing a shift in the geographical distribution of tuna species, and more robust management and effective enforcement are necessary.
Impact of climate change on tuna fisheries	Due to its wide distribution in tropical, sub-tropical, and temperate waters with temperature preferences, tuna is sensitive to temperature and oxygen concentration. Increased climate change might affect food availability and ecosystem productivity, resulting in the expansion of the oxygen minimum zone and ocean stratification, which might affect habitat suitability and the availability of foods. Tuna might move towards higher latitudes due to climate change, with a decrease in ecosystem productivity and body size of tunas.
BBNJ Agreement: Background and Objectives	<p>The BBNJ agreement is an international legally binding instrument for the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction. There are four key elements: area-based management tools, including marine protected areas, environmental impact assessment, and strategic environmental assessment; marine genetic resources, including access and benefit sharing; capacity building and technology transfer; and the promotion of cooperation and coordination in maintaining high seas.</p> <p>Fisheries are excluded from the marine genetic resources chapter, and BBNJ parties intending to propose an MPA are obliged to collaborate and consult with relevant RFMOs. The formal adoption of the BBNJ agreement is expected on 19 June 2023, and 60 states need to ratify it for the agreement to enter into force.</p>
Potential Impact of BBNJ Agreement on Tuna Fisheries	<p>The BBNJ agreement is likely to have significant implications for the work and function of fishery organizations, and there are a few uncertainties that need to be addressed.</p> <p>The BBNJ agreement does not undermine relevant legal instruments and frameworks and relevant global, regional, sub-regional and sectoral bodies that promote coherence and coordination.</p> <p>Parties shall endeavour to promote the objectives of this agreement when participating in decision-making, and the role of regional bodies or agreements when creating measures that overlap with those already established under the BBNJ agreement needs to be determined.</p>

## 4. Plenary

During the plenary session, participants interacted with the panellists and the speakers on various topics related to tuna fisheries and the BBNJ agreement as under:

- Research gaps related to tuna, such as the lack of comprehensive catch data and understanding of the impact of climate change on tuna populations.
- The importance of involving artisanal small-scale fishing communities in decision-making processes related to the management of tuna fisheries in the region.
- The need for regional cooperation and collaboration to ensure the sustainable management of tuna stocks in the Indian Ocean.
- Capacity-building efforts to support developing countries in managing their marine resources, including tuna fisheries.
- The lack of understanding on how the BBNJ agreement can help to deal with the impacts of climate change on tuna populations.
- Inadequate coordination and synergies between Regional Fishery Bodies (RFBs) and Regional Seas Organisations (RSOs) in the management of marine resources.
- The need to modify fishing methods due to changing climate conditions and the expected significant changes in the distribution and abundance of tuna populations.
- The need for strengthening RFBs in the Indian Ocean for the sustainable management of marine resources.
- The potential of establishing marine protected areas as an interim measure to protect important fish habitats and reduce overfishing.

***The deliberations highlighted the need for more research, cooperation, and collaboration among stakeholders in the sustainable management of tuna fisheries and the importance of considering the impacts of climate change and the BBNJ agreement in decision-making processes.***

Delivering the closing remark, **Dr Pratibha Rohit**, Principal Scientist, CMFRI said that the discussion highlighted the need for regional collaboration in scientific research to understand the impact of climate change on transboundary species like tuna. The BOB rim countries should initiate a program to characterize the fishery and understand the changes. The regional research program of the BOBP-IGO could be a milestone, which needs strengthening. The proposed BBNJ agreement can help in dealing with climate change, but involving all stakeholders and designing viable management frameworks remain the key challenges. Synergies between RFBs and RSOs need to be developed, and funding sources diversified to support capacity building in developing countries. Developed countries should step up in providing international assistance.

## 5. Way Forward

Based on the deliberations, following way forward was proposed for further action at all levels.

### Research Needs

- **National Level:**
  - Comprehensive catch data to assess stocks effectively and develop management strategies.
  - Understanding of the impact of climate change on tuna populations in the region.
- **Regional Level:**
  - The stock structure and biomass of tuna in the Indian Ocean to influence management decisions.
  - The impact of climate change on tuna fisheries in the Indian Ocean.

### Policy Needs

- **National Level:**
  - Development and implementation of sustainable fishing practices based on research findings.
  - Involvement of artisanal small-scale fishing communities in decision-making processes related to the management of tuna fisheries.
- **Regional Level:**
  - Coordination and collaboration among multiple countries and regions for sustainable management of tuna stocks.
  - Synergies and coordination between Regional Fishery Bodies (RFBs) and Regional Seas Organisations (RSOs).
  - Establishment of marine protected areas (MPAs) as an interim measure to protect important fish habitats and reduce overfishing.

### Capacity Needs

- **National Level:**
  - Support countries to develop scientific and technical expertise, as well as institutional and governance frameworks.
- **Regional Level:**
  - Strengthening of RFBs for sustainable management of marine resources.

### Cooperation at Regional Level

- Collaboration and coordination among countries and regions for sustainable management of tuna stocks.
- Implementation of the BBNJ agreement to conserve and sustainably use marine biodiversity in areas beyond national jurisdiction (ABNJ).
- Sharing of best practices and knowledge among countries and regions for effective management of tuna fisheries in the Indian Ocean.

In summary, sustainable management of tuna fisheries in the Indian Ocean requires comprehensive research efforts at national and regional levels, development and implementation of sustainable policies, capacity-building efforts, and collective action among multiple countries and regions. This will aid in ensuring the conservation and sustainable use of marine biodiversity in the Indian Ocean and supporting the livelihoods and food security of artisanal small-scale fishing communities.

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## Panel Discussion on Tuna Fisheries in BOB Region: *Emerging Challenges under Changing Climate and BBNJ Regime*

### Agenda

Date: May 2, 2023

Time in IST: 1000 - 1230 hrs

### Panellists

BANGALDESH :	Dr. Yahia Mahmud, <i>Director General, BFRI, Mymensingh</i>
INDIA :	Dr. A. Gopalakrishnan, <i>Director, CMFRI, Kochi</i> Dr. R. Jeyabaskaran, <i>Director General, FSI, Mumbai</i>
MALDIVES :	Dr. Shiham Adam, <i>Director, IPNLF &amp; Former DG, MMRI, Male'</i>
SRI LANKA :	Dr. M.J.S. Wijeyaratne, <i>Chairman, NARA, Colombo</i>

**1000 - 1010** Setting the Context : **Dr. P. Krishnan, Director, BOBP-IGO**

**1010 - 1030** Opening Remarks : **Panellists**

### 1030 - 1130 Lead Presentations

**1030 - 1050** Tuna in Warming Oceans: Changing Behaviour & Management Options  
Dr. E. Vivekanandan, *Consultant, FAO/CMFRI/BOBP-IGO*

**1050 - 1110** BBNJ Agreement: Background and Objectives  
Dr. Maeve Nightingale, *Senior Programme Officer, IUCN Asia Regional Office, Thailand*

**1110 - 1130** Potential Impact of BBNJ Agreement on Tuna Fisheries  
Dr. N. Saravanane<sup>1</sup> & Dr. Hussain Sinan<sup>2</sup>  
<sup>1</sup>Scientist 'F', Centre for Marine Living Resources and Ecology (CMLRE), MoES, GoI  
<sup>2</sup>Director (Fisheries), Maldives & Post-Doctoral Fellow, Dalhousie University, Canada

### 1130 - 1230 Interaction & Strategy Session

**1130 - 1215** Scientific, Technical and Institutional Needs for Sustaining Tuna Fisheries in BOB Region **All Panellists and Participants**

**1215 - 1230** Summary & Way Forward **Dr. A. Gopalakrishnan, Director, ICAR-CMFRI**