Food and Agriculture Organization of the United Nations

BOBP

Report of the National Workshop on
Fisheries Management Inventory (FMInv) - India

28 – 30 July 2025

National Workshop on

Fisheries Management Inventory (FMInv) in India

28 – 30 July 2025

BOBP-IGO Secretariat, Chennai

Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO)
91, Saint Mary's Road, Abiramapuram, Chennai - 600 018. INDIA

About the Organisers

Food and Agricultural Organization of the United Nations (FAO)

FAO is a specialized UN agency founded in 1945 to combat global hunger and promote sustainable agricultural development. Headquartered in Rome, FAO works with governments and international organizations to improve food security, nutrition, and rural livelihoods. It plays a key role in fisheries and aquaculture governance, developing international agreements

Bay of Bengal Inter Governmental Organisation (BOBP-IGO)

The BOBP-IGO is a regional fisheries advisory body with Bangladesh, India, the Maldives and Sri Lanka as its contracting parties. It is mandated to enhance cooperation amongst its member countries and other countries (especially, Indonesia, Malaysia, Myanmar and Thailand) for sustainable fisheries management in the Bay of Bengal region. The BOBP-IGO Secretariat is located in Chennai. The Department of Fisheries, Government of India is the nodal agency from India and the hosting agency.

Report Preparation

This report on the "National Workshop on Fisheries Management Inventory (FMInv) in India".

Core Team

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

Dr. E. Vivekanandan, International Consultant, BOBP-IGO, Chennai

Dr. K Sunil Mohamed, International Consultant, BOBP-IGO

Dr. P. S. Ananthan, Principal Scientist, ICAR- Central Institute of Fisheries Education (CIFE)

Dr. T. Velumani, Project Scientist, BOBP-IGO, Chennai

Design and Layout

Dr. S. Jayaraj, Publication Officer, BOBP-IGO, Chennai; and

Mr. M. Krishna Mohan, Information Assistant, BOBP-IGO, Chennai

Preferred Citation:

BOBP-IGO., 2026. Report of the National Workshop on Fisheries Management Inventory (FMInv) in India: 28-30 July 2025, Chennai. *Bay of Bengal Programme Inter- Governmental Organisation. 37pp*

Summary

The Food and Agriculture Organisation has initiated information collection for preparation of Fishery Management Inventory (FMInv) to share best practices for fisheries assessment and management. The objective of FMInv is to allow fishery managers, fishers and other stakeholders to access information on other management systems and measures, and their effectiveness or not in achieving the intended objectives. During Phase I of FMInv data compilation for selected fisheries, the BOBP-IGO partnered with the FAO and devloped database for 21 fisheries in its member countries (Bangladesh, India, Maldives and Sri Lanka). Building on the information collected in Phase I, the FAO and BOBP-IGO proposed to develop a fully validated database for shortlisted fisheries, through a participatory process involving relevant stakeholders. For this purpose, national workshops were planned.

A National Workshop on four short-listed fisheries from India was held in BOBP-IGO Secretariat, Chennai during 28-30 July 2025. The participants were fishery managers, researchers, fishers and NGOs either engaged in planning management framework and implementing management plans and measures, researchers involved in developing these plans and measures, or involved in following and supporting the measures.

After the Opening Session, the participants discussed on the salient features of each fishery, management framework, management measures and monitoring, enforcement and compliance I four breakout group discussions. Each group was moderated by a Facilitator.

The key takeaways for the four fisheries are:

(i) **Ashtamudi Lake Short-Neck Clam Fishery, Kerala**: The intent of the communities and state institutions to adopt co-management with scientific approach developed by research institutions has helped management of the fishery. Robust monitoring and enforcement arrangement ensures compliance. Fisheries management is a dynamic process, and should take into consideration risks such as environmental shocks, governance gaps and socioeconomic disparities. These risks can be addressed by constant fisher–researcher communication and by following adaptive management through active functioning of co-management system. The resource users should be incentivized for adopting a sustainable management system. The experience and lessons learned from the Ashtamudi clam fishery management initiatives provide valuable insights for strengthening EAFM.

(ii) **Palk Bay Blue Swimming Crab Fishery, Tamil Nadu:** The fishery demonstrates that community ownership ensures higher compliance and stronger enforcement compared to top-down regulations. Market incentives play a crucial role in shaping fisher behavior and complement regulatory frameworks. Persistent conflicts in Palk Bay, particularly between mechanized and small-scale fishers, have compelled the government to introduce conservation measures and promote alternative livelihoods. Addressing social and economic divisions and inequity within fishing communities is crucial to ensure equity and inclusivity in management. Multi-layered system like strong institutional, research and civil society support to fisheries department and community-based organizations support awareness, mobilization, and co-management initiatives and strengthens ecological and socio-economic outcomes. Additional livelihood opportunities are essential to reduce fishing pressure, but cultural traditions and existing skills should be respected. Fishers often resist land-based alternatives preferring sea-based options such as seaweed

farming, mariculture, or eco-tourism. Successful diversification requires linking these initiatives to viable markets and value chains.

(iii**) Lakshadweep Islands Tuna Live-bait Fishery:** The Lakshadweep tuna live bait fishery is intrinsically linked to the tuna fishery, and hence, strengthening management measures for livebait fishery should consider the tuna fishery in its entirety. Non-availability of data on livebait fishery is a critical issue. Lakshadweep islands are ecologically fragile with limited land space and carrying capacity, which need to be considered while planning fisheries development and management. Social cohesion, culture, and support by the communities play an important role in implementing management measures in all the islands. In Minicoy, traditional community-level management is effectively practiced due to this reason. There is good scope for developing co-management arrangement in the islands.

(iv) **West Bengal Hilsa Fishery:** Management of anadromous migratory fish like hilsa has to consider both inland and marine sector holistically, as fisheries in the two sectors are intrinsically linked to each other. Being a transboundary fish, joint management of the fishery by India and Bangladesh is also crucial. Fishery management framework should be strongly supported by effective management measures, especially by factoring high poverty segments to ensure better compliance. Adaptive and data-driven approaches that balance scientific guidance, practical enforcement, awareness campaigns, and socioeconomic realities, are important to ensure that conservation measures are both effective and feasible for sustainability of the fishery. Planning and implementing Ecosystem Approach to Fisheries Management (EAFM) with co-management arrangement and strong science-policy interface by considering ecological well-being and human well-being facilitated by good governance will be practical way forward to sustain the fishery.

Epilogue: The workshop achieved its objectives as all the participants interacted enthusiastically in the discussions and were willing to share their knowledge. Conversations among various stakeholders including fishery managers, researchers, fishers, and NGOs to raise awareness about the importance of management plans and measures for sustainable fisheries management were facilitated. Grass root-level challenges in implementing management plans and measures for the respective fishery, and identification of mutually agreed solutions for their effective implementation among different stakeholders were documented.

As the next step, the FMInv survey data will be updated by the BOBP-IGO based on the information received from the participants in the workshop. The revised survey data will be sent for validation to the Facilitators and resource persons, and submitted to the FAO. To develop better practical fisheries management approaches, adopting ideas and lessons from similar fisheries will be valuable. BOBP-IGO can undertake comparative assessments to understand regional variations and support the improvement of fisheries management strategies.

Acronyms

BOBLME	Bay of Bengal Large Marine Ecosystem
BOBP-IGO	Bay of Bengal Programme Inter-Governmental Organisation
CCRF	Code of Conduct for Responsible Fisheries
CMFRI	Central Marine Fisheries Research Institute
CMPA	Crab Meat Processors Association
EAFM	Ecosystem Approach to Fisheries Management
FAO	Food and Agriculture Organization
FIMSUL	Fisheries Management for Sustainable Livelihood
FMInv	Fishery Management Inventory
FIP	Fishery Improvement Project
ICAR	Indian Council of Agricultural Research
INCOIS	Indian National Centre for Ocean Information Services
MLS	Minimum Legal Size
MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield
NGOs	Non-Governmental Organizations
NFI	National Fisheries Institute
SHO	Station House Officer
SOFIA	State of World Fisheries and Aquaculture
SSNI	Sustainable Seafood Network of India

Table of Contents

Participants at the Workshop

1. Background

Following a recommendation from the First Session of the Sub-Committee on Fisheries Management of the Committee on Fisheries[1], the Food and Agriculture Organization of the United Nations (FAO) has been developing a global process and tool to gather information on current practices for assessment and management of fisheries aimed at empowering fishery managers to improve sustainability. In this context, the FAO initiated information collection for preparation of Fishery Management Inventory (FMInv) to share best practices for fisheries assessment and management and to understand "what is working where" in terms of fishery management measures. The objective of FMInv is to allow fishery managers, fishers and other stakeholders to access information on other management systems and measures, and their effectiveness or not in achieving the intended objectives. This database is the first step to understanding the context and potential pathways for improvement, and ultimately contribute to the development of management plans in line with the Ecosystem Approach to Fisheries Management.

2. FMInv Phase I: Data Compilation for Selected Fisheries

During Phase I of FMInv data compilation for selected fisheries, the BOBP-IGO partnered with the FAO. The BOBP- IGO adopted the data template developed by FAO and contributed to developing the database for 21 fisheries in its member countries (Bangladesh, India, Maldives and Sri Lanka), covering a wide spectrum of fishery types, management systems, and management measures from the four countries, which was reviewed and finalized by the FAO. The required information was collected from researchers, managers, and other stakeholders associated with the selected fisheries (e.g. through literature surveys, interviews and questionnaires).

3. FMInv Phase II: Developing a Validated FMInv Database through National Workshop

Building on the information collected in Phase I, the FAO and BOBP-IGO proposed to develop a fully validated database for shortlisted fisheries, through a participatory process involving relevant stakeholders. For this purpose, national workshops were planned to review the implementation of current fisheries management plans or interventions for three or four fisheries in each country. From a series of discussions with experts from the FAO, BOBP-IGO and other stakeholders, the following four fisheries from India were shortlisted for the workshop:

- Ashtamudi Lake Short-Neck Clam Fishery, Kerala
- Palk Bay Blue Swimming Crab Fishery, Tamil Nadu

[1] https://www.fao.org/3/cd0256t/cd0256t.pdf

- Lakshadweep Islands Tuna Live-bait Fishery
- West Bengal Hilsa Fishery.

India's National Workshop was conducted with the following objectives:

3.1 Specific objectives

- To understand the implementation challenges of current fishery management plans/measures through participatory assessment and cross-learning among fishery managers, researchers, and stakeholders; and
- To foster inclusive dialogue among fishers, managers, and NGOs to co-develop actionable solutions and finalize context-specific management actions for sustainable and participatory fisheries governance.

3.2 Expected outcomes

- Document grassroots-level challenges in implementing management plans and measures for the respective fishery, and identify mutually agreed solutions for their effective implementation among different stakeholders.
- Facilitate conversations among various stakeholders including fishery managers, researchers, fishers, and NGOs to raise awareness about the importance of management plans and measures for sustainable fisheries management.

3.3 Agenda and Venue

- The Workshop was held during 28-30 July 2025 with a Wrap-Up session on 31 July 2025.
- After Opening Session on 28 July 2025, fisheries managers and researchers discussed on the 4 shortlisted fisheries in break-out groups on 28-29 July 2025.
- On 30 July 2025, fishers, researchers and NGOs discussed on the four shortlisted fisheries in breakout groups.
- Plenary sessions were held on 29 July 2025 and 30 July 2025.
- The agenda is placed in the Prospectus ***(Annex 1)***.
- The Workshop was held in the Secretariat of the BOBP-IGO, Chennai.

3.4 Coordinators

- **Dr. P. Krishnan**, Director, BOBP-IGO, Chennai
- **Mr. Carlos Montero Castaño**, Fishery Officer, NFIFM Assessment and Management, FAO, Rome
- **Mr. Varun Tandon**, Fisheries Consultant, NFIFL, FAO, Rome

3.5 Facilitators

- **Mr. Varun Tandon**, Fisheries Consultant, NFIFL, FAO, Rome
- **Dr. E. Vivekanandan**, Senior Scientific Consultant, BOBP-IGO, Chennai
- **Dr. K. Sunil Mohamed**, Chair, Sustainable Seafood Network of India (SSNI), Kochi
- **Dr. P. S Ananthan**, Principal Scientist, ICAR- Central Institute of Fisheries Education (CIFE), Mumbai

3.6 Participants

The participants were fishery managers, researchers, fishers and NGOs either engaged in planning management framework and implementing management plans and measures, researchers involved in developing these plans and measures, or involved in following and supporting the measures. The list of participants arranged by fishery is placed in ***Annex 2.***

4 Opening Session

Dr. P. Krishnan, Director, BOBP-IGO gave an overview of the purpose of the national workshop and mentioned that the four fisheries for the workshop were short-listed from 11 Indian fisheries selected for Phase I of FMInv data collection. He said that the views of the stakeholders directly engaged in the management of the four fisheries will be sought in the workshop, and the validated information will be compiled into a database for fisheries managers worldwide, enabling them to examine the examples, draw lessons, and implement similar approaches in their own contexts.

Mr. Carlos Montero Castaño, FAO explained that the FMInv is more than just a data collection exercise. It is an approach designed to systematically address the complex nature of overfishing by mapping existing fisheries management measures, identifying gaps, and guiding improvements. The process involves capturing information on governance, regulations, monitoring, and enforcement, thereby giving decision-makers a consolidated overview of the management status. He referred to the SOFIA Ripple plot, which illustrates the proportion of fish stocks that are overfished. This visual representation, he noted, makes it easier to understand the scale of the problem and the urgent need for targeted management interventions. Overfishing is not a simple issue to resolve due to ecological, economic, and social complexities. However, the structured methodology of FMInv allows these complexities to be broken down into actionable components. By organizing the data in a consistent and comparable format, stakeholders can prioritize actions and assess progress over time. He further pointed out that management, in itself, is a multifaceted practice requiring coordination among multiple agencies, sectors, and communities. FMInv supports this by serving as a reference point for both national and regional fisheries governance frameworks. It also enables alignment with international reporting obligations and supports evidence-based policymaking. He reiterated that FMInv has already shown success in guiding better management practices in participating countries. While this tool alone cannot solve overfishing, it provides the

necessary structure, transparency, and shared understanding required to move towards sustainable fisheries. Its continued use and refinement will be essential for achieving long-term conservation and resource management goals.

Dr. Grinson George, Director, ICAR-Central Marine Fisheries Research Institute, noted that the FMInv initiative is timely and has the potential to link knowledge generation with practical tools for managers. He said that the inventory could offer context-specific options for stakeholders seeking information on diverse management systems and measures. Drawing on examples from the pilot phase, he referred to the need for validated data gathered through participatory processes. He assured that ICAR-CMFRI would work towards creating a national database on fisheries management to contribute to FAO's efforts and expressed readiness to partner with BOBP-IGO on a regional database. Emphasising the workshop's objectives, he called for participatory assessments, cross-learning, and actionable solutions for sustainable governance. For fisheries managers and researchers, the event offers a chance to reflect on existing plans and explore improvements, while for fishers and resource users it provides a platform to share experiences and suggest changes. He urged the delegates to document grassroots challenges and identify agreed solutions for effective implementation, with the four shortlisted fisheries forming the focus of breakout discussions.

Dr. Mohamed Koya, Fisheries Development Commissioner, Department of Fisheries, Government of India stressed the need for documenting the best practices and case studies in the country, noting India's diverse fisheries, the challenges they face, and the opportunities ahead. Stressing a sustainability-oriented, ecosystem approach to fisheries management, he explained that India's federal structure gives a major role to coastal states, with the Department of Fisheries engaging coastal communities through state governments and relevant institutions, guided by scientific recommendations. He highlighted the value of engagement between scientists and managers. Dr. Koya welcomed the inventorying exercise as model fisheries, and hoped to see similar examples from the tropical regions. He assured continued support of the Department of Fisheries to the initiatives of FAO and BOBP-IGO. He encouraged the scaling up of a regional fisheries database and showcasing India's unique fisheries, community efforts, and government initiatives as examples to the world.

Dr. Sanjay Pandey, Deputy Commissioner, Department of Fisheries, Government of India affirmed the Department's eagerness to review the final documentation and outputs, which he believed could herald a new era in fisheries management. Dr. Pandey also emphasised the importance of analysing marine fisheries policy, legislation, and coordination among stakeholders, and expressed the Department's willingness to be associated with the initiative.

Mr. Varun Tandon, Fisheries Consultant, FAO stated that the workshop will focus on integrating perspectives from diverse stakeholders, recognising that each may view the same implementation differently. The aim is to triangulate what is truly valuable and beneficial for all, while fostering dialogue on the challenges faced by different groups and exploring practical, ground-level solutions. He noted that this approach is distinct in possibly bringing such discussions together for the first time and in linking outcomes to

both ongoing initiatives of BOBP-IGO, including the BOBLME project, and to potential future initiatives that may emerge from these exchanges. He explained that the sessions will be detailed, with specific questions for participants on each management measure, and each topic will be given substantial time for in-depth discussion to extract real lessons learned. This depth, he stressed, is necessary to derive meaningful insights. The process will culminate in a short plenary summarising three to four key lessons for sharing with a global audience. The emphasis of the workshop will be on detailed, hands-on work rather than broad, high-level discussions.

Dr. E. Vivekanandan, Senior Scientific Consultant, BOBP-IGO provided an overview of the policy and legislative framework applicable to the fisheries units selected for discussion. He focused on key legislations central to the fisheries management network, emphasising their role in regulating fishing practices, promoting sustainable resource use, protecting marine biodiversity, and safeguarding the livelihoods of fishing communities. His presentation focused on four key points for fisheries management: the management measures for the identified fisheries, how these measures are monitored and assessed, and the enforcement and compliance levels.

Dr. E. Vivekanandan also explained that the breakout group discussions will focus on how these management measures are decided, implemented, monitored, and enforced, by highlighting practical experiences, challenges, and stakeholder cooperation in real-world implementation. He also explained the composition of breakout groups and outlined the expected outcomes from each group, emphasizing their specific roles, objectives, and contributions towards meeting the objectives of the workshop.

5. Breakout Group and Plenary Sessions

On Day 1 & 2, more than 7 hours were allotted for breakout group discussion consisting fishery managers and researchers. On Day 3, about 4 hours were allotted for breakout group discussion consisting fishers, NGOs and researchers. Long breakout group sessions facilitated in-depth discussion on the management measures and how they are implemented in the four short-listed fisheries. Segregating fishery managers and fishers permitted understanding the perceptions of the resource managers and resource users. Four facilitators, identified from extensive pre-workshop interactions, generated questions and sought the views of the participants on the three days. Note-takers were assigned to each breakout group.

For interacting with the participants in the breakout sessions, the following documents were referred/ prepared in pre-workshop exercise:

- Data collected from experts on the four fisheries in the FMInv survey forms consisting 68 questions in Phase I;
- Brief profile of each fishery prepared from the FMInv survey forms; and
- Questionnaires related to each fishery prepared for discussion with the participants for the guiding the Facilitators.

The salient observations and takeaways for the management implementation of four fisheries based on the breakout group and plenary session discussion during three days are given below:

5.1 Ashtamudi Lake Short-Neck Clam Fishery, Kerala

Salient features of the fishery

- Short-neck clam fishery in Ashtamudi Lake (a Ramsar site), Kerala, India is a smallscale, low-volume, low-value fishery.
- The fishery is operated by local, traditional fishers numbering around 3,000, employing small canoes, and restricting to a limited area in the estuary using highly selective hand-operated dredge and hand-picking by free diving.
- As the catch declined in the late 1990s with increase in the operation of hand dredge due to export demand from southeast Asian countries, the fishers realised the need for management interventions to sustain the fishery.
- On demand from the fishers, implementation of good management measures through co-management arrangement revived the fishery in 2010.
- The fishery was certified as sustainable by Marine Stewardship Council (MSC) in 2014.
- However, due to floods and spread of invasive mussel in the estuary, the fishery declined again in 2020.
- At present, the MSC certification has ceased. There is no export, but the clams are marketed in Kerala and nearby states in India.
- The management measures continue to be implemented, and there are signs of revival of the fishery, with potential for restoration of the fishery and re-certification.

Management framework

- The fishery operates under the Clam Fishery Management Plan (2011), developed by ICAR-Central Marine Fisheries Research Institute and implemented by the Department of Fisheries, Kollam District, Kerala.
- Clam Resources Management Council was established in 2013. The Council is chaired by the District Collector with 20 members represented by the Department of Fisheries, local administration, clam fishers, traders, exporters, research organisations, civil societies, and other relevant stakeholders.
- The management framework combines government oversight and community participation through co-management.
- Kerala state has established a three-tier Fisheries Co-Management Council at State, District and Village levels.
- The fishery is managed under Kerala Inland Fisheries and Aquaculture Act 2010.
- At the national level, the National Policy on Marine Fisheries (2017) and National Environmental Policy 2006 apply to the fishery.

Management measures

Clam Resources Management Council meets regularly to review the management measures and their performance.

Measures include:

- Licensing of fishers and registration of boats and gears engaged in clam fishing is mandatory. There is no cap on clam fisher licenses. Boat registration is one-time, while gear specific to clam collection is not registered.
    - Clam management area has been set-up where the management measures apply. For this purpose, fishing zones have been demarcated to reflect clam distribution.
    - *Seasonal closure*: A fishing ban for three months from December to February protects peak breeding and spat fall. Timing is flexible; for example, in 2022, closure started earlier due to fisher-reported spatfall.
        - *Minimum Legal Size (MLS)*: MLS of 20 mm size limit ensures that clams reproduce before harvest.
        - *Mesh size restriction:* 30 mm mesh prevents juvenile harvest and permits the clams to attain first maturity before harvest.
        - *Ban on mechanical dredging and permission to hand dredging*: Prevents overharvest.
        - *No-Fishing Zones*: Seaward side of the lake declared as No-Fishing Zone under the Kerala Inland Fishery Act.

Monitoring, Enforcement and Compliance

- *Monitoring:* ICAR-CMFRI plays a central role in scientific monitoring by collecting catch and biological data. Regular biomass surveys are undertaken and MSY and Limit Reference Point are estimated. Awareness programmes and women's empowerment programmes are conducted.
- *Implementation*: Mesh-size and MLS measures are enforced through patrolling. Fishers contribute to enforcement by informing authorities of violations and spat fall timings. Enforcement involves layered structures: life guards, extension officers, marine police, and authorized officers.
- *Enforcement:* 13–18 patrols are conducted monthly. Penalties escalate: first offense ₹5,000 and a warning; and second offense ₹10,000 and vessel/catch confiscation. There are 14 authorized officers in Kerala with authority for impounding. Penalty data are documented monthly and annually across districts, with fines submitted to the state treasury. Enforcement is supported by Station House Officers (SHOs) and marine police. Challenges include seizure of truck-transported catch (requires local police assistance) and risk of damaging older boats during patrol interceptions.
- *Compliance:* Fishers generally comply as the communities represent in the council and participate in council meetings. Notably, reported violations have decreased under the stringent patrolling system.
- Community initiative, such as informing spat fall in no-fishing zones, has supported stock recovery.
- Challenges remain in boat registration and licensing. Inland boat building yards are unlicensed, complicating vessel counts. Earlier, outboard boat verification for

kerosene subsidies served as a proxy for vessel counts but it is no longer in practice.

Challenges to clam fishery management and potential solutions

- *TAC monitoring impracticality*: Catch limits are determined by ICAR-CMFRI using Gullan's formula. Total Allowable Catch monitoring was initiated by the local fishers, but failed due to the marketing agents. The agents promoted increased payment for fishers who caught more than the TAC. Landings are dispersed, unlike marine fisheries landing at common points. Suggested solutions include focusing on input controls (licenses, effort limits, fisher registration), baseline enumeration of gear and method, and adopting reference-point management.
- *Open access risks:* Unlimited licenses and vessels threaten sustainability. Solutions include mandatory registration of fishers and boats and linking incentives to compliance.
- *Enforcement constraints*: Jurisdiction issues with truck transport of harvested clams and risks of patrol collisions with older vessels. Solutions include stronger police collaboration and improved patrolling equipment. The impounding authority should be given to the fishery enforcement officers.
- *Governance gaps*: The Council is mandated to meet bi-monthly, but convenes annually. Fishers suggest that seasonal bans may follow Kerala Marine Fishing Regulation Act, wherein fishing ban is for two months during June-July. Many fishers are not aware of 'No fishing' zones. They should be made aware of it.
- *Environmental challenges*: Flood-induced eutrophication, seaweed blooms, altered bathymetry from dam dredging, and invasive *Mytella strigata*. Proposed solutions include biannual closures, halting mining near nursery grounds, and invasive species monitoring and remediation.
- *Socio-economic inequity*: During seasonal closure of clam fishery, the fishers migrate to nearby areas/states and conduct fishing. They send the catch to the middlemen in Kerala who dictate the price and earn substantially, while the fishers earn only modest income. Cooperative marketing, depuration facilities, and direct market access could reduce the inequity.
- *Incentive schemes*: There is no incentive to the fishers. A savings scheme similar to marine trawl fishers (monthly savings matched by the government during ban period) is recommended.

Key takeaways:

- The intent of the communities and state institutions to adopt participatory co-management with scientific approach developed by research institutions has helped sustaining the fishery.
- Robust monitoring and enforcement ensure compliance.
- Fisheries management is a dynamic process, and should take into consideration risks such as environmental shocks, governance gaps and socioeconomic disparities. These risks can be addressed by constant fisher–researcher communication and adaptive management through active functioning of co-management system.

- The resource users should be incentivised for adopting sustainable management system.
- The experience and lessons learned from the Ashtamudi clam fishery management initiatives provide valuable insights for promoting EAFM.

5.2 Palk Bay Blue Swimming Crab Fishery, Tamil Nadu

Salient features of the fishery:

- The Blue Swimming Crab (*Portunus pelagicus*) fishery in the Palk Bay (Tamil Nadu, India) is a small-scale, high value fishery. It is mainly harvested using traditional bottom-set gillnets (locally called *Nanduvalai*) operated by crafts with outboard motor, and is also caught in small quantity as bycatch in shrimp trawlers.
- The crab has a huge export market, with about 99% sold to the US. There are a number of middlemen like local traders involved in the supply chain before export. The Crab Meat Processors Association (CMPA) is a collective of about 11 export-oriented companies engaged in processing and exporting BSC from India. CMPA plays a key role in market-driven export, as nearly 70% of the landed crabs pass through its members.
- BSC fishery in Palk Bay undergoes the following problems from both ecological and socio-economic perspectives: (i) The catch per fisher is steadily reducing, raising concerns over stock depletion and long-term sustainability. (ii) Middlemen dominate the value chain, and fishers are often not informed of the actual price at which crabs are procured by processing companies. Since many fishers depend on loans from middlemen, they are bound to sell their catch at the price dictated by them, leading to economic dependency and unfair returns. (iii) Large quantities of berried female crabs are caught in trawlers and are not released back into the sea. This practice leads to recruitment overfishing and threatens the regeneration of future stocks. (iv) Small fishers are not availing diesel subsidy because it requires boat insurance, which many lack as they operate with old crafts without proper documents. Moreover, they are discouraged by the cost and complexity of insurance procedures, and the perception of low benefits compared to the effort involved. As a result, even registered and licensed boats often skip availing the subsidy.

Management framework:

- The major framework is the Tamil Nadu Marine Fishing Regulation Act & Rules (TNMFRA), 2020, which serves as the primary legislation governing marine fisheries in Tamil Nadu. It provides the legal framework for regulating fishing activities within the state's territorial waters up to 12 nautical miles. The Act empowers the government to control fishing methods, regulate mesh sizes, introduce seasonal closures, and manage vessel registration and licensing. The provisions under this legislation are also applicable to the Blue Swimming Crab (BSC) fishery as well.
- The Fishery Improvement Project (FIP) for the BSC fishery, led by the CMPA with support from the NFI Crab Council (USA), is a market-driven initiative to promote sustainability and secure export market access. It emphasizes stock assessment, responsible fishing, protection of berried females, and habitat conservation, while engaging fishers, processors, and managers in collaborative management. The

Blue Swimming Crab Fisheries Management Plan prepared by ICAR-Central Marine Fisheries Research Institute in 2019 under the FIP provides a scientific roadmap for sustainable BSC management. It recommends minimum legal size, mesh size regulations, protection of breeding stocks, and seasonal/spatial measures, serving as a technical guide for policymakers and industry stakeholders.

- Palk Bay is characterized by strong fishing community-led associations (*Sangams*), which play a vital role in local governance. Several community-devised fisheries management measures have been implemented across the region through these traditional institutions, ensuring compliance and collective stewardship of marine resources.

Management measures:

- *Fishing Vessel Registration and Licensing:* In recent years, registration and licensing of fishing crafts in Tamil Nadu, including those engaged in the BSC fishery, has significantly improved. Almost 90–95% of traditional and motorized crafts are now formally registered and licensed under the Tamil Nadu Marine Fishing Regulation Act (TNMFRA). Earlier, compliance was low, particularly among small-scale motorized crafts, but government initiatives such as the Real Craft scheme have strengthened the process. Trawlers were always regulated through registration and licensing, but now motorized crafts targeting BSC have also been brought under the system. This high level of compliance ensures better monitoring of fishing capacity, supports implementation of management measures, and provides a foundation for sustainable governance of the fishery.
- *Mesh Size Regulations:* Mesh size regulations in the BSC fishery are set at a minimum of 25 mm under TNMFRA, but fishers in Palk Bay voluntarily use larger gillnet mesh sizes (80–120 mm).
- *Close Season:* The 61-day annual fishing ban (close season) for trawlers in Tamil Nadu, usually observed between April and June, plays an indirect but important role in supporting the BSC fishery. During this period, trawlers, where large numbers of berried crabs are often landed as bycatch, remain out of operation. This reduces the harvest pressure on berried females, allowing them to spawn and contribute to stock replenishment. At the same time, the absence of trawlers provides small-scale motorized crab fishers with increased opportunities to operate their gillnets closer to shore, resulting in relatively higher catches during the season. By minimizing trawling effort during the peak breeding period, the close season not only protects berried crabs but also contributes to the long-term sustainability of the BSC stock in Palk Bay.
- *5 NM Reserved for Traditional/Motorized Fishing Boats:* Under the TNMFRA, the nearshore waters up to 5 nautical miles from the coast are reserved exclusively for traditional and motorized fishing crafts, restricting the operation of mechanized trawlers in this zone. This measure was introduced to protect the livelihoods of small-scale fishers, reduce gear conflicts, and safeguard nearshore ecosystems such as seagrass beds that are critical habitats for the BSC.
- *No New Trawlers in Palk Bay:* The trawler registration freeze in Palk Bay helps the BSC fishery by limiting the number of mechanized trawlers, thereby reducing the bycatch of berried female crabs and easing fishing pressure. This measure also

supports small-scale gillnet fishers, ensuring better protection of breeding stocks and long-term sustainability of the resource.

- *Community-Agreed Measure the 3-4 Day Rule:* In the Indian side of Palk Bay, where the fishing grounds are relatively small and shallow, conflicts emerged in the 1970s due to the rapid increase in trawlers that adversely affected small-scale fishers. To resolve this, a community-based arrangement known as the "3-4 Day Rule" was established through mutual agreement between trawler owners and small-scale fishers. Under this system, trawlers are allowed to operate only on Saturday, Monday and Wednesday mornings, returning the following morning, while the remaining four days of the week are reserved exclusively for small-scale gillnet fishers. This locally developed measure has proven effective in reducing gear conflicts, ensuring fair access to fishing grounds, and maintaining a balance between industrial and small-scale fisheries. Its success is largely due to strong community ownership, voluntary compliance, and active monitoring by fisher associations and local institutions.
- *Market Driven Voluntary compliance:* In the BSC fishery, market forces play a crucial role in ensuring compliance with sustainable practices. For example, export-oriented processors, under the Crab Meat Processors Association (CMPA), set strict standards by purchasing only crabs above the minimum size of 100 mm carapace width, based on NFI-Crab council scientific recommendations. Since fishers receive better prices for larger-sized crabs, they voluntarily comply with these size regulations.
- *4-tier Co-Management Arrangement:* Introduced under the FIMSUL project (Fisheries Management for Sustainable Livelihood) and formalized in 2019, the four-tiered co-management system in Tamil Nadu involves committees at the village, district, zonal, and state levels. These multi-stakeholder bodies engage fishers, government, NGOs, and traders in participatory decision-making. In practice, the village-level FMCs have been relatively more active, especially in areas like Palk Bay, where they have been utilized for outreach on safety at sea, marine conservation, and community mobilization. NGOs such as MSSRF and Dakshin Foundation have also partnered with these committees to pilot community-based initiatives. However, the system still faces challenges, particularly due to overlaps with traditional institutions (such as panchayats and *sangams*), limited capacity, and the risk of elite capture.
- *Additional Livelihood Opportunities to Reduce the Fishing Pressure:* Reducing dependence on a single resource is vital for ensuring the long-term sustainability of the Blue Swimming Crab (BSC) fishery in Palk Bay. Promoting additional livelihood opportunities enables fishers to diversify their income sources, thereby easing the pressure on crab stocks. Initiatives such as seaweed farming, mariculture (e.g., seabass and cobia culture), eco-tourism, and value-added processing of marine products are being supported under government schemes like PMMSY and PM-MKSSY. These efforts aim to create sustainable income streams for coastal communities, reduce overreliance on crab fishing, and strengthen both ecological sustainability and community resilience.
- *Dugong Reserve in Palk Bay:* The declaration of Dugong Reserve in Palk Bay plays a vital role in conserving seagrass ecosystems, which are critical habitats for both

dugong and BSC. Seagrass beds provide nursery grounds and shelter for juvenile crabs, as well as breeding areas for berried females, thereby directly supporting the life cycle and stock replenishment of BSC. By protecting these ecosystems through the Dugong Reserve, the ecological foundation of the crab fishery is strengthened, ensuring healthier recruitment and long-term sustainability of the resource.

- *Welfare schemes and measures to enhance fishers socio-economics:* Various government welfare schemes such as modernization of traditional fishing crafts under subsidy, monetary relief during lean and ban seasons, free housing schemes, group accident insurance, fellowships for education of fishers' children, savings-cum-relief schemes, and entrepreneurship opportunities under PMMSY and PM-MKSSY are in place to support the fishers. These schemes provide financial assistance, additional livelihood opportunities, and social security benefits, thereby reducing the economic vulnerability of small-scale fishers. Collectively, these measures strengthen livelihood security, resilience, and overall well-being of fishing communities in the Palk Bay.
- *Fishers' Grievance Redressal:* A formal grievance redressal mechanism is in place where fishers from all villages in Ramanathapuram District, Palk Bay participate in meetings chaired by the District Collector. Initially held monthly, these meetings are now convened once every three months. The Department of Fisheries attends, records the concerns raised by fishers, and takes responsibility for addressing them before the next meeting. This platform provides fishers with direct access to authorities, enabling timely resolution of issues and strengthening trust between fishing communities and government agencies.

<u>Monitoring, Enforcement and Compliance:</u>

- The Department of Fisheries, Tamil Nadu is responsible for enforcing fishing regulations. Penalties are imposed on fishers who fail to comply with key provisions such as vessel registration and licensing, prescribed mesh size regulations, violations of the 5 NM restriction, and fishing during the closed season. However, the effectiveness of enforcement is compromised due to shortage of fisheries officers and the absence of patrolling boats.
- The 3–4-day rule is jointly monitored by fisher associations, including trawl boat associations and traditional boat associations, with the Department of Fisheries also playing a role in monitoring and conflict resolution. Under TNMFRA, 2020, penalties are imposed for violations such as the operation of trawl boats within 5 nautical miles, an area reserved for small-scale fishers and the use of banned fishing methods like pair trawling. These enforcement mechanisms help reduce conflicts, protect traditional fishing rights, and promote sustainable fisheries management in Palk Bay.
- The ICAR-CMFRI has prepared a Blue Swimming Crab Fisheries Management Plan in 2019 that outlines scientific measures for the sustainable exploitation of the resource. However, the plan has not yet been notified by the government and, therefore, its recommendations are not formally enforceable under existing fisheries regulations. In the absence of legal backing, the Crab Meat Processors Association (CMPA) has taken the initiative to promote awareness about the plan

among fishers and other stakeholders. Awareness campaigns include displaying billboards on the impact of harvesting berried and undersized crabs, distributing gauges to fishers for measuring carapace width, and implementing incentive-based initiatives such as releasing berried crabs and endangered, threatened, and protected (ETP) species. Through these efforts, the CMPA is encouraging voluntary compliance with key measures like minimum legal size, release of berried crabs, and responsible fishing practices, thereby bridging the gap until the plan is formally recognized and adopted.

Challenges to Blue Swimming Crab Fishery management and potential solutions

- *Lack of formalized management plan:* The ICAR-CMFRI has developed a Blue Crab Fisheries Management Plan with scientific measures for sustainability. While it is not yet legally adopted, the CMPA is promoting awareness and voluntary compliance. For long-term conservation, it is essential that the plan be legalized and formally adopted by the government.
- Four-tier co-management structure should be reviewed and revitalized to function as a genuine platform for power sharing and collaborative decision-making. By empowering fishers, who are the ground-level implementers, this arrangement can serve as an effective mechanism for managing fisheries measures and ensuring sustainable outcomes. While these committees are often viewed from the government's perspective as instruments of power sharing, they should be seen more importantly as platforms for effectively managing an open-access fishery through collective responsibility and stakeholder participation.
- *Stock Assessment Methodologies:* A disagreement exists between the method preferred by the National Fisheries Institute (NFI) Crab Council of USA (importers) and CMFRI's approach. The CMPA is compelled to follow the NFI method, which CMFRI considers as less robust. Resolving these methodological differences through collaborative research would strengthen stock assessment results.
- *Limited Implementation of Berried Female Release:* The incentive program for releasing berried females currently reaches only 5-6 villages out of 22-24. Improving communication channels and expanding awareness could increase participation, especially since the incentive exceeds market value.

Key takeaways:

- *Effectiveness of Community-Driven Management:* The BSC fishery illustrates that management measures are most effective when initiated by the community and supported by government agencies. The "3–4-day rule", developed as a conflict resolution mechanism between trawlers and small-scale fishers, has evolved into a sustainable management practice. Community ownership ensures higher compliance and stronger enforcement compared to top-down regulations.
- *Market-Driven Conservation:* Market incentives play a crucial role in shaping fisher behavior. The minimum size requirement of 90 mm carapace width and the berried female release program, promoted through the Crab Meat Processors Association (CMPA), demonstrate how better prices and direct incentives can encourage voluntary compliance. Such approaches highlight the potential of market-based mechanisms to complement regulatory frameworks.

- *Conflict as a Catalyst for Sustainability:* Persistent conflicts in Palk Bay, particularly between mechanized and small-scale fishers, have pushed stakeholders toward sustainable management solutions. These crises have compelled the government to introduce conservation measures and promote alternative livelihoods, which indirectly benefit BSC fishery management.
- *Importance of Support Mechanisms:* Strong institutional and civil society support enhances fisheries management. Scientific bodies such as CMFRI provide research and guidance, while fisheries department, NGOs and community-based organizations support awareness, mobilization, and co-management initiatives. This multi-layered support system strengthens both ecological and socio-economic outcomes.
- *Social Differentiation and Collective Action:* Social and economic divisions within fishing communities hinder collective bargaining power among small-scale fishers, as kinship ties with traders often create dependency. In contrast, trawler owners have unified across social groups due to shared economic interests. Addressing these internal imbalances is crucial to ensure equity and inclusivity in BSC management.
- *Cultural Considerations in Livelihood Diversification:* Additional livelihood opportunities are essential to reduce fishing pressure, but they must respect cultural traditions and existing skills. Fishers often resist land-based alternatives preferring sea-based options such as seaweed farming, mariculture, or eco-tourism. Successful diversification requires linking these initiatives to viable markets and value chains.

5.3 Lakshadweep Island Tuna Livebait Fishery

Salient features of the fishery

- Livebait fishery is intrinsically linked to the pole & line fishery and handline fishery tuna fishery, with same boats and same fishers engaged in tuna fishing, catching livebaits in every voyage when venturing into tuna fishing.
- Two types of livebait fishery, the predominant fishing being catching livebaits (18-22 species) for skipjack tuna fishery (using pole & line), and the other (predominantly triggerfish as the livebait) for the emerging yellowfin tuna fishery (using handline). Live bait is caught using selective gear (encircling nets for pelagic species, lift nets for demersal species).
- Data on the livebaits are not collected, but stock assessment is done at periodic intervals using length-based methods by CMFRI. Tuna fishery data is collected by the Department of Fisheries. Dakshin Foundation has collected sporadic community-based, interview-based data collection on tuna and livebait fisheries, and carried out in-water assessments and onboard data collection.
- In the past, fishers shared concern about decline in livebait fish populations. Livebait abundance fluctuates seasonally, but in recent years, there is no evidence for decline of this fast-growing livebait species. However, there is temporal mis-match in the availability of tunas and livebaits. Using traditional knowledge, fishers select the fishing grounds of different species. The fishery for livebaits is being sustained because the skipjack tuna fishery is losing importance due to the following reasons: (i) The market price for *masmin* has reduced, leading to

reduction in the fishing effort for skipjack tuna fishery, in turn reducing the intensity of livebait fishing. (ii) Emergence of yellowfin tuna fishery is diverting the fishing effort from skipjack tuna fishing. (iii) Excess capture and discard of livebaits is not issue in the islands. Fishers have adopted to hold the excess livebaits in holding tanks or share the excess with other fishers or release the unused livebaits into the sea. (iv) Tourism is evolving in the Islands, gradually diverting the fishers from fishing.

- The fishery is managed by Lakshadweep Marine Fishing Regulation Act, which is an umbrella Act, and covers livebait fishery as well.
- Under the Act, boat registration and licensing are mandatory. Registration and licensing are issued by the Department of Fisheries, Union Territory of Lakshadweep, and are common to tuna fishing and livebait fishing boats. There is no cap on the number of boats, thereby, the fishery is considered as open access.
- Net fishing using purse-seine, trawl, gillnet and beach seine is prohibited.
- Fishing ban notice issued every year by the Department of Fisheries, Government of India for 61 days during June-July (southwest monsoon period) applies to the entire fishery in the island. For a few years in the past, three months' ban was practiced (June-August), to ensure sea safety by avoiding rough sea condition during southwest monsoon. However, the closure is reduced to two months in recent years, as the boats are now larger and are able to withstand rough sea conditions.
- Observing all Fridays are fishing holidays for religious purpose reduced the fishing effort.
- The following livebait-specific management measures are practiced through government rules: (i) Livebaits should be used exclusively for tuna fisheries, and should not be sold. (ii) Only small mesh size should be used for catching livebaits so that large-sized fishes will not be caught and sold for other purposes. (ii) Fishing for livebaits during nights is banned. (iii) Two km sea area around Pitti Island Bird Sanctuary, which is a rich livebait fishing ground, is prohibited for any type of fishing.
- The major difference in the management framework of tuna fishery and livebait fishery is that whereas tuna fishery management is under the area of competence of India Ocean Tuna Commission, but the management of livebait fishery is by the UT of Lakshadweep.
- Department of Fisheries, UT of Lakshadweep monitors the fishery, and is responsible for enforcement and compliance. Nine authorized officials (one in each inhabited island) have been posted for monitoring the fishery. Coast guard also monitors fishing activities.
- The government has notified catch reporting by the fishers as mandatory. In the past, those fishers who reported catch details in prescribed logsheets were eligible for diesel subsidy tokens issued by the government. However, in the later years, this system ceased leading to non-compliance of catch reporting by the fishers.
- Fishers do not receive incentives during seasonal fishing ban. However, they are eligible for a 60% government subsidy when purchasing boats.

- The government has fixed a minimum price for fish, but it is not followed in practice.
- Apart from this, compliance is generally good. As the islands are small with limited population, the fisheries official in the island has good acquaintance with the residents. This relationship helps ensuring good compliance. Implementation of welfare measures by the department officials also helps ensuring good compliance. Occasional violations, mostly for use of unauthorized gear, are addressed through fines, cancellation or suspension of fishing licenses, or the impounding of catch. Fishing by boats from the mainland within the territorial waters of Lakshadweep undermines compliance.

- Fishery managers, researchers and other stakeholders consult each other when need arises, but there is no formal mechanism of consultation. ICAR-Central Marine Fisheries Research Institute prepared "Lakshadweep Livebait Fisheries Management Plan" in 2019. However, this is yet to be notified by the government.

- Co-management arrangement was attempted in the past eliciting good support from the fishing communities. Though this initiative did not progress, there is potential to implement co-management system in Lakshadweep. Village panchayat system prevails in each island, which could be considered as co-management unit with additional emphasis on resource management. Each island has women self-help groups (SHGs), with women primarily engaged in *masmeen* production. These SHGs also could be engaged for developing co-management arrangement.
- Community-level traditional management is followed in Minicoy Island for the last two centuries, where a well-knit social and cultural set-up exists. It standing out as a model of sustainability. In this system, one village elder is selected as the leader, who finds solution to issues and conflicts. His decisions are accepted and complied by all. Some of the management decisions taken are: annual area allocation for livebait collection for each boat through group discussion, seasonal fishing closure, restriction on boulder collection, limits on holding excess live baits, and prohibition on use of certain fishing gear. The leader is not replaced, unless he wants to quit. This traditional management has not been formalised by the government, but the government does not interfere with the decision taken by the leader. This practice promotes fairness, minimizes conflicts, and ensures sustainable utilization of the livebait resource. However, this model is not followed in other islands in Lakshadweep, as other islands are culturally different, and it is difficult to ensure compliance of decision taken by one individual. In Minicoy itself, the compliance is reducing as the leader is often questioned, especially by the youth.

<u>Challenges to livebait fishery management and potential solutions</u>

- Absence of formal baitfish and tuna fishery management plan is a challenge. In consultation with relevant stakeholders of Lakshadweep, a Fisheries Development & Management Plan (including livebait fishery) needs to be developed and implemented, following ecosystem approach.

- Data collection, monitoring and enforcement due to inadequate staff in each island is a challenge. Remoteness and geographic isolation of many Lakshadweep islands create difficulties impeding timely inspections, patrols, and compliance actions. Formal government support for data collection, fishery monitoring and

enforcement by following standard protocol and technology-driven approaches like drone survey can be taken up.

- Restricting livebait fishing access to uninhabited islands marked for tourism development is a challenge. Trade-off between tourism and other development activities on one hand and fisheries on the other, need to be assessed to find a solution by assessing the carrying capacity of the islands.
- International demand for *masmin* is reducing, affecting the livelihood of the fishers. Better market support (for *masmin*, and other value added products like canned tuna or sashimi) by the government for Lakshadweep's tuna fisheries is required.

Key takeaways:

- The Lakshadweep live bait fishery, the pole-and-line tuna fishery, is sustained by a mix of traditional and formal management measures, with Minicoy's 200–300-year-old co-management system standing out as a model of sustainability.
- Livebait fishery is a low-volume fishery, but critically linked to the tuna fishery. At present, it is sustained by a mix of traditional and formal management measures. Strengthening management measures for livebait fishery should consider the tuna fishery in its entirety.
- Lakshadweep islands are ecologically fragile with limited land space and carrying capacity, which need to be considered while planning fisheries development and management.
- Social cohesion, culture, and support by the communities play an important role in implementing management measures in all the islands. In Minicoy, traditional community management is effectively practiced due to this reason.
- The rich traditional and local ecological knowledge of the fisher communities can contribute to the formulation of relevant spatial management of livebait fishing grounds.
- Awareness building, training on sustainable fisheries and developing infrastructure development, (particularly improving fish storage facilities), arranging marketing and implementing Minimum Support Price for fish are critically important.
- Constant consultations between fisheries officials and community will help implementing the management measures (in the absence of a co-management arrangement). However, there is good scope for developing co-management arrangement in the islands.

5.4 West Bengal Hilsa Fishery

Salient features of the fishery:

- Hilsa is a high-value fish of immense cultural, societal, and economic significance in West Bengal, particularly in the Ganges river system in West Bengal and the northern Bay of Bengal.

- Being an anadromous fish moving from the sea to the river for breeding, it promotes inland and marine fisheries. The catches are largely seasonal.
- Riverine fishers form 20% and marine fishers 80% of total fisher population.
- The fishery operates using dugout canoes, motorized vessels, and mechanized boats in both riverine and marine environments. A variety of gears are employed, with gillnets contributing the maximum catch.
- Reports indicate that the stock is overfished in West Bengal.
- To meet high consumer demand, hilsa is also imported from Gujarat (India) as well as Bangladesh and Myanmar
- Hilsa is a transboundary fish, migrating between India and Bangladesh and forms fishery of high value in both the countries.

Management framework:

- The fishery is governed by

  - West Bengal Inland Fisheries Act XXV 1984

  - West Bengal Inland Fisheries Rules, 1985 and its amendment in 2013

  - West Bengal Marine Fishing Regulation Act 1993 and its amendment in 2013

  - West Bengal Marine Fishing Regulation Rules, 1995

  - West Bengal Fisheries Policy 2015

  - West Bengal Fisheries Investment Policy 2015

  - West Bengal Inland Fisheries Policy 2023

  - Hilsa Conservation and Research Centre has been established for dedicated research and conservation.

  - At the national level, the National Policy on Marine Fisheries (2017) applies to the fishery.

  - Other national policies that have impact on Hilsa fisheries are: National Environment Policy (2006) and National Water Policy (2012).

Management measures:

- Management in the rivers is primarily area-based, while in marine areas it is registration and license-based. However, there is no catch and effort limit.
- Movement of boats must be reported to an authorized officer, and registered vessels are required to submit catch returns for inspection and verification.
- Catching hilsa with monofilament gillnets with mesh size less than 90 mm and other nets with mesh size below 40mm for other fish is prohibited.
- There is a ban on destructive fishing practices.

- Transport, sale, marketing and possessing Hilsa of size less than 23cm is banned.
- Five river stretches which are designated as spawning grounds, are declared as Hilsa sanctuary where fishing is prohibited during the fish spawning season, from June-August and October-December every year;
- Fishing is prohibited within 5m of Farakka barrage.
- Seasonal fishing ban for marine mechanized boats is enforced for 61 days (14 April – 14 June) every year, in addition to a 10-day hilsa fishing ban (five days prior to and post full moon between 15th Sep to 24th Oct every year).

- Trawling in shallow continental shelf within 12 nautical miles from shore banned.
- Marine fishing vessels with engines exceeding 30 hp are not allowed to operate within 18 km from the shoreline.
- In 2025, INCOIS launched a Hilsa Fish Advisory for fishermen off the West Bengal coast to guide fishing practices.

Monitoring, Enforcement and Compliance:

- Registration and licensing of marine fishing boats are followed.
- There is high compliance by trawlers to the annual ban period of April 14 to June 14.
- Department of Fisheries monitors the fishery through vessel registration and licensing, while catch, abundance, and size data are collected by the Department of Fisheries and ICAR–Central Inland Fisheries Research Institute (CIFRI) at landing centres. CIFRI also undertakes stock assessment to inform management decisions, but the assessments are not regular. Cooperatives and non-governmental organizations play a supportive role in inland fisheries by maintaining catch documentation, but most of the cooperatives are not formally registered. Overall, Hilsa-specific data is limited.
- Individual boat monitoring in the inland sector is largely ineffective due to the dispersed nature of inland fisher communities.
- Enforcement is by the Department of Fisheries supported by coastal police and local fishermen co-operative societies. However, enforcement including compliance in the sanctuaries is generally weak. Fishermen are not aware of the location of sanctuaries. Enforcement is good around the Farakka barrage.
- Tracking boats remains limited as West Bengal lacks a VMS system, transponders are expensive, and border sections near Bangladesh are under supervision of Border Security Force.
- Fishermen found engaging in juvenile fishing are penalized, and confiscation of the entire illegal consignment of hilsa is common.
- Monitoring and surveillance are intensified during breeding seasons, and penalties have become more stringent in recent years to deter illegal practices.

Challenges to Hilsa fishery management and potential solutions:

- While the marine fishery is managed in a better way, the riverine fishery is not so well managed, mainly because of the high poverty level among the inland fishers, and also due to inadequate capacity, skill, motivation and dispersed nature of the fishing community/landing sites along the river, and under-staffing of management officials. Fishing regulations and measures like mesh size regulation need to be implemented effectively in the inland fisheries as hilsa breeds in the freshwater. Despite strong intentions, practical feasibility has limited the implementation of management measures.
- Impact of barrages and dams causing the decline of Hilsa in the upper reaches of rivers, increased water abstraction for irrigation and industrialization, pollution, and climate change have resulted in the decline of Hilsa production. Concerted effort by all the relevant stakeholders is necessary to address multiple issues.
- Multi-species and multi-gear nature of fishery in both marine and riverine stretches results in challenges in implementation and M&E.
- Awareness campaigns held in the past on management measures did not continue, and hence, currently the awareness is low. Awareness building on management measures is essential. The large number of functional fisheries cooperatives can be leveraged for this purpose.
- Livelihood and income concerns are not adequately addressed in hilsa management plans such as implementation of fishing ban and sanctuaries. These concerns need to be addressed, to ensure better compliance.
- Data collection is a challenge. Standard data collection system needs to be developed covering the inter-related hilsa populations in the riverine and marine sectors.

Key Takeways

- Strong hilsa fishery management framework exists, but implementation needs to be strengthened.
- Management has to consider both inland and marine sector holistically, as fisheries in the two sectors are intrinsically linked to each other.
- Livelihood/income concerns need to be factored especially in high poverty segments to ensure better compliance.
- Fishing ban period of this transboundary stock differs between India and Bangladesh. Being a transboundary fish between India and Bangladesh, joint working arrangement needs to be developed to manage the fishery regionally.
- Planning and implementing Ecosystem Approach to Fisheries Management (EAFM) with co-management arrangement and strong science-policy interface by considering ecological well-being and human well-being, facilitated by good governance will be practical way forward to sustain the hilsa fishery.

- Overall, Hilsa management requires adaptive and data-driven approaches that balance scientific guidance, practical enforcement, awareness campaigns, and socioeconomic realities, ensuring that conservation measures are both effective and feasible for sustainability of this emotionally and culturally important fisheries.

6. Closing remarks

Mr. **Carlos Montero Castaño** thanked all participants, who dedicated their time and shared their knowledge and experiences on the four themes and related discussions. He emphasized that collaboration is fundamental since the work focuses on managing theses and ultimately concerns people, making their input essential. The next step involves working together with the BOBP team to properly consolidate all the collected information into a structured survey. This survey and the accompanying database will be circulated to participants for a final check, review, and comments to ensure that all information has been accurately captured and that there are no misunderstandings. Appreciation was expressed for the dedication and contributions of everyone involved. The meeting was recognized as intensive yet productive, providing much deeper insight into the positive aspects as well as the challenges of the four theses. Clearly identifying these challenges will help ensure that the solutions proposed in the future are appropriate and effective. On behalf of the FAO team, Mr. Carlos extended gratitude, along with the hope that this meeting is only the first of many and not the last opportunity for collaboration.

Dr. Krishnan, Director, BOBP-IGO, in his closing remarks, thanked everyone for their active participation throughout the workshop. He emphasized that this event marks the beginning of a significant exercise and an important recognition in fisheries management. He acknowledged the participants as champions of this fishery and encouraged them to now become ambassadors, spreading awareness and popularizing this initiative. Dr. Krishnan highlighted that this is a major positive development that the world will look to as a model to learn from. He credited this recognition to the participants' active involvement, not only in the workshop but also in prior efforts. He extended his gratitude to all special guests, representatives of the fishing community, and community organizations for their valuable time and contributions.

7. Outcomes from the workshop and Next Steps

On 31 July 2025, a wrap-up meeting among the team from FAO, BOBP-IGO and facilitators was held to assess the conduct and outcomes of the workshop, and the next steps to be taken. It was unanimously opined that the workshop achieved its objectives. All the participants participated enthusiastically in the discussions and were willing to share their knowledge. Good acquaintance of the facilitators with many participants helped win the trust on the workshop. It was opined that pre-workshop briefing of the workshop structure and expectations from the participants would have further strengthened the discussions.

Outcomes from the workshop:

- Grassroot-level challenges in implementing management plans and measures for the respective fishery, and identify mutually agreed solutions for their effective implementation among different stakeholders were documented.
- Conversations among various stakeholders including fishery managers, researchers, fishers, and NGOs to raise awareness about the importance of management plans and measures for sustainable fisheries management were facilitated.

Next steps:

- The FMInv survey data in Excel sheets will be revised by the BOBP-IGO based on the updated information received from the participants in the workshop.
- The revised survey data will be sent for validation to the Facilitators and resource persons, and submitted to the FAO.
- To develop better practical fisheries management approaches, adopting ideas and lessons from similar fisheries will be valuable. BOBP-IGO can undertake comparative assessments to understand regional variations and support the improvement of fisheries management strategies on the following fisheries:
  - Blue swimming crab fishery in Palk Bay with that in Sri Lanka
  - Live bait fishery in Lakshadweep with that in the Maldives
  - Hilsa fishery in West Bengal with that in Bangladesh
  - Synthesis of legal frame work for managing Hilsa fisheries in West Bengal.
- A comprehensive information sheet/template will be prepared by the BOBP-IGO and circulated to State Fisheries Departments to capture current management practices, challenges, and relevant data.

ANNEX 1

National Workshop on
Fisheries Management Inventory (FMInv)

Agenda

28 July 2025: Opening Session

0930 – 0945	Registration of the Participants	
0945 – 0955	Welcome & Opening Remarks	Dr P. Krishnan *Director, BOBP-IGO*
0955 – 1010	Introduction of Participants	
1010 – 1025	Special Remarks	Mr Carlos Montero Castaño, Fisheries Officer, FAO Dr Grinson George *Director, ICAR-CMFRI* Dr Mohamed Koya *Fisheries Development Commissioner, Govt of India* Dr. Sanjay Pandey, *Deputy Commissioner of Fisheries, Government of India*
1025 – 1045	Context Setting: Overview of the FMInv Workshop	Dr. Varun Tandon *Fishery Consultant, FAO*
1045 – 1100	National Fisheries Policies & Legislations & De-briefing breakout sessions	Dr. E. Vivekanandan *Senior Scientific Consultant, BOBP-IGO*
1100 – 1120	Group Photo & High Tea	
	28 July 2025: Breakout Session	

29 July 2025: Breakout & Plenary Sessions

Time	Agenda
11:20-13:00	Breakout group discussion on implementation of management plans & management measures
13:00-14:00	Lunch

14:00-15:30	Breakout group discussion on implementation of management plans & management measures (continued)
15:30-15:50	Afternoon tea
15:50-17:00	Breakout group discussion on implementation of management plans & management measures (continued)
17:00	Close for the day

Time	Agenda
09:30-11:00	Breakout group discussion on implementation of management plans & management measures *(continued)*
11:00-11:20	Morning tea
11:20-13:00	Breakout group discussion on implementation of management plans & management measures *(continued)*
13:00-14:00	Lunch
14:00-15:30	Plenary session & close for the day
15:30-15:50	Parting tea

30 July 2025: Breakout & Plenary Sessions

Time	Agenda
09:30-09:45	Welcome, introduction of participants
09:45-10:00	Overview of the FMInv project and tool Overview of the FMInv Workshop
10:00-10:30	National fisheries policies & legislations - Presentation by BOBP
10:30-11:00	Breakout group discussion on implementation of management plans & management measures
11:00-11:20	Morning tea
11:20-13:00	Breakout group discussion on implementation of management plans & management measures *(continued)*
13:00-14:00	Lunch
14:00-15:30	Breakout group discussion on implementation of management plans & management measures *(continued)*
15:30-15:50	Afternoon tea
15:50-17:00	Plenary session & close for the day

Annex 2

National Workshop on
Fisheries Management Inventory (FMInv)

Participants List

No	Fishery	Participants	Mobile/Email
1	**Ashtamudi Clam Fishery**	**Dr. Geetha Sasikumar,** Principal Scientist, ICAR-Central Marine Fisheries Research Institute (CMFRI), Kochi – 688001.	Tel: +91 9448163651 Email: gs.pallath@gmail.com
2		**Mr. C. L. Subash,** Fisheries Extension Officer, Kundara Matsyabhavan, Kochi – 688001.	Tel: +91 94964 10686 Email: subhashfish@gmail.com
3		**Mr. S. Arun,** Inspector of Guard, Marine Enforcement, Neendakara, Kochi – 691602.	Tel: +91 94471 41191 Email: arunsisupalan@gmail.com
4		**Mr. Yesudas Kavanadu,** Ashtamudi Clam Governing Council Member, Kochi – 691602.	Tel: +91 9947309636
5		**Mr. Prasannan Neendakara,** Clam Fisher, Ashtamudi Clam Fishery, Kochi – 691602.	Tel: +91 9895494348
6	**Hilsa Fishery in West Bengal**	**Dr. V. V. R. Suresh,** Principal Scientist & Head, Mariculture Division, ICAR-Central Marine Fisheries Research Institute (CMFRI), Kochi – 691602.	Tel: +91 7003623834 Email: vettath.suresh@icar.gov.in
7		**Prof. Ashim Kumar Nath,** Professor, Department of Zoology, Sidho Kanho Birsha University, Kolkata – 700104.	Tel: +91 98315 38183 Email: nathasim@yahoo.com
8		**Dr. Piyashi DebRoy,** Senior Scientist, ICAR-Central Inland Fisheries Research Institute (CIFRI), Kolkata – 700120.	Tel: +91 9892619978 Email: piyashi.debroy@gmail.com
9		**Dr. Sajal Kanti Kayal,** Founder and CEO, Kankura Mast Social Welfare Society, South 24 Parganas, Kolkata – 743375.	Tel: +91 9830963053 Email: sajalkayal7@gmail.com
10		**Ms. Mita Kayal Mandal,** Kankura Mast Social Welfare Society, Kolkata – 743375.	Tel: +91 9830963053 Email: sajalkayal7@gmail.com

No	Fishery	Participants	Mobile/Email
11		**Mr. Purna Patra,** Fisher, South 24 Parganas, Kolkata – 743375.	Tel: +91 7003692397 Email: sunpatra01@gmail.com
12	**Lakshadweep Livebait Fishery**	**Dr. P. Abdul Azeez,** Scientist, ICAR-Central Marine Fisheries Research Institute (CMFRI), Lakshadweep – 682555.	Tel: +91 9497369257 Email: azeez.cr7@gmail.com
13		**Mr. T. Jafar Hisham,** Assistant Director of Fisheries, Kavaratti, Lakshadweep – 682555.	Tel: +91 9447048400 Email: jaferhisham@gmail.com
14		**Mr. G. Salim,** Fisheries Officer, Kavaratti, Lakshadweep – 682555.	Tel: +91 9496461489 Email: salimminicoy@gmail.com
15		**Dr. Naveen Namboothri,** Trustee and Programme Head, Dakshin Foundation, Bangalore – 560092.	Tel: +91 7022388061 Email: naveen.namboo@gmail.com
16		**Mr. Mahaboob Khan,** Senior Programme Associate, Dakshin Foundation, Bangalore – 560092.	Tel: +91 9447593457 Email: mahaboobkhancp@gmail.com
17		**Mr. Abdul Nazar,** President, Fishermen Society, Lakshadweep – 682553.	Tel: +91 9447474365 Email: naztransports@gmail.com
18	**Palk Bay Blue Swimming Crab Fishery**	**Dr. Josileen Jose,** Principal Scientist, ICAR-Central Marine Fisheries Research Institute (CMFRI), Kochi – 682018.	Tel: +91 9447232966 Email: drjoslin@gmail.com
19		**Dr. Velvizhi,** Director, Coastal and Marine Systems, MSSRF, Chennai – 600113.	Tel: +91 9443261799 Email: velvizhi@mssrf.res.in
20		**Mr. K. T. Gopinath,** Dy. Director, Department of Fisheries and Fishermen Welfare (Regional), Ramanathapuram – 623503.	Tel: +91 9442573649 Email: ddfrmd2024@gmail.com
21		**Mr. G. Gokula Ramanan,** Assistant Director of Fisheries, Commissioner of Fisheries and Fishermen Welfare, Chennai – 600035.	Tel: +91: 9962981845 Email: gogul.ramanan@gmail.com
22		**Mr. B. V. Praveesh,** Secretary, Crab Meat Processors Association (CMPA), Tuticorin – 623501.	Tel: +91 96006 37071 Email: praveesh@sbsindia.co
23		**Mr. V. Venkateson,** Field Coordinator of BSC FIP, Crab Meat Processors Association (CMPA), Tuticorin – 623501.	Tel: +91 8610420203 Email: fip.cmpa@gmail.com

No	Fishery	Participants	Mobile/Email
24		**Ms. U. Sangeetha,** Programme Associate, Dakshin Foundation, Bangalore – 560092.	Tel: +91 73583 68732 Email: sangeetha@dakshin.org
25		**Mrs. Jerald Mary,** Fisher Leader, Karankadu, Ramanathapuram – 623520.	Tel: +91 8870731725

Organizers			
26	**FAO**	**Mr. Carlos Montero Castaño,** Fishery Officer, NFIFM Assessment and Management, Fisheries and Aquaculture Division, Food and Agriculture Organization (FAO) of the United Nations, Rome – 00153.	Tel: +39 Email: carlos.montero@fao.org
27		**Mr. Varun Tandon,** Fishery Consultant, NFIFM Assessment and Management, Fisheries and Aquaculture Division, Food and Agriculture Organization (FAO) of the United Nations, Rome – 00153.	Tel: +39 3792516720 Email: Varun.Tandon@fao.org
28	**BOBP-IGO**	**Dr. P. Krishnan,** Director, Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO), Chennai – 600018.	Tel: +91 9498050062 Email: krishnanars@bobpigo.org
29		**Dr. E. Vivekanandan,** Senior Scientific Consultant, Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO), Chennai – 600018.	Tel: +91 94442 38648 Email: evivekanandan@hotmail.com
30		**Dr. K. Sunil Mohamed,** Chair, Sustainable Seafood Network of India (SSNI), Kochi – 682 018.	Tel: +91 94442 38648 Email: ksmohamed@gmail.com
31		**Dr. P. S. Ananthan,** BOB- Fellow (Social Science) & Principal Scientist, ICAR- Central Institute of Fisheries Education (CIFE), Mumbai – 400061.	Tel: +91 70218 87439 Email: ananthan@cife.edu.in
	Rapporteur Team	**Dr. Ahana Lakshmi, Dr. T. Velumani, Dr. K. Nirmala and Dr. Anisha Shafni** BOBLME Hub Coordinator/Project Scientist/Research Associates from BOBP-IGO	

Bay of Bengal Programme
Inter-Governmental Organisation
91 St. Mary's Road, Chennai - 600 018, India.
Tel: +91 44 42040024
Email: info@bobpigo.org | www.bobpigo.org