Report of the National Workshop on

Operationalising the National Framework on Traceability in Fisheries and Aquaculture:

Strengthening India's Marine Seafood and Marine Ingredients Value Chains through National Digital Traceability System under PM-MKSSY

Our Partners / Collaborators

05 March 2026, Cochin, Kerala

Report on

Operationalising the National Framework on Traceability in Fisheries and Aquaculture:

Strengthening India's Marine Seafood and Marine Ingredients Value Chains through National Digital Traceability System under PM-MKSSY

MPEDA Conference Hall I Kochi

05 March 2026

Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO)
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About the Organisers

Bay of Bengal Inter Governmental Organisation (BOBP-IGO)

The BOBP-IGO is a regional fisheries advisory body with Bangladesh, India, 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 at Chennai. The Department of Fisheries, Government of India is the nodal agency from India and the hosting agency.

Department of Fisheries (DoF)

It is a governmental body responsible for the development, management, and regulation of fisheries and aquaculture in India. It plays a crucial role in formulating policies, implementing schemes, and promoting sustainable fisheries practices to enhance productivity, livelihoods, and food security. The DoF oversees the conservation and management of marine and inland fisheries resources, enforces regulatory frameworks, and collaborates with international organizations like FAO to combat IUU fishing. It also supports capacity-building initiatives, research, and technological advancements to strengthen India's fisheries sector.

Marine Products Export Development Authority (MPEDA)

It is a statutory body under the Ministry of Commerce and Industry, Government of India, responsible for the promotion and development of marine product exports from India. It plays a key role in supporting the seafood export sector through quality assurance, certification, and the development of export-oriented infrastructure. MPEDA facilitates the adoption of international standards for seafood safety, traceability, and sustainability to ensure compliance with global market requirements. It also promotes aquaculture development, particularly shrimp farming, provides technical assistance and capacity-building for stakeholders across the value chain, and supports market development, product diversification, and export promotion to enhance the competitiveness of India's marine products in international markets.

Environmental Defense India Foundation (EDIF)

The Environmental Defense India Foundation (EDIF) is a non-profit organisation focused on strengthening environmental governance, sustainable natural resource management, and climate resilience in India. It works with government agencies, research institutions, and community stakeholders to support evidence-based policy development, capacity building, and on-ground implementation of conservation initiatives.

Report Preparation

This report on the "Operationalising the National Framework on Traceability in Fisheries and Aquaculture: Strengthening India's Marine Seafood and Marine Ingredients Value Chains through National Digital Traceability System under PM-MKSSY" is prepared by BOBP-IGO.

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Preferred Citation

BOBP-IGO. (2026). Report on Operationalising the National Framework on Traceability in Fisheries and Aquaculture: Strengthening India's Marine Seafood and Marine Ingredients Value Chains through National Digital Traceability System under PM-MKSSY. Bay of Bengal Programme Inter-Governmental Organisation.

Executive Summary

India has set a target of USD 10 billion in marine product export revenue by 2030, against current exports of USD 7.66 billion in FY 2023–24, requiring a compound annual growth rate of 3.3%, well within the sector's historical CAGR of 8.8%, provided the right structural enablers, particularly end-to-end digital traceability, are in place. Achieving this target is increasingly contingent on compliance with mandatory international traceability regulations, including the European Union's IUU Regulation with its digital CATCH system mandatory from January 2026, the United States' Seafood Import Monitoring Program (SIMP) and FDA FSMA Rule 204, and evolving standards in Japan, the Republic of Korea and ASEAN markets. To deliberate on operationalising India's National Framework on Traceability in Fisheries and Aquaculture under PM-MKSSY, a national workshop was convened on 05 March 2026 at the Marine Products Export Development Authority (MPEDA) Conference Hall, Cochin, organised by the Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO) in collaboration with the Environmental Defense India Foundation (EDIF). The workshop reviewed global traceability mechanisms and experiences, including Indonesia's integration of GDST principles through the Stellina platform and the transformation of the red grouper fishery in Mexico's Yucatán Peninsula through blockchain-enabled traceability and sustainable fisheries governance as a model for linking small-scale fishers to premium international markets. Sector-specific traceability imperatives were examined across both the seafood and marine ingredients value chains, highlighting that India's approximately 72 fish meal plants producing nearly half a million tonnes annually are integral to aquaculture feed supply, making marine ingredient traceability a prerequisite for the compliance credentials of shrimp exports. Key structural challenges identified include the absence of reliable fishing-phase data from sea to landing centre, fragmented vessel registries, inadequate digitalisation at landing centres, multi-species and multi-gear commingling of catches, and the risk of small-scale fisher exclusion from compliance frameworks. The workshop's Pilot Design Lab breakout groups, comprising exporters and marine ingredient sector representatives, developed practical pilot frameworks around a combined species-based and geography-based rollout strategy, a shared-cost model for equitable distribution of traceability investment, a UPI-like modular interoperable digital architecture, and a Fishers-First design principle ensuring that traceability systems deliver operational value, including improved market access, price transparency, insurance and carbon credit opportunities, rather than functioning solely as regulatory compliance tools. The workshop concluded with a consensus that the critical gap lies in converting PM-MKSSY's policy provisions into bankable, investment-ready project proposals, and proposed a structured way forward encompassing phased pilot implementation, vessel database strengthening, GDST-aligned interoperable digital architecture, inclusive fisher engagement, food safety laboratory integration, alignment with the GDST marine ingredients module scheduled for launch on 1 July, and finalisation of the National Fisheries Digital Platform by 2026 to position traceability as a strategic export multiplier and long-term competitiveness enabler for India's marine seafood and marine ingredients value chains.

Acronyms

AIS	Automatic Identification System
AFD	Agence Française de Développement
ASEAN	Association of Southeast Asian Nations
CCRF	Code of Conduct for Responsible Fisheries
EIC	Export Inspection Council
EU	European Union
FDA	Food and Drug Administration
FIFO	Federation of Indian Organizations
FSSAI	Food Safety and Standards Authority of India
GDST	Global Dialogue on Seafood Traceability
GPS	Global Positioning System
HACCP	Hazard Analysis and Critical Control Points
KDE	Key Data Elements
MFRAs	Marine Fisheries Regulation Acts
MMD	Merchant Marine Department
NABL	National Accreditation Board for Testing and Calibration Laboratories

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Participants at the “Operationalising the National Framework on Traceability in Fisheries and Aquaculture: Strengthening India’s Marine Seafood and Marine Ingredients Value Chains through National Digital Traceability System under PM-MKSSY” MPEDA Conference Hall, Kochi; 05 March 2026

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Background

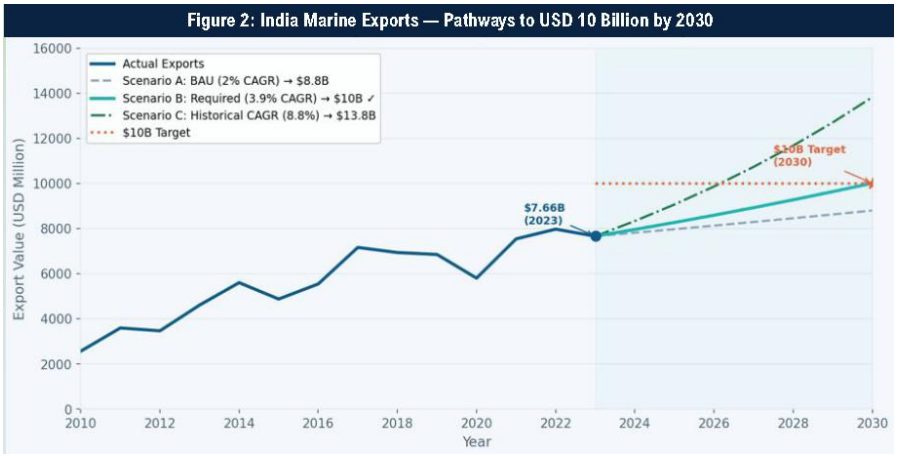
India has set a target of USD 10 billion in export revenue from marine products by 2030. As of FY 2023–24, marine product exports stood at USD 7.66 billion, comprising USD 6.69 billion in seafood and USD 0.63 billion in marine ingredients, leaving a gap of USD 2.34 billion to be bridged over seven years. Analysis of the HS 2022 trade data (2010–2023) confirms that achieving the target requires only a 3.3% compound annual growth rate (CAGR), well below the sector's historical CAGR of 8.8%, making the goal financially credible provided the right structural enablers are in place.

Fisheries and aquaculture serve as a cornerstone of India's seafood export sector. A substantial share of India's seafood exports, valued at USD 7.38 billion in FY 2023–24, is sourced from key species such as shrimp (USD 5.5 billion), tuna, cuttlefish, squid, grouper, snapper, and other finfish constituting the majority of export volumes. Yet an important and rapidly growing second track has emerged: marine ingredients, comprising fish meal, fish oil, omega-3 concentrates, and seaweed-derived extract, which, although currently representing only 8.3% of total exports (USD 0.63 billion in 2023), have grown 21-fold since 2010 at a CAGR of 26.4%. Figure 1 below illustrates the scale and trajectory of these two export tracks.

This dual-track structure, Seafood Dominance and Marine Ingredients Acceleration, has direct implications for how India should prioritise its traceability architecture. The pathway to USD 10 billion as shown in Figure 2.

However, India's continued access to rewarding export markets is becoming increasingly contingent on its ability to demonstrate verifiable end-to-end traceability across seafood supply chains. The European Union's IUU Regulation (with the digital Catch System mandatory from 10 January 2026), the United States' Seafood Import Monitoring Program (SIMP) and FDA FSMA Rule 204, and evolving requirements in Japan, the Republic of Korea, and ASEAN markets now mandate comprehensive chain-of-custody documentation, from point of harvest through processing to final consignment, as a non-negotiable condition of market entry.

Non-compliance exposes exporters to consignment rejections, border alerts, and trade restrictions that erode not only margins of individual firms but also India's collective reputation as a reliable sourcing origin. In this regulatory environment, traceability has shifted from a voluntary quality signal to a binding trade infrastructure requirement.



Scenario A (2% CAGR, BAU) reaches only USD 8.8 billion and misses the target. Scenario B (3.9% CAGR, Moderate Reform) exactly meets the USD 10 billion target. Scenario C (8.8% CAGR, Accelerated Growth matching historical average) would reach USD 13.8 billion—consistent with ITC's Export Potential Map ceiling estimate of USD 14 billion for India's sea animal products.

Therefore, despite being a modest target, achieving the USD 10 billion trade revenue by 2030 presents a structural challenge of considerable complexity. Production is dispersed across thousands of small-scale and artisanal vessels operating diverse gear types, and landing mixed-species catches across 1,363 centres with minimal digital infrastructure, fragmented first-sale documentation, and limited cold-chain integration. **Rather than attempting system-wide coverage from the outset, the most viable approach is to prioritise traceability for species that dominate export portfolios and face the most stringent compliance scrutiny, notably shrimp, tuna, cuttlefish, and squid.**

The marine ingredients sub-sector has some unique structural complexities. A dimension often overlooked is the domestic aquaculture role of marine ingredients. Fishmeal and fish oil sourced from small pelagic fisheries, low-value post-harvest resources, and fish processing waste are critical raw materials for aquafeed, and therefore directly underpin the competitiveness and compliance of India's shrimp aquaculture sector. **Traceability gaps in marine ingredients do not merely threaten ingredient exports; they also jeopardise the compliance credentials of shrimp exports whose feed inputs cannot be verified. This feed-linkage makes marine ingredient traceability a prerequisite for the integrity of seafood exports based on marine ingredients.**

Multiple digital traceability platforms, ranging from QR-code-based systems and mobile-first applications to cloud platforms and blockchain solutions, demonstrate how real-

time visibility of origin, handling, cold chain integrity, and compliance data can be achieved across seafood supply chains. However, the choice of technology architecture must be guided by India-specific requirements: cost-effectiveness for small-scale operators, offline functionality in areas with limited connectivity, integration with MPEDA's and EIC's existing certification platforms, and scalability from priority export species to the broader catch basket.

The Government of India's National Traceability Framework, operationalised through PM-MKSSY, provides the policy framework for developing national digital traceability systems and financing windows to deploy traceability at scale. Traceability should be positioned not only as a compliance tool but as an enterprise and investment enabler, supporting value addition, export market access, job creation, and income growth across aquatic food value chains.

The critical gap lies in converting PM-MKSSY's policy provisions into bankable, investment-ready project proposals.

This workshop proposes a national multi-stakeholder platform to operationalise the traceability framework into practical, inclusive, and market-linked implementation models, with an initial focus on dominant export species. The workshop will assess traceability readiness across the marine export value chain, co-design pilot traceability models for high-value species connecting small-scale fishers, cooperatives, women SHGs, exporters, and domestic buyers through SEAI, MIIA, and MPEDA, and develop a full-fledged bankable project proposal for PM-MKSSY financing based on the workshop's technical outputs.

Opening Session

Welcome Address

Dr. P. Krishnan, *Director, BOBP-IGO* highlighted that the National Workshop on Operationalising the National Framework on Traceability in Fisheries and Aquaculture, held on 05 March 2026 at the Marine Products Export Development Authority (MPEDA) in Cochin, marked an important milestone in strengthening transparency, accountability and competitiveness in India's marine seafood and marine ingredients value chains through the development of a National Digital Traceability System under the PM-MKSSY scheme. Addressing representatives from government agencies, international organisations, industry bodies, technology providers, research institutions and academia, the Director of BOBP-IGO emphasised that traceability is rapidly becoming an essential requirement in global seafood trade, enabling countries to meet evolving international market standards while strengthening governance, monitoring and accountability across fisheries and aquaculture supply chains. He explained that the workshop was organised by the BOBP-IGO in collaboration with the EDF/EDIF, with the MPEDA hosting the event and the Department of Fisheries,

Government of India, serving as a key partner in advancing the national traceability agenda. He further stated that the workshop brought together a broad spectrum of stakeholders, including representatives from central and state fisheries institutions, industry associations such as the Seafood Exporters Association of India (SEAI) and the Indian Marine Ingredients Association (IMIA), seafood exporters, logistics providers and software firms engaged in traceability systems.

Overview & Context Setting

Dr. P. Krishnan, *Director, BOBP-IGO* eexplained that operationalising the National Framework on Traceability in Fisheries and Aquaculture is a key step toward strengthening transparency, compliance and governance in India's marine seafood and marine ingredients value chains. He highlighted that the framework, introduced under the PM-MKSSY scheme, seeks to establish a national digital traceability system that can track seafood from harvest to market by capturing essential data elements and critical tracking events across supply chains. He noted that India's seafood exports are growing rapidly, with the country targeting USD 10 billion by 2030, but maintaining access to international markets increasingly requires compliance with global traceability regulations such as the EU IUU Regulation, the US Seafood Import Monitoring Program and other emerging standards. He further explained that India's dispersed fisheries sector, dominated by small-scale vessels and diverse landing centres, requires a phased and inclusive implementation approach that recognises fishers as the central actors in traceability systems. He also highlighted the importance of addressing the marine ingredients sector, where aggregated raw materials complicate traceability systems. The workshop aimed to bring together stakeholders to discuss global experiences, identify practical pilot approaches and develop implementation pathways, with expected outcomes including a national traceability action brief, digital infrastructure investment matrix and pilot proposals under PM-MKSSY to strengthen traceability across seafood and marine ingredient value chains.

Presidential Address

Dr. M. K. Ram Mohan, *Director, MPEDA* highlighted that strengthening traceability and sustainability frameworks is critical for improving the competitiveness of India's seafood sector in global markets. He noted that fisheries and aquaculture contribute significantly to India's economy, with production reaching about 197 lakh metric tonnes and supporting nearly three crore fishers and fish farmers. India exported about 16.9 lakh tonnes of seafood valued at around USD 7.45 billion, with shrimp dominating export value, but value addition remains limited and unit export value is relatively low compared with other countries. He explained that post-harvest challenges such as inadequate landing infrastructure, poor handling practices and sanitation gaps lead to significant quality deterioration and losses. He further emphasised that global seafood markets are increasingly shaped by sustainability and traceability requirements,

including regulations in the United States, the European Union and Japan. He noted that stronger governance, improved catch documentation systems, enforcement of fisheries regulations and greater community participation in monitoring and compliance are essential to strengthen sustainability and maintain India's access to international markets.

Guest of Honour

Dr. Tarun Kumar Singh, *Asst. Commisioner, Department of Fisheries, MoFAHD, GoI* stated that the newly approved national fisheries scheme, cleared by the Union Cabinet in February 2024 with an outlay of ₹6,000 crore, represents a major initiative to strengthen the fisheries and aquaculture sector through formalisation, improved value chain efficiency and enhanced product safety and traceability. He explained that the programme is supported by financing from the World Bank and the Agence Française de Développement (AFD), and therefore follows rigorous implementation, monitoring and procurement standards. He noted that a key priority of the initiative is the formalisation of the fisheries sector through the development of a National Fisheries Digital Platform, which is designed to register fishers, aquaculture farmers and other value chain actors and establish a comprehensive national database for the sector. This effort, he observed, responds to challenges experienced during the COVID-19 pandemic when the absence of consolidated data on fisheries stakeholders limited the government's ability to deliver targeted support and relief measures. He further explained that the digital platform will facilitate access to institutional finance, strengthen fisheries cooperatives and promote the adoption of aquaculture insurance, thereby improving resilience and financial inclusion across the sector. Dr. Singh also highlighted that the scheme places strong emphasis on improving value chain performance and strengthening quality and safety assurance systems, including the development of a national traceability framework for fisheries and aquaculture. While traceability requirements already exist in export markets, he emphasised that the initiative aims to extend such systems across the entire value chain so that domestic consumers also benefit from safe, high-quality and traceable fish products. The proposed framework, he noted, envisions a unified digital system that captures key data at different stages of the supply chain, from harvesting and production to processing and marketing, through the coordinated participation of fishers, farmers, processors, exporters and regulatory agencies. Emphasising the importance of collaboration and stakeholder participation, he remarked that the effectiveness of the traceability system will depend on trust, data sharing and active engagement among stakeholders across the fisheries sector. If implemented successfully, he added, the initiative is expected to strengthen transparency, improve consumer confidence, support sustainable fisheries management and enhance India's global positioning in responsible aquatic food production and trade.

Session 2: Global Traceability Mechanisms and Experiences

Facilitator: Dr. M. K. Ram Mohan, *Director, MPEDA h*ighlighted that India's fisheries and aquaculture sector has emerged as a significant contributor to the national economy and global seafood supply, accounting for nearly 8 % of global fish production with an annual output of about 19.7 million tonnes. He noted that the sector contributes around 7 % to the agricultural gross value added and about 1 % to the national gross value added, while supporting the livelihoods of nearly 30 million fishers and fish farmers across the country. He observed that India currently ranks among the leading seafood exporting nations, with exports valued at over ₹62,400 crore in the previous year and holding approximately the sixth position globally. In the global seafood trade, estimated at around USD 202 billion, India's share stands at about USD 7.45 billion, or roughly 3.7 %, largely driven by frozen shrimp exports followed by fish, cephalopods and other seafood products. While India's seafood export growth rate of nearly 8.9 % over the past decade has outpaced the global average growth of about 3.9 %, he pointed out that the country still trails competing nations such as China, Thailand, Vietnam and Ecuador in the export of value-added seafood products. He noted that value-added products currently constitute only about 12 % of India's seafood exports, placing the country around the eleventh position globally in this segment. Dr. Ram Mohan further emphasised that although capture fisheries contribute nearly 59 % of the export quantity, they account for only about 35 % of export value due to lower unit value realisation compared with aquaculture shrimp. He remarked that several challenges persist across the marine capture fisheries value chain, including inadequate onboard handling facilities, poor sanitation and hygiene practices, lack of professional harbour management, infrastructure limitations at landing centres and high levels of post-harvest losses estimated at around 20 to 25 % of the total catch. These factors, he noted, not only affect product quality and value realisation but also complicate traceability within the supply chain. He also highlighted the growing influence of international compliance requirements shaping global seafood markets, referring to regulatory frameworks such as the United States Marine Mammal Protection Act, Section 609 of the United States Public Law on turtle conservation, European Union catch certification regulations and emerging traceability and documentation standards in major export markets including the European Union, Japan and the United States. With upcoming regulatory developments, including the transition from simplified catch certificates to vessel-level catch documentation and the introduction of digital traceability systems, he observed that India faces significant challenges in ensuring compliance across its highly fragmented and multi-species fisheries sector. In this context, he stressed the need to strengthen digital traceability systems, regulate intermediary actors such as aggregators and dealers, improve enforcement of fisheries regulations and enhance record keeping across the value chain. Such measures, he concluded, will be critical for maintaining market access, improving transparency and supporting sustainable fisheries

management while enabling India to remain competitive in the evolving global seafood trade environment.

Opportunities for advancing digital traceability for India's seafood sector through adoption of Global Dialogue on seafoods Traceability (GDST)

Mr. Huw Thomas, *Executive Director, Global Dialogue on Seafood Traceability* explained that traditional seafood traceability systems based on "one-up, one-down" record keeping are no longer sufficient to meet growing expectations for detailed information on product origin, sustainability performance, labour standards and supply chain transparency. He noted that the Global Dialogue on Seafood Traceability (GDST) aims to enable fully digital and interoperable data exchange across the global seafood industry by 2030, allowing businesses, regulators and other stakeholders to access near real-time information for informed decision-making. Established in 2017 by WWF for Nature and the Institute of Food Technologists, GDST now brings together more than 130 partners from industry, certification programmes, technology providers, retailers and civil society to develop common standards for digital seafood traceability. He said the GDST standard focuses on defining key data elements, identifying critical tracking events and establishing digital formats that enable information exchange between different software systems, while not prescribing any specific technology platform. He observed that a major challenge in the seafood sector is not the lack of data but the limited ability to share it effectively, with up to 80 percent of supply chain data often not transmitted due to incompatible formats or lack of standardisation. Through ongoing collaboration with governments, industry and civil society, GDST continues to expand technical modules addressing emerging priorities such as aquatic animal welfare, labour and human rights, small-scale fisheries and bycatch management. He also highlighted engagement with international organisations including FAO and the United Nations Transparency Protocol to support interoperable digital traceability systems. Citing Indonesia as an example, he noted that the government has integrated GDST capability into its national traceability framework through the Stellina platform, enabling seafood businesses to submit data directly or share GDST-compliant information through interoperable industry software systems, with pilot implementation underway in export supply chains such as blue swimming crab, farmed shrimp and tuna. Mr. Thomas emphasised that both governments and industry must undertake digital transformation processes including supply chain mapping, identification of key data elements, digitisation of records and adoption of interoperable systems.

Fisheries traceability in Kerala

Shri. B. Abdul Nasar, IAS *Special Secretary (Fisheries), Government of Kerala* stated that the national workshop on operationalising the National Framework on Traceability in Fisheries and Aquaculture marks an important milestone in strengthening India's fisheries governance and marine value chains. He emphasised that the initiative goes beyond digital technologies and compliance protocols, representing a broader effort to redefine how India manages its oceans, fish stocks and fisheries-based economies in the twenty-first century. According to him, traceability should be recognised as a new pillar of fisheries governance, particularly as India seeks to expand seafood exports amid growing global demands for transparency, legality and sustainability across supply chains. He noted that traceability provides three key assurances to international markets and consumers: legality of harvest, sustainability of resource extraction and transparency throughout the supply chain from catch to consumption. Shri Nasar further observed that digital traceability systems under national initiatives should be treated not merely as information technology projects but as core public infrastructure for fisheries governance and value chain management. From Kerala's perspective, he stressed that sustainability must remain the foremost priority, noting that the state's marine fisheries, largely dominated by small pelagic species, demersal finfish, cephalopods, tuna and crustaceans, are primarily harvested by small-scale and artisanal fishers, making it essential to maximise economic value without increasing ecological pressure. In this regard, he explained that traceability systems can support a shift from quantity-driven exploitation to quality-driven and value-based utilisation by improving documentation of species, fishing gears, fishing grounds, seasonal patterns and post-harvest practices, thereby supporting science-based stock management, spatial and seasonal fisheries planning and ecosystem-based fisheries management approaches. He also highlighted persistent inefficiencies in fisheries value chains, noting that India continues to lose economic value due to post-harvest losses, weak cold chain infrastructure, inadequate documentation and informal first-sale transactions. Traceability systems, can enhance value addition, reduce waste and strengthen marine ingredient value chains such as fishmeal, fish oil and omega-3 products that support aquaculture feed and nutraceutical industries, thereby linking capture fisheries, feed production, aquaculture sustainability and food safety within an integrated aquatic food system. From Kerala's fisheries governance perspective, Shri Nasar emphasised that the success of national traceability systems will depend on their ability to include small-scale fishers and coastal communities, suggesting that such systems should be low-cost, mobile-based, multilingual and capable of operating in low-connectivity environments. He noted that cooperatives, women's self-help groups and youth-led digital service providers could support data capture at landing centres, while institutions such as Matsyafed, SAF and the Kerala University of Fisheries and Ocean Studies could contribute to training and institutional capacity building. He also stressed

that traceability has become critical for market access and risk mitigation for India's seafood sector, warning that failure to comply with emerging international requirements related to IUU fishing and digital catch documentation systems could affect the credibility of Indian seafood exports. For coastal states such as Kerala, with extensive coastlines and strong dependence on fisheries for livelihoods and nutrition, establishing credible traceability systems is therefore essential. While the national framework provides policy direction, he noted that effective implementation will depend on state-level actions including modernised landing centres, improved harbour infrastructure and investments in cold chain and digital data systems. Concluding his remarks, Shri Nasar emphasised that traceability requires collaborative engagement among governments, industry, technology providers, research institutions and fishing communities, reaffirming Kerala's commitment to work with the Government of India and other stakeholders to develop scalable pilot initiatives and practical implementation models. He remarked that India's future competitiveness in global seafood markets will depend not only on the quantity of fish harvested but on how sustainably, transparently and responsibly those resources are managed, noting that traceability serves as a bridge between ocean health, economic growth, community livelihoods and international market confidence in support of a sustainable and resilient blue economy.

From data to plate: Traceability in small-scale fisheries in Mexico (Demonstration of a successful integration of a blockchain-enabled traceability platform, QR-based consumer transparency tools and cold-chain monitoring

Dr. Pedro Zapata, *Associate Vice President, Global Ocean Strategies, EDF, Washington* explained that although he does not consider himself a technical specialist in traceability systems, his work focuses on fisheries governance, sustainability policy and international collaboration through initiatives of the Environmental Defense Fund (EDF) in countries such as Mexico and Indonesia, including partnerships with the Environmental Defense India Foundation. Illustrating the role of traceability in strengthening fisheries value chains, he referred to the red grouper fishery in the Yucatán Peninsula in southeastern Mexico, which produces about 5,000 tonnes annually and supports nearly 12,000 families, many of them small-scale fishers. He noted that years of overfishing had placed pressure on the resource, leading to collaborative action from around 2018 involving EDF, government agencies, research institutions and fishing communities through the Red Grouper Recovery Plan, which introduced measures such as biological monitoring, improved regulations, gear improvements and catch limits to rebuild fish stocks. As the resource began to stabilise, he said the focus shifted towards strengthening market access and developing value chains that reward sustainable fishing practices. Fishing cooperatives subsequently established a processing company to consolidate landings of grouper, snapper and

octopus while maintaining a credible chain of custody, and EDF later partnered with the technology firm Whole Chain to develop a digital traceability platform that documents product origin, harvesting practices and handling conditions across the supply chain. According to him, the platform functioned not only as a compliance mechanism but also as trade infrastructure linking sustainable production with global market demand by enabling buyers to verify sourcing information and reducing the risk of seafood fraud. The system was designed to remain inclusive of small-scale fishers through low-cost onboarding processes and user-friendly tools compatible with varying digital capacities. Dr. Zapata further noted that once sustainability and traceability could be credibly demonstrated, the initiative began attracting international interest, including cooperation facilitated with Ireland's fisheries development agency and emerging partnerships with global retailers, cruise lines and hospitality chains, as well as interest from Canada and other countries seeking reliable suppliers of sustainable and traceable seafood. Reflecting on broader lessons, he emphasised that traceability must be built on a foundation of sustainability and responsible fisheries management, noting that tracing products from overexploited resources would have limited value without effective conservation measures. Instead, he observed that credible traceability systems can serve as essential trade infrastructure by enabling producers to differentiate products, access premium markets and establish long-term commercial partnerships. In this context, he suggested that India's efforts to digitise landing centres, strengthen documentation systems and integrate small-scale fishers into value chains could benefit from inclusive and market-oriented traceability approaches. Concluding his remarks, Dr. Zapata emphasised that sustainability supported by reliable traceability and data systems can become a strong competitive advantage in global seafood markets, highlighting the role of governments, research institutions, civil society and industry stakeholders in building partnerships that align ecological sustainability with economic resilience and strengthen transparent, high-value fisheries value chains.

Summing up: Lessons for India and what has been already achieved

Dr. M. K. Ram Mohan, *Director, MPEDA* summarized the discussions of the session by highlighting the key insights presented by the speakers on global traceability systems and their implications for fisheries governance and trade. Referring to the presentation by Mr. Huw Thomas of the Global Dialogue on Seafood Traceability (GDST), he noted that the initiative brings together more than 130 partners, including seafood certification bodies, software solution providers and non-governmental organizations, to develop interoperable digital traceability standards for the global seafood industry. Mr. Thomas had explained how standardized key data elements and critical tracking events form the foundation of digital traceability systems, enabling reliable information exchange across different platforms. He also highlighted the importance of multi-stakeholder collaboration through structured dialogue processes and emphasized the need for

standardized data formats to ensure interoperability among systems. As an example of national implementation, Dr. Ram Mohan recalled the case of Indonesia, where the Stellina traceability legislation integrates GDST principles and aims to implement traceability systems for major traded commodities such as blue swimming crab, farmed shrimp and tuna. He further mentioned that initiatives such as the United Nations Transparency Protocol, which initially focused on textile supply chains, are expanding toward agri-food sectors and could potentially extend to seafood value chains in the future. Additionally, the upcoming marine ingredient traceability module expected to be launched by GDST was highlighted as an important development for strengthening transparency in fisheries-derived feed and ingredient markets.

Dr. Ram Mohan also reflected on the case study presented by Dr. Pedro Zapata from the Environmental Defense Fund, which illustrated how sustainability initiatives combined with digital traceability can enhance market access and value realization for fisheries. The example of the red grouper fishery in Mexico demonstrated how an overexploited resource could be rebuilt through collaborative governance reforms and responsible fishing practices, eventually allowing producers to access premium markets through verifiable traceability systems. According to him, the case clearly demonstrated that traceability can function not merely as a regulatory requirement but as an integral component of trade infrastructure that strengthens buyer confidence and market competitiveness. Drawing lessons for India, he emphasized the need to identify fisheries that are closely linked to export value chains and that could serve as early candidates for traceability implementation. Species-specific and geographically concentrated fisheries, particularly within the small-scale sector, could provide practical entry points for introducing traceability systems.

He further noted that organizations working closely with small-scale fisheries would play a critical role in facilitating capacity building, strengthening self-regulation among fishers and ensuring that catches are channelized into traceable supply chains. State-level institutions and fisheries corporations, such as those managing landing centres, harbours and fish marketing infrastructure, could also play an important role in data capture and transmission across the value chain. In this context, he suggested that fisher-based producer organizations could be established or strengthened to facilitate collective participation in traceability systems while supporting responsible harvesting and improved handling practices. Finally, he observed that Kerala, with its longstanding experience in fisheries governance, including early implementation of marine fisheries regulation, enforcement mechanisms and harbour management systems, could take a lead role in identifying suitable small-scale fisheries for pilot traceability initiatives. Successful implementation at the state level, he suggested, could provide a replicable model for other coastal states across India as the country moves toward strengthening transparency, sustainability and competitiveness in its seafood value chains.

Session 3: Marine Fisheries in India's Export Economy – The Traceability Imperative

Moderator: Dr. P. Krishnan

Director, BOBP-IGO

Seafood Sector: Traceability requirements – Key Issues

Mr. Manoj Varghese, *Seafood Exporters Assn. of India (SEAI), Kochi* explained that India's seafood export industry, valued at approximately USD 7.45 billion, relies heavily on major markets such as the United States, the European Union and Japan, which together account for nearly half of the country's seafood exports. In this context, he observed that traceability has evolved from a voluntary quality assurance mechanism into a mandatory requirement for maintaining international market access, as importing countries increasingly demand verifiable documentation on where fish was harvested, which vessel conducted the fishing operation and when the catch occurred. Without such digital documentation, exporters may face shipment rejection, detention or market bans regardless of product quality. Mr. Varghese highlighted that recent amendments to the European Union's catch certification requirements under the EU IUU Regulation (EC) No. 1005/2008 pose significant challenges, requiring vessels previously covered under simplified procedures to adopt a more detailed electronic catch documentation system designed largely for technologically advanced industrial fleets. While intended to strengthen control over illegal, unreported and unregulated fishing, he noted that these requirements create operational difficulties for countries such as India where fisheries are highly diverse and dominated by small-scale and semi-mechanized vessels. The transition requires detailed documentation including vessel identification, gear information, trip dates, processing declarations and electronic reporting through the EU's digital CATCH portal. He further explained that these requirements expose several gaps in India's current fisheries data systems, including the need for improved vessel registries with gear details, trip-level documentation, captain or owner verification and integration with monitoring tools such as AIS or transponders, as well as stronger linkage between fisheries data systems and export certification platforms operated by MPEDA. Mr. Varghese also reviewed traceability requirements in other markets, noting that the United States applies the Seafood Import Monitoring Program and Food Safety Modernization Act, which require traceability documentation based on critical tracking events and key data elements, while Japan applies relatively simpler documentation requirements focused on vessel identification, catch documentation and processing statements for certain species. According to him, aligning India's traceability systems with these varied regulatory frameworks requires harmonisation of vessel-level data collection, landing centre documentation and export certification processes. To address these challenges, he suggested both immediate and long-term measures, including updating vessel registries with gear and monitoring information, introducing digital trip logbooks,

integrating fisheries monitoring systems with export certification platforms and developing simple mobile-based applications that allow fishers to record essential information such as trip identification, catch location and landing details. Such systems, he emphasised, must be user-friendly and suitable for small-scale fishers with limited digital capacity. In the longer term, he noted that improving fisheries classification systems, standardising gear codes and mapping fishing zones will be essential for establishing a robust national traceability framework. Concluding his remarks, Mr. Varghese stressed that traceability should be viewed not as a regulatory burden but as essential infrastructure for sustaining India's competitiveness in global seafood trade, emphasising the need to begin strengthening institutional, technological and governance systems to close existing traceability gaps and ensure continued compliance with evolving international market requirements.

Fish Meal and fish oil sector: Traceability requirements – key Issues

Dr. Md. Dawood Sait, *President, Indian marine Ingredients Association (IMIA)* fragmented traceability approaches applied only to selected Mr. Dawood stressed that implementing traceability for only a few commodities would not address the broader data gaps and supply chain complexities within India's fisheries sector. He emphasised that the development of a clear national framework supported by a comprehensive fisheries policy is essential to establish standardised definitions of small-scale and industrial fisheries, improve data collection systems and align governance with international principles such as the FAO Code of Conduct for Responsible Fisheries (CCRF). He also highlighted the importance of strengthening stakeholder engagement by involving vessel owners, fisher leaders and industry representatives in the design and implementation of traceability systems. Referring to the economic significance of the marine ingredients sector, Mr. Dawood noted that India currently operates about 72 fish meal plants across five coastal states, producing nearly half a million tonnes of fish meal annually, which plays a vital role in supporting aquaculture and livestock feed industries by converting low-value fish, processing by-products and waste into high-protein feed ingredients. Much of the raw material, he explained, consists of small pelagic species such as sardines, mackerel and scads, along with seafood processing waste and inland fisheries by-products that remain underutilised and often contribute to environmental pollution when discarded. By strengthening waste recovery systems and processing infrastructure, the marine ingredients sector could convert these materials into valuable products such as aquaculture feed inputs, fertilisers and other bio-based products, thereby supporting circular economy principles and advancing Blue Economy objectives. Mr. Dawood further observed that traceability requirements are becoming increasingly relevant for marine ingredient products as global buyers, feed manufacturers and certification programmes demand assurance that fish meal used in aquaculture feeds originates from

legal and responsibly managed fisheries. However, he noted that implementation in India faces several challenges including fragmented supply chains, limited digitalisation at landing centres, reliance on paper-based documentation and the absence of a centralised national database for tracking raw materials used in marine ingredient production, compounded by multi-state governance arrangements and dispersed by-product collection systems. To address these challenges, he proposed measures such as electronic catch documentation systems at major landing centres, expanded vessel monitoring technologies including AIS and satellite-based systems, and batch-level traceability mechanisms linking raw materials to fishing vessels, landing sites and processing facilities. He also highlighted the potential use of QR code systems and mobile applications to facilitate simple data capture while ensuring that systems remain practical and accessible for small-scale fishers and landing centre operators. Complementary approaches such as DNA barcoding for species identification, improved segregation of by-products and the establishment of centralised by-product collection hubs could further strengthen traceability and resource utilisation. Looking ahead, Mr. Dawood outlined a broader vision of integrating traceability within a circular bioeconomy framework, where marine by-products could support the production of high-value products including collagen, bioactive peptides, nutraceuticals and specialised feed ingredients through the development of biorefinery hubs and improved collection infrastructure. Concluding his remarks, he emphasised that the future of the marine ingredients sector depends on building transparent, science-based and digitally enabled supply chains aligned with international sustainability standards and the FAO Blue Transformation agenda, noting that strengthened government–industry collaboration and improved traceability systems can contribute significantly to food security, resource efficiency and sustainable fisheries development in India.

Session 4: Initiatives towards addressing Traceability & Stakeholders Perspectives

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

Initiatives from public sector

Dr. P. Shinoj, Principal Scientist, ICAR-CMFRI

Dr. Shinoj explained that several government agencies are already involved in different aspects of seafood traceability and regulatory compliance, including the MPEDA, the Export Inspection Agency, the FSSAI and the Bureau of Indian Standards, which collectively contribute to certification systems, regulatory oversight, quality assurance standards and food safety frameworks relevant to seafood exports. He noted that the primary role of the public sector in traceability is to support stakeholders in understanding fisheries value chains, defining minimum data requirements, developing compliance frameworks and ensuring adherence to national and international

standards. Research institutions under ICAR, including fisheries research institutes, also play an important role by developing protocols, methodologies and technical guidance for traceability systems while contributing to training and capacity development among fishers and value chain actors. He emphasised that awareness and training programmes are particularly necessary since many fishers and supply chain participants remain unfamiliar with the operational implications of traceability systems, and research and extension institutions have therefore begun conducting sensitisation programmes to prepare stakeholders for emerging compliance requirements. Reflecting on his experience as an agricultural economist working on fisheries policy, Dr. Shinoj observed that traceability was once largely treated as a conceptual term in policy discussions but has recently become a practical necessity due to evolving international seafood trade regulations, particularly for developing countries dependent on export markets. At the same time, he emphasised that traceability must be viewed within the broader context of global trade governance, where regulatory standards influence market access and compliance conditions for exporting countries. While acknowledging the role of traceability in addressing issues such as illegal, unreported and unregulated fishing, sustainable fisheries management and food safety, he noted that implementation strategies must consider the realities of countries like India where fisheries are dominated by small-scale operators who may not immediately meet complex monitoring and documentation requirements. Gradual implementation supported by capacity building, infrastructure development and institutional support will therefore be necessary. He also suggested that major seafood exporting countries such as India should engage constructively in international trade discussions to seek reasonable implementation timelines and practical compliance arrangements. Dr. Shinoj further highlighted the risk that traceability systems could unintentionally increase inequality within the fisheries sector if small-scale fishers are excluded from compliance frameworks, as larger operators may adapt more easily due to greater financial and technological capacity. Given the significant contribution of small-scale fishers to export supply chains, he emphasised that national policies must prioritise inclusive implementation strategies that ensure their continued participation. He also raised questions regarding the scope of traceability within domestic fisheries value chains, noting that while current requirements are largely export-driven, extending similar systems across domestic markets could increase compliance costs and affect consumer prices, and therefore requires careful policy consideration. Concluding his remarks, Dr. Shinoj suggested that the public sector should focus on establishing regulatory frameworks, defining standards and supporting capacity development, while operational traceability platforms may evolve through private sector participation, with governments initially ensuring traceability up to key points such as landing centres and allowing more advanced supply chain tracking systems to develop progressively over time.

Dr. Nilandri Sekhar Chatterjee, *Senior Scientist, ICAT-CIFT*

Dr. Nilandri Sekhar Chatterjee emphasised that integrating food safety science into the national fisheries traceability framework is essential for ensuring regulatory compliance and consumer protection. He explained that traceability systems need not be expensive if designed with flexibility and multiple operational layers. Referring to the national fisheries traceability framework in whose development he was involved, he noted that the proposed system envisions a multi-layer architecture accommodating different levels of technological capacity across the fisheries sector, with simple mobile-based interfaces enabling basic data entry for fishers while processing industries and export enterprises maintain more advanced digital records. Such a tiered approach, he observed, allows traceability systems to remain practical while ensuring effective information flow along the value chain. Dr. Chatterjee further highlighted that traceability is not only relevant for export markets but also embedded in domestic regulatory frameworks under the Food Safety and Standards Authority of India, where it plays a critical role in identifying the origin of contaminated products and enabling rapid responses during food safety incidents. In this context, he explained the role of the National Reference Laboratory system, noting that ICAR-CIFT has functioned as a nationally accredited testing facility since 2006 and later became a designated National Reference Laboratory under FSSAI. These laboratories provide the scientific verification layer within traceability systems by conducting confirmatory testing, standardising analytical methods and supporting regulatory enforcement, while also generating risk-based surveillance data to identify emerging hazards and strengthen national food safety monitoring. Countries with strong laboratory networks, he noted, often face fewer product rejections in international markets as they can scientifically validate the safety and authenticity of their seafood exports. Dr. Chatterjee also explained how traceability and food safety verification operate together in international regulatory frameworks, citing the European Union system where catch certification mechanisms linked to IUU fishing control interact with the TRACES platform for food safety compliance, and the United States Food Safety Modernization Act where traceability requirements are embedded within food safety legislation supported by laboratory networks under the FDA. Highlighting India's technological capabilities, he described analytical tools developed by ICAR-CIFT including rapid fingerprint-based methods for identifying shrimp species, DNA-based authentication services and emerging portable sensor technologies capable of identifying species and potential geographic origin using machine learning. The institute also conducts specialised testing for marine biotoxins and screens hundreds of contaminants in seafood products, with efforts underway to expand coverage to nearly a thousand potential chemical hazards. At the same time, he observed that large volumes of food safety data generated by institutions such as FSSAI, MPEDA, export inspection systems, NABL-accredited laboratories and seafood processing plants remain fragmented across separate digital platforms. Integrating these datasets within a national

fisheries digital platform, he suggested, would enable improved risk assessment, harmonised testing protocols and stronger regulatory decision-making. Concluding his remarks, Dr. Chatterjee emphasised that food safety should be recognised as a foundational pillar of fisheries traceability systems, noting that institutions such as ICAR-CIFT can provide scientific validation, laboratory support and capacity development to strengthen the credibility of India's traceability framework and support both domestic food safety governance and international seafood trade.

Dr. A. Ansar Ali, *Deputy Director, MPEDA*

Dr. A. Ansar Ali explained that the MPEDA has undertaken several initiatives to operationalise fisheries traceability in response to evolving international regulatory requirements. He noted that the process began following the implementation of the European Union's IUU Regulation (EC) No. 1005/2008, which introduced mandatory catch certification for seafood exports to the European Union. India initiated the system in 2010 through largely manual procedures, where fishing trip log sheets collected from landing centres were uploaded by MPEDA officials and printed catch certificates were issued for exporters. As export documentation expanded, the system gradually moved toward greater digitalisation. Dr. Ansar Ali highlighted that a major milestone was the consolidation of vessel information through linking the catch certification system with databases maintained by State Fisheries Departments and integration with the national vessel registry through the ReALCraft platform, ensuring that only registered and licensed vessels are included in the traceability database. To strengthen data capture at landing centres, MPEDA introduced tablet devices for Harbour Export Data Collectors, enabling near real-time recording of catch information and facilitating the transition from paper-based processes to digitised workflows. He also noted that the introduction of online catch certificate issuance has simplified administrative procedures for exporters, allowing applications and approvals to be processed electronically. However, the regulatory landscape continues to evolve with the European Union's digital CATCH system, which requires catch certification processes to become fully digitised and interoperable, with exporting countries expected by 2028 to align national systems with the EU platform or submit documentation through the TRACES system. According to him, the European Union has requested interoperability between India's catch certification system and the EU CATCH platform through XML data transmission to enable automatic integration, replacing the current practice where EU importers manually enter certificate data. Dr. Ansar Ali further noted that amendments to EU rules concerning simplified catch certificates will significantly increase documentation requirements from January 2027, as many vessels previously eligible for simplified certification will now require full catch certificates with detailed information. Currently, MPEDA issues about 30,000 to 32,000 certificates annually, often covering aggregated catches from multiple vessels, but the revised regulations may require individual vessel-level certificates, potentially

increasing the number to between 50,000 and 80,000 per year. Managing this volume will require substantial improvements in digital systems, documentation procedures and institutional capacity. Additional operational challenges include obtaining signatures from vessel masters or owners and collecting detailed vessel registration and licence information, which may be difficult for fishers with limited familiarity with documentation procedures. Concluding his remarks, Dr. Ansar Ali stated that MPEDA is upgrading its digital infrastructure and developing new systems to meet regulatory requirements expected to come into force from January 2027, emphasising that continued collaboration with government agencies, industry stakeholders and international partners will be essential to ensure that India's seafood export sector remains compliant with evolving traceability standards while maintaining efficiency and competitiveness in global markets.

Initiatives from public sector

Mr. Bharath Kumar, *Threshold Software*

He observed that the success of digital fisheries traceability systems ultimately depends on whether they deliver real value to the people expected to use them. He emphasised that technology adoption occurs only when digital platforms solve meaningful problems for users. Using examples of widely adopted digital systems such as identity platforms, payment applications and data services, he noted that if people can function normally without relying on a system, it has failed to address a genuine need. In the fisheries context, he explained that traceability platforms must therefore be designed to support fishers' everyday operations; if fishers can continue fishing, marketing their catch and managing activities without such tools, adoption will remain limited regardless of regulatory requirements. Reflecting on India's fisheries sector, Mr. Kumar highlighted the challenges posed by its large and diverse fishing population dominated by millions of small-scale fishers, unlike the smaller and more technologically structured fleets seen in countries such as Japan or the Republic of Korea. In this setting, he suggested that digital solutions should focus on solving practical challenges faced by fishers, such as improving incomes, reducing waste, enhancing market access and strengthening supply chain efficiency, rather than concentrating only on documentation for export compliance. Drawing on the concept of "product–market fit" from the technology sector, he explained that successful digital systems address real and urgent user needs, noting that discussions on fisheries traceability often emphasise regulatory reporting while fisher representation in system design remains limited. He stressed that traceability systems must incorporate the perspectives of fishers who operate in dynamic landing centre environments where data collection is often time-sensitive and operationally complex. Mr. Kumar also pointed out that successful digital platforms achieve rapid adoption because they provide immediate value, suggesting that fisheries traceability systems should be simple, accessible and capable of improving efficiency or earnings for fishers.

Another important issue he highlighted was trust and data governance, observing that many fishers are concerned about sharing operational data due to fears of future taxation, regulatory scrutiny or external access to fisheries databases. These concerns, he emphasised, must be addressed through transparent governance frameworks clarifying how fisheries data will be used and protected. From a technological perspective, he suggested that traceability infrastructure should function as an open and interoperable ecosystem rather than a single centralised platform, drawing parallels with India's Unified Payments Interface, which allows multiple service providers to build applications on a shared digital backbone. Such an approach would enable diverse technology providers to develop solutions suited to different user needs while maintaining interoperability of fisheries data. He also highlighted the potential of emerging technologies such as artificial intelligence, voice-based interfaces and automated digital assistants to simplify user interaction, noting that with increasing smartphone penetration fishers can adopt new tools if systems are intuitive, available in local languages and designed to minimise complexity. In the future, he suggested, fishers may be able to obtain certificates, access market information or manage documentation through simple voice commands or automated digital tools. Concluding his remarks, Mr. Kumar emphasised that the long-term success of fisheries traceability systems depends on adopting a fishers-first approach, linking traceability not merely to regulatory obligations but to tangible benefits for fishing communities through open digital infrastructure, interoperable systems and user-centred design that promotes widespread adoption across India's fisheries sector.

Mr. Xavier Lawrence, Odaku Online Service Pvt Ltd

He observed that the central challenge in developing fisheries traceability systems in India lies not in the availability of digital technology but in the lack of reliable data originating from fishing activities at sea. He shared practical insights from field-level experience in developing digital traceability solutions. He explained that the "Odaku" platform, named after a term used by fishers in Kerala referring to a seabed structure, was designed nearly a decade ago to capture fishing activity data directly from vessels and has since been used by thousands of fishers across India, including pilot deployments in Kanyakumari. While considerable progress has been made in digitising processes at landing centres, processing facilities and export stages, he noted that the critical gap in the traceability chain remains the absence of structured data from the fishing phase between fishing grounds and landing centres. Mr. Lawrence cautioned that imposing complex applications on fishers without providing operational benefits often leads to low adoption, as fishers primarily seek tools that help them improve fishing efficiency, identify productive locations and reduce fuel consumption rather than systems designed solely for regulatory compliance. To address this challenge, he described the Odaku system as a device-based solution that integrates traditional fisher knowledge with digital technology through a compact onboard device that automatically

records GPS and operational data during fishing trips, capturing vessel movement, trip duration and activity patterns without requiring manual input. These data can generate essential traceability information such as trip identification, fishing location, time at sea and vessel activity while also providing practical benefits such as navigation support and performance insights, thereby encouraging voluntary adoption by fishers. The system records vessel tracks at frequent intervals and produces detailed trip profiles including distance travelled, operational zones and fishing effort, allowing traceability elements and compliance information to be derived automatically while also generating datasets useful for fisheries science and resource management. Mr. Lawrence further explained that the platform links fishing activity data with downstream supply chain documentation through QR codes and digital certificates, enabling buyers and consumers to access information on vessel identity, fishing location, trip details and processing history, thereby supporting end-to-end traceability from sea to consumer. Verified operational data, he noted, can also create economic opportunities for fishers by supporting better market prices, access to financial services, insurance claims and emerging initiatives such as carbon credit schemes. He emphasised that the broader traceability ecosystem should function as an interoperable digital data layer capable of integrating with government and private-sector systems through application programming interfaces, allowing a single dataset generated at sea to support multiple regulatory and market requirements. Concluding his presentation, Mr. Lawrence stressed that fisher-level data generation is the foundation of effective traceability systems, noting that without reliable information from fishing operations downstream traceability frameworks will remain incomplete, and he called for stronger institutional support, recognition of digital trip records by regulatory authorities and improved financing mechanisms to enable wider adoption of such technologies.

Dr. Jayan Nallancherry, *TRALEXHO*

He noted that building effective fisheries traceability systems requires balancing complex regulatory requirements with practical usability for stakeholders across seafood value chains. He emphasised that although numerous global standards and compliance frameworks exist, stakeholders operating at the ground level, such as fishers, traders and processors, should not be burdened with these complexities. Instead, traceability systems should manage regulatory requirements in the background while presenting simple and intuitive interfaces for users. He explained that the digital traceability platform developed by TRALEXHO was designed specifically for seafood supply chains, allowing stakeholders across the value chain to record and transmit traceability information using basic mobile devices. The platform functions both online and offline, enabling operations in coastal areas where internet connectivity may be limited, and requires minimal manual data entry, with users only entering basic information such as product weight or quantity while the remaining traceability data is captured automatically through system integrations. Dr.

Nallancherry referred to pilot initiatives in India, including implementations in seafood supply chains along the Kanyakumari coast, where the system enabled end-to-end digital traceability from fishing vessels to collection centres and export logistics for products shipped to markets in the Middle East and Europe. According to him, the system required minimal training because stakeholders could operate it through familiar smartphone interfaces, demonstrating the importance of designing digital solutions aligned with users' everyday technological habits. He also highlighted the integration of artificial intelligence and data analytics within the platform, which allows supply chain data to be analysed to identify inefficiencies, monitor quality parameters and detect product losses or waste, thereby helping businesses optimise logistics, improve productivity and reduce operational costs while also providing consumer-facing features that enable buyers to access information on product origin and sustainability attributes. Dr. Nallancherry emphasised that cost efficiency is critical in designing traceability systems for competitive seafood markets, noting that digital solutions must operate at very low cost per product unit to remain viable for industry stakeholders. Another key design principle he highlighted was adaptability, explaining that traceability platforms must be capable of integrating evolving regulatory standards without requiring major operational restructuring by businesses. Concluding his remarks, he observed that the technological tools necessary for fisheries traceability already exist and can be adapted for India's fisheries sector, emphasising that the primary challenge lies in tailoring these solutions to the realities of complex supply chains and small-scale fisheries. By combining simplicity, affordability and adaptability, he noted that digital traceability platforms can support international compliance while enhancing operational efficiency and value creation across the seafood industry.

Fishers & Fish Workers Perspectives

Mr. Joseph Xavier, Consultant, South Indian Federation of Fishermen Societies

He emphasised that the effectiveness of fisheries traceability systems ultimately depends on how meaningfully they engage fishing communities and address the realities faced by fishers at the ground level. He observed that while various technological solutions and regulatory frameworks were discussed during the workshop, the central issue remains how traceability can become relevant and beneficial to fishers themselves. He highlighted that landing centres and first-sale points represent the most critical nodes in the traceability chain, as these are the locations where fishers interact directly with the fisheries value chain; if traceability systems are not anchored at these points, fishers risk being excluded from the process since they rarely participate in later stages beyond landing and initial sale. Mr. Xavier further noted that community-based institutions such as fisher cooperatives, harbour societies and fisher producer organisations can play an important role in supporting traceability initiatives, as they already operate within fishing communities and enjoy high levels of trust. These institutions, he explained, can act as intermediaries for collecting and validating

traceability information while reducing administrative costs by relying on existing organisational structures, thereby enabling traceability systems to function as community-supported mechanisms rather than externally imposed frameworks. He also emphasised that digital technologies introduced for traceability must remain simple and accessible, adapting to existing fishing practices rather than requiring fishers to adopt complex procedures. In addition, he observed that traceability can support broader fisheries management objectives by improving transparency in sourcing, helping address issues such as juvenile fishing and promoting responsible use of raw materials for marine ingredient production, thereby contributing to long-term sustainability of fish stocks. Mr. Xavier stressed that traceability systems must deliver tangible benefits to fishing communities if they are to succeed, noting that fishers are more likely to participate when they see direct advantages such as improved market access, better prices or enhanced income opportunities. Concluding his remarks, he reiterated that the long-term success of fisheries traceability will depend on keeping fishers at the centre of the process and ensuring that the system generates clear value for them alongside regulatory compliance and market requirements.

Mr. J. Vincent Jain, President and CEO, Federation of Indian Organizations (FIFO)

He emphasised the importance of aligning conceptual traceability frameworks with the operational realities of fisheries management. He noted that while earlier discussions identified the point of sale as a potential starting node for traceability systems, regulatory frameworks aimed at preventing illegal, unreported and unregulated fishing require traceability ideally to begin at the point of harvest. Establishing traceability from the moment fish are harvested, he explained, would strengthen compliance and enhance transparency throughout the supply chain. At the same time, he raised a critical question regarding why large-scale adoption remains limited despite the existence of several traceability solutions that claim to be simple and effective. Drawing on earlier initiatives, Mr. Jain referred to pilot projects undertaken around 2016 to develop digital harbour-based monitoring systems designed to capture vessel-level operational information, including vessel registration details, fuel quantities, crew lists and expected departure and arrival times for fishing trips. The system also aimed to record activities at sea such as fishing ground operations, shooting and hauling events and species composition of the catch, supported by catalogues containing local, English and scientific names of commercially important species and image-processing tools capable of identifying banned species. In addition, GPS-based vessel monitoring technologies were proposed to record latitude and longitude coordinates during fishing operations. However, he noted that the project could not be sustained due to institutional constraints, as the initiative was implemented as part of an academic engineering programme and development was discontinued once students graduated and faculty members moved on to other assignments. Reflecting on

this experience, Mr. Jain emphasised that successful traceability implementation requires sustained collaboration between fisheries stakeholders and information technology specialists, along with long-term institutional support. By integrating existing technologies such as vessel monitoring systems, GPS tracking, digital data entry platforms and communication tools into a unified operational framework, he suggested that more practical and robust traceability systems can be developed. Concluding his remarks, Mr. Jain observed that most technological components required for fisheries traceability already exist, and that the key challenge lies in effectively integrating these tools and ensuring sustained institutional commitment to transform technological potential into operational systems.

Mr. Siddhart Chaktavarthy, NFSF Coordinator

He reflected on the discussions during the final session on public and private initiatives and shared perspectives based on his recent engagement with small-scale fish worker communities in West Bengal. He observed that traceability had largely been discussed in the context of export market access, where consumers increasingly demand traceable seafood to ensure ethical and sustainable sourcing. While recognising the importance of these market-driven requirements, he emphasised that for small-scale fish workers the concept of sustainability is often linked to more immediate concerns such as declining marine catches and threats to livelihood security. In this regard, he suggested that traceability initiatives should be communicated in ways that connect with these realities by linking traceability with fish stock sustainability and the long-term stability of fishing livelihoods. Mr. Siddhart further noted that the institutional dynamics of capture fisheries differ from those of aquaculture systems, where upstream activities are largely driven by private actors, whereas capture fisheries governance is closely linked to state institutions, particularly fisheries departments and their field-level officers who interact directly with fishing communities. He therefore emphasised the need for stronger collaboration between government institutions and private technology providers in designing traceability systems so that such initiatives align with existing governance structures and are effectively communicated to fishers. At the same time, he highlighted broader sustainability concerns affecting the sector, particularly the impacts of bottom trawling, noting that operations of large trawlers with high engine capacities and gear that capture juvenile fish pose significant threats to fish stocks and artisanal livelihoods. Ensuring effective compliance with Marine Fishing Regulation Acts and addressing such practices, he observed, will be essential for meaningful sustainability outcomes. Participants also raised issues regarding government initiatives such as vessel tracking applications and transponder-based monitoring systems intended to improve safety and oversight of fishing voyages, while concerns were expressed about uneven access and implementation among fishing communities. The discussion further touched upon practices such as LED light fishing and associated regulatory considerations, reflecting

differing views on ecological impacts and regulatory approaches. Overall, Mr. Siddhart concluded that effective traceability systems must integrate technological tools with social, governance and ecological considerations, emphasising that successful implementation will depend not only on digital solutions and compliance frameworks but also on inclusive engagement with fishing communities and alignment with fisheries governance structures. The session concluded with a call for further group discussions to identify practical pathways for advancing traceability in the fisheries sector.

Session 5: Pilot Design lab – Breakout Groups

Group 1: Exporters

1. Where should India begin its rollout (specific species vs geography)? The discussions noted that the traceability imperative under the national framework must be aligned with the EU catch certification regulations, especially in light of the recent amendment to decked vessel rules which provides a limited window of about ten months for compliance. Failure to meet these requirements could lead to severe disruptions in India's access to the European market for marine capture seafood commodities. Given this urgency, the group noted that a purely species-based approach will not be sufficient, and that ultimately all decked vessels across the entire geography of India will have to meet regulatory standards. In the short term, however, implementation could begin through a combined species- and geography-based pilot approach focusing on export-oriented fisheries. Priority species may include high-value export commodities such as cultured shrimp, tuna, sailfish, swordfish, kingfish, grouper, snapper, squid, cuttlefish and octopus, while geographically the rollout may begin in selected coastal regions, major landing centres and fishing harbours where export fisheries are concentrated. As an example, pilot initiatives could begin with experienced deep-sea fishers from the Thoothoor region operating through Thengapattanam Fishing Harbour and the Thoppumpady landing centre. At the operational level, the discussions emphasised that traceability must incorporate accurate documentation of fishing trips and catch origin at sea, with FAO fishing area–based identification considered a more practical option than providing exact latitude–longitude coordinates. Strengthening vessel databases is also essential, including updating vessel registrations and licenses within the RealCraft system, reissuing licenses where required, and incorporating gear codes to identify vessel categories and fishing methods. The current classification of vessels under 24 metres, despite the presence of vessels up to 29 metres as reflected in MPEDA catch certificates, also requires clarification with the Merchant Marine Department (MMD). At the same time, catch documentation systems must address challenges arising from India's multi-species and multi-gear fisheries, particularly the commingling of catches and aggregation of landings from multiple vessels for a single processor or exporter, which may require changes in fisher reporting practices and certification procedures by MPEDA.

2. How can India balance strict compliance with small-scale inclusion? The group observed that strict documentation and digital reporting requirements can create barriers for small-scale fishers who may have limited digital literacy and restricted access to infrastructure. To address this, simplified reporting mechanisms such as tablet- or mobile-based applications, or harbour-level digital entry systems managed by trained personnel, could be introduced during the early stages of implementation. Fisheries cooperatives, extension officers, researchers, fisheries college students and interns could assist fishers in recording catch details and uploading data to the traceability system, particularly in pilot areas such as Thengapattanam and Thoppumpady. Capacity-building programs will be essential to gradually enable fishers to participate directly in digital reporting through mobile applications and electronic identification systems. At the same time, the discussions emphasised that compliance with traceability rules will also depend on broader regulatory alignment, particularly with state Marine Fisheries Regulation Acts (MFRAs). Violations relating to gear regulations, engine capacity limits, mesh sizes, entry into exclusion zones and cross-state fishing operations, especially trespassing into neighbouring territorial waters, pose a major challenge since EU traceability rules would make such activities visible. These compliance concerns may also lead to reluctance among mechanised vessel operators to adopt GPS- or AIS-based monitoring systems, as such systems would reveal operational fishing grounds. Aligning MFRA provisions with traceability requirements through discussions with state governments will therefore be necessary, although rapid amendments may be difficult to achieve within the short compliance timeline.

3. How can the costs and benefits of traceability systems be distributed fairly? The discussions highlighted the need for a shared-cost approach to distribute financial responsibilities equitably across the seafood value chain. Governments may undertake initial investments in infrastructure development, digital platforms and supporting systems, while exporters, processors and seafood companies, who benefit directly from improved access to international markets, could contribute through cost-sharing or profit-sharing arrangements that support operational expenses, manpower and data management. Development agencies and international fisheries programmes may also provide technical and financial assistance during the early stages of implementation. At the same time, fishers must receive tangible economic incentives, as they represent the most critical link in operationalising traceability systems. Improved market access, better price transparency and stronger bargaining power within the supply chain can encourage participation. The discussions emphasised that a “Fishers First” approach should guide the design of traceability systems so that the reporting requirements do not increase operational burdens while ensuring that fishers receive a fair share of the economic benefits generated through improved traceability and export competitiveness.

4. What architecture guarantees interoperability from the beginning? To ensure effective integration of traceability systems across the fisheries supply chain,

the group emphasised the importance of adopting a modular and interoperable digital architecture from the outset. Such an architecture would rely on standardised data formats, unified vessel identification systems and compatible digital platforms that enable seamless information exchange among fishers, fisheries departments, harbour authorities, processors, exporters and certification agencies. The system should also be capable of integrating with national digital initiatives such as the National Fisheries Digital Platform to provide end-to-end visibility across capture fisheries and aquaculture supply chains. The discussions also examined the Odaku system, which was considered by the Sustainable Seafood Alliance of India (SEAI) as a potentially suitable traceability tool due to its ability to support vessel tracking and data recording. However, several operational questions remain, including how catches would be recorded through electronic logbooks, whether reporting of catch data would align with vessel tracking positions, and how data privacy, storage and access will be managed. Addressing these issues will be essential before pilot projects using the Odaku system can be implemented. Additional technologies such as blockchain-enabled platforms, QR codes, geospatial tracking systems and cloud-based data management could also be incorporated to strengthen traceability, provided that operational aspects of catch reporting, electronic logbooks and data governance are clearly defined.

5. How can traceability become an export multiplier rather than a compliance cost?
The discussions emphasised that while the immediate objective of traceability implementation is to avoid disruption to India's seafood exports to the European Union, the longer-term objective should be to transform traceability into a mechanism that enhances market value and competitiveness. By providing reliable information on the origin of fish, harvesting practices and handling conditions, traceability can strengthen buyer confidence, facilitate compliance with international trade requirements and enable exporters to access premium markets. At the same time, pilot initiatives must demonstrate how traceability adds value throughout the supply chain and ensure that the resulting benefits are equitably shared with fishers. Incentivising fishing operators to participate in digital reporting systems, through subsidies for satellite communication equipment, vessel monitoring systems and technologies that also provide weather information and sea-to-shore communication, can further support adoption. Given the limited timeline available for compliance, the discussions highlighted the need for a structured month-by-month action plan, beginning with a roundtable involving MPEDA, the Department of Fisheries at both central and state levels, SEAI and fishing cooperatives to improve transparency on EU regulatory changes and their implications for Indian seafood exports. Integrating the response to EU traceability rules within broader national initiatives such as PM-MKSSY and aligning with other international trade standards including SIMP, HACCP and SPS requirements can help ensure that traceability evolves from a regulatory obligation into a strategic tool for sustainable fisheries management, export growth and long-term competitiveness.

Group 2: Marine Ingredients

1. Where should India begin the rollout of digital traceability systems (species-based or geography-based)?

India can begin the rollout through a combined species-based and geography-based pilot approach. From a species perspective, the initial phase may focus on marine ingredient fisheries involving major small pelagic species such as sardine, lesser sardine and silver bellies, which are widely landed and already move through organised supply chains. These fisheries are primarily sourced from Tamil Nadu, Kerala, Maharashtra, Goa and Gujarat, making them suitable entry points for early implementation. At the same time, priority may also be given to high-value export species such as tuna, sailfish, swordfish, kingfish, grouper and snapper, which already face strict international traceability requirements. Geographically, the rollout can begin in selected coastal regions, fishing harbours or major landing centres where export-oriented fisheries are concentrated. A practical pilot could involve experienced deep-sea fishers from the Thoothoor region operating through Thengapattanam Fishing Harbour and the Thopumpady fish landing centre. Starting with such targeted pilots will allow the system to be tested and refined before expanding to other fisheries and regions.

2. How can strict traceability requirements be implemented without excluding small-scale fishers?

Traceability systems should be introduced in a manner that ensures the participation of small-scale fishers while recognising their limited digital access and varying levels of digital literacy. Simplified reporting mechanisms, such as mobile or tablet-based applications and harbour-level data-entry support, can help fishers record catch information without creating excessive compliance burdens. Fisheries cooperatives, extension officers, researchers, and trained students or interns can assist fishers in documenting catches and uploading data to the system during the early stages of implementation. Another practical strategy discussed was the collectivisation of fishers, which can help organise supply chains more effectively and ensure that small-scale fishers remain integrated within the traceability framework. Over time, targeted capacity-building programmes can strengthen fishers' digital skills and gradually enable them to participate directly in digital reporting systems.

3. How can the costs and benefits of traceability systems be shared fairly among stakeholders?

A shared-cost model can help distribute financial responsibilities equitably among stakeholders. Governments may undertake the initial investments required for infrastructure development and the establishment of national digital platforms. Exporters, processors and seafood companies, who benefit from improved market access and stronger supply chain transparency, can contribute through profit-sharing arrangements or sectoral support mechanisms. Development agencies and international fisheries programmes may also provide financial and technical assistance

during the early stages of implementation. At the same time, fishers must receive clear economic incentives to participate. Benefits generated through traceability should reach fishers through collective mechanisms, ensuring that the system does not become purely compliance-driven. Improved access to premium export markets, better price transparency, and stronger bargaining power can provide tangible returns to fishers, including those involved in pilot initiatives such as the Thoothoor deep-sea fleet. When fishers experience direct economic benefits, the likelihood of long-term adoption and sustainability of the traceability system increases significantly.

4. What digital architecture should be adopted to ensure interoperability and effective data sharing?

The traceability system should be built on a modular digital architecture that ensures interoperability from the outset, allowing different systems and stakeholders to exchange information efficiently. The architecture could be developed around a common national platform established by the Ministry, with multiple sub-applications integrating into the shared infrastructure. Similar to the UPI ecosystem, different stakeholders, including fisheries departments, harbour authorities, processors, exporters and certification agencies, could operate their own applications while connecting to the central platform. Standardised data formats, unified vessel identification systems and compatible digital interfaces will be essential to ensure seamless data exchange. Catch records generated at landing centres such as Thengapattanam and Thoppumpady should integrate smoothly with national fisheries databases as well as international seafood traceability systems. Such a design would allow scalability, flexibility and interoperability while accommodating the diversity of fisheries operating along India's coasts.

5. How can traceability systems strengthen export competitiveness rather than becoming only a compliance requirement?

Traceability should be positioned as a market-enabling mechanism rather than merely a regulatory obligation. By providing reliable and verifiable information on the origin of fish, harvesting practices and handling conditions, traceability strengthens buyer confidence and helps exporters meet the documentation requirements of international markets. This enables Indian seafood products to access premium markets, obtain better prices and enhance brand credibility. Incentive mechanisms can further encourage participation across the supply chain. For instance, fishers could receive payments or rewards for sharing verified trip and vessel information required for export documentation. Pilot initiatives involving export-oriented fisheries, such as the Thoothoor deep-sea fleet landing tuna and other high-value species, can demonstrate how traceability generates additional value across the supply chain. In this way, traceability evolves from a compliance cost into a strategic tool that supports export growth and improves the overall competitiveness of Indian seafood exports.

Sesson 6: Closing Session

End Note: Vision and commitment from EDIF

Dr. D. Vijai, *Senior Manager, Climate Resilient Fisheries, EDIF* expressed his appreciation to Dr. Krishnan, BOBP-IGO, Dr. M. K. Ram Mohan, MPEDA and his entire team for organising the workshop and for including EDF as part of the important event. Reflecting on the discussions, he noted that the workshop provided a valuable learning experience and thanked all participants for their insightful contributions and perspectives shared throughout the sessions. Referring to the case study from Mexico presented earlier by his colleague Dr. Pedro Zapata, he indicated that EDF is keen to explore opportunities to support similar initiatives in the region, adapting relevant ideas that emerged during the workshop discussions. He explained that EDF would be open to contributing through targeted funding, pilot initiatives or collaborative project work, in partnership with institutions such as BOBP-IGO and other stakeholders. Emphasising the importance of continued dialogue and cooperation, he expressed EDF's interest in building on the momentum created during the workshop and looked forward to sustaining engagement and collaboration with the participants in taking forward some of the ideas discussed.

Vote of Thanks

Dr. K. Ganesh, *Deputy Director, MPEDA* emphasised that traceability must be understood not merely as a slogan or symbolic concept, but as a practical system that requires sustained collaboration, coordinated action and collective responsibility across institutions and stakeholders. He noted that only through such joint efforts can the origin of seafood products be accurately identified and documented, thereby strengthening transparency and accountability in fisheries value chains. This collaborative spirit enabled the event to be jointly organised and facilitated the participation of a wide range of stakeholders from across the fisheries sector. He acknowledged the contributions of the many organisations and institutions present, including representatives from government agencies, research institutions, exporters' associations, fisheries universities, technology partners, industry groups and fisher organisations, whose participation enriched the discussions and ensured a practical and solution-oriented dialogue. He also expressed appreciation for the valuable presentations delivered during the workshop, including those by international experts, and encouraged continued engagement and knowledge exchange in the future. Concluding his remarks, he extended special thanks to the BOBP-IGO team and all those involved in organising the workshop, recognising their efforts in coordinating arrangements and bringing together such a diverse group of stakeholders.

Discussion

Whether the National Fisheries Digital Platform would facilitate traceability records and include Key Data Elements (KDEs)?

Dr. Tarun Kumar Singh stated that the traceability module is still under development, but it is intended to incorporate all required Key Data Elements. He clarified that stakeholders will be able to enter their information into the system, and the data will remain their own rather than being owned by the government.

What kind of financial support would the PM-MKSSY scheme provide to a fisherman going to sea to catch shrimp?

Dr. Tarun Kumar Singh explained that the scheme does not provide direct assistance for routine fishing operations. However, if a vessel owner or enterprise undertakes innovative or efficiency-enhancing investments, such as adopting solar panels, energy-efficient systems or advanced technologies, they may become eligible for benefits under Components 2 and 3 of the schemes.

Should the scheme offer incentives to fishers for reporting traceability data?

Dr. Singh acknowledged that the present scheme does not include any direct monetary incentive for fishers to enter traceability data. He noted, however, that the government may consider such possibilities in future, while at present the incentive may have to come through better prices or recognition from processors and buyers for traceable products.

What mechanism is proposed for putting traceability data into the system?

Dr. Singh stated that the traceability system will be developed through a national database platform supported by mobile applications. Stakeholders will be able to open their own accounts and enter data related to each event in the value chain through a simple mobile-based system.

How will fishers enter data when there is no internet connectivity at sea?

Dr. Singh explained that in cases where real-time entry is not possible due to lack of network connectivity, fishers can enter the information once they return to a landing centre or another area with connectivity. The important requirement is that the information should be entered in a time-synchronised and reliable manner as soon as feasible.

Whether GDST supports system capability and data validity by providing advisory support on digital traceability solutions, or whether it provides access to solutions for piloting?

He clarified that marine ingredients are very much included within the framework, even if not explicitly highlighted in the presentation. Once fish enters the value chain, its subsequent journey, including processing into fishmeal or fish oil, can be captured within the system.

How will the voluntary nature of data declaration affect export compliance and certification requirements?

Dr. Singh responded that there is currently no mandatory government monetary support for voluntary reporting, which is why he emphasised the need for market actors, especially processors and exporters, to reward those who participate in traceability. He suggested that better prices and recognition could motivate primary stakeholders to provide the required information.

Should the traceability team visit fish landing centres and harbours before finalising the system?

Dr. Tarun agreed with the suggestion and noted that such field-level visits would be undertaken. He also clarified that the straight-line representation shown in the presentation was only for simplicity, whereas the actual landing and auction processes are much more complex and would need to be reflected in the final design.

Can existing documentation systems used by fisher organisations or cooperatives be incorporated into the traceability framework?

Dr. Singh stated that this would be possible if those systems are compatible with the proposed framework. He pointed to interoperability as a key design principle and said that existing systems could be integrated where feasible.

Has the Department of Fisheries fixed a timeline to finalise the IT-based traceability system?

Dr. Tarun confirmed that the indicative timeline mentioned in the presentation is 2026, and that the department is working towards developing the system within that timeframe.

Is it necessary to record exact latitude and longitude coordinates for capture fisheries in the traceability system?

Dr. Singh explained that such detailed spatial information may not be necessary for domestic consumers, but it may become important where export markets require it, particularly for certification and compliance purposes. He noted that the extent of data required would depend on the requirements of the destination market.

Does the Global Dialogue on Seafood Traceability (GDST) provide advisory support for governments and organizations in developing traceability systems?

Mr. Thomas explained that GDST operates as a partnership platform involving seafood businesses, NGOs, certification bodies and technology providers. GDST does not develop traceability software itself, but provides a capability testing framework to verify whether digital solutions meet the GDST standard. Software providers can test their systems through a GDST capability test to demonstrate that they can send and receive standardized data. Currently, about 15 software solutions have been verified as GDST-capable. Governments can access this testing process free of charge, and GDST also provides advisory support to help government systems become GDST-capable.

What is the relationship between private standards such as GDST and government regulations like those of the European Union or the United States, and whether conflicts may arise between them?

Mr. Thomas stated that he does not see any conflict between private standards such as GDST and government regulations. GDST is a not-for-profit public-benefit standard designed to facilitate digital interoperability and traceability across seafood supply chains. Governments may choose whether or not to formally adopt third-party standards in regulations. For example, while the European Union does not formally embed such standards in its legislation, it has acknowledged GDST as best practice for digital interoperable data exchange and traceability. The purpose of GDST is to provide a neutral technical framework that can support regulatory compliance and industry needs simultaneously.

How can traceability standards address concerns related to marine ingredient fisheries, fragmented fishery improvement projects (FIPs), and perceived inequities in sustainability benchmarking processes?

Mr. Thomas noted that GDST's role is limited to establishing standards for digital traceability and chain-of-custody data exchange, and it does not intervene in the governance of sustainability certification schemes or benchmarking processes. However, he indicated that GDST has already conducted a specific dialogue on marine ingredients, and a dedicated marine ingredients module under the GDST standard will be launched on 1 July. This module aims to address traceability challenges associated with reduction fisheries, multi-species catches and by-product commingling. He suggested that standardized digital data exchange could help stakeholders demonstrate transparency and provide stronger evidence in sustainability assessments and benchmarking processes.

Considering that a large proportion of catches from small-scale and artisanal fishers are consumed locally and many fishers lack smartphones or reliable internet connectivity, how can traceability systems ensure meaningful participation of these fishers, particularly in regions where cooperatives and landing centres may not be fully functional?

Shri. Nasar acknowledged that the majority of India's marine fisheries, including those in Kerala, depend on small-scale, motorized and non-motorized traditional fishers. He noted that traceability should not be viewed only in the context of export markets but must also support domestic fish consumption by ensuring quality, hygiene and consumer confidence. Recognizing the technological limitations faced by many artisanal fishers, he stated that governments, both at the state and national levels, are committed to providing financial and institutional support to strengthen the traditional fishing sector. Budgetary allocations and development programmes are being directed toward improving infrastructure, technological access and capacity building so that small-scale fishers can gradually integrate into traceability systems without creating undue burdens on their livelihoods.

Are there currently any organized mechanisms in Kerala for collecting catch data from motorized or artisanal fishing sectors, and how is the state planning to strengthen such data systems for traceability and compliance purposes?

Shri. Nasar explained that Kerala already operates certain digital systems, including the ReALCraft software used primarily for vessel licensing. In addition, catch data collection mechanisms exist, though he acknowledged that these systems are not yet fully comprehensive. The state government is working to improve data capture so that unreported catches and information gaps can be minimized. Efforts are underway to strengthen systematic data collection through agencies such as Matsyafed and other fisheries institutions. He further noted that the government is exploring measures such as controlled entry and exit points at fishing harbours and landing centres, which would help record vessel movements and catch information more accurately. These initiatives are expected to contribute to more reliable fisheries data and support the implementation of digital traceability systems in the coming years.

In many fisheries, unsustainability is often linked with informal credit arrangements and the presence of intermediaries in the value chain. After introducing traceability in the red grouper fishery in Mexico, did fishers experience any improvement in prices or market conditions? Additionally, how was the trade arrangement structured between Mexico and importing countries such as Canada?

Dr. Zapata explained that the traceability initiative enabled producers to differentiate their products and demonstrate verifiable sustainability practices, which helped them access premium markets. As a result, the participating producer groups experienced a noticeable increase in demand and improved prices for their products, particularly in markets such as the United States and Europe. Regarding trade arrangements, he clarified that while government-to-government cooperation, such as memoranda of understanding, may facilitate collaboration and policy alignment, the actual commercial transactions occur between private sector actors. Retailers, hospitality chains and seafood buyers are connected with producers through platforms and intermediaries such as WholeChain, which help assemble market demand and facilitate trade relationships.

In fisheries where mixed catches and commingling occur at landing centres, how was traceability maintained in the red grouper fishery project in Mexico?

Dr. Zapata stated that participating cooperatives addressed the issue by establishing a dedicated processing company and organizing landings in a way that preserved the chain of custody from harvest to market. Fishers who wished to access the traceable supply chain were required to land their catch at designated landing points and comply with specific conditions, including gear restrictions, size limits and registration requirements. Because the fishery mainly used handline gear targeting grouper and snapper, species selectivity was relatively high and commingling was minimized. The system created a clear incentive for fishers to comply with these rules, as traceable products fetched higher prices in international markets.

If most Indian fisheries are small-scale, would such fishers also face the same traceability challenges under the new EU catch certification requirements?

Mr. Varghese clarified that many small-scale vessels may still fall under the simplified catch certificate system because the recent EU amendment primarily removed the simplified category for certain larger vessels, particularly trawlers. Vessels below specified size thresholds, generally below 12 meters without trawl gear or below 8 meters with other gear, may still qualify for simplified certification. However, he noted that India does not yet have a clearly defined national classification of small-scale fisheries, which could create complications when aligning domestic vessel categories with European regulatory definitions.

Considering that some Indian states already use token systems to monitor vessel departures and returns from fishing harbours, could such systems be adapted to capture fishing trip information required for traceability?

Mr. Varghese acknowledged that existing mechanisms such as the token system used in certain states could indeed be adapted for traceability purposes. In such systems, vessels receive a token when leaving the harbour and return it upon arrival, effectively recording trip movements. With minor modifications, these systems could be expanded to capture essential information such as trip identification, departure and return times, and fishing activity details, thereby supporting the documentation requirements needed for traceability systems.

Given that several countries exporting seafood to major markets face similar traceability requirements, are countries such as Thailand and Vietnam better prepared for compliance compared to India?

Mr. Varghese explained that countries like Thailand and Vietnam have already faced stricter scrutiny under international traceability and IUU control frameworks. For example, Vietnam has previously received warning measures related to IUU fishing and has been undertaking extensive reforms to address these issues. India, by contrast, has not faced such sanctions but still needs to strengthen its traceability systems to avoid similar situations in the future. He emphasized that India's fisheries sector is far more complex due to its scale, diversity and artisanal nature, which makes rapid implementation more challenging but also underscores the importance of gradually developing practical systems suited to local realities.

From the perspective of fishers' organizations, there is concern that the expansion of fish meal factories creates a guaranteed market for juvenile fish, which may encourage fishers to target small or immature fish. How can this issue be addressed, and can traceability help prevent such practices?

Mr. Dawood responded that the marine ingredients industry does not encourage the capture of juvenile fish and that juvenile catches are not economically beneficial for fish meal producers because low-quality or spoiled fish negatively affect the amino acid profile and overall quality of fish meal. He explained that fisheries in India are largely

multi-species and often target shoals of small pelagic fish such as sardines and mackerel, where both large and small fish occur together, making it difficult to selectively avoid smaller individuals. He further argued that management should rely more on ecosystem-based scientific approaches, including mesh size regulations, catch controls and improved stock assessments, rather than depending solely on minimum legal size rules. According to him, better scientific data, ecological management measures and improved monitoring systems would help address the issue more effectively than attributing the problem to the fish meal industry alone.

Given the growing debate around sustainability and responsible sourcing in marine ingredient supply chains, how can the industry ensure that raw materials used for fish meal production come from legal and sustainable fisheries?

Mr. Dawood explained that improving traceability across the marine ingredients supply chain is essential for demonstrating responsible sourcing. He noted that the industry is exploring systems such as electronic catch documentation, species identification tools, vessel monitoring technologies and batch-level traceability mechanisms linking fish meal production to landing centres and vessel records. He also highlighted the importance of aligning industry practices with international frameworks such as the FAO Code of Conduct for Responsible Fisheries and developing national-level traceability platforms for fish meal and fish oil products. According to him, collaboration between government agencies, industry bodies and development partners will be necessary to implement digital data systems, strengthen documentation and ensure compliance with sustainability standards required by global seafood markets.

What is the major gap in the current seafood traceability systems in India?

Mr. Xavier Lawrence explained that the primary gap in India's traceability system lies in the lack of reliable data from the fishing stage, particularly from the sea to the landing centre. While several technological solutions exist for processing, export and supply chain stages, the most critical missing element is data generated directly from fishing operations. Without capturing information at the point of fishing, the traceability chain remains incomplete.

Why do many traceability systems fail to gain acceptance among fishers?

Mr. Lawrence noted that many systems fail because they do not provide direct value to fishers. In many cases, fishers are asked to use mobile applications or digital tools that do not address their immediate needs. Fishers are primarily concerned with practical aspects such as identifying productive fishing grounds, reducing fuel consumption and improving catch efficiency. If a technology does not support these needs, fishers are unlikely to adopt it.

How can traceability data be captured without creating additional burdens for fishers?

Mr. Lawrence explained that traceability should be generated as a by-product of tools that fishers already find useful. His system uses a simple device connected through Bluetooth that automatically records vessel movement and operational data such as GPS location, trip duration and fishing activity. By keeping the device switched on during fishing operations, the system automatically captures key data elements required for traceability without requiring manual data entry.

How can the traceability data collect from fishers be integrated into broader supply chain systems?

Mr. Lawrence stated that the data collected at sea can be integrated into broader traceability systems through application programming interfaces (APIs). These interfaces allow the data to connect with government portals, private platforms and certification systems, enabling seamless integration across the supply chain without requiring fishers to repeatedly provide the same information.

What additional benefits can traceability systems provide to fishers beyond regulatory compliance?

According to Mr. Lawrence, traceability data can generate multiple benefits for fishers, including improved market access, potential price premiums, insurance claims, carbon credit opportunities and access to financial services. Verified operational data can also help fishers demonstrate legal fishing practices and improve their credibility in formal markets.

How can traceability information be communicated to consumers?

Mr. Lawrence explained that the system can generate QR-code based digital certificates for seafood products. When consumers scan the QR code on a seafood package, they can access detailed information such as the vessel name, fishing location, captain's name, landing details and processing information. This allows consumers to verify the origin and authenticity of the product.

How is catch composition recorded in the system?

In response to a question during the discussion, Mr. Lawrence clarified that while vessel movement and operational data are automatically captured, catch composition is currently recorded manually by fishers. However, this information is used to develop fishing ground analytics that can later assist fishers in identifying productive fishing areas through data-driven insights.

How can traceability systems be implemented without imposing complex data entry requirements on fishers and other actors in the seafood value chain?

Dr. Jayan Nallancherry explained that traceability systems should be designed in a way that minimizes manual data entry for stakeholders at the operational level. According to him, fishers and other supply chain actors should only provide minimal

information such as weight or quantity of the catch, while the rest of the required data should be automatically captured by the system. Through mobile-based platforms operating both online and offline, events across the supply chain can be recorded with only a few simple interactions, ensuring that regulatory requirements are met without creating additional burdens on the users.

How can traceability systems remain adaptable to evolving international regulations and market requirements?

Dr. Nallancherry noted that seafood supply chains are subject to a wide range of evolving standards, regulations and certification frameworks. To address this challenge, traceability platforms must be designed as dynamic and flexible systems capable of adapting to new requirements as they arise. He emphasized that technology solutions should automatically incorporate regulatory changes without requiring users to restructure their operational processes, thereby ensuring long-term functionality and compliance.

Beyond regulatory compliance, what additional value can traceability systems generate for seafood supply chains?

Dr. Nallancherry highlighted that traceability systems can provide valuable analytical insights for improving productivity, reducing waste and enhancing operational efficiency. By integrating artificial intelligence and data analytics, traceability data can help businesses identify inefficiencies in the supply chain, monitor product quality and respond to consumer feedback. These insights allow stakeholders to improve operational performance while simultaneously meeting traceability requirements.

How can traceability systems be made meaningful and relevant to fishing communities?

Mr. Joseph Xavier emphasized that traceability initiatives must be designed in a way that directly benefits fishers. He noted that fishers are more likely to participate in traceability systems if they see tangible improvements in their livelihoods, such as better market access, improved prices for their catch or enhanced income opportunities. Without such incentives, fishers may have little motivation to provide the required information or comply with traceability procedures.

At which stage of the fisheries value chain should traceability systems be initiated?

Mr. Xavier explained that traceability systems should ideally begin at the landing centre or first point of sale, as this is the stage where fishers are most directly involved in the value chain. By capturing data at this critical node, fishers remain part of the traceability process before the product moves further along the supply chain where their direct participation is limited.

What institutional mechanisms can support the effective implementation of traceability systems?

Mr. Xavier highlighted the important role of fisher institutions, including cooperatives, harbour management societies and fisher producer organizations. These community-based institutions already have strong relationships with fishers and can act as intermediaries in collecting and managing traceability data. Utilizing existing institutional structures can also reduce administrative costs and help establish community-led traceability systems.

How should traceability be communicated to small-scale fishing communities to ensure their participation?

Mr. Siddhart pointed out that traceability is often presented primarily as a requirement for export markets and international consumers seeking ethically sourced seafood. However, for small-scale fish workers the more immediate concern is the sustainability of their livelihoods in the face of declining marine catches. Therefore, he suggested that traceability should be framed in terms of improving fisheries sustainability and protecting fish stocks, which would make the concept more relevant and meaningful for fishing communities.

What role should government institutions play in implementing fisheries traceability systems?

Mr. Siddhart emphasized that in capture fisheries the state plays a central governance role, particularly through fisheries departments and their field-level officials. These officers often represent the primary interface between the government and fishing communities. Therefore, effective traceability systems should involve strong collaboration between public institutions and private technology providers to ensure proper communication, implementation and regulatory integration.

What sustainability challenges must be addressed alongside the implementation of traceability systems?

Dr. Siddhart highlighted the significant ecological and livelihood impacts associated with certain fishing practices, particularly bottom trawling. He noted that these operations can affect fish stocks and create conflicts with small-scale fishers operating within coastal zones. Addressing such sustainability concerns, along with ensuring compliance with Marine Fishing Regulation Acts, is essential for traceability systems to contribute meaningfully to sustainable fisheries management.

Way forward

Based on the deliberations, the following way forward was proposed for further action:

Strengthening Vessel Databases and Fish Catch Documentation Systems

- Update vessel registrations and licences within the ReALCraft system, reissue licences where required and incorporate gear marking to identify vessel categories and fishing methods.
- Clarify the classification of vessels up to 29 metres as reflected in MPEDA catch certificates through coordination with the Merchant Marine Department (MMD).
- Introduce digital trip logbooks and update vessel registries with gear and monitoring information, including AIS or transponder details.
- Address commingling of catches and aggregation of landings from multiple vessels in catch documentation and MPEDA certification procedures.

Phased and Priority-Based Rollout of Traceability Implementation

- Initiate traceability rollout through a combined species-based and geography-based pilot approach, drawing lessons from successful initiatives such as the Walmart shrimp traceability program, and prioritizing high-value export species such as cultured shrimp, tuna, kingfish, grouper, snapper, squid, cuttlefish, and octopus, beginning at major landing centres such as Thengapattanam Fishing Harbour and Thoppumpady.
- Extend the initial pilot to marine ingredient fisheries, prioritising small pelagic species such as sardine, lesser sardine and silver bellies from Tamil Nadu, Kerala, Maharashtra, Goa and Gujarat, given their organised supply chain linkages.
- Structure the phased rollout within the available compliance window, recognising that ultimately all decked vessels across India will have to meet EU catch certification regulatory standards.

Achieving Interoperability through a Modular Digital Architecture

- Design the national traceability system on a modular and interoperable digital architecture using standardised data formats, unified vessel identification systems and compatible digital platforms to enable seamless information exchange across all value chain actors.
- Integrate the national traceability system with the National Fisheries Digital Platform, incorporating Key Data Elements (KDEs) and Critical Tracking Events (CTEs) as required under GDST standards and international regulatory frameworks.
- Work towards interoperability between India's catch certification system and the EU CATCH platform through XML data transmission to replace manual entry.

Ensuring Inclusion of Small-Scale Fishers and Community-Based Institutions

- Introduce simplified reporting mechanisms such as mobile- or tablet-based applications and harbour-level digital entry systems managed by trained personnel during the early stages of implementation.
- Strengthen fisher-based producer organisations to facilitate collective participation in traceability systems while supporting responsible harvesting and improved handling practices.
- Adapt existing vessel departure and return monitoring mechanisms, such as token-based systems used in certain states, to capture traceability information including trip identification, departure and return times and fishing activity details.
- Ensure traceability systems are low-cost, mobile-based, multilingual and capable of offline operation, so that data can be entered upon return to a landing centre or area with connectivity.

Adopting a Fishers-First Approach to Technology Design and Data Governance

- Design traceability systems to address fishers' operational needs such as identifying productive fishing grounds, reducing fuel consumption and improving catch efficiency, so that adoption is driven by practical benefit and not regulatory obligation alone.
- Use device-based solutions that automatically record GPS and operational data during fishing trips without requiring manual data entry, as demonstrated by the Odaku system.
- Develop the traceability infrastructure as an open and interoperable ecosystem with APIs connecting government portals, private platforms and certification systems, and integrate AI, voice-based and multilingual interfaces to simplify user interaction.

Distributing Costs and Benefits Equitably Across the Value Chain

- Ensure fishers receive tangible economic incentives including improved market access, better price transparency and stronger bargaining power, with traceability benefits shared through verified operational data supporting price premiums, insurance claims, carbon credits and access to financial services.
- Explore direct incentive mechanisms for fishers reporting traceability data through recognition and better prices from processors and buyers, and position traceability investments under PM-MKSSY Components 2 and 3 for vessel owners adopting satellite communication and energy-efficient technologies.

Strengthening Regulatory Alignment and Multi-Stakeholder Coordination

- Convene a structured roundtable involving MPEDA, the Department of Fisheries, SEAI and fishing cooperatives with a month-by-month action plan to address EU regulatory changes.

- Align state Marine Fisheries Regulation Acts (MFRAs) with traceability requirements, particularly provisions relating to gear regulations, engine capacity limits, mesh sizes, exclusion zones and cross-state fishing operations, which would become visible through GPS and AIS monitoring.
- Integrate the response to EU traceability requirements within PM-MKSSY and align with SIMP, HACCP and SPS standards to transform traceability from a regulatory obligation into a strategic export competitiveness tool.

Strengthening Marine Ingredient Traceability and Circular Economy Approaches

- Establish electronic catch documentation systems at major landing centres and develop batch-level traceability mechanisms linking raw materials used in fish meal and fish oil production to fishing vessels, landing sites and processing facilities.
- Promote improved segregation of fishery by-products, establishment of by-product collection hubs and adoption of technologies such as QR codes and DNA-based species identification to enhance traceability and resource utilisation.

Transforming Traceability into a Market-Enabling Mechanism

- Position traceability not only as a regulatory compliance requirement but as a strategic tool for strengthening buyer confidence, improving supply chain transparency and enabling access to premium international seafood markets.
- Demonstrate the economic value of traceability through pilot initiatives in export-oriented fisheries to show how verified data on origin, harvesting practices and handling conditions can enhance competitiveness and generate benefits throughout the supply chain.

Utilising the GDST Marine Ingredients Module and Advancing Transparency in Reduction Fisheries

- Engage with the dedicated marine ingredients module under the GDST standard, scheduled for launch on 1 July, designed to address traceability challenges in reduction fisheries, multi-species catches and by-product commingling.
- Implement ecosystem-based fisheries management measures including mesh size regulations, catch controls and improved stock assessments in parallel with traceability, to ensure systems support sustainable fisheries rather than merely document practices in overexploited resources.

Time	Session Content	Speakers/Facilitators
0915 – 0945	**Registration**	
0945 – 1100	**Opening Session**	
	Facilitator: Dr. D. Vijai, *Senior Manager, Climate Resilient Fisheries, EDIF*	
0945 – 0950	Welcome Address	**Dr. M. K. Ram Mohan** *Director, MPEDA*
0950 – 1000	Context Setting	**Dr. P. Krishnan** *Director, BOBP-IGO*
1000 - 1010	Guest of Honour Remarks	**Dr. George Ninan** *Director, ICAR-CIFT*
1010 – 1025	Presidential Address	**Shri. D. V. Swamy** *Chairman, MPEDA*
1025 – 1040	Chief Guest Address	**Shri. Sagar Mehra, IAS** *Joint Secretary, DoF, GoI*
1040 – 1100	**Group Photo / Tea Break**	
1100 – 1215	**Session 2: Global Traceability Mechanisms and Experiences**	
	Facilitator: Dr. M. K. Ram Mohan, *Director, MPEDA*	
1100 – 1115	Fisheries traceability in Kerala	**Shri. B. Abdul Nasar, IAS** *Special Secretary (Fisheries),* *Govt. of Kerala*
1115 – 1130	Traceability in the context of small-scale fisheries	**Dr. Nada Bougouss** *Sr. Fishery Officer (Traceability),* *FAO, Rome (Virtual)*
1130 - 1145	Opportunities for advancing digital traceability for India's seafood sector through adoption of Global Dialogue on seafoods Traceability (GDST)	**Mr. Huw Thomas** *Executive Director, Global Dialogue on Seafood Traceability*
1145 – 1200	From data to plate: Traceability in small-scale fisheries in Mexico (Demonstration of a successful integration of a blockchain-enabled traceability platform,	**Dr. Pedro Zapata** *Associate Vice President,*

	QR-based consumer transparency tools and cold-chain monitoring	*Global Ocean Strategies, EDF, Washington.*
1200 – 1215	Summing up: Lessons for India and what has been already achieved	**Dr. M. K. Ram Mohan** *Director, MPEDA*
1215 – 1300	**Session 3: Marine Fisheries in India's Export Economy – The Traceability Imperative**	
	Facilitator: Shri. P. Anil Kumar, *Joint Director, MPEDA*	
1215 – 1230	Introduction to national framework on traceability in fisheries sand aquaculture	**Dr. Tarun Kumar Singh,** *Asst. Commissioner, DoF,* *MoFAHD, GoI*
1230 – 1245	Seafood Sector: Traceability requirements – Key Issues	**Mr. Manoj Varghese** **Mr. Sheraz Anwar** *Seafood Exporters Assn. of India (SEAI), Kochi*
1245 – 1300	Fish Meal and fish oil sector: Traceability requirements – key Issues	**Dr. Md. Dawood Sait** *President, Indian marine Ingredients Association (IMIA), Bangalore*
1300 – 1400	**Lunch Break**	
1400 – 1520	**Session 4: Initiatives towards addressing Traceability & Stakeholders Perspectives**	
	Moderator: Dr. P. Krishnan, *Director, BOBP-IGO*	
1400 – 1430	Initiatives from public sector **Dr. P. Shinoj** *Pr. Scientist, ICAR-CMFRI* **Dr. Nilandri Sekhar Chatterjee** *Senior Scientist, ICAT-CIFT* **Dr. A. Ansar Ali** *Deputy Director, MPEDA*	
1430 – 1500	Initiatives from public sector **Mr. Bharath Kumar** *Threshold Software* **Mr. Xavier Lawrence** *Odaku Online Service Pvt Ltd* **Dr. Jayan Nallancherry**	

	TRALEXHO	
1500 – 1520	Fishers & Fish Workers Perspectives MATSYAFED, NFF, NFSF, SIFFS, FIFO and other representatives	
1520 - 1530	**Tea Break**	
1530 – 1645	**Session 5: Pilot Design lab – Breakout Groups** Each group produces: target species and value chain segment; traceability gap; proposed mpilot intervention; technology and institutional requirements; target geography; indicative cost estimate; expected compliance and market access outcome **Facilitator: Mr. K. N. Raghavan**, *IRS, CEO, Seafood Exporters Assn. of India (SEAI), Kochi*	
1530 – 1615	Parallel breakout groups (45 min) **Group 1:** Shrimp export value chain – capture – processing – EU/US consignment **Group 2:** Tuna and cuttlefish/squid export value chain – multi gear capture – processing export **Group 3:** Marine ingredients – Fish meal and fish oil	**All participants**
1615 - 1645	Group presentations: Roadmap for Traceability in seafood and marine ingredients under PM-MKSSY (10 min each group – reporting & discussion)	**Each group representatives**
1645 – 1700	**Sesson 6: Closing Session**	
1645 – 1650	Workshop outputs and way forward	**Dr. P. Krishnan** *Director, BOBP-IGO*
1650 – 1655	End Note: Vision and commitment from EDIF	**Dr. Hishom Mundol** *Chief Adviser, EDF-India & Director, EDIF*
1655 - 1700	Vote of Thanks	**Dr. K. Ganesh** *Deputy Director, MPEDA*

List of Participants

Annexure II

No.	Organization/ Institutions	Name & Affiliation	Mobile/Email
Inaugural Guest			
1.	**DoF, Kerala**	**Shri. B. Abdul Nasar, IAS,** Special Secretary (Fisheries), Department of Fisheries in Kerala, Kerala.	Email: fisheriesdirector@gmail.com
2.	**GDST**	**Dr. Huw Thomas,** *Virtual,* Executive Director, Global Dialogue on Seafood Traceability, UK.	Mob: +44 7703 785481 Email: huw.thomas@thegdst.org
No	**Organization/ Institutions**	**Participants**	**Mobile/Email**
MPEDA Team			
1.	**MPEDA**	**Dr. M. K. Ram Mohan,** Director, Marine Products Export Development Authority (MPEDA), MPEDA House, P.B. No. 4272, Panampilly Avenue, Panampilly Nagar P.O., Kochi – 682 036, Kerala.	
2.		**Dr. K. Ganesh,** Deputy Director, Marine Products Export Development Authority (MPEDA), MPEDA House, P.B. No. 4272, Panampilly Avenue, Panampilly Nagar P.O., Kochi – 682 036, Kerala.	
3.		**Dr. A. Ansar Ali,** Deputy Director, Marine Products Export Development Authority (MPEDA), MPEDA House, P.B. No. 4272, Panampilly Avenue, Panampilly Nagar P.O., Kochi – 682 036, Kerala.	
4.		**Dr. Rakesh Thomas Kurian,** Deputy Director, Marine Products Export Development Authority (MPEDA), MPEDA House, P.B. No. 4272, Panampilly Avenue, Panampilly Nagar P.O., Kochi – 682 036, Kerala.	
5.		**Mr. A. Sakthivel,** Asst. Director, Marine Products Export Development Authority (MPEDA), MPEDA House, P.B. No. 4272, Panampilly Avenue, Panampilly Nagar P.O., Kochi – 682 036, Kerala.	
6.	**NETFISH - MPEDA**	**Dr. Joice V. Thomas,** Chief Executive, MPEDA-NETFISH, Vallarpadam, Kochi - 682504, Kerala.	

No.	Organization/ Institutions	Name & Affiliation	Mobile/Email
7.		**Mr. N. K. Santhosh,** State Coordinator, NETFISH- MPEDA, Vallarpadam, Kochi - 682504, Kerala.	
8.		**Ms. N. R. Sangeetha,** State Coordinator, NETFISH- MPEDA, Vallarpadam, Kochi - 682504, Kerala.	
Fisheries Department (GoI and Kerala)			
9.	**DoF**	**Dr. Tarun Kumar Singh,** *Virtual,* Asst. Commissioner, Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying, New Delhi- 110001.	Email: tarunkr.singh@gov.in
10.		**Dr. Asha Augustine,** Joint Director (CZ), Department of Fisheries, Kochi, Kerala.	
11.		**Ms. P. Arya,** Assistant Director, Department of Fisheries, Kochi, Kerala.	
12.		**Dr. Vinu Jacob,** AFEO, Fisheries Station, Vypin, Kochi, Kerala.	
Seafood Exporters (SEAI)			
13.	**SEAI**	**Dr. K. N. Raghavan,** Chief Executive Officer, Seafood Exporters, Association of India (SEAI), 'Seafood House', Willindon Island, Kochi - 682 003, Kerala	Email: ceo@seai.org.in
14.		**Mr. Manoj Varghese,** SEAI, Seafood House', Willingdon Island, Kochi - 682 003, Kerala.	
15.		**Mr. Sheraz Anwar,** SEAI, Seafood House', Willingdon Island, Kochi - 682 003, Kerala.	
Marine Ingredients (IMIA)			
16.	**IMIA**	**Dr. Md. Dawood Sait,** President, Indian Marine Ingredients Association, IMIA, Bangalore, Karnataka.	Mob: + 91 93412 28350 Email: President@imia.co.in
17.		**Mr. G. Stephen** General Manager, Jenefa, Indian Marine Ingredients Association, IMIA, Tuticorin, Tamil Nadu.	

No.	Organization/ Institutions	Name & Affiliation	Mobile/Email
18.		**Mr. Sivakumar Gurunathan,** Managing Director, Gurunathan Aqua Products Pvt Ltd, Kuttam, Tisaiyanvilai, Tamil Nadu.	
19.		**Mr. C. A. Mohan** CFO, Gurunathan Aqua Products Pvt Ltd, Kuttam, Tisaiyanvilai, Tamil Nadu.	
20.		**Mr. Faisal,** Director, NPM Fishmeal, Kerala	
21.		**Mr. Joseph John,** CEO, Arbee Biomarine Extracts Pvt. Ltd. Nanjangud - 571302, Karnataka.	
Academia and Researchers			
22.	**ICAR-CMFRI**	**Dr. P. Shinoj,** Principal Scientist, ICAR- Central Marine Fisheries Research Institute, Kochi, Kerala.	Mob: +91 94956 09723 Email: pshinoj@gmail.com
23.		**Dr. A. R. Anuja,** Scientist, ICAR- CMFRI ICAR- Central Marine Fisheries Research Institute, Kerala.	Mob: +91 78383 43681 Email: anuja.akathoottu@gmail.co anuja.ar@icar.org.in
24.	**ICAR-CIFT**	**Dr. Nikita Gopal,** Head, EIS Division & Principal Scientist, ICAR-Central Institute of Fisheries Technology CIFT Jn., Matsyapuri P.O., Willingdon Island, Cochin - 682 029, Kerala.	Email: nikiajith@gmail.com
25.		**Dr. Niladri Sekhar Chatterjee,** Senior Scientist, ICAR-Central Institute for Fisheries Technology (CIFT), CIFT Junction, Willingdon Island, Matsyapuri P.O., Kochi - 682 029, Kerala.	
26.		**Dr. S. J. Laly,** Senior Scientist, Central Institute of Fisheries Technology (ICAR- CIFT), CIFT Junction, Willingdon Island, Matsyapuri (PO), Cochin-682029, Kerala.	
27.		**Dr. A. Suresh,** Principal Scientist, ICAR-Central Institute for Fisheries Technology (CIFT), CIFT Junction, Willingdon Island, Matsyapuri P.O., Kochi - 682 029, Kerala.	

No.	Organization/ Institutions	Name & Affiliation	Mobile/Email
28.	**NIFPHATT**	**Dr. C. T. Nithin,** Processing cum Quality Assurance Supervisor**,** NIFPHATT, P.B.No.4272, Panampilly Avenue, Panampilly Nagar P.O, Kochi, Kerala.	Mob: +91 97451 58028 Email: nifphatt@nic.in
29.	**CIFNET**	**Dr. S. Balu,** Senior Instructor CIFNET Fine Arts Avenue Kochi – 682 016, Kerala	
30.	**TNJFU**	**Dr. T. Umamaheswari,** Assistant Professor, Tamil Nadu Dr. J. Jayalalithaa Fisheries, University (TNJFU-OMR Campus), Vaniyanchavadi, Chennai- 603 103, Tamil Nadu.	Mob: + 91 98400 84314 Email: uma@tnjfu.ac.in
31.	**KUFOS**	**Dr. Naveen Nivas,** Visiting Faculty, Department of Aquaculture, Kerala University of Fisheries & Ocean Studies (KUFOS), Panangad Road, Madavana, Junction, Kochi - 682506, Kerala	Mob: + 91 7397015822
32.	**CUSAT**	**Mr. Sabu,** Associate Professor, School of Industrial Fisheries, Cochin University of Science and Technology (CUSAT) Kochi, Kerala.	Email: sabuif@cusat.ac.in
IT FIRMS			
33.	**ZEROCODE**	**Mr. Bharath Kumar,** Founder & CEO, Threshold Software, Co-Founder & CEO, ZeroCode Innovations Founder & CEO, NextGen MultiTouch. Pvt Ltd, Hyderabad, Telangana.	Mob: + 91 9908500117 Email: bharath.b@thresholdsoft.com
34.	**ODAKU**	**Mr. Xavier Lawrence,** Odaku Online Service Pvt Ltd, Vaniyakudy, Colachel, Kanyakumari District – 629251, Tamil Nadu.	Mob: + 91 94432 16829 Email: info@odaku.in
35.	**TRALEXHO**	**Dr. Jayan Nallacherry,** Managing Director, TRALEXHO, Bengaluru, Karnataka.	Mob: + 91 90089 55889 Email: *jayan.nallacherry@tralexho.com*
36.		**Mr. Rajesh K. Menon,** Director, TRALEXHO, Bengaluru, Karnataka.	

No.	Organization/ Institutions	Name & Affiliation	Mobile/Email
Fisher Associations			
37.	**NFSF**	**Mr. Siddhart Chaktavarthy,** NFSF Coordinator, Bangalore, Karnataka.	Tel: + 91 9819155868 Email: oceanbanter@gmail.com
38.	**SIFFS**	**Mr. Joseph Xavier,** Consultant, South Indian Federation of Fishermen Societies, Trivandrum - 2, Kerala.	
39.	**FIFO**	**Mr. J. Vincent Jain,** President and CEO, Federation of Indian Fisher Organizations (FIFO), No. 7, SLB South Road, Ramavarmapuram, Nagercoil – 629 001, Kanyakumari District, Tamil Nadu.	Email: fifopresidentceo@gmail.com
40.	**MATSYAFED & Others**	**Mr. A. R. Biju Kumar** President, AKFMCA Munabam Kerala	
41.		**Mr. D. P. Gireesh,** Secretary, Trawlnet Boat Owners, Kerala	
42.		**Mr. P. S. Shinekumar,** KMF Sea Food, Kerala	
Organizers/ Facilitators			
43.	**EDIF**	**Dr. Pedro Zapata,** Associate Vice President, Global Oceans Strategies, EDF, Washington, USA.	
44.		**Dr. D. Vijai,** Senior Manager, Environmental Défense India Foundation (EDIF), Videocon Tower – 110005, New Delhi.	Mob: + 91 6238706802 Email: vijaid@edif.org.in
45.		**Mr. Amey Bhogte,** Assistant Manager, Environmental Défense India Foundation, Mumbai, Maharashtra.	Email: amey@edif.org.in +91 90297 95702
46.	**BOBP-IGO**	**Dr. P. Krishnan,** Director, Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO), Chennai – 600 018, Tamil Nadu.	Mob: +91 9498050062 Email: krishnanars@bobpigo.org
47.		**Dr. K. Sunil Mohamed,** Consultant, Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO), Chennai – 600 018, Tamil Nadu.	Mob: + 91 9447056559 Email: ksmohamed@gmail.com

No.	Organization/ Institutions	Name & Affiliation	Mobile/Email
48.		**Mr. M. Krishna Mohan,** Information Assistant, Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO), Chennai – 600 018, Tamil Nadu.	Mob: + 91 9840051890 Email: krishnamohan@bobpigo.org
49.		**Dr. K. Nirmala,** Project Scientist, Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO), Chennai – 600 018, Tamil Nadu.	Mob: +91 98841 15095
50.		**Dr. V. Anisha Shafni John,** EDIF-EAFM Coordinator, Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO), Chennai – 600 018, Tamil Nadu.	Mob: + 91 9442113135

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