



BOBP

BREZZ

A Quadrimester Newsletter

September-December 2022

Vol. I; Issue 3

Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO) is a Regional Fisheries Advisory Body (RFAB) for promoting sustainable fisheries in the Bay of Bengal and associated regions. Its current members are Bangladesh, India, the Maldives, and Sri Lanka. It serves as the think tank on transboundary and contemporary national issues of the member countries concerning fisheries management.



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Dr. P. Krishnan
Director, BOBP

Data-driven Comradery Approach Needed for Women's Participation in the Fisheries Sector

A girl born in 1985 will be 40 years old in another three years. It is likely that she already has her own family and possibly a teenage daughter. It is also equally likely that the daughter has the same anonymity as her mother, her work is not visible and she usually is not encouraged to express her views. The phrase, 'gender mainstreaming' was coined in 1985 during the Third World Conference on Women in Nairobi. Since then the phrase has entered into all developmental programmes, the latest of which is the International Year for Artisanal Fisheries and Aquaculture being celebrated in 2022. It is time now to look back and take stock of the situation.

Women play a pivotal role in the fisheries sector, facilitating all aspects of fisheries from pre- to post-harvest activities apart from value addition activities and general well-being. Their role is more pronounced in the case of the artisanal and small-scale fisheries (ASSF), where the family still remains the whole production unit, in contrast to the commercial fisheries, where a factory-type arrangement is becoming more and more prevalent. Despite this, the role of women in the whole gamut of fisheries production remains largely curtailed. This has led to the inclusion of the **"Pillar 5: Gender equality and equity: Acknowledging that women and men in small-scale artisanal fisheries and aquaculture are equals"** in the Global Action Plan developed for IYAFA 2022.

While we have a clear goal for the last forty years that gender mainstreaming should be done, there is no clear guidance at the least, on how it can be done. As far as the economic

empowerment of women is concerned, the effort is largely in terms of bringing market-based activities to women or developing a market for many non-market activities carried out by women. To do this, the planners and policymakers (or the aimers) usually followed a benevolent administrative approach, developed, at best, through a Delphi method, to formulate general schemes and programmes. This is akin to the stories of the 'White Knight' galloping to save a 'lady in distress', as it does not consider the factors responsible for distress, the actual support required by the lady to come out of distress, and what next.

There are practical difficulties in understanding the diverse situations and factors depriving women from their active participation, expression of their (women's) own aspirations, and in coming out with a perfect solution for remedying gender inequality.

However, this should not disdain us from searching for the best possible solution using available data and intelligence, and research.

A core challenge in making effective policies and programmes is the lack of information on the daily untold chores of women, especially in the fisheries sector, to aid as actionable information for policy makers. The need for developing a gender-inclusive database and prioritising gender-based research is not often properly reflected in the policy document allowing the ignorance to perpetuate. While there is a growing interest in gender-based research, results are often too late or not scalable enough to take a policy decision. In addition, there is no regular socio-economic data reporting/monitoring process in most of the countries and in the BOBP-IGO member countries, as well.

We do not know how much fisher women receive. Do they receive the first catch or the leftover; what do they do with the catch if they have received it; how many of them have a bank account and have full control over it; their source of getting information on the government programmes and so on.

When data is available, new insight can be obtained into the nature of gender imbalance. For example, in India, socio-economic data started flowing regularly since the initiation of the quinquennial marine fisheries census in 2005. It shows that while the total employment in the marine fisheries sector has gone down between 2005 and 2016 (last census), despite growth in fish production and trade, the share of women in total employment largely remains the same. At the same time, while women's educational attainment has improved during the period, their job profile largely remains unchanged. The picture is quite contrasting and the underlying questions should be answered before any intervention can be planned.

- One possible approach to address the issue concerning neglect of women's empowerment is to take a data-driven comradery approach (DDCA). The DDCA measures provide a macro picture of gender-specific sectoral needs generated through data collection, collation, and analysis. In addition, instead of telling what to do, the system will follow a gradual approach of admitting → empathising → solution searching → joint-decision making. In essence, the comradery approach is a



The bicycle designed for men and women is a model case showing how technology should take care of the differences in socio-cultural context.

bottom-up participatory approach improved further by allowing the woman to take the role of the decision-maker while expanding her options through data-driven assistance blocks, that can be combined according to one's needs.

The gamut of gender mainstreaming in fisheries goes much beyond the economic empowerment of women. And it also goes beyond the fisheries sector. It is unlikely that real gender mainstreaming can be achieved in the fisheries sector unless the same happens with the rest of the economy. However, this should not be the reason for being laid back but the motivation should be usurped for showing the way forward in achieving the goal of gender mainstreaming in its real sense!

The 'White Knight' or the current approach, pre-supposes what women should do and provides a generic solution as it is not aware of the context. Therefore, it is often not effective to make a sustainable impact on women's participation.

Salient Programs/Events

International Seaweed Conference held in Chennai



An International Conference on the promotion of the seaweed value chain in India – “Seaweed India-2022” was held during 28-29 Sep 2022 at the Delta Auditorium, National Centre for Sustainable Coastal Management (NCSCM), Chennai. The event was organised by BOBP-IGO and Smart Agri-post in collaboration with National Fisheries Development Board (NFDB), and Central Marine Fisheries Research Institute (ICAR-CMFRI) with support from the Ministry of Fisheries, Animal Husbandry, and Dairying, Government of India (MFAHD), and the Department of Fisheries and Fishermen Welfare, Government of Tamil Nadu (DFFW).

Mr. Jatindra Nath Swain, IAS, Secretary, MFAHD, Mr. A. Karthik, IAS, Principal Secretary to the Government of Tamil Nadu, Animal Husbandry, Dairying, Fisheries, and Fishermen Welfare Department, Dr. K. S. Palanisamy, IAS, Commissioner of Fisheries, DFFW, Dr. J. K. Jena, DDG (Fisheries), ICAR, and Dr. A. Gopalakrishnan, Director, ICAR-CMFRI took part along with representatives from the industry, start-ups, women entrepreneurs, eminent researchers, experts, technocrats and policymakers

Highlights:

- The Secretary, MFAHD assured all support to the entrepreneurs to address the issues that impede the development of the seaweed industry in India.
- The Secretary and Commissioner of Fisheries, Government of Tamil Nadu announced a single window system for investors and entrepreneurs to make the State the one-stop destination for the seaweed sector.
- DDG (Fisheries), ICAR highlighted the research advancements made by the ICAR towards seaweed farming and overall R&D support available to the sector.
- Experts from FAO and SEAFDEC shared global and regional experience in seaweed farming emphasizing the need for setting up a suitable management framework.
- Director, BOBP called for expanding the sector based on a robust scientific foundation and learning from the experiences of other countries in the region.



Glimpses from the Seaweed Conference

World Food Day Celebrated



The BOBP-IGO along with Arnawaz Vasudev Charity, conducted a sketching event at Cholamandal Artists Village on 16th October 2022 to commemorate World Food Day. The event was well attended by senior artists and art enthusiasts. The theme for the day was to do still-life sketches of crabs and fishes.

Sketching Event at ICAR-CIFT

A thematic sketching event was hosted by CIFT on its premises in Kochi on 28 October 2022, wherein about 30 prominent artists and fine arts students from Chennai and Kochi participated. Dr. S. Jayaraj from BOBP-IGO and Mr. B.O. Shailesh from Arnawaz Charities coordinated the event. The amateur artists got an opportunity to learn about the nuances of the art from the professionals.



Waves of Art Special Event during GAF-8

The Waves of Art, a social art initiative of BOBP aims to build a network of communication ambassadors, who are committed to contributing to the cause of fisheries and coastal livelihoods.

BOBP IGO organized a live sketching event on the sidelines of the Global Conference on 'Gender in Aquaculture and Fisheries' organized by the Asian Fisheries Society and Central Institute of Fisheries Technology (CIFT) in Kochi, India, during 21-22 November 2022. The fisheries and gender experts participating in the GAF-8 Conference from different parts of the world took part.



Artists and Fisheries Experts at the Kochi Art Events

Release of Book

The publication, “Women in Fisheries and Aquaculture – Through the Eyes of the Artists”, prepared by BOBP-IGO jointly with Arnawaz Charities, ICAR-CIFT, Asian Fisheries Society (AFS) was released by Sh. Arif Mohammed Khan, Hon'ble Governor of Kerala during the inaugural function of GAF-8, on 20 November 2022 in Kochi, Kerala. It has over 70 sketches made by professional artists and enthusiasts, portraying the role of women in aquaculture, fishing, and post-harvest activities including processing and



Release of 'Women in Fisheries and Aquaculture – Through the Eyes of the Artists' during the Opening Ceremony of the GAF-8

The publication is available at:

<https://www.bobpigo.org/webroot/publications/Waves%20of%20Art-Series-2-Women%20in%20Aquaculture%20and%20Fisheries.pdf>

Strengthening Cooperation

BOBP-IGO Participated in RSN-9



Meeting of the RSN-9 for closer cooperation amongst the RFBs

The ninth meeting of the Regional Fishery Body Secretariat Network (RSN) was held at FAO Headquarters in Rome during 2-3 September 2022 prior to the 35th Meeting of the FAO Committee on Fisheries (COFI).

Dr. P. Krishnan, Director, BOBP-IGO took part in the event and briefed the new initiatives of the Organisation. The meeting highlighted the regional issues, areas of networking and called for closer interactions among the RFBs for knowledge and experience sharing.

35th Session of COFI at FAO HQ, Rome



Dr. P Krishnan, Director BOBP, took part in the 35th Session of the Committee on Fisheries (COFI), a subsidiary body of the FAO Council, during 05-09 September 2022. COFI is the only global inter-governmental forum, where FAO Members meet to review and consider the issues and challenges related to fisheries and aquaculture.

COFI provides periodic global recommendations and policy advice to governments, regional

fishery bodies (RFBs), civil society organizations, and actors from the private sector and international community.

Taking part in the event, BOBP called for the increased cooperation of Regional Fisheries Bodies towards aiding evidence-based resource management, curbing IUU fishing, mainstreaming sea safety and achieving better living conditions for the fishers.

The Statement of BOBP-IGO presented during the 35th COFI is at:

https://www.fao.org/fileadmin/user_upload/COFI/COFI35/statements/BOBPGeneralStatementCOFI35.pdf

The Director, BOBP-IGO also had bilateral meetings with Dr. Manual Barange, Director (Fisheries and Aquaculture), FAO, and other senior officials from the Fisheries & Aquaculture Division of the FAO on global and regional work programs.

Technical Committee Meeting of CIRDAP

Dr. P. Krishnan, Director, BOBP-IGO participated in the 37th Technical Committee (TC) meeting of the Centre for Integrated Rural Development for the Asia-Pacific (CIRDAP) held in Bangkok on 11 September 2022. The members of TC comprising member countries and expert observers of CIRDAP visited the Mab Aung Natural Agriculture Centre, which demonstrates natural farming practices and propagates the Sufficiency Economy Philosophy (SEP), as envisioned by His Majesty the King of Thailand.

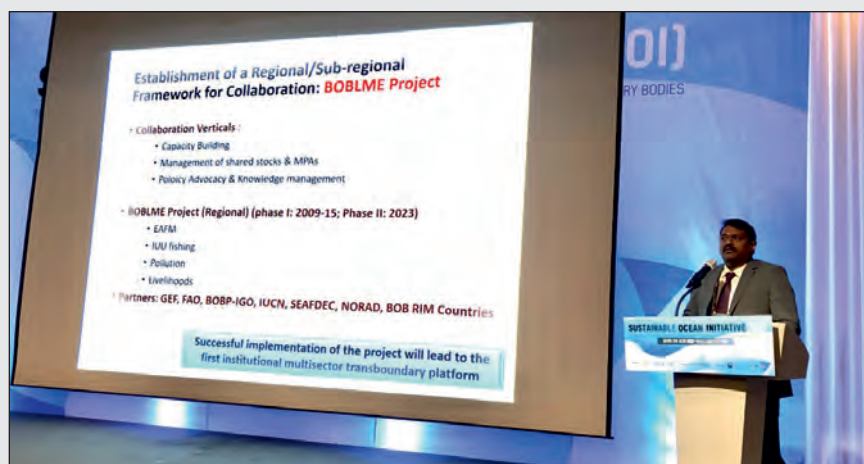


Mab Aung Natural Agriculture Centre

3rd SOI Global Dialogue between RSOs and RFBs in Busan, South Korea

The Third Sustainable Oceans Initiative (SOI) Global Dialogue with Regional Seas Organizations (RSO) and the Regional Fisheries Bodies (RFB), organized by Convention on Biological Diversity (CBD), UNEP, and FAO was held during 25 – 28 October 2022 in Busan, South Korea. Dr. P. Krishnan, Director, BOBP, made a coordinated presentation on behalf of the RFBs and RSOs in the Asia Pacific Region (BOBP, APFIC, SEAFDEC, COBSEA, and SECAP), highlighting the current status and future strategies for strengthening cooperation and collaboration among the RFBs and RSOs in the region.

*Above: Dr. P. Krishnan presenting before the 3rd SOI.
Below: Participants of the 3rd SOI*



Possibilities for Promoting Coastal Aquaculture in Bangladesh Explored

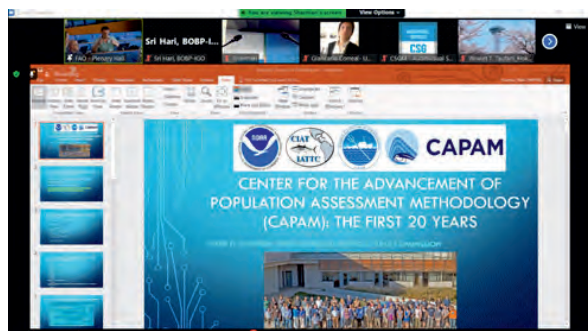
The BOBP facilitated a planning meeting between Syed Mahmudul Huq, Chairman, Bangladesh Shrimp, and Fish Foundation (BSFF), and representatives from manufacturers and exporters of feed, pro-biotic, and other aqua-inputs in India on October 06, 2022, at its Secretariat.

The discussions focused on all aspects of possible collaboration relating to shrimp and fish feeds and other aqua-inputs including technical expertise for the development of sustainable coastal aquaculture in Bangladesh; possible investment by Indian manufacturers in different aqua-inputs including feeds in Bangladesh and identification of appropriate ingredients that could lower the carbon footprint.



Bangladesh-India exploratory meeting on coastal aquaculture held at the BOBP-IGO Office

BOBP-IGO Facilitated the Participation of Researchers from the BOB Region in the FAO-CAPAM Workshop on Fisheries Stock Assessment Good Practices



The Center for the Advancement of Population Assessment Methodology (CAPAM) and the Food and Agriculture Organization (FAO) hosted a technical

workshop on Stock Assessment Good Practices in Rome from 24 to 28 October, 2022.

During the Workshop, global stock assessment leaders discussed several topics such as next-generation stock assessment models, spatial stock assessment, spatio-temporal modeling, recruitment, data weighting, growth, selectivity, etc.

BOBP-IGO facilitated the participation of students, researchers, and resource managers in this important workshop, as part of the regional capacity-building initiative. A total of 148 participants from BOBP Member countries registered and attended the workshop.

NFDB & BOBP Signed MoA for the Evaluation of the FIDF Scheme



The National Fisheries Development Board (NFDB), India, and the BOBP-IGO signed a Memorandum of Agreement (MoA) on 1st December 2022 to evaluate the Fisheries and Aquaculture Infrastructure Development Fund (FIDF) of Department of Fisheries, Ministry of Fisheries, Animal Husbandry & Dairying, Government of India. Mr. S. Reddy, Executive Director (Tech), NFDB, and Dr. P. Krishnan, Director, BOBP-IGO, signed the MoA in presence of Dr (Smt.) C. Suvarna, IFS, Chief Executive, NFDB, and senior officials from the NFDB and the BOBP-IGO.

Meetings / Events Participated

Meeting with Ambassador of India to Italy

Dr. P. Krishnan, Director, BOBP-IGO joined the Indian Delegation to interact with Dr. Neena Malhotra, IFS, Ambassador of India to the Republic of Italy, San Marino & UN Organization in Rome on 08 September 2022. The delegation briefed the Ambassador about the development in the fisheries sector in India and areas where international cooperation is required.



Delegates from India and the BOBP-IGO with the Ambassador of India to Italy

South-South Development Expo 2022



The Director, BOBP-IGO with the delegates at the South-South Development Expo 2022

Director, BOBP-IGO participated in the Global South-South Development Expo 2022 held at United Nations Conference Centre (UNCC) in Bangkok, Thailand on 12 September 2022. Mr. Antonio Guterres, Secretary General of the UN, and Mr. Abdulla Shahid, President of the UN General Assembly delivered the leadership messages. Delegates from different countries, UN bodies, IGOs, and other stakeholders participated in the event, coinciding with the UN Day for South-South Cooperation to discuss the transboundary issues requiring south-south collaboration.



Meeting of Indo-Norwegian Team on Marine Spatial Planning (MSP)

The National Centre of Coastal Research (NCCR), Ministry of Earth Sciences, Govt. of India, Chennai convened the Brainstorming Session at Chennai during 03-06 October 2022. The meeting was to plan on integration of the data related to fisheries resources and stock assessment, shoreline protection and management, tourism, CRZ, and ecology on the proposed web-based tool for Marine Spatial Planning, i.e., SAHAV. Participating in the event on 04 October 2022, Dr. P. Krishnan, Director, BOBP, called for evolving a data-sharing framework for the collation and integration of historic datasets of various themes into the national MSP platform.



The Director, BOBP-IGO with the experts during Indo-Norwegian Meeting

EAF-NANSEN Programme Forum at Dakar, Senegal

The Ecosystem Approach to Fisheries (EAF)- Nansen Programme Forum was held at Dakar, Senegal during 18-20, October 2022. The event, organized by FAO, and Norad, was attended by representatives from 32 member countries and Regional Fisheries Bodies from Africa and the Bay of Bengal region. The Forum discussed the achievements and the work plan for the current phase (2022-23) and programs for the next phase (2024-29). Dr. P. Krishnan, Director, BOBP-IGO, who also serves as a Member in the Core Group of EAF Nansen, engaged in preparing the ProDoc 2024-2028 and coordinating the consultations, attended the Forum.

Group photo of the participants of EAF-NANSEN Forum



Brainstorming Session on Ocean Accounting

Dr. P. Krishnan, Director, BOBP-IGO participated in the Brainstorming Session at National Centre for Coastal Research (NCCR), Chennai on 4 November 2022, jointly organized by the Ministry of Statistics and Programme Implementation and Ministry of Earth Science, Government of India. Policymakers, researchers, and experts from different national and international organizations participated in the meeting.



Participants of the Brainstorming Session on Ocean Accounting

Keynote Address at Gender in Aquaculture and Fisheries (GAF-8) Conference



Dr. Krishnan, Director, BOBP delivered the Keynote address during the GAF-8, a global conference on gender in aquaculture and fisheries in Kochi, Kerala on 21 November 2022. The event was organized by AFS and ICAR-CIFT. He highlighted the non-availability of gender-disaggregated data for policy-making and the participation of women in works that do not have adequate regulatory support (e.g., marketing in open places and seed collection).

Dr. Krishnan called for developing gender-accommodating technologies, to ensure the organic participation of women in the active fishing arena.

USI-HD International Multi-Lateral Table-Top Exercise in the Bay of Bengal



The United Service Institution of India (USI), and the Centre for Humanitarian Dialogue (HD), Singapore organized an international multi-lateral table-top exercise (TTX) for the littoral countries of the Bay of Bengal during 22-23 November 2022 in the USI premises in New Delhi. Maritime Law Enforcement Agencies (MLEAs) from Sri Lanka, India, Bangladesh, Myanmar, and Thailand attended the TTX along with experts and fisheries stakeholders.

Mr. Rajdeep Mukherjee, Policy analyst, BOBP-IGO attended the TTX and highlighted the need for humanitarian treatment of fishers at sea and improving safety at sea while calling for enhance multilateral coordination in the areas of IUU fishing, search and rescue operations. He also emphasized the need for proper documentation in the case of IUU fishing, especially in the instances where a fishing vessel is suspected to involve in non-fishing illegal activity such as drug smuggling, arms running, etc., which were welcomed by the TTX.



High-Level Meeting on Aquaculture Transformation in Asia and the Pacific Region

FAO Regional Office for Asia and the Pacific (FAORAP) in collaboration with the Network of Aquaculture Centres in Asia-Pacific (NACA) organized a High-Level Meeting on Aquaculture Transformation in Asia and the Pacific Region during 22-23 November 2022 in virtual mode. Over 50 participants including senior government officials from Asia-Pacific countries and officials from FAO and NACA joined the event.

During the meeting, Dr. P. Krishnan, Director, said that Asian countries are leading the aquaculture revolution. However, there is little evidence of collaborative research among these countries. Dr. Krishnan also highlighted the substantial scope of mutual learning in terms of management practices and regulatory frameworks in different countries, for framing suitable regulations for sustainable aquaculture.

International Conference on Security and Prosperity in the Bay of Bengal



The Director, BOBP-IGO, participated in the International Conference on Security and Prosperity in the Bay of Bengal, held in Kochi, India from 29 November to 01 December 2022. The conference was organized by the Centre for Public Policy Research (CPPR), Kochi, and supported by the Friedrich Naumann Foundation, New Delhi. Diplomats, Government officials, academicians, experts, and international media personalities from India, Bangladesh, Nepal and Maldives, Sri Lanka, Nepal, Thailand, Bhutan, and Germany attended. Speaking on the occasion, Dr. Krishnan said that the region's fishery is dominated by a large but impoverished artisanal sector which boosts the local economy and

contributes to nutritional security. Therefore, he said, discussions about the blue economy should now centre on how to protect the interests of small-scale aquafarmers and fishers as well as how to guarantee women's economic freedom.

4th ASEAN- India Workshop



The 4th ASEAN- India Workshop on Blue Economy was organized by the Ministry of External Affairs, Govt. of India (MEA) in collaboration with the Republic of Indonesia and regional think tanks (RIS, ASEAN, NMF, and ERIA) at Hotel Le Meridian, New Delhi during 15-16 December 2022. Senior officials from India and Indonesia and representatives from SEA countries and prominent regional think tanks attended the workshop.

Speaking on the occasion, Dr. P. Krishnan, Director, BOBP highlighted the key concerns of sustainable fisheries management and flagged key research themes. He highlighted the need for a strong collaboration among the research and academic communities in the region to facilitate evidence-based fisheries management.

Director, BOBP Meets Secretary, DoF, Bangladesh



Dr. Krishnan, Director, BOBP met with Dr. Nahid Rashid, Secretary, Ministry of Fisheries & Livestock (MoFL), Government of Bangladesh, Dr. K.H. Mahbubul Haque, Director General, Department of Fisheries, and senior officials from the MoFL on 21st December 2021 in Chennai. He briefed them about the activities of the organization. The Bangladeshi officials were visiting India to see the development of Vannamee shrimp farming in India.

Other events/meetings attended by BOBP-IGO Staff

Dr. P Krishnan, Director

- Online review meeting on Implementation of BOBLME Phase II convened by Department of Fisheries, Government of India (16 Sep 2022).
- Periodic meetings of the EAF-NANSEN Core Group as its Member.
- Resource Person in the Management Development Programme (MDP) organized by National Academy of Agricultural Research Management (NAARM) on 17 Sep 2022.
- Inauguration ceremony of "Fishing for Life": South and Southeast Asian Conference on Small Scale Fisheries and Aquaculture (SACSFA - 2022) conducted by the Sri Lanka Forum for Small Scale Fisheries (SLFSSF) on 19 Sep 2022.
- Delivered a lecture on "Competency Enhancement in Agricultural Research and Education" in the Faculty Development Program (FDP) organized by NAARM (24 Sep 2022).
- Scoping meeting for "Developing methodological framework for economic valuation of coastal ecosystems in BOB Region" convened by National Centre for Coastal Research (NCCR), on 07 Oct 2022.
- National Training of Trainers (ToT) on the SSF Guidelines organized by International Collective in Support of Fishworkers (ICSF) Trust on the SSF Guidelines during 13-15 Oct 2022.
- Interactive Sessions on during the Foundation Course for Faculty Agricultural Universities (FoCAU), conducted by NAARM on "Problem identification and building research concepts" and "Building research concepts – Introduction to terminologies" (08-09 Dec 2022).
- Meeting organized by the Department of Fisheries, Government of India at Central Institute of Fisheries Education (CIFE), Mumbai to discuss the Draft National Fisheries Policy (10 Dec 2022).
- Expert Committee meeting convened by Department of Fisheries, Government of India to examine the use and regulations concerning Purse Seine fishing in India (12 Dec 2022).
- International Conference on 'Responsible Aquaculture and Sustainable Fisheries Interact (RASHI)' conducted by College of Fisheries

(CAU), Tripura during 13-16 Dec 2022; Delivered a keynote address on "Fisheries Resources and Sustainability", in the event.

- Sixth meeting of the Global Record Informal Open-Ended Technical and Advisory Working Group (GRWG6)" and Third meeting of the Agreement on Port State Measures (PSMA) Open-ended Technical Working Group on Information Exchange (TWG-IE3) during 13-14 Dec 2022, organized the Food and Agriculture Organization, Rome, Italy.

Dr. S Jayaraj, Publication Officer

- Participated in the Regional Inception Workshop of the GEF Seventh Operational Phase of Small Grants Programme in India (SGP-O97) on 13th Sep 2022 organized by Ministry of Environment, Forest and Climate Change (MoEF&CC), with the support from the United Nations Development Programme (UNDP) and The Energy and Resources Institute (TERI)

Mr. Rajdeep Mukherjee, Policy Analyst

- Participated in National conference on Sustainable Coastal Management, 10th – 11th Sep, 2022 at Bhubaneswar, Odisha
- Participated in USI-HD International multi-lateral table top exercise in the Bay of Bengal on 23-24 Nov, 2022 at New Delhi

Dr. M Sri Hari, Project Scientist

- National Webinar on 1 December, 2022, organized by Dr. MGR Fisheries College and Research Institute, Thalainayeru, Nagapattinam on 01 Dec 2022; Delivered a talk on "Research advances in fisheries biology and resource management".

Innovative Investment for Infrastructure Development in the Fisheries Sector: Experiences from India

Infrastructure refers to physical structures that are necessary for promoting economic activity. Economic theory and empirical evidence show that investments in infrastructure promote economic growth by improving the productivity of capital and labor. Though we usually associate the word “infrastructure” with large-scale public facilities such as road and electricity, infrastructure is also a type of capital good used by the society at large and private entities.

In case of the fisheries sector, infrastructure is needed both for public (e.g. a fishing harbour) and private uses (e.g. a fish pond). However, it is always a challenge to assess the infrastructure need for different uses and devise a mechanism to provide an adequate amount of infrastructure. Especially, in the developing countries, where capital is scarce, this is a major task.

One way to approach this is to create an investment marketplace, where a supply and demand of capital can play a role to ensure adequate infrastructure for both public and private uses. The Fisheries and Aquaculture Infrastructure Development Fund (FIDF), a scheme initiated by the

Department of Fisheries, Government of India during 2018-19 for a period of five years is a test case in this aspect.

FIDF: A brief overview

India is amongst the top three fish producers in the world. The total fisheries production, from capture and culture fisheries, is showing steady growth. Over the last decade (2010 to 2020), the total fisheries production has nearly doubled from 8.5 million tonnes (MT) to 14.16 MT. During 2018-19, the fisheries sector added a gross value (GVA) of Rs. 2.12 lakh crore¹, which is about one percent of the GDP. Moreover, India has untapped potential in the culture fisheries sector (e.g. underutilized reservoirs), which can be tapped to enhance production further. The Government is also emphasizing increasing production to meet nutritional needs and enhancing fishers' income.

However, the investment from the public sector in fisheries is only about 0.34 percent of the GVA from fisheries. This may not be sufficient to maintain the existing stock of fixed capital, which is being consumed at a rate of 7-9 percent annually in the process of

production. There is also a need to address current infrastructure shortfalls. For example, there is a shortfall of 34 thousand safe landing and berthing places for mechanized fishing vessels (MFVs) and a shortfall of 15,365 million fish fries to optimally stock the ponds, and reservoirs in the country.

In this background, the FIDF scheme was launched with the following objectives:

- *Creation and modernization of capture & culture fisheries infrastructure;*
- *Creation of marine aquaculture infrastructure;*
- *Creation and modernization of inland fisheries infrastructure;*
- *Infrastructure support to reduce post-harvest losses and improve domestic marketing facilities; and*
- *Bridge the resource gap and facilitate the completion of ongoing infrastructure projects.*

The FIDF has aimed at mobilizing an estimated fund size of Rs. 7522.48 crores comprising of Rs. 5266.40 crores to be raised by the Nodal Loaning Entities (NLEs), Rs. 1316.60 crore beneficiaries' contribution, and Rs. 939.48 crore budgetary support from Government of India. The National Fisheries Development Board (NFDB) was the designated National Implementation Agency (NIA) for the scheme. The incentives provided under the scheme are (i) an interest

The Fisheries and Aquaculture Infrastructure Development Fund (FIDF) was conceived to create an infrastructure investment marketplace that is first of its kind and unique in nature. This is to ensure that investment goes to needy areas and that the risks of oversupplying or undersupplying can be mitigated by the forces of demand and supply.

subvention of up to 3 percent with a payment term of 12 years; (ii) no restriction on the number of units that can be funded under the scheme.

At the time of writing this report (01 December 2022) altogether, 231 proposals had been received, out of which 60 proposals were approved and another 76 proposals are at different stages of scrutiny. The actual fund size mobilized under the Scheme stood at 38 percent of planned fund size. Disbursement of loan under the scheme is lagging as actual amount of loan sanctioned is 36 percent of the planned loan from the NLEs. Resultantly, only about one percent of the budgetary allocation for the scheme was utilized. (Table 1). The quarterly flow of proposals indicates that the number picked up during the first quarter of 2020 and then slipped possibly due to the pandemic. It again started picking up in the third quarter of 2021 (Figure 1).

There was a significant variation in the number of proposals received from different regions and also the sectors to which the support was solicited. The highest number of proposals were received from the southern region (45%); followed by the eastern region (19.05%). Most of the proposals are received from the states for

funding large-scale infrastructures such as fishing harbours. Private proposals were mostly for aquaculture investments.

Key issues in implementation

- **Timing of the Scheme:** The launch of the scheme coincided with the global pandemic which like in any other sector halted the activities in the fisheries. The future was bleak which was not conducive to investment planning. The focus of the provincial governments as well as private entrepreneurs was mostly on the recovery. By the time the pandemic subsided, the number of proposals submitted under the scheme started to increase slowly. However, it seems that investors, especially, private investors are still trading cautiously to plan large-scale investments.
- **Difficulties in meeting bank norms:** Once a project is approved, the entrepreneurs need to meet bank norms for securing the loan. Banks usually considered fishery as risky since the fish stock under-water cannot be seen for verification during operations. In addition, many of the entrepreneurs did not

have adequate collaterals against the loan to secure it. These factors could have led to a slowing down of the disbursement of loans for private investors.

- **Financial and technical constraints in the preparation of proposals:** A potential investor needs to make a considerable investment for the preparation of a project proposal. Especially, since infrastructure projects are complex and have engineering, environmental and other dimensions, a certain level of technical expertise is also required. Mobilizing funds and hiring technical support for proposal preparation were observed to be the major impediments for the government agencies. In case of the private sector, the proposals were mostly small-scale and based on tested and tried technologies, which could be attributed to financial and technical limitations.

FIDF vis-à-vis global guidelines on infrastructure investment

The 1995 Code of Conduct for Responsible Fisheries of the Food and Agriculture Organization of the United Nations recommends that "States should ensure that fishing facilities and equipment, as well as all fisheries activities, allow for safe, healthy, and fair working and living conditions and meet internationally agreed standards adopted by relevant international organizations." (Art 6.17). It further says that "States should set minimum standards for safety and quality assurance and make sure that these standards are effectively applied throughout the industry.

Table 1. Summary of performance of the FIDF Scheme as of 01 December 2022 (Estimated from the FIDF Dashboard)

Particulars	Planned	Actual	Achievement (%)
Fund size (Rs. Cr.)	7,522.48	2,838.12	37.73
NLEs (Rs. Cr.)	5,266.40	1,871.71	35.54
Beneficiary (Rs. Cr.)	1,316.60	944.01	71.70
GOI (Rs. Cr.)	939.48	9.00	0.96
Production (m t)	20	14.73	73.65
Fisheries Production Growth rate in India	8%	8%	100.00

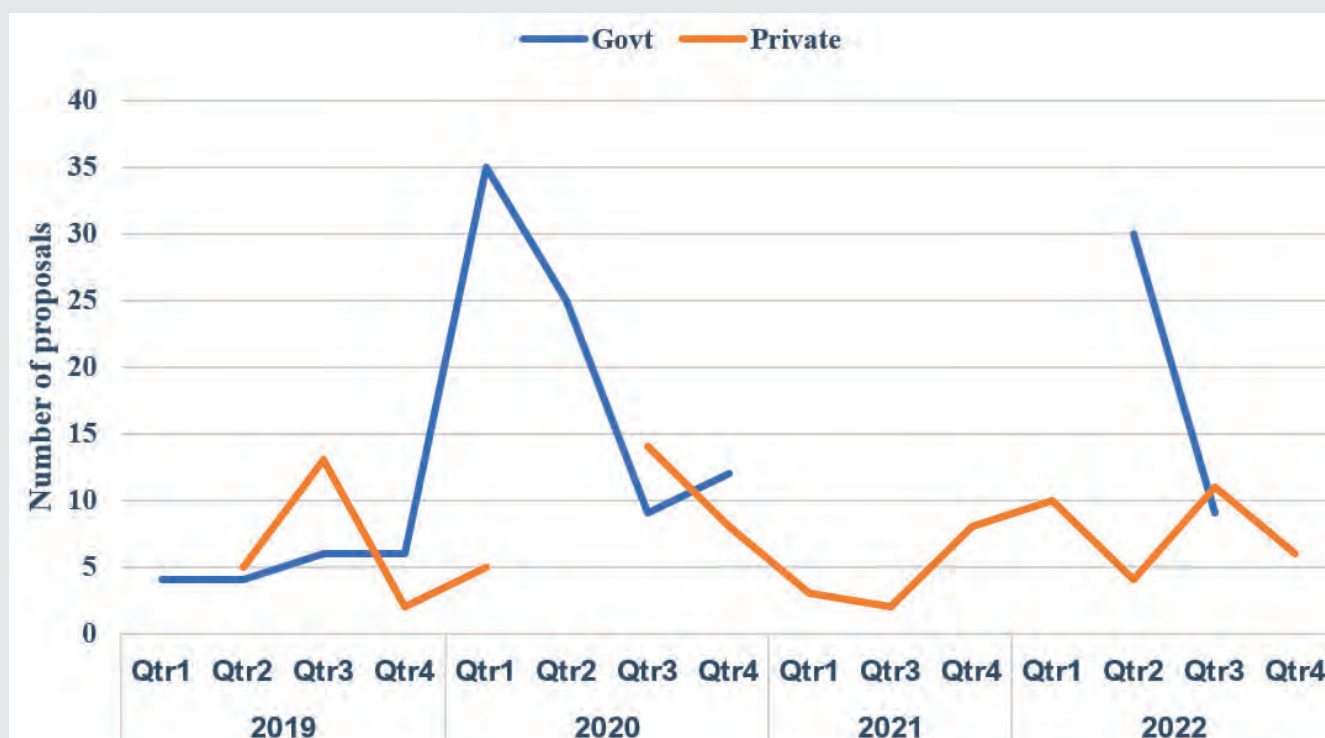


Figure 1. The flow of Proposals under FIDF till 01 December 2022

However, while investing in infrastructure, the state should also ensure that the investment leads to a balanced and inclusive development. In this context, a set of “Principles for Responsible Investment in Agriculture and Food Systems” was laid down by the Committee on World Food Security (CFS). It recommends that:

- *First, developing an appropriate policy and investment mechanism to prioritize investment in critical areas that can ensure better productive capacity, livelihoods, and equity while ensuring minimal impact on ecosystems and cultural values.*
- *Second, create space for private investment, and*
- *Third, monitor and regulate investment in infrastructure by taking a precautionary approach.*

A comparison of FIDF design against the CFS principles shows

that the FIDF scheme largely adheres to good investment practices (Table 2).

There are three critical areas where more focus may be given in the future, namely, post-scheme M&E, incentives for participation of the marginal section, and conservation and resource enhancement schemes.

Some lessons for developing infrastructure investment schemes

Market-based infrastructure investment plan: In developing countries, historically, infrastructure investment, especially investment in large-scale infrastructure remains in the domain of the state. For example, in the Bay of Bengal region, states usually have different kinds of Plans under which budgetary provision is made for investment in infrastructure. Therefore, a market-based infrastructure investment plan is a novel approach. This is an uncharted

area where the countries have started trading now. However, this should be viewed in terms of an inefficient credit market that usually defines developing countries.

Enabling policy to alleviate the impact of climate change on the cost of Infrastructure: Mitigating climate risk is costly and it would also increase the cost of infrastructure and the entrepreneurs are now subjected to greater risk than that in the past, which has led to under-investment in rural private infrastructure, e.g., ponds, fishing vessels, productive but non-destructive fishing gear, effluent treatment, etc. In view of the above, there is a need for a support scheme to reduce the cost of capital and to enable the flow of private investment to less profitable but productive and sustainable components.

Equitable participation of marginal sections: While developing the scheme the

special needs of women and other marginal sections, such as small-scale and artisanal fishers and fish farmers, should be considered. For example, a large section of women in the region is illiterate, or do not have any assets. Therefore, there should be provisions so that such groups can also take part. This could be done through the formation of groups, handholding or other measures based on the situation and realities.

Incentivizing investment in infrastructure projects on sustainability: Sustainability-oriented activities such as stock enhancement, pollution control, etc., do not generate adequate market returns in short term. To encourage investment in such activities, various incentives, for example, a higher interest subvention, may be considered. The state over time will recover

the investment through revenue earned from increased production and marketing.

Separate schemes for private and public investments: The Government and private entities usually pursue different objectives for investment and therefore, need different incentives and support services. Moreover, when the funding is limited and both the government and the private entities are competing for it, there is an inherent risk that government entities may outbid the private entities. Therefore, to ensure the flow of private investment, it may be necessary to have different schemes for government and private investment projects.

Finally, it is necessary to develop a conducive ecosystem to boost infrastructure investment. For example, in the case of India, there are business incubation

centres and technical labs in different institutions to advance technology and business practices. There are also trade bodies and associations of different stakeholders. Measures should be taken to integrate them with the investment market place so as to enable the inflow of newer ideas and possibilities and creation of adequate awareness on potential investment opportunities in the sector.

¹ 1 lakh = 0.1 million; 1 crore = 10 million

² CFS is an intergovernmental body that serves as a forum in the United Nations System to review and follow-up of policies concerning world food security including production and physical and economic access to food. CFS is the most inclusive international and intergovernmental platform for all stakeholders to work together to ensure food security and nutrition for all.

Table 2. How does FIDF hold up against CFS Principles?

CFS Principles	Provision in FIDF
Principle 1: Contribute to food security and nutrition	Food production target set. Productive activities promoted.
Principle 2: Contribute to sustainable and inclusive economic development	Private investment is encouraged, However, additional supportive measures are required.
Principle 3: Foster gender equality and women's empowerment	Encouraged women's participation. Additional affirmative actions are required to support it.
Principle 4: Engage and empower youth	Innovative activities encouraged.
Principle 5: Respect the tenure of land, fisheries, forests, and water	Environment clearance and economic viability are mandatory.
Principle 6: Conserve natural resources and contribute to climate change adaptation and mitigation	The scheme has a provision for innovative projects which can be used for infrastructure for climate change adaptation and sustainable resource use.
Principle 7: Respect for cultural heritage and traditional knowledge	Affected parties need to be consulted, while preparing a project.
Principle 8: Promote safe and healthy productive systems:	Good practices promoted.
Principle 9: Incorporate inclusive, and accessible governance structures, processes, and grievance mechanisms	Helplines established. Institutional mechanisms are in place.
Principle 10: Review impacts and ensure accountability and transparency	M&E during construction phase is provided. Support needed for long-term M&E.

Perspective

In this section, policy options to address specific issues are presented based on analysis of regional fisheries scenarios.

Making a Case for Successful Sea Ranching in BOB Region

R Mukherjee & P Krishnan

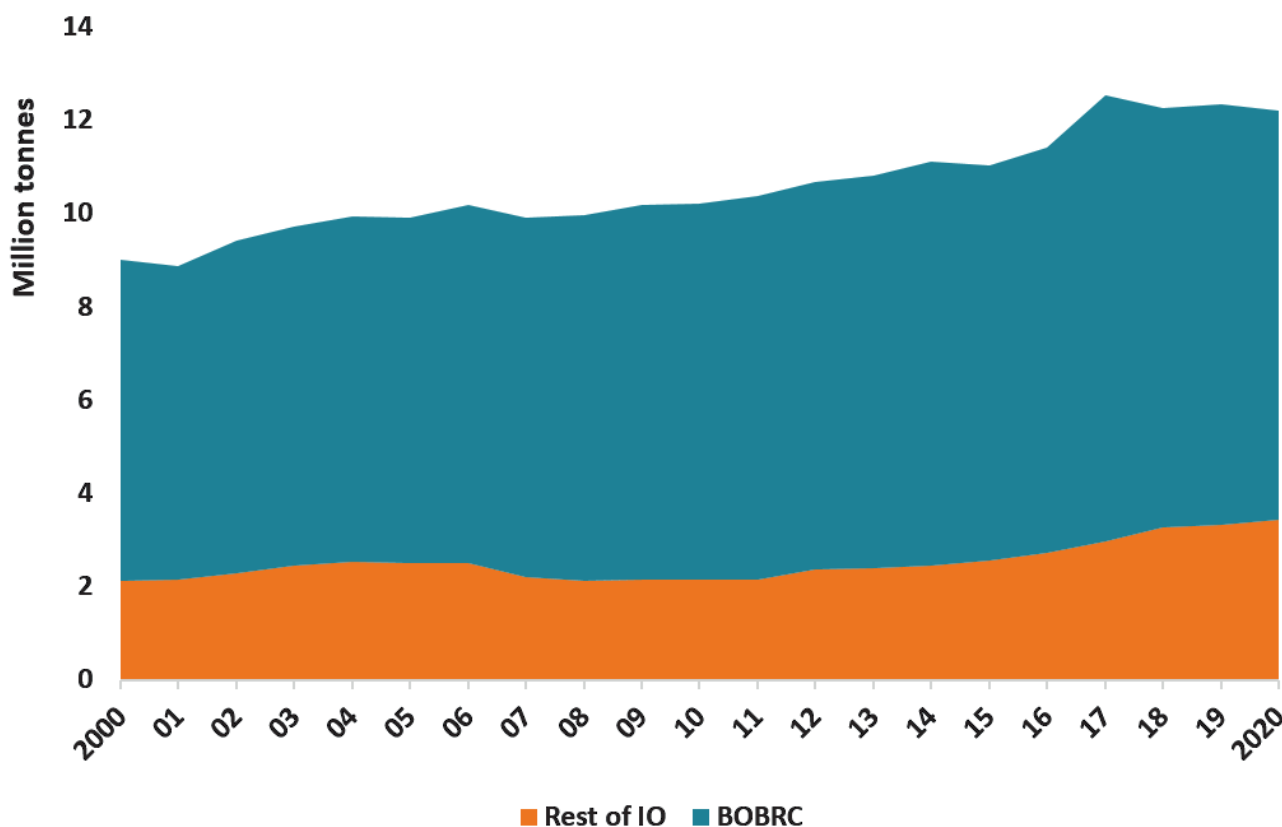
Context

The importance of the Indian Ocean (IO) in marine capture fisheries is continuing to increase. Its share in global marine capture production has increased from 5 to 15 percent since 1950 to the present. The production from IO is growing at about 4 percent per year as compared to the rest of the oceans, where the growth rate is about 2 percent. Within the IO, The Bay of Bengal rim countries (BOBRC), namely, Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka, and Thailand

are the engines of fisheries growth in the IO contributing about 71 percent of production at present (Figure 1). However, the growth trajectory in the BOBRC is flattening since 2017. Here is also a growing concern over the stock status in the IO. Data provided by the SeaAroundUs project reported that in the eastern IO, the number of over-exploited and collapsed stocks has increased from 13 percent to 23 percent between 2000-09 and 2010-19. In the case of the western IO, the same has increased from 20 percent to 22 percent during the last two decades.

While, this calls for an effort alignment in the socio-economic context of the BOBRC and IO as a whole, the same is a long-term process. For most of the fishers, capturing fisheries is the sole livelihood option due to various structural and cultural reasons (e.g., landlessness, illiteracy, culture), and therefore, creating a conducive mechanism to siphon surplus effort from fisheries to another suitable sector needs time.

This mounting concern emphasizes the need to rapidly replenish fish stock and thereby improve fish yields. Sea ranching



TERMINOLOGIES

Various terminologies are used (stocking, restocking, stock enhancement, supplementation, sea ranching, sea farming, reseeded, culture-based fisheries, or enhancement), often interchangeably, to describe aquaculture-based fisheries enhancement techniques. The key terms are defined below:

Stock enhancement: Stocking cultured organisms to replenish depleting stocks or increase abundance of wild stocks. It aims at both inter- and intra-generational stocking effects.

Sea ranching: Stocking for *put-grow-and-take* food fisheries. Sea ranching programs target an intra-generational effect. Sea ranching aims at harvesting all juveniles (as much possible) released in the harvesting areas, which can be managed by the fishers.

Restocking: Restoring depleted spawning biomass to a level of producing regular yields. Restocking activities expect an inter-generational effect.

is a method of fisheries enhancement primarily to increase the production of commercially harvested and especially overfished species. From the business perspective, it is quite similar to fish farming where seedlings are stocked in a pond to allow them to grow and then harvest at a desirable size. Bell *et al.*, 2008 defined sea ranching as “the release of cultured juveniles into unenclosed marine and estuarine environments for harvest at a larger size in 'put, grow, and take' operations.”

Fisheries enhancement methods are centuries old. However, the recent interest in sea ranching stems from three factors: depletion of fish stocks, the commercially important fish stocks, and increasing demand for fish and fishery products, which in turn can be attributed to increasing population, rising per capita fish consumption and possibly greater awareness on fish as healthy food. These push factors were coordinated with improvements in hatchery technology brought about by the aquaculture revolution and a better understanding of ecosystem factors governing the survival of wild fish stocks. In the context of the BOBRC, sea ranching could be seen as a

bridging measure between current unsustainability and future holistic structural adjustment.

Global experience in fisheries enhancement

Sea ranching and other fisheries enhancement projects are largely carried out within the national boundaries. Information on these projects is mostly available through research publications. An earlier global review in 2004 reported that 64 countries, in one way or other, were engaged in some marine stocking activities covering about 180 species. A recent review for the period 2011-17 put the figure to only 20 countries covering 187 species. The study also found that fisheries enhancement is growing in Asia and the Mediterranean. Chum salmon (*Oncorhynchus keta*) is the most important species under CBF (Culture-Based Fisheries) in terms of numbers released and is practiced largely by Japan, Russia, the USA, Canada, and South Korea. Pink salmon (*O. gorbuscha*, Salmonidae) is the second most important and is done largely by the USA, Russia, Japan, and Canada. Sockeye salmon (*O. nerka*, Salmonidae), is the third most important species, released mostly in Canada and the USA. Japan is the topmost

country in terms of species released followed by Taiwan, the USA, and China. However, the global experience from fisheries enhancement projects was mixed. Some of the successful interventions were the stock enhancement of scallops in Japan, and shrimp, scallops, and sea cucumbers in China.

Experience from Japan

The modern-day sea ranching in Japan was initiated by the Fishery Agency in 1963 to improve degraded habitats and thereby enhance coastal fisheries. It currently rears over 80 anadromous and marine species, and of these, over 70 are released for ocean ranching. By far the most important species in terms of volume is salmon, especially chum (*Oncorhynchus keta*) and Ezo scallop (*Patinopecten yessoensis*). In 2017, 74 marine species (excluding salmon) were released in Japan, including 34 fishes, 10 crustaceans, 22 shellfish, and 8 other marine species (e.g., sea urchin, sea cucumber, and octopus). *The essential structure of the Japanese ocean ranching industry comprises (i) the government (federal and municipal) which runs the research, hatching, and release operations, and (ii) the fishing*

species, the catch trend at the species level as reported earlier (SeaAroundUs) indicates that many of these stocks are being over-exploited if not already collapsed.

Therefore, there is a strong incentive for exploring alternative options to enhance the stock status till the structural adjustment towards MSY takes place in the region. Sea ranching could be one optimistic option.

For the member countries of the BOBP-IGO, the scope of stock enhancement can be seen in the case of hilsa (Bangladesh and India), shrimps, and a few fish species in the Gulf of Mannar (India and Sri Lanka). However, these are only examples, as actual sea ranching should be based on ground truthing and technical feasibility.

The moot point here is to develop a regional sea ranching program vis-à-vis a national sea ranching program. When the BOB is considered as a whole, the chance of ranched fishes escaping the fishers of the Bay is very low and thus it may ensure the economic efficiency of the program. At the national level, as the global experience suggests, transboundary escaping could be a major cause of economic inefficiency.

Policy Implications

The emerging concept of fisheries management highlights the need for the co-development of capture and culture fisheries with sufficient investment. Designing an implementation strategy is of foremost importance for sea ranching.

Sea ranching has to be implemented as a part of a conscious national fisheries management policy, in conjunction with appropriate fishing regulations and habitat restoration measures. This will warrant a detailed roadmap, including the establishment of *conservation hatcheries*, which, unlike commercial hatcheries, will also factor in the preferable genetic characteristics of the seeds vis-à-vis those in the wild.

To pilot the sea ranching program and explore the possibility of scaling up, a business plan is required clearly identifying the policies, objectives, species, areas, institutions, partners, appropriate technology, economics, and M&E mechanism.

The BOBP-IGO, in partnership with national and regional research agencies/experts, can aid in preparing a Country-specific Strategy Document to Steer an Evidence-driven Sea Ranching Program, building on the global experiences and best practices, comprising details on criteria for the choice of species and locations; implementation mechanism; M&E indicators; operational aspects for the sustainability of efforts and benefits, etc.

³Bell, J.D., K.M. Leber, H.L. Blankenship, N.R. Loneragan and R. Masuda. 2008. A new era for restocking, stock enhancement and sea ranching of coastal fisheries resources. *Reviews in Fisheries Science* 16: 1-8.

⁴Kitada S (2018) Economic, ecological and genetic impacts of marine stock enhancement and sea ranching: A systematic review. *Fish and Fisheries* 19: 511–532.

⁵Johann D. Bell , Kenneth M. Leber , H. Lee Blankenship , Neil R. Loneragan & Reiji Masuda (2008): A New Era for Restocking, Stock Enhancement and Sea Ranching of Coastal Fisheries Resources, *Reviews in Fisheries Science*, 16:1-3, 1-9

Development of Beach-Landing Craft on the East Coast of India

The Problem

Till 1970s, the beach landing crafts were the major component of marine fish production, however, their range of operation and carrying capacity was limited. Attempts to improve these traditional craft started as early as the '50s and '60s by FAO and other development agencies. While motorization of canoes operating from placid beaches, creeks, and minor fishing harbours started with the availability of low-powered agricultural diesel engines and the successful introduction of wooden shrimp trawlers during the early '60s, the problem of operating from surf-beaten beaches remained. Operating a heavy motorized boat from steep beaches and avoiding structural damage while beach landing was a challenge.

BOBP Intervention

The FAO-Bay of Bengal Programme for the Development of Small-Scale Fisheries, which

started in 1979 considered the development of a beach landing craft (BLCs) overcoming earlier shortcomings as a key issue in its overall agenda.

The BOBP developed several prototypes from IND 10 to IND 25, each successive one addressing the lessons learnt from the previous one. Materials of construction and construction methods ranged from conventional timber to plywood to finally fiberglass reinforced plastic (FRP).

Early trials in the 80s also showed that fishers from different regions preferred designs closer to their traditional craft. For example, the Tamil Nadu fishers using Kattumarams from rough surf beaten beaches indicated their preference for self-draining boats like the IND 11 and IND 21 unlike the Nava fishers of Andhra Pradesh and Orissa who preferred the IND 20. Over the years, the availability and cost of suitable timber became prohibitive. Plywood with FRP sheathing and

FRP became viable. The development push from GOI and coastal states through various schemes made FRP the clear choice for introduction on a large scale.

While the use of light weight diesel engines became the choice for motorization, BOBP continued to believe that the engine installed inboard with a retractable propeller system was the only and safe choice. The fishers, however, felt otherwise and eventually preferred the use of a power-pole or long-tail installation possibly due to strong marketing by engine manufacturers. The power-pole was also far less complicated and definitely cheaper, even though it was susceptible to severe damage in the event of a capsize.

Fishing trials conducted by BOBP over extended periods of time in Andhra Pradesh established the economic feasibility of the IND 20, resulting in a special scheme by Agricultural Refinance Development Corporation (ARDC) to introduce 100 IND 20 BLCs



Ind 13



Ind 23



Ind 20

Sea Trails of BLCs designed by BOBP



IND 20s at APFC Boatyard Kakinada in Andhra Pradesh

built at the APFDC Kakinada Boatyard. In Tamil Nadu, the kattumaram fishers discarded the self-draining IND 21 and later the IND 25 the former being structurally weak and the latter being too heavy compared to the craft they were used to. They eventually adopted an FRP craft which was a hybrid of the IND 20; the Kerala vallam and the self-draining kattumaram.

BOBP Impact

In Andhra Pradesh and Orissa, BOBP's FRP BLCs were the catalyst for a proliferation of village level FRP boatyards building IND 20s; its clones and some local designs based on the Teppa – a smaller version of the kattumaram. In Tamil Nadu, dozens of village boatyards built the BLC hybrid.

The BOBP intervention led to the popularization of FRP in India as the most sought-after material for the construction of fishing vessels in India. If we look at the cumulative impact of the introduction of the FRP, it can be considered as the first green initiative in the country.

The introduction of new range of boats, contributed in making the artisanal and small-scale fishers more competitive by increasing their range and catching efficiency. Today, half the Indian fishing fleet are motorized FRP vessels, showing their economic importance for artisanal and small-scale fishers.

Finally, the need for quality management, a message, communicated by the BOBP-IGO throughout the intervention, is still relevant, as damage to fishing vessels remains a major concern among the fishers.

(S Jayaraj with inputs from R Ravikumar, Naval Architect and former staff of FAO-BOBP)



BLC hybrid in TN

Testimonial

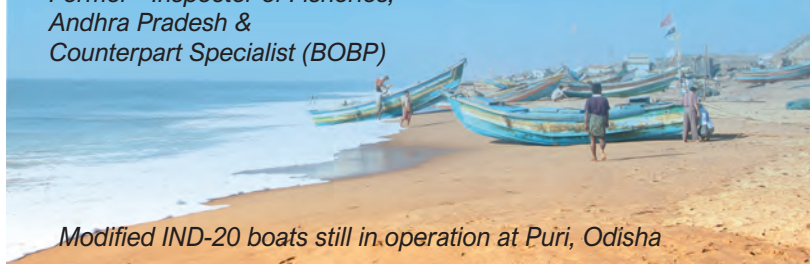
Nearly 80% of the fishermen owned wooden Teppas/ Kattumaram along the East coast of India. High cost and less availability of timber for the construction of boats was a major concern for fishermen in the late 70s. The “Beach Landing Craft (BLC) development project” was launched by BOBP, which led to the development and commercialization of the widely popular IND-20 model in Andhra Pradesh and Orissa.

BOBP's intervention and contribution to the development of the Beach landing craft can be seen even now. Fishermen in Puri, Odisha are still using the Design of IND-20 for the construction of FRP boats. Further, FRP Navas which is currently being used in Andhra Pradesh is the modified design of IND-20. Fishermen modified the IND-20 by increasing its length and breadth of their convenience. Fishermen also changed BOB Drive (Engine) and started using high power inboard and outboard engines.

Involvement of BOBP in popularizing the FRP as a boat building material, helped the fishermen to improve their income and livelihood.

S B Sharma

Former - Inspector of Fisheries,
Andhra Pradesh &
Counterpart Specialist (BOBP)



Modified IND-20 boats still in operation at Puri, Odisha



Upcoming Activities

HD-BOBP Dialogue on the Development of a Regional Marine Fisheries Research Network for the Bay of Bengal Region (14 February 2023)

BOBP-IGO is set to organize the Dialogue jointly with Centre for Humanitarian Dialogue (HD) to develop roadmap for promoting greater regional cooperation on marine fisheries research in the Bay of Bengal Region (BOBR). Representatives from the Bay of Bengal rim countries will be participating.

National Consultation on Valuation Methodology for Ecosystem Services (March, 2023)

The consultation will be organized in collaboration with National Centre for Coastal Research (NCCR), Ministry of Earth Sciences, Government of India to develop a methodological framework for the valuation of ecosystem services by involving subject matter experts from the region.

International Symposium and Industry Expo on Innovations in Fishing Technologies for Sustainable and Resilient Fisheries (13 to 17 February 2023)

The 23rd Meeting of the International Council for the Exploration of the Sea (ICES)-FAO Joint Working Group on Fishing Technology and Fish Behaviour (ICES-FAO WGFTFB23) and International Symposium on Innovations in Fishing Technologies for Sustainable and Resilient Fisheries will be organized in Kochi, Kerala, India jointly with NFDB. The event aims to provide a platform for sharing knowledge from global experience on eco-friendly, low-carbon fishing technology that can contribute to sustaining fisheries resources. An Industry Expo to showcase the latest advances in fishing gear and technology will also be organized at the side-lines.

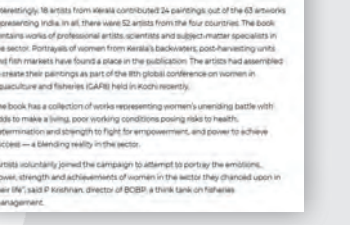
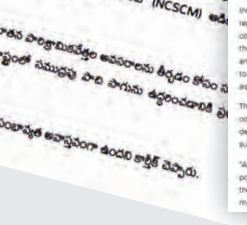
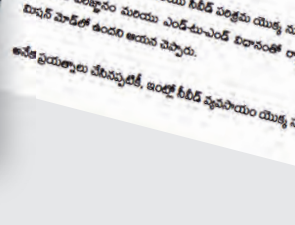
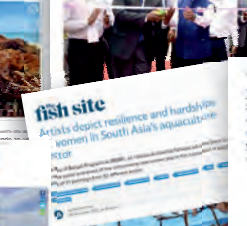
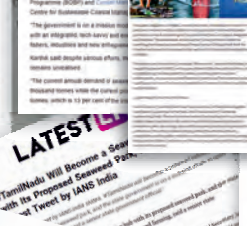
Workshop on Future Proofing and Greening the Small Scale Fisheries (16 February 2023)

The broad objectives of the side event that will be held in the sidelines of the International Symposium are to identify existing socio-economic and environmental challenges for the development of sustainable SSF and developing strategies towards the application of innovative technologies for securing sustainable SSF sector and mitigating climate change.

BOBP-IGO in the Media



'Seaweed the next big thing in agriculture'



Visitors



Dr. Maarten Bavinck
Retd. Professor, University of Amsterdam



Dr. J. R. Bhatt
Advisor, Ministry of Environment, Govt. of India



Mr. Mohanasundaram, Ex-Director, MPEDA and Dr. Ramachandra Bhatta, Former Emeritus Scientist (ICAR)



Dr. Ravichandran, IFS
Director, Indian Institute of Forest Management (IIFM), Bhopal



Dr. P. Paul Pandian
Former FDC, GOI



Dr. M. Samayakannan
Project Manager, RGCA



Bay of Bengal Programme
Inter-Governmental Organisation

