Indian Climate Leadership

Harnessing the Blue Economy

Blue Economy, Shipping and Fisheries Pre-Read

1.Fisher-people first approach

India is the 3rd largest fish producing country in the world, accounting for 8 percent of global production. India's fish produce accounts for 1.1 percent of its GVA and 6.72 percent of its agricultural GVA[1] . Through such fish production, India addresses a significant global and domestic demand for an affordable quality source for fish protein. Further, India's domestic demand for fish produce is likely to grow in the coming years - with a rise in population levels (India's population is projected to grow to 1.66 billion by 2050[2]), and as more people diversify diets away from cereals to proteins and fats. More than 28 million people are employed in India's fisheries sector - which has been recognised as a 'sunrise sector' due to its rapid growth in recent years[3]. The sector is an important area for income generation and nutrition security - particularly for vulnerable and marginalised communities in different parts of India and has contributed to their socio-economic development. Fisherfolk in the rural areas are largely engaged in producing and catching fish, while those in urban and semi-urban areas are mostly engaged in the supply chain and subsidiary industries[4].

At this roundtable conference, we will be employing a '*fisher-people first approach*' - this means that while we will be placing the lives and livelihoods of India's fisherfolk at the centre of our discussion. We will be delving deeper into India's blue economy, shipping, and fisheries sectors - which we will view as pathways to improve the socio-economic conditions of all fishing communities in India, while enhancing India's GDP and leadership opportunities in global trade, and protecting the environment. Given our 'fisher-people first approach', our focus will be on building solutions to primarily address the vulnerability experienced by fisherfolk on account of various economic, environmental, and technological challenges, while identifying macro-level (and perhaps overlooked) opportunities for improving India's growth potential and resolving demand-supply mismatches in these sectors.

2. Valuing the overlooked

Given the complex and dynamic landscape of the blue economy in India, there is value in exploring innovative approaches to enhance the sustainability of natural fish stocks, while optimising existing marine reserves and realising synergies with other sectors. There is a growing need for multidimensional approaches, spanning financial, technological, and partnership focussed solutions.

Further, natural asset pricing has growing relevance, wherein monetary values are attached to various environmental services - such as marine reserves, open oceans, or natural water bodies. Pricing natural assets or services is a crucial way to regulate, provision and apportion the services and resources provided by nature, while limiting instances of harmful exploitation[5]. In the context of India's blue economy, natural asset pricing can create awareness on the economic value of natural resources - imputed from the value of products/services (in the form of fish and subsidiary industry goods), thereby making a strong case for the protection of such natural marine reserves and for the sustainability of the overall sector. So far, natural asset pricing is an untapped avenue, with the potential to enhance the sustainability of India's blue economy - by attaching value to natural resources that are presently perceived as 'free' and 'available for common use'.

1. Invest India, Government of India. 2023. www.investindia.gov.in/sector/fisheries-aquaculture
2. Department of Economic and Social Affairs, United Nations. 2022. www.population.un.org/wpp/Graphs/Probabilistic/POP/TOT/356
3. Press Information Bureau, Government of India. 2021. www.pib.gov.in/PressReleasePage.aspx?PRID=1786303
4. Federation of Indian Chamber of Commerce and Industries. 2022. www.pwc.in/assets/pdfs/grid/agriculture/championing-the-blue-economy-promoting-sustainable-growth-of-the-fisheries-sector-in-india.pdf
5. CFA Institute. 2021. www.blogs.cfainstitute.org/investor/2021/02/10/the-price-of-nature/

The specific case of mangroves is significant in the context of India's blue economy. Globally, mangroves sequester 22.86 metric gigatons of CO_2, which is about half of the annual CO_2 emissions from the burning of fossil fuels, land-use change and industrial processes[6]. They act as a buffer against ocean acidification and are a sink for micro-plastics - in addition to harbouring a diverse ecosystem of fish species which are vital for India's blue economy. In fact, mangrove systems are noted to provide flood protection benefits worth $7.8 billion (for property), while safeguarding an estimated 2.87 million people from floods[7]. However, mangrove systems in India face growing threats due to rising sea levels, growing pollution, and extreme weather events[8]. Against this backdrop, it is vital that the valuation of natural assets like mangroves also involve their economic assessment and evaluation, so as to adequately recognise the economic benefits (in terms of their impetus to India's fisheries) which are linked to their environmental benefits (including flood protection, soil and coastal protection, climate resilience and biodiversity protection). Such assessments will also help to better recognise the role of the communities who live in/around mangrove systems, and to empower them to protect their neighbourhoods. In the context of mangrove conservation, there is also an opportunity to involve corporate institutions in mangrove conservation - as part of their Corporate Social Responsibility (CSR). This offers an opportunity for the private sector to play a more leading role in conservation efforts, while feeding into the blue economy and maximising its outputs in a more balanced and equitable manner.

What are some of the other untapped avenues through which India's blue economy can be made more sustainable? Are there certain overlooked areas that hold the potential to transform India's fisheries sector in the future? What kind of financing or technological options can we explore?

3. Supply Side Crisis

India has a rich and diverse set of water resources implying diverse fisheries resources. 10 percent of the global biodiversity in terms of fish and shellfish species found in India[9]. Despite being a rapidly growing sector, the fisheries sector in India faces a range of challenges.

For one, India has the largest unmanaged fisheries sector in the world - characterised by open access. This means that anyone can fish in India's water resources, and there are no mechanisms to manage fleet sizes. The majority of marine fisherfolk in India are small-scale fishermen, artisanal fishers, or aquaculture labourers. Most Indian fisherfolk operate non-mechanised boats and modern mechanised boats with GPS/satellite tracking are yet to gain momentum[10]. Most non-mechanised boats used can only travel up to 5 kilometres across natural waters and common property resources. Given that the bulk of fisher folk operate in that range, there has been considerable depletion of natural fish reserves, In fact, 95 percent of India's marine eco-systems have been mapped and exploited - and there are no new sites within India's territorial waters[11]. This in turn increases risks for small-scale fishers, who must now go deeper into the sea and for longer periods of time to catch fish. Increased water stresses also exacerbate supply side challenges in aquaculture: recirculating aquaculture systems require 100 litres of water to produce 1 kilogram of freshwater shrimp - which places immense pressures on freshwater resources in the long run, while affecting the water quality[12].

6. Global Mangrove Alliance. 2022. www.mangrovealliance.org/wp-content/uploads/2022/09/The-State-of-the-Worlds-Mangroves-Report_2022.pdf
7. Nature. 2020. www.nature.com/articles/s41598-020-61136-6
8. National Maritime Organisation. 2020. https://tinyurl.com/ystvr6um
9. Invest India. 2023. www.investindia.gov.in/sector/fisheries-aquaculture
10. Federation of Indian Chamber of Commerce and Industries. 2022. https://tinyurl.com/2xdtt4f3
11. Small-Scale Fisheries Resource and Collaboration Hub. 2023. https://ssfhub.org/
12. Federation of Indian Chamber of Commerce and Industries. 2022. https://tinyurl.com/3e4axbt5

Other elements of the supply side crisis are caused by the environmental destruction due to poor fishing and catching practices. For one, smaller fisherfolk often use mesh nets which degrade the biosphere surrounding the fish, which in turn causes loss of marine life and rapid reductions in overall fish supply. Further, there is ample evidence of traditional knowledge systems being ignored, and there is increasing homogenization of practices towards bulk fishing and trawling[13]. Bottom trawling by large trawlers is a widely harmful fishing practice that has been noted to destroy natural fish habitats. Large trawlers employ widespread nets that sweep the ocean floor, thereby trapping several non-target organisms in addition to young fish. This in turn harms the breeding cycles, while critically affecting fragile marine eco-systems and levels of fish supply[14]. In essence, '*bigger versus smaller fisher folk*' remains a contentious issue - particularly in the context of the increasing marginalisation of small fisherfolk, the privatisation of common property rights and marine protected areas (MPAs), and the exclusion of local communities from the management of coastal ecosystems.

In addition, there are challenges associated with pollution and waste disposal. Factors like overfishing and marine litter are associated with environmental pollution and degradation, which further lower fish stocks. Notably, there is a growing trend of waste fish being directed towards the feed sector. Such practices, coupled with inadequate extension services and improper pond management systems, are associated with the rising instances of pests/diseases across fisheries, and within the fish produce offered to domestic and international markets. In fact, according to estimates, 25 percent of the cultivated aqua produce are lost to diseases[15].

Against this backdrop of a growing supply side crisis, it is important to think of solutions that build resilient fisheries eco-systems and prosperous communities. *What kind of financial support solutions will help support the building of resilient fisherfolk communities? How can technology solutions be used to translate science to onshore action? In what ways can the provision of timely information and advisory knowledge help build prosperous fishing communities? How can the challenges of the environment and the needs of the fisherfolk be balanced better through policy innovation and support?*

4. Demand Side Interventions

India's fisheries sector has immense potential to double its exports - however, it is important that financial and policy support is provided to help this sector grow in a responsible, equitable and sustainable manner. This in turn will help improve the income levels and socio-economic conditions of millions of fishing families, many of whom presently operate in economically backward areas in the country[16]. Given the supply side challenges noted in the previous section, it is important to look at opportunities to intervene on the demand side.

It is important to note that the demand for fish and fish-based products are often location specific and seasonal across the country. Looking at internal demand patterns - with increasing urbanisation and fast-paced lifestyles, there is a preference for easy-to-prepare healthy meals comprising fish protein. Furthermore, with rising income levels, there is growing purchasing power and affordability of high-value species like shrimp, pomfrets, and crabs - in addition to common species like '*catla*' and '*rohu*'[17]. Looking at external demand - frozen shrimps and prawns are the most commonly exported aqua products, with destination markets located in the United States, China, and the European Union[18].

13. Small-Scale Fisheries Resource and Collaboration Hub. 2023. https://ssfhub.org/
14. India Water Portal. 2017. www.indiawaterportal.org/articles/palk-bay-trawled-and-damaged
15. Federation of Indian Chamber of Commerce and Industries. 2022. https://tinyurl.com/3e4axbt5
16. Press Information Bureau, Government of India. 2021. https://www.pib.gov.in/PressReleasePage.aspx?PRID=1786303
17. Federation of Indian Chamber of Commerce and Industries. 2022. https://tinyurl.com/3e4axbt5
18. Federation of Indian Chamber of Commerce and Industries. 2022. https://tinyurl.com/3e4axbt5

Against this backdrop, it is important to understand how Indian markets can better incentivise sustainable fish production - particularly by promoting traceability, encouraging better data on supply chains, and giving greater impetus to standards and certifications. It is also worth exploring the potential for formalising the presently informal Indian fish market, by creating an umbrella enterprise for fisheries across the country. This will help optimise fish production - by strengthening domestic supply chains and enhancing domestic demand for high-quality and affordable fish protein. Further, with India emerging as a '*fish surplus*' country and with fish export volumes rising steadily in the last 15 years, there is a growing need to have more Indian fisheries certified under global certifications/standards such as the Marine Stewardship Council (MSC). Being globally certified will help Indian fisherfolk access global markets on an equal footing, aid in their price discovery activities, afford them legitimacy, and enable them to access higher incomes.

What are the key demand-side interventions that would help resolve supply side issues? How can policy or financial support on the demand-side strengthen India's blue economy? What forms of demand-side interventions can best improve the lives and livelihoods of ordinary fisherfolk in India? Does India's blue economy presently offer a space for domestic and global consumers - in terms of addressing their priorities and fulfilling their demands adequately?

5. Infrastructure Interventions

To foster India's blue economy, it is vital to continue investing in infrastructural interventions. Infrastructural interventions can be multifaceted – ranging from faster production techniques to efficient end-to-end supply chain methods. For one, outward-facing infrastructure interventions are required at the port level, especially in enhancing transshipment efficiency to boost sustainability. In particular, there is an opportunity to create a 'green shipping corridor' linking the US West Coast, Latin America, US East Coast, Europe, UAE, India, Singapore/Hong King, China, Japan, and Australia. Given that the bulk of India's fish export destinations are in the US, China, and the European Union, such a corridor would help to transport larger quantities of aqua products to existing markets, while exploring newer markets and benefitting from savings in time and resources.

In addition, inward-facing infrastructure interventions should look at exploring the fish production potential of inland waterways. The opening of inland waterways should be accompanied by impact assessments that forecast or measure the socio-economic and environmental consequences of utilising inland water resources[19]. Presently, the bulk of India's fish production comes from inland water resources – and future policy should look to enhance the productivity of these natural assets, by developing cold chain facilities and retail markets in nearby areas. Further, the bulk of India's fish landings (both marine and inland) happens near the beach/shore. Infrastructural interventions should focus on enhancing the connectivity of these landing sites with cold storage facilities and processing centres, which are further in-land. Such infrastructural interventions can range from enhancing transportation facilities (including investing in insulated boxes, rotomoulded ice boxes, small cold storage units and freezer vehicles trucks/freight trains) and developing specific routes for the transport of fresh fish produce. This will help reduce post-harvest losses while ensuring the quality of the aqua produce.

19. Invest India, Government of India. 2023. www.investindia.gov.in/sector/fisheries-aquaculture

Further, it is crucial to recognise that fish trading in India still follows traditional patterns, with a significant proportion of ordinary fisherfolk lacking access to adequate bargaining power and price discovery mechanisms. Fisher-people often lack access to markets and extension services, and realise non-remunerative prices for their produce, thereby contributing to a downward income spiral[20]. Against this context, there is a growing need to promote the collectivisation of fisherfolk, to consolidate their negotiating power and to offer greater price stability and income security to their fish production activities. The growth of fish-farming cooperatives would be an important step in this direction and would help to make the fish production playing field more equitable in favour of the smaller fish farmers.

What are some of the infrastructural interventions which should be prioritised to promote India's blue economy? What are the strategic infrastructural shifts required to eliminate existing gaps and inefficiencies in aquaculture and related activities? What are the ways through infrastructural interventions can help achieve economies of scale? Can synergies be achieved through infrastructural partnerships with other nations?

6. Indian Leadership Opportunities

India's blue economy represents burgeoning socio-economic growth potential. Globally, India ranks first in inland capture fish production and second in aquaculture fish production – and is clearly a global leader in the fisheries and blue economy space. At this juncture, it is vital to discuss the specific areas wherein India could show leadership - such as by developing niche expertise in managing in-land fisheries, or in exporting certain varieties of fish under a national label/brand. It is also important to recognise that fish production must happen in tandem with environmental preservation – and to therefore explore if greener fuels (such as fuels derived from hydrogen) could help in making fishery operations more energy-efficient and less polluting.

From a financial perspective, it is crucial to explore the potential for better risk assessment and forecasting models, to predict future prices, operational costs, and demand trends in fish produce. Disseminating such information to ordinary fisherfolk is key for last-mile delivery of information - in line with our 'fisher-people first approach'. Moreover, from a policy implementation perspective, it is important to discuss whether India can develop a unique small-fisher approach that works and can be a lighthouse for other countries. Finally, from a research perspective, it is important to leverage India's research capabilities in this sector in the country's immediate neighbourhood - across South and Southeast Asia. It is also worth exploring the potential of establishing a global fisheries institute in India - to foster R&D, and to lead the way in future technological innovation and research efforts.

Where can India showcase leadership? What kind of technologies could it lead in building in this space? What kinds of financial forecasting and economic analytical models can help advance India's leadership in the global blue economy scape? Can India be a scientific thought leader for the region, providing necessary technical support to other countries, in the areas related to fisheries and the blue economy? How can India take up leadership positions in global aqua products trade, while adopting a 'fisher-people first approach'?

20. Federation of Indian Chamber of Commerce and Industries. 2022. https://tinyurl.com/3e4axbt5

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