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On Marine Environment Protection

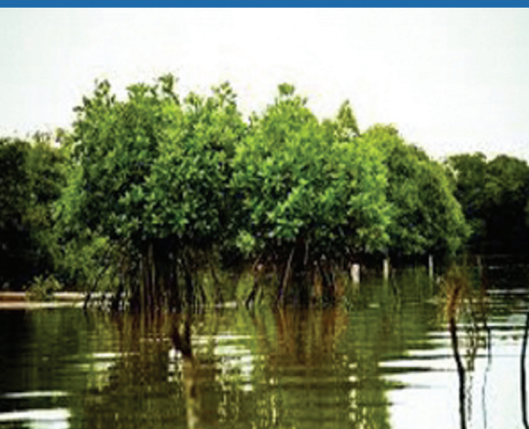
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Marine Fishers : Experiences and Expectations

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India is the second largest producer of fish in the world, contributing to 5.68% of global fish production. India accounts for 2.5% of the global fish market and the fisheries sector is a source of livelihood for over 1.44 crore people. During the 11th five year plan, the fisheries sector contributed 1.1% to the GDP. Contribution to agricultural GDP in the year 2014-15 was 5.3%. Total production during 2013-14 is at 9.58 Million Metric Tonnes (MMT), (Marine- 3.44 MMT and Inland- 6.14 MMT). Overall growth in fish production in 2013-14 was 5.9% (Marine- 3.7% and Inland- 7.3%). Fisheries is one of the major forex earners with revenue reaching Rs.18,856 crore in 2012-13, accounting for about 18% of agricultural exports. During 2013-14 the volume of fish and fish products exported was 9.8 lakh tones, worth Rs.30213.26 crores. The sector began

playing a vital role in the Indian economy through its consistent contributions to the GDP, besides becoming a vital source of livelihood for about four million people including 1.6 million active fishermen. Indian marine fisheries research sector is catering to the needs of a variety of stakeholders. These stakeholders include fishermen; mariculture farmers; seafood exporters, wholesalers, retailers and vendors in domestic marketing; self-help groups; developmental department for fisheries in 9 maritime states and 4 UT's; Department of Animal Husbandry Dairying and Fisheries; financial institutions; researchers and academicians; policy planners; conservationists and all associated fraternities contributing to the better cause of marine fisheries in the country. The Central Marine Fisheries Research Institute (CMFRI) established in 1947 has been foraying into the research and development activities in marine fisheries sector supporting all these stakeholders in different capacities directly or indirectly. This article is looking into our past experiences, futuristic plans and research support provided to these stakeholders.

Over a period of time, the marine fisheries sector of the country changed tremendously. The fishing fleet became larger and more energy-intensive, and the catch and trade of marine fishes increased substantially. However, conflicts in sharing the limited resources intensified within and with other sectors and this, in turn, had high economic, social and environmental costs. In 'business-as-usual' scenario, fish catches in the tropics are expected to decline, and since most of the seafood comes from wild capture, such a situation will be detrimental to our food security. We have to change this situation by reducing our dependence on wild capture and instead, promote mariculture.

Mariculture, the farming and husbandry of marine plants and animals in the marine environment, is the fastest growing subsector of aquaculture. Over a period of time, the proportion of production from coastal and marine aquaculture should be aimed at 40% and in terms of value, at 70%. Any planned sectoral development needs appropriate policies, legislations

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and acts. As the existing policies are inadequate to meet the anticipated challenges in the sector, it is important to develop effective new policies. In the case of mariculture, as it is an emerging sector, there is need for developing leasing policies and other regulations.

However, the current operating environment in marine fisheries is focused on short-term profits and livelihood instead of long-term sustainability and profitability. This 'business' environment is harmful to the oceans, fishermen, traders, consumers, and the coastal communities. Fishermen need predictable and stable access to fisheries and a flexible management regime that allows them to improve their financial security while safeguarding the invaluable marine ecosystems. India being very rich in marine biodiversity, there are opportunities for providing monetary benefits to the coastal communities through benefit sharing from biodiversity conservation. The profit should motivate the community to conserve biodiversity. A consortium of biodiversity conservationists, biotechnologists and communities will change the operating environment of the sector from solely fishery dependent activities to "earning from biodiversity conservation".



Fig 18. Open Sea cage fish farming

On the down side, increasing marginalization or even complete disappearance of traditional fishing communities and small-scale fishermen is likely. The

changes in species composition, distribution and abundance of fish stocks due to climate change impacts are likely to alter the fishing types, costs and benefits. As these changes will be beneficial to larger boats with greater mobility, small-scale fishermen may find fishing unviable. With the anticipated addition of Marine Protected Areas, marine sanctuaries and no-fishing zones, a large number of fishing communities are likely to be displaced. As a result, we are likely to see an outflow of skilled human labour (fishing communities) seeking a non-risky and sustainable livelihood option and inflow of un-skilled migrant labourers from non-coastal States into marine fisheries. Increased mechanization and correspondingly increased dependence on fossil fuels will occur. Thus the operating environment in the capture fisheries sector would see an increasing cost of fishing coupled with scarcity of skilled manpower. Consequently, the government agencies will have to either increase financial flow or attract funds in to the sector to meet the requirements (labour, capital and infrastructure) of the transformed industrialized marine fishing sector.

Along with all the changes in the capture fisheries sector, a progressive shift towards fish farming is also anticipated to change the operating environment. Development of an entirely new set of technological interventions and infrastructure such as state-of-the-art hatcheries, feed mills and ancillary facilities will be seen with changes in the entrepreneurship, trade and societal responses. All the changes envisaged in the operating environment will result in a broader scale of operation with change in the composition of stakeholders. The anticipated open trade of fish and fish products will add another dimension to the sector which warrants an increase in India's competitiveness and bargaining power in international trade.

Until the time seed production techniques are standardized, Capture-based Aquaculture (CBA) or the practice of collecting seed material from the wild is an option to address seed scarcity for mariculture. Large-

scale collection and conditioning of wild collected seed and establishment of seed banks are urgently required. This will facilitate the farmers and entrepreneurs to get the required seed. On a global level, marine ornamental fish trade has emerged as a multi-million dollar enterprise. Establishment of small-scale ornamental fish hatcheries can lead to income generation for rural communities.

An overhaul of the domestic fish marketing system is envisaged for better returns to the fishermen and continued economic viability of the sector. A Sophisticated Market intelligence and Information System using a combination of real time data and ICT needs to be established. A domestic fish marketing grid will help the fishers to receive the maximum share of consumer's rupee. The advanced market intelligence system ensured by the fish marketing grid will pave the way for profitable vertical and horizontal market integration.

The fisher's households do not get a sustained income throughout the year due to various factors such as closed seasons, natural calamities such as cyclones and other related factors, which affect their livelihood seriously. Hence, a supporting income through any alternate livelihood options (ALO's) is very much essential. Mariculture or sea cage farming including sea weed farming, repairing of crafts and gears are a few areas of ALO's which have proved successful. The ALO's will be successful only when it is linked with sustained market potential. Biodiversity conservation and the benefits arising out of that such as mariculture of non-conventional species (sponges, holothurians, gastropods etc.) could be developed as an alternate livelihood option for affected coastal communities. Bio prospecting from the marine ecosystems on a public-private partnership with active involvement of local communities is also another viable option. Developing successful rehabilitation models for launching any capital intensive labour displacement (alternate livelihood) is also essential.

Research institutions, governments and non-governmental organizations looking for achieving the vision of *Seafood for all and forever* should consider a suite of appropriate approaches that will rebuild fisheries and ecosystems that can create incentives for stakeholders and lead to environmentally and economically sustainable fisheries and mariculture. To support and meet the goals, a strategic plan for each approach listed in 'Way Forward' is needed. The framework for the strategy of preparation and implementation of plans should be characterized by participation of a large number of national research and development organizations, consultations with regional and global organizations, and stakeholders such as fishermen associations, traders, processors, environmentalists, conservationists etc.

Collaboration with survey agencies for information and infrastructure support, fishing industry for skilled human resource for exploration and harnessing of offshore resources is important. For integration of remote sensing in fisheries and spatial management, collaboration with the space research agencies, oceanographic laboratories and numerical modelling groups are needed. To operationalize the domestic fish marketing grid collaboration with regional fisheries research, education and developmental organizations are necessary. Policy formulation and implementation support from government agencies are essential to meet the goals.

Resource management can succeed only with the involvement and participation of all the stakeholders in the sector as well those from relevant non-fishery sectors. This involves developing vital links with all stakeholders. The contribution of fisheries to nutritional security, economic growth and livelihoods is often ignored. The priority is in convincing governments that the sector has an important role to play in the national development process by contributing to growth process in a substantive manner; and include fisheries and aquaculture in national development agenda.