



Indian Fisheries : A Progressive Outlook



Editors
K.K. Vijayan, P. Jayasankar and
P. Vijayagopal



National Fisheries Development Board and Fisheries Policy

S. Ayyappan and A.D. Diwan

Indian Council of Agricultural Research (ICAR)

New Delhi - 110 012

ayyapans@yahoo.co.uk

1. Introduction

Indian fisheries and aquaculture are important sectors of food production, providing nutritional security to the food basket, contributing to the agricultural exports and engaging about fourteen million people in different activities. With diverse resources ranging from deep seas to lakes in the mountains and more than 10% of the global biodiversity in terms of fish and shellfish species, the country has shown continuous and sustained increments in fish production since independence. Constituting about 4.4% of the global fish production, the sector contributes to 1.07% of the GDP and 4.7% of the agricultural GDP. The total fish production of 6.4 million metric tonnes presently has nearly 55% contribution from the inland sector and nearly the same from culture fisheries. Paradigm shifts in terms of increasing contributions from inland sector and further from aquaculture are significant over the years. With high growth rates, the different facets of marine fisheries, coastal aquaculture, mariculture inland fisheries, freshwater aquaculture and coldwater fisheries are increasingly being diversified, contributing to food, health, economy, exports, employment and tourism of the country.

Indian Fisheries - Current Scenario

Global position	3 rd in Fisheries 2 nd in Aquaculture
Contribution of Fisheries to GDP(%)	1.07
Contribution of Fisheries to Agril. GDP (%)	4.69

Per capita fish availability (Kg.)	9.0
Annual export earnings (Rs. in crore)	7,200
Employment in sector (million)	14.0

The country has 429 Fish Farmers Development Agencies (FFDAs) and 39 Brackishwater Fish Farmers Development Agencies (BFDAs) for promoting freshwater and coastal aquaculture. The annual carp seed production is to the tune of 20 billion and that of shrimp about 8 billion, with increasing diversification in the recent past. Along with food fish culture, ornamental fish culture and high value fish farming are gaining importance in the recent past. With over 2.4 lakh fishing crafts operating in the coast, six major fishing harbours, 40 minor fishing harbours and 151 fish landing centres are functioning to cater to the needs of over 3.5 million fisherfolk.

Resources

Coastline	8128 kms
Exclusive Economic Zone	2.02 million sq. km
Continental Shelf	0.506 million sq. km
Rivers and Canals	1,97,024 km
Reservoirs	3.15 million ha
Ponds and Tanks	2.35 million ha
Oxbow lakes and derelict waters	1.3 million ha
Brackishwaters	1.24 million ha
Estuaries	0.29 million ha

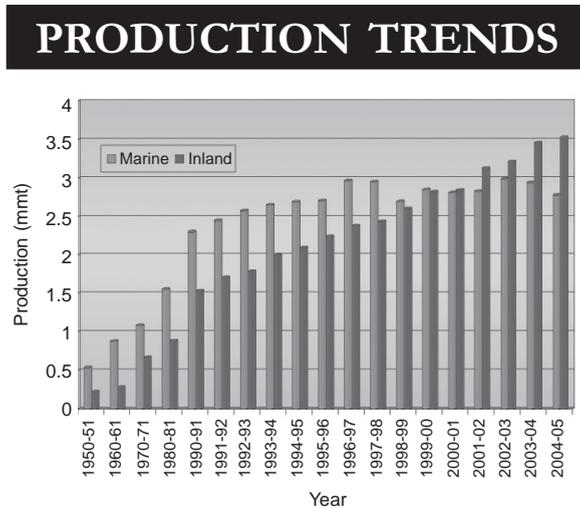
Fish Facts

Present fish production	6.4 mmt
Inland	3.4 mmt
Marine	3.0 mmt
Potential fish production	8.4 mmt
Fish seed production	21,000 million fry
Hatcheries	1,070
FFDAs	429
BFDAs	39

Fish and fish products have presently emerged as the largest group in agricultural exports of India, with 5.2 lakh tonnes in terms of quantity and Rs. 7,200 crores in value. This accounts for around 3% of the total exports of the country and nearly 20% of the agricultural exports. More than 50 different types of fish and shellfish products are exported to 75 countries around the world.

2. Towards Blue Revolution

There is a large untapped potential in fisheries and aquaculture, which can contribute considerably to improve the livelihoods as also women empowerment. The future development of aquaculture depends on adoption of new and innovative production technologies, management and utilization of less utilized water resources and proper market tie-ups. Reservoir fisheries offer a major opportunity to enhance fish production in the country. In the marine sector, while the coastal fisheries have been fully



exploited, deep-sea fisheries resources are yet to be harnessed. Diversification and high value produce could add new dimensions to the sector. Proper post harvest handling, reduction of losses and hygienic primary processing are important to realize the full potentials of the

sector. Simultaneously, effective marketing arrangements are to be made to ensure adequate returns to the fishers and the farmers, and also to make available good quality fish at affordable prices to the consumers. With these in view, an end-to-end approach from ensuring proper input availability to efficient marketing is contemplated, for a 'win-win' situation for both the fish producer and the consumer. Set in this background, the National Fisheries Development Board (NFDB) would seek to realize the full potentials of Indian fisheries through coordination of different agencies and public-private partnerships.

3. Objectives

- To bring major activities relating to fisheries and aquaculture for focused attention and professional management
- To coordinate activities pertaining to fisheries undertaken by different Ministries/ Departments in the Central Government and also coordinate with the State/ Union Territory Governments
- To improve production, processing, storage, transport and marketing of the products of capture and culture fisheries
- To achieve sustainable management and conservation of natural aquatic resources including the fish stocks
- To apply modern tools of research and development including biotechnology for optimizing production and productivity from fisheries
- To provide modern infrastructure mechanisms for fisheries and ensure their effective management and optimum utilization
- To generate substantial employment
- To train and empower women in the fisheries sector
- To enhance the contribution of fish towards food and nutritional security

To meet the above objectives, the various activities including the targets and also tentative budget allocation envisaged under NFDB are mentioned below:

4. Activities

4.1 Intensive Aquaculture in Ponds and Tanks

Target of pond fish productivity of 5 tonnes/ha/year in 8 lakh hectares, with 50,000 hectares new area.

- Carp polyculture
- Freshwater prawn farming
- Integrated fish farming
- Running water fish culture
- Hatcheries
- Aqua-shops

- Soil-Water testing and disease diagnostic laboratories
- Feed production units
- Demonstration centres
- Farmers' training
- Capacity building in State Fisheries Departments
- Publications and learning material
- Funds for Technology upgradation

4.1.1 Anticipated benefits: Additional annual fish production of 26.5 lakh tonnes and employment for 18 lakhs people.

4.2 Reservoir Fisheries

Target of reservoir fish productivity of 150 kg/ha/year in 15 lakh hectares.

- Fish seed rearing units
- Reservoir stocking with fish fingerlings
- Cage culture
- Pen culture
- Fishing craft and gear
- Training and Demonstration
- Funds for Technology upgradation

4.2.1 Anticipated benefits: Additional annual fish production of 2.25 lakh tonnes and employment for 7.5 lakhs people.

4.3 Deep Sea Fishing and Tuna Processing

Facilitating Tuna fishing and value addition

- Value addition and processing of tuna
- Training and Demonstration
- Funds for Technology upgradation

4.3.1 Anticipated benefits: Additional annual fish production of 2 lakh tonnes; optimal utilization of tuna resources and enhanced exports.

4.4 Mariculture

Facilitating mariculture for supplementing marine fisheries

- Diversified finfish/shellfish seed production
- Farming of mussels and oysters
- Cage culture in open seas and coastal waters
- Training and Demonstration
- Funds for Technology upgradation

4.4.1 Anticipated benefits: Additional annual fish production of 5 lakh tonnes and production of high value sea food.

4.5 Sea Ranching

Stocking of seed of selected fin fish/shell fish species as a conservation activity

- Breeding centres and Hatcheries
- Training and Demonstration

4.5.1 Anticipated benefits: Sustained marine fish production

4.6 Seaweed Cultivation

Diversified activity in mariculture for utilizing the coastal areas

- Cultivation of commercially important seaweeds
- Post-harvest drying and processing
- Training and Demonstration

4.6.1 Anticipated benefits: Diversified marine products and activity for fishers; Export potentials; Employment for coastal population

4.7 Infrastructure for Post-harvest Processing

Improvement of fish landing and handling facilities

- Better facilities at fishing harbours
- Hygienic landing centres
- Facilities for SPF Shrimp seed
- Funds for Technology upgradation

4.7.1 Anticipated benefits: Better fish handling facilities and access to quality shrimp seed

4.8 Fish Dressing Centres and Solar Drying of Fish

Model fish dressing centres and solar drying units

- Setting up of model fish dressing centres in coastal States
- Setting up of solar fish drying units and sun drying platforms
- Training of fisherwomen
- Demonstration units
- Funds for technology upgradation

4.8.1 Anticipated benefits: Hygienic handling of fish; better dry fish for domestic consumption as well as export; Reduction in post-harvest losses

4.9 Domestic marketing

Upgradation of wholesale fish markets and establishment of quality retail outlets

- Modernisation of wholesale fish markets
- Cold chains of varying levels
- Hygienic retail outlets
- Funds for design of outlets and Technology upgradation

4.9.1 Anticipated benefits: Hygienic marketing of fish; better quality fish to the consumers; stability in prices; reduction of post-harvest losses

5. Other Activities

Innovative areas in fisheries and aquaculture

- Artificial Reefs/Fish Aggregating Devices in the seas
- Pearl culture
- Sport fisheries
- Aqua-tourism
- Establishment of Aqua-Tech Parks

5.1 Anticipated benefits: Innovative fisheries and aquaculture models.

6. Fisheries Policies

For sustainable management of fisheries both in inland and marine sector and also to accelerate fish production and productivity in a responsible manner the Government of India has introduced a number of fishing policies recently *viz.*, Comprehensive Marine Fishing Policy 2004, Coastal Aquaculture Authority -Act, Rules, Guidelines and Notifications 2006 and Biological Diversity Act 2002. Besides, Government of India is also planning to introduce Model Bill for Inland Fisheries and Aquaculture Sector. Code of Conduct for Responsible Fisheries is also being introduced at the state level so as to carry out management aspects in the fisheries in a responsible manner.

6.1 Marine Fishing Policy 2004

The marine fishing policy announced by the Govt. of India in the past focused only on the developmental needs of the deep-sea sector, leaving aside similar issues pertaining to the coastal sector to the respective marine states / UT's. Even though substantial assistance was channelised through Central and Centrally Sponsored Schemes to the States / UT's for the development of coastal fisheries, non-existence of an integrated policy for this sector was found to hamper fulfillment of the national objectives. Therefore, in the present policy the Government seeks to bring the traditional and coastal fishermen also to the focus together with stakeholders in the deep-sea sector so as to achieve harmonized development of marine fishery both in the territorial and extra territorial waters of our country. The theme of comprehensive marine fishing policy is enshrined in the National Agriculture Policy promulgated by the Government. It is significant that the new policy is being pronounced during the initial years of the X Five Year Plan, contained elements to be gainfully used by the implementing Departments in the Central and State Governments so as to reach the benefits to the stakeholders.

The policy objectives are: (1) to augment marine fish production of the country up to the sustainable level in a responsible manner so as to boost export of sea food from the country and also to increase per capita fish protein intake of the masses, (2) to ensure socio-economic security of the artisanal fishermen whose livelihood solely depends on this vocation, and (3) to ensure sustainable development of marine fisheries with due concern for ecological integrity and biodiversity.

6.2 Coastal Aquaculture Authority Act 2005

The Parliament in 2005 passed the Coastal Aquaculture Authority Act (Act 24 of 2005) and the Central Government framed the rules and guidelines to improve the productivity under sustained conditions. The Central Government has established the Coastal Aquaculture Authority with its Headquarters at Chennai. The Act encompasses the farming of shrimp, prawn, fish or any other aquatic life under controlled conditions in ponds, pens, enclosures or any other brackish water bodies, but excludes fresh water aquaculture. Under the provisions of the Act, coastal areas include areas of land within a distance of two kilometers from the High Tide Line of seas, rivers, creeks and backwaters. The Act is expected to give an impetus to sustainable development of aquaculture and to an environment conducive for species diversification. The Act has to be implemented effectively in order to protect the environment while increasing the production. Persons running aquaculture farms must abide by the provisions of the Act, Rules, Regulations and the Guidelines. Running coastal aquaculture farms without registration is now a criminal offence.

7. The Biological Diversity Act 2002

Biodiversity encompasses the variety of all life on earth. India is one of the 12 mega diverse countries of the world. With only 2.5% of the land area, India already accounts for 7.8% of the globally recorded species. India is also rich in traditional and indigenous knowledge, both coded and informal. The Central Government has brought Biological Diversity Act, 2002 with the following salient features: (i) to regulate access to biological resource of the country with the purpose of securing equitable share in benefits arising out of the use of biological resources; and associated knowledge relating to biological resources; (ii) to conserve and sustainably use biological diversity; (iii) to respect and protect knowledge of local communities related to biodiversity; (iv) to secure sharing of benefits with local people as conservers of biological resources; (v) conservation and development of areas of importance from the standpoint of biological diversity by declaring them as biological diversity heritage sites; (vi) protection and rehabilitation of threatened species; and (vii) involvement of institutions of state governments in the broad scheme of the implementation of the Biological Diversity Act through constitution of committees.

8. The Model Bill for Inland Fisheries and Aquaculture Sector

Recognizing the economic, social, nutritional, environmental and aesthetic importance of inland fisheries and aquaculture, the Government of India through this Model Bill on Inland Fisheries and Aquaculture intends to ensure sustainable fish production to meet the needs of food and nutritional security, generation of gainful employment in rural sector, improving the socio-economic condition of the target groups and increasing the export earnings. Therefore, to draw the economic, social and nutritional benefits from inland fisheries and aquaculture in a sustainable manner, it is essential to adopt a judicious combination of implementable and effective regulatory framework, eco-friendly fishing and aquaculture practices with the larger involvement of the fisher communities and fish farmers.

The present Model Bill provides broad guidelines for sustainable development and management of inland fisheries and aquaculture in the country. All concerned stakeholders are encouraged to give effect to this bill for ushering an era of long-term sustainability of inland fisheries and aquaculture.

9. Code of Conduct for Responsible Fisheries and its importance

It is now well known that fisheries, including aquaculture, provide food security, employment, recreation, trade and economic well-being for people through out the world and therefore, while dealing this professional work, it should be done in a responsible manner to ensure sustainable benefits. Considering important developments in the world fisheries, the FAO governing bodies recommended formulation of a global code of conduct for responsible fisheries, which is a non-mandatory and establishes principles and nominations applicable to the conservations, management and development of all fisheries. Hence, introduction of Code of Conduct for responsible fisheries is very much essential at every step. The code sets out principles and international standards of behaviour for responsible practices with a view to ensuring the effective conservation, management and development of living aquatic resources with due respect for the ecosystem and biodiversity. The code also takes care, nutritional, economic, social, environmental and cultural importance, so also it accounts the biological characteristics of the resources and their environment and interests of the consumers and other users. It also covers the capture, processing and trade of fish and fishery products, fishing operations, aquaculture, fisheries research and the integration of fisheries into coastal area management. It is

most essential that the states and all those involved in the fisheries professionals are encouraged to apply the code and give effect to it.

There are twelve articles in the code. Article one covers nature and scope of the code, and objectives of the code are given in article two. Article three gives the rules covered under international laws of the seas as reflected in United Nations Convention on the Laws of Seas (UNCLOS, 1982). So far as implementation, monitoring and updating are concerned, the same is covered in article four. Special requirements for implementing the code for developing countries are given in article five and article six discusses general principles of the code in an elaborate manner. Article seven deals with fisheries management which covers management framework, procedures, data gathering and management advice, precautionary approach, management measures, implementation and financial institutions. Fishing operations details are given in article eight of the code which covers, duties of states, flag state duties, port state duties, fishing gear selectivity, energy optimization, protection of aquatic environment, protection of atmosphere, harbour and landing places for fishing vessels, abandonment of structures and other materials and artificial reef and fish aggregation device. The details regarding aquaculture development are given in article nine of the code. Article ten describes integration of fisheries into coastal area. Management, post-harvest practices and trade and fisheries research are covered in articles eleven and twelve of the code, respectively.

The growth in the fisheries sector can be enhanced by increasing fish production either through capture fisheries or aquaculture including coastal aquaculture and mariculture. Fish export and fish trade would add to our national economy, generating more employment and food security, particularly, among fishers and unemployed youths. The ratio of supply and demand has to be maintained on a continuous basis for the survival and progress of the sector. Capture fisheries all over the world are dwindling and some of the resources are declining at alarming levels. Hence, for enhancing fish production through capture fisheries, we may have to explore deep sea water resources keeping in view of the economic aspects. For harvesting off shore resources on continuous basis, fisheries management becomes very important and hence the code of conduct for responsible fisheries has to play a pivotal role.