Journal of Advances in Developmental Research (IJAIDR)
E-ISSN: 0976-4844 ● Website: www.ijaidr.com ● Email: editor@ijaidr.com

Potential of Natural Fresh Water Resourcesin Growth and Developmentof Inland Fisheries in India

Sudha Garg

Associate Professor
Hindu College Moradabad

Abstract

In India, the Inland fishery sector plays a great role in nutritional security and employment potential. Although, Inland Aquaculture has grown in absolute terms but the development in terms of its potential is yet to be realized. The vast and varied inland fishery potential resources present in our country offer great opportunities for livelihood development. The sector is also an important source of ancillary jobs for the rural population, especially in marketing, retailing, transportation, etc. However, the sector remains largely unorganized even today mainly due to the scattered and diffused nature of activities. There is a large gap in the potential and actual yields in these rainfed water bodies and there is scope for enhancing the fish production by about 3 to 5 times considering the present low productivity level of 2 tons/ha. Access to the water body and their management for fishery development have been identified as major challenges in the promotion of inland fishery.

Keywords: Inland Fishery, Aquaculture, Rainfed Water Bodies

Introduction

Inland fishery systems can be summed up as capture fisheries in natural water resources like rivers, estuaries, lagoons, and lakes including the aquaculture in ponds, various forms of enhancements (mainly culture-based fisheries and stock enhancement) being practiced in reservoirs, lakes, and floodplain wetlands. In a typical capture fishery, the wild untended stock of organisms is harvested with little human intervention on either habitat variables or the biotic communities, while in a culture fishery (aquaculture), the production process is based on captive stocks with a high degree of effective human control over the water quality and other habitat variables. The fish production system which is intermediate to capture and culture is collectively called 'enhancement'.India is bestowed with vast and varied inland fisheries potential resources in the form of rivers and canals (1.95 lakh km), floodplain lakes (8.12 lakh hectares), ponds and tanks (24.1 lakh hectares), reservoirs (31.5 lakh hectares), brackish water (12.4 lakh hectares), saline/alkaline affected areas (12 lakh hectares) etc., with current estimated fish production potential of about 17 million ton as against production of 9.58 million tons during 2018-19(provisional). This production is harnessing only 56.3% of the potential of water resources in India while 43.7% is remaining to be tapped. India is one of the largest fish-producing countries in the world and shares 7.58% of the global production. Contributing 1.24% to India's Gross Value Added (GVA)

and 7.28% (2018-19) to the agricultural GVA, fisheries, and aquaculture continue to be an important source of food, nutrition, income, and livelihood to millions of people. The fisheries sector in India has shown impressive growth with an average annual growth rate of 10.88% during the year from 2014-15 to 2018-19 (National Fisheries Development Board of India Govt.). The fisheries sector in India has registered a commendable 11-fold growth during the last six decades, propelling the country to the forefront of fish-producing nations in the world. Fish production in India increased from 0.75 in the 1950s to 8.29 million tonnes in 2010-11 from both marine (3.22 million tonnes) and inland (5.07 million tonnes) water resources. Over the years, the contribution of marine fish to the total fish production has gradually decreased from 71 in the 1950s to 39 percent during 2010-11 with a corresponding increase in inland fish production (DAHD&F, 2011; Fig 1).As per the data of the year2012, India ranks third in the worldfish production and is the second largest producer of inland fish.With

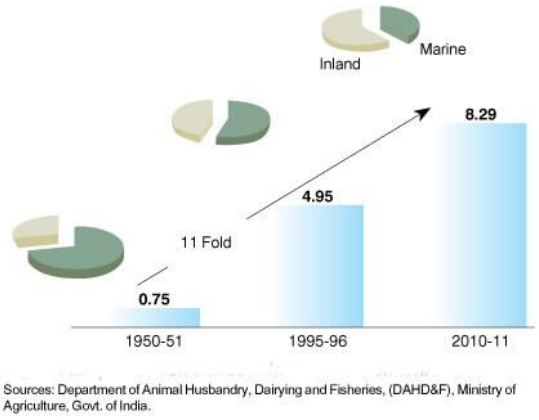

Fig. 1: Fish production trends in India (in million tonnes).

an annual production of over 8.29 million tonnes (2010-11), which accounts for a turnover of Rs 415 billion, fish contributes to more than 1 per cent of the national GDP and its share in the agricultural GDP is about 5 per cent (fisheries is understood by policy makers to be a component of agriculture). Table 1 shows inland fish production in metric tons in different kind of water bodies.

TABLE 1. Inland Fish Production in India ('000t)

Type of fisheries	1984–85	1989–90	1994–95	2002–03
Capture	591.74 (53.64)	396.50 (28.28)	334.03 (15.93)	500.00 (15.67)
Aquaculture	511.50 (46.36)	1005.5071.72)	1762.70 (84.07)	2690.00 (84.33)
Fresh water	308.30((27.95))	779.40((55.59))	1392.30((66.40))	2100.00 ((65.83))
Brackish water	203.20((18.41))	226.10((16.13))	370.40 ((17.67))	590.00 ((18.50))
Total inland fish Production	1103.20	1402.00	2096.70	3190.00

(Katiha&Bhatta, 2002 and Dehardrai, 2004).

Major Inland Fish Producing States- The share of various states in the country's total inland fish production was analysed and its composition was presented for the year 1990-1991 and 2003-2004 to

understand the dynamics of this sector in contributing to total fish production. In the years 1990-1991, the major producing states were West Bengal, Bihar, Andhra Pradesh, Uttar Pradesh, and Orissa. Together they contributed about 68 percent to total inland fish production. In the subsequent 15 years, Andhra Pradesh and Uttar Pradesh had made tremendous progress in its share of total inland production, overtaking West Bengal, which was static in its increase and hence lost to these emerging states. Bihar and Orissa were maintaining their share in inland production, though they have reached stagnation in output. Another major state, whose contribution is improving rapidly, is Punjab. Apart from these, the states that are reaching a point of maximum output are Assam, Kerala, Maharashtra and Tamil-Nadu. Gujarat, Karnataka and Madhya Pradesh were experiencing negative growth in production. Again, the promising UT in inland production is Puducherry (Balasubramanian 2010).In the last 25 years, total fish production has been growing at an annual growth rate of about 4.6 percent, in which the marine sector was growing at a rate of 3.24 and the inland sector was growing at a rate of 6.2 percent. In all, the inland sector fared better in all the periods, from 1980-1981 to 1989-1990, 1990-1991 to 1999-2000 and 2000-2001 to 2005-2006. There has been slower growth of this sector in recent times. In contrast, the marine sector had negative growth in the period 2000-2001 and 2005- 2006, which indicates the exhaustion of marine resources especially in inshore and near shore waters, where maximum harvest has occurred (Table 2). In the initial years, the marine sector contributed more to total fish production than the inland sector. In the 1950-51, marine production contributed about 71 percent, but fell gradually to 43 percent in 2005-06, while the inland sector contributed 29 percent in 1950-51 and rose to about 57 percent in 2005-06. In fact, by the year 2000, its share reached 50 percent and the sources of inland fish production until the mid-1980s. But fish production from rivers and lakes followed a declining trend, primarily because of the proliferation of water control habitat degradation (Katiha and Bhatta 2002).

Table 2. Compound growth rate in fish production,1980-81 to 2005-06.

Year	Marine	Inland	Total
1980-81 to 1989-90	3.80	5.28	4.39
1990-91 to 1999-00	2.33	6.55	4.13
2000-01 to 2005-06	-0.21	5.37	2.75
1980-81 to 2005-06	3.24	6.20	4.60
1980-81 to 1980-91 (Pre-WTO)	4.35	5.43	4.78
1991-92 to 2005-06 (Post-WTO)	0.84	5.71	3.18

Although inland fisheries and aquaculture have grown in absolute terms, the development in terms of its potential is yet to be realized and it remains a sector with much promise.The fisheries sector particularly, is a complex enterprise, that functions under an integrated network of natural resources, with other enterprises that have forward and backward linkages with fisheries and other socio-political variables. The major functions of the fisheries enterprises, including production, transportation, storage, and processing involve value additions from labor, capital, and management which greatly influence the rapid economic development of the country (Ayyappan and Krishnan 2004). The unutilized and

underutilized vast and varied water resources offer great opportunities for enhanced production along with livelihood development and ushering economic prosperity in the country. The sector provides livelihood to about 25 million fishers and fish farmers at the primary level and twice the number along the value chain. Hence sustained and focused attention must be given to the fisheries sector through formulating the policies and increasing the financial support to accelerate its development in a sustainable, responsible, inclusive, and equitable manner. Further, since the majority of fisher folk directly depend on the sector, especially the small-scale and artisanal fishers, and continue to fall behind the national indices of socio-economic development, it is essential to provide requisite impetus towards amelioration of poverty and backwardness among these marginalized and vulnerable communities and promote their holistic development and welfare.In the coming decades, aquaculture will likely be the greatest source of increased fish production, as fish farmers expand the water surface area under cultivation and increase yields per unit of area cultivated. However, the sector must overcome several major challenges to sustain the rapid growth of the past 25 years.

• Aquaculture would face competition from other users of land and water, as much as these resources would become severely scarce in the future (Rosegrant et al. 2002).
• The marine sector would face an energy crisis as it uses more fossil fuels for expansion.
• Aquaculture production would be restrained by diseases as the sector expands (Subasinghe et al. 2001).
• The availability of fish meat and fish oil as feed inputs may also become a limiting factor. Yield increases can come either from increased inputs or greater efficiency of inputs. It is likely that in the next several decades, aquaculture production will benefit from both sources of yield and growth. Greater use of compounded aquaculture feeds along with improvements in rearing technology and selective breeding has the potential to increase the productivity of many farms of aquaculture. (Kumar, Dutta and Joshi 2010).

Drivers of Future Growth

To sustain this growth of the sector in general, technology, infrastructure and market play major roles as does enhanced investment in research and development.Technology has been the main factor responsible for the phenomenal growth of aqua-culture, particularly after the advent of carp polyculture and composite fishculture in the late 1970s. Similarly, major investments in infrastructure, such as the construction of mini harbors, jetties, landing centers, the introduction of trawlers and mechanized vessels, and the supply of nets led to increased catch in the capture fisheries sector. However, the market has not been able to play a major role in the growth of the sector, so far. To tap the potential of the sector, the market would have to take the lead in furthering the growth, especially in the emergence of the aquaculture sector. Some of the illustrative aspects of each major driving force are described below (Balasubramanian 2010).

Technology

- Quality seed production
- Selective breeding of carps
- Formulation of low-cost feed materials using locally available ingredients
- Fabrication of nets for targeted fishing

Infrastructure

- Constructing landing centers in second tier potential coastal towns
- Creation of cold storage near landing centers
- Upgrading manually operated boats into outboard motorized ones
- Supply of ice boxes

Market

- Creation of domestic markets
- Creation of institutional structures like marketing societies with fishermen / fish farmers as members
- Creation of cold storage facilities
- Transportation of fish and fishery products by refrigerated containers from point of landing / production to consumption centres
- Documentation of innovative market models already existing in the sector and replicating in similar areas with support from both Govt. and non-governmental Agencies.
- Gradation, Standardization and Branding of fish and fishery products
- Creation of a Market Information System with the application of ICT tools.

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