



FRESHWATER AQUACULTURE IN INDIA: TRENDS AND PROSPECTS

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Aquaculture has become a savior at a stage when production from capture fisheries in the country witnessed almost stagnation. The overwhelming ten-fold growth in just three decades i.e. from 0.37 million tonnes in 1980 to 4.0 million tonnes at present, sharing 50% of the total fish production of 8.0 million tonnes at present, amply justifies the recognition of aquaculture as an industry. While marine farming in the country is almost at its nadir and the land-based coastal aquaculture sector has been contributed by a single group, the shrimp, with production levels hovering just around 0.1 million tonnes, the freshwater aquaculture has been contributing over 95% of the aquaculture production in terms of quantity. The large-scale adoption of scientific carp polyculture together with entrepreneurial initiatives and financial investments has guided the sector to elevate it from a backyard activity vibrant a commercial enterprise.

Although the farming practice has witnessed overwhelming growth in terms of geographical coverage and intensification of farming practice, the three Indian major carps, viz., catla, rohu and mrigal have been continued to form major species group and contribute a lion's share. The introduction of exotic silver carp, grass carp and common carp into the Indian major carp based polyculture system even though added new dimensions to the system owing to their compatibility and high growth rates, they have remained as the second preferred group due to low consumer preference. With the average production under carp farming has been 5-6 tonnes/ha/year in progressive states like Andhra Pradesh, West Bengal, Punjab and Haryana, and several farmers even demonstrating impressive production levels of 8-12 tonnes/ha/year, the sector shows the potential to boost the average national pond productivity from the present level of 2.5 tonnes/ha/yr to a modest level of 4.0 tonnes/ha/yr by 2020, thereby achieving the expected contribution of 7.0 million tonnes from the sector by then.

R&D efforts on species diversification over the years although led to development of protocol for mass-scale breeding and seed production of several indigenous species, their commercial farming remained confined to giant freshwater prawn, *Macrobrachium rosenbergii* and to some extent the catfish, *Clarias batrachus*. Recent years, however, has witnessed drastic reduction in culture area of freshwater prawn with production reduced from about 40,000 tonnes in 2005 to about 10,000 tonnes at present. With availability of

technology of seed production and grow-out farming of several medium and minor carps viz., *Labeo fimbriatus*, *L. gonius*, *L. calbasu*, *L. bata*, *Puntius sarana*, etc.; murrels *Channa striatus* and *C. marulius*; catfishes *Pangasius pangasius*, *Horabagras brachysoma* and *Ompok bimaculatus* and several other non-conventional candidate species, recent years has observed incorporation of several of these as components in polyculture system. Exotic catfishes, *Clarias gariepinus* and *Pangasianodon hypophthalmus* are some of the recent illegal entrants in freshwater aquaculture, although the latter has been legalized recently for its farming. In spite of ban imposed by Government of India, the farming of *C. gariepinus* has spread all across the due to its high growth rate. Higher growth and production potential of *P. hypophthalmus* have been responsible for large-scale adoption of the species, especially in Krishna-Godavari Delta of Andhra Pradesh. Although the production of the species reached from zero to about 0.6 million tonnes within a span of 4-5 years, unexpectedly it witnessed rather a sharp decline in one year, i.e. 0.2 million tonnes at present, which however was based on market demand.

Availability of required technological back up coupled with critical inputs like seed at the doorsteps has been the major factors for achieving consistent growth rate of 6-7% per year by the sector over last three decades. Further, availability of improved stocks, balanced feed in the form of floating and sinking pellets, formulations against common disease threats, and above all sustained increase in demand for fish as preferred animal protein have been able to take the sector forward. Current research programmes on different aspects of freshwater aquaculture, including domestication and standardization of breeding and culture techniques of non-conventional species, biofertilisation, genetic improvement of the cultivable species, feed development for larvae and grow-out stages, bioremediation, therapeutics and vaccines against dreaded pathogens and above all biotechnological interventions have to play a significant role in sustainability of freshwater aquaculture in years to come to overcome from the challenges of possible water scarcity for aquaculture, water quality deterioration, increase in cost of critical inputs and also competition from other sectors, and above all the climate change. Aquaculture, therefore, need to shift its focus from production to profits and further to production of safe produce on a sustainable basis.