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Prospects and Potential of Fisheries and Aquaculture

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The fisheries sector of India provides nutritional security, contributes to the national GDP and provides employment to over 14 million people (25 percent of whom belong to the poor, backward, and tribal community). It generates over Rs 8,000 crores worth of foreign exchange. Its contribution is significant, being 1.07 percent and 4.96 percent of the total and agricultural GDP respectively of the country. The annual Indian fish production is around 6.37 million tonnes, of which the share of inland fish production is a little over half (51.70 percent), which is shared between aquaculture (79.36 percent) and capture fisheries (20.64 percent). Though India is the seventh largest producer of fish globally and occupies the second position in aquaculture production among the countries of the world. The per capita availability of fish in India is a mere 9 kg. However, it needs to be raised to a level of at least 12 kg. The prospects in India for such a development are considered good as there is no dearth of physical resources, which, if properly utilised, could produce over 9.0 million metric tonnes of fish annually from the existing inland resources.

Jharkhand is a landlocked State of India, endowed with resources such as ponds, reservoirs, lakes and rivers. The fisheries of all these resources are waiting for concerted efforts aimed at well-planned development. As far as ponds are concerned, rigorous efforts have been initiated to develop them by desilting and dredging them wherever possible for the purpose of development of fish culture and providing sustainable livelihood to the stakeholders.

Reservoirs constitute the prime inland fishery resource of Jharkhand by virtue of their enormous fish production potential. This man-made ecosystem offers considerable scope through ecological maneuvering, paving the way for increase in production at a relatively low capital investment. Unlike aquaculture systems, where

development is capital intensive, reservoir fisheries development is labour-oriented and ensures employment for some of the weakest sections of our society, thereby ensuring nutritional security and gender equity.

The reservoir fisheries hold a very good developmental promise in Jharkhand. They have an extensive wealth of fishery resources, contained in 99 reservoirs of various categories, covering a waterspread area of about 73,727 hectares. Unfortunately, majority of these water bodies are not being scientifically managed with a prospective planning. Compared to some of the South Indian reservoirs, per hectare fish production from the reservoirs of Jharkhand is very poor being only about 5kg/ha/yr. However, over the years, there has been a growing realisation of the importance of this aquatic resource, thereby setting the tone for substantially increasing the inland fish production.

Reservoirs could be utilised for intensive and semi-intensive fish and giant freshwater prawn, and ornamental fish production, maintaining a capture-culture balance. Bivalve molluscs can also be grown in identified zones of reservoirs for producing cultured freshwater pearls.

Potential for Fisheries Development in Jharkhand State

The fishery resources of Jharkhand State are generally of three kinds: 1) Farm-oriented fishery resource, 2) Culture-based capture fishery resource, and 3) Capture based fishery resource.

From the point of view of development, the greatest potential lies in the farm fishery sector, provided required inputs per hectare per year are applied for obtaining sustainable optimal yield per hectare.

The main farm fishery potential of Jharkhand lies in ponds and tanks, which are distributed throughout the

length and breadth of its 22 districts. The total waterspread of ponds in the State is of the order of 30,094 ha. Of these, ponds with an estimated waterspread of 10,050 ha are privately owned and 20,044 ha are State-owned under the control of the Department of Fisheries, Government of Jharkhand.

Lakes, known as *Jheels* in common parlance in the State, are another major resource for fisheries development by a combination of capture and culture systems of fish production. On the capture side, the rivers passing through Jharkhand are important for their natural fish population. In both these resources, there exists a scope for development of cage and pen farming. The fisheries of the rivers of Jharkhand, which stand overfished, need urgent attention in respect of conservation of their resources and regulation of their fishing for restoring sustainability of the resources.

Methodology

The study was conducted by analysing SWOT of fisheries sector, which shows the present scenario of fisheries in Jharkhand and which helps to understand the causes of low production and enables formulation of strategies that are to be adopted to improve the sector.

SWOT analysis is a tool for assessing the strengths, weakness, opportunities, and threats. Strengths and weakness are internal to the system whereas opportunities and threats are external and are of a futuristic perspective. SWOT analysis is very important in order to upgrade the sector, since it helps in identifying the problems and thereby one can go for proper planning, decision making and appropriate technology implementation. It takes into account the risk factors involved in it. The SWOT analysis also provides a roadmap to



the future in suggesting ample guidelines for the development of the fisheries and aquaculture sector.

SWOT analysis in any production unit will help in: 1) Providing a basis for future action; 2) Helps in rational decision making; 3) Provides feedback on the performance and thereby helps in taking steps for improvement; 4) Provides basis for taking up planned research to convert weaknesses into strengths and threats into opportunity and 5) Enables formulation of needed management techniques and their implementation.

Results and Discussion

The strengths, weakness, opportunities, threats of fisheries and aquaculture in Jharkhand are indicated below:

Strengths

1. Resource Endowment:

Jharkhand is a landlocked State of India, endowed with resources such as ponds, reservoirs, lakes and rivers. The fisheries of all these resources are waiting for well-planned development.

2. Abundance of Reservoirs:

The database on fish production from reservoirs of the Jharkhand State are medium-productive and can be developed to produce substantial quantity of fish. The lakes which are shallow, but are highly productive due to good nutrient status and most favourable range of physico-chemical features and the conditions of existence of such water bodies are extremely conducive for fish production. Therefore, these unutilised but productive natural resources can be utilised beneficially for fisheries development.

3. Institutional Establishment:

The State possesses numerous institutional establishments and innovations like AQUASHOP at Ranchi. **4. Adequate Human Resources:** One of the major strengths is the availability of manpower at low cost. The labour cost per person usually ranges from Rs 50 to 80 per day for fishing and aquaculture operations.

5. Biotic Flora and Fauna:

Aquatic resources of Jharkhand have a rich diversity consisting of a large number of indigenous and exotic ornamental

fishes. They include several species of barbs, catfishes, loaches, gauramis, murrels, river and hill stream fishes etc, which have high demand in the national and international markets.

6. Rich Breeding Grounds:

Paddy fields in certain pockets of Ranchi, Lohardaga and Gumla districts provide natural breeding grounds for Magur, the brooders of which migrate from pools and ditches in the lowlands. **7. Low Cost of Production:** As the cost of inputs are comparatively cheaper the cost of production is low. This will ensure higher returns from crop per hectare.

8. Seed Production Units:

There are three hatcheries, one known as Shalimar at Ranchi, another at Gumla and the third one at Chaibasa in the Government sector with the annual production capacity of 5, 8 and 5 million spawn/fry respectively, as at present. The seed availability will not be a constraint in augmenting fish production in the State.

Weaknesses

1. Inadequate Database:

The database on fish production from tanks is insufficient for any concerted

2. Non - uniformity in Regulatory Measures:

Inland fisheries being a State subject, there is no uniform national law and each State has its own policies and rules regarding closed season, mesh size and minimum size of fish (Indian Major Carps) to be caught and with no restrictions on the number of boats, their lengths and types of nets, no/size of hooks etc and with no catch limits or catch quota. Use of dynamite, poison and indiscriminate fishing adversely affects fisheries of the region.

3. Shortage of Qualified and Trained Manpower:

This is equally true of the inland fisheries development sector where the shortage of planners, administrators, development officers and extension specialists is acutely felt.

4. Lack of Proper Management Techniques:

In addition to a comprehensive stocking policy, a system for sustainably exploiting the

vast expanse with high potential has to be promoted.

5. Seasonality of Resources:

Seasonal nature of the rivers harnessed is a constraint with endemic fish population, dominated by small economic species of predators and at the same time poorly represented by Indian major carps.

6. Lack of Knowledge:

Low retrieval of the fish stocked due to unplanned stocking which is because of lack of knowledge and awareness about the culture-capture fishery development.

7. Shortage of Seed Production and Dependence on Riverine Fish Seed:

Riverine fish seed is a mixture of wanted and unwanted species of fishes. This has an effect on the availability of natural stock of quality seed for growth in reservoirs.

8. Problems in Marketing:

These are: Lack of integrated marketing arrangements that would facilitate pooling up of catches, storing them in centralised cold storages and the organising regulated release to the market.

9. Traditional Practices:

Fisheries practices in the Jharkhand State continue to be traditional due to lack of awareness of the problems. There is also the lack of tested technologies for application.

Opportunities

1. Renovation of Resources:

If all the derelict ponds and tanks are renovated for fish farming and semi-intensive rather than intensive farming practices are followed, it would be possible to increase pond fish production substantially.

2. Integrated Farming System:

Apart from the present practices of monoculture and composite farming with Indian major carps and suitable exotic carps and freshwater prawn, there is an enormous scope to encourage integrated fish farming involving poultry, piggyery, cattle, horticulture etc.

3. Underutilised and Untiltised Resources:

There is a great potential to develop pond fish farming in some of the districts of Jharkhand State, which has vast fallow land, having an





extent of estimated area of over 23 lakh ha, most of which has underground water in sufficient quantity and the climatic conditions are favourable for the proper and good growth of fish and prawn.

4.) Enhancement of Fisheries: The most important and potential water areas for improvement and development for fishery in Jharkhand are the reservoirs. The reservoir fisheries, if developed on scientific lines, will provide a source of relatively low priced, good quality animal protein and also occupational opportunities. Fish farming in reservoirs can be practised through pens, cages and floating nets.

5.) Infrastructure Development: Establishment of fish farms and setting up of supporting hatcheries for the production of seed is needed in the State. It is suggested that these infrastructural facilities need to be developed in each of the districts of Jharkhand State either under governmental or private control. Each of the farms, integrated in nature, can be of 10 ha, incorporating also a hatchery therein. Such fish farms would serve the purpose of imparting practical training in fish farming, breeding, seed rearing etc., in addition to serving as demonstration centres for ornamental fish culture, pearl culture, freshwater prawn farming and integrated aquaculture.

6.) Development of Ornamental Fish Culture: Jharkhand State has wide prospects for development of ornamental fish culture as a cottage industry. A highlightable aspect is that it can be taken as a part time or as full-time self-employment business.

7.) State of Craft and Gear: Traditional gears and crafts in use may be improved and modernised.

Threats

1. Uncontrolled Poaching: There exists widespread fish poaching from reservoirs and ponds which results in poor retrieval of the grown-up fish from the stock.

2.) Development Hazards: In most of the reservoirs of Jharkhand State, the bottom topography is uneven and numerous obstacles such as decaying large tree trunks, boulders and various other structures have been allowed to

go under submergence *in situ* during the construction phase, causing great deal of inconvenience to the fishing operations and hindering the use of dragging gear.

3.) Stocking of Yearlings: The desirable policy and norms of stocking reservoirs with fish yearlings in the initial years of trophic burst (first two years after impoundment) are not followed. As a result of this, undesirable fish species including the predatory species have fully taken foothold in most of the reservoirs which have been causing large scale damage to the desirable fish seed of the Indian major carps now being stocked.

4.) Eutrophication of Lakes into Swamps: The lakes, regardless of their origin, in most cases, inexorably move towards eutrophication, mainly because of gradual filling of their basins, the order of change in the lentic series being lake-pond-swamp.

5.) Overexploitation of Resources: Due to heavy exploitation of riverine fishery, the availability of fish seed from this resource is declining at a fast rate.

6.) Industrial Pollution: There is a growth of domestic and industrial pollution in the rivers, lakes, etc which affect the fertility status of the resources

7.) Storage Infrastructure: Fish being a perishable commodity, ice should be plentifully available at all fish handling stations and fish markets should have refrigerated fish holds.

8.) Vested Interest of Fishermen's Cooperatives: The functioning of the present fishermen's cooperatives is not at all satisfactory. They are dominated by influential persons who simply act as middlemen or money lenders.

9.) Lack of Policy Initiatives: The State needs to develop a policy encompassing the interests of the different stakeholders of the economy.

Conclusion

The development of aquaculture in the State of Jharkhand needs focal attention for its accelerated growth. Considering the urgent requirement to boost fish production in the State, the major thrust should be directed at reservoir fishery development based on a well designed short-term approach. Fisheries management of the small reservoirs (50 – 1000 ha) is

almost of the same type as extensive aquafarming practices, where fish seed are stocked but no fertilisation is done and no feed is provided as inputs. It is advisable to follow 'culture-based-capture fisheries' in the small reservoirs which can play an important role in the integrated rural development as it is a feasible proposition to combine the activity with horticulture, poultry, duckery and piggery.

Jharkhand State is estimated to have rivers of a total length of 34,201 km. The fisheries of the rivers have to be conserved rather than subjecting them to intensive exploitation. It is difficult to achieve the multiple goals of production, income generation, problems of foreign exchange earnings and livelihood of the poor tribal and backward farmers and fishermen, in the present circumstances. The fisheries developmental burden has to be shared with a definite role for the research scientists and fisheries teachers, fisheries developmental & extension officers, local administrators, NGOs, SHGs, Banks & individual fishers and fish farmers.

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