

Original Article

Status of Small-Scale Inland Fisheries in Bihar, India

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Abstract - *The present status of Small-Scale Inland Fisheries (SSIF) of Bihar, its importance as a means of livelihood, and problems are identified through a critical review of the recent schemes under fisheries of Bihar. Conclusions are made on the basis of available information and provisions made under the state fisheries policy as a means of development of the sector. Being a landlocked state, inland small-scale fisheries provides a way of income source with less investment to the disadvantaged population of the state. The small-scale fisheries of riverine systems, as well as wetlands (Mauns and Chaur), are being managed collectively by the community or SHG or state department through the leasing process. Though various schemes have been formulated for the small-scale fisheries, so far the development is not up to the expectations. Subsidies should be diverted towards the development of basic infrastructure, market facilities and to control water pollution. Due to high population dependency, climate change, pollution, etc. sustainability of small-scale fisheries always remains a question. The creation of awareness for the optimum utilization of fisheries resources, strict enforcement of the fish ban, and ranching of fish seed into natural water bodies may lead maintains the fish stock which will provide income and employment on a continuous basis. The study will help in making policies for the development of inland small-scale fisheries of Bihar.*

Keywords - *Small-scale fisheries, Sustainability, Fisheries policy, Bihar*

I. INTRODUCTION

Small-scale fisheries include small-scale coastal fisheries and small-scale inland fisheries (SSIF). The small-scale inland fisheries comprise of three categories viz. small-scale inland culture fisheries, small-scale inland capture fisheries, and small-scale inland culture-based capture fisheries (rarely observed). In general, small-scale coastal fisheries have been given more attention in comparison to small-scale inland fisheries. Inland fisheries can be defined as fishing activities

performed in freshwater, brackish water, estuarine (both lotic and lentic) natural and man-made water bodies. In nutshell, inland fisheries deal all about the capture and culture-based fishing and aquaculture which do not take place in marine waters. In India, the inland fisheries sector is often considered as merely small-scale and comprises poor as well as marginal fishers. Many of them are found to be part-time fishers, as most of the time they are engaged in agriculture and other labor works to eke out a living. Unlike the marine sector, inland fisheries sectors are largely restricted for local and domestic human consumption, with very little or no contribution to the country's exports (1).

Indian fisheries remain away from the homogenized or fully industrialized fisheries sector. There are many fishers and fish farmers of various social and economic backgrounds. Most of them are categorized under the "small-scale fisheries sector". The social and economic constraints often make the external policymakers illegible or incomprehensible about the sector which results in a reductionist view on the segment of small-scale fisheries (SSF) that considers the sector locked in the vicious circle of poverty. This view is well accepted in India and that becomes a de facto definition (2).

The FAO refined artisanal or small-scale fisheries as "traditional fisheries with fishing households using a relatively small amount of capital and energy, small fishing vessels (if any), making short fishing trips close to the shore and intended mainly for local consumption. This would be either for subsistence or commercial purposes." On the basis of FAO's definition, it can be concluded that "the small-scale inland fisheries (SSIF) is an artisanal fishery where fishers or fish farmers usually do fishing or fish culture in inland water bodies or small artificial ponds by applying traditional methods which need a relatively smaller amount of capital and energy along with small traditional boat (if any). The major purpose of this kind of fishing is for local consumption and/or for livelihood purpose". However, so far, there is no exact definition available



for small-scale fisheries. The FAO also stressed the urgent action that has to be taken on small-scale fisheries and aquaculture among all subsectors of fisheries, especially with respect to food security and nutritional policies.

It is observed that small-scale fisheries contribute around half of the global fish catches in developing countries and cover nearly 90 percent of the world's capture fishers. A bulk amount (90-95%) from these huge landings is destined for local human consumption which is very important from the food security point of view. It not only acts as a means for food security but also provides employment to the people who are directly or indirectly linked with it. In spite of the benefits that the sector is providing, many fishing communities continue to be marginalized and their contribution is underestimated by policymakers as well as the government.

The FAO stated that about 90 percent of 38 million people are small-scale fishers and fish farmers and an additional 100 million more people are employed in other fisheries-related works. But millions of people who do fishing seasonally (part-time fishing) in coastal and inland waters are not considered fishers. This data is just enough to tell how important is small-scale fisheries as a livelihood. The small-scale fisheries by etymology, we mean small in scale but not in importance. Small-scale fisheries are too big to ignore as it is directly or indirectly related to food security, nutritional security, and poverty reduction in developing countries. However, it has received less attention as compared to coastal small-scale fisheries. The importance of small-scale inland fisheries can't be ignored as riverine fisheries, reservoir fisheries and aquaculture are significantly contributing towards employment generation, poverty reduction, and food security. Unlike large-scale industrial fisheries small-scale fisheries have got less visibility and attention from policy-makers. These resources are contributing relatively less to the national Gross Domestic Product (GDP) and demanding little political attention or support through research, subsidies, etc. Though, some small-scale fisheries are indulged in poverty still receive project support from international development donors. However, they are not receiving systematic research support to improve functioning, governance, human, and also resource benefits. Small-scale fisheries are more important from a livelihood viewpoint but not from the contribution to the national GDP.

Voluntary guidelines are required for the sustainability of small-scale fisheries in the context of food security and poverty reduction. These guidelines may act as a complement to the 1995 FAO's Code of Conduct for Responsible Fisheries. These guidelines are intended to magnify the visibility; recognition and enhancement of the importance of small-scale

fisheries. These guidelines also provide a way to eradicate hunger and poverty at national as well as global levels (3). These guidelines will come into force when the world realizes the importance of small-scale fisheries and their sustainability as these resources are declining at faster rates for which conservation is needed. However, these guidelines are not enforced strictly at ground level for many reasons like;

- Most small fishers are economically poor and totally dependent on fishing activity for their livelihoods they do not have alternative occupations therefore they are not following the instructions.
- They are not aware of the harmful effects of overfishing and pollution as they are either less educated or illiterates.
- Most of the fishers' are least concerned for others, hence they do not follow the guidelines voluntarily in order to get benefitted individually.

In order to achieve efficient and sustainable use of small-scale fishery resources, the following measures have to be followed strictly-

- The dependency of the number of fishermen communities on SSF should be reduced by creating alternative livelihoods
- Creating awareness program for the responsible use of fisheries resources and to reduce the pollution in the natural water bodies
- Fisheries management rules must be enforced strictly by involving the local leaders who can influence the fishing communities for the successful adoption of those rules.

Small-scale fisheries have two components viz. subsistence and commercial fisheries which co-exist. Both subsistence and commercial fisheries are important as the former provides food for local consumption and the latter brings cash incomes. However, both of them contribute to food security either in a direct or indirect way through the purchase of other food fishes by consumers (4).

In order to reduce the fishing capacity and rent extraction, a wealth-based approach is followed as the way forward in the world's fisheries. Though the model has its own merits even then it is being adapted by many developing countries to its small-scale fisheries sector as these countries severely lack capacity and resources, poor governance, and weak public, as well as private institutions which, are necessary elements for the creation and equitable redistribution of rent. With these drawbacks, relying on rent maximization as a means to poverty alleviation in the small-scale fisheries sector appears to be unrealistic as it solves only the problem of livelihood but not rent maximization (5).

Subsidies and small-scale fisheries:

The earlier studies revealed that a person engaged in large-scale fisheries has obtained 4 times a greater number of subsidies than that of counterpart SSF. Furthermore, almost 90 percent of capacity enhancing subsidies are diverted to the large-scale fisheries that creating an unfair competitive advantage to this sector which is already highly competitive. This unfair competition leads to developmental, economic, and social consequences

such as inequity that ultimately retards the economic viability of already vulnerable small-scale fisheries. In order to overcome such problems, taxpayers' money (subsidies) should be used to foster sustainable fishing practices. Efforts have to be made across both the (small and large-scale fisheries) sectors to reduce capacity-enhancing subsidies or to convert them into beneficial ones as SSF receives very little of these subsidies. Hence, they may have minimum negative effects and enable the sector to be economically more viable (6).

II. LOCATION OF STUDY

Bihar which is located in the eastern part of India is the 13th largest state by its area. The inland fishery resources of the state include; rivers (Ganga, Gandak, Kosi, Bagmati, Kamala, Balan, BudhiGandak, Mahananda, Son, Punpun, Saryuetc.)

and canals which cover a length of 3,200 km, reservoirs (7,200 ha), floodplain wetlands (5,000 ha), oxbow lakes (48,000 ha), chairs and ponds (65,000 ha). So there is immense possibility for small-scale fisheries development by using these resources efficiently. The locale of the study is shown in Fig.1.



Fig. 1 Map of Bihar state (7)

III. Fish production trends in Bihar state:

The state's fish production is steadily increasing over the years. The total fish production in the state during 2009-10 was 297.4 Thousand Tonnes

(TT) which is increased to 506.09 by the end of 2015-16. Fig.2 depicts the trend line of total fish production in the state during the period 2009-10 to 2015-16 (8).

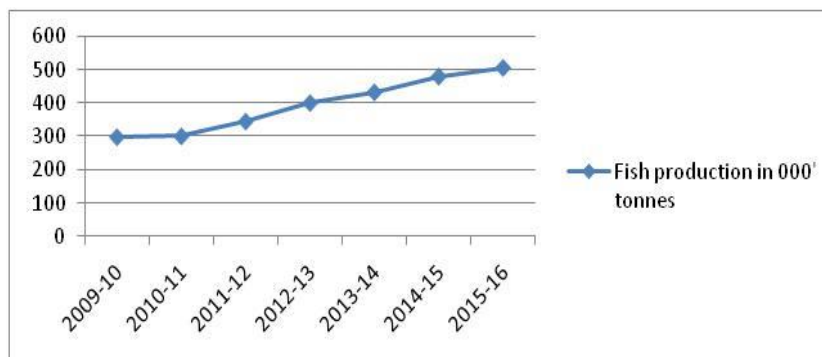


Fig. 2 Fish production trends in the state

Though the fish production is increasing steadily over the years the state average fish production (2.2 tonnes/ha under FFDA) is comparatively lesser than

other states. A study conducted in the Chaur region of Samastipur district of Bihar compared the profits of culture fisheries and agriculture. The average profit

under culture fisheries was about Rs.294378.06/ha which is more than the average profit of agriculture (i.e. Rs.87186.82/ha). The profits of privately-owned fish farms and co-operative fish farms of Chaur were Rs.79,522.99/ha and Rs.77,512.76/ha respectively. The unregulated fisheries of Chaur yielded about Rs.24,236.14/ha (13). However, the average annual production of the state (i.e. 2.66 lakh tonnes) indicates the low productivity which is mainly driven by traditional fish farming practices, undeveloped markets, overexploitation of riverine systems, etc. In order to increase annual production and efficiency following strategies are suggested;

- The yield of carp culture should be raised to 4 tonnes/ha/year
- The yield of freshwater prawn has to be increased up to 1 tonne/ha/year
- Production of integrated fish farming (fish-duck-poultry) has to raise up to 2 tonnes/ha/year
- Yield from pen culture in wetlands has to increase up to 2 tonnes/ha/year
- Production of culture-based fisheries in wetlands has to increase up to 1 tonne/ha/year
- Measures to be taken to protect habitats along rivers banks

With the adoption of the above strategies, the annual fish production of Bihar can be increased up to 4.5 lakh tonnes which are just enough to be self-sufficient in meeting the local demand for fish.

A. Fisheries Management and Policy implication in Bihar

Since fisheries are the subject matter of the state, the management aspects of fisheries resource like small and large water bodies are undertaken by the state itself. The FDA plays a key role in leasing out these water bodies. The water bodies will be leased out through open bidding where the interested individuals are asked to bid. For large water bodies, the minimum price set for bid is very high because of which the traditional fish farmers are not able to bid individually to own them. The large water bodies are usually leased out to the co-operative societies. The FDA develops ponds and leases them out to the Mullahs (fish farmers) with the consent of the cooperative society. The investment has to be returned within 10 years. FDA also has schemes like the construction of houses for the welfare of fish farmers.

However, one of the reasons for the ineffective utilization of water bodies and poor development of aquaculture in the state is the lack of an appropriate leasing policy. The short-term and long-term leasing policies of water bodies are defined by the Bihar Fish Farm Management Act 2006. This leasing policy is framed on a community-

based approach for the integrated development of aquaculture. Generally, small water bodies are managed at the panchayat level while large ones are by the fisheries department (9).

B. Bihar Fisheries Policy (2008)

In spite of having vast fishery resources, it has been observed a gap between demand and supply (43%). Considering the available water resources and the gap between demand and supply of fish, comprehensive fisheries and aquaculture policy has been made. The policy aims to increase fish production to the extent to secure food and nutrition security as well as rural livelihood. The highlights of the policy are as follows:

- Improve the data collection techniques so that a true picture of state fish production and consumption can be assessed
- For the development of aquaculture, improved aquaculture practices can be adopted in ponds with less than 10 ha which is large in number but has low productivity
- For the development of the fisheries sector, various water bodies such as ox-bow lakes, floodplain wetlands, etc. can also be effectively utilized. The floodplain wetlands can be managed more effectively by community collective management.
- The leasing policy which is applicable to reservoirs must give priority to those people who are displaced or affected and traditional fishers. The lease amount which is collected from the cooperatives, associations, and SHGs is used as a means of rehabilitation to these people. If the affected people are not found or absent, the reservoir can be leased out to the unemployed youth, private entrepreneurs, public undertakings, etc. through open auction. The lease period will be ten years.
- Conservation of Aquatic Biodiversity
- Marketing and value addition
- Human Resource Development
- Extension service delivery and support system

C. The Bihar Fisheries Bill, 2013 (draft)

The draft was made for the conservation and sustainable development of fish and fisheries resources. The draft bill aims at providing protection, conservation, development, propagation, exploitation, disposal, marketing, regulation of fish and fisheries in a scientific manner. The bill includes the following aspects:

- There is provision for the formation of a committee (with two fisher/fish farmer representatives) to advise the state on the matters of conservation and sustainable development of fisheries resources

- A complete list is prepared about a variety of gear used, crafts and the power of the engine, destruction of resources, exploitation of resources, etc.
- Provision is made for the development of fish sanctuaries
- Registration and license for production and marketing of fish are made compulsory and the state itself provides such registration facilities
- Provision for developing broodstock to maintain the fish seed banks
- Aims at regulating, monitoring, and setting up a certification process for the sale of fish seed and feed.

D. The Bihar Fish Seed Certification & Accreditation Act (2018)

The act was enforced in 2018 in order to improve the quality of fish seed and to avoid illegal activities. The act describes the following aspects:

- Committees are constituted at state as well as district levels for seed certification & accreditation
- Fully functional fish seed laboratories to be established
- Registration and licensing should be made mandatory for seed production and its marketing
- Prohibition of using explosives, poisons, and any kind of harmful chemicals in hatchery operations, fishing, or any other such operations
- The sale of brooders is strictly prohibited

E. Recent scheme for inland fisheries development in Bihar

Scheme 1: ₹ 490 lakhs are allotted for the production of fingerlings and to improve the quality of fish seed. The fish farmers will receive fish seed at a 50 % subsidy.

Scheme 2: About ₹ 1265.15 lakhs are allotted for the development of nursery ponds. There is provision for SC and farmers for the construction of nursery ponds and they will be provided a 90 percent subsidy. The aim of the scheme is to develop 311 acres of water area for nursery ponds.

Scheme 3: About ₹ 27.544 crores are allotted under “Mukhya Mantri Matsya Vikas Pariyojana”. The scheme provides a 40 percent subsidy for fish farmers. The aim is to develop 177 ha of new ponds, 425 ha of water area under wetlands, and 210 ha of water area for rearing ponds (12).

IV. Suggestions for the development of small-scale fisheries in Bihar

- A transparent leasing policy and supporting rules should be framed and enforced strictly at ground level in order to use available natural water resources efficiently.
- In order to increase the productivity of natural water bodies such as Reservoirs, Rivers, and wetlands culture-based capture fisheries may be promoted.
- The popularisation of different aquaculture practices and supportive extension activities are needed for the development of aquaculture in the state.
- There is a need to establish a greater number of hatcheries in order to produce quality fish seed and ensure supply throughout the year.
- The development of marketing and storage facilities in rural areas is required to reduce the loss of production and ensure the quality of the product.
- The creation of facilities for the preparation of value-added products may help increase consumption and also generate employment opportunities.

V. CONCLUSION

Small-scale inland fisheries is considered as an important income source for landless people particularly in the land-locked areas like the state Bihar. This sector is making a significant contribution to food and nutritional security. In spite of having potential water resources and endless state government effort in the form of framing schemes and acts, development in this sector has not met the expectations. Climate change, overexploitation, pollution of natural water bodies, and exploitation of fishers by dominant personalities and some government officials are found to be major constraints for the development of small-scale inland fisheries. This sector was found to be less competitive compared to the large-scale fisheries sector. The small-scale fisheries largely depended on subsidies given by the government. But subsidies have negative effects on the sustainability of the small-scale fisheries sector hence the same can be diverted towards the development of basic infrastructure such as marketing, processing, storage facilities, etc. that are essential for making this sector more competitive. Creating awareness among fishers and fish farmers about state fisheries policy and fisheries bills may increase the number of beneficiaries. Transparent leasing policy, popularising different aquaculture practices, extension services for promoting culture-based capture fisheries, creation of marketing and storage facilities, etc. are equally important in order to make the sector more competitive and profitable for the people who are dependent on it.

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