

# A Study of Fish Farming Development in Small Scale Pond in Bihar

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## Abstract

The cultivation of fresh water fish in a variety of aquatic bodies, eastern India's state of Bihar provides an ideal sub-tropical environment. Aquaculture has a significant impact on the state's food supply and rural economy. The integration of locally accessible biological resources, a pilot experiment with a group of resource-poor farmers shown that tiny seasonal farmhouse ponds could produce roughly 1 800 kg/ha/yr. Developing small-scale fish farming businesses in rural areas might have a significant impact on the local economy. Bihar's inland small-scale fisheries will benefit from the findings of this research. This pilot project was only the beginning of aquaculture education for farmers in the area, since aquaculture is a relatively new technique in the region. Fishermen in the Darbhanga area of Bihar were surveyed for their views on the challenges they face.

**Keywords:** - *Small-scale fisheries, Sustainability, Fisheries policy, Bihar, Aquaculture.*

## 1. INTRODUCTION

In addition to small-scale coastal and small-scale inland fisheries, small-scale fisheries include (SSIF). Small-scale inland culture fisheries, small-scale inland capture fisheries, and small-scale inland culture-based capture fisheries are all examples of small-scale inland fishing (rarely observed). There has been greater focus on small-scale coastal fishing than small-scale inland fisheries, on the whole. There are a variety of types of inland fisheries, including freshwater, brackish water, estuary (both lotic and lentic) natural and man-made water bodies. Fishing and aquaculture that does not take place in coastal waters are the focus of inland fisheries. Fishing communities are frequently regarded to be small-scale in India, and they are made up of both poor and marginal fishermen. Most of their time is spent working in agriculture or other manual labor to make ends meet, therefore many of them are discovered to be part-time fishermen. This industry, unlike the marine one, is mostly used for internal consumption and does not contribute to the country's exports in any significant way.

There is no homogenization or comprehensive industrialization of Indian fishing. Fishermen and fish farmers come from all walks of life and all economic levels. The majority of them fall under the "small-scale fisheries industry" umbrella. Small-scale fisheries (SSF) are sometimes seen as being trapped in a vicious cycle of poverty because of these social and economic constraints, which makes external policymakers opaque or unintelligible. The eastern Indian state of Bihar is the 13th biggest state by land area. Rivers (Ganga, Gandak, Kosi, Bagmati), canals (3,000 km long), reservoirs (7,000 ha), floodplain wetlands (5,000 ha), oxbow lakes (48,000 ha), chairs (and ponds) are all part of the state's fisheries resources (65,000 ha). Small-scale fisheries development may be achieved through maximizing the use of these resources. Figure 1 depicts the study's location.



**Fig. 1: Map of Bihar state**

## 2. LITERATURE REVIEW

**Ganesh Chandra (2019)** - In addition to providing food, fodder, fuel, and water for both home and industrial purposes, wetlands are among the most productive life support systems in the world and have a significant socioeconomic impact. Wetlands are abundant in India because of the country's great range of climate and topography. In the eastern states of Assam and Bihar, vast amounts of freshwater resources, such as marshes, tanks, ponds, and rivers, may be discovered. Assam and Bihar's most valuable fisheries resource is found in the floodplain wetlands (known as beels and chaur, respectively, in Assam and Bihar), which cover an area of more than 100,000 ha in Assam and more than 2,00,000 ha in the latter state. Because of their connections with the land and water systems, these wetlands are regarded one of the most productive ecosystems. The fisherman's family has relied on fishing in these floodplain marshes from time immemorial. There are numerous uses and different users for the floodplain wetlands. These are common property resources that are subject to a variety of management approaches. The fisheries of wetlands are owned and controlled by a number of different entities. There are several parties having an interest in the Wetlands, including fishermen, landowners, governmental agencies, non-profit organizations, financial institutions, research institutions, and others. Wetlands in the region are managed in a variety of ways, including private ownership (individuals and organizations), fishermen's cooperative management, community-based fisheries management, and open access. In both Assam and Bihar, cooperatives and individual fishermen were both required to sign seven-year leases. The development of sustainable fisheries needs an integrated strategy and the cooperation of a wide range of stakeholders, all of whom have a stake in the success of the project. For the sake of describing how stakeholders might exploit floodplain wetland resources for desired results, an effort has been made in this message to identify management regimes and institutional arrangements (positive or negative).

**Pintu Paul (2016)** - The socio-economic development of emerging nations depends heavily on inland fishing. In densely populated nations like India, this kind of economic activity would go hand in hand with agriculture. Aside from providing us with a source of revenue, fishing is also an excellent supply of nutrition. Aside from that, fishing has a positive impact on the local and national economies, provides opportunities for rural women and marginal farmers to get involved, helps to alleviate poverty by creating jobs, promotes the growth of supporting industries and infrastructure, and protects aquatic biodiversity. A region's overall development benefits from this. Nadia district in West Bengal, India, has been examined in this chapter in order to emphasize the above-mentioned facts. Focus here is on how much socioeconomic development has been achieved in this region with the use of inland fishing, and how much may be achieved with good planning.

**Ajay Kumar Singh (2015)** - The rapid speed of urbanization is threatening the natural ecosystems in peri-urban regions, and as a result, the livelihoods of people and other environmental services have been adversely affected. To begin, urban planners are looking for places where water may be stored,

such as ponds and streams. As a consequence, agriculture and biodiversity are seriously harmed in these regions. Because of this, the lives of small and marginal farmers are in jeopardy. The relevance of aquatic reservoirs in peri-urban settings is also being examined. Surveys of villagers in Uttar Pradesh's Gorakhpur district, where the Mahatma Gandhi National Rural Employment Guarantee Act of 2005 resurrected a 0.55-acre pond, formed the basis of this research (MNREGA). The cost-benefit analysis of ponds and wetlands in peri-urban regions is the topic of this article. This research included a meeting with local farmers to learn about the realities of pond ecosystems and the advantages they provide. A cost-benefit ratio was calculated based on this public engagement. Aquatic reservoirs in peri-urban settings have been shown to have a substantial impact on people's lives.

**Sanjeev Kumar (2012)** - Synthetic (man-made) agricultural systems may be found in both the natural and social worlds. "An assemblage of components connected by some type of interaction and dependency" is how it is defined (Mc Connel and Dillon, 1997). Research in agriculture should transcend disciplines, commodities, experimental farms, and labs, according to a general agreement (ICAR, 2000). There hasn't been much progress despite the bluster for over 30 years now. The status quo is perpetuated by a lack of clarity about the notion, skepticism about its rigor and scientific validity, and organizational and operational rigidity. Agricultural and farming systems are being introduced, and the Indian experience is being narrated in this context, as well as some proposals for integrating the farming system viewpoint into the national research system are being offered.

### 3. METHODOLOGY

Bihar's Darbhanga district was the site of the research. Due to its abundance of ponds and rivers, as well as other reservoirs, the district of Darbhanga was purposefully chosen as the site of the research because of its importance as a fish-growing region. It's important for the district to have a technical backstop to help it increase production. Darbhanga district has a total of 18 blocks. Two blocks were chosen at random from a pool of 18 based on the size of their fish ponds. The blocks Jale and Keoti were chosen at random for this investigation. One-hundred and thirty (300) fish breeders were randomly picked from the various blocks. There were 60 fish farmers included in this study's population of participants. As part of the research, a personal interview schedule was designed and prepared to gather pertinent data from farmers in a face-to-face interview setting. Perceived constraint magnitude was measured using a three-point continuum, with scores ranging from 2 to 1 to 0 (zero). Respondents were sorted according to their frequency, proportion of the population, standard deviation, mean score, and limitations.

### 4. DATA ANALYSIS AND OBSERVATION

#### THE DIFFICULTIES EXPERIENCED BY FISH PRODUCERS IN ADOPTING THE RECOMMENDED TECHNIQUES IN FISH FARMING:

Efforts were undertaken to gather information from respondents on the challenges they faced in adopting the suggested package of practices for fish production, and how these challenges might be overcome. During the interview, the participants were asked to describe the challenges they experienced in adopting the suggested package of practices for fish and to provide their recommendations. Respondents' restrictions are listed in Table-1, with percentages and frequencies allocated depending on their severity.

Table 1 shows that 85.0% of the fish producers strongly agreed that "non-availability of quality fish seeds" was a limitation. 81.67% of fish producers cited a lack of government assistance as a barrier, while 73.33% of them said the same thing about "High labor costs." "Lack of marketing facility" was the most common restraint for fish farmers, followed by flooding (65.00%), disease of fish (60.00%), soil productivity in the pond (55.00%), and a dearth of extension services (68.33%). (51.67 per cent). About 48.33% of fish farmers agreed to the restriction in "Distance from the dwelling." More over half (46.67 percent) of fish producers admitted to having a lack of natural feed in their ponds, while 38.33 percent admitted to having poisoned their fish. Also, 53.33 percent of the fish producers surveyed said that theft and pilferage were a major problem for them.

According to the classification of strongly agree, agree, and disagree, there are a total of twelve limitations. The points were awarded in the following ratios: 2, 1, and 0. Constraints were ranked according to their mean score. It's all laid out in Table 2.

Table 2 shows that the top limitation is the lack of quality fish seeds, with a mean score of 1.83, followed by "Lack of natural feed in pond," with a mean score of 1.77, and "Lack of government assistance," with a mean score of 1.70, as the first and second most important constraints. Flooding (5th rank) was followed by fish disease (6th rank) and its mean score of 1.45, a lack of marketing facility (7th rank) and its score of 1.40, a lack of extension service (8th rank) and its mean score of 1.32, and the productivity of the soil in the pond's 9th rank was its mean score of 1.28. Poisoning (11th) and theft and pilferage (12th) were the other significant restrictions, with mean scores of 1.05, 0.85, and 0.73 respectively.

**Table.1 The difficulties experienced by fish producers in adopting the recommended techniques in fish farming**

S. No	Constraints	Degree of agree (N = 60)					
		Strongly agree (2)		Agree (1)		Disagree (0)	
		f	%	F	%	f	%
1	Non availability of quality fish seeds	51	85.00	8	13.33	1	1.67
2	Productivity of the soil of the pond	33	55.00	11	18.33	16	26.67
3	Lack of natural feed in pond	19	31.67	28	46.67	13	21.67
4	Disease of fish	36	60.00	15	25.00	9	15.00
5	Poisoning	14	23.33	23	38.33	23	38.33
6	Lack of government support	49	81.67	11	18.33	0	0
7	Lack of extension service	31	51.67	17	28.33	12	20.00
8	High labour cost	44	73.33	13	21.67	3	5.00
9	Distance from the house	17	28.33	29	48.33	14	23.33
10	Flooding	39	65.00	14	23.33	7	11.67
11	Lack of marketing facility	41	68.33	14	23.33	5	8.33
12	Theft and pilferages	16	26.67	12	20.00	32	53.33

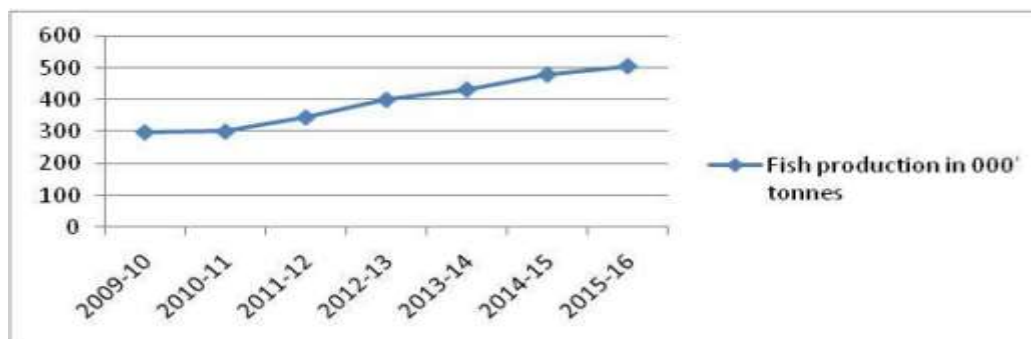
**Table.2 As a fish producer, you confront a number of constraints (rank-wise).**

Sl. No	Statement	Total score	Mean score	Rank
1	Non availability of quality fish seeds	110	1.83	I
2	Productivity of the soil of the pond	77	1.28	IX
3	Lack of natural feed in pond	106	1.77	II
4	Disease of fish	87	1.45	VI
5	Poisoning	51	0.85	XI
6	Lack of government support	102	1.7	III
7	Lack of extension service	79	1.32	VIII
8	High labour cost	101	1.68	IV
9	Distance from the house	63	1.05	X
10	Flooding	90	1.5	V
11	Lack of marketing facility	84	1.4	VII
12	Theft and pilferages	44	0.73	XII

Most fish farmers firmly agreed that "Non availability of quality fish seeds" was the most common restraint, followed by "Lack of government assistance" (81.67%) and "High labor costs" (73.33%), according to the study's findings. Lack of marketing facilities was found to be a major problem for fish producers, accounting for 68.33 per cent of the respondents. Flooding, fish disease, and the productivity of the pond's soil were all found to be major issues (51.67 per cent). Also apparent in the research is how "Lack of natural feed in pond" obtained the second-highest ranking, with a mean score

of 1.77, while "Lack of government assistance" received the third-highest ranking, with a mean score of 1.70. For both producers and consumers, it is possible that government involvement in order to promote domestic output may have reduced market middlemen's dependency and so ensured that the interests of both parties would be protected.

## 5. TRENDS IN THE FISHING INDUSTRY IN BIHAR:



**Fig 2: The state's fisheries production patterns**

Fish output in the state has been rising substantially over the years. In 2009-10, the state produced 297.4 thousand Tones (TT) of fish, and that number is expected to rise to 506.09 TT by the end of 2015-16. Fig.2 displays the state's total fish output from 2009-10 to 2015-16, as shown in the graph.

## 6. CONCLUSION

Landless people in landlocked places like Bihar, small-scale inland fishing provides a significant source of income. In terms of food and nutrition security, this industry is providing a substantial contribution. Despite the abundance of available water and the tireless efforts of the state government in the form of legislation and plans, growth in this area has fallen short of expectations. Small-scale inland fisheries are hindered by climate change, overfishing, contamination of natural water bodies, and the exploitation of fishermen by dominating personalities and certain government officials. When compared to large-scale fisheries, this industry was determined to be less competitive. Subsidies from the government were crucial to the success of small-scale fishing. Small-scale fisheries subsidies may have a detrimental impact on the sustainability of the industry; therefore, the money can be used to create basic infrastructure like marketing, processing, and storage facilities. Increasing the number of people who benefit from the state's fisheries policy and fisheries law might be done through raising awareness among fishermen and fish growers. Equally crucial is a transparent leasing policy, the promotion of various aquaculture approaches, the provision of extension services for boosting culture-based capture fisheries and the construction of marketing and storage facilities.

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