



Study Of Fish Production And Marketing As A Livelihood Support System In A Gadchiroli Area

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Abstract: This study investigates the role of fish production and marketing as a livelihood support system in a rural village, exploring its socio-economic impact, production practices, and marketing challenges. Fish farming has become a vital source of income and food security for many rural households, offering both direct and indirect employment opportunities. The study examines the different types of fish farming practiced in the area, including pond and cage aquaculture, and identifies the key factors influencing production, such as water quality management, breeding techniques, and disease control. Additionally, the marketing aspect of fish production is analyzed, focusing on market channels, pricing, and value chain dynamics. Challenges faced by fish farmers and marketers, including limited infrastructure, competition, and price volatility, are also highlighted. The findings indicate that fish farming significantly contributes to local economies, improves household income, and empowers marginalized groups, particularly women and youth. However, issues such as insufficient technical knowledge, inadequate market access, and fluctuating market prices need to be addressed for sustainable development. The study concludes with recommendations for improving production practices, enhancing market linkages, and providing policy support to ensure the sustainability of fish farming as a viable livelihood option in rural areas.

Keywords: Fisheries, fish farmer, livelihood, marketing, sustainability, employment, economic growth, marginalized and vulnerable communities

I. INTRODUCTION

India is one of the largest fish producing countries in the world and shares 7.58% to 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. 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.

Fisheries and aquaculture remain an important source of food, nutrition, employment and income for millions, especially the rural populations. In fact, the sector provides livelihood to about 25 million fishers and fish farmers at the primary level and twice the number along the value chain. Fish being an affordable and rich source of animal protein, is one of the healthiest options to mitigate hunger and nutrient deficiency.

In this context, fisheries play a key role in promoting health by providing animal protein as well as generating employment and economic growth.

Majority of fisher folk directly depend on the sector, especially the small scale and artisanal fishers and are continue to fall behind the national indices of socio-economic development.

It is essential to provide stimulus towards improvement of poverty and backwardness among these marginalized and vulnerable communities and promote their holistic development and welfare.

If given the proper socio-economic, environmental and institutional frameworks, fisheries can contribute significantly to the household income and provide a way out of poverty for a significant section in India.

II. RESEARCH METHODOLOGY

1. Research Design

Data was collected from both the primary and secondary sources. This study employs a mixed-methods approach, combining qualitative methodologies which consist of Interviews, Participant Observation.

2. Data Collection

2.1 Primary Data

Primary data was collected from key informants - individual fish farmers having own ponds, fish farmers doing fishing in river, fishermen co-operative societies and fish retailers. The study was conducted from March 2024 to June 2024. The data was gathered through survey of 323 fisher folk selected through Purposive Sampling Method and Quota Sampling Method based on occupational status. Interviews and focus group discussions were also carried out. The sample size according to different occupational status is given in Table 1.0. Earlier it was decided to do the survey of at least 500 fisher folks but it was not possible due to time and resource constraints.

2.2 Study Area

The study focuses on northern area of Gadchiroli district which includes five Taluka places and big villages surrounding them are as follows –

1. **Gadchiroli** (district place)
2. Village – Porla (Taluka Gadchiroli)
3. Village – Wasa (Taluka Gadchiroli)
4. **Armori** (Taluka place)
5. Village – Wadadha (Taluka Armori)
6. Village – Wasala (Taluka Armori)
7. **Wadsa / Desaiganj** (Taluka place)
8. Village – Kondhala (Taluka Wadsa)
9. **Kurkheda** (Taluka place)
10. Village – Ghati (Taluka Kurkheda)
11. Village – Palasgarh (Taluka Kurkheda)
12. **Korchi** – (Taluka place)

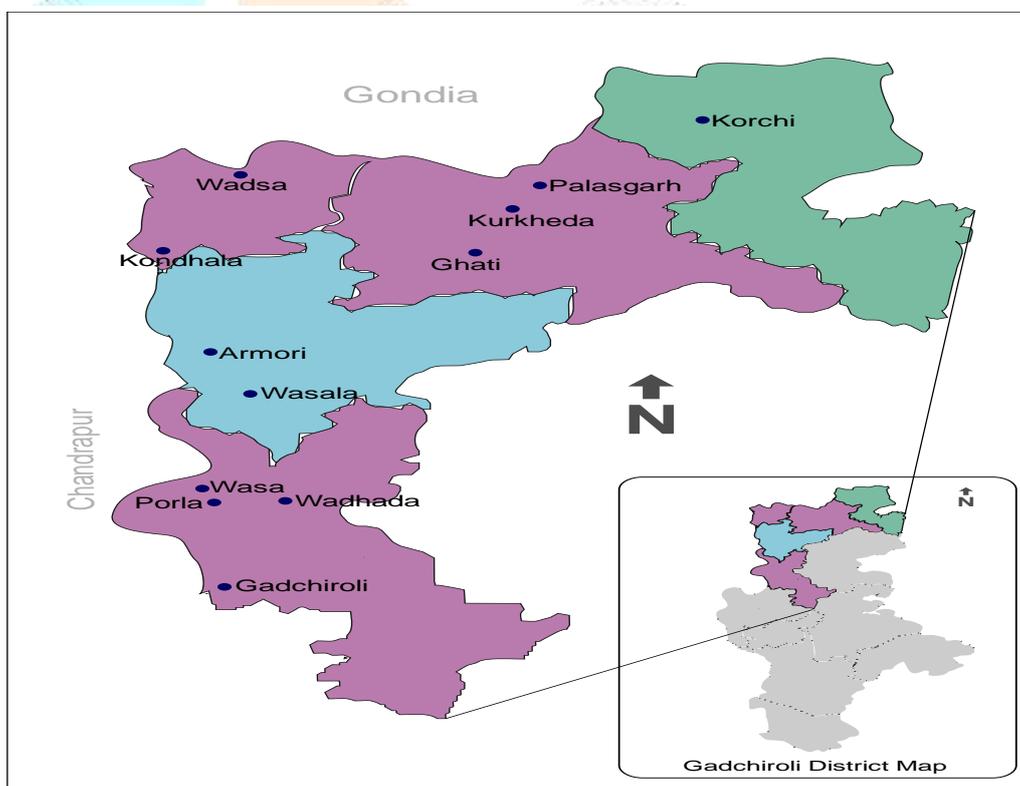


Table 1.0: Sample size according to occupational status

Occupational Status	Sample Size
Individual fish farmers having own ponds	15
Fish farmers doing fishing in river	32
Fisher folks in fishermen co-operative societies	255
Fish retailers / traders	21
Total	323

2.3 Secondary Data

Secondary data sources included – Gadchiroli District Fisheries Department. Also, the government reports, research papers, and existing aquaculture studies is taken as a reference.

III. DATA ANALYSIS

1. Fishing Sources

Fishing is one of the major activities supporting livelihoods and mainly involves procuring fish from different sources – (1) Village Ponds or Tanks (2) River and (3) Private Ponds.

1.1 Village Ponds or Tanks

Tanks are another major source of fishing. In PESA area tanks are own and operated by Gram Panchayat (village councils). While the tanks in non-PESA area are maintained by Zilla Parishad. Panchayat auction the tanks to the fishing community. First priority is given to the local village fishermen co-operative societies. Till date fish farming is done in traditional manner only.

1.2 River

The other major source for fishing activity is the river network and its tributaries. Numbers of fishermen dependant on the river network vary largely. Fish catch obtained from river source is found to be uncertain due to natural constraints, frequent tearing of nets etc.

1.3 Private Ponds

Private ponds are own and operated by the individuals who hold the land. These pond constructions include initial high investment and capital. Owner of the land is responsible for the pond management. Sometimes, these ponds can be leased to another person who is willing to do the farming. Nowadays, private pond owners are not only from the fishermen communities but also the individuals belonging to tribes and other communities. They have also tried to adopt the new fishing techniques like biofloc, semi-biofloc, RAS, cage culture etc.

2. Socio-Economic Aspects

2.1 Fishing Communities

Fishing communities, located throughout the district, are either restricted to a few households spread out in a village or living in a locality together in groups, or “Mohalla”. They are concentrated more in the Waingangā River stretch. Difference in economic status across fishermen is found to be evident. Very few households are found totally dependent on fishing and others have supplementary income from other sources. Most of the families are below the poverty level. Fishermen prefer that their children develop skills other than fishing but the lack of interest in schooling, poverty and bad habits like alcohol, tobacco consumption children at a very young age are dropout of the school and go along with father for fishing and finally, they become expert in catching fish.

2.2 Role of Women

In Konkan region of Maharashtra, when men come back home from fishing in sea the female are used sell the fishes in the market. But in this region, the role of women in fisheries is very much negligible. The number of women members in fishermen co-operative societies is very low. And many of these women have joined the society on the husband’s place after the death of their husbands. Only men do the work like catching fish, selling, trading and marketing. There are only “fisher-men” co-operative societies but not a single “fisher-women” co-operative society.

2.3 Fishermen Co-operative Societies (FCS)

Fisheries Department promotes the formation of FCS, which can be formed by registering under the Cooperative Society's Act 1956. In Gadchiroli district, total 64 FCS have been registered. During the study, interactions were held with 5 societies to understand their role, functions and constraints.

2.4 Individual fish farmers having own pond

Few years back, we have seen those families or the individuals from fishing community who are financially in good condition used to go for fish farming in own pond. They were doing it as a part-time profession and in a traditional manner. But as the "BLUE REVOLUTION" word is spreading lot of people come to know about the economics of fisheries and aquaculture. At present, situation of educated youth facing the problem of unemployment due to various constraints, they are attracted towards the fisheries sector. Nowadays, people investing into the fisheries, doing it as a full-time profession and earning the good amount of money.

2.5 Fish Traders

Traders are engaged at different levels in the fish marketing chain. Based on their roles, they can be grouped into (1) Catchers cum traders (2) Individual sellers (see table 2.0). 70% of traders were involved full time.

Table 2.0: Traders role at different levels

Traders Type	Roles
Catchers cum traders	Catch and sell the fish in nearby villages
Individual Sellers	<ul style="list-style-type: none"> - Buy fish either from market or fishermen and sell in villages/towns - Buy from other districts/taluka's and distribute to retail traders across towns

Schematic representation of fish trade



3. Markets

Every Taluka place has at least a single selling outlet where the local traders sell fish. Markets are not well managed and have no proper storage facilities. The district place Gadchiroli, is the big market for fisheries. However, in Gadchiroli, mainly fishes purchased from other districts are sold. In addition to local fishes produced are sold at village level at lesser price. Fish is sold through fishermen co-operative societies as well to the traders directly based on the understanding they have with them. There are no definite methods followed in selling fish, rather, it is a combination of traditional practices, networking and mutual understanding. Individual fish farmers having private ponds/tanks also sell their fish to local traders and wholesalers.

IV. ECONOMICS OF THE FISH FARMING

1. Fish farmers doing fishing in river

Average biomass in kg per harvest	3 kg - 5 kg
Working days per year	60 to 70 days
Working hours	12 hours
Distance travel per trip	6 km
Investment (last year)	Rs. 1500/-
Earnings per day	Rs. 250/-
Total Earnings per annum	Rs. 15000/- to Rs. 17500/-

2. Fish farmers in fishermen co-operative societies

Average biomass in kg per harvest	100 kg
Working days per year	50 to 60 days
Working hours	8 hours
Distance travel per trip	5 km
Investment (last year)	Rs. 2000/-
Earnings per day	Rs. 500/-
Total Earnings per annum	Rs. 25000/- to Rs. 30000/-

3. Individual fish farmers having own ponds

Average biomass in kg per harvest	50 kg
Working months per year @ farming	10 -12 months per crop
Working hours @ farming	24 hours
Working days per year @ harvest	40 days
Working hours @ harvest	6 hours
Investment (last year)	Rs. 12000/-
Distance travel per trip	10 km
Earnings per annum	Rs. 350000/-

4. Small Fish Retailers / Traders

Average biomass in kg per day	10 kg - 20 kg
Working days per year	200 to 240 days
Working hours	8 hours
Distance travel per trip	50 km
Investment (last year)	Rs. 8000/-
Earnings per day	Rs. 650/-
Total Earnings per annum	Rs. 130000/- to Rs. Rs. 156000/-

V. ECOSYSTEM

The fishermen co-operative societies and the individual fish farmers having own pond do take care of the pond ecosystem. Every year they release the fingerlings into the pond. Gadchiroli district have around 67 fishermen co-operative societies and many other private pond owners but here there is not a single fish hatchery. The seed/fingerlings are imported from Chhattisgarh. Mostly these seed are not purchased from authorized hatcheries, so there is problem of alien species which is causing problem to fishes belonging to Indian major carps (IMC). Introduction of fish tilapia affecting the growth of other species.

VIII. RESULT AND DISCUSSION

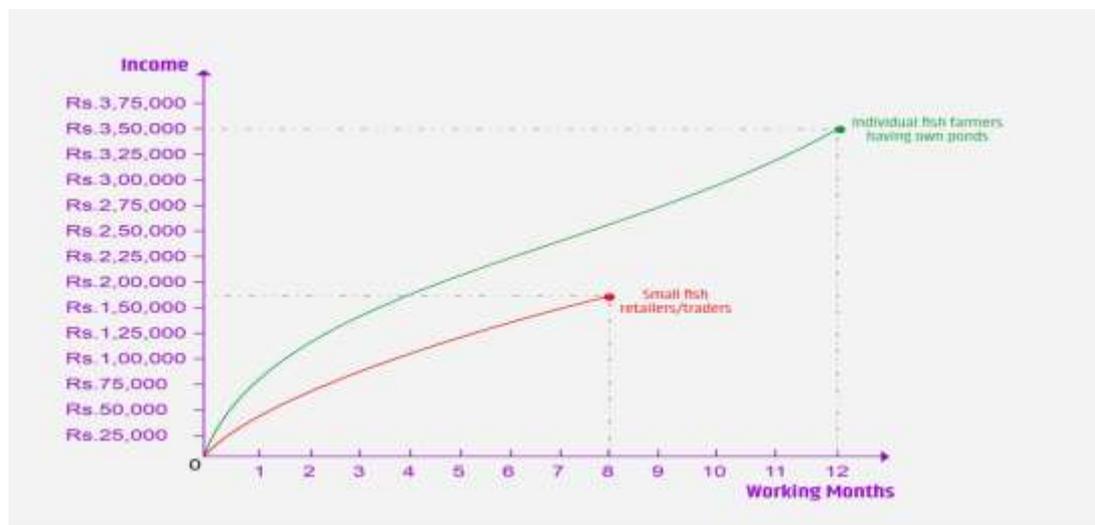
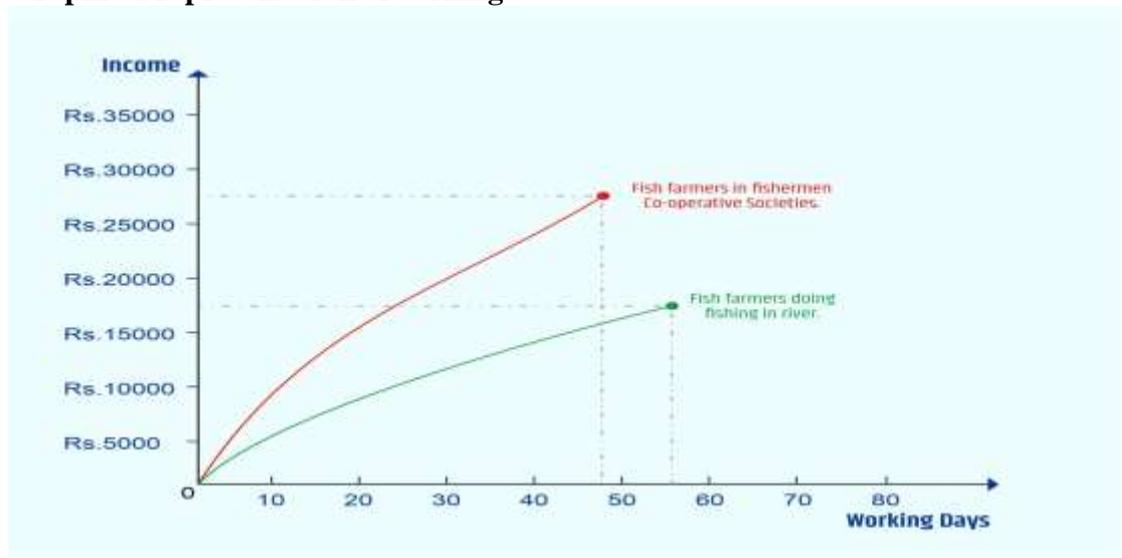
1. Fishing and Livelihood

- The study shows that there is difference in economic status across fishermen is found to be evident.
- Very few households are found totally dependent on fishing and others have supplementary income from other sources.
- Most of the families from fishermen community are below the poverty level.
- The income earned from the fisheries is likely supporting the households.
- The individual fish farmers and the retailers / traders are earning better compared to the others. (Please refer the tabular data from the “Economics of fish farming”.)
- Today lot of educated unemployed as well as employed youths are investing in fish farming and fish related activities as a full-time profession by seeing the opportunities in fisheries.

2. Dependency level

- Dependency level on fisheries is decreasing compared to earlier days as most of the fishermen feel that fishing is less remunerative.
- Tender system has increased their investment costs and their dependency on middlemen.
- As income derived from fisheries is found to be meager and uncertain, diversification into other occupations seems common.
- Most of the fishermen migrate for work during lean season.
- 90% of fishermen work in other sectors during monsoon period.
- Due to availability of labor work like MNREGA and other skilled and semi-skilled works, that has forced them to move out of fishing activities.

Graphical representation of earnings



3. Profitability and Employment opportunities in fisheries activities

- As we see in the detailed analysis of tabular data from the “Economics of fish farming” with less amount of investment fishermen are getting the average daily income.
- As compared to fishermen doing fisheries in river and fisher folks in fishermen co-operative societies, the individual fish farmers do the lot of capital investment and also getting the good returns.
- There is huge gap between the demand and supply of the fish in the market.
- If we understand the profit calculation at micro-level,

Average rate of fingerling	Rs. 5/- per piece
FCR (Feed conversion ratio for 1kg biomass)	1.5
Feed required	1.5 kg
Average cost of feed	Rs. 50/- per kg
Cost of feeding	Rs. 75/- per piece
Cost of Medicine and Probiotics	Rs. 10 /- per piece
Electricity charges	Rs. 10/- per piece
Labour charges	Rs. 10 /- per piece
Total cost	Rs. 110/- per kg
Selling Price to Retailers and traders	Rs. 150/- per kg
Selling Price to Consumers	Rs. 220/- per kg

From above table we see that –

- If fish farmer directly sells the fish to consumer, for 1 kg biomass he will get profit of Rs.110/-
- If sell the fish to retailers/ traders, for 1 kg biomass he will get profit of Rs.40/-
- Similarly, fish retailers and traders get the profit of Rs.70/- per kg biomass.

- As the production level expands, profit margin will be more visible.
- If we compare the fish farming to the agriculture, in this area paddy in 1 acre area gives you the profit of Rs.15000/- to Rs.20000/- at the end of six months duration. While the fish farming in same 1 acre area will give you profit of Rs.100000 /- to Rs.150000/- at the end of six months.
- If given the proper socio-economic, environmental and institutional frameworks, fisheries can contribute significantly to the household income and provide a way out of poverty for a significant section in India.

VI. CHALLENGES

1. Fisheries in river

- Decline trend in production of fish from the river due to indiscriminate fishing.
- Department of fisheries also did not have any data about the current production of fish from the major river and its tributaries.
- Regulated and unregulated sand mining posing the threat to river ecosystem and biodiversity.
- Dams and barrages have cut off the natural path of the prawns and fishes.
- Problem of alien / exotic species.
- There is no mechanism to replenish the riverine ecosystem.
- In summer season, fishermen used to stay in river banks and do the fishing in the night. But wildlife animals like tigers, wild boar causing threat among the fishermen.

2. Fish farming in pond/tanks by fishermen co-operative societies

- Till date, fishermen co-operative societies are doing the fish farming in traditional manner.
- Lack of enthusiasm towards the new fish farming technology.
- Very few fishermen co-operative societies do the extra efforts for maintaining the pond ecosystem.
- Growth of weed in the pond which causing the problem during the harvest.
- Purchase of fish seed is not from the authorized hatchery which causing the introduction of alien and exotic species to the pond.
- Problem of thieves.

3. Fish farming in pond/tanks by individual fishermen

- Initial high capital investment.
- Unavailability of good quality seed in the local market.
- Unavailability of good quality feed in the local market.
- If the farmer is doing intensive fish culture, then it requires high operational cost.
- If the farmer is doing biofloc or RAS fish culture then it requires 24*7 electricity.
- Problem of thieves.

4. Fish retailers and traders

- Markets are not well managed and have no proper storage facilities.
- Fluctuation in prices.
- Less consumption of fish during the festival seasons.
- Availability of fish.

5. Lack of integrated approach

- Various departments including Fisheries, Irrigation and Agriculture do not have a common strategy or management to address the problems and needs of respective sectors.

VII. CONCLUSION

The study shows that fisheries in northern area of Gadchiroli district support the livelihoods of a significant proportion of the population.

The main focus of rivers is on agriculture and managing water to meet the needs of irrigation and domestic drinking water. Programs like river ranching should be incorporated to sustain and conserve the biodiversity in the river, increase the fish production and enhance income and livelihood opportunities to communities dependent on these resources.

There need to be policies and institutions which can facilitate the entry of poor, women and youth into fisheries. There is need of an integrated framework within which where the relevant policies, departments and programs can be pulled together for facilitating the access to the poor.

Various measures can be imitated at the local level, like improving the water bodies, developing local co-operative insurance schemes to include poor, legitimizing community networks, increasing training programs etc. The complexities of the poor are diverse that need to be addressed through a holistic approach with regard to future fisheries development programs.

VIII. RECOMMENDATIONS

1. Education and Training: The low literacy status among the community restricts them from acquiring proper skills. It is important to design training programs that suit community. Besides, extension services are dominated by men, and men-women contact is not allowed socially. Training should be conducted close to villages or homesteads, during the day when women are free from household chores using simple visual aids.

2. Women's participation in aquaculture: Benefits women through an increase in household income and improvement in nutrition. Helps women gain control over their own livelihoods and improve their status both within the household and the community. Improved access to income and livelihood options. Higher household income due to added human capital in aquaculture. Increased participation in various decision-making processes within the family.

3. Access to credit: There need to be smooth and easy loan or credit availability for fisheries activities like kharif / rabbi crop loan process.

4. Agriculture status to Fisheries: Government should give the agriculture status to the fisheries. This will give the advantage of easy availability of credit like the crop loan, subsidized electricity and insurance scheme which is need of the hour.

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