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Research Paper

# Synthesis of Fisheries Business Success Models under Public and Private Sector in Chhattisgarh, India

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**ABSTRACT**

The objective of the present study was to analyze the successful fisheries business model in Chhattisgarh. Since various public and private sector are involved for fisheries development in the state directly or indirectly such as state fisheries department/colleges/Institution/Federation/Center/Company Group/ Farmer etc. The respondents were selected randomly and the pre-structured questionnaire were sent through mail or direct meeting and in case of private sectors a few entrepreneur were selected purposely following random sampling for the study. In Chhattisgarh few numbers of stakeholders are available for the supply chain management in fisheries sector. The study noticed that private sector, progressive farmers, co-operative sector and companies play a pivotal role and major contribution of fish seed production, fish production, ornamental fish and fish feed. Futhermore, State universities and college develop human resources for the sector. The fish farmers were mainly involved in fish production practices whereas the harvesting practices was carried out by Machhuara community cum retailer which is the main reason behind less producer share in consumer rupee of fish farmer.

**HIGHLIGHTS**

- Fisheries sector not only supplies dietary essentials for human consumption, but provides excellent opportunities for employment and income generation, especially in the more economically backward rural areas.

**Keywords:** Market, Fish business models, stakeholder, Public and Private sector

China is one of the leading markets for fish items like Ribbon fish, Croacker etc. China accounted for 31.75% in volume and 10.03% in value of the total export of marine products from India (Ayyappan S. and M. Krishnan).

The inland fisheries resources of the country include a length of 0.19 million km rivers and canals and 6.76 million ha area of reservoirs, ponds and tanks, lakes and derelict waters. During 2018-19, the annual production of the country was 13.7 million metric tonnes (MMT) with a contribution of 8.92 MMT (65%) from the inland sector alone (Economic Survey, Department of Economic Affairs, Ministry of Finance, Govt. of India; 2018-19).

As per the report of Fisheries Department, Government of Chhattisgarh, the state has 78 numbers of circular hatcheries, 59 numbers of fish farm and 1126 number of individual rearing space with the available water area of 639.29 ha both in public and private sector. Present demand of fish seed is placed at more than 140 crores standards fry against of which 288 crore have been produced in 2020-21.

The state is playing significant role by generating

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self-employment through fisheries related business in rural areas for about 2.20 lakh persons and providing ₹ 264.00 lakh man-days of employment in 2019-20. At present 1595 number of fisheries co-operative societies with 51712 members registered in Chhattisgarh (Annual Report-2019-20, Department of Fisheries, Govt. of Chhattisgarh).

Fisheries management involved all the activities, agencies and policy starting from procurement of farm inputs by the farmers and the movement of fish and fish value added products from farm/ landing center to the ultimate consumers. Development of fisheries sector equally important both input and output supply management (Kohls, R.L. and Uhl, J.N.).

The efficient movement of produce mainly depends on the management of supply chain involving transportation, processing and handling of produce. Supply chain management, therefore, needs to be given top priority as under-developed supply chains are unlikely to help industry (Murali, D. *et al.*).

Both the public such as Fisheries Department, Chhattisgarh State Cooperative Fish Federation, Self Help Group and private sector like Progressive Farmers, Fish Feed Company, Aqua-clinics & Aquapreneurship Center, Aquarium & Accessories Center and individual Farmers, NGOs etc can play a major role for fisheries supply chain management in the state.

The Chhattisgarh State Cooperative Fish Federation, Raipur came in to existence on 1st November 2000 on the eve of the bifurcation of Madhya Pradesh State. It is apex body of primary fisheries cooperative society presently with 434 members, which play a major role for the upliftment of various fisheries societies.

The C.G. Fish Federation has 09 numbers of fish hatcheries with a total water area of 39.69 Ha. These centers are producing 9843 lakh Spawn and 622 lakh fry annually *(Source: Department of Fisheries, Chhattisgarh)*.

The Main aim of C.G. Fish federation is to generate maximum employment to fishermen through raising fish production in different water bodies such as lake, reservoirs, canal etc. Under state fisheries policy 2014-15 Amendment more than 1000 ha capacity reservoirs were provided to Cooperative Fish Federation for culture and management at royalty charges. In these fish farm and reservoirs pangasius fish farming, prawn culture, and major carp farming were done. The federation are undertaking fish culture in 13 reservoirs with total water area of 39035.75 ha and producing 2593 MT fish annually with employment generation about 1.50 lakh fishermen days.

Nevertheless, fisheries sector is one of the most promising allied sectors in agriculture for enhancing income, employment, nutritional security and revenue of the state. Keeping the view of its importance for the development of fisheries sector in the state, a study on synthesis of fisheries business success Models under public and private sector in Chhattisgarh has been attempted in this study.

## METHODOLOGY

**Data collection-** The various numbers of public and private sector working for development of fisheries sector in Chhattisgarh like governmental Organization/Institution/Federation/Center/ Company/ Group/ Farmer were categorized and selected randomly & in case of private sectors a few (12) entrepreneur were selected purposely following random sampling procedure for the study. The study was based on both primary as well as secondary data. The primary data were collected of governmental organization and private farm from the survey of sample through personal interview and e-mail with the help of pre-tested and structured schedules. The secondary data were collected from various reports, journal and annual reports of the government department and through internet source.

## RESULTS AND DISCUSSION

### Public Sector:

**Chhattisgarh State Cooperative Fish Federation:-** Healthy and diseases free seed is very important for success of farm. The state co-operative organization regularly supplies of healthy fish seed at reasonable price to farmers. Culture practices is help full for earn profit and decreases cost of production. The Chhattisgarh State Cooperative Fish Federation was provided properly training to farmers. The successful shop and center operated from 2014-15 for ensure that the consumer's get the fresh fish, retail outlets are being.

## RESULTS AND DISCUSSION

Chhattisagrh state has Rice based culture system and food grain production is more popular as compare to fish production. Initially, cost and risk were high in case of fish production. Large number of marginal and small farmers in the state and have lack of asset for aquaculture and should be need to finance and support. Public sector like cooperative fish federation and departmental farm is success. Few numbers of progressive farmers were successful in state. Public sector intervention private farms were very success.

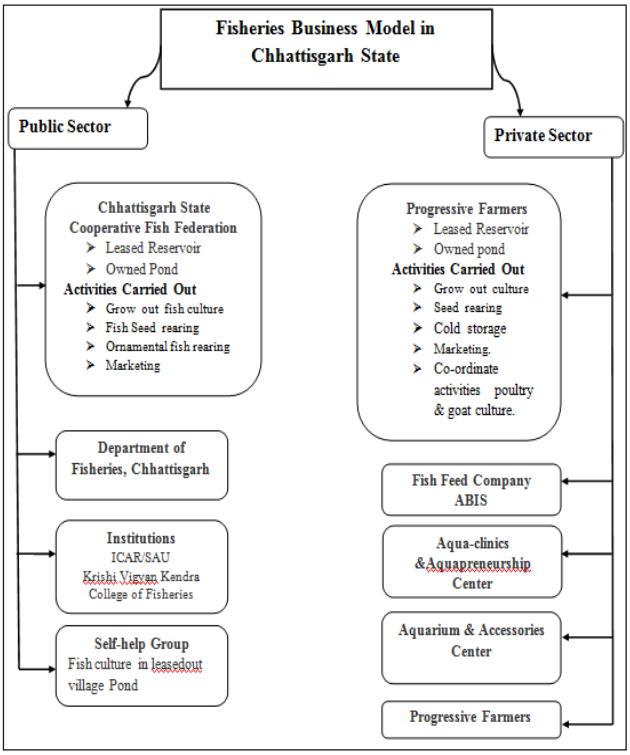


Fig. 1: Fisheries Business model in Chhattisgarh

**Table 1:** Fish Seed Farm under Chhattisgarh State Cooperative Fish Federation (2020-21)

| Sl. No. | Fish Seed Farm | Area (ha.) |
|---|---|---|
| 1 | Demar (District-Dhamtari) | 26.50 |
| 2 | Sellod (District-Durg) | 10.50 |
| 3 | Khutelabhata (District- Durg) | 14.00 |
| 4 | Khutaghat (District- Bilaspur) | 2.12 |
| 5 | Atmanagar (District- Korba) | 1.50 |
| 6 | Dudhawa (District-Kanker) | 2.00 |
| | **Total** | **56.62** |

***Source:*** *Department of Fisheries, Chhattisgarh.*

**Table 2:** Reservoirs under Chhattisgarh State Cooperative Fish Federation (2020-21)

| Sl. No. | Reservoirs | Area (ha.) |
|---|---|---|
| 1 | Dudhawa (District-Kanker) | 2511.00 |
| 2 | Madamsilli (District- Dhamtari) | 1367.00 |
| 3 | Sikaser (District-Gariyaband) | 1174.00 |
| 4 | Manoharsagar (District-Rajnandgaon) | 2518.00 |
| 5 | Kodar (District-Mahasamund) | 2050.00 |
| 6 | Kharkhara (District-Balod) | 1875.00 |
| 7 | Tandula (District-Balod) | 2275.00 |
| 8 | Gondali (District-Balod) | 1118.00 |
| 9 | Darri (District-Korba) | 1333.75 |
| 10 | Khudiya (District-Mungeli) | 1667.00 |
| 11 | Khutaghat (District-Bilaspur) | 2712.00 |
| 12 | Hasdeo-Bango (District-Korba) | 11500.00 |
| 13 | Gangrel (District-Dhamtari) | 6935.00 |
| | **Total** | **39035.75** |

***Source:*** *Department of Fisheries, Chhattisgarh.*

**Department of fisheries, Chhattisgarh:** Department of fisheries plays a significant role in the development of fisheries in the state. The main objectives of fisheries Department were Strengthening infrastructure in harvest, post-harvest, value addition and marketing, Increasing the per capita availability and consumption of fish to about 20 kg / capita /annum, securing and increasing employment opportunities in the sector & most important. To double the income of the fishers and fish farmers with special focus on increasing productivity and better marketing post-harvest infrastructure including e-commerce and other technologies and global best innovations. Department have many resources of fish production like seed production farms, cage culture, input supply, given subsidies for the improvement of fish farm, providing technical and other support to fish farmers. The department also organized training programs for farmers within state and outside the state, study tours and exposure visits for the Chhattisgarh fish farmers. Nevertheless the department established demonstration units for farmers' awareness and capacity building among fish farmers. Training was imparted to farmers and out of the state study tours should be conducted to teach them new techniques of fish farming (Singh, R. *et al.*)

**Self-help Group:** Many SHG has taken the village pond on lease which is under the purview of *Gram Panchayat*. Such practices of fish farming support the livelihood of the Self-help Group members. Some of the constraints faced by the members were low productivity of village pond due to extensive system of fish culture and no scientific techniques were practiced. Moreover they have to sell their produce to village peoples at price as fixed by the gram *panchayat* which is comparatively lesser than market price. Also the excess productions were sold to the Machhuara community cum retailer at 50-50 percentage profit basis.

**KVK's & College:** In Chhattisgarh 27 no. of Krishi Vigyan Kendra are there and one Fisheries College & one Fisheries Polytechnic college established. College of fisheries, Kawardha is a constitute college of Dau Shri Vashudeo Kamdhenu Vishwavidyala (DSVKV), Durg and it is the 19th Fisheries College in the country. The vision of the College are to develop human resources in fisheries for the improvement and management of aquatic resources, conduct research and development studies on different areas of fisheries *viz.* aquaculture, capture fisheries, aquatic management and fish processing technology. Such institute also play important role in transfer of technologies through training, extension and outreach programs for government and non-government organization on fisheries management, policies and development. The scope of diversification of enterprises within the gamut of aquaculture operations is available in the literature generated by fisheries research institutes and fisheries colleges located in the country (Ayyappan S. and M. Krishnan).

## Private Sector

**Progressive farmer:** Mohammad Imran Khan Farm (MIKF), a progressive fish farm of the state was purposively random selected for the study. It is located at Sihawa, Block- Nagari which is about 71 km away from Dhamtari district. The owner of this farm is Mr. Mohammad Imran Khan. The farm has total area of 10 ha. in which 8 ponds are constructed, 2 pond were rearing pond and 6 pond were grow out pond.

## Activities Carried Out at Mohammad Imran Khan Fish Cultivation

- **Seed-rearing:** Rearing of seeds have been practiced in this farm. Here mainly three types of species are reared (Catla, Rohu and pangassius) mainly for stocking in dam.
- **Grow outculture:** Culture of two species viz:- Tilapa and Pangassius upto marketable size.
- **Cold storage:** A cold storage room is a great place to stored fresh fish so that they can be keep for longer duration. Cold storage was maintained at temperature -15°C. Total capacity of the room is 96000 kg fish.
- **Fish packing in thermocol box –** Packaging of fish plays an important role in protecting the product from contamination and prevent it from spoilage using Thermocol. Here thermocol was brought from the Andhra Pradesh as it is very costly in the state.
- **Import – export of fishes:** Fishes brought from Dudhawa dam, Mordemsilli dam and Bango dam were transport to Raipur, Korba, Kolkata and local market.
- **Poultry culture:** A popular variety of Kadaknath were Culture and sell at Raipur and Local Market @ ₹ 550/kg.
- **Goat culture:** Goat farming was also practiced in the farm which were sold at Raipur @ ₹ 450/ kg.
- **Ice crushing:** The ice crushing machine was used to crush the block ice into flake ice or snow ice that were used for fish storage.

**Staff Information**: Many peoples are working under Mohammad Imran Khan Fish Cultivation for various works in which staffs are involved in data collection and record keeping, Workers are involved in different management practices and Fishermen are mainly involved in fishing activities.

- Total 761 no. of people including worker, staff, fishermen are working under Mohammad Imran Khan Fish Cultivation.
- 285 no. of seller are attached with Mohammad Imran Khan Fish Cultivation.

## Dam Culture

Dudhawa, Madam Silliand Hasdeo Bango Dam

was on leased by Mr. Mohmmad Imran Khan. The various fish species are *Catla catla, Labeo rohita, Cirrhinus mrigala, Cyprinu scarpio, Ctenopharyngodon idella, Labeo calbasu, Wallago attu, Sperata singhala, Ompok papda, Macrobrachium rosenbergii, Tilapia mossambica, Mastacemablus armatus* were culture in dam under pen and cage culture system. In species wise *Catla* has stocked highest 74 per cent and Grass carp has stocked lowest 1 per cent. In species wise *Rohu* has harvested highest 35 per cent and *Jhinga* has harvested lowest 1 per cent in open dam culture system. Total 240000 no. stocking of fish in 40 no. of cage (Area: 15.82 $m^2$). Reservoirs and reverie was developed for better fish breeding and fish production in Chhattisgarh state (Singh, R. *et al.*).

**Fish Feed Company (ABIS Group):** IB Group is growing conglomerates headquarter at Rajnandgaon, Chhattisgarh. IB group has diversified itself into a well-integrated business unit that produces poultry, dairy, oil, animal feed, fish feed and specialized pet food. IB group manufactures high quality extruded floating fish & shrimp feed production in 2008 by setting up a world-class plant with American and European technology. Produced using the best ingredients— HI-PRO SOYA and De-Oiled Rice Bran. Apart from the leadership position in the Indian market, IB Group also exports the Fish Feed to East Asia and Southwest Africa The total production capacity is 1200 TPD. The extruded floating fish feed contains balanced quantities of protein, fat, vitamins, minerals, and amino acids for maintaining good fish health. Key benefits: best FCR, faster growth, less pond pollution, less pathogenic diseases risk, reduced costs and risks to farmers, and tasty fish for consumers.

**Aqua-clinics Center:** There are many number of aqua-clinics shop in Chhattisgarh, in which they provide various medicine which are used in fish-culture, they also give consultancy services to their customers. Major medicines for fish health management are as follows-EXO-CLEAN-(The Composition of exo-clean is Concentrated Herbal Liquid with Copper), ZEON-(Organic/ Chelated multi mineral compounds added with gas adsorbents Hydrated Sodium Calcium Alumino Silicate (HSCAS) and Bottom clean **(**Special selective beneficial bacteria having bio degradation action and sludge accumulation properties).

**Aquarium & Accessories Shop:** There are numerous aquarium & accessories shop in Chhattisgarh, in which they sell many ornamental fishes, various aquarium, aquarium accessories. It is the one of the new and upcoming business model in fisheries sector in Chhattisgarh. Many entrepreneurs bring the fishes from Kolkata, Chennai & Mumbai and some of them import fishes from the foreign countries like Indonesia, Singapore and Malaysia. In Chhattisgarh Goldfish & Molly were the common fish varieties in aquarium shop. Common goldfish varieties such as Oranda gold, Shubunkin, Black goldfish, Orange cap gold fish were found in various ornamental fish shop. There are many accessories found in Ornamental fish shop like Glass tanks, Aerator, Electric water pump, Sponge filter, Power filter, Gravel, Lights & its fixers,water heater toys, hand net,ornamental fish feed, blower etc. Now diversified aquaculture for women fisher with ornamental fish culture in the Chhattisgarh for income and employment. Available mainly indigenous species are suitable for culture and farming in Chhattisgarh. Listed various ornamental fish species were Barbs (07), Loaches (04), Catfishes (07), Mud Perches(02), Paradise fish (02) and Gourami(02)*etc.*(Saha, D).

**Individual farmers-**The study was identified that the three types of marketing channel used by individual fish farmer in marketing of fishes produce. This marketing channel ware as follows:-

- Channel-I: Fish farmers → Village trader → Retailers → Consumer
- Channel-II: Fish farmers → Retailers → Consumer
- Channel-III: Fish farmers → Consumer

In the study we had seen that channel-II is most prevalent among the individual fish farmers. In case of most of the farmers the production practices was done by farmers but the harvesting practices was done by *Machhuara* community cum retailer which is the main reason behind less producer share in consumer rupee of fish farmer.

## CONCLUSION

In Chhattisgarh few numbers of stakeholders are available for the supply chain management in fisheries sector. The study noticed that private sector like progressive farmers and companies play

a pivotal role and major contribution of fish seed production, fish production, ornamental fish and fish feed *etc.* The fish and fish seed production were increasing trend, but more share in total production lies with limited farmers in Chhattisgarh during 2003-04 to 2020-21 (Sonvanee *et al.*). Co-operative sector plays a significant role in the development of fishes in the state. State universities and college also develop human resources in fisheries for the improvement and management of aquatic resources, conduct research and development studies on different areas of fisheries such as aquaculture, capture fisheries, aquatic management and fish processing technology. It has also been observed that KVK, colleges play significant role in transfer of technologies through training, extension and outreach programs for government and non-government organization on fisheries management. GIS plays a pivotal role in visualizing spatial data and understanding relationship supply chain management between specific locations which helps entrepreneur to make more strategic business decision (Singh, R. *et al.*). Fresh water aquaculture fish and pond fish meant for domestic consumption from the district reach the retailers across the Chhattisgarh state in three different manners after the harvest. First, a small portion of the total catch goes for local consumption. Such fish travel from local village market to retail centers without ice. Second, a significant portion of the catch from reservoirs goes to distant places within the state. Primary among these is Bilaspur, Durg and Raipur. Third, Delivering in bulk to secondary auction markets in Kolkata and to the processing unit (Saha, D.). It has been concluded that for the improvement of the fisheries sector in the state it is need of the hour to developed strong linkages between producer and consumer, special attention for post-harvest management which can be achieve through effective capacity building programas well as development of modern fish marketing facilities and cold storage facilities.

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