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# Ornamental fish trading pattern in West Bengal

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**Abstract**
In the Indian state of West Bengal, key districts popularly known for varieties of ornamental fish breeding & culture are Howrah and South 24 Parganas. However, the only wholesale market for ornamental fish trade is in CTI bazaar, Dasnagar, Howrah. From the present study it is revealed that about 3000 - 4000 pieces of fishes everyday which fetch them approximately 3000 INR/day. Almost 1500-1800 such collectors work in the business in the state among which 85% are concentrated in Howrah district alone. More than 1500 rural youths are occupied in the trade as collectors and earn livelihood. On the other hand ornamental fish farmers are constricted to breeding and culture operations. They are unaware about wholesale prices, demand pattern and quality requirement. It is observed that collectors have higher bargaining power and negotiate very low price. Farmers are thus affected by lower margins and sustainable growth of OFT in the state is at a stake. The document presents major varieties of fishes traded, the sales channels in OFT and its operations and reasons for poor economic growth of farmers (also referred as breeder and rearers) using a survey based methodology. A three prong approach of Developing farmers, Adopting new technologies and Channel design can ensure sustainable growth of the trade and inclusive development.

**Keywords:** Ornamental fish, trading, distribution channel, West Bengal

## 1. Introduction
Ornamental fish trade (OFT) is trade in live organisms and demands absolute care, dedicated, experienced and delicate handling, live packaging and transportation. The most unique feature of ornamental fish trade lies in the need for after sales service. Despite the fact that the ornamental fish trade is a seller's market, the degree of sophistication that has been brought in to develop and sustain the market especially in the metropolitan markets, lies in the after sales service. The largest segment of ornamental fish production lies in the livelihood segment. The apparently disaggregated production systems commands a market that has a cohesion built into it by production and trade practices that have been built on age old practices steeped in traditions like that found in the Gallif Street market in Kolkata [3]. Ornamental fish trade is an admirable business prospect in India as there is sturdy requirement in domestic and export markets [2]. Ornamental fishes possess excellent prospective due to massive geological stretch, widespread species range and rigorous research and expansion endeavor that are in practice by the allied institutions [5]. Ornamental fishes have large demand across India which is largely sourced mainly from West Bengal, Tamil Nadu and Maharashtra states of India. The state of West Bengal is a leading state of fish and fisheries with abundant blessings of nature in terms of favourable climate, ample availability of quality water resources and its geographical position [4]. The state holds leading position in fish production & export for years consistently. In addition to food fish, this state has a firm position for production of ornamental fish in domestic as well as in export markets [7]. Among all the states West Bengal holds almost 50% share alone of the export value of ornamental fishes [10]. West Bengal has wealthy variety of ornamental fishes with more than 176 indigenous varieties, adding up to a comparable number of exotic varieties which are possible to breed in captive condition [6]. Despite its high potential and significance in domestic as well as international market, ornamental fish trade remains unorganized and poor information and/or data is unavailable, which could be possibly linked to establish contentions of improper marketing techniques and inadequate awareness among the different stakeholders. If all the agencies/ stakeholders involved in the ornamental fish trade take up coordinated efforts towards breeding of indigenous and exotic ornamental fish species this in turn may bring up new avenues for horizontal and vertical expansion of the ornamental fish sector. Therefore, it is essential to document the multidimensional

performances of ornamental fisheries in the domestic market and the role of the different intermediaries involved in the sector. Thus, considering all the above facts the present study was carried out for in-depth analysis of ornamental fish market channel and trading pattern.

## 2. Materials and Methods

### 2.1 Study Area

The present study was carried out in West Bengal based on the activities and growth in the field of ornamental fisheries during March 2017 to January 2018. The lucrative business of ornamental fisheries in West Bengal is concentrated mainly in three districts viz. Howrah, North 24-Paraganas and south 24 Paraganas. There are more than 400 units present in the districts of Howrah, North and South 24 Parganas. Howrah district is known for its largest ornamental wholesale market in India. It is only 38 km away from the main city of Kolkata. A number of ornamental wholesaler, retailer and accessories manufacturers who supply different aquariums accessories and decorations throughout the country. North 24-Parganas District is located in the southern West Bengal and the distance between Kolkata to North Parganas is about 81.6 km. More than 36.97 percent area of West Bengal available in North 24-parganas alone for fisheries activities. South 24-parganas is located 101 km away from Kolkata. Galif Street in Bagbazar, Kolkata is important ornamental fish market in India. It is 7 km away from Howrah.

### 2.2 Sampling Frame

The present study falls into the category of an exploratory research that provides insights and understanding and has characteristics such as flexible and unstructured research process, loosely defined information, small and non-representative sample and qualitative analysis of primary data [1] [8]. In the present study, surveys were carried out which aimed at two different sets of respondents. The first sets of respondents were the producers of the ornamental fish of the study locations which included breeders, rearers and breeder cum rearer. The second set focused were the ornamental fish traders including wholesalers, retailers, commission agents and other related traders and transporters as well. In view of the limited time and resources, the study focused on blocks of Howrah district with special emphasis at CTI Bazar, Dasnagar on the intensity of business and its turnover; as the Howrah district (Dasnagar) is considered the ornamental trading hub of West Bengal.

### 2.3 Methods and Tools for Data Collection

#### 2.3.1 Primary data

##### 2.3.1.1. Key informant interviews

Some of the key informants who provided valuable information were government officials including scientists and experts from fisheries department, private entrepreneurs, cooperative societies members, Head of the villages, traders, NGOs as well as researchers.

##### 2.3.1.2 Structured interviews

A semi-structured interview schedule, specifically prepared by incorporating all aspects of ornamental fisheries on which data and information were required served as the major tool and means for collection of data. The respondents were contacted individually and interviewed in an amicable atmosphere, either at homes or at work places. All the responses and explanations were recorded in the schedule.

##### 2.3.1.3 Focus group discussion

Focus group discussions were also organized in each of the selected study area to gather more detailed and concrete ideas of that particular area. According to the Messer and Townsley [9] the focus group discussions can contribute to establishing mechanisms that will enable investigators to continue their learning about livelihoods and institutions after the initial investigation has been completed on other issues that may be of importance in development work.

#### 2.3.2 Secondary sources

Collection of secondary data from different sources such as fisheries department, ICAR fisheries research institutes, Cooperative societies, MPEDA and NGOs served as major sources of information which were not available at the primary level. The data were collected from journals, annual reports, newspapers and Internet. A range of information and statistics from secondary sources helped to understand the weakness and "vulnerability context" – shocks, trends, seasonality as well as people's assets and livelihood strategies.

### 2.4 Data Analysis

Data collected through primary surveys were edited, coded and analysed using MS-Excel. Univariate analysis, simple statistical measures such as frequencies, cross tabulations and descriptive statistics such as percentages, arithmetic mean and standard deviation are used for exploring their relationship within the variables.

## 3. Results and Discussion

The required data collected from different respondents of the study area were compiled together and discussed below. Some of the data were tabulated and analyzed wherever it is necessary and presented in concise form. Based on the objectives of the study, the results and discussions are broadly organized and presented under the following sub-headings.

### 3.1 Organisational structure, institutional arrangements and distribution channel for ornamental fish production and trade in West Bengal

Institutional arrangement can play a pivotal role in sustainable development of any business or trade. It is an integration of various forms of collective action such as producer groups, input and output marketing cooperatives, Self-help groups and production or marketing schemes which can be supported with government organizations and NGOs. In ornamental fisheries the purpose of institutional arrangement is to satisfy all the stakeholders/beneficiaries inclusively.

Generally organizational structure in ornamental fisheries involves ornamental fish production units, input supply units (eg. feed, seed), ancillary units (decoration, aquarium and accessories etc.), research and development organizations, extension and training institutions which are mainly supported by financial institutions (NABARD, Cooperative banks in the value chain). An intricate and complex relationship can be observed in the organisational structure of ornamental fish production and trade in Kolkata. The process of fish breeding and rearing in Kolkata has been instutionalised in a very complex manner which supplies brooders being brought from various north-eastern states to the breeding centres in various locations in Kolkata and in other neighbouring districts. The organisational structure is highly personalised and basically depends upon the price paid by the breeders for fresh brood

stock. Since it is a market driven model and there is no unity among the breeders and rearers, the price of the brooder is based on the bid placed by the buyer. The price is not only influenced by the bid but also depends on the staying power of the wild collectors.

During the survey different key intermediaries were found in fish marketing (from farmers to wholesale market) viz, breeder, rearer, collector or carriers, wholesaler, retailer and hobbyists (Fig. 1). Besides these, several other intermediaries like local fish collectors and fishermen cooperatives also exist in market.

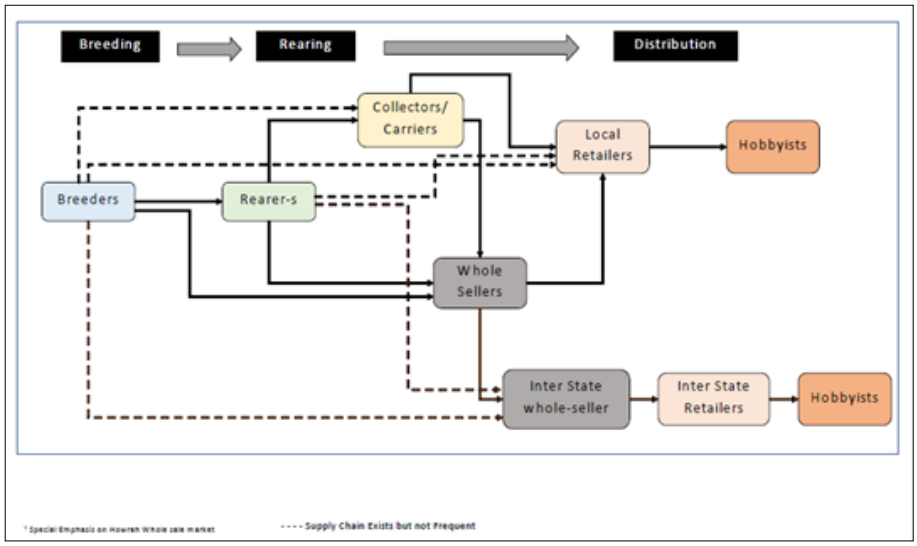


**Fig 1:** Ornamental fish distribution channels and supply chain in West Bengal

Figure 1 explained the framework of organisational structure for ornamental fisheries in West Bengal. It is envisaged that the ornamental fish production and trade must be driven by a top-down approach as far as production and trade are concern. The policy must totally integrate the need for increasing ornamental fish production but also should address itself to the need for insuring sustainability of the natural wild stock. This end of the policy will require the active corporation of Ministry of Agriculture and Corporation, Department of Agriculture Research and Education (DARE) and Ministry of Environment and Forests. The other end of the policy which addresses itself to enhancing production should be taken care of by the Ministry of Commerce
(MPEDA) and also by Ministry of Agriculture (NFDB). In addition to this, central agencies and ministries the department of fisheries of the respective states, the department of environment and forest and other related departments must address itself to the issue of ensuring sustainable ornamental fish production and trade. It is necessary for both the central department and ministries and state department to work in tandem to achieve this goal. In the distributional channel the market operational functions were observed in the following pattern i.e. individuals youths (Collectors) owning cycle or motorized two wheelers and smart phones. They communicate which social media services. Few collectors lease pickup trucks for transport of fishes from farmers to whole sale market. Whereas the whole sellers do the oxygen aided packing and sedation for dispatch to inter and intra state orders. Few whole sellers have storage facilities.
In the study the focus is on the seven exotic species namely 1. Guppy, 2. Molly 3. Platy, 4.Gold fish, 5. Koi carp, 6. Zebra fish and 7. Angel fish was adopted on the basis of volume of trade in each of the species and to maintain uniformity and continuity in the discussion. The export market channels for ornamental fisheries are more or less same in all the three study locations but the domestic marketing channels vary from place to place.

### 3.2 Ornamental fish market scenario and dynamics of West Bengal

In West Bengal, key districts popularly known for ornamental fish breeding & culture are Howrah and South 24 Parganas. In Howrah, the five community development blocks, Bally Jagacha, Domjur, Panchla, Sankrail & Jagatballavpur, have large contribution in ornamental fish production & culture (Fig. 2). In South 24 Parganas, the blocks Bishnupur I & II, Magrahat I & II, Falta & Budge Budge I & II have ornamental fish trade (OFT) operations. The other districts in West Bengal where OFT is also prevalent are East Burdwan, East Midnapore, Nadia, Jalpaigudi, Murshidabad, & Hooghly. The ornamental fish trade in Kolkata involved collectors, suppliers, retailers and exporters. The process for collection, acclimatisation, packing and transportation and marketing of the fishes are done by traders themselves. The wild collectors collect fishes from different water bodies such as rivers and lakes. The fish collectors engaged themselves in collection work as a secondary occupation. They took orders from the supplier or agents and received remuneration on per piece basis. Some of the collectors also collected livefeed on the basis of the demand of the traders.
As far as the domestic marketing channels for ornamental fisheries in Kolkata market is concerned, it can be divided into 6. The first channels were traced by the investigator to begin from the breeder which moves to the rearer then to the wholesaler which again moves to the retailers and finally reaches the consumer. The second channel started with the breeders cum rearer then the fish was sold to the wholesaler which is again purchased by the retailer and was passed on to the consumer in the final transaction. The third marketing channel for ornamental fishes in Kolkata market started with the breeder moved on to the wholesaler, to the retailer
and finally to the consumer. The domestic wholesale market of the state is situated in CTI Bazar, Das Nagar, Howrah

where almost 45 wholesale outlets operate. These outlets receive ornamental fishes from all over the states through collectors. The collectors collect fishes from the farmers and producers directly by paying cash immediately and transport the fishes to market in motorized two wheelers. The present study revealed that a collector sells 3000-4000 pieces of fishes everyday which fetch them approximately 3000 INR/day. Almost 1500-1800 such collectors work in the business in the state among which 85% are concentrated in Howrah district alone (Fig. 3). Collectors are dominant sales channel. It is noted that farmers are generally satisfied with collector's services.

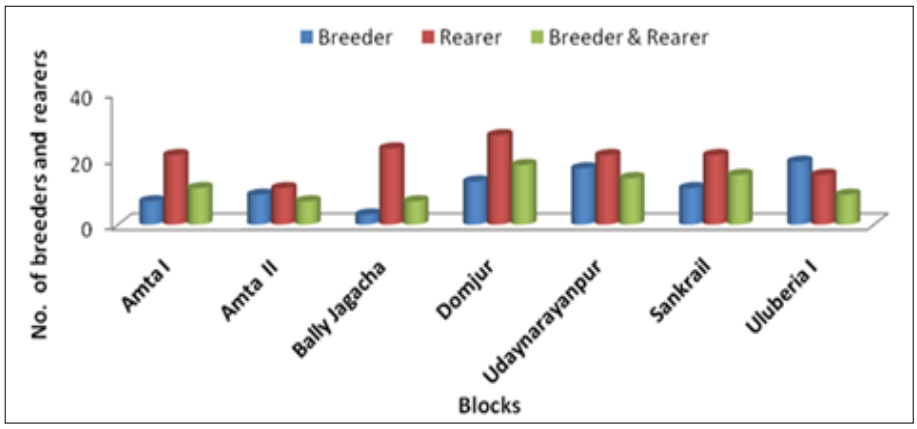


**Fig 2:** Block wise ornamental breeders and rearers scenario of Howrah district

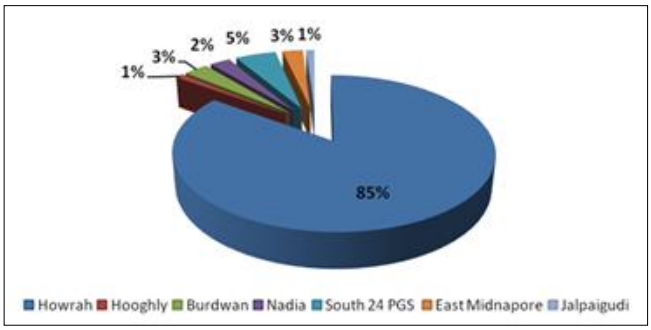


**Fig 3:** Ornamental fish collectors of different districts of West Bengal

Transactions with collectors are hassle free and collectors take ownership of the downstream sales of fishes. The collectors have information about quantity and quality of fishes available at farmers end. Once collectors receive orders from whole sellers, they collect fishes from farmers in early morning & carry fishes in well oxygenated polythene packet hanging in the motorbike to reach market by early trade hours.

Ornamental fish prices vary by channels and also due to supply – demand mismatch created in summer & winter seasons. It is observed that fish farmer's direct selling price to whole sellers is higher than the selling price of fishes to collectors. Thus collectors source ornamental fishes at lower prices from farmers and earn higher margins than farmers could have earned by selling directly to wholesale market. It is also observed that maximum farmers are lacking of market information like demand, trend & pricing of ornamental fishes. Price variation due to seasonal effect is indicated in Fig 4 for commonly traded ornamental fishes. Eurythermal species like Gold fishes can sustain wide temp. Variance (0 – 41 ºC) and thus price variation for such species due to seasonal effect is negligible. Lack of temperature control systems during winter increases mortality rate & poor growth rate of stenothermal species. Supplies of these species are affected in winter resulting price hike.

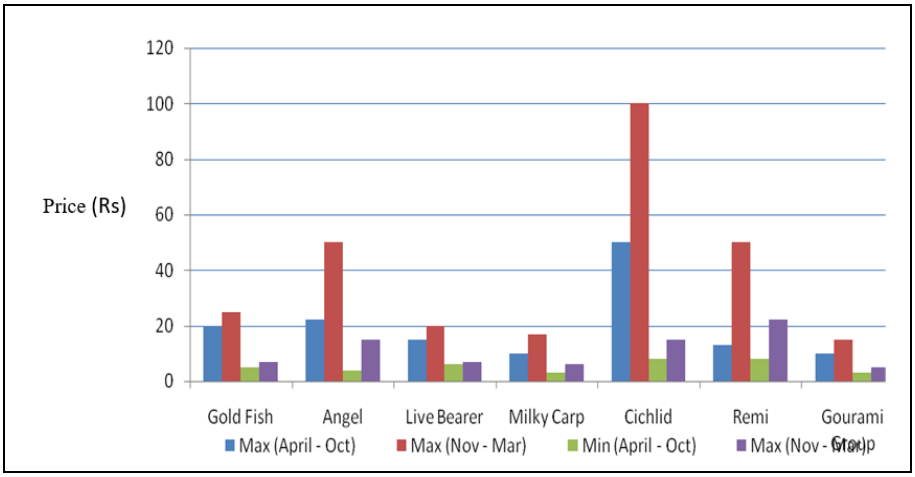


**Fig 4:** Price variation comparison due to seasonal effect

Fish farmers recognize sizable potential and opportunities, ornamental fish trade offers. But during the survey different constraints found for better growth of the industry and presented in Table 1 (arranged in sequence of priority).

**Table 1:** Constraints to the growth of ornamental trade in West Bengal

| Issues | Amta I | Amta II | Bally Jagacha | Domjur | Udanaryanpur | Sankrail | Uluberia I | Total |
|---|---|---|---|---|---|---|---|---|
| Inadquete training and technical advise. | 7 | 7 | 3 | 3 | 7 | 6 | 5 | 38 |
| Absence of real time market Information | 6 | 5 | 7 | 4 | 6 | 7 | 4 | 39 |
| High Operating Cost | 2 | 3 | 5 | 7 | 3 | 2 | 3 | 25 |
| Infrastructure Issues | 4 | 6 | 4 | 5 | 5 | 5 | 6 | 35 |
| Economy of Scale | 5 | 4 | 6 | 6 | 4 | 4 | 7 | 36 |
| Brood Stock | 1 | 1 | 1 | 2 | 1 | 3 | 1 | 10 |
| Unpredicatble Demand | 3 | 2 | 2 | 1 | 2 | 1 | 2 | 13 |

## 4. Conclusion

Significant opportunities exist for ornamental fish trade in West Bengal and in specific the focused area of study. There are multiple entities in OFT supply chain. 4 -11% of fish farmers supply directly to wholesale market and most farmers prefer collectors for supply. Most collectors collect fishes from farmers and pack the fishes mostly by themselves by adding oxygen and even carrying oxygen cylinders at times. The farmers receive payments for supplies to collectors in cash immediately and they have no further liabilities to risks like hazards during transportation, mortality if any & sales process during whole sale market. These collectors are vital element in OFT supply chain. Over last 15 years, there has been significant growth in number of collectors which has also generated employment opportunities for rural, semi urban youth. However, distribution of margins between fish farmers, collectors and whole sellers is asymmetric. Fish farmer's margin is significantly lower than that of collectors. As a consequence, fish farmers are unable to invest in breeding and culture, upgrade infrastructure and technologies. Fish farmers also switch over to alternate livelihood. Such a scenario is detrimental for ornamental fish trade sustainable growth in the state.

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