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Research Paper

Marketing Prospects and Challenges of Fisheries Business in Pithoragarh District of Uttarakhand

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ABSTRACT: *The fisheries sector is crucial for India's socio-economic development, contributing to economic growth and human welfare. It generates income and employment and stimulates subsidiary industries, providing nutritious food at a low cost and earning foreign exchange. The study was carried out to investigate the fish production, marketing system, economic features of marketing activities and inefficiencies in hill district Pithoragarh of Uttarakhand. The primary data were collected through field surveys, questionnaire interviews and focus group discussions with the fish farmers of several villages, fish marketers, local agents, and commission agents/wholesalers. Secondary data was collected from the Department of Fisheries. The state government is providing financial help to develop fish-cultured ponds. Three types of marketing channels were recognized. Channel I had the most significant proportion of fisher's share and the lowest in channel III. A range of intermediates are involved in the market chain that connects producers to consumers. It has been concluded that an organized institutional arrangement and better financial assistance through the state government can improve fish market development.*

KEYWORDS: *Marketing channels, Consumer and Fish cultured ponds*

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I. INTRODUCTION

The fishing industry is widely recognized as a powerful source of revenue because it provides affordable, nutritious food and spurs the growth of numerous related businesses. The fishing industry profoundly affects the socio-economic lives of countless individuals, both directly and indirectly. It provides millions of rural farmers with a vital source of income and employment opportunities (Alam, 2010). Aquaculture in India has progressed from being a purely domestic endeavour to a thriving sector driven mainly through entrepreneurial endeavours. Given that many catch fisheries have stagnant yields, freshwater aquaculture is crucial for raising the nation's fish output level (Abdurrahan, 2017).

Fish is perishable, and farmers and fishermen are concerned about its marketing. The State domestic fish market excludes the privately owned sector, where numerous market functionaries are associated with their livelihood. The fish marketing system can play a vital role in stabilizing fish prices and linking the fishermen to stakeholders, including input suppliers and consumers (Devi, 2018).

Markets play a crucial role in physical marketing activities and help convey important information to producers and consumers about the costs of purchasing goods and their advantages (Upadhyay, 2016). An ideal domestic fish market is essential for creating an efficient production system and ensuring the satisfaction of everyone involved, from producers to consumers, in the flow of goods and services. Nonetheless, unlike marketing systems of agricultural products, the fish marketing system is characterized by the heterogeneous nature of the products concerning species, size, weight, nutritional quality, storage quality and price (Upadhyay, 2008).

Though there has been advancement both in market infrastructure and technology, such as the development of an e-commerce hi-tech market in different parts of the country, the development of the domestic fish market of Pithoragarh Uttarakhand is still in an infant stage and significantly less study has been carried out till now. The present study will help to know the socio-economic status of the market functionaries, existing fish marketing conditions, and their constraints on the major fish markets of Pithoragarh district of Uttarakhand.

II. REVIEW OF LITERATURE

[1]. Kumar, B., G., Datta, K., K., Katiha, P., K., Ravishanker, T., Barik, N., K., Suresh, R., Bhatta, R., Ravindranath, K., Shinoj, P., Salim, S. S., and Reddy, G., V., S., Kumar, P. and Sathiadhas, R. (2008). The study asserts that Indian diets are increasingly focusing on fish and fisheries products due to rising incomes, urbanization, globalization, changing dietary preferences, and increasing working women. Fish is a nutrient-dense diet that promotes socio-economic development and supports the fishing industry, which employs approximately 14 million people in India, with 90% of the 200 million fish workers in underdeveloped nations.

[2]. Devi, B., N., Vardia, H., K., Sahu, S., and Singh, F. (2018). The current fish marketing system, in particular, emphasizes the socio-economic status of market workers. People should also identify the obstacles related to fish marketing and offer solutions for any issues that arise with marketing.

[3]. Vala, S., R., Lende, S., R., Jora, K., Dhimmar, H., Mevada, J., Fofandi, D., Dhimmar, S. (2020). States that market facilities, present market status, nature of cost, and factors influence the market system. In Himmatnagar, nearly all fish traded within move through the private sector, and many people are giving and taking fish distribution and marketing systems. The primary fish sources in the Himmatnagar fish market are the Dharoi dam, lake, small rivers, and reservoir, which supply various fish. Most fish, near about 30%, are locally supplied, and nearly 70% of fish are transferred to Ahmedabad.

[4]. Kumar, R., Kumar, N. R., Kishore, P., Kumar, M., Prakash, S. and Kumar, S. (2016). Highlights of the abundant fish resources in the flood plains of Chaurs, Northern Bihar, utilized for capture and culture fisheries, are examined. The research identifies three active channels in the disposal of fish from Chaur regions, which also tries to quantify price spread and evaluate marketing efficiency.

III. PURPOSE OF THE RESEARCH PAPER

The main objective of the research paper is to comprehend the advantages and opportunities for the development of the fisheries sector and the Recreation of Aquaculture in Uttarakhand. The promotion of fisheries business in hilly areas of Uttarakhand is significantly facilitated by both government and non-governmental schemes as a strategy to promote rural prosperity and to highlight the challenges in the development in the rural areas of Uttarakhand.

IV. OPPORTUNITIES FOR FISH FARMING IN UTTARAKHAND

Fish Farming can prove to be a robust measure for the livelihood security of farmers in this state as an additional occupation based on agriculture because the combination of unique climate, topography and natural resources is entirely conducive to promoting fisheries. A market is a place where the price of a commodity tends to be consistent, accounting for transportation costs. The marketing channel is the route that a product takes from the producer to reach the final consumer.

V. CHALLENGES FOR FISH MARKETING

The study is analyzed and discussed based on primary data collected from 115 different stakeholders in fish marketing using a personal interview method with the help of a questionnaire designed for the study. The study was conducted at the market level for capture and culture fisheries. Stakeholders at different levels of fish marketing were chosen through a multistage stratified random sampling method.

Table 1. Distribution of sample market Intermediaries

Intermediaries	**Market**	**Sample size**	
Producers			
a. Fish Farmers	Different Hill stream fishes	5	Approximate
b. Fishers	Different Pond fishes	115	Approximate
Wholesalers	Siltham	1	
	Local Bus Station	2	
Retailers	Siltham	3	
	Wadda	2	
	Ghat	2	
	Jauljibi	3	Approximate
	Jhulaghat	2	Approximate
Vendors	Grand Total	135	Approximate
Source: Field survey, 2022-23			

The data collected for the study pertained to the agricultural year 2022-2023. Besides simple statistical tools such as average and percentage, measures of marketing cost, marketing margin, price spread, producers' share in consumers' rupee and marketing efficiency as per Acharya (2004).

Price spread (PS) = price paid by the consumer (PC) - Price received by the producer (PF)

Producers' share in consumers' rupee is the price received by the farmer expressed as a percentage of the consumer's price (i.e., the price paid by the consumer). This can be expressed as follows:

$$PS = (PF/PC)\ 100$$

Where, PS = producer's share in consumer's rupee
PF = price received by the farmer/producer
PC = price paid by the consumers

According to Acharya (2004) an ideal measure of marketing efficiency, particularly for comparing the efficiency of alternate channels, should be such that which takes into account all of the following:

$$MME = PF / (MC + MM)$$

Where, MME = Modified Measure of Efficiency,
PF = price received by the farmers,
MC = Marketing cost and
MM = Marketing margin.

Uttarakhand fish production data was reported at 6090 Tons in 2022. This stayed constant from the previous number of 6090 Ton for 2021. The increase in fish production is 1793 tonnes in five years. Fisheries are emerging as a prominent sector in Uttarakhand, promoting it as a priority sector by incorporating the latest technology; now, fish production in the state has increased annually, with 4297 tonnes in 2016-17. The inland water resources of Uttarakhand can be categorized in Table 2.

Table 2. Water resources for fish production of Uttarakhand

S.No	Resources	Extent
1	Rivers	2686 km
2	Natural Lakes	297 hectares
3	Reservoirs	20587 hectares
4	Ponds ,Tanks etc.	869

Village Dungri Kanalichina block district Pithoragarh has over 200 fish ponds, producing over 80 quintals of fish every year. The total fish production in Munsiyari blocks of district Pithoragarh in 2018-19 is 20 quintal, 2019-20 is 30 quintal, in 2020-21 is 31.50 quintal and 2021-22 is 31.00 quintal. Similarly, the total production from pond culture fisheries of other blocks in Pithoragarh increased yearly from 268 to 305 quintals from 2019-2022 (Table 3).

Production of rohu is 3.00 quintal, Grass carp is 183.00 quintal, Silver carp is 7 quintal, Common carp is 63 quintal, Trout is 59 and Pangasius is 12 quintal in 2022 respectively. The highest total production from ponds of the Kanalichina block is 328 quintals. Fisheries are emerging as a big sector in Pithoragarh district. The increase in fish production in Pithoragarh district in five years proves this. The Trout and other fish species here are being sent to other states, including Delhi, Uttar Pradesh.

Table 3. Fish Production in different blocks of district Pithoragarh India 2019 to 2023 (Production in quintal)

Year	Munsiyari	Dharchula	Berinag	Didihat	Kanalichina	Gangolihat	Pithoragarh	Munakote
2018-19	20.00	53.00	2.00	0.00	98.00	6.00	48.00	38.00
2019-20	30.00	66.00	1.00	1.00	96.70	5.50	49.00	38.80
2020-21	31.50	67.00	3.00	1.00	98.50	7.00	49.00	39.00
2021-22	31.00	67.00	3.00	0.50	98.00	7.00	49.00	39.00
Source: Field survey, 2021-23 and Department of Fisheries Pithoragarh Uttarakhand India (Government)								

The state government's fisheries department provides partial financial help for the development of ponds and assistance following the implementation of the existing programme. From the study, it was observed

that the majority of the cultured ponds (70.25%) were smaller (1-4 Decimal) whereas only 29.75% of ponds were comparatively large (0.02-0.03) in size (Table 4). Furthermore, more than half of the ponds had a lower depth of 1-2 m, which is ideal for fish culture. In addition, most of the ponds were seasonal, respectively. 75% of farmers recorded culture fish in their pond; in contrast, 10% of ponds had multiple ownership.

Table 4. Characteristics and pattern of ownership of ponds at district Pithoragarh India

Ponds area in Hectares	%	Pond depth (m)	Pond type	Pond ownership %	
0.01	70.25	>2	Perennial	Own	90
0.02	29.75	>2	Perennial	Multiple	10
Source: Field survey, 2022-23					

The majority of fish market workers, 64.35%, are illiterate; 14.2% of marketers are educated only through middle school, while 21.45% are educated through high school. Over 100 people work as day labourers for the dealers and are paid Rs 200 /day for their efforts. According to the survey results, practically all persons who work as labourers daily have fishing as a secondary occupation. Approximately 150 families in Dungari village are earning good income from fish farming. With the help of the Fisheries Department, today, all the villagers are saving up to Rs 60 thousand from one pond in a season.

The fish market in Pithoragarh is unusual to a certain extent. Siltham, Wadda, and Local Bus Station fish market can be easily identified as the core zone of the Pithoragarh district regarding the fish marketing system. Siltham fish market receives edible fish daily from the Khatima fish Mandi (Nanakmata reservoir) and Kicha fish Mandi (Tumaria Haripura reservoir, Baur, Gullarbhoj); these fishes are imported from outside of the district. According to the results of the survey, it is found that one wholesaler in Siltham fish market and, three retailers in the local Bus Station and two retailers in Wadda were operating alongside some people who worked as labourers with the traders daily. Jauljibi, Ghat, and Jhulaghat fish shops use culturable fishes to inhabit these resources; mahseers, Assela, Trout, and common carp are important. Most fishermen catch fish and sell it directly to consumers and local restaurants.

The fish marketing channels indicate that the fish flows from the producer to the endpoint, i.e., the consumer, through different intermediaries. Direct fish marketing from producer to consumer was observed in Ghat, Jhulaghat and Jauljibi fish markets. It was estimated that about half of fishes sold in various sites of Pithoragarh fish shops are primarily Pangasius, Rohu, Catla and Mangur (Table 5). Some marine fishes imported from the south are sting ray, Trout, and Assela, used for their taste. Indigenous carp are preferred over exotic carp due to their taste, while low-income people prefer to buy exotic carp such as silver carp, grass carp, etc.

Table 5. Price of different edible fish species in Pithoragarh fish markets

S.No	Fishes Name	Price of fish/kg	Availability	Consumption
Reservoir fishes				
1	Pangas	150	Whole year	Not fixed
2	Rohu	200	Whole year	Not fixed
3	Catla	190	Whole year	Not fixed
4	Mangur	190	Whole year	Not fixed
5	Pomfret	200	Whole year	Not fixed
6	Mahaseer	180-200	Whole year	Not fixed
Sea fishes				
7	Sting ray	800	Not fixed	Not fixed
8	Hilsa	600	Not fixed	Not fixed
9	Chitala	240	Not fixed	Not fixed
Local Pond Fishes (Culture fishes)				
10	Silver carp	120	Whole year	20 -25 kg /week
11	Grass carp	120	Whole year	20 -25 kg/ week
12	Common Carp	350	Whole year	20-25 kg/week
13	Trout	600	Whole year	Not fixed
14	Assela	250	Whole year	Not fixed
15	Pangas	150	March to October	20-25 kg /week
Source: Field survey, 2022-23				

The marketing cost per kilogram of fish paid by the fisher/local agent/trader/wholesaler/retailer is given in Table 7. The table revealed that the highest marketing cost was borne by the retailer Rs. 7.75/kg followed by fisher (Rs. 5.15/kg), trader (Rs. 4.40/kg), local agent (Rs. 2.95/kg) and wholesaler (Rs.2.50/kg). Out of total marketing costs, the retailer spent the highest share on overhead charges, Rs. 4.70/kg, followed by transportation from the fish market to the retail sale point (Rs. 2.20/kg). The trader spent the maximum share of Rs.2.40/kg as transportation charges, followed by ice cube Rs. 0.90/kg (Table 6).

Table 6. Marketing cost of fish paid by fisher's/ local agent/trader/wholesaler/retailer (Rs/Kg)

S. No.	Particulars	Fisher	Local agent	Trader	Wholesaler	Retailer
1	Transportation	-	-	2.40	-	2.20
2	Overhead charge	4.70	-	-	-	4.70
3	Container	0.45	-	0.45	0.55	0.45
4	Collection and assembling	-	2.55	-	-	-
5	Weighing	-	0.40	0.40	0.40	0.40
6	Loading and unloading	-	-	0.25	-	-
7	Ice cubes	-	-	0.90	0.90	-
8	Storage	-	-	-	0.35	-
	Total	5.15	2.95	4.40	2.50	7.75
Source: Field survey, 2023						

The marketing margin in various channels for fish marketing is given in Table 8. The highest net sale price received by the fisherman was in channel I, which was Rs. 350/kg. Additionally, the local agent spent Rs. 2.95/kg as a marketing cost and received a net margin of Rs.3.50/kg. The trader spent Rs. 3.40/kg as a marketing cost and received a net margin of Rs. 5.15/kg. The marketing cost of the wholesaler was Rs.2.50/kg and received a net margin of Rs. 3.25/kg. The retailer spent Rs. 7.75/kg as a marketing cost and got a net margin of Rs. 11.50/kg in channel II, while it was lowest in channel III, being Rs. 10.50/kg only because more intermediaries were involved in this channel. Table 7 shows the price spread and fisher's share in various fish marketing channels. According to the table, the price spread in fish marketing was Rs. 40.00 and Rs. 50.00 per kilogram for channels II and III, respectively. It showed that the price spread was bigger in channel III, where the most intermediaries were involved in selling fish, and lowest in channel I, where no intermediaries were involved between the fisher and the consumer.

Most of the existing fish retail outlets in the Pithoragarh district are unorganized, seasonal, part-time, and unhygienic. This is due to a mismatch of supply and demand and region-specific preference for the consumption of fish species. Hence, establishing hygienic retail outlets with proper storage facilities would help retailers store various fish for continuous supply, as per the consumer's preference. For this purpose, state-of-the-art retail outlets with proper hygienic storage facilities and modern infrastructure are needed. During the investigation, fish were traded without proper marketing mechanisms, leading to severe losses to fishers and producers. Electronic auctioning procedures need to be introduced under the aegis of an independent marketing agency, which could be done on the lines of the Agriculture Costs and Price Commission (ACPC).

Table 7. Marketing margin in the various channels in the marketing of fish (Rs/Kg)

S.No	Particulars	Channel I	Channel II	Channel III
1	Fishers price	350.00; 800	160.00	160.00; 800
2	Marketing cost born by fishers	-	-	-
3	Net price of fisher	-	160.00	160.00
4	Marketing cost born by local agent	-	2.95	2.95
5	Net margin of local agent	-	3.50	3.50
6	Marketing cost born by wholesaler	-	3.40	3.40
7	Net margin of trader	-	5.15	5.15
8	Marketing cost born by wholesaler	-	-	2.50
9	Net margin of wholesaler	-	-	3.25
10	Marketing cost born by retailer	-	7.75	7.75
11	Net margin of retailer	-	11.50	10.50
12	Retail sale price/consumer price	350.00; 800	200.00	210.00; 999
Source: Field survey, 2023				

Table 7 also demonstrated that, of the three marketing channels discovered for fish, the channel I had the largest proportion of fisher's share, i.e., fisher's-consumer being 97.55 percent, because there was no intermediary involved in this channel. The producer's share of the consumer's price was 80.51 percent in channel II, i.e., fisherman-local agent-trader-retailer consumer, and 79.16 percent in channel III, which involved four intermediaries between the fisherman and the consumer, namely local agent trader-wholesaler-retailer. These findings show that the percentage of fishers' share of consumer rupee is inversely related to the number of mediators involved in the marketing process.

The primary market is the marketing level, primarily the catching point in rural areas. Fish collectors, also known as distributors, obtain fish from catchers with the assistance of local brokers, who receive a profit margin or commission from the vendors. In Pithoragarh district, a farmer catches fish from ponds and sells it to the final consumer at the point of production and at the consumer's doorstep. A portion of the catch is also sold locally by the catcher/farmer or local stores. Occasionally, fishermen/fish traders bypass traditional routes and sell directly to secondary markets.

Secondary market: Collectors transport the fish from the primary market to the landing centres, usually located near a market or in an area well connected by rivers, roads, and rail networks. The fish were sold to distributors by the producer. The wholesalers transport the fish by road and to the nearest city/town markets. These are the main distribution markets, and the distributors once again sold the fish to another group of distributors using aratdars.

Tertiary markets: These are the end-user markets. After purchasing them from the higher secondary market, the distributors sold the fish to the retailers. There are two retailing channels: urban retailers selling fish in urban marketplaces on permanent booths or vendors and merchants who take the fish to sub-urban areas or villages.

Profit margin: According to the current investigation, local pond fish farmers receive a total price from the consumer. In Channel 3, primary producers only receive 50-55% of retail market pricing for their products. Fishermen's or fish farmers' retail pricing portion varied significantly, primarily to shipping costs, icing, and market leaseholders. Mediators received 30-35%, quality or weight loss received 5-8%, and the remaining 10-15% was spent on shipping, preservation and other fees.

VI. CONCLUSIONS AND RECOMMENDATIONS

An efficient marketing strategy is one of the most crucial elements for developing any economy. The study examines the marketing channel and price distribution of fish in the Uttarakhand highlands. According to the study, marketing channel I was the most efficient with the least price spread but had restricted disposal capacity of the three dominant marketing channels for fish. Marketing channel II was the most common for both culture and catch fisheries. While marketing to maximize the farmer's profits through channel II, proper procedures should be made to prevent vendors from taking one kilogram more for every ten kilograms purchased. Marketing channel III which includes wholesalers accounts for a minor portion of total produce (3.5%). Pithoragarh district's fish marketing sector remains very unorganized and unregulated. It has long been ignored for many reasons, and significant attempts have not been made to increase fish marketing compared to production. Now, trout farming is also developing in Uttarakhand with concerted efforts of DCFR (Directorate of Coldwater Fisheries Research). Being a low-volume, high-value commodity, rainbow trout has good potential for domestic consumption and foreign export. However, there is ample scope for further enhancement of trout production in hill states through a participatory approach.

Trout farming has immense scope in the Himalayan and some peninsular regions, where sufficient quantity of quality water is available. Nainisaini, Lelu, Dungari and Kanalichina villages developed fish culture ponds with the help of state government fishery department. The programme will build people's capacities, provide skills, and strengthen fish farming. With its abundant natural resources and successful production of grass carp, common carp, silver carp, Trout, and other fish, the Pithoragarh district has tremendous potential to export fish to local and national markets. Despite the production of fish in different blocks (Bin, Kanalichina, Munakote, Didihat, Dharchula, Munsiyari, Berinag and Gangolihat) of Pithoragarh District has been facing challenges in the development of self-help groups in the fishery sector. There is also a lack of adequate market linkages, transport systems, large-scale cold storage, value addition, and processing facilities. Improvement of transportation and preservation facilities, introduction of modern wholesaling and retailing facilities (in local ponds fishes), provision of government funding assistance, and improvement of hygienic conditions of landing centres and markets are some specific suggestions for improving the existing marketing system that affects food, nutrition, and export earnings.

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