

Perception of Farmers and Constraints in Marketing of Shrimp in Punjab

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Abstract

The present study was conducted in Punjab in 2022–23. The objectives of the study were to study the perceptions of shrimp farmers and the constraints faced by them in the marketing of shrimp. The study revealed that size of shrimp matters in marketing (4.96, $p < 0.001$) followed by selling shrimp after grading to fetch a good price (4.68, $p < 0.001$). The lack of processing units in the region for direct marketing of shrimp (4.92), followed by the lack of ready market availability for shrimp in Punjab region (3.41) are major constraints faced by shrimp farmers. Four important factors were identified i.e. lack of ready marketing structure, low price of the produce, post-harvest handling and lack of processing unit. Farmers sell their produce their own to dealers from other state they come and directly buy their produce. The government should make efforts to connect farmers to local market for more marketing opportunities to the farmers. The chain of market availability and processing units needed to boost shrimp farming in the state.

Key words: Shrimp farming, Marketing, Constraints, Farmers

JEL Classification: M31, O13, M39, M1

Introduction

Shrimp farming is an aquaculture based activity in marine or freshwater environments to produce shrimp for human consumption. Shrimp farming is one of the most profitable and fastest growing sectors of the aquaculture industry (Leung and Engle, 2006). Shrimp farming is the practice of cultivating shrimp in a controlled environment, such as ponds or tanks, for commercial purposes. In recent years, shrimp farming has gained significant importance in the global seafood market, with India emerging as one of the leading producers of shrimp (Kutty, 2005). The Indian shrimp industry has excellent potential to grow significantly and take the lead on a global scale (Jothi and Judit, 2021). India stands in second place in shrimp farming. Amongst all the states, Andhra Pradesh ranks first, and Maharashtra occupies the sixth position. Maharashtra has a huge potential for the development of shrimp farming (Patil and Sharma, 2021).

India is also the second-largest exporter of shrimp (Charishma et al., 2022). The US and China are the main importers of Indian shrimp, as are firms from coastal states. Andhra Pradesh is the main export hub for shrimp overseas. India's shrimp farming industry has experienced rapid growth in the last few decades, driven by factors such as increasing demand for seafood, the availability of suitable land and water resources, favourable climate conditions,

and supportive government policies. The majority of shrimp farms in India are located in coastal states such as Andhra Pradesh, Tamil Nadu, Kerala, Gujarat, and West Bengal. These states have a favourable climate and access to seawater, making them ideal locations for shrimp farming. There are several species of shrimp that are farmed in India, including the black tiger shrimp, the giant tiger prawn, the Indian white shrimp, and the blue shrimp. Shrimp farming in India has witnessed significant growth and is a prominent sector within the country's aquaculture industry. Shrimp farming holds huge potential in Punjab. About 1.5 lakh ha of salt-affected lands are available in the south-west districts of Punjab, covering six districts: Sri Muktsar Sahib, Bathinda, Fazilka, Mansa, Faridkot, and Ferozepur (Ansal and Singh, 2021). Farmers do not sell shrimp in Punjab. They sell their produce to dealers from Kerala or other southern states that come directly to pick the produce. Punjab has immense scope to convert uncultivable saline and water-logged lands into shrimp farming. A chain of processing units can be a game changer (Hindustan Times, 2022). In Punjab, about 1212 acres are under shrimp farming, with shrimp production of 2413 metric tons in 2022–23 (The Indian Express, 2023). India is one of the leading exporters of shrimp globally, with significant quantities being exported to the United States, the European Union, Japan, and Southeast Asia. Export-oriented shrimp farming places emphasis on meeting international quality standards, obtaining certifications, and

implementing sustainable practices. Shrimp farming is an important economic activity in India, but it faces a lot of challenges, like legal, environmental, and social, as well as disease issues. Disease is a major threat to aquaculture production and profitability (Subasinghe, 2005).

Hassan et al. (2012) revealed that the majority of farmers in the Khulna, Satkhira, and Bagerhat regions are unaware of how to properly handle products after harvest in order to maintain the standards set by the European Union. Solanke (2013) identified farmed shrimps in Thane District that are sold through various intermediaries, namely commission agents, processing agents, exporter liaison agents, and hypermarkets. Islam et al. (2014) found that 80 percent of shrimp is exported and the rest, 20 percent, is consumed in the local market of Bangladesh. Usually, shrimp is exported through exporting agencies and firms. Sahu et al. (2014) found that farmers are unwilling to adopt more scientific practices as the market price of shrimp fluctuates heavily and lack of training and capacity building to the farmers. Lack of credit facilities is also a major issue, as scientific shrimp farming is more expensive these days. Lack of guidance on the technologies was also raised as an important constraint, as farmers are not fully aware of the new scientific techniques of shrimp farming. Other constraints indicated by the respondents were labour scarcity, lack of electricity, and poor seed quality. Tandel and Mehta (2019) found the South Gujarati shrimp market is characterized by the involvement of numerous middlemen. Each intermediary adds a few extra costs to the purchase price of shrimp as part of their involvement or profit when it moves through value chains. Pradhan and Dash (2021) revealed that negative impacts on shrimp culture due to climate change are significantly observed, starting from pond preparation to harvest and post-harvest management. Charishma et al. (2022) found fluctuations in shrimp price and lack of market information were major marketing constraints faced by the shrimpfarmers in the marketing.

The shrimp farming industry is of great economic (significant export earnings) and social (numerous employment opportunities) importance. But shrimp farming has also been criticized for generating negative impacts on the environment, aquatic ecosystems, and human lives in coastal areas (Diana, 2009). The financial risk of shrimp farming, mainly due to inappropriate practices and disease outbreaks, has also been noticed, as have social conflicts generated by competing uses of natural resources such as land and water (Paul and Vogl, 2011). Keeping the significance of the present study the analyse the perceptions of the farmers regarding various aspects of shrimp business in Punjab and constraints faced by them.

Data Sources and Methodology

The population of the study consists of shrimp farmers in Mansa, Shri Muktsar Sahib and Fazilka districts of Punjab.

Sampling technique and selection of sample size

A total number of 90 farmers were selected through snow ball sampling technique. A sample of 30 shrimp farmers were selected from the each district. Thus, a sample comprises of 90 farmers were selected to meet the objective of the study.

Data collection

To meet the objectives of the study, primary data were collected. The data were collected through a well-designed and pre-test schedule. Literature was studied before developing the schedule. Various studies were reviewed to have a thorough understanding about various parameters to be included in the questionnaire. Respondents were asked their responses on a five-point Likert scale indicating their level of agreement, (5 = Strongly agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly disagree).

Data analysis

After collection of data, master table was constructed and analysis of the collected data was done using suitable statistical tools like mean scores, standard deviation and factor analysis.

Factor analysis

Factor analysis is a statistical technique used in data analysis to identify hidden patterns or underlying relationships among a large set of variables. Principle components analysis aims to extract factors that account for the maximum possible variance in the observed variables. Factor weights are computed to extract successive factors until no further meaningful variance can be extracted. After extraction, the factor model is often rotated for further analysis to enhance interpretability.

Determine the suitability of data for factor analysis

Bartlett's Test: Check the significance level to determine if the correlation matrix is suitable for factor analysis.

Kaiser Meyer Olkin (KMO) Measure: Verify the sampling adequacy. A value greater than 0.6 is generally considered acceptable.

Results and Discussion

Table 1 depicts the profile of the respondents. Most of the farmers (35 per cent) were in the age group of 30-40 years followed by (27.80 per cent) in the age group of 40-50 years. Most of the farmers (44.4 per cent) were educated up to high school and higher secondary pass, followed by (32.2 per cent) were graduates. In most of the farmers' family i.e. 42.2 per cent there were 4-6 family members and their annual family income was between Rs. 1-2 lakh. Most of the Shrimp farmers (40 per cent) carried out the shrimp farming between 4-10 acres land followed by 2-4 acres (26 per cent).

Table 2 shows that highest mean score (4.95) was observed for the statement "Size of shrimp matter in marketing" followed by "Selling shrimp after grading fetch

Table 1: Demographic profile of the respondents (N=90)

S. No.	Particular	Frequency	Per cent
A	Male respondents	90	100.00
B	Age		
1.	20-30 years	23	25.60
2.	31-40 years	32	35.60
3.	41-50 years	25	27.80
4.	Above 50 years	10	11.10
C	Education qualification		
1.	Primary level	2	2.20
2.	Middle level	18	20.00
3.	High school and Higher secondary	40	44.40
4.	Graduation	29	32.20
5.	Post- graduation	1	1.10
D	Family members (Number)		
1.	2-4	28	31.10
2.	4-6	38	42.20
3.	6-8	24	26.70
E	Family income (Rs.)		
1.	1-2 lakhs	10	88.8
2.	Above 2 lakhs	80	11.2
F	Land holding		
1.	Less than 2 acres	9	10.0
2.	2-4 acres	4	4.4
3.	4-8 acres	22	24.4
4.	Above 8 acres	55	61.1
G	Land under shrimp farming		
1.	0-2 acres	15	16.7
2.	2-4 acres	26	28.9
3.	4-10 acres	36	40.0
4.	Above 10 acres	13	14.4
5.	Total	90	100.00

Source: Primary data

good price” (4.68) followed by the statement “There is demand of shrimp in market” with a mean score (4.63). “Government schemes are helpful in marketing of Shrimp” (4.24) followed by “Farmers are getting any technological and extension support from agriculture department” (4.00) followed by “Shrimp farming is a profitable business” with the mean score (3.91) further followed by “Collective marketing of shrimp helps in fetching good price for marketing” (3.78), followed by “You will expand your shrimp business in future” with a mean score (3.52) and “You have knowledge of marketing plan” (3.40)

Table 3 depicts constraint faced by shrimp farmers; according to the farmers “Lack of processing industry in the region for direct marketing of shrimp was considered as the major constraints. At present the middlemen (mainly from Gujarat, Andhra Pradesh region) visit the shrimp farmers who further sell the same to the processing units. The farmers of Punjab do not have direct access to the processing facilities, therefore Lack of processing facilities is considered as the major constraints by them. Further, the farmers consider that there is lack of market for shrimp in Punjab. There is no physical market place, where the shrimp farmers can go and sell their produce. This was depicted by farmers with average

Table 2: Perception of the farmers regarding various aspects of Shrimp marketing (N=90)

S. No.	Statements	Mean	SD	t-stat	p-value
1.	Size of shrimp matter in marketing	4.95	0.29	62.57	<0.001
2.	Selling shrimp after grading fetch good price	4.68	0.46	34.41	<0.001
3.	There is demand of shrimp in the market	4.63	0.48	31.97	<0.001
4.	Government schemes are helpful in marketing of Shrimp	4.24	0.75	15.65	<0.001
5.	Farmers are getting technological and extension support	4.00	0.61	15.34	<0.001
6.	Shrimp farming is a profitable business	3.91	0.85	10.09	<0.001
7.	Collective marketing of shrimp helps in fetching good price	3.78	0.48	15.41	<0.001
8.	Open bargaining gives you high price for shrimp	3.60	0.79	7.20	<0.001
9.	You will expand your shrimp business in future	3.52	0.72	6.85	<0.001
10.	You have knowledge of marketing plan	3.40	0.64	5.83	<0.001

mean score of 3.41 (out of 5) of the statement 'Lack of ready market availability for shrimp in the region' For the above two parameters shown more than 3 mean score (out of 5) and found statistically significant different from 3 ($p \leq .001$).

Factor analysis

Value of chi-square for Bartlett's Test of Sphericity came out to be 216.43. This value was found to be significant ($p < 0.001$) with 45 degrees of freedom. Value of KMO value and results of Bartlett's Test of Sphericity indicated factor analysis could be performed on the given data set. Results from factor analysis have been presented in Table 4.

Factor definition

Four major factors emerged from the results obtained from various rotated matrix. These factors were able to explain 68.12 per cent of variation. Depending upon factor

loading, following four factors emerged

Lack of ready marketing structure: Four variables are highly correlated and combine on this factor. The variables in this factor are lack of market availability while marketing and exploitation by middlemen. It was found that the correlation between above mentioned four variables is high. As there is not ready market availability for marketing of shrimp in Punjab, therefore its relationship with variables such as exploitation by middlemen and transportation cost has been notices. Collective production of shrimp is showing high co-relation. It may be because present production quantities are not able to attract the customers required by the shrimp farmers. This factor explains 23.63 per cent variance.

Low price of produce: After applying factor analysis, it has been found that, low price in the market while marketing

Table 3: Constraints faced by farmers in marketing of shrimp (N=90)

S. No.	Statements	Mean	SD	t-stat	p-value
1.	Lack of processing industry in the region for direct marketing of shrimp	4.92	0.37	48.74	<0.001
2.	Lack of ready market availability for shrimp in the region	3.41	0.63	6.15	<0.001
3.	Lack of production in cooperative or farmers group in the region	2.52	0.69	-6.56	<0.001
4.	Lack of training and capacity building of the farmers	2.50	0.86	-5.48	<0.001
5.	Lack of market information and knowledge availability for production and marketing of shrimp	2.27	0.73	-9.32	<0.001
6.	Higher transportation cost while marketing of shrimp	1.88	0.78	-13.42	<0.001
7.	Problems of post-harvest handling and storage management while production of shrimp	1.75	0.83	-14.07	<0.001
8.	Low price in the market while marketing of shrimp	1.70	0.69	-17.76	<0.001
9.	Exploitation by middleman or trader in the market while marketing	1.42	0.61	-24.23	<0.001
10.	Delay in payment by trader's effects profits	1.37	0.51	-30.17	<0.001

Table 4: Factors extracted

S. No.	Factors	% of variance	Items	Item loading
A	Lack of ready marketing structure	23.63	Lack of ready market availability for shrimp	0.538
			Lack of production/cooperatives/FPO group	0.821
			Higher Transportation cost while marketing	0.835
			Exploitation by middlemen	0.629
B	Low price of the produce	15.95	Low price in the market	0.848
C	Post-harvest handling	14.29	Problem of post-harvest handling and storage	0.740
			Delay in payments by traders	0.742
D	Lack of processing unit	14.25	Lack of processing industry in the region	0.572

has emerged another factor. In the absence of any market, the middlemen approach the farmers at farm gate. The deal is stuck after negotiation between the farmers and the middlemen. The farmers believe that in marketing of shrimp, this is a factor. It explains 15.95 per cent of total variance.

Post-harvest handling: Two variables i.e. post-harvest handling and delayed payments have emerged as another factor. Post-harvest handling of the shrimp along with storage plays an important role in marketing of shrimp (table 3). Loaded with another variable of delayed payment when the farmers were asked about their agreement with the statement delayed payments by traders affect profits. The factor contributes 14.29 per cent of the total variance.

Lack of processing Unit: It has emerged as a single factor. It explains 14.25 per cent (table 3) of the total variance. Due to lack of processing facilities, the farmers feel that the market is not available and therefore, other issues emerge in the area of shrimp marketing.

Conclusions and Policy implications

Shrimp farming is catching up in the regions of Punjab particularly the areas affected by saline water. The study was conducted to understand the perception of farmers towards shrimp farming and various constraints faced by them. From the study it is found that most of the farmers believe that size of shrimp matter in marketing and selling shrimp after grading fetches better price. The farmers believe that there is demand of shrimp in the market. Lack of processing unit in the region and lack of ready market availability were important constraints faced by shrimp farmers. Farmers also reported problem of ready market and low price of produce in the market. Generalization of the findings is limited by a smaller sample size and it is limitation of the study. Schemes and processing units in the region could provide the ready market availability to the shrimp farmers and better price in the marketing of the shrimp.

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