

An analysis of consumer behaviour at selected fish markets of West Bengal, India

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Abstract

Many factors, components influence a consumer towards his/her decision-making process, which affects his/her purchasing behaviour. The present study was conducted in selected markets to analyse consumer behaviour for purchasing of fish and other available aquatic species. Primary data was collected from one hundred and twenty randomly selected consumers from four purposively selected retail markets. The frequency, percentage analysis and Kruskal-Wallis 'H' test were used to analyse consumers' preferences and constraints. The study revealed that consumers' preference was based on different income groups while the frequency of purchase was largely influenced by the family size of the consumers. Dominancy of the male consumers (85.83%) in the market was also documented. A perception index score of variety of fishes and price in the markets revealed that there was a significant difference in score between the markets, $X^2(3) = 14.711$, $p = 0.002$ and $X^2(3) = 10.848$, $p = 0.013$, respectively. Lack of local fresh fish was the major constraint identified followed by irregular supply of fish, price fluctuation, unhygienic condition and congestion of the market.

Keywords: Constraint, Consumer behaviour, Consumption pattern, Purchasing behaviour

Highlights

- Fish consumers' preferences and frequency of purchase varied with income and family size of the consumers respectively.
- The perception index for the variety of fishes and prices revealed a significant difference between them.
- Primary constraints were the lack of local fresh fish, irregular supply, price fluctuations, unhygienic conditions, and congestion.

INTRODUCTION

Consumption of fish and fish products is increasing day by day throughout the world for its nutritional and medicinal values (Chen et al., 2022). Thus, it has occupied a significant position in world market as a cheap source of animal protein with high consumer demand (Goswami et al., 2012). India contributes 8.92% to world fish production with annual per capita fish consumption more than 13 kg in 2022-23 which is expected to reach 21 kg by 2031 (Government of India [GoI], 2023). In India, it has been estimated that around 60% of the population consume fish (Shyam, 2016). The average consumption of marine fish is higher for urban households, while the rural households' average consumption of carp is higher (Needham & Funge-Smith, 2015). In West Bengal, per capita fish consumption per month in a rural area was 0.81 kg and 1.03 kg for urban people (Government of India [GoI], 2023). Currently being the second fish producing state in India, West Bengal still it imports

fish from states like Andhra Pradesh, Odisha and from neighbouring country like Bangladesh to fulfil the gap between demand and supply (Ngasotter et al., 2020). According to Santhakumar and Sanjeeviraj (2000), in modern marketing concept marketing activities revolved around the consumer. For any market research consumer behaviour, consumption pattern, purchasing behaviour, income level and family type play a major role. West Bengal, being a fish loving state with a high preference of fish consumption it is of interest to investigate the market dynamism. Therefore, the present study was focused to the patterns of consumer behaviour, factors affecting purchase of fish and constraints faced by consumers in selected markets of West Bengal.

MATERIALS AND METHODS

Considering the popularity, growth and market potential of fish, West Bengal was selected to study the consumer behaviour and to identify several

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parameters affecting the purchase decision and constraints being faced by the consumers. The study was based on collection of primary data from 120 fish consumers from four fish markets, namely Malancha Fish market (North 24 Parganas), Baruipur fish market (South 24 Parganas), Garia fish market (South 24 Parganas) and Sonarpur fish market (South 24 Parganas). The markets were selected using purposive sampling based on the availability of both fresh and marine water fish and types of market. Malancha Fish market is dominant with marine fishes as it is close to Icchamati River and the Bidyadhari River and kind of rural market. Where Garia, Sonarpur and Baruipur fish markets are urban market dominant with fresh water fishes. From each of the selected fish markets, 30 fish consumers were selected randomly for the study who visited on the day of survey. Thus, a total of 120 fish consumers were selected for the study. The survey was conducted during Sep-Oct, 2019 through personal interview method with the help of pre-tested and specially designed schedule. Simple statistical tools like frequency, percentage and mean were used to analyse consumer profile (age, family size, sex, education and income) including the nature of consumer's interest and buying behaviour (Kumar et al., 2023). The Kruskal-Wallis 'H' test was used to test the significant difference in variables in the market by SPSS-20 computer program (SPSS Inc. Chicago, Illinois, USA). Perception of consumers towards the traditional fish market and the modern retail market was analysed using data generated through a 3-Point Likert Scale.

Constraints in fish purchase were studied and analyzed using the Garrett ranking technique (Garrett & Woodworth, 1971).

$$\text{Percentage position} = 100 (R_{ij} - 0.5) / N_j$$

Where, R_{ij} = Rank given for i^{th} factor by j^{th} respondents and N_j = Number of factors ranked by j^{th} respondents.

RESULTS

The study of consumer behaviour revealed that different socio-economic factors influenced the day-to-day decision-making process by the consumers. Information on the socio-economic profile of the fish consumers, collected in terms of age, gender, family size, education and annual income indicates that though both male and female consumer visit the market, the number of males (85.83%) were very high in comparison to female (14.17%). It was found that market was patronised by the consumer of age group

41 to 50 years (46.67%), followed by 30 to 40 years (35%), more than 50 years (10.83%) and less than 30 years age group (7.53%). Majority of the consumers (53.33%) had a family size of four to five, while 30.83% of consumers having more than five-member family and about 15.83% of consumers had a family size two to three-member of the family. As per education level is concern 34.17% of the respondents were educated graduate or more, followed by 30% of 8th to 10th pass, 29.17% of 12th pass and 6.25% was illiterate. Maximum numbers of 8th to 10th pass and illiterate group of the customer were observed in Malancha Fish market (39.17%) whereas maximum graduate consumers were found in Sonarpur (17%) and Garia (23.16%) fish market. To analyse the income-consumption relationship, the respondents were categorised into three income groups based on their annual income; low-income group (less than Rs. 0.65 lakhs/annum), medium income group (Rs. 0.65-1.4 lakhs/annum) and high-income group (more than Rs. 1.4 lakhs/annum) which reflects that 47.50% of the respondents were in the medium income group followed by low-income group (29.17%) and high-income group (23.33%). Majority of the fish consumers preferred locally produced fresh fish and remaining expressed preference for imported fish from other states like Andhra Pradesh and Gujarat etc. due to low price in compare with local fresh fish.

Consumers' preference towards different aquatic species, viz. fish, crab, prawn, shrimps etc. were analysed based on different income group, which reveals that, *Labeo rohita* [rohu] was most preferred (40%) followed by *Oreochromis mossambicus* [tilapia] (22.50%), *Labeo catla* [catla] (14.17%), *Cyprinus carpio* (6.67%), *Penaeus monodon* (6.67%) and others (Bhola, Pomfret, Mackerel, Tuna, Tangra, Pabda, Crab etc) were preferred by 10% of the consumers. Consumers' preference was based on different income groups, showed that 40% of lower-income group consumers and 43.86% of medium-income group preferred rohu. Similarly, 32.14% of higher-income group also preferred rohu followed by catla (25.00%). It was also revealed that *Penaeus monodon* was most preferred by high-income group 14.29% followed by medium-income group 5.26% and lower-income group 2.86%. So, consumers' preference for different species varies with their income viz., higher the income groups prefer high priced fish and vice-versa.

Frequency and quantity of purchase per visit by respondents was estimated based on income groups and family size, are presented in Table 1 which revealed that 34.29% of low-income group consumers visited

the market thrice a week, 40.35% of medium-income group consumers visited the market twice a week and 35.71% high-income group consumers visited the market thrice a week which indicates that annual income of fish consumers has less influenced the frequency of visit to fish market. Frequency of visit based on family size indicate that majority (36.84%) of small size family (2-3 members) visited the market once a week, while 48.44% of medium size family (4-5 members) visited twice a week and about 43.24% of large size family (> 5 members) visited market almost daily basis. Study on fish purchasing quantity per visit showed that 0.5-1 kg fish per visit was frequently brought by the small family size (47.37%), followed by 1-2 kg fish per visit by medium size family (81.25%) and more than 2 kg per visit by large size family (56.76%). So, this can be concluded that larger the family size, more frequency of visit to market with a higher quantity of fish purchased per visit and conversely.

The purchasing behaviour of the consumer was analysed based on income group, and family size is presented on Table 2. It was observed that consumption was positively influenced by purchasing power of the consumer. The consumer of low-income group was inordinate species specific (48.57%) and preferred whole fish or cut fish simultaneously, but mostly marine fish (82.86%). Medium income group preferred whole fish (45.61%) of freshwater fish (85.96%) and high-income group consumer also preferred whole fish (46.43%) of freshwater fish (82.14%). Table 2 also revealed the relation between family size and purchasing behaviour of the consumer, where small family preferred cut fish, whereas the large family consumer purchased whole fish.

Consumer perception towards quality, variety, and price of the different fish markets was analysed by Kruskal- Wallis H test which showed that there was no statistically significant difference in quality score between the markets, $X^2(3) = 7.107$, $p = 0.069$, with a mean rank of 55.78 for Garia fish market, 73.42 for Sonarpur fish market, 59.47 for Baruipur fish market, and 53.33 for Malancha fish market. But in case of variety there was a statistically significant difference in score between the markets, $X^2(3) = 14.711$, $p = 0.002$, with a mean rank of 66.92, 49.37, 50.05 and 75.67 for Garia fish market, Sonarpur fish market, Baruipur fish market and Malancha fish market respectively. Price score also showed a statistically significant difference between the markets, $X^2(3) = 10.848$, $p = 0.013$, with a mean rank of 48.83 for Garia fish market, 53.50 for Sonarpur fish market, 66.53 for Baruipur fish market,

and 73.13 for Malancha fish market.

In the present study, seven significant constraints were identified, which were faced by the consumer during their market visit. The constraints were ranked by Garret ranking technique by which consumers identified lack of local fresh fish as the most important constrain (mean score: 62.83), followed by price fluctuation (mean score: 55.72). Irregular supply of fish (mean score: 51.83) was another major problem which indirectly influences the price fluctuation in the market. The other constraints faced by the consumers were the unhygienic condition of the market (mean score: 40.83), followed by market congestion (mean score: 39.79).

DISCUSSION

The study on consumer behavior regarding fish purchases gives valuable insights into the factors that impact consumer decision-making in relation to socio-economic aspects (Gosh, 2024). It, therefore, showed marked differences between males and females in as far as buying fish is concerned. Similar observations have been made at other places like Tripura where women's involvement in purchasing fish was quite low (Upadhyay et al., 2014). Ngasotter et al. (2020) documented less participation of female in fish purchase as observed in the state of Tripura, where female participation was 13.13%. Higher prevalence of middle-aged individuals as primary purchasers of fish had greater purchasing power or specific dietary preferences that make them frequent buyers of fish products (Mohan et al., 2022). In addition, family size influenced buying patterns with four to five individuals being the main buyers in many cases. A considerable percentage of respondents were highly educated graduates and above meaning that the more educated people become aware of nutritional benefits that come from eating fish. Furthermore, an analysis of income-consumption relationships reveals changes in consumers' preferences for particular species between different groups based on their income levels.

The study reveals that there is a high consumer's preference for locally available freshwater fishes in the market of West Bengal (Sit et al., 2021). Hence, the freshwater fish production of the state needs a boost to cut down the supply dependency on neighbouring states and for ensuring a steady supply of the fishes. Specifically, rohu, tilapia and catla are the most preferred fish among the consumers. This preference is further supported by the findings of Bhutia et al. (2021), who observed similar patterns in their study. At the same time, the supply of such species in the fresh and

Table 1. Frequency and volume of purchase (n=120)

Particulars	Income group				Family size									
	Low (<0.65 lakhs) (n=35)	Medium (0.65-1.3 lakhs) (n=57)	High (>1.3 lakhs) (n=28)	% members (n=19)	4-5 members (n=64)	% members (n=37)	% Overall (n=120)							
	Frequency of visit (No.)													
Daily	5	8	3	10.71	3	15.79	6	9.38	16	43.24	25	20.83		
Once a week	8	11	6	21.43	7	36.84	17	26.56	4	10.81	28	23.33		
Twice a week	10	23	9	32.14	5	26.32	31	48.44	8	21.62	44	36.67		
Thrice a week	12	17	10	35.71	4	21.05	10	15.63	9	24.32	23	19.17		
Quantity of purchase(kg/visit)														
<0.5 kg	6	17.14	3	5.26	0	0.00	2	10.53	1	1.56	0	3	2.50	
0.5-1 kg	9	25.71	10	17.54	1	3.57	9	47.37	7	10.94	4	10.81	20	16.67
1-2 kg	18	51.43	37	64.91	16	57.14	7	36.84	52	81.25	12	32.43	71	59.17
>2 kg	2	5.71	7	12.28	11	39.29	1	5.26	4	6.25	21	56.76	26	21.67

Table 2. Purchasing behaviour of consumer (n=120)

Particulars	Income group				Family size									
	Low (<0.65 lakhs) (n=35)	Medium (0.65-1.3 lakhs) (n=57)	High (>1.3 lakhs) (n=28)	%	4-5 members (n=64)	%	>5 members (n=37)	%						
	Specificity				Form of purchase									
Species specific	17	14	5	17.86	3	15.79	26	40.63	10	27.03	39	32.50		
Whole fish	8	26	13	46.43	7	36.84	21	32.81	16	43.24	44	36.67		
Cut fish	10	17	10	35.71	9	47.37	17	26.56	11	29.73	37	30.83		
Freshwater	6	17.14	49	85.96	23	82.14	17	89.47	6	9.38	28	75.68	51	42.5
Marine	29	82.86	8	14.04	5	17.86	2	10.53	58	90.63	9	24.32	69	57.5

live condition is very limited in the market which needs special attention besides the variability of price in different markets. Furthermore, irregular fluctuations in supply and market price underlined the need for a more organised and systematic marketing framework with proper dissemination of market information.

Conflict of interest: The authors declare no actual or potential conflict of interest associated with this study.

Author's contributions: MRM: Acquisition of data; SP, OB, SS: Conception, design, and statistical analysis of data; PV: Performed interpretation of the results.

Data availability statement: Additional data are available with corresponding author upon reasonable request.

REFERENCES

- Bhutia, T. P., Yadav, V. K., Qureshi, N. W., & Kesavan, S. (2021). Fish of choice-An analytical hierarchy process to determine fish consumption in West Bengal. *Indian Journal of Economics and Development*, 17(3), 693-699. <http://dx.doi.org/10.35716/IJED/20201>
- Chen, J., Jayachandran, M., Bai, W., & Xu, B. (2022). A critical review on the health benefits of fish consumption and its bioactive constituents. *Food Chemistry*, 369, 130874. <https://doi.org/10.1016/j.foodchem.2021.130874>
- Garrett, H. E., & Woodworth, R. S. (1971). *Statistics in Psychology and Education*. Vakils, Feffer and Simons Ltd, New York.
- Gosh, K. (2024). Exploring the influential factors shaping consumer behavior and purchase intentions of catfish products in the Southern USA. *Aquaculture*, 592, 741225. <https://doi.org/10.1016/j.aquaculture.2024.741225>
- Goswami, B., Mukhopadhyay, S. B., & Dana, S. S. (2012). A study on factors influencing the adoption behaviour of fish farmers with special reference to scientific fish culture in West Bengal, India. *International Journal of Bio-resource and Stress Management*, 3(3), 362-367. <https://doi.org/10.13140/rg.2.2.10474.62408>
- Government of India. (2023). *Handbook of Fisheries Statistics*. Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India (GoI), New Delh. Available online at: <https://dof.gov.in/sites/default/files/2023-08/HandbookFisheriesStatistics19012023.pdf> [Accessed on 11th January, 2024]
- Kumar, H. R. H., Bindu, H. A., & Pavan, V. (2023). A study on consumers' behavior and factors influencing the consumption of fish in selected districts of North Karnataka, India. *Asian Journal of Agricultural Extension Economics & Sociology*, 41(9), 125-132. <https://doi.org/10.9734/ajaes/2023/v41i92023>
- Mohan, K., Maheswarappa, N. B., & Banerjee, R. (2022). Exploring the dynamics of women consumer preference, attitude and behaviour towards meat and meat products consumption in India. *Meat Science*, 193, 108926. <https://doi.org/10.1016/j.meatsci.2022.108926>
- Needham, S., & Funge-Smith, S. J. (2014). *The consumption of fish and fish products in the Asia-Pacific region based on household surveys*. FAO Regional Office for Asia and the Pacific, Bangkok, Thailand. RAP Publication 2015/12. 87pp. <http://www.fao.org/3/a-i5151e.pdf>
- Ngasotter, S., Panda, S. P., Mohanty, U., Akter, S., Mukherjee, S., Waikhom, D., & Devi, L. S. (2020). Current scenario of fisheries and aquaculture in India with special reference to Odisha: A review on its status, issues and prospects for sustainable development. *International Journal of Bio-resource and Stress Management*, 11(4), 370-380. <https://doi.org/10.23910/1.2020.2126a>
- Santhakumar, R., & Sanjeeviraj, G. (2000). Characteristics and consumption behaviour of fish consumers. In *Proceedings of the workshop on 'Rural Fish Marketing' organized at Fisheries College and Research Institute, Tamil Nadu Veterinary and Animal Sciences University, Thoothukudi* (pp. 51-53).
- Shyam, S. S. (2016). Fish consumption pattern in India: Paradigm shifts and Paradox of export trade (Fish consumption pattern in India, exports-Overview). *Food and Beverage News*, 25-28.
- Sit, G., Jana, A., & Chanda, A. (2021). A study on fish diversity, marketing and economics in fish markets at Kharagpur, West Bengal, India. *Bhartiya Krishi Anusandhan Patrika*, 36(2), 112-119. <http://dx.doi.org/10.18805/BKAP310>
- Upadhyay, A. D., Pandey, D. K., & Singh, Y. J. (2014). Socio-economic determinants of consumption pattern of fish in urban area of Tripura. *Economic Affairs*, 59(3), 355-362. <http://dx.doi.org/10.5958/0976-4666.2014.00004.7>

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