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Marketing system and consumer attitude towards pangas fish in selected areas of Mymensingh district

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ABSTRACT

This study aims to examine the marketing system and consumer attitudes towards pangas fish in selected areas of the Mymensingh district. It is based on primary data collected from three upazilas: Trishal, Muktagacha, and Sadar. A total of 108 samples were randomly selected, including 10 fish farmers, 10 beparis, 10 aratdars, 10 paikers, 20 retailers, and 48 consumers. The study identified four different channels in the current pangas fish marketing system. Consumers generally expressed a positive attitude towards pangas fish. However, a greater quantity of fish needs to be produced to bridge the gap between supply and demand. The study revealed that while many appreciate its affordability, taste, and year-round availability, concerns about farming practices, especially the use of poultry litter, were notably raised. Both producers and traders reported several challenges, including insufficient knowledge and technical support, a lack of quality fingerlings, high prices for various inputs, inadequate transportation and communication facilities, price instability, and a lack of market information. The findings indicate that the marketing of pangas fish is a profitable business. Based on these insights, several recommendations were made to improve the marketing of pangas fish in the country.

INTRODUCTION

Bangladesh is one of the world's leading fish-producing countries, owing to its vast inland fisheries resources including ponds, rivers, canals, beels, haors, and baors which provide ideal environments for freshwater fish production (BBS, 2023). The country's fish farming sector has witnessed rapid growth due to increasing domestic demand and its significant contribution to food security and livelihoods. The fisheries sector contributes approximately 2.41% to the national GDP, with around 1.28 million people directly engaged in fisheries activities and an estimated 3.08 million involved in fish farming. Additionally, nearly 12 million people earn their livelihoods through fisheries-related enterprises (BBS, 2023).

Among the major aquaculture species, pangas (*Pangasius hypophthalmus*) has emerged as a preferred choice for both producers and consumers. Originally introduced from Thailand in 1989, pangas has adapted well to the country's ecological and climatic conditions. Its compatibility with shallow and seasonal ponds, low production costs, and year-round availability have made it a vital contributor to food security, employment, and rural income generation (Razeim et al., 2017). Pangas is also the only catfish species extensively cultivated under commercial aquaculture systems in Bangladesh.

The popularity of pangas among low- and middle-income consumers stems from its affordability, palatability, and consistent market presence. However, the fish is highly perishable, necessitating a swift and efficient marketing system to bridge the geographic gap between production and consumption zones (Uddin et al., 2019). Modern and scientific production methods can enhance pangas output, but their benefits can only be fully realized through a streamlined and equitable marketing infrastructure.

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The marketing system for pangas involves a range of actors farmers, aratdars (commission agents), paikers (wholesalers), retailers, and consumers each playing a critical role in moving the product along the value chain (Rabby et al., 2019). Intermediaries, particularly aratdars, serve as key facilitators, often without taking ownership of the fish, and also act as informal credit providers to farmers. However, their strong influence can sometimes lead to profit imbalances and increased consumer prices due to multiple transaction layers.

Prior studies have identified various marketing channels and their associated efficiencies. For instance, Mandal et al. (2024) found that the most efficient channel was Farmer → Aratdar → Paiker → Retailer → Hotel, while the least efficient was Farmer → Local Wholesaler → Retailer → Consumer, due to higher marketing costs and lower producer margins. Similarly, Shafiuddin (2021) emphasized post-harvest losses caused by inadequate storage and transportation, which hinder profitability and quality maintenance in the supply chain.

Consumer behavior is another crucial factor in the fish marketing system. Chowdhury et al. (2019) reported that urban consumers, especially in Dhaka, prefer fresh, formalin-free fish and expressed concerns over market hygiene and product safety. Uddin et al. (2019) further identified key determinants influencing fish consumption: price, freshness, size, availability, and socio-economic factors such as income and household size. Pangas and tilapia are particularly favored for their low prices and year-round accessibility.

Despite its economic and nutritional importance, limited research has been conducted on the marketing dynamics of pangas fish in Bangladesh. The role of intermediaries, the efficiency of marketing channels, and consumer attitudes toward pangas particularly in terms of quality and food safety remain underexplored. Addressing this knowledge gap is essential for enhancing market efficiency and ensuring equitable benefit distribution across the value chain. Therefore, the present study aims to achieve to examine the existing marketing system of pangas fish and to evaluate consumer attitudes toward pangas fish in selected areas of Mymensingh district.

MATERIAL AND METHODS

The present study employed a field survey method to collect primary data from respondents, utilizing a mixed-methods approach that combined quantitative surveys with qualitative interviews to understand the topic comprehensively. The focus was on the Mymensingh district, home to numerous successful Pangas fish producers and traders, including *Aratdars*, *Beparis*, *Paikers*, and retailers.

The research was conducted in three specific Upazilas: Mymensingh Sadar, Muktagachha, and Trishal, where Pangas fish cultivation is mainly concentrated. A multistage purposive sampling technique was adopted to select the sample, resulting in 108 participants. This group included 10 fish farmers (5 from Trishal and 5 from Muktagachha) and 50 traders. The intermediaries involved in Pangas marketing were categorized into four groups: *Bepari*, *Aratdar*, *Paiker*, and retailer. The sample included 10 *Beparis*, 10 *Paikers*, 10 *Aratdars*, and 20 retailers. Specifically, 5 *Aratdars* and 5 *Beparis* were chosen from Trishal and Muktagachha, while 5 *Paikers* were selected from the same Upazilas. The 20 retailers were exclusively chosen from Mymensingh Sadar.

To evaluate consumer attitudes towards Pangas fish, 48 respondents were selected, consisting of 15 from Trishal, 15 from Muktagachha, and 18 from Mymensingh Sadar. The data collection process utilized semi-structured interview schedules.

Three distinct interview schedules were developed to gather pertinent information from traders, aligning with the study's objectives. Furthermore, the researcher observed and recorded various characteristics of the selected markets. During the interviews, each respondent was provided with a brief introduction outlining the nature and purpose of the study. Questions were presented systematically in clear language, with clarifications given as needed, while

responses were meticulously recorded on the schedules. Primary data were collected through face-to-face interviews conducted in June 2024. Simple statistical techniques, such as descriptive statistics and Likert scale methods, were employed for data analysis.

RESULTS AND DISCUSSION

Consumers attitude towards Pangas fish

One of the primary reasons for conducting marketing research is to understand consumer attitudes, which significantly impact behavior. In marketing, the goal is often to encourage the purchase of a product or service. Marketers must identify any attitudinal barriers that might hinder purchasing decisions, enabling them to strategize effectively to overcome these obstacles through their marketing activities. Generally, consumers have individual preferences shaped by their likes and dislikes. When a significant portion of a particular demographic feels a certain way about a product, service, person, or entity, it creates a generalized consumer attitude that can positively or negatively influence marketing efforts. Marketers aim to influence consumer attitudes, and understanding the prevailing sentiment is the first step toward changing it if necessary.

Since 2000, Pangas have become one of the most popular fish consumed in our country, primarily due to their appealing taste and relatively low cost. Additionally, Pangas are rich in heart-healthy omega-3 fatty acids, believed to help lower blood pressure and reduce the risk of certain cancers, inflammatory conditions such as rheumatoid arthritis, and even cognitive decline. Currently, some regions in our country are recognized for extensive Pangas farming.

Various factors, including sex, culture, religion, occupation, age, education, income, and personality, influence consumer preferences for Pangas. Nevertheless, perceptions play a significant role in shaping these preferences, and these factors are not mutually exclusive. Among these, psychological factors are particularly important in determining consumer preference for Pangas.

In Bangladesh, the survey method using an interview schedule remains the primary tool for studying consumer attitudes. Researchers often employ the Likert scale method to gauge people's attitudes. To assess consumer attitudes toward Pangas among the final consumers in the Mymensingh district, we selected 48 representative samples and conducted surveys using an interview schedule.

We implemented a five-point Likert scale to determine consumer attitudes and included five statements. The total responses according to these statements are summarized in Table 1.

Table 1. Consumer attitude using Likert scale

Sl no.	Statement	Degree of Expression				
		Strongly agree	Agree	Undecided	Disagree	Strongly Disagree
1	Pangas fish is delicious	12 (25.00)	18 (37.50)	12 (25.00)	6 (12.50)	-
2	The flavor of pangas is excellent	11 (22.92)	19 (39.58)	11 (22.92)	7 (14.58)	-
3	The price of pangas is cheap	19 (39.58)	20 (41.67)	6 (12.50)	2 (4.17)	1 (2.08)
4	Pangas fish is very good for health	2 (4.17)	14 (29.17)	30 (62.50)	2 (4.16)	-
5	Pangas fish is known as poor people fish	-	7 (14.58)	12 (25.00)	18 (37.50)	11 (22.92)
6	As pangas is available year the round, it can be consumed any time	14 (29.17)	24 (50.00)	8 (16.67)	2 (4.16)	-
7	Pangas is preferable because of containing less bone	12 (25.00)	22 (45.83)	14 (29.17)	-	-
8	We do not eat pangas because it has bad smell	7 (14.58)	11 (22.92)	8 (16.67)	13 (27.08)	9 (18.75)
9	Cultured pangas is objectionable because farmers use poultry liter	6 (12.50)	10 (20.83)	10 (20.83)	12 (25.00)	10 (20.83)

10	We eat pangas because live pangas which is free from any chemical adulteration is available in the market	22 (45.83)	24 (50.00)	2 (4.17)	-	-

Note: '-' indicates no response. Figures in the parentheses indicate the percentage of all respondent

Based on the responses of a total number of respondents, categorized into five groups: strongly agree, agree, undecided, disagree, and strongly disagree. Each category is assigned a weight on a five-point scale, either as 1, 2, 3, 4, 5 or as 5, 4, 3, 2, 1, depending on whether the item is perceived favorably or unfavorably.

For favorable statements regarding Pangus, the weights were assigned as Strongly Agree: 5, Agree: 4, Undecided: 3, Disagree: 2 and Strongly Disagree: 1. In contrast, if negative statements (those indicating a rejection of Pangus consumption) had been included, the weights would have been reversed.

After calculating the total score for each respondent, it's crucial to establish a basis for selecting items to include in the final scale. This can be done using a method known as "item analysis." In item analysis, each item is evaluated for its ability to distinguish between high and low scores. This ability is called the item's discriminative power (DP).

From the Table 2, it can be said that weighted total and weighted mean for the high 25% are 54 and 4.5 respectively. For low 25% weighted total and weighted mean are 39 and 3.25 respectively. After calculation we can say that DP value is 1.25.

Determining the Discriminative power

Table 2: Computation of discriminative power (DP) value for the First Statement

Group	Number in group	Scale value					Weighted total	Weighted mean	DP (Q1-Q3)
		5	4	3	2	1			
High (25%)	12	7	4	1	0	0	54	4.5	1.25
Low (25%)	12	3	3	2	2	2	39	3.25	

Weighted total = Score × Number who check that score
Weighted mean = Weighted total / number in groups

Table 3: Computation of discriminative power (DP) value for the second statement

Group	Number in group	Scale value					Weighted total	Weighted mean	DP (Q1-Q3)
		5	4	3	2	1			
High (25%)	12	5	4	3	0	0	50	4.166	1
Low (25%)	12		4	6	2	0	38	3.166	

For the second statement DP value is 1

Table 4. Computation of discriminative power (DP) value for the 3rd statement

Group	Number in group	Scale value					Weighted total	Weighted mean	DP (Q1-Q3)
		5	4	3	2	1			
High (25%)	12	4	7	1	0	0	51	4.25	0.75
Low (25%)	12	2	6	1	2	1	42	3.5	

For the third statement DP value is 0.75

Table 5. Computation of discriminative power (DP) value **for the 4th statement**

Group	Number in group	Scale value					Weighted total	Weighted mean	DP (Q1-Q3)
		5	*4*	*3*	*2*	*1*			
High (25%)	12	2	5	5	0	0	45	3.75	0.667
Low (25%)	12	0	3	7	2	0	37	3.083	

For the fourth statement DP value is 0.667

Table 6. Computation of discriminative power (DP) value **for the 5th statement**

Group	Number in group	Scale value					Weighted total	Weighted mean	DP (Q1-Q3)
		1	*2*	*3*	*4*	*5*			
High (25%)	12	0	1	2	4	5	49	4.083	0.417
Low (25%)	5	0	2	3	4	3	44	3.666	

For the fifth statement DP value is 0.417

Table 7. Computation of discriminative power (DP) value **for the 6th statement**

Group	Number in group	Scale value					Weighted total	Weighted mean	DP (Q1-Q3)
		5	*4*	*3*	*2*	*1*			
High (25%)	12	7	5	0	0	0	55	4.583	1.25
Low (25%)	12	0	6	4	2		40	3.333	

For the sixth statement DP value is 1.25

Table 8. Computation of discriminative power (DP) value **for the 7th statement**

Group	Number in group	Scale value					Weighted total	Weighted mean	DP (Q1-Q3)
		5	*4*	*3*	*2*	*1*			
High (25%)	12	4	4	4	0	0	53	4.416	0.666
Low (25%)	12	2	5	5	0	0	45	3.75	

For the sixth statement DP value is 0.666

Table 9. Computation of discriminative power (DP) value **for the 8th statement**

Group	Number in group	Scale value					Weighted total	Weighted mean	DP (Q1-Q3)
		1	*2*	*3*	*4*	*5*			
High (25%)	12	0	1	1	4	6	53	4.25	2.25
Low (25%)	12	4	5	2	1	0	24	2	

For the sixth statement DP value is 2.25

Table 10. Computation of discriminative power (DP) value **for the 9th statement**

Group	Number in group	Scale value					Weighted total	Weighted mean	DP (Q1-Q3)
		1	*2*	*3*	*4*	*5*			
High (25%)	12	0	1	0	4	7	53	4.416	2.416
Low (25%)	12	4	5	2	1	0	24	2	

For the sixth statement DP value is 2.416

Table 11. Computation of discriminative power (DP) value **for the 10th statement**

Group	Number in group	Scale value					Weighted total	Weighted mean	DP (Q1-Q3)
		5	*4*	*3*	*2*	*1*			
High (25%)	12	5	6	1	0	0	52	4.333	0.333
Low (25%)	12	3	6	3	0	0	48	4	

For the sixth statement DP value is 0.333

Table 12. Computed DP values according to descending order

Sl. No.	Statements	DP value
1	Cultured pangas is objectionable because farmers use poultry liter	2.416
2	We do not eat pangas because it has bad smell	2.25
3.	Pangas fish is delicious	1.25
4.	As pangas is available year the round, it can be consumed any time	1.25
5.	The flavor of pangas is excellent	1
6.	The price of pangas is cheap	0.75
7.	Pangas fish is very good for health	0.667
8.	Pangas is preferable because of containing less bone	0.666
9.	Pangas fish is known as poor people fish	0.417

The DP values were calculated for each scale item, and the items with the highest DP values were selected. These selected items effectively differentiate between individuals expressing various attitudes toward the measured concept. The DP values are presented in a table arranged in descending order. The item with the lowest DP value, "As pangas is available year-round, it can be consumed at any time," was excluded due to its low discriminative power. In contrast, the statement with the highest DP value is "Cultured pangas are objectionable because farmers use poultry litter." This indicates that most consumers perceive producers using poultry litter to cultivate pangas fish.

Favorability and unfavourability of consumers towards Pangas fish

The total score reflecting individual favorability and unfavourability toward pangas fish consumption can be summarized as follows. Consumers were categorized into four groups: i) highly unfavorable attitudes toward pangas fish (score range: 10-20), ii) unfavorable attitudes toward pangas fish (score range: 21-30), iii) favorable attitudes toward pangas fish (score range: 31-40), and iv) highly favorable attitudes toward pangas fish (score range: 41-50) (Table 13).

Table 13. Percentage of Favorable and Unfavorable Attitudes Toward Pangas Fish Based on Individual Scores

Score	Particulars	No. o respondents	Percentage
10-20	Highly disfavored attitude towar pangas fish	-	-
21-30	Disfavored attitudes towar pangas fish	10	20.83
31-40	Favorable attitudes toward pangas fish	26	54.17
41-50	Highly favorabl attitudes toward pangas	12	25
Total		48	100

Marketing system of pangas fish

Marketing system

The marketing system is analyzed to understand the marketing channels, functions, and performance of intermediaries involved with

Pangas fish, addressing the study's second objective. This system is a vital link between producers and consumers, often called "the marketing machinery" or "distribution system." It encompasses all activities involved in moving goods from the point of initial production to the final consumer.

Bangladesh's agricultural marketing system consists of various functions and services conducted by several institutions and market participants, including Bepari, Aratdar, Paikar, retailers, exporters, and manufacturers. Their roles are crucial for transferring products from the farm gate to domestic and international consumers.
Increased agricultural production is of little value if producers cannot efficiently deliver their products to consumers at fair prices. Therefore, an efficient marketing system is essential for producers, intermediaries, and consumers' success.

Marketing channel of Pangas fish

A marketing channel can be defined as a series of intermediaries involved in the transaction of goods from the producer to the ultimate consumer. The marketing channel for Pangas fish begins with the fish farmers and passes through several intermediaries before reaching the end consumers. The length of the marketing channel can vary for different commodities based on factors such as product quality and the nature and number of consumers and producers involved. In most cases, Pangas fish must travel a long distance from the fishing points to reach the kitchens of the ultimate consumers.

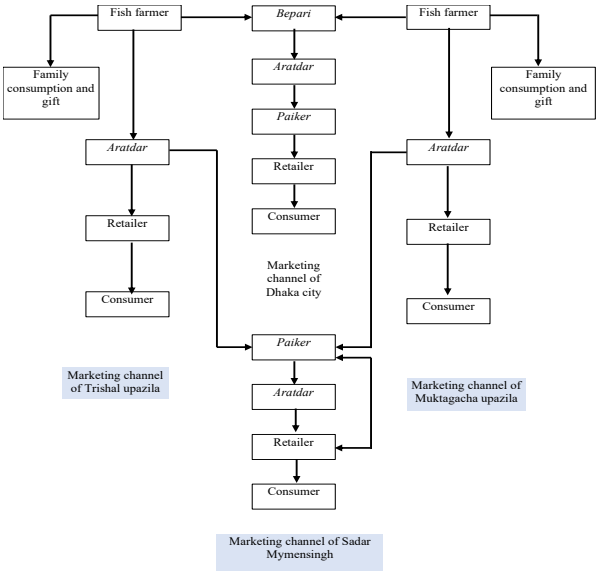

Fig. 1. Marketing channels of Pangas fish

Channel I ⇒ Fish farmer ⇒ *Aratdar* ⇒ retailer ⇒ Consumer
(Upazila level)
Channel II ⇒ Fish farmer ⇒ *Bepari* ⇒ *Aratdar* ⇒ *Paiker* ⇒ Retailer ⇒ Consumer
(Distant market level)
Channel II ⇒ Fish farmer ⇒ *Bepari* ⇒ *Aratdar* ⇒ Retailer ⇒ Consumer
(Distant market level)
Channel III ⇒ Fish farmer ⇒ *Aratdar* ⇒ *Paiker* ⇒ *Aratdar* ⇒ Retailer ⇒ Consumer
(Upazila level) (District level)
Channel IV ⇒ Fish farmer ⇒ *Aratdar* ⇒ *Paiker* ⇒ Retailer ⇒ Consumer
(Upazila level) (District level)

Characteristics of market participants

In the Pangas fish marketing channel within the study areas, the product moves from farmers to consumers through several market intermediaries, including *Aratdars*, *Beparis*, *Paikers*, and retailers.

Fish Farmers

Fish farmers are the initial link in the pond fish marketing channel. They typically sell their fish at the pond side to *Beparis*, while the rest of their catch is sold to local *Aratdars*. Notably, no fish

farmers were found selling directly to consumers in the market.

Aratdars

Aratdars serve as commission agents with fixed establishments in secondary markets at the upazila level and higher secondary markets in nearby towns. They are the largest fish traders in the marketing channel, albeit limited in number. Their role involves negotiating transactions between buyers and sellers of fish, providing assistance at their business premises, and receiving a commission for their services. In the study area, the *Aratdars* of Trishal and Muktagacha negotiated transactions between fish farmers and *Paikers* or retailers, charging a commission of Tk. 3 per kg from the farmers. In Mymensingh town, *Aratdars* facilitated fish transactions between *Paikers* and retailers, earning a commission of 3 percent on the value of the products sold. All *Aratdars* operated with a business license.

Beparis

Beparis are professional fish traders who deal with large volumes of products. In Trishal and Muktagacha upazilas, *Beparis* purchases fish from farmers on the pond side on credit. They then sell their produce to various *Aratdars* in different areas of Bangladesh. After receiving payments from the *Aratdars*, they settle their debts with the farmers.

Paikers

Paikers are also professional fish traders who handle large volumes of products, though they are fewer in number. They primarily purchase Pangas fish from producers through *Aratdars* and sell it to retailers, often through *Aratdars*. Occasionally, they sell small amounts directly to retailers in Mymensingh town. Most *Paikers* are self-financed.

Retailers

Retailers represent the final link in the Pangas fish marketing channel. They are the smallest type of fish traders, purchasing fish in wholesale markets from Aratdars and selling directly to consumers. Generally, the retailers in Mymensingh town buy Pangas fish from Trishal and Muktagacha Aratdars due to convenient transportation and competitive pricing. They do not have permanent establishments but usually have a fixed area in the market center. Sometimes, they purchase fish on short-term credit. Retailers sell their fish to consumers for cash, procuring supplies and displaying them conveniently for shopper access.

Marketing functions of pangas Fish

Marketing functions can be defined as specialized business activities that are essential to the food marketing process. In the study area, the marketing of Pangas fish has been categorized into several functions, including buying and selling, transportation, grading, stocking, financing, market information, and pricing.

Buying and Selling

Marketing encompasses the commercial transactions of buying, selling, and physical distribution. The activities involved in transferring goods are carried out through buying and selling, also referred to as exchange functions in marketing. Buying typically consists of selecting the types of goods, determining their quality, and choosing sources of supply. Selling is a personal and impersonal process to assist and persuade prospective customers to purchase a commodity or service.

The percentages of fish transactions by fish farmers and intermediaries in Trishal, Muktagacha, and Mymensingh town are presented in Tables 13, 14, and 15, respectively. In Trishal, fish farmers sold 87.5% of their fish to *beparis* (wholesalers), 6.5% to *paikars* (intermediaries), and 5.6% to retailers through *aratdars* (market agents). The remaining 0.4% was kept for personal consumption or given as gifts.

Beparis purchased fish from fish farmers, selling 64.5% to *paikars* and 35.5% to retailers through *aratdars* from different districts. *Paikars* sold all their produce to retailers in various upazilas, while retailers sold all the fish to the ultimate consumers (as shown in Table 14).

Table 14. Percentage of fish transacted by fish farmers and intermediaries in Trishal

Farmers and intermediaries	Purchased from (%)				Sold to (%)				Consumed and gift
	farmer	*beparai*	*paiker*	retailer	*bepari*	*paiker*	retailer	consumer	
Fish farmers					87.5	6.5	5.6		0.4
Beparis	100					64.5	35.5		
Paikers	100						100		
Retailer	100							100	

In Muktagacha, fish farmers sold 89.7% of their fish to *beparis*, 5.6% to *paikers*, and 4% to retailers through *aratdars*. The remaining 0.7% was kept for personal consumption and gifts. *Beparis* purchased all the fish from farmers and sold 78.5% to paikers and 21.5% to retailers through *aratdars* at various district markets. *Paikers* also bought all their fish from farmers and sold their entire inventory to retailers through *aratdars* in different upazila markets. Retailers, in turn, sold all the fish to the ultimate consumers after purchasing them from the farmers.

Table 15. Percentage of fish transacted by fish farmers and intermediaries in Muktagacha

Farmers and intermediaries	Purchased from (%)				Sold to(%)				Consumed and gift
	farmer	*bepari*	*paiker*	retailer	*bepari*	*paiker*	retailer	consumper	
Fish farmers					89.7	5.6	4.0		0.7
Beparis	100					78.5	21.5		
Paikers	100						100		
Retailer	100							100	

In Mymensingh town, *Paikers* sourced 100% of their products from farmers in various areas, using local *Aratdars* as intermediaries. They sold all their products to retailers through these *Aratdars.* Before selling everything to consumers, the retailers obtained 70% of their stock directly from farmers and 30% from *Paikers* via the *Aratdars* (see Table 16).

Table 16. Percentage of fish transacted by fish farmers and intermediaries in Mymensingh town

Farmers and intermediaries	Purchased from (%)			Sold to (%)		
	Farmer	*Paiker*	Retailer	*Paiker*	Retailer	consumers
Paiker	100	-			100	
Retailer	70	30			-	100

Transportation

Transportation facilitates the movement of products between locations, creating place utility and ensuring that goods are available at the right time, in the proper condition, and at the right place. An efficient transportation system is crucial for highly perishable commodities like pangas fish. These perishable goods must be transported from the production to the consumption centers as quickly as possible. Therefore, adequate and efficient transportation is the cornerstone of a modern marketing system.

In the studied areas, fish farmers and intermediaries utilized various modes of transportation, including vans, rickshaws, trucks,

buses, pickups, tempos, and headloads, to transfer products from production areas to consumption centers.

In Trishal, 80% of farmers used vans or rickshaws to transport their products to the local market, while in Muktagachha, 60% employed the same modes. All *beparis* (fish traders) in Trishal and Muktagachha relied on trucks for transportation. In Trishal, 60% of *paikers* (local distributors) used buses, and 40% used pickups, whereas in Muktagachha, 40% opted for buses and 60% for pickups.

In Mymensingh town, 20% of *paikers* used vans or rickshaws, 50% used buses, and 30% used pickups for transportation.

At the retail level in Mymensingh town, about 50% of retailers relied on vans or rickshaws, while 25% used buses, 15% opted for pickups, and the remaining 10% utilized headloads to carry their products.

Table 17. Modes of transportation used by fish farmers and intermediaries

Mode of transportation	Trishal			Muktagachha			Mymensingh town	
	Fish farmer	*bepari*	***paiker***	Fish farmer	*bepari*	***paiker***	*paiker*	*retailer*
Van/ rickshaw	4(80)	-		*3(60)*	-		*2(20)*	*10(50)*
Truck	-	5 (100)		-	5 (100)	-		
Bus	-	-	3(60)	-	-	2(40)	5(50)	5(25)
Pick up	1(20)	-	2(20)	2(40)	-	3(60)	3(30)	3(15)
Head load	-	-		-	-	-		2(10)

Figures in the parentheses are percentages

Grading

Grading is the sorting of produce into different market qualities. It facilitates exchange by simplifying buying and selling, making the sale by sample and description possible. It also simplifies the concentration process and makes the movement of goods through the marketing channel easier and less costly. In the study area at the Arath center, fish were graded based on size and quality. At the *Paiker* level, grading was done for big rather than small fish. At the retail market level, big and small fish were graded based on size only through eye estimation.

Storage

Due to its perishable nature, storage is a crucial aspect of marketing, particularly for fish. It creates time utility and helps stabilize prices between peak and lean seasons. The primary goal of the storage function is to ensure that goods are available when needed, which allows traders to maximize their returns. Given the high perishability of fish, specialized storage facilities are necessary to align seasonal supply with demand. However, no proper storage facilities were available in the study areas. Most traders relied on ice during marketing, but their use of ice needed to be scientifically managed. Consequently, a significant quantity of fish could have been used more. In central markets, retailers often stored unsold fish with ice overnight.

Financing

Financing refers to the process of providing money to support various aspects of marketing. It is essential for the smooth operation of the fish marketing system, particularly for Pangas fish. Timely access to finance is crucial for fish farmers, *Aratdars*, *Paikers*, and retailers. In the study areas, most fish farmers and traders were self-financed, with very few receiving credit from banks, friends, or relatives. The sources of finance for these groups are illustrated in Table 18.

Table 18. Sources of finance of fish farmer and intermediaries

Source	Trishal				Muktagacha				Mymensingh town
	Farmer	Aratder	*Bepari*	*Paiker*	Farmer	Aratder	*Bepari*	*Paiker*	*Retailer*
Self	4(80)	4 (80)	4(80)	5(100)	4 (80)	5(100)	4(80)	5(100)	20(100)
Friend and relatives	1(20)				-	-	-		
Bank	1 (20)	1(20)	2(40)	-	2(20)		2(40)		
NGO		-		1(20)	-				

Figures in the parentheses are percentages

Market information

Market information is a crucial marketing function that helps predict the potential outcomes of marketing decisions related to market offerings for the target market. It also aids in evaluating those results and identifying new marketing opportunities to address buyers' unmet wants and needs.

In the study areas, the primary sources of market information for farmers and intermediaries included visits to markets, personal observations, conversations with fellow fish farmers, traders, and relatives, and communication via telephone or mobile. The distribution of responses according to the sources of market information is summarized in Table 19.

The findings reveal that 80% of fish farmers, 10% of *beparis* (wholesalers), 70% of *paikers* (fish collectors), and all retailers gathered market information based on market visits and personal observations. Additionally, 60% of fish farmers, 20% of *beparis*, 40% of *paikers*, and 30% of retailers reported receiving information about the fish market from fellow farmers, traders, and relatives. Furthermore, 80% of farmers, all *beparis*, 70% of *paikers*, and 60% of retailers indicated they obtained information about the fish market through telephone or mobile communication.

Table 19. Sources of market information for farmer and intermediaries

Source	Market participants				
	Farmer (10)	Aratder (10)	*Bepari (10)*	*Paiker* (10)	Retailer (20)
Market visit and personal observation	8(80)	8(80)	1(10)	7(70)	20(100)
Fellow fish farmers, traders and relatives	6(60)		2(20)	4(40)	3(30)
Telephone (mobile)	8(80)	10(100)	10(100)	7(70)	6(60)

Figures in the parentheses are percentages

Pricing

In the study areas, all intermediaries involved in the buying and selling Pangas fish used an open bargaining method to set the prices of their products. Fish farmers had low bargaining power due to several factors, including the perishability of the product, the lack of storage facilities, and the immediate need for cash. The prices at the market level were primarily determined by the number of buyers present and the volume of products offered for sale. In the wholesale market, prices varied based on the quality and size of the fish. At the auction level, prices were established through bidding and were determined by supply and demand.

CONCLUSION

The findings of this study indicate that the marketing of Pangas fish is diverse, suggesting significant potential for the development of Pangas

trading in the country. It highlights the crucial role of an efficient marketing system in ensuring fair pricing and effective distribution from producers to consumers. This system includes various participants—fish farmers, *Aratdars, Beparis*, *Paikers,* and retailers—performing essential functions such as transportation, storage, grading, financing, and pricing. The demand for Pangas fish is steadily increasing, which has led many individuals to engage in its production and marketing. To enhance profitability, developing an efficient marketing system that reduces costs and improves marketing services is important. If appropriate and sufficient steps are taken to develop this enterprise commercially, it would become more profitable for entrepreneurs and could expand pangas marketing throughout the country.

The research also provides valuable insights into consumer attitudes toward Pangas fish in Bangladesh. Using a Likert scale, various perceptions were analyzed, revealing both positive and negative sentiments. Many respondents appreciated Pangas for its affordability, taste, and year-round availability. However, some expressed concerns regarding its farming practices, particularly the use of poultry litter, which received the highest Discriminative Power (DP) value.

Despite these challenges, Pangas fish generally maintains a favorable position due to its affordability, year-round availability, and health benefits, including omega-3 fatty acids. The findings emphasize the need to address negative perceptions while reinforcing positive attributes to enhance consumer acceptance. A balanced approach can guide marketers and policymakers in effectively promoting Pangas fish, ensuring its sustained popularity and consumption across various demographic groups.

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