

## Marketing System of Shrimp in Some Selected Areas of Bangladesh

Md. Imran Omar<sup>1\*</sup>, Md. Ashraf Islam<sup>2</sup>, Syed Ariful Haque<sup>3</sup> & Mohammad Azharul Alam<sup>3</sup>, and Umme Aymon Janifa<sup>4</sup>

<sup>1</sup>Scientific officer, Agricultural Economics Division, Bangladesh Agricultural Research Institute, Joydevpur, Gazipur-1701.

<sup>2</sup>Assistant Professor, Department of Dairy and Poultry Science, Patuakhali Science and Technology University, Bangladesh,

<sup>3</sup>Lecturer, Department of Fisheries Technology & Department of Fisheries Biology and Genetics, Sheikh Fajilatunnesa Mujib Fisheries College, Melandah, Jamalpur.

<sup>4</sup>M.S Student, Department of Aquaculture, Faculty of Fisheries, Bangladesh Agricultural University, Mymensingh-2200.

**Email:imran238bau@gmail.com**

### ABSTRACT

A study was undertaken to examine the marketing system value chain analysis of shrimp in selected areas of Khulna district of Bangladesh during the month of March-April 2012. The objectives of the study were to estimate costs and margins, seasonal price variation and to test market integration of shrimp. Primary were used for this study. The higher marketing cost was incurred by aratdars and the lowest by retailer. On the other hand, retailers earned the highest net marketing margins. The findings of the study revealed that the marketing of shrimp was a profitable business and some recommendations were provided for the improvement of shrimp marketing in the country.

**Keywords:** Engle Granger co-integration, Market integration, marketing system, price behavior

### INTRODUCTION

The economy of Bangladesh has benefited enormously from the rapid development of the aquaculture production, in particular from shrimp cultivation. The economic benefits are paralleled with substantial environmental, natural resource and health effects that can be attributed to shrimp farming. The ultimate aim of our research program is to identify those types of shrimp enterprises that have large economic returns but modest environmental, natural resource and health impacts, so that they can serve as a model for sustainable development. The economy of Bangladesh can benefit enormously from increased shrimp cultivation. Therefore, the tradeoff between the micro and macroeconomic benefits and the environmental impacts of shrimp farming needs to be examined.

The role of fisheries in Bangladesh in supplying animal protein, in providing employment, in earning foreign exchange and in supporting multifarious ancillary industries at the rural levels is well-known. The fishery-based economy will, no doubt, gain even greater importance in the future. Because of the limitations of capture fisheries and the vast potential for the development of culture fisheries, most of the additional fish production, necessary for domestic consumption or for export will have to come from aquaculture. It is also felt that a large part of the surplus labour could be productively absorbed through the development of aquaculture.

In Bangladesh, both freshwater and brackish water aquaculture are practiced. Culture of marine organisms in the marine environment is, however, yet to be introduced. The Bay of Bengal and the associated river mouths are characterized by strong waves, wide tidal and salinity fluctuations, frequent cyclones and tidal bores. The open beaches are strongly surf-bitten. The lack of lagoons, backwaters or other sheltered marine environments is apparently why apiculture has not taken off. Extensive areas in the coastal belt are, however, under brackish water aquaculture, which is entirely shrimp-based.

Shrimp was once much cheaper locally than fish and was not considered an attractive food item. In the early Seventies, however, Bangladesh entered the world export market for shrimp and since then this Crustacean has suddenly become a very high-priced commodity. Simultaneous with the public sector efforts to harvest marine shrimp by trawling, some farsighted entrepreneurs began to look at brackish water aqua farming. Before long, aquaculture efforts proved more rewarding than marine capture. More and more areas were brought under brackish water aquaculture and more and more people engaged themselves in shrimp farming. The increasing demand and steadily rising price of shrimp in the international market caused a silent revolution in brackish water aqua farming development. Once a casual activity of little economic significance, brackish water aqua farming soon emerged as a multi-million taka farming industry in a few years.

All these developments took place in the private sector with very little inputs from Government. It is only since 1980, the starting year of the Second Five-Year Plan, that the contribution of brackish water aqua farming has been officially recognized. With favorable environmental conditions for brackish water aquaculture and the

existence of large areas with good potential for aquaculture, the Government has given high priority to brackish water aqua farming because of the urgent needs of export and rural employment.

### MATERIALS AND METHODS

The present study was conducted based on field survey method wherein primary data were collected from the respondents. Secondary data was collected from journals, thesis and raw data from monthly bulletin of Directorate of Agricultural Marketing (DAM) and District Fisheries Office. In Khulna district there were a number of successful shrimp producers, trader's i.e. *Aratdar*, *Bepari*, LC (Letter of Credite) paiker, *Paiker* and retailer etc. The study area is confined to one Upazilas namely KhulnaSadar in Khulna district, where the cultivation of shrimp fish was concentrated. Purposive sampling techniques were used for selecting the sample. Total sample size of the study was 100 .Selected samples consisted of 20 fish farmers and 80 traders. The intermediaries dealing with shrimp marketing were categorized into three groups, namely, *Aratdar*, *Paiker Depot owner*, Processing *plant* and retailer. From different stages of fish marketing, 10 *Aratdars* 8 LC (Letter of Credite) paiker, 5 *Depot owners*, 7 Processing *plant* 10 *Paikers* and 40 retailers were selected as respondents for the study.

#### Analytical Techniques

**Farmer's net prices were calculated by using following formulas:**

Farmer's net price = Farmer's sale price - Farmer's marketing cost

**Percentages of total value addition cost/net profit calculated =**

$$\frac{\text{Marketing cost/ Net marketing margin}}{\text{Total marketing cost/ net marketing margin}} \times 100$$

### RESULTS AND DISCUSSION

#### MARKETING PRACTICES

##### *Buying and selling*

In the study areas, the whole marketing of shrimp has been broken down into various functions such as buying and selling, transportation, grading, storing, weighing, financing, market information and pricing. The activities involved in the transfer of goods are completed through buying and selling functions. *Aratdars* do the functions of negotiation between buyers and sellers of shrimp and help them at their own business premises on receipt of commission. They do not take the ownership of the products. Shrimp farmers sell 5% of their shrimps to *farias*; 50% to *beparis*, 15% to *paikers* and 5% to retailers via *aratdar* and 25% to depot owners. *Farias* sell 60% to depot owners and 40% to retailers via *aratdar*. Depot owner and *bepari* each sell 100% of their shrimp to account holders. *Paikers* sell 100% of their shrimps to retailers via *aratdar*. Account holders each sell 100% shrimp to processing plant owners and world market (export) respectively. Retailers sell the entire shrimp to ultimate consumers. Shrimp *farias* purchase 100% shrimp from farmers. Depot owners purchase 40% shrimp from farmers directly, 20% from *farias* and 40% from farmers via *aratdar*. *Paiker* and *bepari* purchase 100% shrimp from farmers through *aratdar*. Account holders purchase 30% shrimp from farmers, 50% from *beparis* and 20% from depot owners. Retailers purchase 80% from *beparis* and 20% from farmers via *aratdar*. Consumers purchase 100% of shrimp from the retailers in the study area (Table 7).

**Table 1. Percent of shrimp/prawn transacted by value chain actors**

Value chain actor	Purchase from (%)						
	Farmer	<i>Faria</i>	Farmer via <i>Aratdar</i>	<i>Bepari</i>	Depot owner	AC Holder	Retailer
<i>Faria</i>	100	-	-	-	-	-	-
Depot owner	40	20	40	-	-	-	-
<i>Paiker</i>	-	-	100	-	-	-	-
<i>Bepari</i>	-	-	100	-	-	-	-
A/C Holder	30	-	-	50	20	-	-
Processing plant	-	-	-	-	-	-	-
Retailer	-	-	20	80	-	-	-
Consumer	-	-	-	-	-	-	100

Value chain actor	Sold to (%)							
	<i>Faria</i>	Retailer via <i>Aratdar</i>	<i>Bepari</i> via <i>Aratdar</i>	<i>Paiker</i> via <i>Aratdar</i>	Depot owner	AC holder	Processing plant	Consumer
Farmer	5	5	50	15	25	-	-	-
<i>Faria</i>	-	40	-	-	60	-	-	-
Depot owner	-	-	-	-	-	100	-	-
<i>Paiker</i>	-	100	-	-	-	-	-	-
<i>Bepari</i>	-	-	-	-	-	100	-	-
A/C Holder	-	-	-	-	-	-	100	-
Processing plant	-	World market	-	-	-	-	-	-
Retailer	-	-	-	-	-	-	-	100

Source: Field survey, 2012.

### Grading

Grading is the basic function of sales transactions and is defined as the classification of products according to some standards or measures (Kohls and Uhl, 2005; p. 314). Grading is the sorting of produce into different market quality which facilitates exchange by simplifying buying and selling as it makes the sale by showing sample and description possible. It also simplifies the concentration process and makes easier and less costly the movement of goods through the marketing channel. Grading facilitates sale since different sizes of Shrimp have different prices. In Bangladesh, all intermediaries' grade shrimp on the basis of weight. However, Grading system of shrimp is different from other species. Here grading is based on number of pieces to make one kg. In case of golda, it starts from U-5 (under 5) meaning  $\leq 5$  pieces of golda to make one kg, and bagda starts from 8/12 meaning that 8 to 12 pieces comprise one kg.

### Storage

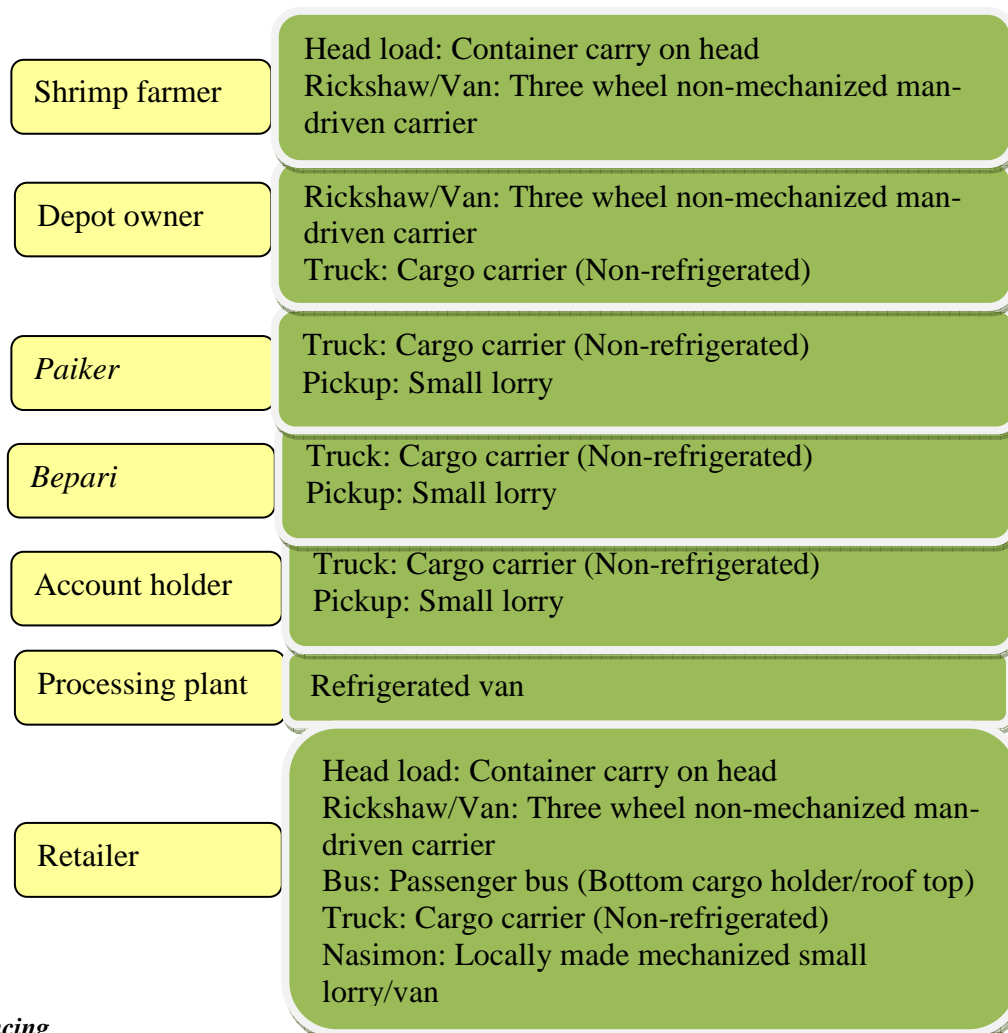
The storage facilities help buyers and sellers to reduce the wide fluctuation of prices between peak and lean seasons. The storage function is primarily concerned with making goods available at the desired time and enables traders to receive better prices for their products. Because of high perishability, shrimp requires extremely specialized storage facilities matching the seasonal demand. Only the processing plants in the shrimp industry use proper storage systems for export to the world market. Other intermediaries use only ice to transport shrimps from one place to another. Though all intermediaries use ice during marketing, their use of ice in shrimp is not scientific for which quality of shrimp gets affected. While retail selling, some use ice and some do not.

### Transportation

Transportation is a basic function of making goods available at proper place and it creates place utility. Perishable goods must be moved as early as possible from the producing centre to the consumer centre. So transportation is essential for highly perishable commodities like shrimp. Adequate and efficient transportation is a cornerstone for the modern marketing system (Kohls and Uhl, 2005, p.319). In the study areas, the shrimp farmers and intermediaries use various modes of transports such as van, rickshaw, truck, passenger bus, pickup, *Nasimon* (locally made pick-up type van for transporting passengers and goods), head load etc, to transfer

product from the producing areas to the consumption centre. Figures 1 show different modes of transport used by the intermediaries to transport shrimp from one place to another.

**Figure 1.** Mode of transport used by farmers and intermediaries for movement Of shrimp



### Financing

The financing function is the advancing of money by someone to carry on the business. For effective operation, financing is of crucial importance in the whole marketing system of shrimp. The source of finance for the value chain actors in the study areas are shown in Table 10.

Table 2 shows that in the case of shrimp, most of the farmers, *aratdar*, *bepari* and retailers are self-financed. Depot owners use a combination of own funds, bank loans, NGO and *aratdars* for shrimp marketing. Only 20% of depot owners procure loans from banks while 5% and 3% received from NGOs and *dadon* giving *aratdars* respectively. However, a majority of depot owners use their own fund for the business. 34% of the *paikers* take *dadon*

**Table 2.** Sources of finance of shrimp farmers and intermediaries

Sources of finance	Market participants (%)							
	Farmer	Depot	<i>Aratdar</i>	<i>Paiker</i>	<i>Bepari</i>	A/C holder	Processing plant	retailer
Own fund	78	72	100	64	91	70	43	100
Bank	0	20		0	0	30	57	
NGO	7	5		2	0			
Friend and relatives	1	0		0	0			
<i>Dadon</i> from <i>Aratdar</i>	14	3		34	9			

Source: Field survey, 2012.

### Market Information

Market information is a facilitative function required for efficiently operating marketing system. In the study area, visiting the markets and use of telephone/mobile phones are the most common sources of collecting market information for all value chain actors. Table 11 shows that fellow traders are also a common source of market information for all types of value chain actors except processing plants. These and LC *paikers* mainly depend on email/internet to gather market information from *aratdar* besides their own funds to run their businesses. Account holders partly and processing plant owners mostly depend on bank loans to accelerate the business operations.

**Table 3.** Sources of market information for farmers and intermediaries

Sources of market information	Market participants (%)								
	Farmer	Depot owner	<i>Aratdar</i>	<i>Paiker</i>	Retailer	LC <i>paiker</i>	<i>Bepari</i>	A/C holder	Processing plant
From market	80		58	73	92	40	71	80	50
Fellow traders	51		45	43	25	20	29	20	0
Email/Internet	0		0	0	0	80	0	0	100
Telephone/mobile	60	100	90	87	55	100	100	100	100

Source: Field survey, 2012.

### Packaging

Packaging may be defined as the general group of activities in product planning which involves designing and producing the container or wrapper for a product (Stanton, 1991). Packaging is essential for proper transportation of shrimp. 'Box' made of cork sheet is widely used by A/C holders and processing plant owners in shrimp. Different sizes of packaging materials along with their capacities are shown in table 4.

**Table 4.** Packaging practices of shrimp marketing in Bangladesh

Packaging practices	Using materials	Capacity	Used by
Basket	Bamboo, Rope and Polythene	40 kg 20 kg	Farmer, <i>Paiker</i> and Retailer Retailer
Drum	Plastic	40 kg 20 kg	Farmer, <i>Paiker</i> Retailer
Crate	Plastic, Polythene	40 kg	Depot owner (shrimp), <i>Paiker</i> , <i>Bepari</i> , Account holder (Shrimp), Retailer
Steel box	Steel sheet	250 kg	<i>Paiker</i> , <i>Bepari</i> (hilsha)
Wooden box	Wood, Polythene	160 kg	<i>Bepari</i> , <i>Paiker</i> ,
Box	Cork sheet	40 and 20 kg	Account holder, Processing plant (shrimp)

Source: Field survey, 2012.

### Pricing

In the study areas, all intermediaries are involved in buying and selling of shrimp. Depot owners, *bepari* and AC holders of shrimp marketing chain follow prefixed prices set by the processing plant. Farmer, *aratdar*, *paiker*, LC *paiker*, and processing plants practice open bargaining, auction and going market prices method for fixing price of their products in varying degree. Cent percent of the retailers follow open bargain for selling their shrimp to consumers (Table 5).

**Table 5.** Pricing methods followed in selling shrimpes in Bangladesh

Pricing methods	Market participants (%)								
	Farmer	Depot owner	<i>Aratdar</i>	<i>Paiker</i>	Retailer	LC <i>paiker</i>	<i>Bepari</i>	A/C holder	Processing plant
Open bargaining	29	0	10	53	100	20	30	0	99
Auction	60	0	99	37	0	40	0	0	0
Based on going market prices	29	0	0	30	0	80	70	0	15
Prefixed prices	0	100	0	0	0	0	100	100	0
Cost-plus method	0	0	0	0	0	0	0	0	0

Source: Field survey, 2012.

## Shrimp Marketing Channels

Shrimp is sold in both domestic and overseas market. Major supply chains of shrimp in the study areas are shown below:

### Overseas Value chain

- Value chain - I Shrimp Farmer – *Aratdar* – *Bepari* – Account Holder – Processing plant – Consumer
- Value chain - II Shrimp Farmer – Depot owner – Account Holder – Processing plant – Consumer
- Value chain - III Shrimp Farmer – Account Holder – Processing plant – Consumer

### Domestic value chain

- Value chain - IV Shrimpermen – *Aratdar* – Retailer – Consumer (Local market)
- Value chain - V Shrimp Farmer – *Aratdar* – *Paiker* – Retailer – Consumer (Distant market)

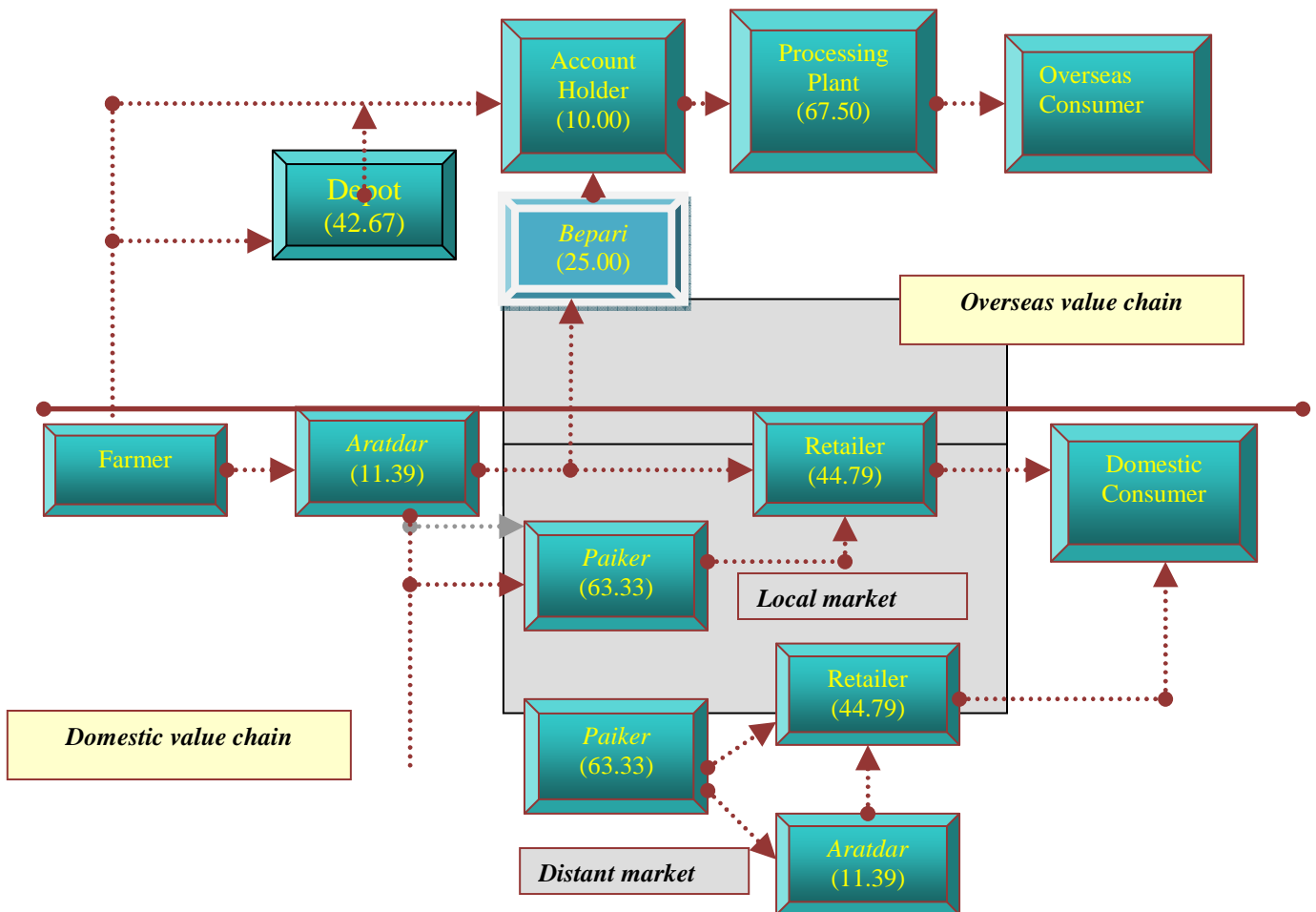


Figure 2. Value chain of shrimp in Bangladesh

### Value Addition Costs by Different Actors

The cost incurred to transport the product from producers to consumers is ordinarily known as marketing cost. In other words, the cost of marketing represents the cost of performing various marketing functions (Kohls and Uhl, 2005; p.96). Marketing costs are incurred when commodities are shipped from the farm to the final market. Intermediary-wise marketing costs are discussed below:

In case of shrimp marketing system, the highest value added cost is incurred by farmers (Taka 1193.35) per maund. The second and third highest costs are incurred by *paikers* (Taka 1116.47) and the processing plants (Taka 1050.26) respectively. The *paiker* in shrimp marketing system operates at the local producing markets as well as in the inter district consuming markets. Here, *beparis* have no *aratdari* commission because *beparis* sell all of their shrimp to account holders. Shrimp marketing system is clustered around the commission agent 'account holder'. The major cost item is *aratdar's* commission for farmers' and *paikers*. Transportation cost is

the highest cost item for depot owners, *beparis* and retailers. Wages and salaries are the major cost item for *aratdars* and processing plants respectively. Icing is the major cost for A/C holder for shrimp marketing system in the study area. *Aratdar's* commission (35.25%) constituted the highest cost in shrimp/prawn marketing. (Table 6).

**Table 6.** Total marketing cost of different intermediaries involved in shrimp marketing (per maund)

Cost items	Farmer	<i>Aratdar</i>	Depot owner	<i>Paiker</i>
<i>Aratdar's</i> commission	1017.24	-	-	758.96
Transportation	36.40	-	190.40	138.93
Baskets	73.03	-	40.00	40.00
Icing	-	-	52.10	76.34
Wage	-	90.95	164.64	70.51
Salaries	-	34.67	145.61	-
House rent	-	17.50	18.81	-
Electricity	-	5.87	6.36	-
Telephone bill	15.03	46.38	19.63	11.81
Personal expenses	51.65	40.52	58.33	19.90
Packaging for export	-	-	-	-
Storage	-	-	-	-
Tips and donation	-	11.89	5.20	-
Wastage	-	-	-	-
Others	-	6.70	-	-
Total	1193.35	254.48	701.08	1116.47

Source: Field survey, 2012

**Table 6.** Total marketing cost of different intermediaries involved in shrimp marketing (per maund).....Contd.

Cost items	<i>Bepari</i>	A/C holder	Processing plant	Retailer	Total
<i>Aratdar's</i> commission	-	-	-	-	1776.20 (35.27)
Transportation	162.67	53.28	237.50	102.35	921.53 (18.30)
Baskets	50.00	11.34	7.32	10.00	231.69 (4.60)
Icing	44.00	73.70	20.80	62.45	329.39 (6.54)
Wage	14.00	10.31	172.62	-	523.03 (10.39)
Salaries	-	15.17	545.63	-	741.08 (14.72)
House rent	-	1.35	-	2..21	37.66 (0.75)
Electricity	-	0.89	281.75	3.26	298.13 (5.92)
Telephone bill	4.67	2.42	8.63	21.15	129.72 (2.58)
Personal expenses	4.33	4.35	2.46	10.91	192.45 (3.82)
Packaging for export	-	-	4.92	-	4.92 (0.10)
Storage	-	-	3.81	-	3.81 (0.08)
Tips	-	0.33	-	-	17.42 (0.35)
Wastage	-	-	2.32	34.23	36.55 (0.73)
Others	-	-	-	7.60	14.30 (0.28)
Total	279.67	173.16	1050.26	267.72	5036.19 (100.00)

\*Figures in the parentheses indicate percentages of total cost. 1 maund = 40kg

Source: Field survey, 2012.

### Marketing Margin

Average net marketing margins of all intermediaries for Shrimp are given in Table 7. Farmer average marketing cost is Taka 1193.35 per maund. Among all intermediaries, profit of the processing plant is the highest of Taka 1649.74 per maund followed by retailers (Taka 1523.95), *paiker* (Taka 1416.86), depot owner (Taka 1005.72) and *bepari* (Taka 720.33). *aratdars* and A/C holders earn apparently less profit than other intermediaries in shrimp marketing system because they only charge the fixed amount of commission against their volume of business. However, *aratdars* and A/C holders perform a large volume of business everyday so their total profit is not less than that of other intermediaries except for processing plant owners. Processing plant owners create very high value addition for export buyers so definitely they gain more profit than other intermediaries in shrimp marketing system in Bangladesh.

**Table 7.** Average net marketing margin of different intermediaries for shrimp marketing (Tk/maund)

Intermediaries	Purchase price	Sale price	Gross marketing margin	Marketing cost in	Net marketing margin
Farmer	-	21560.00	21560.00	1193.35	20366.65
<i>Aratdar</i>	-	-	455.65	254.48	201.17
Depot owner	21760.00	23466.80	1706.80	701.08	1005.72
<i>Paiker</i>	17866.67	20400.00	2533.33	1116.47	1416.86
<i>Bepari</i>	23800.00	24800.00	1000.00	279.67	720.33
Account Holder	-	-	400.00	173.16	226.84
Processing plant	24766.67	27466.67	2700.00	1050.26	1649.74
Retailer	24844.44	26636.11	1791.67	267.72	1523.95

Source: Field survey, 2012.

Note: *Aratdar* Gross margin = Average received *Aratdar's* commission. Gross margin = Sale price – purchase price. Net margin = gross margin – marketing costs

### Distribution of Value Addition Cost and Net Profit

Table 8 shows the percentages of total value addition cost and total net profit by different intermediaries for different shrimp marketing system in Bangladesh. Farmers, in shrimp marketing, bear the major marketing cost (23.70% of total cost) because they have to pay *aratdar's* commission which ultimately increases their marketing cost.

**Table 8 Percentage** distribution of value addition cost and profit by intermediaries and marketing system

Intermediaries	Shrimp	
	% of total cost	% of total profit
Farmer	23.70	-
<i>Aratdar</i>	5.05	2.98
Depot owner	13.92	14.91
Inter district <i>bepari</i>	-	-
<i>Bepari</i>	5.55	10.68
Inter district <i>paiker</i>	-	-
LC <i>paiker</i>	-	-
<i>Paikar</i>	22.17	21.01
Account Holder	3.44	3.36
Processing plant	20.85	24.46
Retailer	5.32	22.60

Source: Field survey, 2012.

Note: Percentages of total value addition cost/net profit calculated =

$$\frac{\text{Marketing cost/ Net marketing margin}}{\text{Total marketing cost/ net marketing margin}} \times 100$$

### Intermediaries Share to Consumers' Taka



Farmers'/shrimpermen's share of different species of shrimpes is reasonable in the study areas except for shrimp shrimp. The major share (46%) of consumer Taka goes to *mahajon* in shrimp marketing system of Bangladesh. For other species farmers' share is 67%, 72% and 76% for major carp-pangas-tilapia, shrimp (overseas value chain) and shrimp (domestic value chain) respectively. The price spread is the highest in shrimp (overseas value chain) for its world market demand and the lowest in major carp-pangas and tilapia for the shortest supply chain and lower unit price than shrimp.

**Table 9.** Share (%) of intermediaries to consumer's Taka by distribution channel

Intermediaries	Shrimp	
	Overseas value chain	Domestic value chain
Farmer	72	76
<i>Mahajon</i>	-	-
<i>Aratdar</i>	4	4
<i>Paiker</i>	-	10
<i>Bepari</i>	4	-
Account Holder	10	-
Processing plant	10	-
Retailer	-	7
Price spread (Tk/kg)*	177.50	156.74

Source: Field survey, 2012.

\*Equals Farmer's net price/margin received minus retailer's sale price in per kg terms

## CONCLUSION

Though shrimp marketing in Bangladesh is beset with a number of problems, there have been a number of positive changes that are expected to improve shrimp marketing environment in the country. These positive drivers includes, i) the shift from subsistence to commercial shrimp farming, ii) emergence of super-markets, and iii) a changing social attitude towards shrimp marketing, as it is less considered as a dishonourable job as it was in the past. But the government in Bangladesh needs to ensure that the proper infrastructure and necessary social capital are available for effective participation of all the market intermediaries of the seafood value chain. For better shrimp marketing, side by side with the private sector, government should also play active role in providing physical facilities like refrigerated storage, refrigerated vans, good market places with related facilities like water, ice, electricity, drainage facilities and sitting arrangements etc. Development of road networks is greatly needed, which is a responsibility of the government. Market regulations needs to be strictly followed. Monitoring to ensure shrimp quality needs to be strengthened. Similarly, it is also the responsibility of the government to see that consignment can reach the destination without requiring to pay unnecessary tolls and subscriptions. The development of good road and transport networks can reduce superfluous involvement of intermediaries, which could be beneficial for both the shrimpers/farmers and consumers. Assembling centers with refrigerated storage facilities may be developed so that the perishability of shrimp is checked, which would enable the assembling centers to make bulk sell/transfer to the next destination. This could reduce post harvest loss and provide better price for the shrimpers/farmers.

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