

A study on

“Improving Transportation System of Supply Chain Management for Shrimp in Satkhira”

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Declaration

It is hereby declared that I am the sole author of this dissertation. It is also declared that this dissertation or any part of it has not been submitted elsewhere for the award of any degree or diploma.

January 2015

Md. Abul Hasan

January 2015

Certificate

This is my pleasure to certify that the dissertation entitled “Improving Transportation System of Supply Chain Management for Shrimp in Satkhira” is the original work of Md. Abul Hasan that is completed under my direct guidance and supervision. So far I know, the dissertation is an individual achievement of the candidate’s own efforts, and it is not a conjoint work.

I also certify that I have gone through the draft and final version of the dissertation and found it satisfactory for submission to BRAC Institute of Governance and Development (BIGD), BRAC University in partial fulfillment of the requirements for the degree of Masters in Procurement and Supply Management.

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Abstract

The study titled “Improving Transportation System of Supply Chain Management for Shrimp in Satkhira” was carried out from November to December 2014 on the basis of both primary and secondary information. Shrimp farming has emerged one of the most important economic activities in Bangladesh and become, by and large, the third largest export industry in Bangladesh. Shrimp culture in coastal areas plays a vital role providing employment, income, food security, and poverty alleviation to remote coastal people. The urban population is also benefited from processing, value adding, and marketing of the shrimp as a whole. The increasing demand and steadily rising prices of shrimp encourage its cultivation in the coastal belt of the country especially in Satkhira. In export markets, the demand for shrimps is huge although it is faced with quite a large number of challenges which are related to ensuring compliance with hygiene standards, non-tariff barriers, and some stiffer terms and conditions.

Transportation is one of the most dominating factors in shrimp farming and exporting. Any lapse of transportation activities can significantly damage the whole process of shrimp industry. In this study, a number of transportation problems have been identified and analyzed in the shrimp industry in Satkhira. The disintegrated supply chain management of shrimp is a great problem in this area. Poor infrastructure facilities such as lack of modern transport, ice factory, electricity, proper transportation system of prawns and shrimps from remote areas to depots, lack of technical knowledge in marketing and shrimp cultivation, grading and processing are the great problems in shrimp industry.

In this study, the primary data have been collected mostly from the five different groups which are local shrimp farmers, local shrimp post larva (PL) suppliers, *Beparies*, *Aratdars* and Depot owners. These five groups are mainly involved in shrimp cultivation and business. The main focus of this study is to examine the existing supply chain transportation system used in the shrimp of Satkhira district. The objective of this study is to find out the problems directly related to shrimp cultivation and shrimp marketing. Finally, this study has drawn some recommendations which are expected to help improve the shrimp transportation system in Satkhira district.

Chapter One

Introduction

Bangladesh has achieved remarkable progress in fisheries, especially in shrimps. Fisheries have been playing a very significant role in our economy and deserve potential for future development in the agrarian economy of Bangladesh. Fisheries sector contributed 4.43% to national GDP, 22.21% to the agricultural GDP and 2.73% to foreign exchange earnings by exporting fish and fish products in 2010-2011. Fish provides about 60% of national animal protein consumption. Fisheries sector also plays an important role in rural employment generation and poverty alleviation (GoB, DoF, 2013).

Shrimp is one of the most prominent industries of fisheries contributing heavily to the development of our economy. As an integral part of the export-led growth strategy since independence (in 1970), Bangladesh have been trying to improve the performance of shrimp sector by adopting various measures. Emphasis was laid on increasing the production of shrimp through both marine catch and coastal aquaculture, because of their demand in international market, *Gher*¹ employment opportunity and the environmental situation in Bangladesh, which enables culture of the exportable species. Nation has gained success in this respect (Rahman and Rahman, 2001).

The frozen shrimp industries earned a total of export of US\$ 487.87 million in 2007-08 financial year compared to US\$ 3.17 million in 1972-73. It also provides direct employment to over 600,000 people who in turn support well over 3.5 million dependents (GoB, DoF, 2009). In last two decades, frozen shrimp production as well as its revenue increased gradually. In 1992-93, frozen shrimp production was 19224 metric ton and its value was 604.03 Crore Taka. But in 2010-11, frozen shrimp production increased to 54891 metric ton and value to 3568.2 Crore Taka (BBS, 2012).

Since Bangladesh is endowed with vast coastal areas and criss-crossed with a large number of rivers, canals, lakes, ponds, haors and huge flood prone areas, it has got some natural advantages in growing shrimp culture and its export. The diversity of water

¹*Gher* is a shrimp farming land which is closed with soiled boundary.

bodies, geographical configuration, location and aqua-ecological conditions altogether make Bangladesh a unique 'aqua-treasure' nation (Rahman and Rahman, 2001).

Historically, shrimp culture in Bangladesh started flourishing in late '60s within 'polders' constructed by Water Development Board (WDB) to ease out the difficulty of agriculture in low laying coastal flood plains (Nuruzzaman, 1995). At that era, shrimp was used to cultivate as secondary occupation of the farmers and traded only in the local market because the transportation system was vulnerable. At that time, maximum road communication was muddy, so the farmers used to carry shrimp by boat from long way to local markets where shrimp was traded because of undeveloped road communication system used in transporting shrimp, it took much time and incurred high expenditure carrying shrimp from Satkhira to Chittagong port and ultimately to foreign countries like USA, EU countries, Japan etc. For these reason, the amount of exported shrimp was quite little. But in late '70s, the demand for shrimp increased in the international market and subsequently cultivable land for shrimp also increased. Observing the rising demand for shrimp, from time to time government gave keen attention to develop the transportation system from coastal areas to Capital city, Dhaka to Chittagong port. After decades, shrimp farmers and exporters used to get the benefits of comparatively better road transportation system developed by government. In addition, cheaper transportation vehicles like gas driven microbus, truck, covered-van, etc. provide opportunity for all the parties in the supply chain to get more profit. For these reason, currently most of the land is under shrimp cultivation in Satkhira. In addition, the availability of saline water which is necessary for shrimp cultivation and making profit rather than rice cultivation. In 1994, government declared the coastal region as 'open for brackish water shrimp farming' through a government order. From then, brackish water shrimp farming has been expanded rapidly. By 2012, over 209456 hectare of land were brought under shrimp culture and till it is increasing (GoB, DoF, 2012). This area for shrimp cultivation has doubled in the last 20 years. In total about 1.2 million people are working along the entire shrimp production value-chain: growing, harvesting, transporting, processing and selling (Hensler, Loni, 2012).

The total value created by the shrimp industry can be attributed to a wide variety of activities and services. These activities and services primarily include shrimp post larva

(PL)² collection, shrimp PL nursing, shrimp feeding, using chemicals to maintain the hygiene standard in water, flowing water, shrimp harvesting, processing and storage, checking by a doctor to ensure the health and hygiene standard, packaging and finally transportation of shrimp. Since, shrimp is a perishable and sensitive product at every stage of value creating activities, each and every parties and service rendering agencies have to work maintaining a greater amount of care and sensitivity. Many things are often observed in harvesting, post-harvest handling and processing in plants so that finished products sometimes do not satisfy the criteria of standard quality and thus, plant suffers serious losses. Post-harvest losses of shrimp have been reported at different stages of handling and transportation (Kamal et al. 2000). For cultured shrimp and artisanal catch another problems is the delivery of raw material. Shrimps are first collected from farmers or fishermen and are brought to the receiving centers without ice partly containing mud and debris. They are exposed to ambient temperature for a long time from capture site to until receiving at the depots.³ Ice is used in depots³ only when a bulk quantity is gathered and finally transported to the plants. Serious quality deterioration has been reported at this stage (Kamal et al. 2000). On the other hand, available source reported that the effect of delayed post-harvest handling exerts serious threat on quality of shrimp (Rahman et al. 2001).

Moreover, most of the shrimp is exported to foreign countries. The buyers of foreign countries also impose some preconditions in order to maintain the quality and hygiene standards of shrimp. The importing countries, particularly the EU, USA and Japan are highly conscious about food hygiene and safety. These countries do not accept any food item with doubtful quality in respect of its freshness, hygiene and safety for human health. As the presence of filth, foreign material and decomposition are the major reasons of rejection of shrimp exports from Bangladesh to the US and EU markets, proper initiatives should be taken to prevent such type adulteration to ensure labeling of shrimp products. There is increased pressure from importing countries for fish processors to establish effective quality assurance systems in their plants (Hussain and Uddin, 2004). As a result, each and every party in value creating activities needs to perform their

² After eggs hatch, it passes three stages include Nauplii (1-2 days), Zoea (3-5 days), and Mysis (3-5 days). After completing these three stages of larval development, the animals are fully developed as a shape of shrimp is called post larva (PL).

³ Depot is a room where shrimps are gathered and send it to exporters/factory owners by using different types of transports.

activities and render services in compliance with the preconditions and requirements set by the foreign buyers.

Of all these value creating activities in shrimp industries, transportation is, by far, one of the most dominating activities important in the shrimp industry. Any lapse of transportation activities can significantly damage the whole industry. These transportation activity starts from buying shrimp PL from the producers. Usually, most of the shrimp PL is produced in the coastal areas in Cox's Bazar district. Thus, local shrimp PL suppliers in Satkhira had to buy these shrimp PL from Cox's Bazar. After buying the shrimp PL from Cox's Bazar, local suppliers⁴ in Satkhira carry these shrimp PL in two ways:

- (a) By Road transport; and
- (b) By Air transport.

The substantial amount of shrimp PL is carried by road transport especially microbus, truck, pick-up, and covered-van. It takes 16-20 hours. Some shrimp PL is carried by air transport from the hatchery of Cox's Bazar to Jessore airport. Once these shrimp PL is landed in Jessore airport, they are brought from Jessore to shrimp culture farms in Satkhira by using pick-up, microbus, and truck. It takes 2-3 hours. To ensure quality, the hatchery operators in Cox's Bazar had to use air transport to transfer the shrimp PL to Satkhira region. The air transport cost is much higher than any other types of transportation system.

Shrimp farmers buy and carry shrimp PL from different places and release this shrimp PL to *Gher*. After releasing the shrimp PL to *Gher*, it takes 3-4 months to get matured with a view to exporting in foreign countries. Immediately after harvesting the shrimp from the farms, the farmers used to sell them to some local intermediaries. These first level intermediaries buy these shrimp from the farmers and sell them to the *Aratdars*⁵; these *Aratdars* do their business at the *Set*⁶. Or, the farmers directly carry their harvested shrimp to the *Set* and the *Aratdar* initially process the shrimp and clean it up. The

⁴ Local suppliers are local businessmen in Satkhira. They collect shrimp post larva (PL) from Cox's Bazaar and/or different local *Beparies*.

⁵ *Aratdar* is a *Arat/Chatal* owner who has *Arat/Chatal* in the *Set*. *Arat/Chatal* is a small paved/mosaic place where shrimps are kept for giving auction.

⁶ *Set* is a bazaar where shrimps are traded.

Aratdars usually do not spend much time to hold the shrimp. Once processing and washing work is done, immediately they sell it to the second tier of intermediaries/local businessmen of the *Set* with getting the commission of 2%-3%. To carry the shrimp from the farmers to the *Set*, the local day labors, human-driven vans (HDVs), rickshaws, engine-driven vans (EDVs), etc. are used. Carrying shrimp from farm to the *Set* different amount of time ranging from 30 minutes to 3 hours depending upon the distance and speed up communication vehicles used. Sometimes, it is observed that these slowest forms of transportation take more time and the quality of shrimp gets deteriorated at this stage. It is important to know the volume of quality losses from farm to processing plants. It is also important to know the reasons why such losses are occurred at farm and depot level during handling and transportation. There is a long value chain in the marketing of the shrimp in Bangladesh and it is likely to expect that the post-harvest losses are occurred in value chain during handling and transportation since the shrimp are more perishable and vulnerable to contaminants and spoilage bacteria (Paul et al. 2010).

The study has been conducted to get insights into the existing transportation systems and explore the problems at different stages of transportation in supply chain of shrimp and shrimp PL by interviewing of the shrimp farmers, shrimpPL suppliers, local *Beparies*⁷(Faria), *Aratdars*, and Depot owners⁸.

1.1 Scope of the Study

This study has been undertaken on the supply chain used in shrimp transportation. The study is primarily limited to the responses of the respondents including farmers, intermediaries in different levels living in Satkhira who are directly involved in shrimp cultivation and shrimp business. The main focus of the study is to examine comprehensively the supply chain transportation system used in the shrimp of Satkhira.

1.2 Significance of the Study

Shrimp is one of the largest sectors generating foreign earning for our economy. The ranking of shrimp in terms of foreign earnings stands ranging from 2nd to 3rd position. In addition, a certain portion of our population is engaged in this sector in order to maintain

⁷ *Beparies* are called as Faria who are engaged with the trading of shrimp in a local area/bazaar.

⁸ Depot owners are called as middlemen of shrimp trading and transportation. They buy shrimp from local shrimp bazaar and send it to exporters/factory owners.

their livelihood where the country is over populated. Thus, this sector is of great importance to our economy. The study is expected to unearth the nitty-gritty of supply chain transportation system used in the shrimp marketing of Satkhira. The study is also designed to identify the problem areas of shrimp transportation system in supply chain, determine the underlying factors creating the problems and prescribe some recommendations that can aid in improving the shrimp export system. Thus, the study will be of great importance from the perspective of our export earnings.

Chapter Two

2.1 Methodology

This is an exploratory type research. A large number of studies have been done on shrimp culture, value adding activities in supply chain, shrimp export, etc. But no comprehensive studies have yet been conducted on transportation system of shrimp in Satkhira. Thus, this research attempts to uncover the basic insights into the transportation system used in shrimp business in Satkhira area.

The study is conducted based on both primary and secondary data. The secondary data have been collected from different books, journals, annual reports, magazines, national dailies, etc.

The primary data have been collected mostly from the local shrimp farmers, local shrimp PL suppliers, *Beparies*, *Aratdars*, and Depot owners who are directly involved in shrimp business. Because of lack of the exact number of intermediaries, the non-probability sampling technique has been used in selecting the local shrimp farmers, local shrimp PL suppliers, *Beparies*, *Aratdar*, and Depot owners. In selecting intermediaries, judgmental sampling has been used in selecting five categories of respondents such as shrimp farmers, shrimp PL suppliers, *Beparies* (Faria), *Aratdars*, and Depot owners. They have been interviewed for the purpose of this study. Since the total number of respondents in each category is not known, the non-probability sampling (judgmental sampling) has been the better option for selecting the respondents. The sample size of each category is determined based on subjective judgment. Thus, five respondents in each category have been determined as the size of the sample.

A formal questionnaire instrument has been used for collecting data from different groups of respondents ranging from the shrimp PL producer to the Depot owner. These groups have been interviewed with the formal questionnaire. The questionnaire contains a wide range of close-ended and open-ended questions. For collecting necessary data, some group discussions have been held with these five categories of respondents.

Once data have been collected through questionnaire and data have been properly classified, tabulated, summarized and recorded for writing this report.

Since the study area is confined to Satkhira, local shrimp farmers, local shrimp PL suppliers, *Beparies*, *Aratdars*, and Depot owners have been selected only from Satkhira. The data have been collected from November 2014 to December 2014.

For analyzing data, no rigorous statistical tools and techniques have been used. Rather, simple mean, standard diagram, tables, graphs, charts, etc. have been used to analyze data.

To avoid bias in collecting primary data, special care has also been taken. Information that seems to be unreliable and contradicting has been dropped. Moreover, information collected from the farmers and the intermediaries have also been cross-checked and verified to ensure the reliability and validity of the data.

2.2 Objectives of the Study

The broader objective of this study is to evaluate the overall transportation system in the supply chain used in the shrimp business in Satkhira. More specifically, the objectives are:

- (a) To reveal the existing transportation system used in shrimp business;
- (b) To identify the problem areas in transportation system; and
- (c) To recommend some suggestions for improving the transportation system used in shrimp business in Satkhira.

2.3 Limitations of the Study

The study has got a number of limitations which also discount the authenticity and reliability of the findings of the study. Some of the limitations are given as under:

- (a) Time constraint is the main limitation of this study. The stipulated time for the submission of the dissertation was only two months. Had the researcher been given more time, a thorough study could have been conducted.
- (b) Budget constraint is also a vital limitation of this study. Primary data collection for this study has been a major part of the study. Due to budget limitation the researcher has been compelled to keep the sample size small.
- (c) Each and every respondent of this study is found not well concerned about the whole transportation system of the shrimp supply chain. A different type of supply chain transportation system prevails in every segment of the whole supply

chain. So no one has found to have the practical experience in the whole supply chain transportation system.

- (d) In conducting this study the amount of secondary data found available is not sufficient for this study. Because most studies have been conducted on shrimp export, shrimp culture, etc. No in-depth study on supply chain has been undertaken.

Chapter Three

3.0 Literature Review

Different reports, books, journals, and articles have been reviewed to have clean understanding of the existing situation of shrimp cultivation and transportation system. A brief description of literature review is described in the following section:

The Fisheries Statistical Report of Bangladesh 2012-2013 (Department of Fisheries, DoF) mentioned the statistical data, production and development of shrimp, potential and challenges of shrimp culture in Bangladesh. This report also mentioned the contribution of fisheries sector in socio-economic development of Bangladesh. Bangladesh is blessed with huge open water. The report includes the information about shrimp culture, marketing channel and export. This report attempts to explore the overall situation of fisheries sector in Bangladesh. Here, a large portion of this report is made based on the shrimp cultivation such as shrimp PL production, collection, shrimp culture, marketing and export. This report is hardly mentioned the transportation system of shrimp in Bangladesh.

A study entitled “Probability Analysis of Bagda Farming in Some Selected Areas of Satkhira District” was conducted by A. N. M. Wasim Feroz, M. H. A. Rashid and Mahbub Hossain, (2009). This study aimed at examining the relative profitability of shrimp production in some areas of Satkhira district. Farm level data were collected through interviewing 60 randomly selected farmers. Mainly Cobb-Douglas production function was used to estimate the contribution of key variables to the production process of shrimp farming. The study identified some problems and suggested some possible steps to remove these problems. Shrimp farming in coastal areas needs to be analyzed further as an extension of particular economy. Under the present conditions, it is no doubt, beneficial for a section of people, but it is a matter of great concern for the majority of people. The farmers should be provided with training, information and necessary facilities to cope with new and changed situation. Bank loan and institutional credit should be made available on easy terms and condition to the shrimp farmers. Availability of quality shrimp fry should be ensured at proper time for shrimp farming. Attention should be given to improve transportation and marketing facilities of the study area. Field level agronomic research is suggested to be carried out for studying the impact of salinity on the yield of various crops including vegetables and fruits. Physiological and soil related research should be conducted to study the real causes of

die back diseases and bud drop of coconut and date palm trees. Finally, if more areas could be brought under shrimp cultivation, the country could probably have earned a huge amount of foreign exchange by exporting shrimp.

S Paul, M S Reza, F H Shikha, M N A Khan and M Kamal (2010) conducted a research paper entitled “Culture Practices and Quality Loss of Shrimp and Prawn at Different Stages of Handling and Transportation in Bangladesh.” The study was conducted to investigate the quality problems in giant tiger (*Penaeus monodon*) and giant freshwater (*Macrobrachium rosenbergii*) prawn at different stages of value chain in Bangladesh. Thirty nine *P. monodon* farms and 20 *M. rosenbergii* farms located in Cox’s Bazar, Bagerhat, Satkhira, Khulna and Mymensingh were visited and information were collected using prescribed questionnaires from cross-section of people working at farms, depot level and processing industries. The major aspects of information collected were: farm size; water source; culture type; source and size of PL; stocking density; feed and frequency of feeding; harvesting; farm production; post-harvest care; handling and transportation; infrastructure facilities; condition of shrimp during receiving at farm and depot level. Overall major problems of quality deterioration in shrimp value chain were use of unclean pond water for washing, longer duration of harvesting, exposure of shrimp at high ambient temperature (delayed icing), contamination, lack of general hygiene, lack of personal hygiene, excess water in shrimp, packed under pressure, piled up shrimp on a dirty floor, body crushed due to heavy pressure, rough handling, use of dirty utensils, contamination with flies and insects at depot level, resulting in considerable loss of shrimp quality. This paper helps me to acquire the knowledge of shrimp culture, loss of quality of shrimp and prawn, different stages of handling and transportation of shrimp.

Md. Alamgir (2009) conducted a study entitled “Impact of Shrimp Farming on Homestead Production Systems in Shyamnagar Upazila of Satkhira District”. The study focused on the impact of shrimp farming on homestead production system. This study was conducted in three selected unions under Shyamnagar Upazila of Satkhira district to determine the impact of shrimp farming on homestead production systems. The study was conducted through household survey by interviewing 100 farm households. A total of 46 tree species (both fruit and forest) and 29 vegetable species (both summer and winter) were identified in the studied homesteads. The numbers of plant species

have been decreased over time due to increase of salinity. Land use for rice production (31.46 percent) and vegetable cultivation (84.17 percent) were decreased while increased in case of shrimp farming (60.87 percent). Thus, production and income (both local and modern varieties) from rice was decreased due to shrimp farming and the arable land was shifted to shrimp farming and to some extent shrimp cum rice farming. The production of livestock feed and fodder was declined drastically which ultimately reduced livestock population. In most of the cases, however the poor, illiterate, land less and marginal farmers have been suffering much who has no relation with the shrimp farming. Abundance of salt water, ill growth of plants, less productivity, top dying of tree species were the major problems for homestead plantation, which were the outcome of salinity due to shrimp farming. Lastly, the paper has drawn some recommendations to solve the problems.

S. Jahangir Hasan Masum (2008) has conducted a study entitled “Working Together for Responsible & Eco-friendly Shrimp Farming in Bangladesh”. The study was focused on the responsible and eco-friendly shrimp farming. Although Bangladesh is a small stakeholder in the global shrimp market, the shrimp sector is a key stakeholder in Bangladesh economy in terms of employment, income generation and earning of foreign currency for the country. Although shrimp certification has already been recognized as a tool for global market access issue, the current shrimp certification systems are non-participatory and do not incorporate the social problems linked with the shrimp industry. Consequently, most of shrimp farms are not following the Global Aquaculture Certification Council and EurepGAP standards on Mangrove Conservation and Biodiversity Protection. The global trend of shrimp business envisages that without informing consumers about sustainable farming practices, it will be gradually difficult to sell the shrimp products. Considering the social, environmental and local issues integrated commercial shrimp farming, the present study would like to rename CSR as CLOSER (Corporate Local, Social & Environmental Responsibility) for protecting ecosystem and community at local production level as well as to promote Environment-friendly Export-oriented Shrimp Cultivation. Shrimp farm associations with support from government and NGOs can provide technical assistance, training and extension services to producers to promote responsible shrimp farming. However, International shrimp buyers and retailers must take responsibility to recognize local knowledge base to

ensure ecosystem friendly responsible shrimp farming and any shrimp certification must account for social and environmental externalities in production.

Loni Hensler and Sustaining Ethical Aquaculture Trade (2012) conducted a study entitled “A sustainable future for Shrimp production in Bangladesh.” This paper focuses the story of a shrimp born into the conventional supply-chain and problem areas in Bangladesh. While prices between retailer and the processing plants are negotiated, at the lower end of the value-chain among fry collectors and middlemen bargaining is very limited. Small farmers depend very often on larger, dominant buyers and have very little ability to influence the price. Beside the fact that the farmers are mainly price takers, they face some other disadvantages: Firstly, the price is very unstable and can fluctuate greatly. Secondly, farmers lose a part of their profit because they have to pay a fee to the middlemen and the payment is irregular. Thirdly, only rarely do they receive payments directly. Usually farmers need to wait between 2 weeks and up to 3 months for payment, and sometimes they are never paid. Moreover, the payment is normally not documented, hindering any transparency. For the farmer, especially if he is very poor and uneducated, this means a lot of stress selling and bargaining the price in the market and then not having the security of receiving payment, making it impossible to plan for the future, and even impossible to support his family in acceptable living conditions. Some of the poorer farmers have had to take out loans, because they do not have the means to save money and are unable to accommodate the irregular prices and payments on their own. Compared to the time when the farmers produced rice, now only the richer farmers still have rice farming land and the poor have to buy all their rice at the market therefore, in terms of food security, many small-scale and poor farmers are not self-sufficient anymore. This study mentioned the entire shrimp production value-chain: growing, harvesting, transporting, processing and selling system of shrimp. This study also explore the issues facing the conventional Bangladeshi shrimp value-chain, the insecurity and powerlessness of shrimp farmers, environmental issues and animal welfare, the harmful use of chemicals and shrimp farmers, impacts of aquaculture on biodiversity, social issues: working conditions, inequality and gender and finally, drawn some recommendations to improve the overall shrimp production in Bangladesh. This paper is helpful to the researcher to acquire the knowledge of shrimp culture and shrimp supply chain management system in Bangladesh.

A research article entitled “Economic study on production and marketing of shrimp and prawn seed in Bangladesh” was written by MS Islam, MS Rahman, MM Haque, S Sharmin (2011). The study focused on shrimp farming and related activities contribute significantly to the national economy of Bangladesh. Successful shrimp culture depends mainly on the availability of healthy and quality shrimp seeds. The study was designed to analyze the production and marketing system of shrimp seed in Bangladesh. A total sample of 80 stakeholders comprising each of 20 operators of *bagda* and *golda* hatcheries, and each of 20 shrimp seed traders and *faria (bapari)* were selected purposively. Data and information mainly on shrimp seed production and marketing were collected from Cox’s Bazar and Jessore districts depending upon the concentration of hatcheries established for shrimp seed production. Shrimp seed production is capital intensive and it is risky business. Although shrimp seed production cost is very high but the farm could earn higher profit by ensuring better culture and management. Marketing channel and distribution system of shrimp seed were identified in this study. Shrimp seed passed from hatcheries to shrimp farmers followed by sequence of intermediaries. This study showed that hatcheries directly sell about 80% shrimp seed to *Aratdar* and rest 20% to shrimp seed traders but in case of shifting shrimp seed by cargo plane almost all are sold to *Aratdar* in sale centre. However, less number of intermediaries was involved in shrimp seed marketing. This is a good study to obtain the knowledge of production, marketing of shrimp and prawn seed. But this study did not mention how to improve the transportation system of shrimp in Bangladesh.

An article entitled “Production and Export of Shrimp of Bangladesh: Problems and Prospects” was written by M. M. Rahman and M. M. Hossain (2009). This study focuses on problems and prospects of shrimp production and marketing from Bangladesh on the basis of secondary information. Shrimp farming has emerged one of the important economic activities in Bangladesh and become the second largest export industry after garments. Shrimp aquaculture in coastal areas plays a major role providing employment, income and food security to remote coastal people where alternative livelihood options are limited. In coastal Bangladesh, shrimp culture has led to many social and environmental problems. In export markets, shrimps are great but many challenges remain ahead because of increasing requirements of quality, food hygiene and development of technological and trade barriers in large shrimp markets in

USA and EU countries. However, challenges lie with good aquaculture practice and competitive export, which are the effective tools for poverty alleviation and national development program for Bangladesh.

A research article named “Present Status of Shrimp at the Stage of Production and Marketing: A Study on Khulna District of Bangladesh” was prepared by M.K. Dev and Md. Nuruzzaman (2006). This study mentioned the production and marketing of shrimp in Khulna district. Thousands of farmers in this area have converted their paddy fields to shrimp and prawn farms to accommodate a profitable shrimp culture practice. Farmers directly sell their shrimps to the local markets during March-May/June and prawns during October/November-January/February. However, now the production of shrimp and prawn are turned over all around the year. The shrimps/prawns supply chain from farmers to the international markets always pass through a number of middlemen: foria (field workers), prawn traders, agents and companies. This research showed that the shrimp cultivation is gradually increased in Khulna district. As a result employment is being generated day by day. The shrimp/prawn is a highly valued product for the international markets and therefore, almost all shrimps/prawns are exported to the international markets.

Jannatul Mawa Nupur (2010) conducted a study “Problems and Prospects of Shrimp Farming in Bangladesh.” This study provided a comprehensive evaluation of problems and prospects of shrimp industry in Bangladesh. The objectives of this study was i) to analyze the current status of the shrimp industry in southwestern area of Bangladesh, ii) to find out the problems with the supply chain in the shrimp industry, iii) to identify the problems those affected the shrimp farming and iv) to provide some recommendations for cultivating shrimp in Bangladesh. Both primary and secondary data were used in this study. This study intends to find out the problems related to the shrimp industry in Bangladesh to export in the international markets. As such a research study has been undertaken on shrimp farmers, experts and government employees of the shrimp farming areas. To gauge the prospects of shrimp farming, the south-western region of Bangladesh has been considered as the core farming areas. These three categories of stakeholders are related to the problems and prospects of shrimp industry in Bangladesh. A total of 100 stakeholders were selected to respond. The author suggested that problems including high mortality rate, lack of virus screening facility and the unfair practices should be

taken into account for the both operative and strategic level without delay. Enforcement of food security from the external sector of the government ought to be discovered.

Chapter Four

4.0 Discussions, Analyses, Findings and Recommendations

This section is divided into two broad heads in the captions of **(A)**Shrimp Post Larva (PL) Collection and Transportation and **(B)**Shrimp Trading and Transportation by a number of channel members including shrimp farmers, local suppliers of shrimp PL, *Beparies*, *Aratdars*, and Depot owners.

4. A.ShrimpPost Larva (PL) Collection and Transportation

This part will include the activities related to shrimpPL collection by different levels of intermediaries and transportation.

4. A.1.1Shrimp Post Larva (PL) Collection Activities by Shrimp Farmers

The supply of shrimp PL to shrimp farmers is very essential for scientific culture and management for shrimp. For this purpose, shrimp seed farms (SSFs) or hatcheries for shrimp PL are developed and established mainly in Cox's Bazar region. But major culture grounds for shrimps are situated in Southwest region especially Khulna, Bagerhat, and Satkhira districts in Bangladesh (GoB, DoF, 2013). At the same time, successful shrimp culture depends mainly on the availability of healthy and quality shrimp PL. For distribution of shrimp PL, direct marketing between hatchery owner and shrimp farmer is rarely practiced. In most cases, SSFs channel their post larva through agents so that they can concentrate their energies on production. Here, marketing channel is the sequence of intermediaries through whichshrimp PL passes from SSFs to shrimp farmers. This channel may be short or long, depending on the size and quality of shrimp PL marketed, available marketing services, and the prevailing social and physical environment. SSFs reported that shrimp PL produced from hatchery can meet about 95-100% of shrimp PL demanded by shrimp farmers. In case of shrimp PL, only a small percentage of natural PL is used by the shrimp farmers (Islam et.al, 2011).

Currently, about 59 hatcheries of shrimphave been established by both government and private sectors which produced 125000 lakh in the country in 2012 (GoB, DoF, 2012). The shrimp PL collection by shrimp farmers is given in **table-1** (please see the table-1 in the appendix).

Table-1 shows that the shrimp farmers purchase the shrimp PL from various sources. In our study, it is observed that all the respondents (100%) collect the shrimp PL from local suppliers. Shrimp PL suppliers work as agents and get a fixed amount of commission

based on their amount of business. The shrimp PL suppliers are mainly local businessmen. They have different areas of nursery in Satkhira. Immediately after being transported shrimp PL from Cox's Bazar to nurseries in Satkhira, shrimp PL needs nursing for a varying time period. It may range from some hours to few days. In the study, it is found that 60% respondents collect shrimp PL from local *Beparies* (Faria). *Beparies* basically gather shrimp PL from fishermen and finally sell them to shrimp farmers and/or local suppliers. 20% respondents collect shrimp PL from other sources which mainly include fishermen. They are mainly marginal farmers and they need only a small amount of shrimp PL. These fishermen collect shrimp PL from nearby rivers which include Ichamati, Raimangal, Hariabhanga. Besides, fishermen catch shrimp PL from coastal sea shore of the Southern part of Satkhira. This shrimp PL is generally bought and sold between the farmers and the fishermen in different places in Satkhira such as Munshiganj, Vetkhali, Nildumur, Harinagar, Shyamnagar.

In our study, an attempt has also been made to know whether the shrimp farmers collect shrimp PL from local suppliers, or suppliers from Cox's Bazar or both. In our study, it is observed that all the farmers collect shrimp PL from local suppliers as can be seen in **table-2** in the appendix.

It is worth mentioning that the maximum amount of shrimp PL is produced in Cox's Bazar. Since there is one level of intermediaries involved in between shrimp PL producers in Cox's Bazar and shrimp farmers in Satkhira, the shrimp farmers have to buy shrimp PL at a higher price. Because certain amount of profit margin is received by this level of intermediaries. Moreover, transportation cost also increases the price to shrimp PL.

4.A.1.2 Transportation Activities for Collecting the Shrimp Post Larva (PL) from Local Suppliers and Local *Beparies* (Faria) by Shrimp Farmers

Human-driven van (HDV), engine-driven van (EDV), bicycle, motorbike, pick-up, and laborer are usually used as the transportation vehicle by the local suppliers and local *Beparies* (Faria). They use above mentioned different transportation vehicles depending on the amount of shrimp PL, and distances from local nursing point of local suppliers to *Gher*. In our study, it is observed that local farmers among five respondents purchase shrimp PL from local *Bepari*. *Beparies* have been asked to know about where

from they collect the shrimp larva. Their responses indicate that they used to collect it from fishermen who catch the shrimp PL from local rivers and sell the shrimp PL in different places in Satkhira such as Munshiganj, Vetkhali, Nildumur, Harinagar, Shyamnagar bazaar, etc.

The study shows that the distance from shrimp PL trading bazar to *Gher* is around 50-60 k.m. All *Ghers* are situated in Satkhira district. While using motorbike and/or pick-up for carrying shrimp PL, it usually takes one hour to one and half hours. But the local shrimp farmers generally use engine-driven van (EDV), pick-up, human-driven van (HDV), and bicycle. **Table-3** in the appendix demonstrates different types of vehicles used by shrimp farmers while purchasing shrimp PL from local suppliers. Since shrimp farmers use more than one vehicle, the percentage of farmers using vehicles is more than 100 percentages. Table-3 shows that 80% shrimp farmers used engine-driven van (EDV), 40% pick-up, 20% human-driven van (HDV), and 20% bicycle.

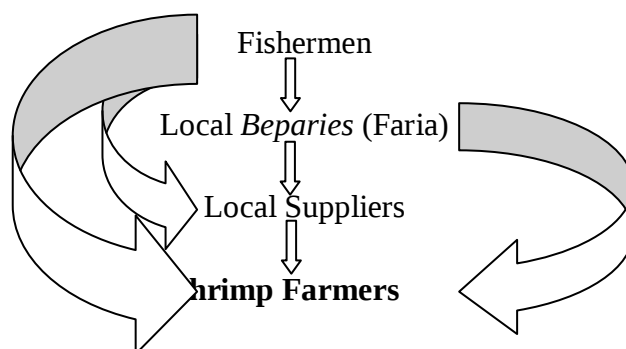
Farmers use human-driven vehicles or engine-driven vehicles depending on the distance between local shrimp PL nurseries and *Ghers* as well as the volume of shrimp PL purchased each time. In the study, it is found that the shrimp farmers purchase shrimp PL from two places such as *Parulia bazaar* and Satkhira *Sadarbazaar*. Most of the nurseries are located in *Parulia bazaar*, and Satkhira *Sadarbazaar*. The main nurseries in *Parulia bazaar* are *Satata* hatchery and nursery, *Bismillah* hatchery and nursery, *Amin* hatchery and nursery, *Ichamatihatchery* and nursery, and *Fulbaria* nursery. Many others are in Satkhira *Sadar bazaar* such as *Madina* hatchery and nursery. Although these local intermediaries do not hatch shrimp PL, they have given the name of their nurseries as “hatchery and nursery”. The distances from *Gher* to *Paruliabazaar* and *Gher* to Satkhira *Sadarbazaar* are 1-10 k.m. and 20-30 km respectively. Human-driven van (HDV) is mostly used when shrimp PL is carried from *Paruliabazaar* to *Gher* as the distance is much less. On the other hand, engine-driven van (EDV) and pick-up are used from carrying shrimp PL from Satkhira to *Gher* as the distance is more than that of other places. The speed of different types of vehicles used in carrying shrimp PL from *Paruliabazaar* and Satkhira *Sadarbazaar* to *Gher* varies considerably. The time taken by different modes of vehicles per kilometer is given in the **table-4** in the appendix. It is observed that engine-driven vehicle is speedier in carrying shrimp PL while human-driven vehicle is very slow in carrying shrimp PL.

Thus, farmers use engine-driven vehicles for long distances and human-driven vehicles for short distances. It is clear from the table-4 that engine-driven van (EDV) is mostly used by the shrimp farmers because they can carry much shrimp PL at a reasonable cost and within a short period of time. Bicycle is mainly used by marginal farmers who cultivate from 0-5 *Bighas* (1 Bigha=33 decimal) of land. Additionally, when the street is muddy in rainy season, laborer is needed to carry the shrimp PL packages from the hatchery and/or nursery to *Gher*. Therefore, for the betterment of the farmers, it is necessary to transform all soil-built roads into paved-roads (*Pacca* roads). It is also necessary to provide repair and maintenance services for these roads.

4. A.1.3 Different Sources of Shrimp Post Larva (PL) Collection by Shrimp Farmers

In our study, it is found that no farmers collect shrimp PL directly from shrimp PL producers in Cox's Bazar. It is also observed that a number of intermediaries are involved in collecting shrimp PL from the shrimp PL producers in Cox's Bazar and selling to the shrimp farmers. Some shrimp farmers also buy shrimp PL from local *Beparies* who buy shrimp PL from different fishermen engaged in catching shrimp PL from nearby rivers. It is mentioned that these local *Beparies* do their business activities of buying in the same local bazaars where they buy shrimp PL from fishermen of shrimp PL. Some marginal shrimp farmers who culture shrimp in the area of 0-5 *Bighas* land buy directly shrimp PL from local fishermen who catch shrimp PL from nearby rivers.

The **diagram-1** showing different sources of shrimp PL collection by shrimp farmers is given below:



[Diagram-1]

4. A.1.4 Problems Regarding the Local Transportation System Used in the Collection of Shrimp Post Larva (PL) by Shrimp Farmers

The problems faced by most shrimp farmers in the transportation of shrimp PL are quite large in number. Of them, only major problems faced by the farmers while being interviewed are mentioned as under:

First, almost all the farmers unequivocally mention that the roads they use for carrying shrimp PL are very bad. Basically, shrimp PL is very sensitive and if it is not carried in short times they may not remain alive or may not remain robust. Sometimes, it is found that some shrimp PL dies due to long time taken while carrying them from local suppliers to *Gher*.

Second, in rainy season, the road becomes so muddy that no vehicles except labor can be used for carrying shrimp PL. Thus, farmers have to use only humans for carrying shrimp PL. But when they need to carry huge amount of shrimp PL, they have to face trouble. For this reason, a labor can only carry a small quantity of shrimp PL.

Third, farmers also face trouble while using engine driven vehicles. These engine-driven vehicles are not legally approved by the concerned authority of the government. Thus, police officers sometimes create obstruction in using these vehicles.

Fourth, engine-driven van does not have any cover to tie the vessels containing shrimp PL. Thus, most often the vessels drop from the vehicles when they pass roads which are very bad conditioned. Sometimes, vehicles get upside down because of heavy weight of the vessels. These vehicles do not have sufficient control measurers so that they can be stopped right away. Because of lack of sufficient control measure, sometimes the vehicles fall in severe accident.

Fifth, when using motorbike and or bicycle, farmers face a lot of problems. Some of them are as follows:

- (a) Because of high jerking, water drops from the vessels containing shrimp PL. If water level goes down in the vessels, it becomes difficult on part of the shrimp PL to survive. Sometimes, because of low level of water, the shrimp PL becomes weaker. When they are released in the *Gher*, they may die in a couple of days.
- (b) Sometimes, they cannot use motorbike as they are not readily available all the time.

(c) When using motorbike, the farmers have to pay higher rentals. Thus, it also drives up the cost of carrying shrimp PL.

Sixth, some farmers report that small farmers cannot use any type of pick-ups. For this reason, they have to carry only a small amount of shrimp PL which is not sufficient for using a pick-up. Likewise, pick-up cannot be used while carrying shrimp PL from short distances. But pick-up is very cheap in terms of transportation cost for carrying shrimp PL in large volume.

4. A.1.5 Recommendations for Improving Local Transportation System

The solutions suggested by most shrimp farmers are many in number and diverse in nature. Of them, only vital solutions addressed by the farmers are given below:

First, since the condition of roads is very bad, it is badly needed to transform the soil road (*kacha*) into paved (*pacca*) roads. At the same time, it is necessary to continue the repair and maintenance works of the roads which are used for the shrimp PL (also shrimp) transportation.

Second, it is observed that the locally made engine driven vans such as *Nasimans*, *Karimans*, etc. are not legally approved by the concerned authority of the government. Government should take immediate measures to stop these types of unauthorized vans. But for the betterment of transportation system, government has to take steps to introduce *Gram-bangla*, *Mahendra*, and Auto-rickshaw which are attached with seat and tied with shed. These types of vehicles are usually authorized and licensed by the proper authority. It is suitable for shrimp PL (also shrimp) transportation. Thus, government should take necessary measures to introduce *Gram-bangle*, *Mahendra*, and Auto-rickshaw in lieu of engine-driven vans (EDVs).

Third, in the transportation of shrimp PL (also shrimp), the farmers sometimes have to pay tolls under duress (*chada*) to some local people who are highly organized and sheltered by political parties. These people collect this type of toll in the name of different types of programs, social events, etc. Thus, government has to take right measures to stop them from collecting tolls under duress (*chada*). Initially, government should give some exemplary punishment to them so that all other accomplices can get a message that they need to stop toll collection.

Fourth, in our study using pick-up in carrying shrimp PL is relatively cheaper. But small and medium farmers cannot take the advantage of it. If a person is selected and assigned with the task of communicating with all small and medium shrimp farmers, then it is possible to ensure big volume of shrimp PL and use pick-up and take the advantage of carrying shrimp PL at a low cost.

4. A.2.1 Shrimp Post Larva (PL) Collection and Transportation Activities by Local Suppliers in Satkhira

Local suppliers of shrimp PL are called as the commission agents of the shrimp PL producers. The shrimp PL producers are located mainly in Cox's Bazar. Thus, local suppliers of shrimp PL in *Satkhira* had to buy these shrimp PL from Cox's Bazar. After buying the shrimp PL from Cox's Bazar, they use road transport and air transport.

It is observed from the field study that all the local suppliers collect the shrimp PL from producers located in Cox's Bazar. In addition, some of them (20%) collect shrimp PL from the local *Beparies* (please see the **table-5** in the appendix). The survey result shows that 98% of shrimp PL is collected from the producers and 2% collected from local sources. Local sources include local *Beparies* and fishermen. In carrying 98% shrimp PL from the producer in Cox's Bazar, local suppliers use air transport, and road transport. The study reveals that all respondents use both air and road transport for shrimp PL transportation. About 79% of shrimp PL is transported by air transport as opposed to 21% shrimp PL by the road (please see the **table-6** in the appendix). While carrying shrimp PL from producers of Cox's Bazar to nurseries in *Satkhira*, local suppliers use different types of vehicles such as truck, pick-up, covered-van, microbus, etc. to their nursing points in *Satkhira*. The study shows that all the local suppliers (100%) use truck, of them, 3 local suppliers (60%) use pick-up, followed by 1 local supplier (20%) use covered-van, and 1 local supplier (20%) use microbus (please see the **table-7** in the appendix).

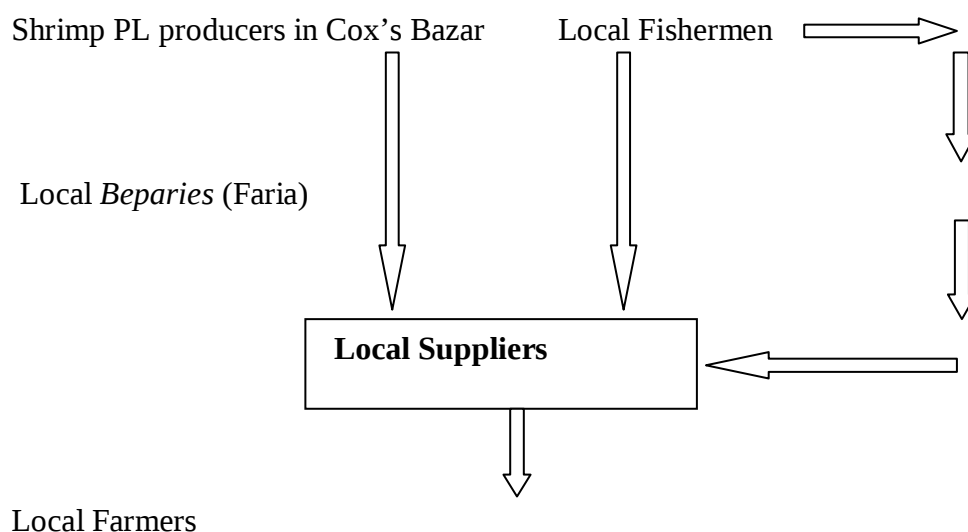
The study shows that 63% of shrimp PL is carried by truck, 11% by pick-up, 17% by covered-van, and the rest of 9% by microbus (please see the **table-8** in the appendix). It is observed that on average 16-20 hours is taken by almost all the vehicles used in road transport from Cox's Bazar to the nursing points of local suppliers in *Satkhira*. Since road transport takes much time to transport shrimp PL, the mortality rate of shrimp PL (27-30%) is much higher than that of shrimp PL (5-10%) when used air transport. It is

also observed that the quality of shrimp PL can be better ensured if by air transport is used.

However, while using air transport, the local suppliers also have to use different types of road transports carrying shrimp PL from hatcheries to Cox's Bazar airport, and Jessore airport to local nurseries. Using different types of vehicles for carrying a particular lot of shrimp PL is very much troublesome and expensive for the local suppliers.

Though, in terms of ensuring good health of shrimp PL and keeping mortality rate of shrimp PL low air transport is good, sometimes the local suppliers can get some other types of advantages if they use only a single road transport vehicle for carrying shrimp PL directly from Cox's Bazar hatcheries to local nurseries in *Satkhira*. Because of that local suppliers do not need to transfer shrimp PL from one vehicle to another vehicle.

The **diagram-2** showing different sources of shrimp PL collection by local suppliers in *Satkhira* is given below:



[Diagram-2]

4. A.2.2 Problems of Transportation System Used in the Collection of ShrimpPost Larva (PL) from Cox's Bazar to Satkira

The major problems faced by the local suppliers while carrying shrimp PL from Cox's Bazar to local nurseries are given below:

First, almost all the local suppliers mention that the roads they use for carrying shrimp PL are not in a good condition. Basically, shrimp PL is very sensitive and if it is not carried in short time, they may not remain alive or may not remain robust. Sometimes, it is found that some shrimp PL dies due to long time taken while carrying them from hatcheries in Cox's Bazar to the nursing points of local suppliers in Satkhira.

Second, Traffic jam is another problem for transporting shrimp PL. It takes much more time by road transport than by air transport. The study shows that on average 16-20 hours is taken by road transports in carrying shrimp PL from various hatcheries in Cox's Bazar to the local nursing points in Satkhira. So, the mortality rate of shrimp PL is higher than that of shrimp PL when air transportation is used.

Third, toll collection under duress and harassment by some miscreants are found while carrying shrimp PL by road transport. The harassments include creating obstruction in the movement of vehicle, unnecessary wasting time that damages the quality of shrimp PL, etc. Sometimes, officers of law enforcing agencies harass them, in the name of checking documents related to vehicles and finally taking money and allowing them to go again.

Fourth, *hartal* (strike) is frequently observed in Bangladesh. As a result, it creates serious problems for the shrimp PL suppliers. For time constraints, huge amount of shrimp PL goes dead and incurs loss.

Fifth, every road transport is to cross the capital city Dhaka full of huge traffic jam. Sometimes, this traffic jam takes even some hours that can adversely affect the quality of shrimp PL.

Sixth, since ferry transport is an integral part of road transport, it takes much time ranging some hours to a few days due to bad weather as scarcity of ferry availability, etc.

Seventh, unavailability of air conditioned covered van is a big problem for transporting shrimp PL. In summer season, the water contained in the vessel of polythene gets heated. As a result, it is difficult to keep the shrimp PL alive for a long time, and this situation reduces the robustness of the shrimp PL.

Eight, there is no gas supply in the South-western part of Bangladesh. So, gas-driven vehicles are not found in this area. Thus, local suppliers of shrimp PL are bound to use oil-driven vehicles. As a result, the local suppliers have to spend a lot of transportation cost for carrying shrimp PL from Cox's Bazar to Satkhira.

Ninth, road accidents are also another problem in transporting the shrimp PL. This type of accident may take place in any route used in carrying and transporting shrimp PL and shrimp.

Tenth, one of the problems in carrying shrimp PL from Cox's Bazar to Satkhira is the unavailability of sufficient number of cargo plane during peak season. As a result, the middlemen who carry shrimp PL cannot take the advantage of carrying shrimp PL in very short time.

4.A.2.3 Recommendations for Improving Transportation System in the Collection of Shrimp Post Larva (PL) from Cox's Bazar to Satkhira

Local suppliers have mentioned different types of recommendations that are expected to resolve most of the problems they are to face in doing their business. Some of the recommendations are mentioned in the following:

First, it is necessary to do repair and maintenance works on a regular basis of the roads used for the shrimp PL and the shrimp transportation.

Second, to speed up the overall transportation system, it is very much necessary to increase efficiency by shortening the transportation time. Thus, government should take measures so that traffic jam can be reduced. Government can appoint some traffic officials who can help in increasing efficiency by reducing traffic jam.

Third, toll collection under duress (*chada*) and harassments occurred by some miscreants in the road should be reduced significantly. Government can activate its law enforcing agencies to stop these types of activities done by the miscreants.

Fourth, transportation service for shrimp and shrimp PL should be declared as emergency service so that unnecessary delay in ferry, harassment by the union/political party-backed groups can be reduced or stopped.

Fifth, government can build by-pass road which can enable the businessmen to avoid Dhaka city for carrying shrimp PL from Cox's Bazar route Dhaka to Satkhira. Since the transportation time for truck in Dhaka city is restricted, it creates problems in carrying shrimp PL.

Sixth, *Padma Bridge*⁹ can help the businessmen in reducing the cost and time of transportation. Thus, steps should be taken to build it on a priority basis. It can also have a great contribution to the shrimp sector as well as to our national economy.

Seventh, some local suppliers have mentioned that the covered van (air conditioned) is necessary for carrying the shrimp PL during the summer season. If the covered van with air conditioned facility is not used, the mortality rate of shrimp PL goes up as the water containing shrimp PL gets heated. Thus, government in collaboration with Transport Owners' Association can take step to introduce air-conditioned covered-van as an emergency vehicle.

Eight, government should take step to establish compressed natural gas (CNG) stations in Satkhira so that the cost of transportation can be kept at minimum level.

Ninth, government can take the initiative to introduce cargo plane services so that shrimp PL which is highly sensitive can be carried from Cox's Bazar to Satkhira in short period of time.

Tenth, since unavailable of sufficient number of cargo planes in peak season creates problems for the intermediaries carry shrimp PL from Cox's Bazar to Satkhira, government should take special measures to increase the number of cargo planes. This will also contribute to raising the efficiency level of overall transportation system for shrimp PL.

4. BShrimp Trading and Transportation

⁹ *Padma Bridge* is a proposed bridge by the government of Bangladesh over the big river named *Padma* in Bangladesh.

This part will cover the activities related to shrimp culture by farmers, shrimp buy and sale activities by different levels of intermediaries and transportation and other supporting activities relating to shrimp which is exported to foreign countries.

4. B.3.1 Shrimp Trading and Local Transportation System

In this study the farmers are classified into marginal farmers, small farmers, small-medium farmers, medium farmers, and large farmers. The study shows that 20% respondents who cultivate 0-5 bighas of land are classified as marginal farmers, followed by 20% respondents cultivating 6-20 bighas of land classified as small up to medium farmers, followed by 20% respondents cultivating 21-50 bighas of land classified as medium up to large farmers. The farmers cultivating land 51-100 bighas of land are classified as medium farmers, and farmers cultivating land over 100 bighas of land are classified as big farmers (please see the **table-9** in the appendix).

After doing all preparatory works in the shrimp *Gher*, the farmers release the shrimp PL into the *Gher* where shrimp live together with other species of fish. Some shrimps are cultivated in semi-saline water. The study shows that shrimps are generally caught from 75-100 days from the day of releasing shrimp PL into the *Gher*. They also have to use different types of chemicals to grow the shrimp and to ensure good health of shrimp. The farmers put net traps in the *Gher* in order to catch the shrimps once they become grown up for sale.

The study shows that after harvesting the shrimp, the local farmers sell it to the local *Beparis* (Faria) and or *Aratdars*. All farmers (100%) sell the shrimp to local *Aratdars* in the *Set*. In addition, some of them (40%) sell the shrimp to local *Beparis* (please see the **table-10** in the appendix). *Beparis* buy the shrimp from the farmers at local markets or streets. In many times, *Beparis* go to the shrimp *Gher* and buy it. These middlemen receive a substantial amount of profit. Both shrimp farmers and *Beparis* carry the shrimp to *Aratdars* in the *Set* for selling. *Aratdar/Chatal* owners get a fixed amount of commission for buying and selling shrimps. After carrying the shrimp to *Aratdars* in the *Set*, they keep the shrimp in plastic *karet*¹⁰. To keep the shrimp in the plastic *karet*, they have to ensure that shrimp have been washed by clean water. Then it is displayed over *Chatal/Arat* in the *Set* and it is sold by auction. For accomplishing these activities, the

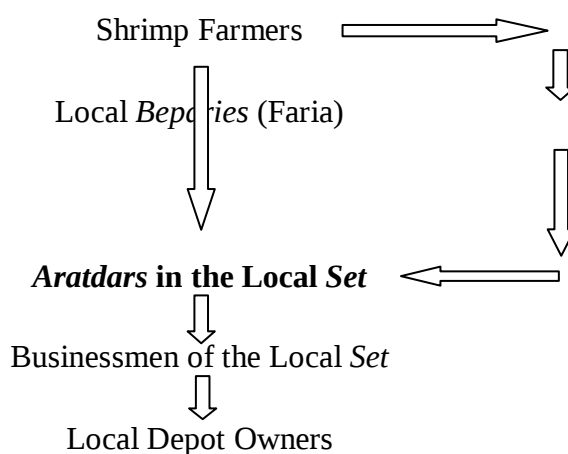
¹⁰ *Karet* are made by plastic. It has many holes for passing the melted ice water so that shrimp can be kept fresh.

owners of the *Chatal/Arat* get around 2-3% commission. These intermediaries are regarded as middlemen in our study.

The study shows that the distance from *Gher* to *Set* is connected by *katcha* (soiled) roads. In these roads mostly unauthorized vehicles are found to carry shrimp. It takes varying amount of time depending on different types of vehicles used and different amount of distances. The time taken by different modes of transportation is the same carrying for either shrimp PL or shrimp. The local farmers and *Beparies* generally use the local transport. It is observed that 60% farmers and *Beparies* use bicycle, while 20% use labor, 20% engine-driven van (EDV) and the rest 20% use motorbike (please see the **table-11** in the appendix). It is found from the study that 60% of shrimp is transported through bicycle, followed by 20% also by laborer, 18% by engine-driven van (EDV), and the rest 2% by motorbike.

It is obvious from the field study that the local farmers cannot sell the shrimp directly to the exporters or factory owners due to vulnerable road condition and/or the lack of improved transportation system.

The following **diagram-3** shows different channels of the shrimp collection and transportation:



[Diagram-3]

4. B.3.2 Problems of Shrimp Trading and Local Transportation System

In our study it is observed that most shrimp farmers face different types of problem in transporting shrimps. Based on our study, the problems they usually face are given in the following:

First, the shrimp farmers usually sell the shrimp from *Gher* to local *Beparies* in order to avoid roads not suitable for transportation and use different modes of local transports not comfortable for carrying shrimp finding no better alternatives.

Second, some unnecessary businessmen push jelly, sago, starch, etc. in order to increase the weight. Thus, the quality of shrimp gets reduced to an alarming level. As a result, the image of Bangladesh as a shrimp exporting country to foreign countries is tarnished terribly.

Third, a huge number of intermediaries are involved in the shrimp trading mechanism. Each intermediary receives certain amount of commission, which directly contributes to increasing the ultimate price of shrimp. But the farmers are deprived of this price.

Fourth, the shrimp farmers generally sell the shrimp to intermediaries on credit. Sometimes, shrimp farmers cannot recover the total amount due from the intermediaries. Basically, the amount of money the farmers are supposed to get is also contingent upon chain of the receipts of money by the intermediaries involved up to the intermediaries selling to the importer.

Fifth, almost all the shrimp farmers unequivocally have mentioned that the roads they use for carrying shrimp are very bad. Sometimes, it is found that some shrimp dies due to long time taken while carrying them from *Gher* to the *Set*. Thus, the quality of shrimp is deteriorated.

Sixth, in Rainy season, the road becomes so muddy that only human carrier (labor) can be used for carrying shrimp. Thus, farmers have to use only humans for carrying shrimp. But while carrying huge amount of shrimp, farmers have to face trouble, because a human can carry only a small quantity of shrimp.

Seventh, farmers also face trouble while using engine-driven vehicles. These engine-driven vehicles are not legally approved by the concerned authority of the government. Thus, police officers sometimes create obstruction in using these vehicles.

Eight, engine-driven van(EDV) does not have any cover to tie the plastic *karet* containing shrimp. Thus, most often the *karet* drops from the vehicles while running in the roads which are very bad. Sometimes, vehicles slip down because of heavy weight of the *karets*. These vehicles lack strong control measures so that they can be stopped right away. Because of lack of strong control measure, the vehicles fall in severe accident.

Ninth, when using motorbike, the farmers have to pay higher rentals. Thus, it also inflates the cost of carrying shrimp. Sometimes, they cannot rent motorbike as they are not readily available all the time. Here it needed to mention that marginal shrimp farmers use their bicycle to carry the shrimp from *Gher* to the *Set* because they need to carry very small amount of shrimp.

Tenth, some farmers have also mentioned that small farmers cannot use any type of pick-ups, because they carry only a small amount of shrimp which is not sufficient for using a pick-up. Likewise, pick-up cannot be used while carrying shrimp for short distances. But pick-up is very cheap in terms of transportation cost for carrying shrimp in large volume.

4. B.3.3 Recommendations for Shrimp Trading and Local Transportation System

The recommendations suggested by the different levels of businessmen and intermediaries are given below:

First, since the condition of roads is very bad, it is badly needed to transform the soiled road (*kacha*) into paved (*pacca*) roads. At the same time, it is necessary to continue the repair and maintenance works of the roads which are used for the shrimp (also shrimp PL) transportation.

Second, administrative actions should be taken to stop any kind of activities such as pushing jelly, sago, starch, etc. into the body of shrimp done by unscrupulous businessmen.

Third, the excessive number of intermediaries involved between farmers and importers should be reduced. If it is possible, then the farmers will receive higher price. At the same time, the price needed to pay by the importers will be low.

Fourth, government should take steps so that adulteration activities can be stopped. If this can be stopped, the payment process can also be speeded up as importers will be happy with the quality of shrimp. The foreign buyers will feel encourage to make payment properly.

Fifth, it is observed that the locally made engine-driven vans (EDVs) such as *Nasimans*¹¹, *Karimans*¹², etc. are not legally approved by the concerned authority of the government. Government should take immediate measures to stop these types of unauthorized vans. But for the betterment of transportation system, government has to take steps to introduce *Gram-bangla*¹³, *Mahendra*¹⁴, and Auto-rickshaw which are attached with seat and tied with shed. These types of vehicles can be authorized and licensed by the proper authority. It will be suitable for shrimp (also shrimp PL) transportation. Thus, government should take necessary measures to introduce *Gram-bangle*, *Mahendra*, and Auto-rickshaw in lieu of engine-driven vans (EDVs).

Sixth, in the transportation of shrimp(also shrimp PL), the farmers sometimes have to pay tolls under duress (*chada*) to some local people who are highly organized and sheltered by political parties. These people collect these types of tool in the name of different types of programs, social events, etc. Thus, government has to take right measures to stop them from collecting tolls under duress (*chada*).

Seventh, to enable small and medium farmers to take the advantage of using pick-up which is a cheaper mode of transport, a person can be assigned with the task of communicating with all small and medium shrimp farmers. Then it will be possible to ensure big volume of shrimp and use pick-up and take the advantage of carrying shrimp at a low cost.

4. B.4.1 Shrimp Trading and Transportation Activities by Depot Owners

Local Depot owners buy shrimp from the local businessmen in the *Set*. The study shows that all Depot owners process the shrimp before they transport to exporters/factory

¹¹ *Nasimans* are locally made engine-driven vans which are used for carrying shrimp and/or people.

¹² *Karimans* are also as like as *Nasimans*, only name is differently called by local people.

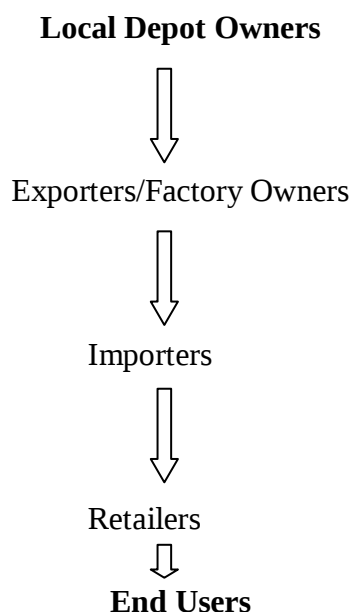
¹³ *Gram-bangla* is like as Auto-rickshaw which is covered by shed and comfortable seat is attached with this vehicle.

¹⁴ *Mahendra* is also like as *Gram-bangla*, only name is differently called by local people.

owners. Generally, they clean the shrimp with deep tube wells water. It is kept in plastic *karet* with ice packaging by polythene.

Every plastic *karet* contains 10-15 k.g shrimp. It takes around half an hour for completing the processing works. After completing processing works, Depot owners send it to the factory owners/ exporters using transportations. Factories are mainly located in the districts of Chittagong, Khulna, and Jessore. The study shows that all Depot owners used to send the maximum amount of shrimp (58%) to Chittagong and 38% to Khulna. In addition, some of them (20%) of Depot owners send a small amount (only 4%) of shrimp to Jessore. For transportation, different types of vehicles like truck, pick-up and covered-van are used. **Table-12** shows that 100% Depot owners used truck, followed by 80% Depot owners who used pick-up. And only 20% Depot owners used covered-van. **Table-13** shows the amount of shrimp transported in different types of vehicles. It is observed that 78% of shrimp is transported by truck, 18% by pick-up and the rest 4% by covered-van. It is also clear from the study that the shrimp is not transported by air like cargo plane within home country.

The **diagram-4** shows the channel of the shrimp collection and transportation:



[Diagram-4]

4.B.4.2 Problems Related to Shrimp Out-bound Transportation Faced by Depot Owners

Depot owners also face quite a diverse set of problems while transporting the shrimp from Satkhira to Chittagong, Khulna and Jessore. It is worth mentioning that the problems of carrying shrimp PL from Cox's Bazar to Satkhira are almost the same while transporting shrimp from Satkhira to Chittagong, Khulna and Jessore. Thus, these problems are not discussed here. Rather, some other problems which are not found in other cases are discussed in the following sections:

- (a) Vehicles used in carrying shrimp from Satkhira to Chittagong, Khulna and Jessore are trucks, pick-ups and covered-vans. The problems the intermediaries face while carrying shrimp are the unavailability of these vehicles on need. If these types of vehicles are not available, the Depot owners have to incur huge loss as the quality of the shrimp gets deteriorated very quickly.
- (b) For ensuring good quality of shrimp, it is essential to use covered-van that has the facility to preserve shrimp in iced condition. But Depot owners sometime become bound to carry trucks and pick-ups finding no better alternatives. As a result, the quality of shrimp goes down and they are deprived of good prices from the foreign buyers of shrimp.

4. B.4.3 Recommendations Related to Shrimp Out-bound Transportation

The recommendations prescribed in other sections are also applicable for the solutions to the problems faced by Depot owners. In addition, the following recommendations are also prescribed:

- (a) Government should take necessary steps to ensure the availability of different types of vehicles so that in the peak season the Depot owners do not face any problem.
- (b) At the summer season, it is necessary to make available sufficient number of covered-vans with air conditioning facility so that quality of shrimp can remain intact during transportation time.

Chapter Five

5.0 Conclusion

Foreign earning through shrimp export is a great opportunity for Bangladesh. Although the earning through shrimp export is found increasing, there is a great possibility of increasing this earning if some necessary steps are taken on an emergency basis. The transportation system of supply chain management plays a dominant role in the export of shrimp. But unfortunately the transportation system used for shrimp is ill-conditioned and highly miserable. In transporting shrimp PL and shrimp, shrimp farmers face diverse problems. These problems lead to increase the farmers' cost of production and carrying cost. These problems also deteriorate the quality of shrimp and shrimp PL. The bad scenarios of transportation system of shrimp adversely affecting the shrimp export. Thus, government should pay attention to improve the transportation system of shrimp. The suggestions derived from the local farmers and intermediaries should be taken as necessary doings for the government. If these problems are resolved, it is expected that our shrimp export will increase many fold and the pace of our economic development will be accelerated.

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Appendices

Table-1: Information Relating to Shrimp Post Larva(PL) Purchased by ShrimpFarmers

From Whom	Frequency(N=5)	Percentage (%)
Producer	0	00
Local Supplier	5	100
LocalBepari(Faria)	3	60
Others	1	20

Source: Field Work*Respondents mentioned more than one response.

Table-2: From Where the ShrimpPost Larva (PL) Purchased by Shrimp Farmers

Name of Places	Frequency	Percentage (%)
Cox's Bazar	0	00
Chittagong	0	00
Local Places	5	100
Other Places	0	00
Total	N=5	100

Source: Field Work.

Table-3: Vehicles Used by Shrimp Farmers while purchasing Shrimp Post Larva (PL) from Local Suppliers

Name of Vehicles	Frequency(N=5)	Percentage (%)
Human-driven van (HDV)	1	20
Engine-driven van (EDV)	4	80
Bicycle	1	20
Pick-up	2	40

Source: Field Work.

*Respondents mentioned more than one response.

Table-4: Time Taken by Different Types of Vehicles for Carrying ShrimpPost Larva (PL)

Sl. No.	Name of Respondents	Human-driven van (HDV)		Engine-driven van (EDV)		Bicycle		Pick-up	
		Distance (k.m.)	Minutes	Distance (k.m.)	Minutes	Distance (k.m.)	Minutes	Distance (k.m.)	Minutes
1	Md. Hossen Ali			20	60-90				
2	Md. Shahidul Islam					02	10-12		
3	Md. Kabir Hossen	06	60-90	06	30				
4	Md. Mahbub Alam(Julu)			8-10	40-50			20-25	30-45
5	Md. Shahjahan Ali			7-8	30-40			20-25	30-45
Average		per k.m	12-13 minutes	per k.m	4-5 minutes	per k.m	5-6 minutes	per k.m	about 2 minutes

Source: Field Work

*Respondents mentioned more than one response.

Table-5: Information relating to ShrimpPost Larva (PL) Purchased by Local Suppliers

From Whom	Frequency(N=5)	Percentage (%)
Producer	5	100
LocalBepari(Faria)	2	20
Others	0	00

Source: Field Work

*Respondents mentioned more than one response.

Table-6: ShrimpPost Larva (PL) Purchased by Local Suppliers from Producers in Cox's Bazar by Using Air Transport and Road Transport

Sl. No.	Name of Respondents	Volume of Shrimp PL (%)	
		Air	Road
1.	Md. Golam Faruk	70	30
2.	Md. Nur Amin	90	10
3.	Md. Abdul Aziz	80	20
4.	Md. Johirul Haq	80	20
5.	Md. Mithun Hossen	75	25
Average		79%	21%

Source: Field Work.

Table-7: ShrimpPost Larva (PL) Purchased by Local Suppliers from Producers in Cox's Bazar by Using Different Vehicles in the Road.

Name of Vehicles	Frequency(N=5)	Percentage (%)
Truck	5	100
Pick-up	3	60
Covered-van	1	20
Microbus	1	20

Source: Field Work. *Respondents mentioned more than one response.

Table-8: Shrimp Post Larva(PL) Purchased by Local Suppliers from Producers in Cox's Bazar by using Different Vehicles in the Road.

Sl. No.	Name of Vehicles	Volume of Shrimp PL (%)			
		Truck	Pick-up	Covered-van	Microbus
1.	Md. Golam Faruk	35	20		45
2.	Md. Nur Amin	15		85	
3.	Md. Abdul Aziz	100			
4.	Md. Johirul Haq	90	10		
5.	Md. Mithun Hossen	75	25		
Average		63%	11%	17%	9%

Source: Field Work.

Table-9: Information Relating to the Amount of Land of Shrimp Cultivation

Amount of Land(<i>Bighas</i>)	Frequency (N=5)	Percentage (%)
0-5	1	20
6-20	1	20
21-50	1	20
51-100	1	20
100+	1	20
Total	5	100%

Source: Field work

Table-10: Information about Selling of Shrimp by Shrimp Famers

To whom	Frequency (N=5)	Percentage (%)
Local <i>Bepari</i>	2	40
Local <i>Aratdar</i>	5	100
Depot Owner	0	00

Source: Field work *Respondents mentioned more than one response.

Table-11: Local Transportation System Used by Shrimp Famers and *Beparies*

Name of Vehicles	Frequency(N=5)	Percentage (%)
Laborer	1	20
Bicycle	3	60
Engine-driven van (EDV)	1	20
Motorbike	1	20

Source: Field Work. *Respondents mentioned more than one response.

Table-12: Different Kinds of Vehicles Used by Local Depot Owners.

Name of Vehicles	Frequency(N=5)	Percentage (%)
Truck	5	100
Pick-up	4	80
Covered-van	1	20

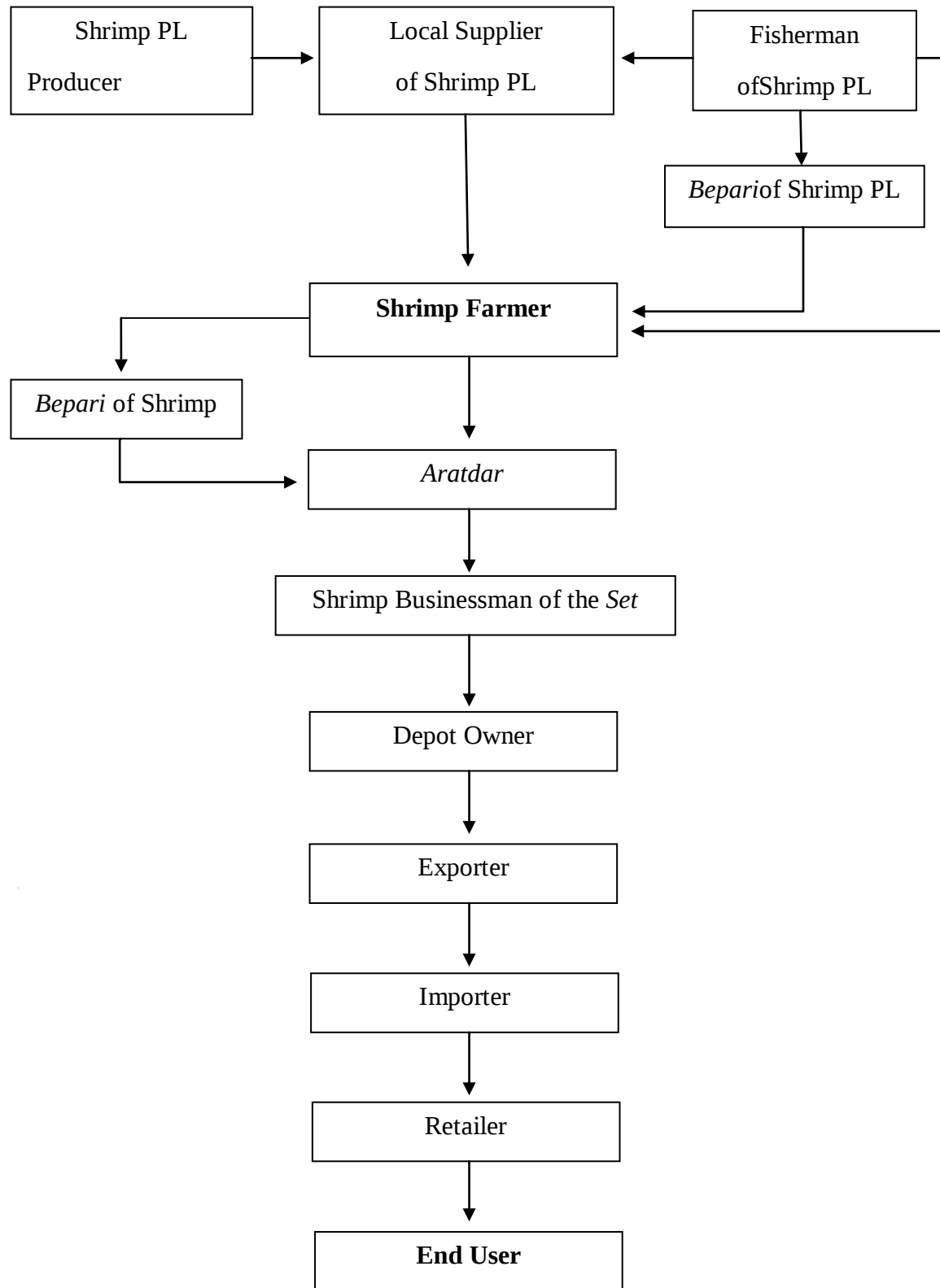
Source: Field Work. *Respondents mentioned more than one response.

Table-13: Shrimp Transported by Local Depot Owners from Satkhira to Different Factories Located in Chittagong, Khulna and Jessore.

Sl. No.	Name of Respondents	Volume of Shrimp (%)		
		Truck	Pick-up	Covered-van
1.	Md. Nur Mohammad	80		20
2.	Md. Unus Ali	80	20	
3.	Md. Rofikul Islam	70	30	
4.	Md. Mehedi Hasan (Khokon)	80	20	
5.	Md. Azharul Islam	80	20	
Average		78%	18%	4%

Source: Field Work

The **diagram-5** shows the existing shrimp supply chain transportation system



[Diagram-5]

Questionnaire

Questionnaire

MþelYvi wkþivYvg: "Improving Transportation System of Supply Chain Management for Shrimp in Satkhira"

(msM,,nxZ Z_`vejx þKejgvÎ MþelYvi KvþR e`eüZ nþe Ges Gi þMvcbxqZv iýv Kiv nþe)

Z_`vZvi bvg :eqm :

wVKvbv :

ZwiL:

**þckv/e`emvi aiY :** evM`v Pvlx / evM`v þiYy þcvbvi `´vbxq mieivnKvix /
`´vbxq þecvix (dwoqv) / Avor`vi / wWþcv gvwjK; (evKx Ask,þjv þKþU
w`b)|

þhvMvþhvM/þmj bs:

K - Ask

evM`v Pvlx (evM`v þiYy þcvbv welqK)

1. evM`v þiYy þcvbv Kvi KvQ þ_þKµq Kþib ? (GK/GKvwaK wUK wPý
w`b)|

K) Drcv`bKvix L) evM`v þiYy þcvbvi `´vbxq mieivnKvix M)
`´vbxq þecvix N) Ab`KviI

2. evM`v þiYy þcvbv þKv_v nþZ µq Kþib ? (GK/GKvwaK wUK wPý
w`b)|

K) KK&ªevRvi L) PÆMÖvg M) `´vbxq N) Ab`´´vb

3.KK&ªevRvi/PÆMÖvg þ_þK Drcv`bKvixi wbKU nþZ µþqi þýþÎ Avcwb
wK aiþYi cwienY e`e´´v e`envi Kþib ? (GK/GKvwaK wUK wPý w`b)|

K) AvKvk c_ L) `´j c\_ M) Ab`vb`

(1)kZKiv wnþmþe þKvbwUþZ KZUzKz cwienY Kþib ?

K) 'j c_ -----L) AvKvk c_ -----M) Ab"vb"-----
--

(2)hw` 'j c_ nq;

(K) Avcwb wK aiYi cwienY e"envi Kib ?
(GK/GKvwaK wUK wPy w`b)|

K) U^avK L) wcK Avc M) KvfvW© f`vb N) gvBμv
evm

O) Ab"vb"

(L) KZ mgq jvM ?DĚi :

(M) KZ % tiYy †cvbv RxweZ _vK ?DĚi :

(N) myweavmg~n wK wK ?

DĚi:

(O) Amyweavmg~n wK wK ?

DĚi :

(P) mycvwik wK ? (Avcbvi cwienY mgm"v mgvavbi Rb" wK Kiv `iKvi
e†j Avcwb g†b Kib)|

DĚi:

(3)hw` AvKvk c_ nq;

(K) KZ mgq jvM ?DĚi :

(L) KZ % tiYy †cvbv RxweZ _vK ?DĚi :

(M) myweavmg~n wK wK ?

DĚi:

(N) Amyweavmg~n wK wK ?

DĚi:

(O) mycvwik wK ? (Avcbvi cwienY mgm~v mgvav~bi Rb~ wK Kiv
~iKvi e~j Avcwb g~b K~ib)|

DĚi:

4.b`xi b~vPvivy evM`v ~iYy ~cvbv ~'vbxq ~ecvixi wbKU n~Z ~~qi ~~j~I
Avcwb wK cvwienY e~e~'v e~envi K~ib ? (GK/GKvwaK wUK wP~y w`b)|

K) kÖwgK evnbL) f~vb M) BwÄbPvwjZ f~vb N) evBmvB~Kj
O) ~gvUimvB~Kj P) wcK Avc Q) ~bxKv R) U~jvi
S) Ab~vb~

(1) ~'vbxq ~ecvix b`xi b~vPvivy evM`v ~iYy ~cvbv Kvi KvQ ~_~K ~q
K~ib ?

DĚi :

(2) ~'vbxq ~ecvix b`xi b~vPvivy evM`v ~iYy ~cvbv ~Kv_v ~_~K ~q K~ib ?
(GK/GKvwaK wUK wP~y w`b)|

K) BQvgwZ b`x L) ~fULvjx M) k~vgbMi N) `w~Y mvZ~xiv~'
mgy`^a DcK~j|

(3) ~~iZ; KZ? DĚi:

(4) ~iYy ~cvbv cwien~Y KZ mgq jv~M? DĚi:

5. ~'vbxq mieivnKvix n~Z ~~q Avcwb Kx cwienY e~envi K~ib?

K) kÖwgK evnb M) BwÄbPvwjZ f`vb N) evBmvB‡Kj P) wcK
Avc

(1) `~iZi KZ? DËi:

(2) †iYy †cvbv cwien‡Y KZ mgq jv‡M? DËi:

L - Ask

evM`v †iY~ †cvbvi ¬'vbxq mieivnKvix

6.evM`v †iYy †cvbv Kvi KvQ †\_‡K µq K‡ib ? (GK/GKvwaK wUK wPý w`b)|

K) Drcv`bKvix L) ¬'vbxq ‡ecvix M) Ab`KviI

7. evM`v †iYy †cvbv †Kv\_v n‡Z µq K‡ib ? (GK/GKvwaK wUK wPý w`b)|

K) KK&ªevRvi L) PÆMÖvg M) ¬'vbxq N) Ab`¬'vb

8.KK&ªevRvi/PÆMÖvg †_‡K Drcv`bKvixi wbKU n‡Z µ‡qi †ÿ‡Î Avcwb wK ai‡Yi cwienY e`e¬'v e`envi K‡ib ? (GK/GKvwaK wUK wPý w`b)|

K) AvKvk c_ L) ¬'j c_ M) Ab`vb`

(1)kZKiv wn‡m‡e †KvbwU‡Z KZUzKz cwienY K‡ib ?

K) ¬'j c_ -----L) AvKvk c_ -----M) Ab`vb`-----
-

(2)hw`¬'j c_ nq;

(K) Avcwb wK ai‡Yi cwienY e`envi K‡ib ?
(GK/GKvwaK wUK wPý w`b)|

K) UªvK L) wcK Avc M) KvfvW© f`vb N) gvB‡µv
evm

O) Ab`vb`

(L) KZ mgq jv‡M ?DËi :

(M) KZ % †iYy †cvbv RxweZ _v‡K ?DËi :

(N) myweavmg~n wK wK ?

DËi:

(O) Amyweavmg~n wK wK ?

DËi :

(P) mycvwik wK ? (Avcbvi cwienY mgm"v mgvav‡bi Rb" wK Kiv `iKvi e‡j Avcwb g‡b K‡ib)|

DËi:

(3)hw` AvKvk c_ nq;

(K) KZ mgq jv‡M ?DËi :

(L) KZ % †iYy †cvbv RxweZ _v‡K ?DËi :

(M) myweavmg~n wK wK ?

DËi:

(N) Amyweavmg~n wK wK ?

DËi:

(O) mycvwik wK ? (Avcbvi cwienY mgm"v mgvav‡bi Rb" wK Kiv `iKvi e‡j Avcwb g‡b K‡ib)|

DËi:

(4) b`xi b"vPvivj evM`v †iYy †cvbv "vbxq †ecvixi wbKU n‡Z µ‡qi †ÿ‡Î Avcwb wK cvwienY e"e"v e"envi K‡ib ?

K) kÖwgK evnbL) f"vb M) BwÄbPvwjZ f"vb N) evBmvB‡Kj
O) ‡gvUimvB‡Kj P) wcK Avc Q) †bxKv R) Uªjvi
S) Ab"vb"

M - Ask

evM`v Pvlx (evM`v welqK)

9. Avcwb KZ weNv Rwg $\ddot{Z}$ evM`v Pvl K $\ddot{ib}$? D $\ddot{E}$ i:
10. evM`v $\ddot{t}$ iYy $\ddot{t}$ cvbv $\ddot{N}$ $\ddot{t}$ i Aegy³ Kivi ci KZ gv $\ddot{t}$ mi g $\ddot{t}$ a $\ddot{v}$ aiv hvq ? D $\ddot{E}$ i :
11. evM`v aivi ci Kvi Kv $\ddot{t}$ Q wew $\mu$  K $\ddot{ib}$  ? (GK/GKvwaK wUK wP $\acute{y}$  w`b)|
- K) $\overline{v}$ bxq $\ddot{t}$ ecvix L) $\overline{v}$ bxq Avor`vi M) wW $\ddot{t}$ cv gvwjK N) we $\ddot{t}$ `kx
ms $\overline{v}$ / Gb wR I
12. $\ddot{t}$ m $\ddot{t}$ U wb $\ddot{t}$ q wew μ i $\ddot{t}$ $\ddot{y}$ $\ddot{t}$ $\hat{I}$ $\ddot{t}$ Kvb ai $\ddot{t}$ Yi cwienY e $\ddot{v}$ envi K $\ddot{ib}$?
(GK/GKvwaK wUK wP $\acute{y}$ w`b)|
- K) k $\ddot{O}$ wgK evnbL) f $\ddot{v}$ b M) Bw $\ddot{A}$ bPvwjZ f $\ddot{v}$ b N) evBmvB $\ddot{t}$ Kj
O) $\ddot{t}$ gvUimvB $\ddot{t}$ Kj P) wcK Avc Q) $\ddot{t}$ bxKv R) U $\acute{a}$ jvi
S) Ab $\ddot{v}$ b $\ddot{v}$
13. $\ddot{t}$ Ni $\ddot{t}$ $_$ $\ddot{t}$ K $\ddot{t}$ mU KZ $\sim$ $\ddot{t}$ i Aew $\overline{v}$ 'Z ? D $\ddot{E}$ i:
14. Avcbvi e $\ddot{v}$ e $\ddot{u}$ Z cwien $\ddot{t}$ Y KZ mgq jv $\ddot{t}$ M ? D $\ddot{E}$ i:
15. gvQ aivi ci we μ $\ddot{t}$ qi $\ddot{t}$ $\ddot{y}$ $\ddot{t}$ $\hat{I}$ wK wK mgm $\ddot{v}$ i m α $\ddot{s}$ yLxb n $\ddot{t}$ Z nq ?
D $\ddot{E}$ i:
16. G mgm $\ddot{v}$ mgvav $\ddot{t}$ bi Dcvq wK e $\ddot{t}$ j Avcwb g $\ddot{t}$ b K $\ddot{ib}$?
D $\ddot{E}$ i:

17. gvQ aivi ci cwienþYi †ÿþÎ wK wK mgm̃vi mᵃᶤyLxb nþZ nq ?

DĖi:

18.G mgm̃v mgvavþbi Dcvq wK eþj Avcwb gþb Kþib ?

DĖi:

N - Ask

ˊvbxq þecvix (dwoqv)

19. Avcwb þKv_v †_þK evM̃v µq Kþib ? DĖi:

20.µþqi ci cÖwµqvRvZKiþYi KvR Kþib wK-bv ? (wUK wPý w`b)| K)
nũv L) bv

21. nũv-nþj, Kx aiþYi ? DĖi:

22. †÷vþiR-Gi ẽeˊv AvþQ wK-bv ? (wUK wPý w`b)| K) nũv L)
bv

23. nũv-nþj, Kx aiþYi ? DĖi:

24. µþqi ci †Kv_vq weµq Kþib ?

K) †mU L) wWþcv gvwjK M) Ab̃vb̃

25. þmU/ wWþcv gvwjþKi wbKU weµþqi †ÿþÎ wK aiþbi cwienY ẽeˊv
ẽenvi Kþib?(GK/GKvwaK wUK wPý w`b)|

K) kÖwgKevnbL) f̃vb M) BwÄbPvwjZ f̃vb N) evBmvBþKj
O) þgvUimvBþKj P) wcK Avc Q) †bxKv R) Uªjvi
S) Ab̃vb̃

26. µþqi ci cwienþYi †ÿþÎ wK wK mgm̃vi mᵃᶤyLxb nþZ nq ?

DĖi:

27.G mǵm`v mǵvavǵbi Dcvq wK eǵj Avcbw gǵb Kǵib ?

DĖi:

O - Ask

Avor`vi

28. Avcbvi Avoǵr Kviv evM`v wbǵq Avǵm ?(GK/GKvwaK wUK wPý w`b)|

K) evM`v Pvlx L) `vbxq ǵecvix M) Ab`vb`

29. Avoǵr Avmvi ci evM`v cÖwµqvRvZKiǵYi KvR Kǵib wK-bv ? (wUK wPý w`b)| K) nu`v L) bv

30. nu`v-nǵj, Kx aiǵYi ? DĖi:

31. †÷vǵiR-Gi e`e`v AvǵQ wK-bv ? (wUK wPý w`b)| K) nu`v L) bv

32. nu`v-nǵj, Kx aiǵYi ? DĖi:

33.Avoǵr evM`v Avmvi ci weµǵqi Rb` mvaviYZ: KZ mgq jvǵM ? DĖi:

34. evM`v weµǵqi †ÿǵÎ KZ % Kwgkb †bb ? DĖi:

35. weµǵqi †ÿǵÎ AvcbvǵK wK wK mǵm`vi mǵ§yLxb nǵZ nq ?

DĖi:

36. G mǵm`v mǵvavǵbi Dcvq wK eǵj Avcwb gǵb Kǵib ?

Dǵi:

P - Ask

wWǵcv gvwjK

37. Kvi KvQ ǵ_ǵK evM`v µq Kǵib ? (GK/GKvwaK wUK wPý w`b)|

K) evM`v Pvlx    L) ǵecvix    M) ǵmǵUi e`emvqx N) Ab`vb`

38. G µǵqi †ǵǵÎ Avcwb wK aiǵYi cwienY e`e`v e`envi Kǵib ?
(GK/GKvwaK wUK wPý w`b)|

K) kÖwgKevnb L) f`vb    M) BwÄbPvwjZ f`vb N) evBmvBǵKj

O) ǵgvUimvBǵKj P) wcK Avc Q) Ab`vb`

39. µǵqi ci cÖwµqvRvZKiǵYi KvR Kǵib wK-bv ? (wUK wPý w`b)| K)
nu`v L) bv

40. nu`v-nǵj;

(1) Kx aiǵYi ?

Dǵi:

(2) KZ mgq jvǵM ?Dǵi :

41. †÷vǵiR-Gi e`e`v AvǵQ wK-bv ? (wUK wPý w`b)|    K) nu`v
L) bv

42. nu`v-nǵj;

(1) Kx aiþYi ?

DËi:

(2) KZ mgq jvþM ?DËi :

43. evM`vi d`v±ix/ißvbxKviþKi KvþQ †Kv_vq †cuxQvb ? (GK/GKvwaK wUK wPý w`b)|

K) Lyjbv L) hþkvi M) PÆMÖvg N) Ab`´'vb

44. GþÿþÎ Avcwb wK aiþYi cwienY e`envi Kþib ? (GK/GKvwaK wUK wPý w`b)|

K) UªvK L) wcK Avc M) KvfvW© f`vb      N) gvBþµv evm      O) KvþM©v †cøb P) Ab`vb`

45. G cwienY e`e´'vq wK wK mgm`vi mªÿyLxb nb?

DËi:

46. G cwienY e`e´'v DbæZ Kiv A\_ev mgm`v mgvavþbi þÿþÎ Avcbvi gZvgZ wK ?

DËi:

BRAC Institute of Governance and Development (BIGD)

BRAC University, Mohakhali, Dhaka, Bangladesh.

Questionnaire

MþelYvi wkþivYvg: "Improving Transportation System of Supply Chain Management for Shrimp in Satkhira"

(msM,,nxZ Z_`vejx þKejgvÎ MþelYvi KvþR e`eüZ nþe Ges Gi þMvcbxqZv iýv Kiv nþe)

Z_`vZvi bvg :

eqm :

wVKvbv :

ZwiL:

þckv/e`emvi aiY : evM`v Pvlx / evM`v þiYy þcvbvi ´vbxq mieivnKvix / ´vbxq þecvix (dwoqv) / Avor`vi / wWþcv gvwjK; (evKx Ask,þjv þKþU w`b)|

þhvMvþhvM/þmj bs:

K - Ask

evM`v Pvlx (evM`v þiYy þcvbv welqK)

1. evM`v þiYy þcvbv Kvi KvQ þ\_þK µq Kþib ? (GK/GKvwaK wUK wPý w`b)|

K) Drcv`bKvix      L) evM`v þiYy þcvbvi ´vbxq mieivnKvix M) ´vbxq þecvix
N) Ab`KviI

2. evM`v þiYy þcvbv þKv\_v nþZ µq Kþib ? (GK/GKvwaK wUK wPý w`b)|

K) KK&`evRvi      L) PÆMÖvg      M) ´vbxq      N) Ab`´vb

3. KK&`evRvi/ PÆMÖvg þ\_þK Drcv`bKvixi wbKU nþZ µþqi þýþÎ Avcwb wK aiþYi cwienY e`e´v e`envi Kþib ? (GK/GKvwaK wUK wPý w`b)|

K) AvKvk c_ L) ´j c_ M) Ab`vb`

(1) kZKiv wnþmþe þKvbwUþZ KZUzKz cwienY Kþib ?

K) ˘'j c_ ----- L) AvKvk c_ -----M) Ab˘vb˘-----

(2) hw` ˘'j c_ nq;

(K) Avcwb wK ai†Yi cwienY e˘˘envi K†ib ? (GK/GKvwaK
wUK wPý w`b)|

K) U˘vK L) wcK Avc M) KvfvW© f˘vb N) gvB†µv evm

O) Ab˘vb˘

(L) KZ mgq jv†M ? DËi :

(M) KZ % †iYy †cvbv RxweZ _v†K ? DËi :

(N) myweavmg~n wK wK ?

DËi:

(O) Amyweavmg~n wK wK ?

DËi :

(P) mycvwik wK ? (Avcbvi cwienY mgm˘v mgvav†bi Rb˘ wK Kiv `iKvi e†j Avcwb
g†b K†ib)|

DËi:

(3) hw` AvKvk c_ nq;

(K) KZ mgq jv†M ? DËi :

(L) KZ % †iYy †cvbv RxweZ _v†K ? DËi :

(M) myweavmg~n wK wK ?

DĚi:

(N) Amyweavmg~n wK wK ?

DĚi:

(O) mycvwik wK ? (Avcbvi cwienY mgm~v mgvav~bi Rb~ wK Kiv `iKvi e~j Avcwb g~b K~ib)|

DĚi:

4. b`xi b~vPvivj evM~v ~iYy ~cvbv ~'vbxq ~ecvixi wbKU n~Z ~~qi ~~j~i Avcwb wK cvwienY e~e~'v e~envi K~ib ? (GK/GKvwaK wUK wPý w`b)|

K) kÖwgK evnb L) f~vb M) BwÄbPvwjZ f~vb N) evBmvB~Kj
O) ~gvUimvB~Kj P) wcK Avc Q) ~bxKv R) U~jvi S)
Ab~vb~

(1) ~'vbxq ~ecvix b`xi b~vPvivj evM~v ~iYy ~cvbv Kvi KvQ ~_~K ~q K~ib ?

DĚi :

(2) ~'vbxq ~ecvix b`xi b~vPvivj evM~v ~iYy ~cvbv ~Kv_v ~_~K ~q K~ib ?
(GK/GKvwaK wUK wPý w`b)|

K) BQvgwZ b`x    L) ~fULvjx    M) k~vgbMi    N) `w~Y mvZ~xiv~' mgy~^a DcK~j|

(3) `~iZ; KZ? DĚi:

(4) ~iYy ~cvbv cwien~Y KZ mgq jv~M? DĚi:

5. ~'vbxq mieivnKvix n~Z ~~q Avcwb Kx cwienY e~envi K~ib?

K) kÖwgK evnb M) BwÄbPvwjZ f~vb N) evBmvB~Kj P) wcK Avc

(1) `~iZ; KZ? DĚi:

(2) †iYy †cvbv cwien‡Y KZ mgq jv‡M? DĖi:

L - Ask

evM`v †iY~ †cvbvi ¬'vbxq mieivnKvix

6. evM`v †iYy †cvbv Kvi KvQ †\_‡K µq K‡ib ? (GK/GKvwaK wUK wPý w`b)|

K) Drcv`bKvix                      L) ¬'vbxq ‡ecvix                      M) Ab`KviI

7. evM`v †iYy †cvbv †Kv\_v n‡Z µq K‡ib ? (GK/GKvwaK wUK wPý w`b)|

K) KK&ªevRvi L) PÆMÖvg M) ¬'vbxq N) Ab`¬'vb

8. KK&ªevRvi/ PÆMÖvg †_‡K Drcv`bKvixi wbKU n‡Z µ‡qi †ÿ‡Î Avcwb wK ai‡Yi cwienY e`e¬'v e`envi K‡ib ? (GK/GKvwaK wUK wPý w`b)|

K) AvKvk c_ L) ¬'j c_ M) Ab`vb`

(1) kZKiv wn‡m‡e †KvbwU‡Z KZUzKz cwienY K‡ib ?

K) ¬'j c_ ----- L) AvKvk c_ -----M) Ab`vb`-----

(2) hw` ¬'j c_ nq;

(K) Avcwb wK ai‡Yi cwienY e`envi K‡ib ? (GK/GKvwaK wUK wPý w`b)|

K) UªvK L) wcK Avc M) KvfvW© f`vb N) gvB‡µv evm

O) Ab`vb`

(L) KZ mgq jv‡M ? DĖi :

(M) KZ % †iYy †cvbv RxweZ _v‡K ? DĖi :

(N) myweavmg~n wK wK ?

DĖi:

(O) Amyweavmg~n wK wK ?

DËi :

(P) mycvwik wK ? (Avcbvi cwienY mgm"v mgvav‡bi Rb" wK Kiv `iKvi e‡j Avcwb g‡b K‡ib)|

DËi:

(3) hw` AvKvk c_ nq;

(K) KZ mgq jv‡M ? DËi :

(L) KZ % †iYy †cvbv RxweZ _v‡K ? DËi :

(M) myweavmg~n wK wK ?

DËi:

(N) Amyweavmg~n wK wK ?

DËi:

(O) mycvwik wK ? (Avcbvi cwienY mgm"v mgvav‡bi Rb" wK Kiv `iKvi e‡j Avcwb g‡b K‡ib)|

DËi:

(4) b`xi b"vPvivj evM`v †iYy †cvbv "vbxq †ecvixi wbKU n‡Z µ‡qi †ÿ‡Î Avcwb wK cvwienY e"e"v e"envi K‡ib ?

K) kÖwgK evnb

L) f"vb

M) BwÄbPvwjZ f"vb

N) evBmvB‡Kj

O) ‡gvUimvB‡Kj

P) wcK Avc

Q) †bxKv

R) Uªjvi

S)

Ab"vb"

M - Ask

evM`v Pvlx (evM`v msþkøþl)

9. Avcwb KZ weNv RwgþZ evM`v Pvl Kþib ? DËi:
10. evM`v þiYy þcvbv þNþi Aegy<sup>3</sup> Kivi ci KZ gvþmi gþa` aiv hvq ? DËi :
11. evM`v aivi ci Kvi KvþQ wewµ Kþib ? (GK/GKvwaK wUK wPý w`b)|
- K) `vbxq þecvix L) `vbxq Avor`vi M) wWþcv gvwjK N) weþ`kx ms`v/
Gb wR I
12. þmþU wbþq wewµi þÿþÎ þKvb aiþYi cwienY e`envi Kþib ? (GK/GKvwaK wUK
wPý w`b)|
- K) kÖwgK evnb L) f`vb M) BwÄbPvwjZ f`vb N) evBmvBþKj
O) þgvUimvBþKj P) wcK Avc Q) þbxKv R) U`jvi S)
Ab`vb`
13. þNi þ_þK þmU KZ `þi Aew`Z ? DËi:
14. Avcbvi e`eüZ cwienþY KZ mgq jvþM ? DËi:
15. gvQ aivi ci weµþqi þÿþÎ wK wK mgm`vi mðsyLxb nþZ nq ?
DËi:
16. G mgm`v mgvavþbi Dcvq wK eþj Avcwb gþb Kþib ?
DËi:

17. gvQ aivi ci cwien†Yi †ÿ†Î wK wK mgm̃vi m̃syLxb n†Z nq ?

DËi:

18. G mgm̃v mgvav†bi Dcvq wK e†j Avcwb g†b K†ib ?

DËi:

N - Ask

¬vbxq †ecvix (dwoqv)

19. Avcwb †Kv_v †_†K evM̃v µq K†ib ? DËi:

20. µ†qi ci cÖwµqvRvZKi†Yi KvR K†ib wK-bv ? (wUK wPý w`b)| K) nũv
L) bv

21. nũv-n†j, Kx ai†Yi ? DËi:

22. †÷v†iR-Gi ẽe¬v Av†Q wK-bv ? (wUK wPý w`b)| K) nũv L) bv

23. nũv-n†j, Kx ai†Yi ? DËi:

24. µ†qi ci †Kv_vq weµq K†ib ?

K) †mU L) wW†cv gvwjK M) Ab̃vb̃

25. †mU/ wW†cv gvwj†Ki wbKU weµ†qi †ÿ†Î wK ai†bi cwienY ẽe¬v ẽenvi
K†ib?(GK/GKvwaK wUK wPý w`b)|

K) kÖwgK evnb L) f̃vb M) BwÄbPvwjZ f̃vb N) evBmvB†Kj
O) †gvUimvB†Kj P) wcK Avc Q) †bxKv R) U^ajvi S)
Ab̃vb̃

26. µ†qi ci cwien†Yi †ÿ†Î wK wK mgm̃vi m̃syLxb n†Z nq ?

DĚi:

27. G mǵm`v mǵvavǵbi Dcvq wK eǵj Avcvb gǵb Kǵib ?

DĚi:

O - Ask

Avor`vi

28. Avcbvi Avoǵr Kviv evM`v wbǵq Avǵm ? (GK/GKvwaK wUK wPý w`b)|

K) evM`v Pvlx      L) `vbxq ǵecvix M) Ab`vb`

29. Avoǵr Avmvi ci evM`v cÖwµqvRvZKiǵYi KvR Kǵib wK-bv ? (wUK wPý w`b)|

K) nu`v L) bv

30. nu`v-nǵj, Kx aiǵYi ? DĚi:

31. †÷vǵiR-Gi e`e`v AvǵQ wK-bv ? (wUK wPý w`b)|      K) nu`v L) bv

32. nu`v-nǵj, Kx aiǵYi ? DĚi:

33. Avoǵr evM`v Avmvi ci weµǵqi Rb` mvaviYZ: KZ mgq jvǵM ? DĚi:

34. evM`v weµǵqi †ǵǵÎ KZ % Kwgkb †bb ? DĚi:

35. weµǵqi †ǵǵÎ AvcbvǵK wK wK mǵm`vi mǵsyLxb nǵZ nq ?

DĚi:

36. G mgm`v mgvav#bi Dcvq wK e#j Avcwb g#b K#ib ?

DĚi:

P - Ask

wW#cv gvwjK

37. Kvi KvQ #_#K evM`v μq K#ib ? (GK/GKvwaK wUK wPý w`b)|

K) evM`v Pvlx    L) #ecvix    M) #m#Ui e`emvqx N) Ab`vb`

38. G μ#qi †ŷ#Î Avcwb wK ai#Yi cwienY e`e`v e`envi K#ib ? (GK/GKvwaK wUK wPý w`b)|

K) kÖwgK evnb L) f`vb    M) BwÄbPvwjZ f`vb N) evBmvB#Kj

O) #gvUimvB#Kj P) wcK Avc Q) Ab`vb`

39. μ#qi ci cÖwμqvRvZKi#Yi KvR K#ib wK-bv ? (wUK wPý w`b)|    K) nu`v
L) bv

40. nu`v-n#j;

(1) Kx ai#Yi ?

DĚi:

(2) KZ mgq jv#M ? DĚi :

41. $\dagger \div v \ddagger iR-Gi \text{ e}^{\text{e}^-} \text{'v} Av \ddagger Q wK-bv ? (wUK wP\acute{y} w`b)|$ K) nu^{v} L) bv

42. $nu^{\text{v}}-n \ddagger j;$

(1) $Kx ai \ddagger Yi ?$

DËi:

(2) $KZ mgq jv \ddagger M ?$ DËi :

43. $evM^{\text{v}} i d^{\text{v}} \pm ix/i\beta vb xKvi \ddagger Ki Kv \ddagger Q \dagger Kv_vq \dagger cuxQvb ? (GK/GKvwaK wUK wP\acute{y} w`b)|$

K) $Lyjbv$ L) $h \ddagger kvi$ M) $P\text{Æ}M\ddot{O}vg$ N) $Ab^{\text{v}} \text{'vb}$

44. $G \ddagger \ddot{y} \ddagger \hat{I} Avcbw wK ai \ddagger Yi cwienY \text{ e}^{\text{v}} \text{envi} K \ddagger ib ? (GK/GKvwaK wUK wP\acute{y} w`b)|$

K) $U^a vK$ L) $wcK Avc$ M) $KvfvW\text{©} f^{\text{v}}b$ N) $gvB \ddagger \mu v evm$ O) $Kv \ddagger M\text{©}v \dagger c\text{ø}b$ P) $Ab^{\text{v}}b^{\text{v}}$

45. $G cwienY \text{ e}^{\text{e}^-} \text{'vq} wK wK mgm^{\text{v}} i m\alpha \S yLxb nb ?$

DËi:

46. $G cwienY \text{ e}^{\text{e}^-} \text{'v} Db\text{æ}Z Kiv A_ev mgm^{\text{v}} v mgvav \ddagger bi \ddagger \ddot{y} \ddagger \hat{I} Avcbvi gZvgZ wK ?$

DĚi: