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Problems and Prospects of Shrimp Farming in Bangladesh

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Problems and Prospects of Shrimp Industry in Bangladesh: An Analysis

Abstract

Shrimp is one of the leading exportable products in Bangladesh. Bangladesh is earning about 500 millions of foreign currency yearly by exporting shrimp and contributing 3.78% in GDP. 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.

Keywords: Shrimp, stakeholders of shrimp farming, Technological innovation, South-Western region of Bangladesh.

JEL classification: Q22, Q24, Q55

1.0 Introduction

Shrimp culture is expected to continue to play an important role in ensuring food security and poverty alleviation, particularly for the rural poor. The urban population will be benefited from the improvement in processing, value adding, and marketing of the shrimp industry as a whole. Incidence like “EU ban on Bangladeshi shrimp” should not happen again and most importantly, this industry is operating under capacity and can increase the productivity up to five times than the current capacity. A majority of workers in the processing industries are women. The shrimp industry benefits three to four million “mostly poor” Bangladeshis while providing livelihood directly numbering some 11, 50,000 people. In 2007-2008, a total of 2, 23,095 Metric ton shrimp produced in Bangladesh that contributes 19,567.90 core taka in the GNP. There is ample demand in the international markets for shrimp and Bangladesh is blessed with an environment friendly for shrimp production. Technological innovation has been creating a greater impact on domestic economy. A primary study was undertaken to detect the problems plaguing the different levels of the value chain of shrimp in the country. Consequently, the study was conducted in which the participants were representatives of the various stakeholders in this industry. The increasing demand and steadily rising prices of shrimp encouraged its cultivation in the coastal belt of the country.

By 2007-08, the shrimp farming area occupied nearly 2, 17,877 hectares; the main fresh water shrimp farming districts are Khulna, Bagerhat, Jessore, Narail, Gopalganj, Pirojpur and Noakhali. More or less 80% of the shrimp farming areas are in the southwestern region of Bangladesh while the rest are in the southeastern part. Shrimp is the second most important export item in Bangladesh.

Table: 01: BASIC INFORMATION ON FROZEN FOOD INDUSTRIES IN BANGLADESH, 2009.

1	No of Fish Processing Plants	133
2	Plants Licensed by the GOB	75
3	Fish Processing Plants Approved by the EU	65
4	Quantity of Frozen Food Exported in 2007-2008	75,299 M. Ton
5	Shrimp Exported in 2007-2008	49,907 M. Ton
6	Processing Capacity in the Total Plant	2,65,000 M. Ton
7	Export Earnings from Shrimp & Fish 2007-2008	Tk. 3396.28 Crore
8	No of Shrimp Hatchery	105
9	Production of Shrimp Fly	1200-1500 Crore
10	Shrimp Cultured Land	1,70,000 Hector

Source: *WWW.BFFEA.BD.com*

1.1 Shrimp

Shrimp are swimming crustaceans, decapods classified in the infra-order Caridea, found widely around the world in both fresh and salt water. Adult shrimp are filter feeding benthic animals living close to the bottom.

1.2 Bagda Shrimp

Bagda farms are mostly rice fields converted into shrimp ponds varying in size from 0.4 to 200 hactres. Most of the shrimp farmers are not permanent residents of the areas in which their ghers are situated, even the local big landowners typically lease their land to outside entrepreneurs. Though it requires saline water throughout the entire process.

1.3 Galda Shrimp

There are about 105,000 freshwater prawn farms in Bangladesh “Shrimp Region”. Galda farming has increased quite rapidly in recent years because it can be farmed on a smaller scale. The prawns are grown in freshwater that can often be re-used three or four times, the environmental impact is much less than in Bagda farming. Galda shrimp are cultured in ponds and ghers.

1.4 Scope of the Study

The study tried to show why the problems from government, farmers and experts of shrimp are reducing the chance of golden prospects of shrimp farming in Bangladesh, the south-western region in Khulna, Jessore, Bagerhat and Satkhira.

1.5 Rationale of the Study

- I. Shrimp earned 378 million US dollar in the year 2003-04. During the last ten years, Bangladesh has earned international credibility by responding to the food-safety and quality requirements of its destinations, mostly, the United States and the European Union countries.
- II. 65 processing plants have been approved by the European Commission for exporting shrimp and fish products to the European Union member states. Recently, Bangladesh has also initiated projects for implementing ‘traceability’ regulations of the EU.
- III. It may be noted that, Bangladesh has also focused on organic production of shrimp. Swiss Import Promotion Programmed (SIPPO) is assisting Bangladesh in this initiative.
- IV. A larger number of export processors are now producing greater amount of value-added products such as individually quick-frozen, peeled and divined, and butterfly-cut shrimps as well as cooked and semi-cooked products.
- V. Value-added products have constituted about 33 percent of total exports of 32,000 metric tons valued at 378 million US dollar.

2.0 Literature Review

This literature review emphasizes the Problems and Prospects of Shrimp Industry in Bangladesh, including: (i) Existing problems in shrimp farming. (ii) Government contribution and attention for the shrimp industry development. (iii) The obstacles for shrimp export.

Table: 02 Frozen Shrimp & Fish Exports from Bangladesh (1991-1992 to 2006-2008)

Year	Item	Quantity (Million Pounds)	Value(Million\$)	Taka Core
1991-1992	Shrimp & Fish	44.32	130.53	496.91
1992-1993	Shrimp & Fish	48.35	165.34	642.34
1993-1994	Shrimp & Fish	55.51	210.52	838.90
1994-1 995	Shrimp & Fish	78.36	305.64	1225.92
1995-1996	Shrimp & Fish	75.07	313.69	1283.00
1996-1997	Shrimp & Fish	76.05	320.73	1365.65
1997-1998	Shrimp & Fish	60.85	293.84	1333.13
1998-1999	Shrimp & Fish	58.35	270.32	1316.16
1999-2000	Shrimp & Fish	74.23	343.82	1722.5
2000-2001	Shrimp & Fish	76.70	363.23	1957.79
2001-2002	Shrimp & Fish	88.36	276.11	1585.25
2002-2003	Shrimp & Fish	73.57	321.81	1863.27
2003-2004	Shrimp & Fish	84.48	390.25	2300.92
2004-2005	Shrimp & Fish	96.11	420.74	2587.90
2005-2006	Shrimp & Fish	107.86	459.11	3200.00
2006-2007	Shrimp & Fish	112.15	515.32	3558.78
2007-2008	Shrimp & Fish	106.77	490.58	3396.28

Table: 02, Source: www.bffea.net/export,04 May 2010

Haque (1994) the market for frozen shrimp in the USA has not melted down as some feared might happen in the United States, as well as markets a retail range of frozen shrimp products. International pressure on wild, caught species, increasing global incomes, importing significant quantities of seafood products, and a strengthening demand in these countries, have all combined to result in a steady rise in international prices for shrimp, and the growing importance for cultured shrimp

Khan (1994) in 1975-76 the country's fish production from all sources was 640,000 tons. In 1993-94, this production rose to 1,087,000 tons, whereas the per capita fish consumption went down from 33.4 g to 21g. This has happened simply because fish production increased at an arithmetical rate whereas the human population increased in geometrical proportion. The government-approved hatcheries produce around 120 corer giant freshwater prawns a year against the demand for 120 to 150 corers. The smuggled fry do not grow big, 30-40 of the Indian variety shrimps make one kilogram, but four of the local adult lobsters weigh the same. The Indian fry grown in hatcheries in Andhra Pradesh and Orissa, are sent to Bangladesh after 10/12 days.

Selim(1994) over the last two decades, shrimp farming has emerged as a major industry in Bangladesh. The impact of the process has economic, social and environmental dimensions. All of these may have serious implications for sustainability, not only of shrimp farming, but of the rural community in the coastal areas of Bangladesh. Problems with quality compliance arise at pre-processing phase at the stage of handling of raw shrimp (harvesting, sorting by size and color, removal of heads and peeling which are often carried out under conditions and facilities that are unsuitable from hygiene perspective) and also at processing stage (absence of high quality water and ice, irregular electricity supply, poor infrastructure and transportation facility) which seriously constrain Bangladeshi firms' ability to pursue modern sanitary practices.

Mazid (1994) the country has vast and diversified water resources of 4.34 million hectares. The climate is also very suitable for fish production. In spite of that, the development of fisheries sector during the country's early plan periods remained very slow. The average marine aquaculture farm is 4.5 hectares while the fresh water ponds on inland farms are usually no greater than 0.3 hectares.

The constraints faced in the four sub-sectors (inland culture, inland open water capture, coastal fisheries and marine fisheries) impeding realization of their potential have been also enumerated. The essentially required policy support, approach and strategies, enabling increase of fish production to achieve nutritional food security during next five years and development of ancillary industries have been identified.

Karim (1995) brackish water aquaculture, also known as coastal aquaculture is a rapidly expanding farming activity and plays an important role in the overall fisheries development effort in Bangladesh. Marine and estuarine shrimp, fish and crabs are the farm products. Bagda shrimp (black tiger shrimp, *Penaeus monodon*) is the primary target culture species, while fish, heterogeneous shrimp and crabs are the by-products. Amongst the coastal districts, brackish water aquaculture activities are most visible in Satkhira, Khulna, Bagerhat, Cox's Bazar and Chittagong. Because of the turbulent nature of the Bay of Bengal, the wide fluctuations of tide and salinity, and the absence of any sheltered places, e.g. lagoons or backwaters adjoining the sea, Mari culture (culture of marine organisms in marine environment) has not so far developed in Bangladesh.

Khan (2003) a project funded by USAID has the potentials to increase the value of shrimp exports fivefold to \$1.5 billion by 2010. The United States and the European Union (EU) each import 40 percent of the shrimp, with the remaining 20 percent going to Japan. Bangladesh is already among the top 10 exporters of shrimp in the world and accounts for some 3 percent of global production.

On the basis of aforesaid literature review the study will frame objectives and also decides methodology.

3.0 Objectives of the study:

This study provides a comprehensive evaluation of Problems and Prospects of Shrimp Industry in Bangladesh.

- 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.
- IV. To provide some recommendations for cultivating shrimp in Bangladesh.

4.0 Methodology

4.1 Data Collection.

Both primary and secondary sources were used for the collection of necessary data. Primary data were collected through a questionnaire survey. Use of secondary data was strictly limited to the background discussion of the research, the designing of the report and construction of the survey questionnaire.

4.2 Research Approach.

This study is qualitative in nature. This analysis was done in a formal and rigid fashion to draw inference about the opinion of the shrimp stakeholders.

4.3 Instruments.

To collect the data from the population, a structured questionnaire had been followed.

Primary data have been gathered through interviewing the respondents in their respective workplaces. Three questionnaires had been used to collect the data from three areas such as from the Experts, Producers & Government Employees of shrimp industry.

4.4 Rating Scales.

Likert scale was used in this study. In its most basic form, attitude scaling requires that an individual Strongly Agree, Agree, Neutral, Disagree, or Strongly Disagree with a statement or respond to a single question.

4.5 Sampling units

For this study sampling units was the same as elements for the study. It includes all farmers of shrimp farming, government employees who are working in fisheries department & experts who are the scientists working in Bangladesh Fisheries Research Institute in Khulna, Jessore, Bagerhat and Satkhira as target population for this study.

4.5 Research period: 01 July 1991 -31 August, 2010- this period gave a prominent view about the changes of international rules and regulations related with the shrimp marketing. The questionnaire survey was conducted from August 2009 to August 2010.

4.6 The sampling frame (Random sampling):

Category of sample	Sample Size	Data Collection Points
Producers / Farmers	40	Training center of DOF at 10th August , 2009 03, Jalil Sarani, Boyra, Khulna-9000. Bangladesh
Experts	30	The Experts who are the scientists working in Bangladesh Fisheries Research Institute in Khulna, Jossore and Bagarhat .
Government Employee	30	The Government officers who are working in Khulna area and in Fish inspection & Quality Control, Khulna under department of fisheries.
Total =	100	

5.0 Limitations of the Study

- I. Unwillingness of the respondents to go through a survey process was the main limitation of this survey.
- II. Besides, the severe level of illiteracy among the majority of the stakeholders was a major obstacle to collect reliable information.

6.0 Quantitative Analysis and Findings

6.1 Findings from Experts:

To identify the problems and prospects of shrimp industry in Bangladesh the research has conducted a survey among the experts. (Here it's only in Khulna, Jessore, Bagerhat and Satkhira in the south-western region of Bangladesh.). Because in Bangladesh most Shrimp industries are situated in Khulna, Jessore, Bagerhat and Satkhira in the south-western region of Bangladesh.

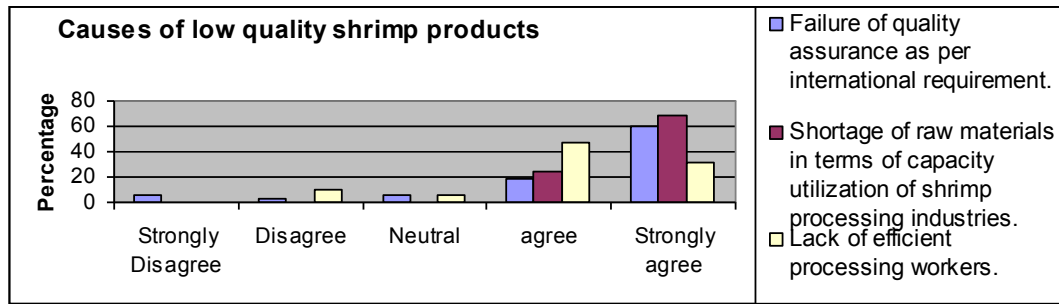
Demographic findings from Experts:

The total sample breakdown in terms of occupation, 33.3% was Senior Scientific Officer & Junior Scientific Officer (16.7%). The majority were Scientific Officer (50.0%).

In terms of working experience 46.7% had 1-10 years of experience, and 50.0% were 11-20 years & +20 years were (3.3%). In terms of working area, out of the total respondents, 53.1% worked in Paikgacha, Khulna, and 21.9% worked in Jessore, 18.8% worked in Bagerhat area.

i. The analysis shows that **(Figure:01)** 73.3 % respondents were strongly agree that there is a shortage of raw materials in terms of capacity utilization of shrimp processing industries, 26.7% respondents were agree with this also. The Shrimp processors are faced with huge demand from the international markets. But they aren't able to meet this demand because of failure to supply adequate shrimp. Inconsistency in the supply chain results in substantial and rapidly changing price structure. As a result unethical practices are prevalent in the value chain. In order to meet the necessary weight requirements, farmers sometimes inject the shrimp with illegal material.

Figure-01



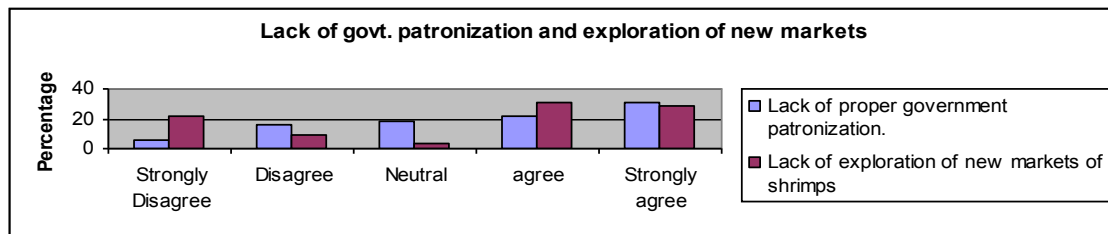
ii. The farmer has not enough technical knowledge about shrimp culture. (See figure: 01)

So that shrimp producer can't achieve their target production. 33% respondents were

Strongly agreed that there is a lack of efficient processing workers. 50 % respondents were agreeing with this statement.

iii. From the analysis shows it has shown that(Figure:01) 63 % respondents were strongly agree that the industry is failure to ensure quality as per international requirements.20% respondents were agree with this statement. In the last few years the international market has experienced quite a revolution. The consumers have grown much more aware about food safety & quality. They want to know whether the imported shrimp is produced maintaining international codes of conduct for food safety & quality

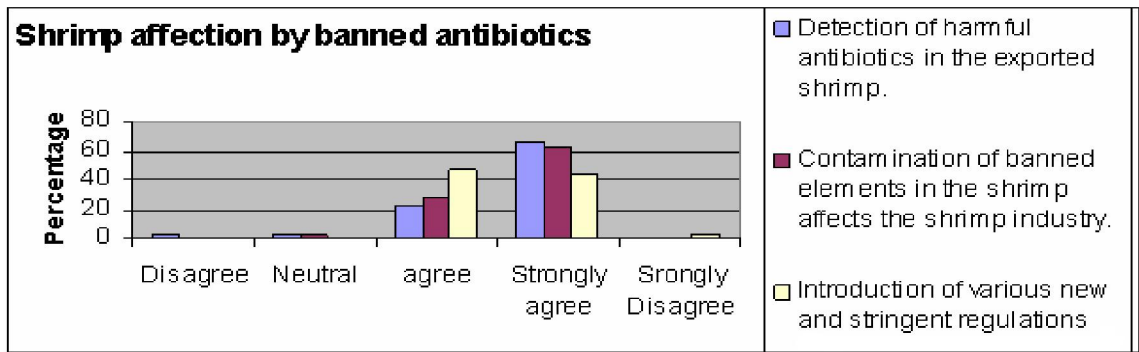
Figure-02



iv.70% respondents were strongly agree that there is a lack of quality awareness among the stakeholders associated with shrimp value chain (Figure: 02) and 30 % respondents were agreed with this statement. Quality and price control measurement are compromised due to inadequate supply. This level of the chain is also characterized by too much dependence on catchers and they eventually dictate prices. Inadequate monitoring and control by law enforcing and monitoring agencies is also a troubling issue in this phase of the chain.

v. In case of Lack of modern machinery, instruments & methodology for testing quality parameters of exportable shrimp 80% respondents were strongly agree with this statement. Laboratory is not enough facilitated with modern & sophisticated, machine, instruments & methodology for testing quality parameters of exportable shrimp.

Figure-03



vi. **(Figure: 03)** The analysis shows that 97 % experts were strongly agree with this statement. Some time some dishonest shrimp producer or businessman malpractices like push of unhygienic liquid and solid bar. These types of adulteration in shrimp create a bad image for shrimp industry in overseas market.

vii. The analysis shows that **(Figure: 03)** 97% respondents were strongly agree that various new and stringent regulations regarding quality assurance are introduced by the importing countries like EU & USA. That creates complexities in shrimp export.

viii. The analysis shows that 60% respondents were strongly agree that the shrimp industry has a lack of proper transport facilities, 33% respondents were also agree. The poor transportation infrastructure of the country further cripples the industry. This problem is even more acute in the case of the shrimp have to be transported. The poor transportation infrastructure of the country further cripples the industry. This problem is even more acute in the case of the shrimp have to be transported. Lack of landing facility for air transporters results in high carrying and time related costs which ultimately results in the farmers paying higher prices.

ix. 55% respondents were strongly supporting that there is not adequate government patronization. 20% respondents were neutral with this statement, **(Figure: 02)** 17 % respondents were disagree with this statement . Government should patronize for shrimp industry because this sector needed lots of development. Government should permit more projects for Shrimp culture. The government has also failed to play a constructive role, evidence by the lack of support from government extension workers. The cost of maintaining nurseries and undertaking experiments is at a time too risky and expensive.

x. **(Figure: 03)** 71% respondents were strongly agreed that harmful antibiotics are mixed with the exported shrimp, 23% respondents were agreeing with this statement. EU banned some harmful antibiotics for fish & animal. The banned antibiotics are Furazolidon, Furaladone, Nitrofurazone & Chloramphenicol Antibiotics. These banned antibiotics are responsible for cancer in human body. But in our country this drugs are available in the market to use randomly in the shrimp farming.

xi. 90 % respondents were supporting that unavailability of ocean going vessel is liable not to deliver the exportable shrimp in foreign market in due time. The ocean going vessel are not available as per its requirements.

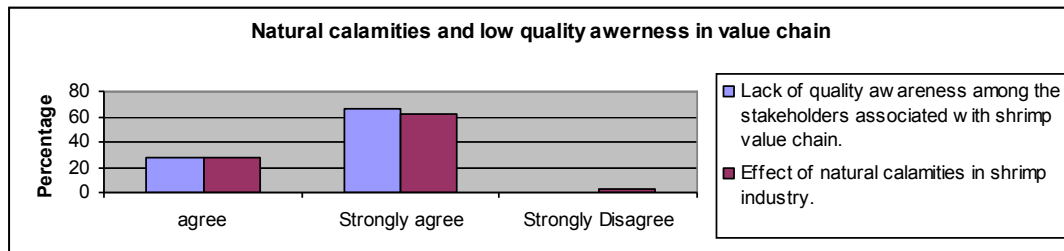
xii. About the shortage of electricity supply in shrimp industry 80% respondents were strongly agree with this statement, 20% respondents were agree with this statement. In Bangladesh electricity supply

is not adequate that hampers the shrimp production. In rural area electricity supply is too shocking because they got electricity a very few time.

xiii. 80% respondents were strongly agree that the lack of technical knowledge among the farmers for shrimp culture will reduce the productivity of the shrimp production. They have no knowledge about modern method of shrimp farming that reduce the productivity.

xiv. 77% respondents were strongly agree that there is a lack of exploration of new markets (**Figure: 02**) for shrimp in local & international areas. Inconsistency in the supply chain results in substantial and rapidly changing price for shrimp in local & international market. In the supply chain of shrimp there is no control over the price of shrimp. For this uncontrolled price some time producers are not getting the right price for shrimp. Inability to create variety of shrimp product to serve the international & local market lack of exploration of new markets of shrimp industry. There is a lot of demand of shrimp in international & local market but marketers failed to execute this demand.

Figure-04



xv. The effect of natural calamities in shrimp industry is very dangerous (**Figure: 04**). 67% respondents were strongly agreed with this statement, 30% respondents were agreeing with this statement. The natural calamities like flood, salinity, Sidre can fully destroy the cultured shrimp. Over rainfall can also change the salinity of the brackish water.

xvi. 67% respondents were strongly agree about the limitation of social security in the shrimp industry, 23 % respondents were agree with this statement. Agents are commercially driven and therefore engage in overselling certain medications such as antibiotics and hormones just to gain profits. Low levels of knowledge regarding bacterial and fungal infestation prohibit them from taking proper measures in preventing and curing such diseases.

xvii. 60% respondents were strongly agreed that social conflict for shrimp cultivation (especially for saline water shrimp) is a common scenario, 30 % respondents were agreeing with this statement. There is conflict between shrimp producer and cereal crop producer.

xviii. 50% respondents were strongly agree that adulteration by the social miscreants (like push of unhygienic liquid and solid bar). 30% respondents were agreeing with this statement. Some time some dishonest shrimp producer or businessman use malpractice like push of unhygienic liquid and solid bar. These types of adulteration in shrimp create a bad image for shrimp industry in overseas market.

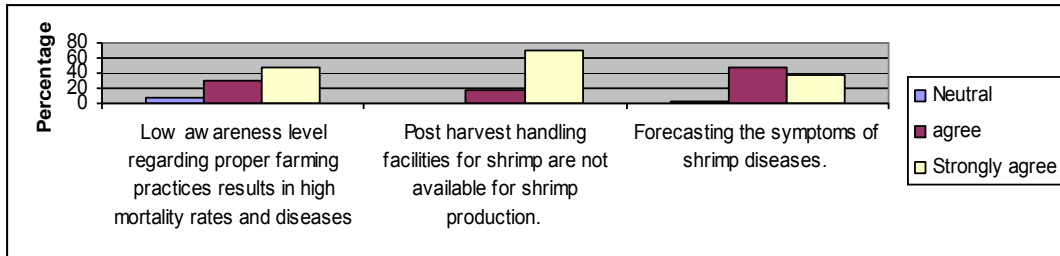
6.2 Findings from the producers or farmers of shrimp:

To identify the problems and prospects of shrimp industry in Bangladesh a survey was also conducted among the producers.

Demographic findings from Farmers:

The findings from the farmers of this study are shown below. Out of the total respondents, 23.5% were 1-5 years of experience of production, 12.5 were +20 years of experience, 15% were 11-15 years, 10% were 16-20 years. The majority were 6-10 years of experience of production 35%. Out of the total respondents 30.0% produce 100-1000 kgs a year, 27.5% produce +2000 kgs a year. The majority produce more than 2000 kgs a year (42.5%). Out of the total respondents 25.0% invested 100,000-10,00,000 taka, and 10% invested 200,000-30,00,000 taka, 12.5 % invested 30,00,000 taka. The majority invested 100,000-10,00,000 taka (52.5 %).

Figure-05



i. 55 % respondents were agree that low awareness level regarding proper farming practices results in high mortality rates and diseases in the farms. **(Figure: 05)** 35% respondents were agree with. The weak financial capability of the farmers is also a great barrier towards development. Inadequate banking support makes it impossible for the farmers to obtain the funding they require.

ii. The analysis shows that 50% respondents were strongly agree that post harvest handling facilities for shrimp are not available for shrimp production. **(Figure: 05)** 20% respondents were agree with this statement. PL (Post Larvae) supplied by the hatcheries is of low quality. It is important to note that the biological, chemical and physical hazards are to be controlled in which are related to food safety and not food quality.

iii. **(Figure: 06)** 82 % respondents were strongly agree that although in recent times, there have been efforts to comply; compliance with HACCP (Hazard Analysis Critical Control Point) is still not adequate .18% respondents were agree with this statement. It is important from a business standpoint to produce high quality seafood products, and the measures taken to produce safe products, no doubt which contribute to quality, the two parameters should be kept separate when developing a HACCP plan. For example, insects, filth, hair, and even spoilage by nonpathogenic microorganisms are undesirable in food and would certainly make it low quality. In July, 1997 the European Commission imposed a ban on imports of shrimp products from Bangladesh into the EU on the ground that exports of this commodity did not meet the stringent provisions of EC's HACCP (Hazard Analysis Critical Control Point) regulations that originated from (a) concerns as regards standards in areas related to health safeguards, quality control, infrastructure and hygiene in the processing units, and (b) lack of trust in the efficiency of the controlling measures carried out by designated Bangladesh, the Department of Fisheries (DOF).

iv. The analysis shows that 75 % respondents were strongly agree that financing related complexities should be reduced for farmer and producer of shrimp, 25% respondents were agree with this statement. Financial agencies consider financing farms non profitable and high risk and therefore are reluctant in

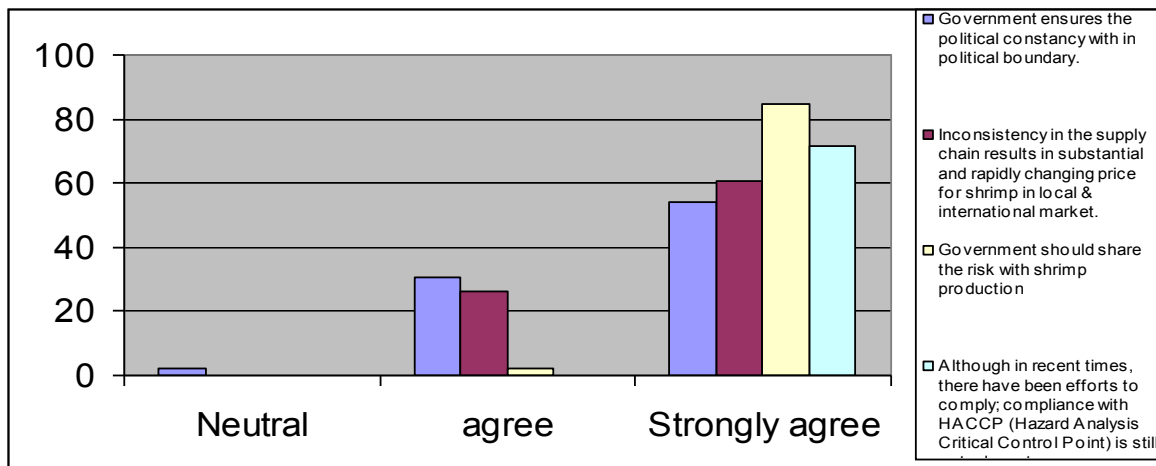
extending loans. The knowledge-base of financial operators regarding the industry is not adequate. Although they are willing to grant loans to hatcheries, they have very little idea of the demand supply status in the industry. Loan disbursement to a large extent is either directed toward hatcheries or processors as they seem to be the larger compared to the rest of the actors in the value chain.

v. 77 % respondents were strongly agree that government should provide more training & development program for shrimp producer., 23% respondents were agree with this statement. Training & development program for shrimp producer is not adequate. It is needed to conduct more and more training & development program for shrimp producer that will enrich their technological knowledge.

vi. The analysis shows(Figure:05) that 43% respondents were strongly agree that forecasting the symptoms of shrimp diseases is poor, 54% respondents were agree with this statement. There is no way to forecast the symptoms of shrimp diseases that is related to the training and development of shrimp farming.

vii. Management inefficiency and lack of technology are considered as main contributing forces behind the rising costs of production.72% respondents were strongly agree with this statement. The government has also failed to play a constructive role, evidenced by the lack of support from government extension workers. The cost of maintaining nurseries and undertaking experiments is at times too risky and expensive.

Figure-06 Government Patronization in the shrimp Industry



In Bangladesh political conflict between government party & opposition party is quite natural thing. These types political conflict destroy a lot of government & private property. Some time opposition party called transportation strike that hampered the shipment of shrimp.

ix. Inconsistency in the supply chain results in substantial and rapidly changing price for shrimp in local & international market. (Figure: 06) 70 % respondents were strongly agree with this statement, 30 % respondents were agree with this statement. As mentioned before, there exists a huge gap between the demand for shrimp by processors and the supply of the same provided by the farmers. Processors dictate prices based on international market rates. Too many depots are engaged in this stage and a large number of these depots and sub-depots are either owned or controlled by agents. All adulteration is performed in the depots or sub-depots. Here shrimp are injected with fluids and other

substances or immersed in water to increase their weight. Again, the measures taken by the government in monitoring of compliance are alarmingly inadequate.

x. The producer's relation with supplier is not always friendly. The analysis shows that 79% respondents were strongly agree with this statement. The producer's relation with supplier is not always friendly. The gap exists between supplier and producer.

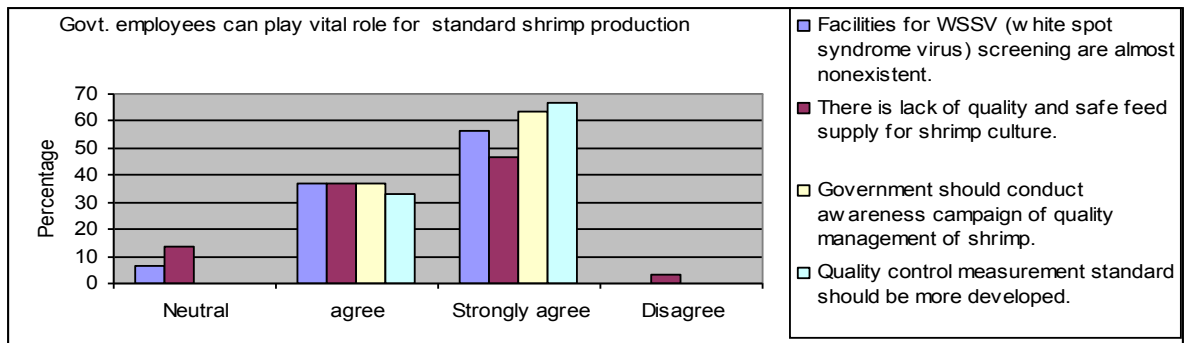
6.3 Findings from the Government Employees:

Government employees are also related with the problems and prospects of shrimp farming in Bangladesh. Their assessment is shown in the following findings.

Demographic findings from Government Employees:

In terms of designation of government employee 16.7% were Microbiologists, and 20.0% were Inspectors, 20.0% were Upozila Fisheries Officers, 6.7% were Quality Control Officers. The majority were Senior Upozila Fisheries Officers (36.7%). In terms of department of government employee 20.0% were in Quality Control Dept. of Fisheries, Khulna, The majority were in Dept. of Fisheries (80.0%). In terms of working area of government employee 20.0% were in Bagerhat, 26.7% were in Jessor, The majority were Khulna (53.3%). In terms of working experience of government employee 30.0% had 0-10 years of working experience, 23.3% had 11-20 years of working experience, 3.3% had +30 years of working experience the majority had 21-30 years of working experience (43.3%).

Figure-07



i. Shrimp processing personnel are not professional. **(Figure: 07)** The analysis shows that 23% respondents were strongly agree with this statement, 30% respondents were agree with this statement. The extension workers provided by the government have so far performed very poorly and failed to facilitate the farmers properly.

ii. Shrimp industry fails to ensure the quality as per international requirement. **(Figure: 07)** 34 % respondents were strongly agree with this statement, 30% respondents were agree with this statement. The quality of raw material (shrimp/prawn) supplied to the processors is not satisfactory because of adulteration, size variation etc. It has also been observed that, some processors engage in this business only for the period for which the tax holiday has been extended. After expiry they simply get a new registration. This practice results in financial default. Lack of marketing efforts and a negative country image are also great obstacles. The negative country image is solely responsible for the low prices Bangladeshi shrimp commands in the international markets and its failure to increase its market share and acquire new markets. Inadequate technology and knowledge transfer also impact operations

iii. Introduction of various new and strict regulations concerning quality assurance by the importing countries like EU & USA becomes a threat for Shrimp export. 90% respondents were agree with this statement. The international market has experienced quite a revolution. The consumers have grown much more aware about food safety, environmental and human rights issues. They want to know whether the imported shrimp is produced maintaining international codes of conduct for food safety, whether it is produced by in an environmental friendly way, whether the human rights and labor rights requirements are followed while producing and processing shrimp.

iv. Integration of banned elements in the shrimp affects image of shrimp industry of Bangladesh. 37 % respondents were strongly agree with this statement, 49% respondents were agree with this statement. Some time some dishonest shrimp producer or businessman malpractice like push of unhygienic liquid and solid bar. These types of adulteration in shrimp create a bad image for shrimp industry in aboard markets.

v. PL (Post Larvae) supplied by the hatcheries is of low quality. 60% respondents were strongly agree with this statement. These agents constitute the major profit making actor in the chain with the least risk. These agents are very influential in the value chain and determine prices. Lack of working capital and availability of special interest rates are outlined as major constraints faced by the group.

vi. Facilities for WSSV (White Spot SyndromVirus) screening are almost nonexistent. 55% respondents were strongly agree with this statement, **(Figure: 07)** 37% respondents were agree with this statement. Inadequate bio-security measures such as drainage, bacterial control, viral control, use of medication, etc. due to inadequate technology base also results in high mortality rate and low quality of the product. The disease called White Spot Syndrome Virus (WSSV) affects the *bagda* species specifically and is the sole contributor behind falling productivity of *bagda*. In the case of *golda* bio security related problems mainly involve bacterial infections and contaminated medicine and feed. The EU imposed a ban on Bangladesh shrimp imports in 1997 because of a failure to comply with EU quality regulations. These events have resulted in a bad image of Bangladeshi shrimp in foreign markets. As a result Bangladesh cannot demand the same price as its competitors can in the international market.

vii. There is lack of quality and safe feed supply for shrimp culture. **(Figure:07)** 47% respondents were strongly agree with this statement, 37% respondents were agree with this statement. There is a shortage of artificial shrimp feed in Bangladesh Only 6,000 ton of shrimp and fish feed are produced locally as opposed to a total requirement of more than 100,000 ton. Apart from the Bangladesh Fisheries Development Corporation's fishmeal plant, there is only one feed mill operating in Mymensingh and a few small-scale local manufacturers of fish feed Shrimp feeds, usually with a shelf-life of about three months, are imported from Thailand and Taiwan. It has been reported that stale feeds are supplied at the farm level, leading to adverse effects on shrimp farming. Consequently, most farmers rely on natural feed and their farms suffer from lower productivity.

viii. Government should conduct awareness campaign of quality management of shrimp. **(Figure: 07)** 100% respondents were strongly agree with this statement. Bangladesh government should conduct more awareness campaign of quality management because there are lacks of knowledge of quality management among the stakeholders.

ix. Quality control measurement standard should be more developed. **(Figure: 07)** 100% respondents were strongly agree with this statement. Quality control measurement standard is not applied properly in shrimp supply chain according to the international requirements.

7. 0 Concluding Remarks

In this study a number of problems have been identified and analyzed on the shrimp industry. But the severe level of illiteracy of the cluster members is the main reason for the significant difference in the imaginary level of the problem and the actual stakeholders' awareness level toward the problems. Besides, lack of monitoring, widespread corruption and the absence of an integrated policy for this industry are also the reasons. The disintegrated supply chain of the industry is also to blame. Bangladesh, with a large deltaic flood plain has a long tradition of fishing and shrimp culture. In recent decades, due to an increased international demand, shrimp has become one of the most important export products. In export earnings 85% of this is earned through export of shrimp. The government has declared shrimp cultivation a priority industry and specific support programmers (both technical and financial) have been designed. The discussion that ensued to identify obstacles to the growth of the industry, develop some intervention strategies that would help eradicate these obstacles and begin to develop a strategic model to achieve an export target of \$1 billion by 2010. It is therefore quite possible to attain the year 2010 export revenue target of \$1 billion if the abovementioned obstacles are overcome.

8.0. Recommendations

Mass level of the stakeholders need institutional and industry related education immediately. Activities like training programs, seminars, and trade-fair are still in the initial level and done on small project base. Industry wise expansion of these kinds of activities should be taken into account immediately. 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 immediately. Enforcement of food safety outside the government should be explored. Following special measures should be taken immediately:

- Shrimp processing industries or shrimp producer some time face lots of risk like disease problems, raising price of shrimp feed, natural calamities, falling of shrimp price etc. So Government should share the risk with them to ensure the productivity of shrimp industry.
- Shrimp transportation should be facilitated with modern facilities like insulated & refrigerated carrier van and handling of shrimp with food graded plastic basket.
- Introduction of quality certification system at all levels of the shrimp and fish based industry to ensure food safety, traceability, environmental sustainability and social responsibility is needed.
- In Bangladesh electricity supply is not adequate but government should ensure the continuous electricity supply in shrimp processing industries.
- Quality control measurement standard should be more developed
- All local manufacturers or importers of shrimp feeds must ensure and certify on the body of feed bag or package that the feed does not contain any EU and USFDA prohibited antibiotics or other chemicals.

- Feed manufacturers should be allowed to import duty free essential ingredients that are not locally available.
- Affordable rate of interest, easy repayment schedule should be introduced for the industry related entrepreneurs.
- Vocational training centers should be established at aquaculture locations for hands-on training in aquaculture, post-harvest handling and processing.
- Laboratory should have enough facilities with Modern and sophisticated, machine, instruments and methodology for testing quality parameters of exportable shrimp.
- Ocean going vessel for the export of shrimp should be available. The ocean going vessel are not available as per it's requirement. Exporter couldn't export Shrimp in due time.
- Inability to create verity of shrimp product to serve the international and local market lack of exploration of new markets of shrimp industry. There is a lot of demand for shrimp in international and local market but marketers fail to execute this demand. Shrimp production should be enhanced.

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