

The Problem and Prospect of Shrimp Cultivators in the Coastal Area of Bangladesh: An Analysis

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Abstract— Shrimp culture has vital role for rising economic success, shaping a more prosperous and sustainable future in Bangladesh, specially in the coastal area but this sector is under threat for various problems, faced by shrimp cultivators. This paper explains the problem, faced by shrimp cultivators in the coastal area of Bangladesh and the solution of those problems with the current attitude of shrimp farmers on shrimp culture. This study has been conducted in three districts, named Bagerhat, Khulna and Shatkhira district of Bangladesh. 200 respondents have been selected randomly who have been cultivating shrimp since several years. A semi-structured questionnaire has been used, four FGDs and three case study interviews have been conducted to identify problems and solutions of those problems and a scale has been used to know their current attitude on shrimp culture. Secondary data have been collected through journal, reports and newspaper. This study has focused on problems, disrupting the shrimp culture constantly and solutions in specific areas of shrimp cultivators but the whole problem of shrimp culture hasn't been included in this study. This study has identified that shrimp cultivators are facing problems a lot which are eroding the benefit from shrimp culture, including shrimp fry remains sick, comparatively high price of shrimp fry, virus, pollution of water, comparatively low price during they sell shrimp, the price of feed is so high, lack of proper transportation, traditional process of culture and lack of monitoring bodies etc. True, to combat these troubling situations and create new possibilities, cooperation is crucial, including- soft loan, training, NGOs' help, and Governmental initiatives. So, the Government of Bangladesh must take cognizance and act decisively to determine the barrier of shrimp cultivators and the solution of those barriers to make a suitable place of shrimp culture which will contribute to enrich the economy of Bangladesh.

Keywords— Shrimp, shrimp fry, shrimp cultivators, Bangladesh, problems and prospects.

I. INTRODUCTION

Bangladesh, a developing country has suitable geographical position to cultivate shrimp, specially Bagda (English name: Black tiger) and Golda (English name: Fresh water Prawn) which have a lot of demands worldwide, specially- in the USA, UK and Japan. Over the few decades, with meeting local demands, this product has been being exported since 1980s by fits and starts and that resulted in earning huge amount of dollars every year as well as turned over a new leaf in those areas. Moreover, shrimp would certainly have helped to rise economy, only that there are many problems. In fact, the cultivator may still fancy to cultivate shrimp but the truth is that there are too problems to cultivate shrimp in Bangladesh, which demotivate farmers to cultivate. Hence, the Bangladesh government has formulated several strategies but that effects have quickly been disappeared, because people abide by those rules irregularly, inappropriately, and infrequently. Subsequently, there is no overall change in this sector. Similarly, shrimp cultivators face problems a lot, yet such problems, that are still horrifying, are becoming far more common. Identifying those problems is only temporary fix, the root cause must be addressed. By and large, the fact that Bangladesh is a poor country proves that there is less focusing on problems and solutions. By emphasizing on this issue, the author has discussed problems, solutions and attitude on shrimp culture in the below.

A. Background of this study

This part shows an overview of the shrimp cultivation in Bangladesh. Bangladesh ranks at 5th in the world as aquaculture producer [1]. Farmers produce 300-350 kg shrimp per hectare in Bangladesh which is fewer than any other countries in which shrimp culture is ongoing. Actually, in the 1950s, the shrimp was first cultivated in Satkhira district and has been being run ever since. In the 1960s, coastal areas of Bangladesh were restored by tidal water and they were reared shrimp for 3-4 months. In the 1980s, exporting shrimp was started in the world market. Around 2,75,583 hectares land are used to cultivate shrimp, among them, 70% land are

situated in Khulna District. Furthermore, 12,000 hectares land are used in other 16 districts in Bangladesh [2]. 16 crores people, among them 2.8 crores people are unemployed live in Bangladesh and shrimp has vital role to give income sources to those unemployed people. To cultivate shrimp, there are sufficient labor, water and land on which shrimp farming is running. 8% foreign income come from fisheries, among it, 92% income come from shrimp sector [2]. Parvez (as cited in EPB, 2018) has said that the demand and price of shrimp have decreased in international market in 2017-18 fiscal year [3].

He also has argued that 8.37% income of shrimp has been decreased.

Fiscal Year (\$)	US Doller
2018	408
2017	446
2016	448
2015	502
2014	545
2013	439

Table I: The income from shrimp sector

Source: EPB,2018

He (as cited from Hussain who is Managing Director of Sobi Fish Processing Industries Ltd) stated that 39,705 tons shrimp have been exported in 2017 but 36,267 tons shrimp have been exported in 2018 [3].

But current price of shrimp has been increased in 2019. Golda has been sold per kilogram highest at \$16.25 and Bagda has been sold per kilogram highest at \$ 10.00 in local shrimp market.

B. Rationale of the study

This section of this paper has focused on the rationality of preparing of this paper. Actually, shrimp is the most beneficial product and cash cow in coastal areas of Bangladesh. So far, it seems that rising of shrimp culture has already contributed to a board pattern of income in those areas. But many reasons have affected this culture which are hidden as yet, specially-problems of cultivators. Although those problems are associated with several sector of shrimp culture but this paper has focused on cultivators' problems and solutions. The Shrimp has more positive sides than negative sides. The Shrimp increases the income of

farmers, majority people of those area are being rich, infrastructures are being developed, the rate of reducing poverty is being increased, their investing in business is increasing for this culture [4].

Chand, N. C., Minster of state for Fisheries and Livestock has said that shrimp culture not only won't be confined in Satkhira district but also will be started in all districts, without Chottogram Hill Tracts in Bangladesh [5]. Although several researches have been conducted on shrimp culture, but researching on shrimp cultivators with their problems and solutions didn't get attention of researchers and research communities in Bangladesh. On the other hand, some environmental organizations have recommended to reduce shrimp culture in coastal areas, because of rising saline water in those areas and preventing environmental degradation. More specifically, to rise shrimp culture, identifying cultivators' problems and solutions is more required the leaps and bounds. The author is an inhabitant of coastal area and he observes the problems which can't be eradicated in a matter of years, or even decades and way of mitigating those problems and the importance of shrimp culture.

C. Objectives of the study

It is clear that so long as problem of shrimp farmers is stopped and solution is visual, the aggrandizement of shrimp culture is not possible. Therefore, this study has focused on problems and prospects of shrimp farmers, including-

- a) To highlight shrimp cultivators,
- b) To learn the problem with buying shrimp fry and how to mitigate,
- c) To learn the problem with selling shrimp and how to mitigate,
- d) To analyze the problem with shrimp cultivation and how to mitigate,
- e) To show shrimp feed-oriented problems and how to mitigate,
- f) To identify the current attitude on shrimp culture.

II. RESEARCH METHODOLOGY AND MATERIALS

This paper was initiated with reviewing previous research paper, current state of shrimp, observing the problems, faced by shrimp farmers and used seven recognized members to collect data from fields who have been mentioned in acknowledgement section. This paper has included mixed method approach to identifying problems and way of mitigation of those

problems and identify farmers attitude in shrimp culture.

A. Research approach

The author has used mixed method research methodology which includes both quantitative and qualitative approach. Quantitative data show numerical presentation of data and qualitative data show the descriptive presentation.

B. Data collection and analysis

Both primary and secondary data are used in this study and findings have made on the basis of collected data. Primary data are collected by four ways, including-interview by using semi-structured questionnaire, FGDs, case study and Likert scale. Quantitative data have been gathered via Likert scale which has been used on 200 shrimp farmers to know current attitude of farmers on shrimp culture by using non-probability sampling (convinced and snowball sampling). Quantitative data have been analyzed statistically and MS Excel has used to make chart.

Qualitative data have been gathered by informal semi-structured questionnaire interview which has been conducted on 200 farmers, farm observations, four FGDs, and three case studies. Qualitative data have been analyzed thematically and used independently.

Secondary data are collected via journals, newspapers, reports of GOs and NGOs in order to discuss shrimp culture, current state of shrimp culture, to format study design and to formulate semi-structured questionnaire, way of FGDs and case study method.

C. Ethical issues

This study has conducted to clarify farmers' problems and prospects with attitude on shrimp culture. Findings are not presupposed in the research, rather by analyzing data, collected from fields these findings have been shown in the Result and Discussion section. On the other hand, ethics has been maintained in conducting interviews, case study and FGDs. All questions have been made in English language and translated in Bangla language by author and participants to ensure efficient communication with respondents. Each of the farmers has got a brief introduction on the nature and purpose of the study before giving answers. Then asking questions and recording answers were started in sequence. A total of four FGDs were conducted with farmers, experts, and dwellers who are observed shrimp culture since many years. Research participants took data at the beginning of the study with building rapport, speaking fluently and observing farmers' facial

condition. Thus, farmers have given data verbally and participants have recorded data exactly.

D. Study area and period

Timing of the study: March 1, 2019 to June 5, 2019, this time is used to review previous research, identify gap, select title, make methodology, select study areas, and make questionnaire. The author and the team member are divided into eight parts and went to collect data on this topic and conducted interviews and collected data on scale. Besides conducting interviews, the author has conducted case study interviews and FGDs. Thus, June 6, 2019 to July 10, 2019, this time is used to collect data from respondents. July 11, 2019 to August 24, 2019, this time has been used to analyze and formulate report.

Areas of the study: Bangladesh, situated on the bank of the Bay of Bengal is considered a proper state to produce shrimp on the basis of saline and unlimited water of coastal areas. The *Bagda* is cultivated in *Bagerhat, Khulna, Satkhira* and *Cox's Bazar* district. But the *Golda* is cultivated in *Bagerhat, Khulna, Joshore, Patuakhali, Barishal, Chottogram, Lakshmipur, Feni, Gopalganj, Madaripur, Kishoregonj, Rajbari* and *Dhaka* district, because the *Golda* is cultivated in fresh water [26]. Actually, Both *Golda* and *Bagda* are cultivated in *Bagerhat, Khulna* and *Bagerhat* district. So, the author has conducted this study in these three districts.

E. Instruments

This study has followed those data which are- updating data on shrimp production, earning state, problems with buying, selling, cultivating, feeding of shrimp and attitude on shrimp culture. Based on these preliminary research and data, specific research questions were developed, including-

F. Interview questions are made of these ways

Four key issues of farmers have been focused, including-

- Problems of shrimp cultivators
 - Way of reducing those problems
 - Showing farmers' well-beings
 - Identifying attitude on shrimp culture.
- a) On the basis of focusing title and objectives, questionnaire has been made, including-
 - b) Questions on biographical state, including- name, age, location,
 - c) Questions on type of shrimp and shrimp *Gher* (pond), including- the amount of shrimp *Gher*

- (pond), size of shrimp *Gher* (pond), cultivating period, and main type of cultivating shrimp,
- d) Questions on buying, selling, cultivating and feed-oriented problems and way of mitigation.
 - e) Questions have focused on natural and social problems, including- water, sunlight, hot weather, drought, and robbery.
 - f) Questions on helping body, including- foreign aids, training, governmental subsidy, NGOs' help, making association, attending seminar and money supply.

G. Likert scale

Liker scale has focused on five attitudes of farmers, including- strongly satisfied, satisfied, undecided, dissatisfied, and strongly dissatisfied.

H. Case study

Case study interview has focused on

- a) Experiences on shrimp culture,
- b) Problems which have been observed to cultivate shrimp,
- c) Solutions of those problems in their opinions,
- d) Way of rising this culture in coastal areas.

I. Focus Group Discussion

Focused Group Discussions have focused "shrimp farmers' problems and prospects". Besides cultivators, experts, inhabitants of those areas who don't cultivate shrimp but observed since many years were present. They have expressed their opinions on shrimp culture over the previous years and current years.

J. Limitations of this study

The quantitative findings from this study can be biased for using non-probability sampling. As this study is not high-quality statistical representation at the national or international level, findings shouldn't be generalized to the entire shrimp cultivators in Bangladesh. Furthermore, there are some limitations, including-

- Only 200 farmers, four FGDs and three case studies have been used to collect data,
- Comparatively less time has been used to analyze,
- Respondents feel nervous, hesitation and fear to give data,
- Only eight participants or members have collected data.

However, besides several limitations, this paper has made a clean pattern on problems of buying fry, selling shrimp, cultivating shrimp, feed supply and the importance of shrimp culture.

III. LITERATURE REVIEW

Literature review is seemed as the internal part of research. This section provides the base of research and sources of data and techniques for analyzing. There are many researches on this topic, but author has discussed those papers which have described about problems and prospects of shrimp culture. A brief review of the relevant literature is given in the below.

The coastal area of Bangladesh is appropriate place to cultivate shrimp. Without cultivating shrimp, the land of those areas is useless because of salinity in water and soil. Some landlords cultivate shrimp in own land but most of shrimp farmers get lease land to cultivate land. The landlord earns huge amount of money by giving lease of land and renting shrimp cultivators earn huge money by cultivating shrimp. These landlords and farmers earn less money by agriculture than shrimp culture [6]. Transforming cultivating system from rice to shrimp has developed the economic state in the coastal area and besides shrimp farming, farmers rear cattle, such as- cow and goat on the dikes of shrimp *Ghers* (ponds) [7]. To get proper benefit from shrimp sector, lack of qualified PL (post larvae) is main barrier. The Problem with PL (post larvae) affects shrimp culture. To rise hatchery is needed to enrich shrimp culture in order to get qualified PL (post larvae) that can rise the economy of Bangladesh [8]. The problem in transporting sector is preventing to get exact price of shrimp. To get exact price of shrimp, farmers have to go *Mokams* (shrimp market) at around 12:00 PM to 1:00 PM. In coastal areas, transportation is so bad and farmers often don't arrive at market at due time [9]. Shrimp diseases are more responsible than other factors to get utilizations. As well as unplanned culture increase salinity in water and land. So, farmers should be aware to cultivate shrimp [10]. The high price of feed is more obstacle to get high utilization from shrimp culture. Comparatively the price of shrimp feed is so high in Bangladesh, farmers often don't buy feed and get less profit than expectation [11]. There are a lot of problems in land tenure system in Bangladesh, like- rich farmers take lease *Ghers*(ponds) by paying high amount and small farmers are failing to take lease *Ghers* (ponds) [12]. Along with, inadequate prawn fry, high production cost, inadequate technical knowledge and low production are obstacle to get proper benefit from shrimp culture in Bangladesh .Moreover, lack of planning, system design, construction, sufficient finance, proper operation management, and political leaders and local power holders who have captured

public places in coastal areas of Bangladesh are preventing to cultivate shrimp exactly [13,14,15].

Fresh water prawn has been cultivated in small-scale in Bangladesh. To get proper benefit they should extensive process which is favorite process in other countries [16]. To increase shrimp production, technology and information supply are must needed. Because every country has changed their technologies in shrimp farming sector and gets proper utilizations but Bangladesh is lag behind from changing pattern of shrimp cultivation [17]. Also, to increase shrimp production, government stimuli, marketing opportunities, technical improvement must be needed. Because above opportunities are so fewer in Bangladesh what disrupt to get exact profits from shrimp culture [18]. Identifying diseases, improve feed supply, maintain water quality and improving hatchery are needed [19]. Proper management system is also required. There is lack of proper management system of shrimp in Bangladesh which disrupts to enhance shrimp culture [20].

There are needs to get aids in production technology and hatchery operations which increase shrimp production. Because of Lacking of proper technologies, shrimp culture is being disrupted [21]. There are no monitoring bodies in Bangladesh, the authority has to make a clear guideline which will monitor ecological impact and introduce programs for shrimp culture [22]. To sustain shrimp culture in Bangladesh, some strategies must be taken, including- knowledge technology, pond preparation, sufficient feeding, using good fry etc. [23]. Shrimp sector has arranged many employment sectors in Bangladesh, including- hatchery operations, feed production and selling, farm workers, marketing and processing of shrimp [24]. Finally, farmers, trade holders, processors, general people should be integrated to laws and legislation to rise our economy [25].

IV. RESULT AND DISCUSSION

A. Shrimp in Bangladesh

The shrimp is found all over the world in both fresh water and saline water. The Shrimp sector, as everyone knows, is unique in Bangladesh. There are many types of shrimp in Bangladesh, including- *Bagda* (English name: Black tiger), *Golda* (English name: Fresh water prawn), *Harina Chingri* (English name: Brown Shrimp), *Chaka Chingri* (English name: Indian white Prawn). With shrimp farming, there are many carp fish have been cultivated in those areas, including- *Catla* (English name: katla), *Mrigal* (English name: Mrigal),

Rui (English name: Rohu), *Silver carp* (English name: Silver carp), *Minor carp* (English name: Common Carp), *Grass carp* (English name: Grass Carp), *Kalibaus* (English name: orange-fin-labes) etc.

B. Shrimp cultivation process

The shrimp is cultivated in traditional process in Bangladesh. Even, other countries have changed their cultivation process and instruments and taken new technologies in order to they can produce huge shrimp. The farmer of Bangladesh remains so unaware about development that they can't get sufficient benefits. Today, the number one task of all farmers should be aware about development, nothing can be more important than that. Indeed, farmers are being careful about their rights. The farmer of Bangladesh cultivate shrimp this way-

- 1.Preparing shrimp *Gher* (pond),
- 2.Collecting shrimp fry: Natural and hatchery fry,
- 3.Shrimp culture (releasing fry +feeding +monitoring),
- 4.Marketing,
- 5.Businessmen,
- 6.Sending local market and exporting to global market.

At first, farmers prepare ponds to release fry. Then, they collect fry from *Mokam* (Fry market) and buy fry and release them as soon as possible. By laboring, feeding and monitoring, they are rearing fry and produce shrimp. After that they send shrimp to market for selling and brokers buy them and send to local market and fish processing companies. At the last, fish processing companies sell them in global markets.

C. The problem of farmers

Shrimp culture has come a long way since the 1980s, more than three decades ago, when the first shrimp was exported but farmers problems are yet to be recognized. From preparing ponds to selling shrimp, farmers are facing various problems but yet no palpable progress has been made. It is a tragedy that some problems are so serious that most of the time having lost, few farmers leave from shrimp culture and commit suicide. Looking the other way, without identifying the terms with the fact of those problems, farmers will not see a downward trend of problems. This section has shown those problems from different angles of view in the below-

Problems with buying fry: Indeed, the shrimp is produced from fry and this fry comes from hatcheries

and rivers. Farmers are facing several problems over and over again when they buy fry, including-

- Comparatively the price of shrimp fry is high,
- Farmers get less shrimp fry than the amount which seller saying,
- A little amount of shrimp fry remains weak, ill and death,
- Sometimes, farmers don't get shrimp fry to buy,
- Fry-seller make syndicate and take high price,
- Comparatively, *Mokams* (shrimp fry market) are situated far away from shrimp *Ghers* (ponds),
- There are huge transportation problems,
- During buying shrimp fry, farmers don't get proper money support,
- Farmers are interested in buying natural shrimp fry but they don't get expected natural shrimp fry,
- Hatchery growing fry is not preferred to buy, because the shrimp of hatchery growing fry won't be big what farmers want,
- Farmers pointed out that a little amount of fry are died after releasing,
- Police prevent to catch natural fry.

Problems with cultivation: After releasing fry, farmers are facing many problems in rearing shrimp, including-

- There are problems in land tenure system, rich people from cities take lease land at high price and local farmers don't get land lease to cultivate,
- Many diseases, including- virus, water logging in head, and shortage beard are preventing to get proper benefits,
- Comparatively, this culture is much expenses than agriculture,
- Before releasing fry, getting lease pond, cleaning ponds, making dikes, repairing weak dikes, eradicating *Pek* (soft mud) at the bottom of the ponds, giving wages to laborers, are more expensive,
- There are no suggestion centers in which they can get urgent suggestions,
- There is no direct governmental help,
- People in power control over public canals,
- Canals and water management bodies aren't aware and sincere about their duties,
- Farmers don't get water in proper way,
- They have fear of theft and robbery,
- Most of farmers don't attend in training and seminar,
- Farmers have associations, but those associations don't work clearly,

- Banks and NGOs take huge interests,
- The wages of laborer is very high,
- Most of farmers don't get NGOs' help or training,
- There are public services in those areas but farmers don't get those services,
- Abrupt climate changes create many accidents.

Problems with selling shrimp: Whenever farmers sell shrimp after catching, they face several problems, including-

- Comparatively the price of *Bagda* is very cheap,
- Most of farmers argued that the price of *Golda* was so cheap a few months ago,
- Shrimp buyers make a syndicate and buy shrimp at low price,
- When huge shrimp are arrived, buyers buy shrimp at low price,
- The condition of *Mokam* (shrimp selling market) is very bad,
- The rate of tax is high,
- Sometimes, some staffs of *Mokam*(shrimp selling market) steal shrimp,
- There is a problem of ice, farmers don't get ice easily,
- There are no monitoring bodies in those areas,
- There is a main problem in transporting system,
- When farmers arrived in late at market, they get low price,
- Sometimes, *Mokam* (shrimp selling market) owner don't pay full money.

Problems with feed: farmers face several problems wherever they buy shrimp feed Including-

- Comparatively the price of feed is very high which prevent to get exact benefit,
- Some feed companies produce low quality feed,
- There are many problems to bear feed in *Ghers*(ponds),
- A few companies use adulterated component in feed,
- There have no clear ideas about the demand of feed of shrimp,
- They feed shrimp in traditional way,
- Snail is the most prominent feed for shrimp but there is very scarcity of snail,
- They don't know the measurement of feed.

Problems with Environment: As a matter of fact, environmental degradation is being increased and impacts on shrimp culture head over heels, including-

- It is hot weather in this year,
- Comparatively raining is less than other years,
- Sometimes, huge raining make flood,
- Almost cyclone disrupts shrimp farming,
- A few areas don't get saline water when farmers use food salt to make saline water,
- A few areas get much saline water that disrupts farming shrimp,
- Sometimes, polluted water makes gas in *Gher* (pond),
- There is no governmental project to reduce water pollution.

D. The Solution of the problem

Removing farmers' problems can't be open-ended and farmers can't wait indefinitely. Also, a situation is especially grave, when there are no steps of solutions. Even if those problems don't prevent farmers to rise shrimp culture, they do prevent to get proper benefits. This is one reason why there are fewer benefits from shrimp culture is identifying solutions is growing less than other countries. The fact of the matter is that his shrimp culture will end up dark if the authority hasn't taken way of solving problems. The author has identified several solutions of those problems, faced by shrimp farmers on the basis of collected data analysis.

Soft loan: All farmers have no sufficient money for farming shrimp. Most farmers take loan from banks and micro-credit-based NGOs. Farmers take money and pay high interests what makes farmers loss substantially. Money lending organizations are also concerned about rising interest rates, which not only put a damper on money returning but also on farmers' benefits. It is not their concern whether farmers survive or not, they want to interests. The fact that this loan system now seems to be disintegrating- at the same time they need soft loan. In this case, when they get soft loan, they can get proper benefit from shrimp farming. Generally, shrimp is died because of virus or diseases and farmers become disappointed at times. Under this circumstance, when they get soft loan and release fry, they can cope up with losses. On the other hand, this loan creates capital that will be used in future.

Governmental help: Obviously, the shrimp earns a high amount of dollars, for existing this occupation, governmental help is urgently needed. Not only at national level but also at international level it has huge demands. If government cannot understand the importance of solutions of farmers' problems, who will? So, government has a lot of obedience. Even steps taken by Bangladesh government are influential but other strategies are claimed by farmers. including-

- Making shrimp fry research center, shrimp research center, and feed research center, although there are research centers but those are not sufficient to cover all Bangladesh,
- Establishing and improving diseases research center,
- Consenting in medicine department of fishing sector,
- Rising awareness among farmers to cultivate shrimp in legal way,
- Rising subsidy in this sector,
- Giving specific attention on this section and making national strategic plan,
- Ensuring monitoring in remote areas,
- Rising suggestion service centers and concerning potential future risks,
- Encouraging people to cultivate shrimp because some farmers are dissatisfied on this culture,
- Arranging new seminars, workshops, projects etc.
- Consenting in feed producing sector,
- Giving economic help to marginal farmers,
- Making updated laws for this sector,
- Making easy to get information,
- Repairing infrastructure,
- Ensuring road safety,
- Government officials have to more attentive on duties.

NGOs' help: NGOs involvement is crucial to take forward shrimp culture. Even if that NGOs don't enable to help everyone with much accuracy, they facilitate timely responses. This is one reason why economic growth is increasing that NGOs help in Bangladesh. So, NGOs help and will continue to do so. Such as-

- NGOs should encourage to rise shrimp farming,
- NGOs have to make suitable policies and projects,
- They can arrange training system for rising shrimp production,
- Giving economic support,
- Lack of help, local associations become weak, so NGOs can help to those local level associations,
- Arranging seminars and workshops,
- Making advertisements in global level,
- Helping and suggesting foreign traders,
- A few organizations focus on fry, they should focus on feed and market place.

Duties of farmers: besides other sectors, farmers have to take numerous steps in multiple stages what farmers argued during data collection. Such as-

- Being aware socially and publicly,
- Taking trainings,
- Obeying laws and regulations,
- Getting public services, when they don't get services they should go to senior officers,
- When they feel any trouble, they should inform Upazila Agriculture Officers,
- When GO, NGOs, and researcher call for information, they should correct information,
- Farmers should inspire to other farmers to be aware and helpful with each other,
- Repairing local level association and make concerted efforts,
- Avoiding traditional way of farming,
- Helping to governmental activities,
- When shrimp become ill, they have to go to disease specialist and relevant authorities,
- And take extra vigilant and extra precautions.

Actions of traders: Shrimp traders have to not only continue their business but also have to keep it mind that the shrimp is the way of income of them. So, they should use legal way of business. It doesn't matter to some traders whether shrimp farmers survive or die. So, they have many activities, including-

- Hatchery owners should use legal way to produce perfect fry,
- Shrimp buyers should pay legal price and avoid illegal ways,
- The staff of *Mokam* (shrimp market) should use legal way to conduct business and pay full prices,
- Feed making companies should rising research and produce feed in legal ways,
- Medicine companies have to rise research on diseases and invent new medicine,
- Shrimp processing companies should follow legal ways and pay full prices,
- Changing the pattern of *Mokams* (shrimp market),
- Ice companies have to supply ice in remote areas

E. Farmers' attitudes

Along with changing time, there are created a lot of attitudes on shrimp culture in coastal areas of Bangladesh. Many people are satisfied but some people are dissatisfied to cultivate shrimp. In this section, the author has shown the attitude of shrimp cultivators on shrimp culture in coastal areas of Bangladesh.

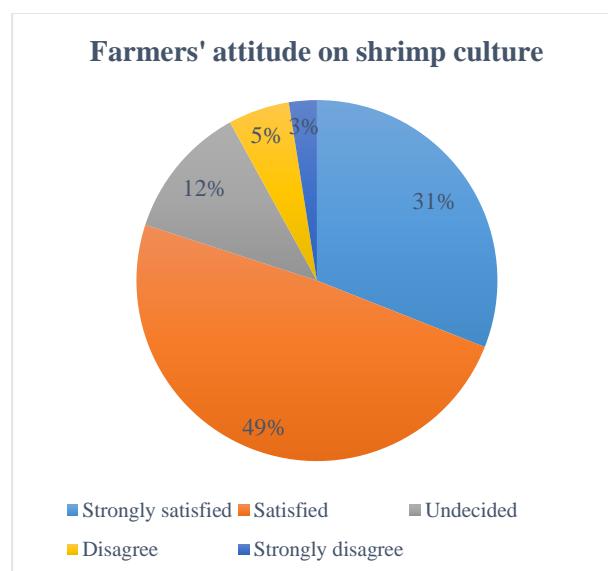


Figure 1: farmers' attitude on shrimp culture

Source: Analyzing of field data

This pie-chart shows the attitude of shrimp cultivators on shrimp farming in coastal areas of Bangladesh by different dimensions, including- strongly satisfied, satisfied, undecided, dissatisfied and strongly dissatisfied. It reveals that many farmers are strongly satisfied on shrimp culture. 31% people prefer to cultivate shrimp in their *Ghers* (ponds). Besides, more people are only satisfied on shrimp culture than others. 49% farmers agree to continue this culture in coastal areas of Bangladesh. But some farmers are undecided to share their arguments, like- 12% farmers of this study who are respondents are undecided to share their attitude on shrimp culture. On the contrary, some farmers of this study are dissatisfied to cultivate shrimp in their *Ghers* (ponds). 5% farmers are dissatisfied to cultivate shrimp. Even, last of all some farmers are strongly satisfied to cultivate shrimp, like- 3% farmers of this study are strongly dissatisfied. From this chart, it can be said that shrimp culture has a great influence in coastal areas of Bangladesh. Actually, shrimp culture is more expensive culture than other cultures, for instance- agriculture. So, to cultivate shrimp, money is more mentionable among all urgent needs. Also, this culture is at risk because virus and other shrimp diseases affect shrimp and shrimp die without alarming immediately. Having lost benefits, capital, and way of income in farming, farmers become disappointed and bad attitude has been emerged in their mind on shrimp culture. There are two types of attitude on shrimp farming, for instance a group of farmers are strongly dissatisfied: who have lost all of their capital in farming shrimp and another group of farmers are only dissatisfied who have faced various problems and

don't get proper benefits. On the other hand, a few farmers have no time to cultivate shrimp and put land without cultivating shrimp and a group who fear to share decision, they are undecided to share their attitude and become undecided farmers. A number of farmers who have shrimp ponds and get benefits in farming with engage in other income sources, they are satisfied with shrimp culture in coastal areas. At last, a group of farmers have got proper benefits and their farming is running, they are strongly satisfied with this shrimp culture. Ultimately, as the dwellers of coastal areas, it is not hopeful that farmers dislike shrimp culture as their profession but situations encourage or discourage them. So, shrimp farming is so urgent that shrimp exporting can be a more influential part of the development of Bangladesh.

F. Discussion of findings

This study has been conducted not because for identifying problems but because by solving those problems, shrimp culture will be enriched. Problems, discussed in problems of shrimp farmers section, disrupted shrimp farming as a whole across the coastal areas of Bangladesh. Without a long-term solution or removing these problems, farmers don't get proper benefits in shrimp farming. Keeping in mind this issue, the author has identified several solutions, leading to novel interventions which are needed to solve immediately. Shrimp culture has been for a long time plagued by the problems which really unhinge shrimp culture. Existing some trends among farmers are so bad and ignorable, for instance- traditional farming system is more beneficial and the shrimp decrease our capital etc. This attitude deserves to be eradicated because it is threatened and influences other farmers who may be demotivated to cultivate shrimp. The Shrimp not only fulfills our local and national demands but also fulfills international demands and earns huge economy as well as enriches economic development and human welfare. So, the government of Bangladesh and the Ministry of Fisheries and Livestock, and the Department of Fisheries have to make proper strategies and conducive circumstance to run properly this culture in coastal areas of Bangladesh. Also, Bangladesh Government must also involve itself in multilateral forums to bring help from international community.

V.CONCLUSION AND RECOMMENDATIONSAt the eleventh hours, the author has been argued that to reduce poverty in Bangladesh, shrimp culture has vital role what is visible. Earlier, although little land is used to firm rice but most of part of those land was unusable and remained in non-benefited way. Yes, huge land

was empty even though farmers didn't firm that. Because the water of tide flowed those areas. But those land has been known as mining of gold. Shrimp has shown us the way ahead and continue to do so. Even if we just for the day become developed nation in the true sense, that too will have an impact. To rise shrimp culture, the author has recommended that

- a. The research centers of public and private universities have to attention on shrimp production,
- b. Officers have to observe by going in fields and make comprehensive plan,
- c. Money supporting organizations and NGOs have to give soft loan,
- d. Besides researching in PL sectors, NGOs have to give attention on every sectors of shrimp culture and make development projects,
- e. Farmers have to leave traditional system of shrimp culture,
- f. Governments have to repair transportation system.

Thus, cultivating white gold will be stabled which take part to develop Bangladesh and Bangladeshi nation surely. Yes, without reducing the problems of farmers, shrimp culture won't be stabled in future. So, identifying their problems and solving those problems is must need.it is only when everyone, related to shrimp culture come forward to enhance shrimp culture that shrimp culture will be sustainable in Bangladesh.

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