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Problems' and Prospects of Fish Farming in Some Selected Area of Bangladesh and Its Implications on Increased Fish Production

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Authors' contributions

This work was carried out in collaboration between both authors. Author MMA designed the research framework and author MBHC supervised the work. Authors MMA and MBHC carried out the data collection, categorization, coding and performed the data analysis. Author MMA wrote the first draft of the manuscript. Author MBHC managed the literature searches and edited the manuscript. Both authors read and approved the final manuscript.

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ABSTRACT

The major purpose of this research was to determine farmers' problems' and prospects of fish farming and its implications on increased fish production. The study was conducted in 15 villages of Kaijuri union of Faridpur district of Bangladesh. An interview schedule was used for data collection. The data were collected during 20th March to 12th April 2013. Appropriate scales were developed in order to measure the variables. Descriptive statistics such as mean, standard deviation, range and percentage were used to describe the variables under consideration. It was found that about 50.5 percent of the pond farmers had medium problem (low price in pick period) compared to 40.6 percent of them having low problem (insufficient credit) and only 8.9 percent having high problem

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(lack of proper marketing facilities). Thus, the vast majority (91.1 percent) of the pond farmers had low to medium problem. The pond owners faced such major problems as: proper marketing facilities, poor communication system, natural calamities, shortage of pond water in dry season, insufficient credit and low price of pond fish in pick period.

Keywords: Pond; fish farming; problem; problem index; implication; Bangladesh.

1. INTRODUCTION

Bangladesh, covering an area of 147,000 km^2 with a population of 164 million, is one of the poorest and most densely populated countries in the world [1]. Vast riverine network and enormous floodplains makes the aquatic resources of this county highly potential and diversified. Fish, the main aquatic resource of Bangladesh, plays a very important role in the daily life of numerous segments of people in Bangladesh. Annually Bangladesh produces more than 3.5 million tonnes of fish mostly through inland capture fisheries and aquaculture [2]. Pond farming represents the backbone of aquaculture in Bangladesh, accounting for 85.8% of total recorded production and 57.7% of the area under culture [3]. Unlike gher[1] culture and seasonal floodplain aquaculture which are limited to a few key districts, pond farming is commonly practiced in nearly every district of the country. Fish farming in Bangladesh is playing an important role to the total national income. As a south Asian country there are hardly any areas in Bangladesh where river or any other water source is not available [2]. In another word, Bangladesh is surrounded by rivers and various types of water sources like pond, stream, lake, etc. which has a profound contribution on the livelihood of the people of Bangladesh. A major part of the total population of this country is directly or indirectly involved with fish or fish related business. Especially, most of the people of southern area of Bangladesh are directly engaged with commercial fish farming or fish farming related business. Moreover, most of the people in Bangladesh depend on fish for their animal protein and fish provides 63.00 percent of animal protein consumption. The fisheries sub-sector contributes 5.38 percent of Gross Domestic Product (GDP) [4]. Bangladesh earns a significant amount of foreign currency, i.e., 4.90 percent of total export earnings from fisheries products [5]. Fish production is dependent on quality fish seed, fish feed, and proper feeding schedule along with proper pond management. The quality fish seed sometimes are not available locally and making necessary arrangement for such seeds often cause higher operational costs [6]. Sometimes shortage of fish seed supply results from the limited number of hatcheries in the local region [7]. Thus, both the quality and quantity of fish seed suffers from limitations [8]. Along with seed, fish feed is equally important. The success of a sustainable aquaculture system depends on the fish feed and fish nutrition [9]. The fish farmers who are engaged in fish farming at the farm sites far away from the potential market, often face a problem of lacking of potential market. The fish farmer doing farming since a long time may have steady customers and may not consider access to market as a problem [10]. Low selling price of fish is another important issue regarding market related challenges. The fish farmers, when unable to secure sufficient loans, they are forced to borrow from unorganized money lenders at relatively higher rates of interest. Therefore, they find no option than selling their harvest at lower prices. The existence of market intermediaries in the supply chain also influences the selling price and farmers' profit. All these problems entangled with knowledge inadequacy among the rural farmer beget overall decrease of fish production. On the basis of this scenario, the study is designed to find out the outermost problem faced by the pond fish farmers and the possible implications.

2. MATERIALS AND METHODS

The study was conducted at Kaijuri union under SadarUpazilla of Faridpur district. Out of 15 villages of Kaijuri union, four were randomly selected. The selected villages were Mongolcot, Vatpara, Chormongolcot and Loskarkandi. The pond owners of selected four villages under SadarUpazilla of Faridpur district were considered as the population of the study. A list of pond owners who are currently growing fish and fish fry in their pond was prepared with the help of Upazilla Fisheries Officer and his field staffs. The number of pond owners was 253

[1] *Gher is modified rice field comprising a trench around the rice field and built up dikes to maintain a depth of around 1 meter in the trench.*

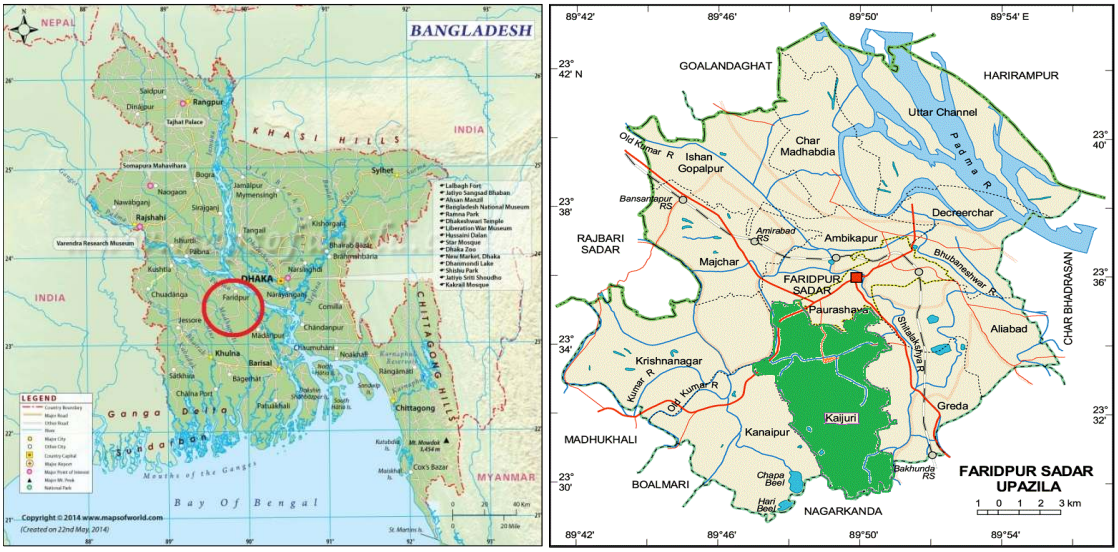

Fig. 1. Map of Bangladesh showing the study area

which constituted the population of the study. About 40 percent of the population was selected proportionately from the selected villages as the sample by following random sampling method. Data were collected from the 101 sample farmers with the help of a pretested interview schedule during the period from 20th March to 12th April 2013.

Problems of fish farming were the main central of the study. Extent of problems was measured by computing the extent of various problems of the farmers with 6 selected items as shown below-

1. Insufficient credit
2. Poor communication system
3. Lack of proper marketing facilities
4. Natural calamities
5. Low price of pond fish in pick period
6. Shortage of pond water in dry season

Each respondent was asked to indicate the extent of his/her problem as severe problem, moderate problem, low problem and problem not at all and score was assigned as 3, 2, 1 and 0 respectively. The problem faced score of a respondent was determined by summing up his/her scores for all the problems. Thus, possible score can vary from zero (0) to 18, where Zero indicated no problem and 18 indicated the highest level of problem.

Severity of problems perceived by the farmers was determined by using Problem Facing Index (PFI) [11] and it was computed by the following formula-

$$\text{Problem Facing Index (PFI)} = (P_s \times 3) + (P_m \times 2) + (P_l \times 1) + (P_n \times 0)$$

Where,

P_s= Number of respondents faced severe problem,

P_m= Number of respondents faced moderate problem,

P_l = Number of respondents faced little problem,

P_n= Number of respondents faced no problem.

Thus the Problem facing index (PFI) of the farmers could range from 0 to 300, where '0' indicating no problem and '300' indicating highest problem.

3. RESULTS AND DISCUSSION

The problem faced score of the pond farmers ranged from 2 to 15 with a mean of 6.47 and standard deviation of 3.11. Based on the problem faced scores, the pond farmers were classified into three categories: "low problem" (up to 5), "medium problem" (6-11) and "high problem" (above 11). The distribution of the pond farmers according to their problem faced is presented in Table 1.

About 50.5 percent of the pond farmers had medium problem compared to 40.6 percent of them having low problem and only 8.9 percent having high problem. Thus, the vast majority (91.1 percent) of the pond farmers had low to medium problem.

The observed problem faced index of the selected six problems in pond fish farming ranged from 98 to 120 against the possible range of 0 to 300. The severity of the problems were arranged in rank order according to the descending order of problem faced index (PFI) as shown in Table 2.

Data contained in Table 2 indicates that lack of proper marketing facilities ranked first severe problem. It was observed that there was no established fish market in the study area. The quality of fish transported to distant places often gets deteriorated and damaged. Poor communication system ranked second, as most of the roads of the study area were still not in good condition. Natural calamities mostly flood was a recurring phenomenon in the study area. Almost every year flood occurs and the ponds get over flooded. Although the pond owners try to protect their pond by net fencing, the fences do not move to be effective due various reasons. As a consequence of this the pond fishes get out of the ponds and washed away with flood water. For these reasons natural calamities ranked the third problem. A certain level of water in the pond is necessary for fish farming. But there were a shortage of water in the pond in dry season (January to April). For this reason it ranked as the forth problem. Related to the financial problem, the pond owners face problems of acquiring various fishing equipment and inputs. High price of the inputs and equipment is experienced by them as a result they need credit. Due to this reason insufficient credit ranked the fifth problem. Market price is an important factor for fish cultivation. If the market price is not stable throughout the seasons, desired profit cannot be achieved. But in reality the market price does not often remain stable. It fluctuates depending upon the supply and demand of fishes and artificial control of market by brokers and other vested interest groups. Pond owners after harvesting took the fishes in the market but they did not get good expected price thus, they become disheartened. However, low price of fish in pick period (March to June) ranked the sixth problem.

Table 1. Distribution of the pond farmers according to their problem faced

Categories	Observed range	Pond farmers (n=101)		Mean	SD
		Number	Percent		
Low problem		41	40.6		
Medium problem	2-15	51	50.5	6.47	3.11
High problem		9	8.9		
Total		101	100		

Table 2. Rank order of the problems faced by the farmers in pond fish farming with Problem Faced Index (PFI)

Sl. no.	Problem	Farmers N=100				Problem facing index	Rank order
		Very high (3)	High (2)	Low (1)	Not at all (0)		
01.	Lack of proper marketing facilities	18	18	30	28	120	1
02.	Poor communication system	10	14	46	19	104	2
03.	Low price of fish in pick period	5	15	43	13	88	6
04.	Natural calamities	10	17	39	19	103	3
05.	Shortage of pond water in dry season	6	18	45	23	99	4
06.	Insufficient credit	10	13	35	33	91	5

4. IMPLICATIONS

From the above result it is revealed that the pond farming situation of the study area was hindered by a set of problems. Most severe problem as identified was lack of proper marketing facilities. This is a mainstream problem of whole farming scenario which leads to the pond farming unpopular among the farmers. To make fish available to consumers at the right time and in the right place requires an effective marketing system. An effective marketing system usually involved four levels (FAO):

1. Primary markets: Markets located in villages, district headquarters or at a crossroads are considered primary markets. They are usually near areas where fish are caught.
2. Secondary markets: The Brokers take the fish bought from the fish farmer/primary markets/landing points to the nearest Upazila or riverport markets by road, river or rail to sell to wholesalers.
3. Higher secondary markets: From secondary markets/fish assembly points, Brokers bring fish to the higher secondary markets serving large areas of consumer/terminal markets. The higher secondary market may consist of one or more wholesale markets or centers.
4. City or terminal markets: Retailers buy fish from wholesaling centres of higher secondary and secondary markets. They sell fish directly to consumers either through fixed stalls.

Fish prices depend on size, weight, quality, seasonality, supply and demand, and distance to markets. Poor communication system is the second most problem faced by the fish farmers. Farmers usually catch fish at night and very early in the morning they go to the market place to sell fish. Despite substantial improvements in road condition particularly in peri-urban areas, remote villages still face an accessibility problem, which in turn affects the quality and price of fish. Heavy rains often destroy the muddy roads in villages making them eventually inaccessible for the vehicles to carry fish to the markets. This leads to high transport costs and hence low profit margins. Due to some demoralized brokers and insufficient storage facilities farmers don't get the actual price of fish during pick period, which is the third ranked problem. Hence the brokers need to be controlled by govt. means as well as the price of fish should be fixed by the government and the storage facilities should be increased to a substantial level.

5. CONCLUSION

On the basis of the results and their interpretation it can be said that considerable investment in infrastructure, capacity building and institutional strengthening is needed for expansion of pond fish farming. Proper marketing facilities including infrastructure development, refrigerated transport need to be provided. Government of Bangladesh should improve the road network and build paved roads of good quality to facilitate the fish market. Credit availability needs to be increased for the poor fish farmers. Creation of a cooperative society among the fish farmers can provide easy access to the credit as well as can help them to successfully distribute their production and get fair prices of fish. Availability of electricity supply and adequate support to provide underground water in dry season are needed to be ensured. Irrigation or water supply system should be operationalized for the whole season of water scarcity in the region. As a highly potential economic sector, proper attention to mitigate the problem of the farmers of the rural area of Bangladesh is urgently needed. Help form different experts such as biologists, veterinarians, zootechnicians, agronomists or even officials of the Bangladesh government (e.g., Ministry of Agriculture or Ministry of Fisheries and Livestock) should provide to the fish farmers of the study region. Nonetheless, knowledge based orientation training program for the farmers are suggested.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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