

# Status of Pond Fish Farmers in Some Selected Areas of Mithapukur Upazila under Rangpur District, Bangladesh

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## Abstract

The present study was conducted in Mithapukur Upazila under Rangpur district to know the status of pond fish farmers from September 2016 to December 2016. The study was done to evaluate the present fish culture practices of pond fish farmers in this area. A total of 100 pond fish farmers were interviewed with a well-structured questionnaire. Average pond size was 0.12 ha where polyculture (97%) of Indian major carps and exotic carp were practiced by most of the farmers. In the study areas, 67% of the ponds were seasonal and 33% were perennial. Fish fingerlings were stocked from March to May and average stocking density was found to be 14,500 fry/ha/yr. Average annual yield of fish was found to be 3,025 kg/ha/yr. Average fish production cost was Tk.3,36,000.00/ha/yr. Average return and net income were Tk. 4,53,750.00/ha/yr and Tk. 1,17,750.00/ha/yr respectively. The average cost-benefit ratio (CBR) was 1.35.

**Keywords:** Pond fish farmer, Polyculture, Stocking density and Cost-benefit ratio

## I. INTRODUCTION

Aquaculture practice has become a promising and gainful methodology to attain self-sufficiency in food sector and also to alleviate poverty in developing country like Bangladesh (Ahmed MNU 2003c). Fisheries sector plays an important role in providing income, employment, nutrition and foreign exchange earnings and also plays a great role in improvement of the fishermen livelihood in Bangladesh. Fish alone supplies about 60 percent of animal protein and about 11 million people are directly or indirectly earn their livelihood out of activity related to fisheries (DoF, 2016). Fish resources play a very important role in the economy of Bangladesh accounting for about 3.69% of GDP (DoF, 2016). About 1.92% of annual export earning comes from the fisheries sector and it ranks 3rd among the export oriented industries (DoF, 2016). Bangladesh has vast inland close water (794361 ha) which is contributing 55% of total fish capture. In Inland close water pond paly very important rules. Total ponds area is 372397 ha and production was 1613240 MT ton (DoF 2016). In 2014-2015 about

3906434 MT, 794361 MT and 599846 MT of total catch were obtained from open water fisheries, close water fisheries and marine water fisheries respectively (DoF, 2016). Rangpur is one of the most important districts for short cycle aquaculture and fish production in the Bangladesh. Total land area of Rangpur district is 515.63 sq km<sup>2</sup> and riverine area 25.66 sq km<sup>2</sup> (BBS 2011). There are about 25810 ponds are present in the district and of which 7677 ponds are present in this upazilla (BBS 2011). Mithapukur upazila can be considered as one of the ideal pond fish production areas in the district. Most of them ponds are suitable for culture (BBS, 2002). Considering the above fact, the present study was carried out to assess the status of pond fish farming in the Mithapukur Upazila of Rangpur district of Bangladesh.

## II. MATERIALS AND METHODS

The present study was based on field survey where primary data were collected from farmers who are involved in pond fish farming. Mithapukur upazila of Rangpur district was selected for the present study. Mithapukur Upazila (Rangpur district) area 515.62 sq km, located in between 25°26' and 25°41' north latitudes and in between 89°06' and 89°27' east longitudes. Data were collected from 100 pond fish farmers of 20 villages under 5 unions (Balarhat, Kafrikhal, Latibpur, Vangni and Payrabond) randomly covering the selected study area. Various literatures and statistical data were collected from Upazila Fisheries Officer (UFO), Local Government and Engineering Department (LGED) office and Statistical office at Mithapukur Upazila. The study was conducted for four month from September 2016 to December 2016. The questionnaire was designed with both closed and open form of questions. The draft questionnaire was tested with 20 fish farmers in the study area. The questionnaire was changed, modified and rearranged according to the experience. The farmers who had pond were mainly considered for collection of personal information and fish farming information. The data were collected using questionnaire and crosscheck interviews. It was difficult to collect data since farmers did not keep any written records on fish culture activities and data which they provided were mostly from their memory. The collected data were scrutinized

and summarized carefully before the actual tabulation. The processed data were transferred to a master sheet from which classified tables were prepared revealing the findings of the study. Then the data were tabulated into a preliminary data sheet of a computer and compared with computer spread sheets to ensure the accuracy of the data entered. After data entry, the data were analyzed with computer program, Microsoft Excel, SPSS-20 version.

### III. RESULTS

The status of pond fish farmers that were found during the present study are as follows:

#### A. Background of Pond Fish Farming

Among the 100 respondents, 11% pond fish farmers started fish farming in 1985 to 1989, 19% farmers started between 1990 to 1994, 31% between 1995 to 1999, 27% between 2000 to 2004 and 12% between 2005 to after (Figure 1).

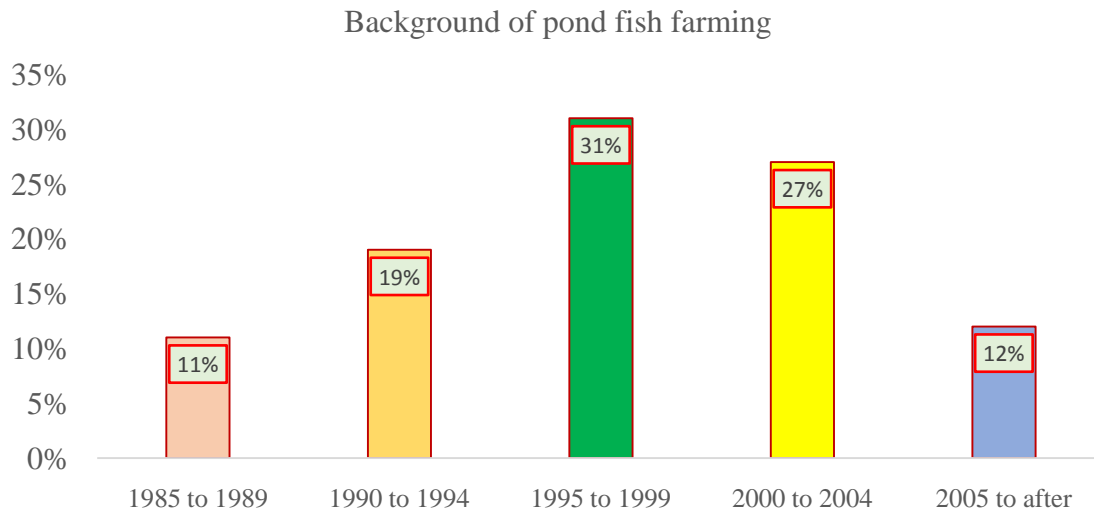


Figure 1: Background of Pond Fish Farming

#### B. General Features of Cultured Ponds

##### 1) Pond Ownership and Size

In the study area, 56% of the farmers had single ownership ponds, 34% had multiple ownership ponds and remaining 10% farmer had leased based ponds. The average size was found to be 0.12 ha in the study area.

##### 2) Pond Type and Depth

In the study area, ponds were two types (a) seasonal and (b) perennial. Sixty seven percent of the ponds were seasonal and thirty three percent were perennial. The average depth of the ponds was 2.50 m.

#### C. Fish Production Technology

##### 1) Culture Season and Method

In the study area, the season of fish farming was from March to October. Fish fries were stocked when they become available in March to May and the culture fishes were harvested during September to October. Most of the farmers (97%) carried out polyculture system. In polyculture system, farmers cultured mainly Indian major carps such as rohu (*Labeo rohita*), catla (*Catla catla*), mrigal (*Cirrhinus cirrhosus*) and Chinese carps such as silver carp (*Hypophthalmichthys*

*molitrix*), grass carp (*Ctenophrayngodon idella*) and common carp (*Cyprinus carpio*), shing (*Heteropneustes fossilis*), pangas (*Pangasius pangasius*), koi (*Anabas testudineus*). Most of the farmers did not follow any scientific combination of the species.

##### 2) Pre-Stocking Management

Pre-stocking management of ponds in the present study area included site selection, dike preparing and repairing, aquatic weed control and undesirable species (predator and trash fish) control. It was found that all farmers controlled aquatic weeds manually.

##### 3) Stocking

From the present survey, it was found that most of the farmer stocked hatchery produced fry (93%) and some farmer stocked wild fry (7%). But they did not follow any scientific of species during stocking their ponds. The average stocking density was found to be 14,500 fry/ha/yr.

##### 4) Fertilization

It was observed that majority of the farmers used cow dung and only a few used poultry droppings

as organic fertilizer. A few farmers used both urea and TSP as inorganic fertilizers. The fish farmers generally used cow dung in their ponds at the rate of 2224 kg/ha/yr on an irregular basis or 1-2 times during the culture period. The average dose of inorganic fertilizer such as urea and TSP was 116 kg/ha/yr and 102 kg/ha/yr, respectively.

5) **Use of Lime and its Application Rate**

All the farmers used lime irregularly in variable doses. The average rate of liming was found to be 741 kg/ha/yr in the study area.

**D. Feed and Feeding**

Most of the farmers applied feed to their cultured species. Almost 83% farmers applied feed to their cultured species and remaining 17% farmers depended on only natural food produced in the pond. It was observed that 87% of the farmers applied supplementary feed prepared with rice-bran and mustard oil cake and 13% farmers used company made

feed. The average rate of rice-bran and oil-cake were 2325 kg/ha/yr, and 556 kg/ha/yr, respectively.

**E. Fish Production**

The fish production was ranged from 1500 kg/ha/yr to 4550 kg/ha/yr. In the present study, it was found that the average annual yield of fish was 3025 kg/ha/yr.

**F. Harvesting and Marketing**

Although fish were harvested throughout the year, but the peak harvesting period was found from September to October. In this season around 70% of the stocked fishes were reported to be harvested and rest of the fish 30% was harvested during other season. Farmers harvested their fish using cast net and seine net locally known as berjal. From the survey it was found that around 75% of the fishes were sold by the farmers to local agent (*Paiker*) and the rest 25% consumed by the households and given to the relatives.

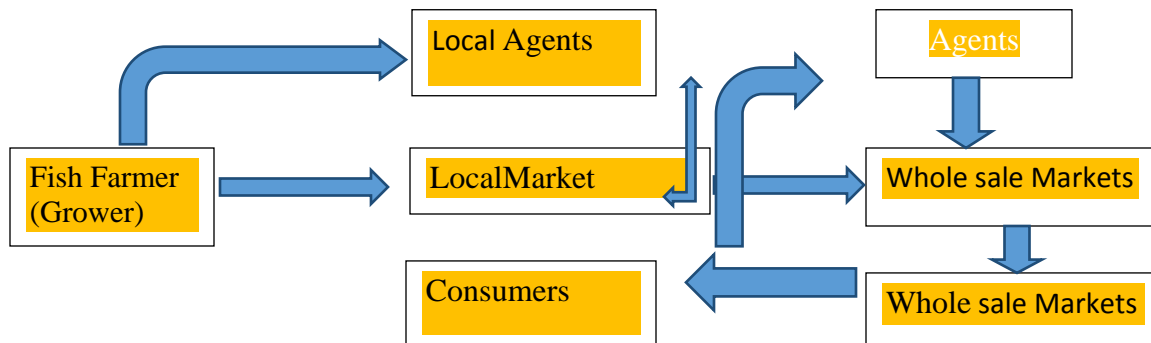


Figure 2: Fish Marketing Channel in the Study Area

**G. Problems Faced by the Pond Fish Farmers**

According to the present study, 28% of farmers reported crisis of fish fry during socking period as the single most important problem for pond fish farming. While respondents were identified fish disease

(21%), insufficient water in dry season (15%), fish poaching (11%), poor technical knowledge(7%), lack of money (8%), , low price of fish (6%) and lack of credit source (4%) respectively to be the most important problems in the study area (Figure 3).

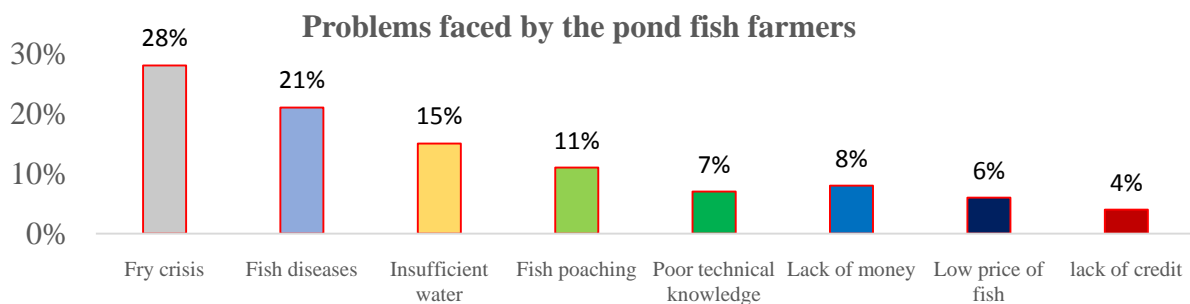
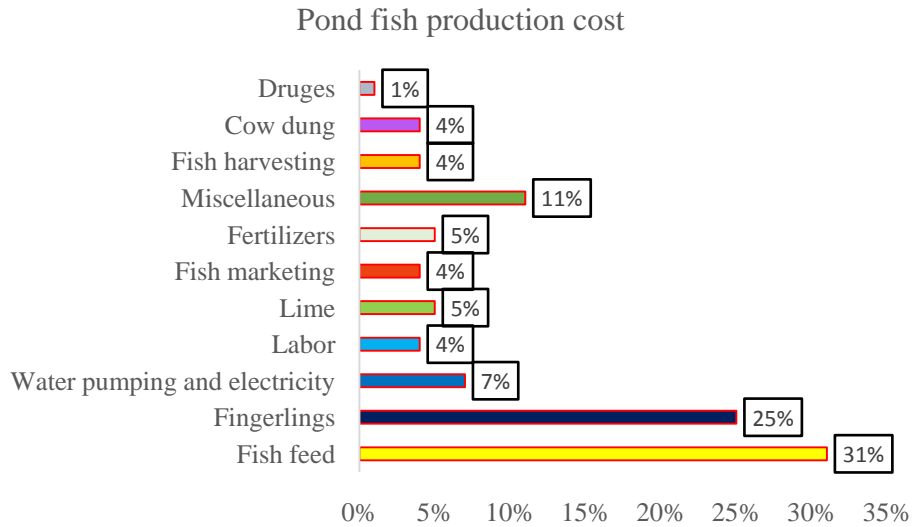


Figure 3: Problem Faced By the Pond Fish Farmers

**H. Pond fish Production Cost**

In the study area, it was found that the average total annual cost of fish production was Tk. 336000.00/ha/yr. In the study area, it was found that the highest amount of production cost was spend for fish

feed (31%) followed by fingerlings (25%), water pumping and electricity (7%), labor (4%), lime (5%), fish marketing (4%), fertilizers (5%), miscellaneous (11%), fish harvesting (4%), cow-dung/organic manure (3%) and drugs (1%) (Figure4).



**Figure 4: Pond Fish Production Cost**

**I. Net Profit and Cost Benefit Ratio (CBR)**

From the survey, it was found that average sell of fish in study area were Tk. 453750.00/ ha/yr. Average production cost of fish culture was Tk. 336000.00/ha/yr where average net profit was Tk. 117750.00/ha/yr. The average cost-benefit ratio (CBR) was 1.35.

**IV. DISCUSSIONS**

According to the survey, 67% ponds were seasonal and the remaining 33% ponds were perennial more or less similar to Hossain *et al.* (2013).The average depth of the ponds was 2.50 m. similar to Kundu (2012), Saha (2004) and Saha (2003). The geographically Rangpur district contain sandy soil properties and water retention capacity is very poor during dry season. For this reason almost 6-8 months have been used for fish culture.In the study area the culture season was from March to October similar toHossain *et al.* (2013).It was found that almost all farmers 97% carried out polyculture system similar toHossain *et al.* (2013). Farmers in this area stocked carp (Indian Major Carps and exotic carp), Pangus and Tilapia. Farms with a perennial water source were stocked as early as the month of April-May Fatema *et al.*(2015). Ahmed (2003a) observed that peak period of carp polyculture was from April to December. Saha (2003) stated that there were two culture seasons in Dinajpur sadar upazila (Fazilpur and Sunderban union).

The average stocking density in the study area was found to be 14,500 fry/ha/yr similar to Khan (2012), Kundu (2012), Rahman (2003), Islam (2005) and Hassanuzzaman (1997). The average dose of inorganic fertilizer such as urea and TSP was 116 kg/ha/yr and 102 kg/ha/yr respectively more or less similar to Kundu (2012), Saha (2004) and Hassanuzzaman (1997). In the study area, 83% farmers gave feed to their cultured species and remaining 17% farmers depended on only natural food produced in the pond. It was found that 77% of the farmers applied supplementary feed prepared with rice-bran and mustard oil cake, and 23% farmers used company made feed. The average doses of rice-bran and oil-cake were 2325 kg/ha/yr and 556 kg/ha/yr, respectively similar to Rahman (2003), Rahman (2007) and Hassanuzzaman (1997). Rahman (2007) found that 80% of the farmers applied supplementary feed prepared with both rice bran and mustard oil cake. In the study area, the peak-harvesting season was September to October because during this season fish become marketable size and price was high similar to Saha (2004), Rahman (2003) and Ahmed (2003b). In the study area respondents were identified crisis of fish fry (28%), fish disease (21%), insufficient water in dry season (15%), fish poaching (11%), poor technical knowledge (7%), lack of money (8%), low price of fish (6%) and lack of credit source (4%) respectively to be the most important problems in the study area like Hussain (1999)and Sarwer (2012). In the

present study, it was found that the average annual yield of fish was 3025 kg/ha/yr like Sarwer (2012), Khan (2012), Rahman (2001) and Hossain *et al.* (2013). From the survey, it was found that average production cost of fish culture was Tk. 453750.00 /ha/yr in Mithapukur upazilla like Hossain *et al.* (2013) and Ahmed (2003c). Average net profit was Tk. 117750.00 /ha/yr in Mithapukur upazilla Hossain *et al.* (2013) and Quddus *et al.* (2000). The average cost-benefit ratio (CBR) was 1.35.

## V. CONCLUSION

During the present study, it was observed that Mithapukur upazilla is a great potential area for fish culture and capture. After survey it can be suggested that farmers should be given various facilities such as training program, input availabilities, provided with credit facilities, increase awareness etc. They should be motivated to utilize all types of water bodies for fish culture as well as integrated culture should be adopted. The fish farmers should be given amenities for education so that they can be well aware of their problems and prime rights. All the water resources should be utilized for fish culture to get maximum production by using suitable technology. More hatcheries should be established, so that farmers can get quality seeds easily. Therefore, the enhanced fish production and good aquaculture practices would be ensured in this upazilla if fishers adopt improved fish culture technology and community based fisheries management.

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