

## Profitability Analysis of Small and Large Farms of Fisheries Sub-Sectors: A Case Study at Trishal Upazila in Mymensingh

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### Abstract

The study intends to analysis of the socio-economic conditions of the sample farmers. This study also examined the costs returns and profitability of fish farming. The study was based on mainly primary data .In case of necessary secondary data were also used. A total of 30 pond fish farmers were randomly selected from two villages namely Dhanikhola and Boilor at Trishal Upazilla in Mymensingh district. In this study, both tabular and statistical techniques were used for analysis of data. The finding of the study are : i ) Fish production and construction of ponds shared major parts of gross cost . In the study areas 77 percent of the small farmers captured only 37 percent of the small farmers captured only 37 percent of total land holding and 23 percent of large farmers occupied about 63 percent of total land holding . Measures should be taken to increase pond fish production of the country. Extension worker and agriculture offices should take steps to encourage small farmers to produce more fish .

### Introduction

Bangladesh is an agro-based country. Crops , fisheries , forestry and livestock are the sub sectors of agriculture. The contribution of agricultural sector in Gross Domestic Product (GDP) was about 19.95 percent in 2010-11. The contribution of fisheries subsector to GDP was 3.68 in 2012-13(BER,2014). This sub sector occupies a significant place in the socio-economic development of the country it plays a very important role in nutrition intake, employment generation, foreign exchange earning the economy of Bangladesh . It is the principle sources of animal protein nearly 80 percent of protein total animal protein is delivered by fish alone (FFYP 1998). Fish is recognized as one of the most essential food item over the world. At present fish production has increased to a large extent in Bangladesh. The annual average growth rate of fish production was 5.58 percent ( Department of Fisheries, 1999). In fact, production of fish from culturable water bodies was increased tremendously but it is blow the level of country requirement. Available data indicated that production of fish was 1781057 tons including, inland culture 712640 tons, inland capture 688920 tons and marine sources 379497 tons in 2000-2001. But it stood to 2328545 tons including inland culture 892049, inland capture 1848735 tons and fish production from marine source was 479810 tons in the same year (Bangladesh Fisheries Information Share Home,2008). Fish production has increased in Bangladesh but it can not meet the increased domestic demand for fish. In order to meet the deficiency of fish in Bangladesh our government and some non-government organizations encourage the people of the country to increase fish production at controlled water bodies like ponds, haors, baors etc. In fact, very little economic investigations for fish farming have so far been undertaken by the researchers in Bangladesh. Rana (1996) observed that pond fish culture was highly profitable activity. He also found that pond ownership , feeding, fertilizers application and use human labor had positive impact on pond fish culture but pond singe and stocking of fingerlings had negative effect on pond fish culture.

Rahman (1995) stated that the highest per hectare profit was earned by NGO management farmers and the lowest profit was achieved by owner operated farmers. Nasiba Akter found that pangus fish production was a profitable enterprise. Akerele , D.et. at (2010) conducted a study in Ogun state in Nigeria. He found that fish production was profitable. Murshida Akter (2009) found that pond fish farming was profitable. She also identified that most of fish farmers were facing some problems and constraints in producing fish. The main problems and constraints were lack of credit facilities, high price of inputs, lack of scientific knowledge, lack of extensive services and operating capital.

Mullah , et,at (1990) observe that large ponds achieved higher production than the medium ponds followed by small ponds in their study area .

Samad (1993) estimated that fishing was found to be highly profitable. Hossain (1999) found that net returns in large farms were more than that of small and medium farms. He estimated that net returns from small, medium and large farms were 25224.68,26060.87,and 32973.33 taka per hectare respectively.

In fact, a few studies have been conducted in Bangladesh on pond fish production Keeping this in view the present study is , therefore , undertaken to analyse the profitability of fish production on small and

large farms and identify the socio-economic characteristics of fish farmers .

**The main objectives of the study are as follows:**

- To examine the socio-economic characteristics of pond fish farmers
- To explain the costs, returns and profitability of pond fish farming
- To recommend some policy measures for the improvement of pond fish culture

**Importance of the study**

The findings of the study may help the fishing community and decision makers regarding fish production. The present study will be helpful to the researchers for further studies. The findings of the study have great academic importance to the teachers and the students of economics.

**Methodology**

The study is based on mainly primary data. Primary data were collected from different categories of fish farmers. For the purpose of the study two sample villages namely Boilor and Dhanikhola at Trishal Upazila under Mymensingh district were chosen. Sample farmers were randomly selected. Thirty farmers were selected. Data were collected by direct interview. The data were collected in respect of operation and activities included fish farming. The duration of data collection was July –September 2013. Data were analysed using both tabular and statistical techniques. In case of necessary, secondary data were also used in the study. Secondary data were collected from different official documents and non-official- sources. In the study we do not analyze the fishing activity and culture of small and large farmers separately. We have explained all the profitability and socio-economic conditions of sample farmers irrespective of small and large farmers. We have analysis all the sample of fish farmer irrespective of small and large size.

**Results and interpretations**

This section deals with the socio-economic characteristics of fish farmers and analysis of costs, returns and profitability of fish farming. Socio-economic characteristics in order to get real picture of fish culture, It is necessary to know the socio-economic characteristics of sample farmers of the study areas.

**Socio-economic characteristics of Sample farmers**

**Age Distribution of Sample Farmers**

In the study the fish farmers were classified into three age groups such as 20-40 year, 41-60 year and above 60 years. Age distribution of sample farmers is presented in Table-1

It is evident from Table 1 that out of the total sample farmers 60 percent belonged to the age group of 20-40 year. About 36.67 percent belong to the age group of 41-60 year. Only 3.33 percent of fish farmers fell in to the age group of above 60 years.

Table 1: Age Distribution of Sample Farmers

| Age group(year) | No. of respondents | percent of respondents |
|-----------------|--------------------|------------------------|
| 20-40           | 18                 | 60.00                  |
| 41-60           | 11                 | 36.67                  |
| Above 60        | 1                  | 3.37                   |
| Total           | 30                 | 100.00                 |

Source: Field survey, 2013

Majority of the sample farmers were in the active age group of 20 -40 year which indicates that they provided more physical labour and efforts for fish farming.

**Educational Status of Sample Farmers**

The literacy level was classified in to four groups. These groups are Illiterate, primary, S.S.C and HSC level. Educational level of the respondents is presented in Table 2

Table 2: Educational status of the respondents

| Level of education | No. of respondents | Percent of respondents |
|--------------------|--------------------|------------------------|
| Illiterate         | 6                  | 20.00                  |
| Primary            | 9                  | 30.00                  |
| S.S.C              | 10                 | 33.33                  |
| H.S.C              | 5                  | 16.67                  |
| Total              | 30                 | 100.00                 |

Source: Field survey, 2013

It is evident from Table 2 that of the total 30 farmers 20 percent were illiterate, 30 percent were primary, 33.33

percent were SSC and 16.67 percent farmers has taken H.S.C level of education.

### Occupation of the Sample Farmers

Sample farmers were engaged in different types of occupation. Table 3 shows the occupation of the sample farmers.

Table-3: Occupation of the sample farmers

| Occupation   | No. of respondents | Percent of respondents |
|--------------|--------------------|------------------------|
| Agriculture  | 9                  | 30.00                  |
| Fish farming | 16                 | 53.33                  |
| Business     | 3                  | 10.00                  |
| Service      | 2                  | 6.67                   |
| Total        | 30                 | 100                    |

Source: Field survey 2013

It is evident from the Table 3 that out of 30 fish farmers only 30 percent engaged in agriculture, 53.33 person involved in fish farms and 10 percent associated with business activities and 6.67 percent engaged in service agriculture, fish farming, business represented occupation for 30 percent, 53.33 percent, 10 percent and 6.67 percent respectively of the fish farmers.

### Household size

In this study, sample farmers were classified in to three household size groups such as 1-5 person, 5-8 person and above 8 persons.

Table 4 : Household Size of the Sample farmers

| Household size(person) | No. of respondents | Percent of total respondents |
|------------------------|--------------------|------------------------------|
| 1-4                    | 8                  | 26.67                        |
| 5-8                    | 21                 | 70.00                        |
| Above 8                | 1                  | 3.33                         |
| Total                  | 30                 | 100.00                       |

Source: Field survey, 2013

It appears from Table 4 that of the total sample farmers 26.67 percent belonged to the household size group of 1-4 person, 70 percent belonged to the size group of 5-8 person and only 3.3 percent of fish farmers fell in to size group of above 8 persons.

### Farming Experience of the Sample Respondents:

Experience is an important item in fish farming. In this study experience of fish farming were divided into five periods such as 0-5 year,5-10 year, 11-15 year and above 15 years.

Table 5 : Experience of sample farmers

| Years of experience | No. of respondents | Percent |
|---------------------|--------------------|---------|
| 0-5                 | 7                  | 23.33   |
| 5-10                | 14                 | 46.67   |
| 11-15               | 9                  | 30.00   |
| Above 15 years      | 0                  | 0       |
| Total               | 30                 | 100.00  |

Source: Field Survey, 2013

It appears that out of 30 farmers 47 percent were belong to 5-10 years experience .

### Distribution of sample farmers

In this study, the fish farmers were classified into three landholdinh categories, such as small farmers, medium farmers and large farmers.

For the purpose of the study, respondents were divided into three groups according to the size groups. These classes are as follows

- 0- 2.50 acres
- 2.51-3.50 acres
- 3.51 acres above

The above classes were also squeezed into two groups and defined as follows :

- Small farmers :Having land between 0.1 and 2.5 acres
- Large farmers : Having land between 3.51 acres and above

Table 6: Patterns of land Ownership of Sample Farmers

| Class                           | No. of respondents | Percents of total respondents | Percentage of land holding |
|---------------------------------|--------------------|-------------------------------|----------------------------|
| Small farmers(0-2.50 acres)     | 23                 | 76.67                         | 37.00                      |
| Medium farmers(2.51-3.50 acres) | 0                  | 0.00                          | 00.00                      |
| Large farmers(3.51 and above)   | 7                  | 23.33                         | 63.00                      |
| Total                           | 30                 | 100.00                        | 100.00                     |

Source: Field Survey, 2013

It is evident from Table 6 that 76.67 percent of small farmers occupied only 37 percent of total land holding and 23.33 percent large farmers captured nearly 63 percent of total land holding.

#### Indebtedness of Sample Farmers

Some farmers borrowed money from banks. Table 6 shows the indebtedness of farmers on the bank of borrowed money. Table 6 shows the indebtedness of farmers.

Table 7: Indebtedness of sample farmers

| Amount of loan Tk | No. of respondents | Percent of total respondents |
|-------------------|--------------------|------------------------------|
| 5,000-10,000      | 5                  | 16.66                        |
| 10,000-15,000     | 3                  | 10.00                        |
| 15,000-20,000     | 2                  | 6.66                         |
| 20,000-25,000     | 1                  | 3.33                         |
| Not indebted      | 19                 | 63.33                        |
| Total             | 30                 | 100                          |

Source :Field Survey, 2013

It is evident from the table 6 that 63.33 percent farmers were not indebted. About 16.66 percent farmers borrowed Tk 5000 to 10000, 10 percent borrowed Tk 15000 to 20000, only 3.33 percent borrowed Tk 20000 to 25000.

#### Profitability analysis of fish farming:

In this section, an attempt has been made to estimate the costs , returns and profitability of fish production .

#### Cost of Fish Production

##### Cost of fingerlings:

In the study areas farmers used purchased fingerlings. The cost of fingerlings was calculated on the basis of farm gate price.

The selected species of fingerlings were Rui, Catla , grass carp, silver carp, mirror carp, mrigel used for fish farming. Per unit price of fingerlings depends on the size and concerned fish species.The average unit price of fingerlings was Tk 1 only. Per acre cost of fingerlings was 5239 Tk / acre, which was about 5.3 percent of the total cost. Per acre cost of fingerlings was only 5239.53. taka which was about 5.39 percent of gross cost. In this study the number of fingerlings was table 8 shows the per acre cost of fingerlings for fish production

| Cost item   | Quantity of fingerlings | price | Tk per Acre |
|-------------|-------------------------|-------|-------------|
| fingerlings | 5239                    | 1Tk   | 5239        |

Source : Field Survey, 2013

**Cost of Fertilizers:** In the study areas farmers used urea and Triple super phosphate

Cost of fertilizer was about 1216.92Tk which was about 1.25 percent of gross cost.

**Cost of Lime:** In this study, farmers study lime farmer used lime to neutralize acidity in the soil and water of pond. Per cost of lime was about 3560.76 which was about 3.71 percent of the total cost.

Table 8: Per Acre costs and Returns of Fish Production

| Particulars                             | Costs and Returns ( TK/Acre) | Percent of the gross Cost |
|---|------------------------------|---------------------------|
| A.Total Yield (kg)                      | 2137.16                      |                           |
| B.Gross Return (TK)                     | 117543.56                    |                           |
| Human labour cost (TK)                  | 20819.08                     | 21.42                     |
| Fertilizer Cost (TK)                    | 1216.92                      | 1.25                      |
| Lime cost (TK)                          | 3560.76                      | 3.66                      |
| Feed Cost (TK)                          | 18019.80                     | 17.54                     |
| Equipment Cost (TK)                     | 2367.24                      | 2.4432                    |
| Irrigation cost (TK)                    | 19207.92                     | 19.77                     |
| Transportation cost (TK)                | 4950.50                      | 5.00                      |
| Fingerling cost (TK)                    | 5239.53                      | 5.39                      |
| Pond Construction cost (TK)             | 21935.19                     | 22.557                    |
| Maintenance Cost (TK)                   | 1332.13                      | 1.36                      |
| D.Gross Cost                            | 97154.64                     | 100.00                    |
| E.Net Return (B-D) Tk.                  | 20,388.92                    |                           |
| F.Return over per Taka Investment (E/D) | 0.21                         |                           |
| Benefit-Cost Ratio ( B/D)               | 1.21                         |                           |

Source: Field Survey, 2013

**Construction cost of ponds:**

per acre cost of ponds was about 21933.19 Tk to 218500tk which was only 22.57 % of the total cost ( Table 8) .

**Cost of human Labor:**

Human labor was largely employed in the study areas. The human labor consisted of permanent, family and hired labor. Per acre cost of human labor was about 20819.08 Tk which was nearly 21.43 percent of total cost.It is observed that human labor and construction of ponds shared major part of gross cost (Table:8 )

**Cost of feed:**

Farmers used various kinds of artificial feed items for fish production.The items were rice bran, oil cake, green grass. Duckweed. In this study per acre cost of feed was about 18019.80 Tk which was only 18.54 percent of the total cost ( Table 8 )

**Cost of Irrigation:**

In the study areas farmers used STW for supplying irrigation water to their ponds. Water level go down in the dry season , as such irrigation water is necessary. Per acre cost of irrigation was about 19207.92tk which was nearly 19.77 percent of the total cost ( Table: 8)

**Cost of Equipments:** per acre cost of equipments was about 2367.24 which shared 2.4 percent of the total cost.

**Transportation costs:**

Per acre transportation cost was about 4950.50 Tk which represented 5.09% of the total cost ( Table: 8)

**Maintenance cost:**

Per acre maintenance cost was about 1332.13 Tk which was occupied only 1.37 percent of the gross cost.

**Gross cost:** Per acre gross cost for fish production was Tk 97154.64 (table 7).

**Gross return:**

gross return was estimated by multiplying the total product by the prevailing market prices. Per acre gross return achieved from fish production was Tk 11754.56.(Table 8)

**Net return:** Net return was calculated by deducting gross cost from gross return . In this study per acre net return was Tk 20388.92.

**Return over per Taka Investment.** Net return per taka invested is the ratio between net return and total cost. Table 8 shows that net return per taka investment in fish farming was 0.21. It indicates that by spending Tk 1.00, a net return of Tk 0.21 was achieved. Benefit-Cost Ratio (Undiscounted) : Benefit-Cost Ratio ( Undiscounted was calculated by dividing gross return by gross cost. Table 8 represents that benefit-cost ratio of fish farming was 1.21 which indicates that production of fish was profitable in the study areas. Benefits-Cost ratio was higher than one suggesting that there is a good potential for fish development in the study areas. Thus we may conclude that fish production is a profitable enterprise.

**Conclusion and policy recommendations:**

On the basis of the findings of the study it is evident that fish production is profitable enterprises. There is a large opportunity prevails in the study areas to increase the production of fish. The following recommendations are made on the basis of the objectives and findings of the study.

1. The findings of the study indicate that fish production is a profitable business. Measures should be taken to increase the pond fish production of the country. Fish production should be raised by improving the production technology upgrading the knowledge level of the farmers. Farmers should be provided sufficient information and enough facilities to increase per acre production of fish.
2. Fish farming should be encouraged. Measures should be taken in order to ensure easy availability of different material inputs to the fish farmers. So that farmers can be attracted to invest more in fish production. Extension workers and agriculture officers should take steps to encourage small farmers to produce more fish.
3. It is evident from the study that fish production is labor intensive. As a result there is a great scope to fishery sub sector for increasing employment opportunity.
4. Assistant of small farmer in farming associations for improving production. The absorbing credit and adopting new technologies. Although members of association would adopt cultural practices and should formulate more efficient production plan. This would bring positive change to the small farmers of Bangladesh.
5. The underutilized land in rural Bengal could be properly utilized for fish farming. If more and more land could be brought under fish farming our country could probably have earned a huge amount of foreign exchange by exporting more fish. In this regard government intervention is required.

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