

Article

Economic analysis of the fishery activities of Bergobindapur *baor* at Chaugachha upazila under Jessore district of Bangladesh

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Abstract: The study was conducted on Bergobindapur *baor* at Chaugachha upazila under Jessore district. The study period was February to June, 2015. Data were collected by using participatory rural appraisal (PRA) tools and personal observation. Net return was loss in 2013-2014 and the loss amount was BDT 254200. Cost benefit-ratio in 2013-2014 was 0.99. Major income (83.30%) of the fishermen community was drawn from the fishery activities of Bergobindapur *baor*. In 2014-2015, average income of fishermen was BDT 25250 during the fishing period. Within the household of fishermen community, the expenditure for food was 19%, clothing, 3%, children's education, 19%, medical, 3%, dowry and religion, 33%, agriculture, 13% and others, such as business, accommodation, sanitation etc. 10%, which came from *baor* activities. The findings of this study indicated that Bergobindapur *baor* plays a vital role for the support of livelihood of fishermen and net profit from *baor* was not satisfactory. A long-term strategy should be developed to make the *baor* profitable. The developed strategic plans should be initiated immediately for the profitability of the *baor* as well as improving the livelihood conditions of the fishermen engaged with the *baor* fishery activities.

Keywords: economic analysis; *baor* fishery activities, impact on fishermen

1. Introduction

Jessore district has a large number of ponds, rivers, marches, *baor*, *beel* and total fish production from Jessore was 70426 MT during 2010-11 (BBS, 2013). A *baor* is ox-bow lake, which is the still part of the flood plain of river connected by inlets and outlets. By screening the inlets and outlets a *baor* can be converted into a culture based fishery (DoF, 1996). Fisheries sector employed about 1.3 million full time fishermen and 12.5 million part times (DoF, 2013). Livelihood support could have various meanings, ranging from livelihood provision, to protection, recovery and promotion (Maxwell, 1999). The average rate of production from *baor* was 633kg/ha which can be increased manifold (DoF, 2011). Abdullah-Bin-Farid *et al.* (2013) found that socio-economic conditions of fishermen of the Baluhar *baor* was 58% lived in joint families, 78% used *kancha* (un-hygenic) sanitary latrine, 58% having 0.041 hectare lands and 74% lived in *kancha* (earthen) house. Das (2014) reported that total benefit from Bergobindapur *baor* was BDT 7135363.5 in the year 2012-13. From the above reviews, it was understood that the study on *baor* was limited and there were no research works about how *baor* had impacts on rural fishermen in the aspect of Bangladesh. Thus the present study was very important and it will

contribute the considerable value for *baor* fishery. Therefore, the present study was undertaken to assess the economic analysis and to know the impacts of *baor* on rural fishermen.

2. Materials and Methods

2.1. Study area and study period

The study was conducted on Bergobindapur *baor*, which was situated at Chaugachha upazila, Jessore from February to June, 2015. The total area of Bergobindapur *baor* was about 217 hectares. (Source: Bergobinapur *baor* office).

2.2. Physical structure

The stage of infrastructural development at Bergobindapur *baor* was much highly established under government departmental management in Oxbow Lakes Project-1 (OLP-1). The general information on physical structures of Bergobindapur *baor* is shown in Table 1.

Table 1. Physical structure of Bergobindapur *baor*.

| Characters | Unit | Bergobindapur <i>baor</i> |
|---------------------|----------|---------------------------|
| Area | Hectare | 217 |
| Average depth | Feet | 30 |
| Surrounding village | Nos | 5 |
| Sluice gate | Nos | 1 |
| Culvert | Nos | 10 |
| Fish landing center | Nos | 1 |
| Guard shed | Nos | 1 |
| Fish Sanctuary | Nos | 0 |
| Pump house | Nos | 1 |
| Electricity supply | 220 volt | Yes |

2.3. *Baor* management system

The culture management of Bergobindapur *baor* was managed by the Department of Fisheries (DoF).

2.4. Target groups

The study was conducted on 50 fishermen engaged with the Bergobindapur *baor* activities. In the study area, a large number of fishermen earned their livelihood in fishing from *baor* and its associated activities.

2.5. Data collection method

Fishermen's data were collected using various participatory rural appraisal (PRA) tools such as focus group discussion (FGD), key informant's information, semi structured interviews etc and relevant data were collected from *baor* office and Fisheries Complex, Arabpur, Jessore.

2.6. Data analysis

All the collected data were summarized and scrutinized carefully and analyzed by MS Excel and then presented in tabular and pie-chart forms.

2.7. Economic analysis

The cost benefit analysis of Bergobindapur *baor* was done. The capital cost, operating cost, revenue income, cost-benefit ratio and net profit were analyzed.

2.7.1. Capital cost

Capital cost (land acquisition cost, residential building construction cost, pump house construction cost etc. associated with *baor* operation) was understood by questionnaire interview.

2.7.2. Operating cost

The operating cost (e.g. wages of staffs, labor, feed, fingerlings cost etc.) was calculated from the costs involved to *baor* fish production in the fiscal year 2013-2014.

2.7.3. Depreciation cost

Annual depreciation cost was calculated by using the following formula (Akhter, 2007):

$$\text{Annual Depreciation Cost} = \frac{\text{Capital cost}}{\text{Project life}}$$

2.7.4. Total cost

Total cost was calculated by using the following formula (Akhter, 2007):

$$\text{Total cost} = \text{Operating cost} + \text{Depreciation cost}$$

2.7.5. Revenue income

The revenue income (total income from fish in the fiscal year 2013-2014 was calculated on the basis of total sale of fish.

2.7.6. Cost-benefit ratio

Total cost-benefit ratio was calculated by using the following formula:

$$\text{Cost-benefit ratio} = \frac{\text{Total benefit}}{\text{Operating cost}}$$

3. Results

3.1. Economic analysis

Economic analysis of Bergobindapur *baor* was done. Capital cost, operating cost, annual depreciation cost, total cost, revenue income, cost-benefit ratio and net profit were analyzed, respectively (Tables 2 to 8).

Table 2. Capital cost.

| Cost items | Capital cost (BDT) |
|---|--------------------|
| Land acquisition cost (45.12 acre) | 682000 |
| Residential building cost (1300 ft ²) | 528000 |
| Guard shed and meters cost | 48000 |
| Pump house construction cost | 68000 |
| Water controlled infrastructure construction cost | 417000 |
| Dynar <i>beel</i> excavation cost (31 hectare) | 2276000 |
| Boundary wall construction and internal facilities cost | 842000 |
| Oxidation tank cost | 41000 |
| Tube well cost | 28000 |
| Adjacent road construction cost (2.04 mile) | 2058000 |
| Electricity line cost (4.15 km) | 1179000 |
| Telephone cost | 2460000 |
| Office cum hatchery building cost (1975 ft ²) | 600000 |
| Fish landing centre cost | 42000 |
| Nursery pond excavation cost | 7000000 |
| Total | 9755000 |

Table 3. Operating cost.

| Cost items | BDT/Fiscal year 2013-2014 |
|-------------------------------------|---------------------------|
| Fish feed cost | 1086000 |
| Fingerling cost (152kg/ha) | 50000 |
| Labor cost (Number of labor 14) | 420000 |
| Land development tax | 70000 |
| Tax | 20000 |
| Electricity cost | 105000 |
| Fuel cost (petrol, Diesel) | 30000 |
| Tools repair and storage cost | 10000 |
| Boat and net repairing cost | 50000 |
| Salaries and allowance of personnel | 1925000 |
| Total cost | 3766000 |

Table 4. Annual depreciation cost.

| | |
|-----------------------------------|-----------------------------------|
| Annual depreciation cost = | Capital cost/ Project life |
| | = 9755000/50 |
| | = 195100 BDT |

Table 5. Total cost.

| Fiscal year | Operating Cost + Annual Depreciation Cost (BDT) | Total cost (BDT) |
|--------------------|--|-------------------------|
| 2013-2014 | 3766000 +195100 | 3966100 |

Table 6. Revenue income.

| Species | BDT/ Fiscal year 2013-2014 |
|-------------------------------------|-----------------------------------|
| Carp fish | 2611900 |
| Small indigenous fish species (SIS) | 1100000 |
| Total income | 3711900 |

Table 7. Cost benefit ratio.

| Fiscal year | Total benefit / Operating cost | Cost benefit ratio |
|--------------------|---------------------------------------|---------------------------|
| 2013-2014 | 3711900/3766000 | 0.99 |

Table 8. Net profit.

| Fiscal year | Total income - Total cost (BDT) | Net profit (BDT) |
|--------------------|--|-------------------------|
| 2013-2014 | 3711900 - 3966100 | -254200 |

3.2. Impacts of *baor* on rural fishermen

3.2.1. Impacts on income sources

Baor has great impacts on rural fishermen income as well as their livelihood. The average income of fishermen was about BDT 25250 during a fishing period from the Bergobindapur *baor*. In the study area, it was observed that total income derived from fishing activity in Bergobindapur *baor* was BDT 1262500 in 2014-2015 (Table 9).

Table 9. Impacts on income sources of fishermen.

| Number of respondents | Income BDT (fishing period) | Average income (BDT) |
|------------------------------|------------------------------------|-----------------------------|
| 10 | 300000 | 25250 |
| 20 | 550000 | |
| 5 | 112500 | |
| 15 | 300000 | |
| Total = 50 | Total = 1262500 | |

In the study area, it was observed that 83.30% of fishermen's incomes were derived from *baor* fishing activity that is termed as primary income. The rest 16.70% were derived from business and agricultural activities (Figure 1).

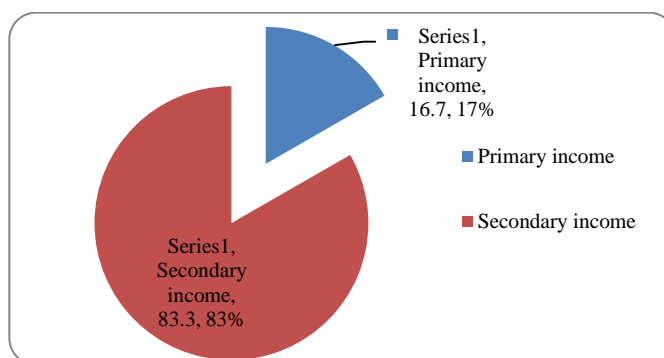


Figure 1. Income sources of fishermen.

3.2.2. Impacts on expenditure

Fishermen’s expenditure derived from the income of *baor* fishing activity in a year were for food, 19%, clothing, 3%, children’s education, 19%, medical, 3%, dowry and religion, 33%, agriculture, 13% and others, such as business, accommodation, sanitation etc. 10%, (Figure 2).

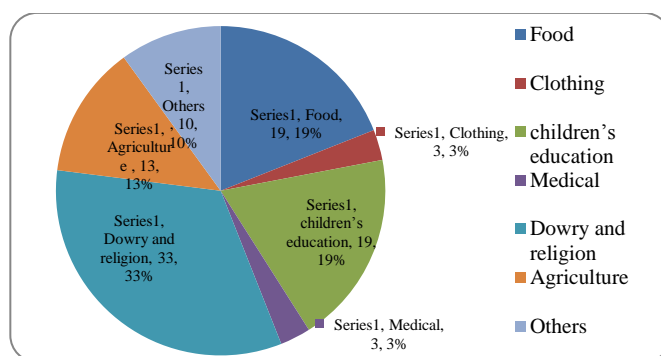


Figure 2. Total expenditure.

4. Discussion

Das (2014) reported that total benefit from Bergobindapur *baor* was 7135363.5 BDT in the year 2012-13, but in the present study it was estimated that net loss and net profit during the fiscal year 2013-2014 was 254200 BDT. Samad *et al.* (2014) reported that cost-benefit ratio of Begobindapur *baor* was 0.941692 during the fiscal year 2011- 2012, but in the present study, it was estimated that cost benefit-ratio during the fiscal year 2013-2014 was 0.99 which was relevant to those of above findings.

During the present study, it was found in a year total income of fishermen was BDT 1262500 during fishing period The primary income of the fishermen were derived from boar fishing activity and other activities interrelated to *baor* such as sometimes stocking of fingerlings, feed supply to culture fish, etc. Fishing activity in the *baor* extended from about March to July and rest of the year most fishermen had no income sources. In the study area, it was observed that 83.30% of fishermen income was derived from *baor* fishing activity. The rest 16.70% from agricultural activity of farmers land, tea stall business. Islam *et al.* (2013) found that fishing activity as the primary source of income of the fishermen in Jessore district. Flowra *et al.* (2009) mentioned that only 4.5% of the fishermen involved as daily laborer in Dahia *beel* area of Natore district, which was more or less similar to that of the present study.

5. Conclusions

A large number household in the fishermen communities depends on the fishery activities in Bergobindapur *baor*. They earned major part of their total earnings from the *baor* and also meet their household nutrition from the fishery activities of the *baor*. Therefore, it has great impacts on rural fishermen income, expenditure and plays a vital role for the support of livelihood of fishermen. However, the net profit of the *baor* was not satisfactory. As the Bergobindapur *baor* is governed by DoF, so the government should take necessary initiatives immediately to make profitable the *baor*. Other than DoF, different organizations like NGOs, entrepreneurs, research organizations may raise their hand and assistance to long-term sustainably development of the *baor* and the improvement of socio-economic conditions of fishermen engaged with the *baor*.

Conflict of interest

None to declare.

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