

FISHERIES MANAGEMENT SCENARIOS OF TWO BAORS IN THE DISTRICT OF CHUADANGA, BANGLADESH

M. MASUDUR RAHMAN BISWAS¹, M. FARIDUL ISLAM², M. MEZBANUR RAHMAN³, M. ABU KAWSAR⁴ AND SHYAMAL KANTI BARMAN⁵

¹ Agriculture, Rural Development and Research Sector, Implementation Monitoring and Evaluation Division, Ministry of planning, Dhaka, ² Palli Karma Sahayak Foundation (PKSF), Sher-e-Bangla Nagar, Dhaka, ³ Comprehensive Disaster Management Programme (CDMP), Climate Change Cell, UNDP,

⁴ Implementation Monitoring and Evaluation Division, Ministry of planning, Dhaka, ⁵ Consultant, Sustainable Development Associates, Bananni, Dhaka, Bangladesh.

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ABSTRACT

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The study was conducted to identify the management scenarios of two Baors namely Bhandardah baor (Baor-1) and Uzalpur baor (Baor-2) in the District of Chuadanga during June 2003 to July 2004. Baor-1 was directly managed by Fisheries Officer while Baor-2 was managed through community based fisheries management. The commonly cultured species were silver carp (*Hypophthalmichthys molitrix*), rohu (*Labeo rohita*), catla (*Catla catla*), mrigal (*Cirrhina cirrhosus*), common carp (*Cyprinus carpio*), grass carp (*Ctenopharyngodon idella*) and the stocking density of those species were 43, 18, 15, 14, 19, 16 kg/ha and 46, 25, 19, 17, 18, 14 kg/ha in Baor-1 and Baor-2 respectively. The species composition of silver carp, rohu, common carp, catla, grass carp and mrigal were 35%, 14%, 15%, 12%, 13% and 11% and 33%, 18%, 13%, 14%, 10%, 12% in baor-1 and baor-2 respectively. Kochal, komor and chack fishing were used for fish harvesting and catch were 481 and 565 kg/ha in Baor-1 and Baor-2 respectively. Income, expenditure and net benefit in Baor-1 were BDT* 18469.38/ha, BDT 10093.8/ha and BDT 8375.6/ha respectively. On the other hand, income, expenditure and net benefit in Baor-2 were BDT23143/ha, BDT11918.91/ha and BDT11224/ha respectively. The study revealed that community based fisheries management (Baor-2) was better in terms of production, income and net benefit. So it could be concluded that all oxbow lakes should be taken under community based fisheries management to gain maximum production.

Keywords: *Baor Fish Production, management scenarios*

INTRODUCTION

The Fisheries resources of Bangladesh are among the richest in the world and the inland fisheries production still ranks fourth in the world only after China, Indonesia and India. The country has vast inland water resources in the form of rivers, canals, estuaries, flood plains, depression (Beels) ox-bow lakes, reservoirs, ponds and shrimp farms in the coastal area and marine waters in the Bay of Bengal with high potential of fish production. Oxbow lakes are semi-closed water bodies, which is occupied by the dead channels of the rivers in the moribund delta of the Ganges. Locally it is called resembled as "horse-shoe" and thus it is named as "Oxbow" lake. There are approximately 600 oxbow lakes in Southwest region of Bangladesh with an estimated combined water area of 5488 ha (Hasan, 1990). Baors were the properties of Jomidars (Landlords) during the British colonial days (1757-1947) and became government property after the abolition of the Jomidary system through a land settlement act in 1951. They were leased to private individuals or cooperatives through open auctions. About six hundred natural lakes covering 5500 hectares (created out of dying or changing course of rivers/creeks) exist in south-western districts of Bangladesh (greater Jessore district with highest concentration, Kushtia and Faridpur district) with a significant potential of raising cultural fish in those lakes. The most successful example of culture-based fisheries that has been accomplished in Bangladesh is in oxbow lakes located in south-west Bangladesh (Hasan *et al.*, 1997) the average yield.

Oxbow lakes are semi-closed water bodies, which are occupied by the dead channels of the rivers in the moribund delta of the Ganges. Locally it is called "Boar" resembled as "horse-shoe" and thus it is named as "Oxbow" lake. They were leased to private individuals or cooperatives through open auctions. About six hundred natural lakes covering 5500 hectares exist in southwestern districts of Bangladesh (greater Jessore district with highest concentration, Kushtia and Faridpur district) with a significant potential of raising cultural fish in those lakes. Three species of Indian major carps (rohu, catla and mrigal,) and three Chinese carps (silver carp, grass carp and common carp) are regularly stocked and harvested. To increase fish production Government has to take initiative program through inland culture fisheries.

MATERIALS AND METHODS

The study was conducted to identify the management scenarios of two Baors namely Bhandardah baor (Baor-1) and Uzalpur baor (Baor-2) in the District of Chuadanga during June, 2003 to July 2004. Area of Baor-1 and Baor-2 are about 49 ha and 35 ha respectively. Baor-1 is characterized as Direct Fisheries Management by the Department of Fisheries and Baor-2 is completely leased out and handed over to the community based fisheries management.

* BDT (Bangladeshi currency called Taka) 1 = USD 0.61 APPROX (as on the study year 2003).

Structured questionnaires were used collect different selected biological and cost related information. The primary data were collected through field survey at the study area. Secondary data were collected from Regional Oxbow Lake Head Office- Chuadanga, Bhandardah Oxbow Lake Office, Chuadanga Fisheries Office, Upazill Oxbow Lake Office.

Collected biological data and information obtained from the survey were accumulated, grouped and interpreted according to the objective. For processing and analysis purpose, MS Excel and MS Word, SPSS program were used.

RESULTS AND DISCUSSION

Baor Culture Management

Stocking time

For fish culture, 8-10 cm sized small fish are carried from different sources for stocking in both baors. During stocking in baors all under size, weak and dead fry were rejected. In the year 2001 to 2004, it was done in the month from June to July.

Fertilizing and feeding

No fertilizer and feed were provided in the year 2000 to 2004. Fish culture was fully dependent on natural feed.

Stocking density

The commonly cultured species were silver carp (*Hypophthalmichthys molitrix*), rohu (*Labeo rohita*), catla (*Catla catla*), mrigal (*Cirrhina cirrhosus*), common carp (*Cyprinus carpio*), grass carp (*Ctenopharyngodon idella*) and the stocking density of those species were 43, 18, 15, 14, 19, 16 kg/ha and 46, 25, 19, 17, 18, 14 kg/ha in Baor-1 and Baor-2 respectively in the year 2003-2004.

Table 1. Stocking density of six major species in Baor-1 and Baor-2

Species	Baor-1(kg/ha)	Baor-2(kg/ha)
Silver carp	43	46
Rohu	18	25
Catla	15	19
Mrigal	14	17
Common carp	19	18
Grass carp	16	14
Total	125	139

Source: Upazilla Fisheries Office, Chuadanga, 2004

Species Composition

The species composition of silver carp, rohu, common carp, catla, grass carp and mrigal were 35%, 14%, 15%, 12%, 13%, 11% and 33%, 18%, 13%, 14%, 10%, 12% in baor-1 and baor-2 respectively.

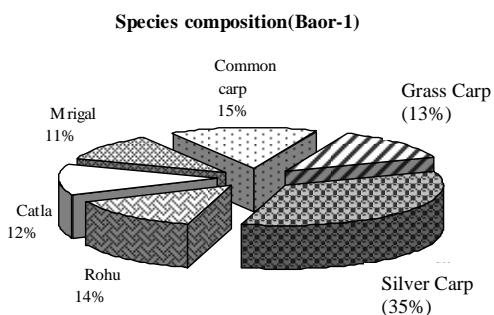


Figure 1. Species composition of six major species in Baor-1

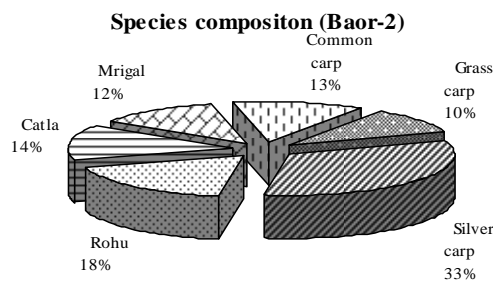


Figure 2. Species composition of six major species in Baor-2

Figure 1 and Figure 2 indicate that silver carp, rohu and common carp were stocked in higher proportion than other species in Baor-1 and Baor-2. In both baors, silver carp production was the highest because available fry locally demand and low cost.

Fish Harvesting Methods

Mainly kochal, komor and chak were used for fish harvesting in both baors.

Table 2. Different fishing methods and catch in different year

Fishing method	Baor-1			Baor-2		
	2001-02	2002-03	2003-04	2001-02	2002-03	2003-04
Kochal fishing	3500	9500	10360	8050	11250	14140
Komor Fishing	5300	6350	6700	2100	2950	3590
Chak fishing	1750	1760	6500	1510	1750	2050
Total (Kg)	10550	17610	23560	11660	15950	19780

Source: Upazilla Fisheries Office, Chuadanga, 2004

Production

Production of Baor-1 was 481 kg/ha in 2003-2004, 359 kg/ha in 2002-2003 and 215 kg/ha in 2001-2002 respectively. On the other hand, production of Baor-2 was 333 kg/ha in 2001-2002, 456 kg/ha in 2002-2003 and 565kg/ha in 2003-2004.

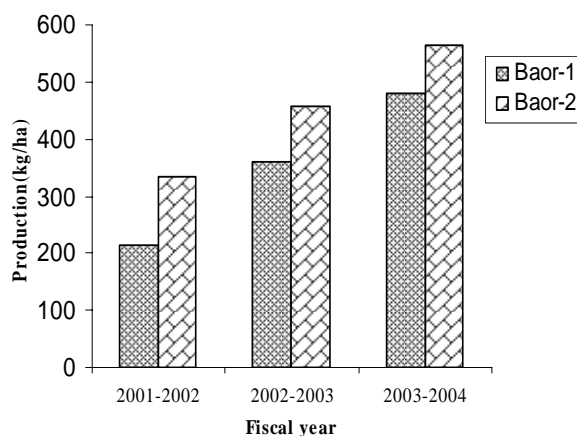


Figure 3. Production of Baor-1 and Baor-2 in different years

Species Wise Production

Six major species were mainly practiced in both the baors. Species wise production was recorded in the studied baors are shown in Table 3. Rohu was found to be the second height individual production after silver carp and common carp occupy the third position in ranking. It was also noted that the overall production in Baor-2 was comparatively better than that of Baor-1.

Table 3. Species wise production in the year 2003-04

Species	Baor-1(kg/ha)	Baor-2(kg/ha)
Silver carp	165	187
Rohu	69	102
Catla	58	77
Mrigal	54	69
Common carp	73	73
Grass carp	62	57
Total	481	565

Source: Upazilla Fisheries Office, Chuadanga, 2004

Cost- Benefit Analysis

The result of cost-benefit ratio of Baor-1 and Baor-2 is provided in Table-4. It was found that the cost-benefit ratio of Baor-1 and Baor-2 varies between 0.829 and 0.941. The highest (0.941) and lowest (0.829) cost-benefit ratio were identified in Baor-2 and Baor-1.

Table 4. Cost-Benefit Analysis of Baor-1 and Baor-2

Cost and benefit	Baor-1	Baor-2
Annual Production (Kg)	23560	19780
Size of the water body (ha.)	49	35
Stocking (Kg)	6125	4865
Unit price (BDT/kg)	38.42	40.95
Gross benefit (BDT)	<u>905000</u>	<u>810000</u>
Cost items		
Lease money (BDT)	0	70000
Salaries(BDT)	176400	126000
Stocking (BDT)	153270	121625
Maintenance (BDT)	45850	21875
Harvesting (BDT)	57428	31020
Marketing (BDT)	55365	39900
Miscellaneous(BDT)	6283	6742
Total cost (BDT)	<u>494596</u>	<u>417162</u>
Net Benefit (BDT)	<u>410404</u>	<u>392838</u>
Total cost (BDT/h.)	<u>10093.8</u>	<u>11918.91</u>
Net Benefit (BDT/h.)	<u>8375.592</u>	<u>11223.94</u>
Cost-Benefit ratio	<u>0.829776</u>	<u>0.941692</u>

Income, cost and net benefit of Baor-1 were BDT 18469.38/ha, BDT 10093.8 /ha and BDT 8375.6 /ha in the year 2003-2004. On the other hand, income, cost and net benefit of Baor-2 were BDT23143/ha, BDT11918.91/ha and BDT11224/ha in the year 2003-2004.

Marketing system

Marketing channels are the alternative routes of product flows from producers to consumers. In the study area, the marketing channels which consisted of fishermen, aratdars, paikers and retailers are depicted.

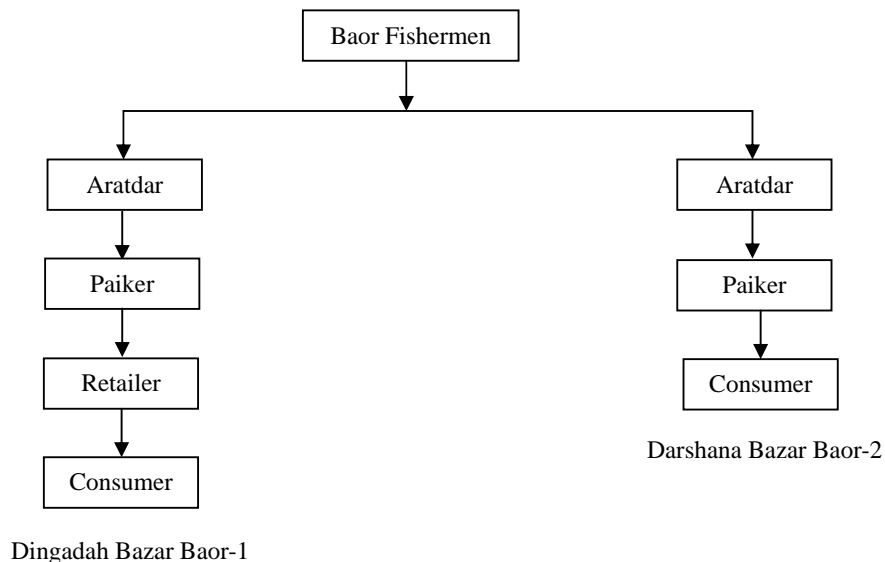


Diagram 1. Marketing channel of Baor-1 and Baor-2

Problems of Baor fisheries management

Baor-1: Lack of developed management system and controlled harvesting, poaching is a common problem in baor fishery, negligence of the fisheries officer, low production due to availability of quality fingerlings, lack of adequate market facilities for fish marketing.

Baor-2: Availability of quality fish seed and fish feed for culture, mugging by the local leaders – members do not have effective accountability, poaching is comparatively less in this baor, lack of fund for baor management.

CONCLUSION

On the basis of problems and results obtained from the study; quality and adequate fingerlings should be ensured, poaching should be stopped and more Government assistance should be provided for Baor-1. For Baor-2; increase guarding facilities to decrease poaching of fish, credit facilities should be ensured for Baor fishers with minimum interest, having a good managing committee and government assistance are essential. Baor fisheries play a vital role in the poverty alleviation of the poor people as well as protein supply for the poor people of the country. There are many problems in baor fisheries management. These problems can be solved through the application of scientific culture technology. As a result, the fish production will be increased and the livelihood status of that fishers' community will be improved. Recommendations are made for sustainable financial returns that are government baor (Baor-I) can be handed over to the private management system.

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