

Article

A study on fishery management of Bergobindapur *baor* at Chaugachha upazila under Jessore district, 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. Stocking densities of silver carp, catla, rohu, mrigal, grass carp, common carp (size 5-6 inch) were 48, 15, 35, 28, 16 and 10 kg/ha and composition were 31%, 10%, 23%, 19%, 10% and 7% in the fiscal year 2013-2014, respectively. In 2014-2015 stocking densities of silver carp, catla, rohu, mrigal, grass carp, common carp (size 5-6 inch) were 28, 9, 23, 9, 9 and 14 kg/ha and composition were 30%, 10%, 25%, 10%, 10%, and 15%, respectively. Total stocking density of carp species was 152 kg/ha in the fiscal year 2013-2014 and 92 kg/ha in 2014-2015. Production of carps and SIS were 345.62 and 258.065 kg/ha in 2013-2014 and 323.065 and 276.50 kg/ha in 2014-2015, respectively. In the study area, seine net was used for *komor and kochal* (local name) fishing. Carp species harvested by *komor and kochal* fishing in 2013-2014 were 276.50 kg/ha, 69.12 kg/ha and in 2014-2015 were 274.61 and 48.43 kg/ha, respectively. Marketing channel started from the fishermen and carp fishes were supplied to three markets namely Chaugachha, Jessore and Jhenidah. The findings of this study assumed that production of fish could be increased 25% through an effective management practices.

Keywords: stocking densities of carp species; composition of carp species; harvesting methods; production of carps and SIS; marketing channel

1. Introduction

A *baor* 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). Jessore district has a large number of ponds, rivers marches, beel and total fish production from Jessore was 70426 MT during 2010-11 (BBS, 2013). Bangladesh was ranked 5th as aquaculture producing country in the world (FAO, 2015). In 2015 total employment in fisheries sector were 17.80 million people that comprised 11% of the total population with a total fish production of 36,48,94 MT (DoF, 2015). Fisheries sector employed about 1.3 million full time fishermen and 12.5 million part times (DoF, 2013). A large number of people, many of whom living below the poverty line, found employment in the domestic fish marketing chain in the form of farmers, processors, traders, intermediaries, day laborers and transporters (Ahmed, 1983). According to Chaston (1987), a fisherman in a small rural community who lands a catch in excess of his need and seeks to exchange the fish for another product is implicitly involved in the activity of fish marketing.

Baor is enriched with freshwater fisheries. In the study area, fishermen's livelihood of five villages (Bergobindapur, Azmotpur, Kushtia, Chandpur and Monmotpur) directly associated with Bergobindapur *baor* fish production, harvesting and marketing. The average rate of production from *baor* 633kg/ha which can be increased manifold (DoF, 2011). Abdullah-Bin-Farid *et al.* (2013) reported that yearly production of Baluhar *baor* was 750 kg/ha. The present study was undertaken to assess the fish production and to understand marketing channel of the *baor* producing carp fish.

2. Materials and Methods

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. The study area is indicated by a circular sign in Figure 1.



Figure 1. Map of Bergobindapur *baor* at Chaugachha upazila in Jessore district.

The culture management of Bergobindapur *baor* was managed by the Department of Fisheries (DoF). The study was conducted on 50 fishermen engaged with the Bergobindapur *baor* activities. Data were collected by field survey through personnel interviews and focus group discussion. Necessary relevant information were collected from Bergobindapur *baor* office. All the collected data were summarized and scrutinized carefully and analyzed by MS Excel and then presented in tabular and pie-chart forms.

3. Results

3.1. Stocking densities of carp species (size 5-6 inch)

The total stocking density of carp species was 152 kg/ha in the year 2013-2014 and 92 kg/ha in the year 2014-2015, respectively in Bergobindapur *baor*. Stocking densities of carp species kg/ha are shown in Table 1.

Table 1. Stocking densities of carp species of size 5-6 inches.

Species	Stocking density (Kg/ha) in 2013-2014	Stocking density (Kg/ha) in 2014-2015
Silver Carp	48	28
Catla	15	9
Rohu	35	23
Mrigal	28	9
Grass Carp	16	9
Common Carp	10	14
Total	152	92

3.2. Composition of carp species

During the fiscal year 2013-2014 stocking of carp species (%/ha) were 31%, 10%, 23%, 19%, 10%, and 7% for silver carp, catla, rohu, mrigal, grass carp and common carp, respectively (Figure 2).

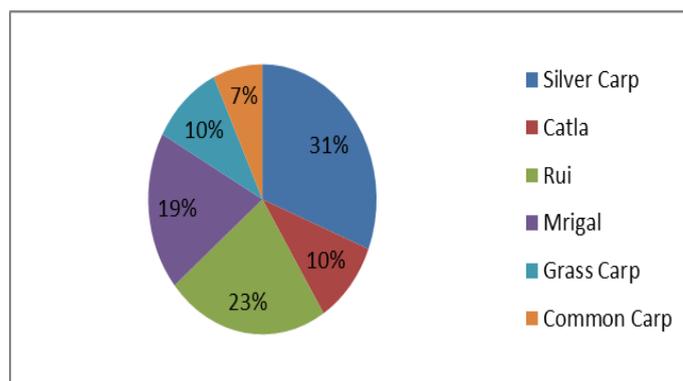


Figure 2. Stocking of carp species (%/ha).

On the other hand, during the fiscal year 2014-2015 of stocking of carp species(%/ha)were 30%, 10%, 25%, 10%, 10%, and 15% for silver carp, catla, rohu, mrigal, grass carp and common carp, respectively (Figure 3).

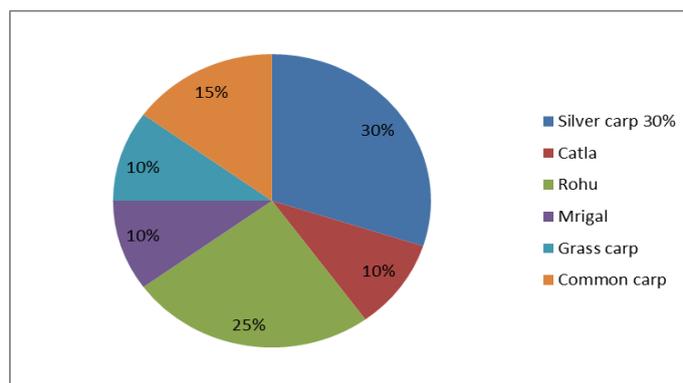


Figure 3. Stocking of carp species (%/ha).

3.3. Harvesting methods

Two types of fishing methods were used in the study area, *Kochal* and *Komor* fishing.

3.3.1. *Kochal* and *Komor* fishing

The terms *kochal* and *komor* fishing were local name in the study area, which were mostly used for fishing the carps. Scientifically, seine net was used for those types of fishing methods. But for the *komor* fishing, carps shelter was prepared. After 5-7 days of *kochal* fishing, carp fishes were harvested with the help of *komor* method. Water was agitated around the shelter, fishes crowded in the shelter and then seine net was used for harvesting. By *komor* and *kochal* fishing during the year 2013-2014 and 2014-2015 carp fishes harvested were 276.50 and 69.12 kg/ha and 274.61, and 48.43 kg/ha, respectively (Table 2).

Table 2. *Kochal* and *Komor* fishing.

Fiscal year	Fishing methods	Harvested carp fish (kg/ha)
2013-2014	Komor	276.50
	Kochal	69.12
2014-2015	Komor	274.61
	Kochal	48.43

3.4. Production of carps and SIS

During the year 2013-2014 the production of carp species (locally called Raja fish) was 345.62 kg/ha and production of small indigenous species (SIS), (locally called Rani Fish) was 258.065 kg/ha. During the year

2014-2015 the production of carp species was 323.065 kg/ha and the production of SIS was 276.50 kg/ha (Table 3).

Table 3. Production of carps and SIS.

Fiscal year	Production of carps (kg/ha)	Production of SIS (kg/ha)
2013-2014	345.62	258.065
2014-2015	323.065	276.50

3.5. Marketing channel

Marketing channels showed how carp fish reached to the consumers from the *baor* fishermen. In the study area, marketing channel started from the fishermen. They brought their fish to three markets namely, Chaugachha, Borobazar and Barobazar market with the inspection of *baor* manager. If fishes were caught during morning 80% fishes were sold to Borobazar Aratdars (Jessore), 15% were sold to Barobazar Aratdars (Jhenidah) and rest of 5% were sold to Chaugachha Aratdar (Jessore). Alternatively, if fishes were caught during afternoon, 80% fishes were sold to Barobazar Aratdars (Jhenidah), 15% were sold to Borobazar Aratdars (Jessore) and rest 5% were sold to Chaugachha Aratdar (Jessore). Then fishes were sold to Paikers. The retailers bought fish in the wholesale market to sale directly to ultimate consumers. In addition, fishes were sold to Dhaka Paikers from Barobazar Aratdars (Jessore) and finally reached to the consumers of Dhaka (Figure 2).

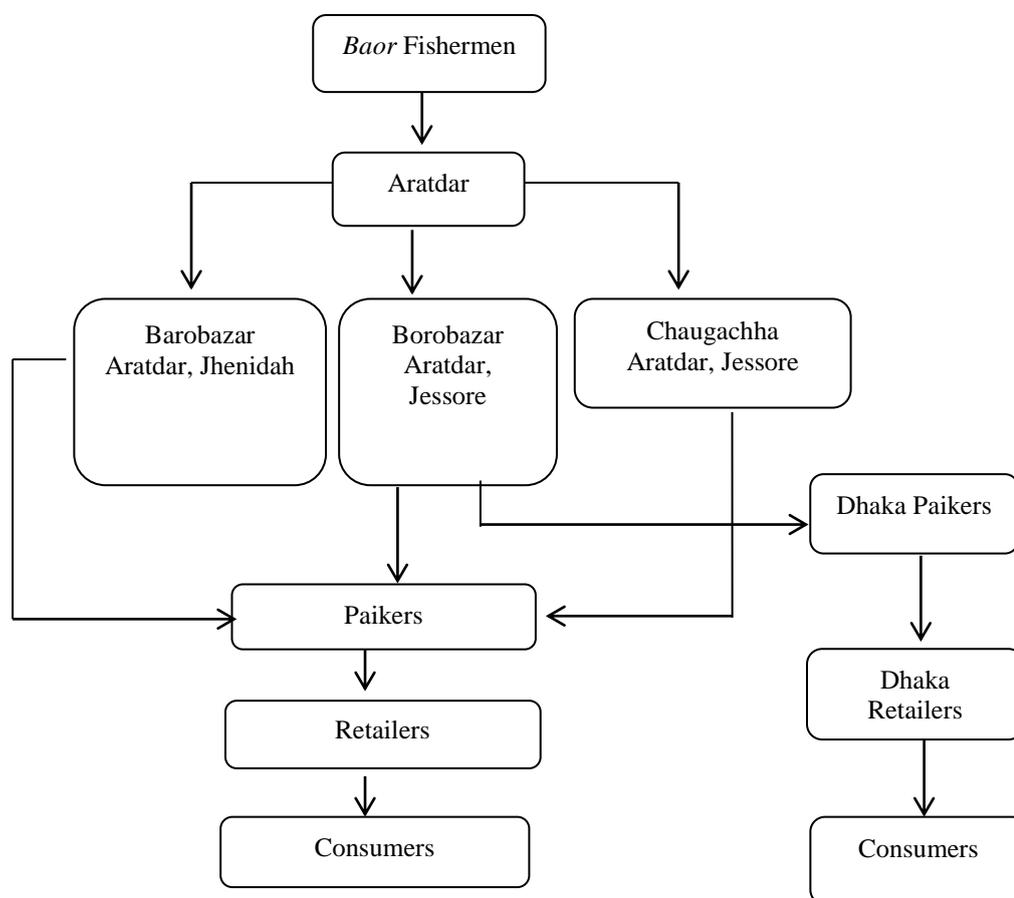


Figure 2. Carp fish marketing channel.

3.6. Problems

Various problems were found in Bergobindapur *baor* such as

- Floods occur irregularly
- Low production due to fingerlings stocking problem,
- Continuous drying of *baor*
- Agro chemicals used for rice cultivation

- e) Disease problem especially gill diseases
- f) Water pollution occurs from September to November
- g) Water hyacinths pressure

4. Discussion

Biswas *et al.* (2009) reported that 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 present study, it was observed that stocking density of carp species were 48, 15, 35, 28,16,10 (kg/ha) and 28,9, 23, 9, 9, and 14 kg/ha for silver carp, catla, rohu, mrigal, grass carp, common carp (size 5-6 inch) in the year 2013-2014 and 2014-2015, respectively. Which were relevant to that of the present findings.

Abdullah-Bin-Farid (2013) reported that, *Hypophthalmichthys molitrix*, *Labeo rohita*, *Catla catla*, *Cirrhina cirrhosus*, *Cyprinus carpio* and *ctenopharyngodon idella* were commonly stocked at the composition of 34%, 13%, 12%, 12%, 15% and 14%, respectively. Biswas *et al.* (2009) reported that 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, which were more or less similar to that of the present study. The present study showed that stocking composition of carp species were 31%,10%, 23%, 19%, 10%, 7% and 30%, 10%, 25%, 10%, 10%, and 15% for silver carp, catla, rohu, mrigal, grass carp and common carp in the fiscal year 2013-2014 and 2014-2015 respectively, which were relevant to those of above findings.

Jamali *et al.* (2013) observed that average production was 3,512.8 kg/ha for carps. Among them 1,862.6 kg/ha (53.02%) were Indian major carps and the remainder of 1,650.2 kg/ha (46.98%) were exotic carps. Biswas *et al.* (2009) reported that 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. During the fiscal year 2013-2014 the production of carp species was 345.62 kg/ha and production of SIS (locally called Rani fish) was 258.065 kg/ha. During the fiscal year 2014-2015 the production of carp species was 323.065 kg/ha and the production of SIS was 276.50kg/ha, respectively.

Abdullah-Bin-Farid (2013) reported that, *kochal*, *komor* and *chack* fishing were used for harvesting and yearly production was 750 kg/ha. Biswas *et al.* (2009) observed that *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. In the study area, it was observed that during the fiscal year 2013-2014 carps fish was harvested by *komor* and *kochal* fishing were 276.50 kg/ha, 69.12kg/ha and in 2014-2015 were 274.61kg/ha and 48.43kg/ha, respectively.

In the study area, marketing channel started from the fishermen. They brought their fish to three markets such as Chaugachha, Borobazar and Barobazar market with the inspection of *baor* manager. In addition, fishes were sold to Dhaka Paikers from Barobazar Aratdars (Jessore) and finally reached to the consumers of Dhaka.

Alam *et al.* (2010) reported that market chain from producers to retailers goes onward through a number of intermediaries: Traders, Broker, Aratder, Wholesalers, Mahajans and Dadondars. Jamali *et al.* (2013) observed that under market channel II consists of (Fish farmer-Wholesalers- Retailers- Consumers).

5. Conclusions

Baor fishery plays a vital role for the support of livelihood of fishermen in the study area. A large number of fishermen communities depends on the fishery activities in Bergobindapur *baor* and they meet their household nutrition from the fishery activities of the *baor*. A number of recommendations have been drawn which could be increased fish production of the *baor* in the study area are as follows-

- Meeting should be arranged for good management practices.
- Fingerlings should be stocked at a proper ratio.
- Water pollution should be controlled.
- Gill diseases should be controlled with proper treatment.
- Water hyacinths should be cleaned properly.

Conflict of interest

None to declare.

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