Present status of fishes and their harvesting in *Beel Kumari* under Rajshahi district

M.E. Haque, M.A. Karim, M.H. Ali, A.C. Barman[1] and M.A.R. Zoarder

Department of Fisheries, Rajshahi University, Rajshahi, [1]Bangladesh Fisheries Research Institute, Mymensingh

Abstract: The research work was carried out to determine the types of fishing gears used, catch per unit effort (CPUE) and catch composition of gears of the *Beel Kumari* adjacent to the Mohanpur and Tanor upazila under Rajshahi district from July, 2006 to January, 2007. Three groups of fishing gears i.e. nets, traps and wounding gears were used and a total of 37 species of fish (including small chingri) were identified in the catches of different gears. Among the different types of nets, the highest number of species was recorded in the berjal (30), which was followed by khepla jal (28) and vair traps (3). The highest and the lowest CPUE of fishes by different gears were recorded in berjal and borshi, (13.38 and 0.383 kg/gear/day) respectively.
Key words: *Beel Kumari,* fishing gears, catch per unit effort, species composition.

Introduction

Bangladesh is unique in having perennial large sized water bodies in the flood plains known as "*Beels*". Besides there are about 2.8 million ha of paddy fields which get inundated during monsoon retaining water for 4-7 months (Rahman, 1985 and DoF, 2007). The *Beel*s generally poses high potential for its high production. The vast open water bodies provide natural habitats for various aquatic resources including wild fishes and Prawns (Das et. el., 1990). Approximately 260 species of freshwater fishes, 24 species of prawns, 50 species of reptiles, 24 species of mammals, 475 species of marine fishes and 36 species of shrimps are found in Bangladesh (Rahman, 1989; World bank, 1991; MAEP, 1996). The fisheries sector plays a very important role in countries socio-cultural and economic life, providing food, employment and foreign exchange. The open water fisheries resources are declining day by day due to lack of proper management policy, over fishing, unplanned establishment of flood controlled drainage (FCD) and flood control drainage and irrigation dams (FCDI). Every year about 8000 mt. of pesticides are used in agriculture fields of Bangladesh (BFRI, 2005). As a result about 54 small indigenous species among 260 fresh water species is about to extinct which are born in floodplains and *Beel*s and these are main nutrition source of poor people (FAP-16, 1995). In recent years fish production from these sources has alarmingly declined. Although the culture fisheries sector has always got to the key attention for the enhancement of fish production, the sector failed to meet the per capita fish requirement for the nation. Nevertheless, the culture fishery has increased by 3 folds over the last decade (DoF, 2002). This could not keep pace with the increasing demand of the people due to a static as even declining trends of its more resourceful inland open water and marine counterparts. At present per capita fish consumption per day is 32.88g (DoF, 2002) which is lower than the minimum requirement 38 g/day (DNFS, 1997) by a margin of around 5g. According to the fisheries Resources Survey System of DoF in 1985, 19362 kg spawn of major carps is produced naturally in open water viz., rivers adjacent flood plains, which stand 5093 kg only in 1993 (Ali and Hossain, 1996) and 1577 kg in 2005 (DoF, 2005). Among many *Beel*s of Rajshahi district *Beel Kumari* is one of the most important one contributing to the adjacent people's livelihood. Therefore, the present study was undertaken to determine the present fishery status of the *Beel Kumari*.

Materials and Methods

Data were collected from the fishermen and beneficiaries of the experimented *Beel*. For this, target group of fishermen and beneficiaries were selected randomly and then questionnaire interview and focus group discussion (FGD) were done. Finally all the collected data were analyzed by MS Excel software.

Results and Discussion

Fishing gears used in *Beel Kumari*: A total of 16 types of fishing gears are operated by the fishermen in "*Beel Kumeri*". All these are commonly classified as net, trap and wounding gears. BCAS (1991) reported that in halti beel the fishermen use approximately 30 different type of fishing gear. Miah (2004) reported 7 types of gear in Savar khagor baria zolkor beel. However the fishing techniques that were followed by the fishermen in BSKB beel have been categorized into netting, trapping, angling, spearing dewatering and hand picking (Dewan and Mazid, 1994). During monsoon when water level increased the use of all types of gear was also increased simultaneously. Due to presence of current, traps were widely used in canal and adjacent shallow water up to October and then decreased gradually with the decrease in water level during rest of the months. At the same time, number of nets used was also decreased but the use of wounding gears increased which were generally used by the subsistence fishermen. These finding indicate that the use of different types of gear varies with the seasonal variation of water level in the beel.

Catch per unit effort (CPUE): Catch per unit effort (CPUE) (kg/gear/day) of different fishing gears such as nets traps and wounding gears of the study area have been shown in the Table 1. Among the gear highest and the lowest CPUE are recorded in Ber jal and borshi (Dhaon, nol and chip) which are 13.38 kg/day and 0.383 kg/day respectively.

In all the gears, *ber jal* is found to be the most effective gear, next to berjal, CPUE of other gear are recorded in current jal (Punti and fash jal) at 4.5 Kg/day, khepla jal at 2.8 kg/day; tana jal at 3.1 kg/day and veshal jal path jal thela jal traps (Polo, chouka, kholsun and vair) and hook/line and spear/harpoon at 3.75, 1.23, 1.78, 2.22, 0.383, 2.53 kg/day respectively. Hossain (1998) found the highest CPUE of 2.75 kg/gear/week, 0.94 kg/gear/day, and

0.35 kg/gear/day for nets, traps and wounding gear respectively in the old Brahmaputra River. Sayduzzaman (1996) found a CPUE of 0.082 kg/hour for kochal jal.

Species composition: The species composition of fishes in the *Beel Kumari* according to catch per different gears is summarized in Table 2.

Ber jal: In case of ber jal, a total of 30 species including small chingri were recorded in Beel Kumari during the study period. Among the 30 species, khori (*Gudusia chapra*) was found to be the most dominant species which contributed about 23.48% and pabda, rani, foli, bata were found to be the least dominant species, which contributed only about 0.25% each to the catch. The next dominant species recorded were, ranga chanda (15.66%), nama chanda (11.36%), chela (9.85%), small chingri (8.08%), bele (3.79%), darkina (3%), and guchi (2.27%). The rest of the species contribute insignificantly to the catch. Miah (2004) and Akandha (2004) recorded 23 & 22 species of fishes in Savar khagor baria zolkor beel and Baila beel which were found to be the highest dominant species of *A. mola* (24.09%) and *M. lamarrei* (34.88%) respectively.

Table 1. Comparison of catch per unit effort (CPUE) of fishes by different gears in *Beel Kumari*

Type of gear	Name of gear	Catch per unit of effort (Kg/gear/day)
Nets	Ber jal	13.38
	Current net (puti jal)	1.97
	Current net (Fash jal)	2.58
	Khepla jal	2.87
	Thela jal	1.23
	Veshal jal	3.75
	Tana jal	3.1
	Path jal	1.78
Traps	Polo	0.5
	Chouka	0.12
	Kholsun	0.20
	Vair	1.4
Wounding gears (Hook or line)	Dhaon borshi	0.033
	Nol borshi	0.09
	Chip borshi	0.26
Wounding gears (Spears or harpoon)	Pacha	0.35
	Koach	0.5
	Kai	1.68

Table 2. Average species composition of fishes in the *Beel Kumari* by catch per different gears

Gears	Total Species	% of catches by number	
		Max	Min
Ber jal	30	Khori, 23.48	Pabda, Rani, Foli, Bata, 0.25
Khepla jal	28	Khori, 11.7	Shing koi, 0.26
Veshal jal	23	Khori, 18.27	Silver carp, 0.48
Current jal	20	Jati punti, 26.62	Catla, 072
Thela jal	18	Ranga chanda, 15.63	Kakila, 0.78
Tana jal	15	Jati punti, 27.19	Foli, 0.88
Path jal	6	Jati punti, 43.75	Silver carp, 6.25
Polo	12	Taki, 18.1	Boal, 1.39
Chouka	6	Tengra, 54.05	Koi, 5.41
Kholsun	18	Chingri, 15.37	Kolisha, 1.32
Vair	3	Carpio, 57.54	Shoal, 14.29
Dhaon borshi	10	Taki, 58.01	Koi, .76
Nol borshi	11	Taki, 52.76	Carpio, 0.85
Chip borshi	8	Punti, 43.2	Magur, 1.6
Sper/harpoon	13	Gucchi, 20.59	Koi, 1.47

Khepla jal: A total of 28 species included small chingri were recorded during the study period in the catch of khepla jal. Akandha (2004) recorded 21 species of fishes and dominant species of *M. lamrrei* (21.79%), *P. sophore* (11.54%), *C. ranga* (10.89%), *E. danricus* (8.97%), *C. punctatus* (5.77%), *P. ticto* (5.77%), *M. pancalus* (5.13%) and *L. guntea* (3.85%). Among the 28 species khori and singhi, koi was found to be the highest and the lowest in quantity which contributed about 11.7% and 0.56% respectively. The next dominant species were recorded ranga chanda (10.11%), nama chanda (8.43%), tit punti (7.87%), jati punti (6.74%), small chingri (6.18%), guchi and bele (5.62%), tengra (4.49%), boicha (3.93%) and mola (2.81%) of the catches. The rest of the species were found to contribute insignificantly quantity to the catch.

Veshal jal: A total of 23 species of fishes were recorded in the catches of veshal jal during the study period. Rahman (1996) recorded 32 species of fishes and the most dominant species punti (23.93%), rui (15.44%), kakila (9.36%), mrigale (8.28%), tengra (7.27%), catla (4.92%) in the BSKB beel. Paul *et .al*. (1993) recorded 28 species of fishes in Halti beel. Among the 23 species khori and silver carp species were found to be the highest and lowest dominant species, which contribute about 18.27% and 0.48% respectively in the catches. The next dominant species were tengra (8.65%), ranga chanda, titputi (10.09%) , nama chanda (9.13%), jati puti and bele (5.29%), gucchi (4.81%) and mola and gutum (3.37%) of the catches. The rest of the species were found to be contributed less significant to the total catches.

Current Jal: In case of current jal, a total of 20 species of fishes were recorded. Paul *et. al.* (1993) 18 species in the catches of gillnet (fash jal) in Chanda and Halti beel. Miah (2004) and Akandha (2002) recorded 9 small Indigenous species (SIS) in Doba beel and 5 SIS fishes in Chara beel; while Hossain (1998) recorded 14 Species in the old Brahmaputra river. Among them jati puti was recorded the highest species which contributed about 26.62% and singh, catla were the lowest dominant species which contributed 0.72% of the catches. The next dominant species were tit puti (14.39%), tengra (12.95%), golsha (7.19%), guchi (5.78%) and khori, kakila (3.58%). The rest of the species were found to contribute less to the catches.

Thela Jal: During the study period about 18 species of fishes were recorded in the catches of the Thela Jal. Among 18 species ranga chanda was found to be the highest dominant species, which contributed about 15.63% and kakila was found to be the lowest species which contributed about 0.78% of the catch. The next dominant species were recorded as nama chanda, small chingri (11.72%), tit punti (9.38%), jati punti (6.25%), darkina (7.03%), khori, gucchi (5.47%), gutum, tengra (3.13%), taki (3.9%). The rest of the species are less significant to the catches. Akandha (2004) recorded 14 species and dominant species *M. lamrrei* (47.53%), *M. puncalus* (10.49%), *Chanda ranga* (6.79%), *P. ticto* (6.17%). *E.danricus* (4.94%). Holder (2002) About 13 species and 16 species of fishes were recorded in Doba and Chara beel by the catches of this net were *C. lalius* (33.61%), *M. Puncalus* (14.29%). *P. ticto* (10.92%). *L. guntea* (9.24%). *E. danricus* (6.72%) in Doba beel and *C. lalius* (24%), *P. ticto* (12%), *E. danricus* (10%) *C. ranga* (9.33%) in Chara beel.

Tana Jal: In the catches of Tana Jal a total of 15 species of fishes were recorded in the beel Kumari during the study period. Among the 15 species jati punti was found to be the highest dominant species which contributed 27.19% and foli was the lowest dominant species which contributed about 0.88% to the catch. The next dominant species were recorded tit punti (18.42%), khori (8.77%), gucchi, ranga chanda (7.89%), baim (6.58%), bele (3.51%), kakila (2.63%) gutum (4.39%), tengra (5.7%). The rest of the species were considered relatively less to the catches.

Patha Jal: About 6 species were recorded during the study period in the catches of path jal. Among them jati punti and shoal, silver carp were the highest and the lowest dominant species of the catches, which were contributed 43.75% and each about 6.25% to the catch. The next dominant species titpunti (18.75%), kakila (15.63%), boal (9.38%).

Traps: Similarly to the nets the kinds of fish were fond to vary with types of traps used for fishing which are given below-

Polo: In the catches polo a total of 12 species of fishes were recorded in Beel Kumari. Among 12 species taki was found to be the highest dominant species which considered about 18.1% and boal was found to be the lowest dominant species which considered about 1.39% to the catch. The next dominant species recorded were gutum (13.89%), jati punti, bele (12.5%), tengra (8.3%), guchi (6.94%), tit punti (9.74%) and shoal (5.56%). The rest of

the specie was found to consider less significantly to the catch.

Chouka: About 6 species were recorded during the study period in the catches of chouka traps. Among them tengra was found to be the highest dominant species which contributed about 54.05% and taki, koi were the lowest which contributed about 5.41% to the catches. The next dominant species were recorded, baim (13.51%) guchi, bele (10.81%) to the catches.

Kholsun: During the study a total of 18 species of fishes including small chingri were recorded in the catches of kholsun. Among them small chingri and Kholisha were the highest and the lowest dominant species which contributed about 15.37% and 1.32% respectively. The next dominant species were recorded about bele (12.28%), ranga chanda (10.96%), nama chanda (9.56%), boicha (6.16%), taki (5.7%), mola, titpunti (5.26%), guchi (4.39%), tengra (3.95%), mrigel fingerling (4.39%), rui fingerling (3.51%). The rest of the species found to contribute insignificantly to the catches.

Vair: A total of 3 species were recorded during the study period in the catches of vair trap. Among them carpio was found to be the highest dominant species which contributed about 57.54% and shoal was found to be the lowest species which contributed about 14.29%.

Miah (2004) recorded were *L. guntea* (23.33%) *G. giuris* (20.0%) *M. vittatus* (16.66%), and *P. sophore* (8.33%) in Savar khagobaria zolkor beel and Rahman (1996) recorded 26 species where dominant species punti (13.05%), baim (11.05), taki (1030%), kholisha (9.63%), tengra (9.22%), rui (7.48%) in the BSKB beel by using traps.

Wounding gears: The following wounding gears were found to use for catching fishes in Beel Kumari,

Hooks and Line: During the present study 3 types of hooks and lines were recorded in the Beel Kumari and the species composition of the gear are as follows-

Dhaon Borshi: A total of 10 species of fishes were recorded in the catches of dhaon borshi of which taki and koi was the highest and the lowest dominant species, which contributed 58.01% and 0.76% and other dominant species were recorded about shoal (15.27%), bele (6.11%), foli (5.34%). Paul *et. al.* (1993) reorded 17 species of fish at Chanda beel in the catches of dhaon borshi in which dominant speces taki (27.2%) shoal (18.8%) tengra (14.55%) but in Haltibeel 9 species were recorded in which dominant species baim (30.85%) ghaira (19.1%) boal (13.15%) However the species composition of the two gears was found more or less similar to the present study.

Nol borshi: A total of 11 species of fishes were recorded in the catches of Nol borshi during the study period. Among them the highest and the lowest dominant species was about taki (52.76%) and common carp (0.85%). The next dominant species were recorded about shole (22.9%), tengra (5.95%), bele (4.26%), boal (3.82%). The rest of the species were found to be considered as insignificantly to the catch.

Chip borshi: Abut 8 species were recorded during the study period in the catches by chip borhsi. Among 8 species punti and magur was found to be the highest and lowest dominant species which contributed about 43.2%

and 1.6% respectively. The next dominant species were, tengra (20%), bele (14.4%), taki (8.8%).

Spear/Harpoon: A total of 3 types of wounding gears were found to be used by the fishermen in Beel Kumari during the study period. Fishermen were found to catch very small amount of fishes by these gears. The fishermen were found to catch relatively longer fishes by using koach and small fishes by using pacha and kai. However a total of 13 species of fishes were recorded in the catches of these gears of which guchi and koi was found to be the highest and the lowest dominant species which contributed 20.59% and 1.47%. The next dominant species were recorded about gutum (14.70%), baim (11.76%), taki (8.82%), tengra (10.29%). Rahman (1996) recorded 11 species of fishes in which dominant species major carps (70.91%) and snakehead (22.72%) Paul *et. al.* (1993) recorded baila (39.10%) was the most dominant species in Chanda Beel.

References

Akandha, M.S.I. 2004. Community Based Fish catch assessment of Baila *beel* in Sherpur districts. M. S. Thesis, Fisheries Management department Bangladesh Agricultural University (BAU). Mymensingh, 33-58 pp.

Ali, M.L. and Hossain, M.N. 1996. Development and Mangement of Fishery Resources in Bangladesh. *In:* Mazid, M. A (ed.). 1996. Technologies and Management for Fisheries Development (in Bangali). Fisheries Research Institute,Mymensingh. 11-16 pp.

BCAS (Bangladesh Center for Advanced Studies). 1991. Floodplain production Monitoring. Initial Study Report. BCAS, Dhaka, Bangladesh. 99 p.

BFRI (Bangladesh Fisheries Research Institute), 2005 Conservation technique of small indigenous fish species. 38 p.

DNFS, 1997. Bulletin of the Department of Nutrition and food Science Dhaka University. Dhaka. 1-170 pp.

DoF, (Department of Fisheries) 2002. Matshya Pakkhya Saranika 2002. Department of Fisheries, Ministry of Fisheries and Livestock. The Government of People Republic of Bangladesh, Ramna, Dhaka, 120 pp.

DoF, (Department of Fisheries) 2005. Matshya pakkhya saranika 2005. Department of Fisheries, Ministry of Fisheries and Livestock. 38-56pp

DoF, (Department of Fisheries). 2007. Masthya Pakkhya Saranika 2007. Department of Fisheries, Ministry of Fisheries and Livestock. Government of the people Republic of Bangladesh, Ramna,Dhaka , 117-121 pp.

Hossain, M. 1998. A preliminary survey on the Fisheries and Socio-economic status of fishermen of the Old Brahmaputra River. M. S. Thesis, Department of fisheries Management Bangladesh Agricultural University, Mymensingh. 95 p.

Hossain, Z. and Howlader, G.C. 1996. Effects of pesticides on Environment and fisheries resources. *In:* Mazid, M.A. (ed.). Technologies and Management for Fisheries Development (in Bengali). FRI, Mymensingh. 22-26 pp.

MAEP. 1996. Mymensingh Aquaculture Extension Project (MAEP), phase-ii Bangladesh. Maskanda, Mymensingh-2200, 23 p.

Miah, M.A.R. 2004.study on the Community Based fish Gtch Assesment of Savar Khagorbaria Zolker *beel* in Pabna district M.S. Thesis, Fisheries Management Department. BAU, Mymensingh. 28-54 pp.

Paul, S. K., Rahman, S., Razzaque, A. and Chakraborty, B. 1993. Gear selectivity of the floodplains. Progress Report (June-September, 1993). Fisheries Research Institute, TFP. Santahar, Bogra.

Rahman, A.K.A. 1985. Introduction of exotic Fisher in Bangladesh. Fisheries Research and Training Centre, Chandpur, Bangladesh, 15 p.

Rahman, A. K. A. 1989. Freshwater fishes of Bangladesh. Zoological Society of Bangladesh, Dhaka, 366 pp.

Rahman, S. 1995. Studies on the selectivity and effects of fishing gears on the fishes of BSKB *beel*. An M.S. Thesis submitted to the Department of Fisheries Technology, Bangladesh Agricultural University, Mymensingh, 113 pp.

Sayduzzaman, A.K.M. 1996. Further studies on the growth, production and fishery of three major and three exotic carps in Nasti baor with special reference to water quality and macrophytes. A brief report, PIV, DANIDA, TA and BARC, 19 pp.

World Bank. 1991. Bangladesh environment strategy review. World Bank. Washington DC. USA. 55 p.