Notes

Brush and Vegetation Park Fishery in the River Titas, Brahmanbaria, Bangladesh

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Abstract

A study was conducted in the River Titas from November 2002 to June 2003 on a fish aggregation device (FAD), locally known as katha (brushpiles), an important means of fishing in this river. A total of 70 kathas were surveyed and catch monitoring data was collected weekly. The size of katha ranged from 0.12 to 1.17 ha with an average size of 0.35 ha. The average total production from katha was estimated as 750 kg $ha^{-1}year^{-1}$. In combined catch, more than 47% fish were Siluriformes (catfish) including *Wallogonia attu, Mystus cavasius, M. gulio and M. vittatus*, followed by Perciformes 19.86% (*Chanda nama, C. baculis and Anabas testudineus*) and Cypriniformes 3.21% (*Puntius sophore, P. sarana, Labeo rohita* and *L. gonia*). Small and large prawn contributed more than 16% of total production.
Key words: Katha, Park fishery, production, species composition, Titas river,

Introduction

Bangladesh is a riverine country and is drained by three major river systems, the Padma (Ganges), Meghna and Jamuna (Brahmaputra). The Titas is a comparatively small trans-boundary floodplain river situated in Brahmanbaria district. It is believed to be an important feeding and breeding ground of riverine species. During the arrival of the monsoon, this river floods and inundates the adjacent area to form a large floodplain. In the dry season upper reaches of the river become dry except for some pools. During that period the fish aggregation device (FAD), locally known as katha, is the important means of fishing in this river. Bernascek *et al*. (1992) have studied extensively the use of katha in the Northeast region of Bangladesh. A preliminary report on katha and kua fisheries in Bangladesh has been made by Wahab and Kibria (1994). Ahmed and Hambery (1999) describe brush shelter fishery, a newly introduced fishing method in the Kaptai lake reservoir fisheries in Bangladesh. WorldFish Center formerly Iclarm, in Bangladesh has been undertaking research on the gears used and the catches taken from the River Titas since 1998 under its Community Based

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Fisheries Management (CBFM) program. Unestimated numbers of kathas are distributed throughout the Ganges, Brahmaputra, Meghna and other rivers of Bangladesh. Despite their wide use, high yields, and the social and environmental conditions surrounding them and their importance as biological production systems they have been little studied.

This paper presents the results of a katha fisheries survey carried out during the period from November 2002 to June 2003. The aim was to identify the status and to estimate the species composition and production of the katha fishery in the River Titas.

Materials and Methods

The River Titas, is a trans-boundary river of south eastern Bangladesh (Fig. 1). It originates in the state of Tripura in India and flowing near Agartala (India), it enters Bangladesh through Akhaura Upazila in the Brahmanbaria District of Bangladesh, then merges with the Meghna River to the south of near Ashuganj. The length of the river is about 98 km and 50-80 m wide in the dry season. During the dry season, the upper reaches of the river become dry, except for some pools. After the onset of the monsoon, (July-November) this area floods and forms the floodplain. The present study was conducted from November 2002 to June 2003 at Goshaipur to Chitri about 12 km at lower reaches of the river.

A census of all katha fixed in the study area was undertaken at the beginning of the study using a katha survey form developed by DOF (Directorate of Fisheries),

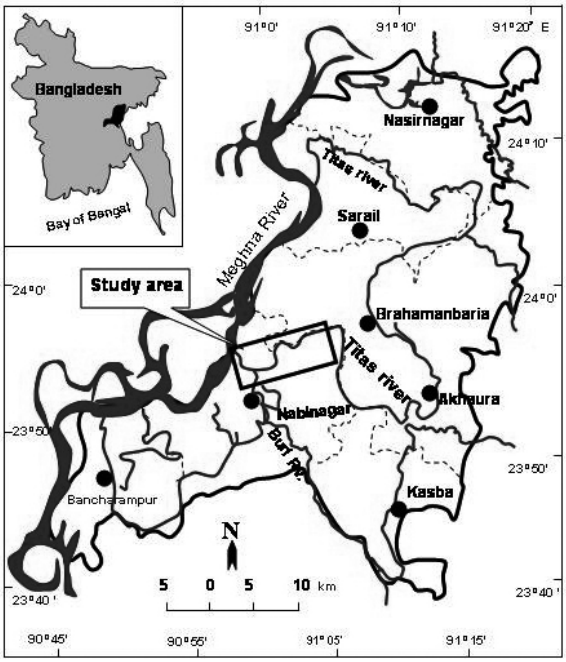

Fig. 1. Map of Brahmanbaria district showing the River Titas and study area.

WorldFish, CARITAS and BRAC (Bangladesh Rural Advancement Committee) (SARKER *et al*. 1999). After that, 21 kathas of various sizes within the study area were selected for catch composition and production estimation. A catch assessment monitoring questionnaire developed for CBFM by the WorldFish Center (in Bangladesh) was used in the present study (Kader *et al*. 1999). In the catch, fish and prawn species were identified using the taxonomic keys provided by SHAFI and QUDDUS (1982), RAHMAN (1989) and KIBRIA (1983). Catch monitoring data were collected on a weekly basis from the fishermen during harvesting. Production was estimated by combining the total harvests in the season of each katha. Data was analyzed using the Microsoft Access and SPSS.

Results and Discussions

A total of 70 different sizes of kathas were surveyed and categorized into 4 types according to their sizes. The maximum and minimum sizes of katha were recorded as 1.17 and 0.12 ha respectively with an average size of 0.35 ha. Fifty percent of kathas were within the size range of 0.41-0.60 ha, 31% katha less than 0.20 ha sizes, 15% katha 0.21-0.40 ha and the remaining 4% was above 0.61 ha sizes. Kathas were also categorized on the basis of the ownership of kathas (Table 1) and it was observed that more than 44% of kathas belonged to small and 24% to medium farmers.

Most of the kathas were prepared with cheap and easily available materials. Katha materials were mainly of two types; materials for shed and materials for shelter of

Table 1. Characteristics of Kathas by landownership category of main owners

Farmer type	No. of Katha	% of Katha	Average size of Katha (ha)	Multi ownership (%)
Land less (< 0.2 ha land)	21	30	0.24	0
Small farmer (0.2-1.01 ha)	31	44.3	0.34	26
Medium Farmer (1.01-3.04 ha)	17	24.3	0.55	12
Large Farmer (>3.04 ha)	1	1.4	0.36	0
Total	70	100	-	-

fishes (Fig.2A, 2B). Floating aquatic vegetations are used for shed or shelter of fishes in the kathas. Among them, *Enhydra fluctuans* (45%), *Ipomoea aquitica* (37%) and *Eichhornia crassipes* (10%) are mostly used. Long bamboos and nylon rope were used to encircle and fix those vegetations. For shelter of bottom dweller fishes and prawns branches and roots of different trees were put under water before set up of katha (Fig. 2A). *Barringtonia acuitangula* (Hijal), *Tamarindus indica* (Tetul), *Enterolobium saman*

(Eucheliptus), *Mangifera indica* (Am), *Psidium guajava* (Peyara) and other locally available tree branches were used for this purpose. Before harvesting kathas were encircled with a seine net up to bottom. Each katha was harvested two to three times in a season (Fig. 3).

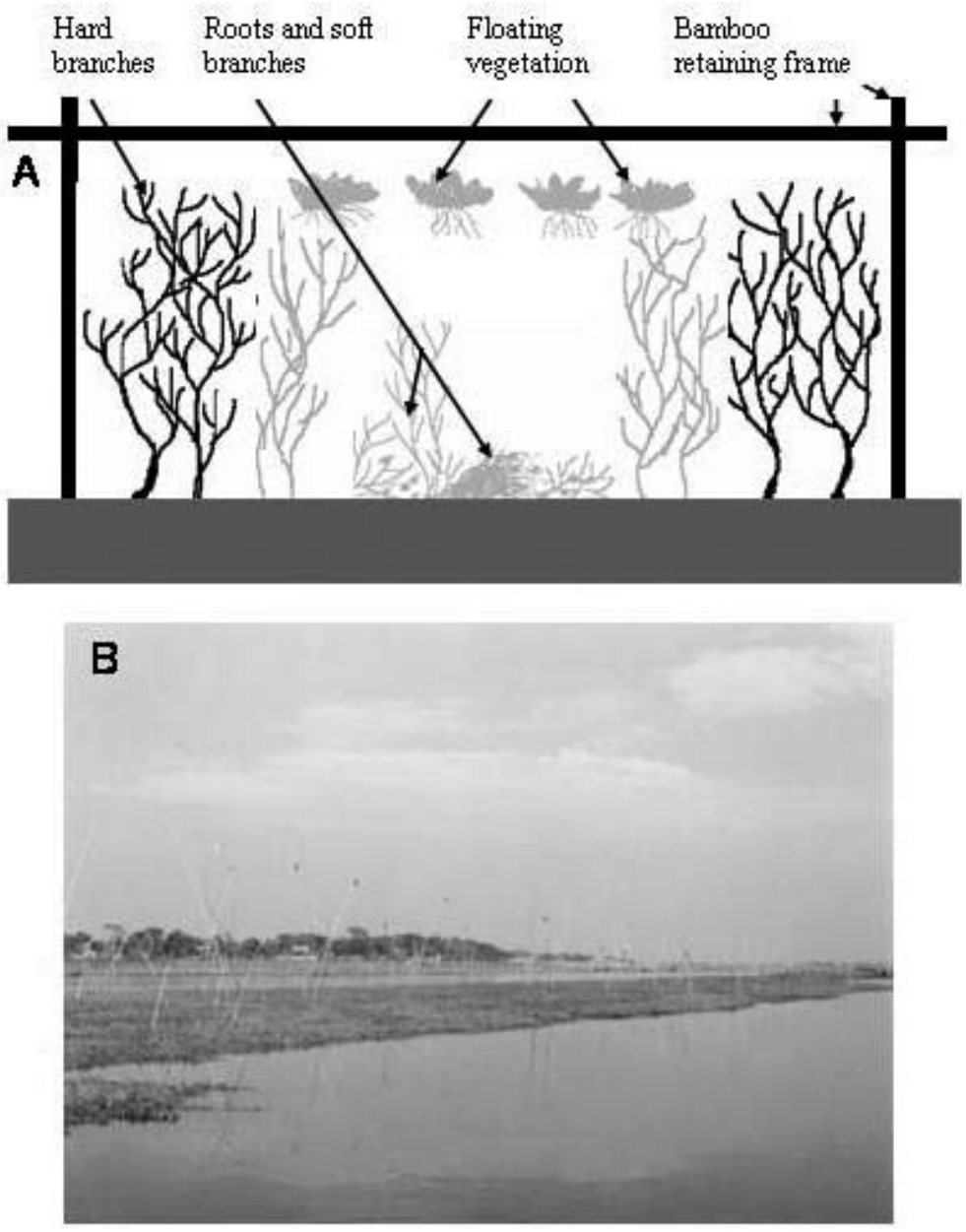

Fig. 2. (A) construction of generalized brush park showing the different elements. (B). Brush park set up in the River Titas, Brahmanbaria.

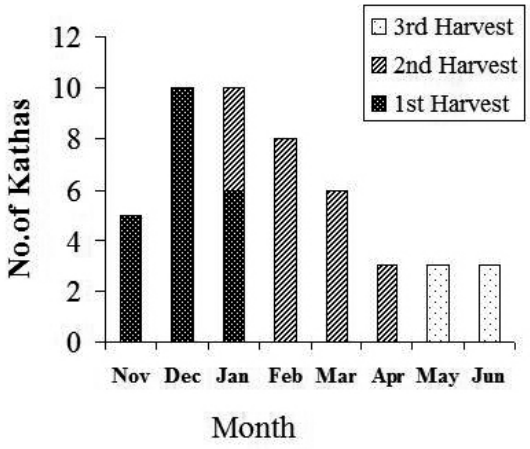

Fig. 3. Number of harvests in different months out of 21 katha randomly selected for sampling during the study period.

Species composition

The species composition of combined catch is listed in Table 2. A total of 35 species of fish was recorded from the catch including two exotic species (*Hypophthelmichthyes molitrix* and *Puntius gonionotus*). More than 47% of total catch was comprised of Siluriformes (catfish) followed by Perciformes (19.86%) and Cypriniformes (3.21%) and the rest 29.11% of the catch were small and medium sized fish and prawn (Fig. 4). The fish composition in Kaptai brush parks consisted of 17% Indian major carps, 24% catfish, 13% clupeids, 9% feather backs, 6% tilapia and 31% others (AHMED and HAMBERY 1999). SAM CHIN HO (1999) listed a mixture of 34 cyprinid, catfish, feather backs and snakeheads species in brushparks of the Cambodian Mekong River. As a single species, *Wallagonia attu* (12.48%), *Mystus cavasius* (10.87%), *M. gulio* (9.99%), *Chanda nama* (9.84%) and *C. baculis* (8.25%) dominated the catch (Table 2). Small prawns (*Palaemon styliformes, Macrobrachium lamarrei,*

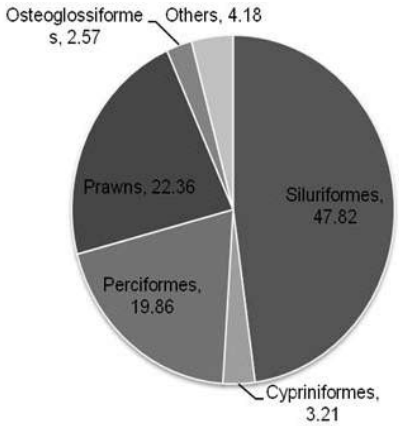

Fig. 4. Percentage composition of different groups of fish and prawn in the harvested katha.

Table 2. Species composition (% of total catch) from the kathas in the River Titas during November 2002 to June 2003

Group	Order	Local name	Scientific name	Contribution in Production (%)
Fish	Siluriformes	Boal	*Wallago attu*	12.48
		Golsha	*Mystus cavasius*	10.87
		Gulya	*Mystus gulio*	9.99
		Tengra	*Mystus vittatus*	6.56
		Ayre	*Mystus aor*	3.58
		Pabda	*Ompok pabda*	3.39
		Batashe	*Batasio batasio*	0.9
		Magur	*Clarias batrachus*	0.05
	Cypriniformes	Rui	*Labeo rohita*	1.89
		Puti	*Puntius stigma*	0.77
		Sar Puti	*Puntius sarana*	0.22
		Gonia	*Labeo gonius*	0.2
		Silver Carp	*ypophthalmichthys molitrix*	0.08
		Chela	*Chela cachius*	0.05
	Perciformes	Nama Chanda	*Chanda nama*	9.84
		Gol Chanda	*Chanda baculis*	8.25
		Bele	*Glossogobius giuris*	0.43
		Gajar	*Channa marulius*	1.56
		Shoal	*Channa striatus*	0.22
	Osteoglossiformes	Foli	*Notopterus notopterus*	2.57
	Synbranchiformes	Baim	*Mastacembelus armatus*	0.38
Crustaceans	Decapoda	Golda Icha	*Macrobrachium rosenbergii*	2.88
		Dima Icha	*Macrobrachinm villosimanus*	1.55
		Chatka Icha	*Macrobrachinm malcolmsonii*	1.18
		Gura Icha (small prawns)	*Palaemon styliformes,* *Macrobrachium lamarrei,* *Macrobrachium dyanus,* *Macrobrachium lichodactylus*	16.75
Others		small fish, snails and crabs		3.36
Total				100

M. dyanus and M. lichodactylus) Contributed 16.75% of total catch which was an indicator of availability food for carnivorous fish like *W. attu, Mystus, Notopterus* and *Channa* species. In a study of the adjacent floodplain of the River Titas it was observed that Cypriniformes comprised the major catch (26%) but as a single species *W. attu* also dominated the total catch (AHMED 2002, 2008). In comparison with other floodplain rivers (SARKER, *et al*. 1999 and KADER *et al*. 1999) the number of species was higher in combined catch of this floodplain river.

Production

In the present study, production from katha was estimated 750 kg ha^{-1} $year^{-1}$ based upon the surveyed fishing season of 243 days. The average floodplain production has been estimated to be 40-60 kg ha-1 year-1 by WELCOMME (1979 and 1985) from lightly exploited floodplain-river systems. It indicated that the Titas river is highly exploited. In Bangladesh yields of 50-300 kg ha^{-1} $year^{-1}$ have been estimated. The highest yields corresponded to permanent water bodies in the floodplains, while lowest yield were found at floodplains fished for 4 months a year (DE GRAAF, *et al*. 1999, DE GRAAF 2001).

In general, catches from over-exploited floodplains, with a high fishing pressure, the large, slow-growing species the species that start to reproduce after 2-3 years are replaced by quick-growing and fast reproducing species (WELCOMME 1985, HOGGAARTH *et al*. 1999). In the Titas, small prawns (other than *M. rosenbergii*) comprised more than 16% of total catch gives an indication of over-exploitation of this floodplain rivers.

BERNASCEK *et al.* (1992) have suggested that a major possibility for increasing fish production above the natural level is through the use of katha as a biological production system, rather than only its current use as simply a fish aggregation device. Katha can increase biological production in three ways by i) creating more secure and diverse spawning habitats for some species and thus increasing reproductive success; ii) creating more secure nursery habitats by lowering predation rates and increasing survival of fry and fingerlings; and, iii) creating large food resources due to growth of periphyton, a high quality natural food and thus increasing fish growth and condition. Further study on biology ecology and population dynamics of commercially exploited species and livelihood assessment of fishermen are needed to undertake a sustainable management policy for this river.

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