Small Fishes as a Resource in Rural Bangladesh

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Abstract

The role of small fishes in the diet of the rural poor in Bangladesh is described. Basic statistics (maximum size reached, length-weight relationships and prices) are presented for 42 species, belonging to 10 families and ranging from sizes of 2 cm (*Danio rerio*, Cyprinidae) to 16 cm maximum length (*Gudusia chapra*, Clupeidae). Price is shown to increase with size; a brief description of the fishery for this valuable resource is presented.

Introduction

Bangladesh is a country strongly shaped by its inland water bodies; these are 2.8 ha·10^6 of floodplains; 1.0 ha·10^6 of rivers (including estuaries and canals), and 1.1 ha·10^5 of natural depressions such as oxbow lakes ("beels" and "haors") and a further 1.6 ha·10^5 of artificial impoundments such as ponds and tanks.

The floodplains produced, in the late 1970s/early 1980s about 235,000 t of fish·year^{-1}, or 84 kg·ha·year^{-1}. By 1986-1987, this had dropped to 184,000 t, or 65 kg·ha·year^{-1}. Causes for this decline are pollution (e.g., through pesticides), periodic outbreak of diseases and the destruction of spawning and nursery grounds through irrigation, drainage and other flood control measures (see Islam 1989 and contributions in Agüero et al. 1989).

Given the simultaneous increase in population, this decline has a strong impact on *per caput* consumption which declined from 33 g·day^{-1} in 1963-64 to 21 g·day^{-1} in 1985.

Aspects of the Fishery

Small inland fishes are caught in Bangladesh using a variety of gears, notably cast nets (*khepla jal*, *chapra jal*); drag nets (*badai jal*, *shikti jal*, *dharma jal* and *jali*); fixed purse nets (*sunti jal*), made of synthetic fiber or nylon thread mosquito nets; and different types of bamboo traps, i.e., *dohar*, *anta kholson*, *britti*, *jangla* or *sarga*, *jankhoi* and *bana*. The fish are also caught with bare hands.

The craft for hauling these gears and/or the fishers and their catch also belong to a multitude of types, e.g., "country boats" (*nikari dingi*, *konai dingi*, *jaila dingi*, *bhedi dingi*, *bhedi nauka*, *kosa nauka*, etc.), crafts made of tree trunks (*donga*), earthen crafts (*chari*), and rafts made of various fibrous plants, including parts of banana trees.

The resources are overfished (Ahmed 1991). In view of much demand as evident from the high prices that some of these species command in the market (Table 1), there is need to conserve/increase production of these short-cycle species through farming them in the vast number of seasonal waterbodies (ponds, ditches, borrow pits) that exist in the country. Studies undertaken in recent years have indicated the suitability of these seasonal waters for farming short-cycle species such as *Puntius gonionotus* and *Oreochromis niloticus* (Gupta 1990).

Species-Specific Information on the Small Fishes of Bangladesh

Table 1 presents some of the information gathered on small inland fishes of Bangladesh. As might be seen, these consist mainly of representatives of the family Cyprinidae.

Within the size range covered here, price correlates rather well with size (see also Table 2 and Fig. 2), and this makes several of the larger species in Table 1 too expensive for most Bangladeshis.

Detailed biological information on these fishes are not presently available; however, Table 3 presents the parameters of length-weight relationships of the form

$$W = a \cdot L^b \qquad \qquad ...1)$$

which we have estimated for a number of species, via double logarithmic linear regressions.

Table 1. Summary of information on small inland food fishes of Bangladesh, arranged according to maximum length observed in this study.

Family	Species	Bengali name	Max. length[1]	Max. length[2]	Max. length[3]	Nr/kg	Price/kg (Taka)	Abund.[4]
Cyprinidae	*Danio rerio*	Anju	1.9	2.9	-	2000	28	A*
Cobitidae	*Nemachilus corica*	Korica	3.5	3.5	-	2100	32	A*
Clupeidae	*Corica soborna*	Kechki	3.5	3.5	5.0ª	-	22	A
Cyprinidae	*Puntius phutunio*	Phutani punti	4.0	4.0	-	1700	28	A
Anabantidae	*Colisa fasciata*	Khalisa	4.2	-	>10.0ᵈ	-	24	A
Anabantidae	*Colisa sota*	Boicha	4.2	4.2	-	800	32	A
Bagridae	*Batasio tengana*	Tengra	4.5	4.5	-	1300	24	A
Cyprinidae	*Chela cachius*	Chep chela	5.0	5.0	9.0ª	1800	36	A
Centropomidae	*Chanda beculis*	Chanda	5.0	5.0	-	2000	12	A
Cyprinidae	*Puntius gelius*	Gili punti	5.0	5.1	-	625	24	F
Cyprinidae	*Puntius guganio*	Mola punti	5.1	5.4	-	700	24	F
Cyprinidae	*Puntius cosuatis*	Kosuati	5.3	6.0	-	-	24	F*
Bagridae	*Chandramara chandramara*	Futkibuzuri	5.5	5.7	-	-	24	F
Cyprinidae	*Esomus danricus*	Darka	6.0	6.0	>10.0ª	1625	24	F
Cyprinidae	*Puntius terio*	Teri punti	6.0	6.3	-	-	24	F*
Cyprinidae	*Puntius ticto*	Tit punti	6.0	6.5	-	600	24	F
Bagridae	*Mystus tengara*	Tengra	6.2	6.2	-	250	36	F
Cyprinodontidae	*Aplocheilus panchax*	Kanpona	6.2	6.2	-	-	28	F*
Pristolepidae	*Badis badis*	Botkoi	6.2	6.3	-	65	16	F*
Cyprinidae	*Chela laubuca*	Laubuca	6.7	6.7	-	-	32	F
Cyprinidae	*Rasbora daniconius*	Darkina	7.0	-	-	-	32	F
Cyprinidae	*Barilius vagra*	Koksa	7.0	7.5	12.7ᵈ	-	24	F
Cyprinidae	*Amblypharyngodon microlepis*	Mola	7.2	-	-	-	28	F
Cyprinidae	*Rasbora rasbora*	Darkina	7.2	8.0	-	1230	32	F
Schilbeidae	*Pseudeutropius atherinoides*	Batasi	7.5	8.0	-	-	50	F
Centropomidae	*Chanda ranga*	Lal chanda	7.8	8.0	-	-	24	F
Cyprinidae	*Barilius shacra*	Koksa	8.0	8.2	-	-	32	F
Cyprinidae	*Salmostoma argentea*	Chela	8.2	8.2	-	400	48	F*
Cyprinidae	*Amblypharyngodon mola*	Moya	9.0	9.0	15.0ᵇ	-	28	F
Cyprinidae	*Danio devario*	Banspata	9.1	9.3	-	900	32	F
Cyprinidae	*Labeo boga*	Bhangan bata	9.2	9.7	-	-	36	F
Cyprinidae	*Puntius conchonius*	Kanchanpunti	9.3	9.9	-	475	24	F
Centropomidae	*Chanda nama*	Nama chanda	9.5	10.0	-	-	24	F
Cyprinidae	*Aspidoparia jaya*	Jaya	9.8	9.7	-	-	24	F
Cyprinidae	*Salmostoma phulo*	Fulchela	9.8	9.8	-	350	48	F
Cyprinidae	*Rohtee cotio*	Chela	10.1	10.8	-	-	40	A
Cyprinidae	*Crossocheilus latius*	Kala bata	10.2	10.2	-	-	40	A
Cyprinidae	*Puntius sophore*	Jat punti	10.2	12.2	-	-	40	A
Bagridae	*Mystus vittatus*	Tengra	10.7	11.7	-	-	70	A
Schilbeidae	*Ailiichthys punctata*	Kajuli	10.8	11.0	-	-	50	A
Cyprinidae	*Puntius chola*	Chala punti	10.8	13.8	-	-	40	A
Cyprinidae	*Danio aequipinnatus*	Chebli	11.0	12.5	-	-	30	A
Cyprinidae	*Salmostoma bacaila*	Katari	11.2	14.2	-	-	30	A
Cobitidae	*Botia dario*	Rani	15.1	15.1	-	-	50	R*
Bagridae	*Mystus bleekeri*	Tengra	15.1	15.5	-	-	60	R
Schilbeidae	*Ailia coila*	Baspata	15.2	15.4	-	-	60	R
Schilbeidae	*Clupisoma murius*	Muri bacha	15.3	15.3	20.0ª	-	55	R*
Siluridae	*Ompok pabda*	Madhu pabda	15.5	16.0	30.0ᶜ	-	80	R
Clupeidae	*Gudusia chapra*	Chapila	16.5	20.0	-	-	50	R

[1]Maximum length (cm; TL); this study.
[2]Maximum length reported by Rahman (1989).
[3]Maximum length reported in other sources, i.e., (a) Day (1878); (b) Ahmad (1953); (c) Bhuiyan (1964); and (d) Rahman (1989).
[4]Relative abundance: A = Abundant; F = Frequent in catches; R = Rarely in catches; a "—" indicates that this fish was *not* listed in the "List of Important Fish and Prawns Harvested from Inland Waters of Bangladesh" included as Appendix 3 in Agüero et al. (1989).

Table 2. Summary of data on four size groups of small freshwater fishes of Bangladesh.[1]

Group	Size range (mm)	Number of Species	Number of Genera	Number of Families	Price Tk/kg[2]	Relative abund.[3]
A	19 - 59	9	8	6	26	18.4
B	60 - 99	26	16	6	29	53.1
C	100 - 119	3	7	8	42	16.3
D	120 - 165	4	6	6	59	12.2

[1]Adapted from Table 1.
[2]US$1 = Taka 39
[3]Weight % in catch samples analyzed by the authors.

$$Y = 11.2 + 2.86X$$
d.f. 47, r = 0.732
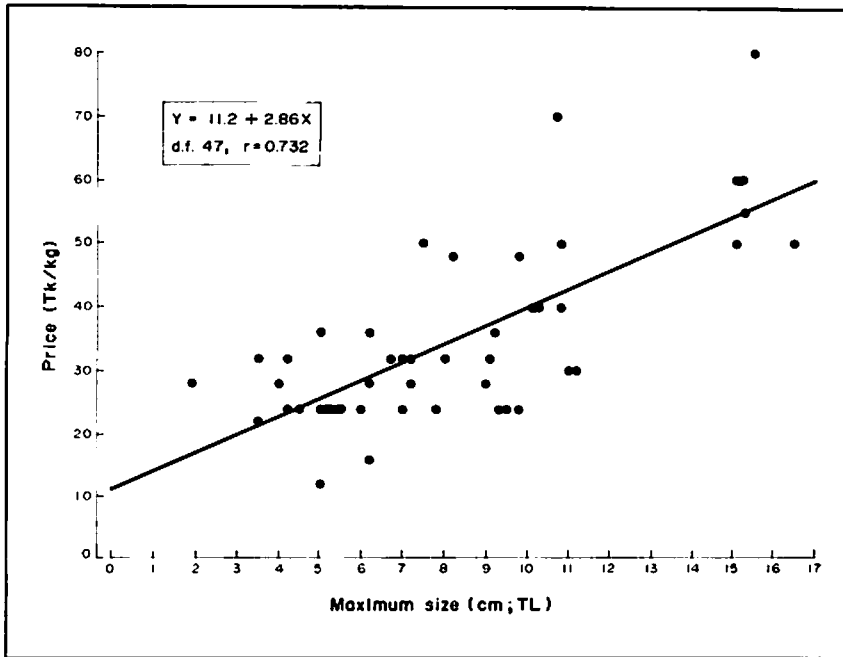
Table 3. Length/weight relationship of five small freshwater fish species of Bangladesh (total length in cm; w in g).

Species	a	b
Corica soborna	0.0069	3.0516
Colisa fasciata	0.0355	2.7960
Rasbora daniconius	0.0488	2.1356
Pseudeutropius atherinoides	0.0202	2.7303
Mystus bleekeri	0.0562	2.6664

Fig. 1. Relationship between size and price of small freshwater fishes of Bangladesh.

Discussion

The admittedly sparse information presented here highlights the need for further studies on the biology of the small fishes of Bangladesh. Development of breeding and low input culture technologies for some of the economically important species could lead to increased utilization of underutilized waterbodies for production. This, in turn, would provide increased income and animal protein intake for rural households and create employment. Conservation of some of these species (e.g., *Aplocheilus panchax*) can also help to control mosquito larvae.

Biological information, especially on the growth, reproductive cycles and habitat requirements of these fishes would complement the economic studies of Ahmed (1991) and the taxonomic work of Rahman (1989), both of which have contributed significantly to the understanding of Bangladesh inland fisheries resources.

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