J. Sylhet Agril. Univ. 3(2):233-243, 2016 **ISSN: 2308-1597**

FISH DIVERSITY OF KAPTAI LAKE IN A AREA TO RANGAMATI HILL DISTRICT

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Abstract

An investigation was carried out in fish landing centers and fish markets adjacent to Kaptai lake, Rangamati to identify the potentiality of fish landing centers, the diversity of available fish fauna and the marketing channel. The study was done by questionnaire interviews (QI) of fish traders, focus group discussions (FGD) and secondary data collection from April 2014 to March 2015 in 03 landing centers and 15 markets of Rangamati district. A total of 84 species of fishes, which consists of 75 finfish and 9 shellfish were identified during the study period. Among 75 finfish, 52 were indigenous freshwater fish species, 10 exotic species and 13 marine species. In shellfish group, 7 prawn and shrimp, 1 crab and 1 pond tortoise species were found. Different types of freshwater fish, marine fish, crustacean and dry fish were found in the investigated markets of Rangamati town. The most abundant freshwater fish species were *Catla catla, Labeo rohita, Clarias batrachus, Cirrhinus cirrhosus, Channa punctatus.* Few numbers of marine fishes including *Latescal carifer, Euthynnus affinis* and *Mugil cephalus* were also recorded. *Macrobrachium rosenbergii* and *Penaeus monodon* were found most abundantly during the study period. A total 20 species were threatened according to IUCN red list of Bangladesh including 7 vulnerable, 10 endangered and 3 critically endangered species out of 54 threatened fishes in fresh waters of Bangladesh. Among 7 vulnerable fishes 6 were available, 1 was rarely available. Among 10 endangered species 9 were available and 1 was rarely available. Among 3 critically endangered species 1 species was found available and 2 species were rarely available. Ten exotic fish species (*Hypophthalmicthys molitrix, Ctenopharyngo donidella, Cyprinus carpio, Puntius gonionotus, Oreochromis niloticus, Oreochromis mossambicus, Pangasius hypopthalmus, Mylopharyngodon piceus, Aristichthys nobilis* and *Clarias gariepinus*) were found in Kaptai lake during the study period. Fish biodiversity of Kaptailake is decreasing day by day due to habitat degradation and different manmade causes. Proper conservation measures should be taken to protect the threatened fish species from extinction.

***Keywords*:** Kaptai lake, fish fauna, diversity, landing center and fish market.

Introduction

Inland aquatic habitats of Bangladesh are rich in faunal diversity containing at least 265 species of finfish, 63 species of prawn, and several species of turtles, tortoises, freshwater mussels and other living aquatic organisms (Rahman, 2005). Bangladesh is also rich in marine fishes having 475 marine finfish and 36 Marine shrimp species (DoF, 2013). Almost all varieties of fishes, both inland (fresh and brackish) and marine water fish species are available in the fish landing centers of Rangamati town.

The Kaptai reservoir is one of the largest man-made freshwater lake in South-east Asia (Fernando, 1980), was created in 1961 by damming the River Karnaphuli at Kaptai, mainly to provide electricity by hydropower. Fisheries, flood control, navigation, drainage and irrigation were considered as secondary options. The reservoir covers an area of approximately 68,800 ha and constitutes a significant component of inland water resources accounting for 46.8% of the total pond area of Bangladesh (Ahmed, 1999). Fishing in the Kaptai reservoir was leased in 1963 for 99 years to BFDC, which has landing station, ice plant and refrigeration facilities. The management of the Kaptai reservoir

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fisheries basically pertains to: (a) restricting fishing to certain periods, (b) issuing licenses to the fishermen, (c) implementing the Fisheries Act, and (d) using the most advocated and widely practiced stocking and recaptures techniques.

Fish landing center is the place where different types of fresh and fisheries commodities are accumulated from different sources of waterbodies such as river, beel, pond, *gher*, estuaries and sea, and these fishes are transferred from here to local markets via different intermediaries and channels (Ali *et al.,* 2004). Fish landing center plays a vital role in quick and smooth disposal of fresh fish and in this regard the fish landing centers of Rangamati town may be the point of observation to survey the availability of fish species.

Rangamati region is recognized as the fisheries zone of the country. A number of huge varieties fish are available in the landing centers of Rangamati town. Both inland and marine fish species are found in these centers. Availability of species in fish landing centers and markets which would be helpful to provide a preliminary knowledge about fish fauna, mostly to know about the fish fauna in the biggest artificial lake-Kaptai. However, no methodical study has been carried on the fish diversity; catch composition, seasonal variation of fish availability and the causes of decreasing fish diversity which is consequently limit the establishment of biodiversity conservation strategies. Therefore, considering the above mentioned facts the present study has been set up to assess the diversity of available fish fauna in this important lake of Bangladesh.

Materials and Methods

Fish market

There are many markets in around Rangamati town. Among these 09 fish markets were selected for study. The study area includes- Bonorupa bazar, Rijab bazar, TNT bazar, Tobolchori bazar, Assambosti bazar, Ghagra, Vetvedhi, TNT bazaar and College ghat.

Landing centers

Three fish landing centers were surveyed during the study period. The landing centers are located in main town that includes BFDC fish landing center, Kaptai fish landing center and Mohalchori fish landing center in Rangamati.

Selection of samples

Total sample size of the study was 100 of which 70 were fish traders, 10 aratdar and 20 were fish retailer. Fish traders were categorized into three groups namely *bepari*, *aratdar* and *retailer*.

Preparation of questionnaire

Three different questionnaires were carefully prepared to interview the selected *retailer*, *aratdar* and *bepari* of this study.

Period of data collection

For the study the data were collected during the months of April 2014 to March 2015.

Data collection

Several visits were made in each of the landing centers and fish markets of Rangamati town. As the supply of the fishes varied with seasons, the data were collected in different seasons *i.e.* throughout the years by repeated visit in the landing centers and markets.

Questionnaire interview and focus group discussion (FGD)

For questionnaire interviews, simple random sampling method was followed for 3 *bepari*, 2 *aratders* and 3 *retailers* in each study sites per visit.

Results and Discussion

Fish landing center plays a vital role in quick and smooth disposal of fresh fish and in this regard the fish landing centers of Rangamati town may be the point of observation to survey the status of fish, source of fish and dry fish availability. A total 84 species of fishes were found. A good number (62) of freshwater fish species, marine species (13) were supplied to Rangamati town from Kaptai lake and different places of the country. Fifty four (52) freshwater fishes, 10 exotic, 13 marine, and 7 prawn/ shrimp, 1 crab and 1 pond tortoise species were found during study period. However, freshwater fishes were mainly coming from different types of waterbodies (River, Kaptai lake, Creeks, etc.) of greater Rangamati district. Major dominant species were Chapila (*G. chapra*), Bata (*L. bata*), Chapila (*Gonialosa manmina*), Kachki (*C. soborna*), Air (*Mystus aor*), Kuncho chingri (*Machrobrachium lamarrei*), Kajoli (*Ailia coila*), Mola (*Amblypharyngodon mola*), Tilapia (*Oreochromis mossambicus*).

Out of 74 species of fin fishes, 30 were abundant in winter (WN), 19 were abundant in summer (SM) and the rest 26 were available throughout the year (TY) (Tables 1, 2 and 4). All the exotic species were freshwater fishes and they were found all the year round as they are being cultured by commercial fish farmers. Nine (9) shellfishes were found most of the landing centers and fish markets. Different species of freshwater fish, marine fish, crustaceans and exotic fish species and their scientific names, family, common names and local names are presented in Tables 1, 2, 3 and 4.

Table 1. Availability of freshwater fish species in different fish markets and fish landing centers of Kaptai lake

Family	Lacal name	Common name	Scientific name	Seasonal abundance
1. Mastacembelidae	Tara baim	One stripe spiny eel/Lesser spinyeel	*Macrognathus aculeatus*	WN
	Guchibaim	Striped spiny eel/ Barred spinyeel	*Macrognathus pancalus*	WN
2.Osphronemidae	Khalisha/ Khailsha	Giant gourami	*Colisa fasciatus*	TY
	Lalk halisha	Red gourami	*Colisa lalia*	TY
3.Anabantidae	Koi	Climbing perch	*Anabas testudineus*	TY
4.Gobiidae	Bele	Tank goby	*Glossogobius giuris*	WN
5.Nandidae	Bheda	Mud perch	*Nandus nandus*	SM
6.Sciaenidae	Poa	Pama	*Otolithoides pama*	SM
7.Ambassidae	Ranga chanda	Indian glassy fish	*Parambassis ranga*	WN
	Lomba chanda	Elongate glass-perchlet	*Chanda nama*	SM
8.Synbranchidae	Kuicha	Cuchia	*Monopterus cuchia*	TY
9.Chanidae	Shol	Striped snakehead	*Channa striatus*	SM
	Gajar/ Gajal	Giant snakehead	*Channa marulius*	SM
	Taki, Lata	Spotted snakehead	*Channa punctatus*	SM
10.Belonidae	Kaikka	Needle fish	*Xenentodon cancila*	WN
11.Heteropneustide	Shing	Stinging catfish	*Heteropneustes fossilis*	SM
12.Clariidae	Magur	Air breathing catfish	*Clarias batrachus*	WN
13.Pangasidae	Pangas	Yellowtail catfish	*Pangasius pangasius*	TY
14.Schilbeidae	Bacha	Bacha	*Eutropiichthys vacha*	WN
	Kajuli	Gangeticalilia	*Ailia colia*	WN
	Banspata	River catfish	*Ailia punctata*	WN
	Batasi	Indian potasi	*Pseudeutropius artherinoides*	WN
15.Siluridae	Kani Pabda	Indian butter catfish/ pabo catfish	*Ompok bimaculatus*	SM
	Boal	Freshwater shark	*Wallaga attu*	WN
	Modhu pabda	Pabdah catfish	*Ompok pabda*	SM

	Tengra	Striped dwarf catfish	*Mystus vittatus*	WN
	Golsha tengra	Gangeticmystus	*Mystus bleekeri*	WN
	Bujuri-tengra	Tengramystus	*Mystus tengara*	WN
16. Bagridae	Ayre	Long-whiskered catfish	*Sperata aor*	WN
17.Cobitidae	Gutum	Cross fish	*Lepidocephalichthys guntea*	SM
	Rani	Bengal loach	*Botia dario*	WN
18.Cyprinidae	Rui	Rohu	*Labeo rohita*	TY
	Catla	Catla	*Catla catla*	TY
	Mrigel	Mrigal	*Cirrhinus cirrhosus*	TY
	Kalibaus	Black rohu	*Labeo calbasu*	TY
	Bhangon bata	Bata labeo	*Labeo bata*	SM
	Sarpunti	Olive barb	*Puntius sarana*	TY
	Tit punti	Ticto barb	*Puntius ticto*	SM
	Jat punti	Pool barb	*Puntius stigma*	SM
	Mola punti	Glass barb	*Puntius guganio*	SM
	Bashpata	Sind danio	*Devario devario*	WN
	Bhangon	Bogalabeo	*Labeo boga*	SM
	Mola	Molacarplet	*Amblypharyngodon mola*	SM
	Dhela	Cotio	*Rohtee cotio*	WN
	Dankina	Rasbora	*Rasbora rasbora*	WN
	Chela	Silver razorbelly minnow	*Salmostoma bacaila*	SM
	Shada ghonia	Kurialabeo	*Labeo gonius*	WN
19.Notopteridae	Chital	Humped featherback	*Notopterus chitala*	WN
	Foli	Grey featherback	*Notopterus notopterus*	WN
20.Engraulidae	Phasa	Gangetichairfin anchovy	*Setipinna phasa*	WN
	Chapila	Indian river shad	*Gudusia chapra*	WN
	Kachki	Ganga river	*Corica saborna*	WN

SM= summer, WN= winter, TY= throughout the year

Table 2. Marine fish species observed in fish market of Kaptai lake, Rangamati

Family	Lacal Name	English Name	Scientific Name	Seasonal abundance
1.Centropomidae	Bhetki	Vetki	*Lates calcarifer*	TY
2.Tunnidae	Tuna	Born maittya	*Euthynnus affinis*	WN
3. Harpadontidae	Loitta/ Nehari	Bombay duck	*Harpadon nehereus*	WN
4. Sciaenidae	Poa	Pama	*Pama pama*	WN
	Vola/ Lalpoa	Silver jew	*Johnius argentatus*	TY
	Sadapoa	Silver jew	*Otolithes argentatus*	TY
5. Polynemidae	Lakhua	Indian threadfin	*Leptomelanosoma indicus*	WN
	Lakhua	Indian salmon	*Polynemus indicus*	WN
6. Mugilidae	Bhangan	Mullet	*Mugil cephalus*	SM
7. Trichiudae	Churi	Ribbon fish	*Lepturacanthus savala*	TY
8. Scatophagidae	Chitra	Spotted butterish	*Scatophagus argus*	TY
9. Stromatidae	Rup chanda	Chinese pomfiret	*Pampus chinensis*	TY
10. Engraulidae	Phasa	Hairfin anchovy	*Setipinna taty*	SM

SM= summer, WN= winter, TY= throughout the year.

Table 3. List of crustaceans observed in fish landing centres of Kaptai lake, Rangamati

Family	Lacal Name	English Name	Scientific Name	Seasonal abundance
1. Palaemonidae	Golda chingri	Fresh water prawn	*Macrobrachium rosenbergii*	TY
	Chatka chingri	Monsoon river prawn	*Macrobrachium malcolmsonii*	TY
	Pata chingri	River prawn	*Macrobrachium rude*	TY
	Gura chingri	Spider prawn	*Nematopalaernon tenuipes*	TY
2. Penaeidae	Bagda chingri	Giant tiger shrimp	*Penaeus monodon*	TY
	Chaka chingri	Indian white shrimp	*Penaeus indicus*	TY
	Horina chingri	Brown shrimp	*Metapenaeus monoceros*	TY
3. Portunidae	Shela kakra	Mud crab	*Scylla serrata*	TY
4. Bataguridae	Pond tortoise	Kasim	*Melanochelys trijuga*	TY

TY= throughout the year

A total 84 species of fishes were found during study period of which 62 freshwater fishes (52 indigenous and 10 exotic), 13 marine, 7 prawn and shrimp, 1 crab and 1 pond tortoise species. During investigation, Cypriniformes was recorded as the most diversified fish group in terms of both number of species and individuals. Galib *et al*. (2013) reported a total of 63 species of fishes belonging to 41 genera, 23 families and 9 orders in the Choto Jamuna River, which was more or similar with the findings of the present study.

Table 4. List of exotic fish species observed in the fish markets of Kaptai Lake, Rangamati

Family	Lacal Name	Common Name	Scientific Name	Seasonal abundance
1.Cyprinidae	Silver carp	Silver carp	*Hypophthalmichthys molitrix*	TY
	Carpu	Common carp	*Cyprinus carpio*	TY
	Bighead carp	Bighead carp	*Aristichthys nobilis*	TY
	Black carp	Black carp	*Mylopharyngodon piceus*	TY
	Rajputi/ Thai sarputi	Silver barb	*Puntius gonionotus*	TY
	Grass carp	Grass carp	*Ctenopharyngodon idella*	TY
2. Clariidae	African catfish	North African catfish	*Clarias gariepinus*	TY
3.Pangasiidae	Thai pungus	Big-catfish	*Pangasiu shypophthalmus*	TY
4.Cichlidae	Tilapia	Mozambique tilapia	*Oreochromis mossambicus*	TY
	Nilotica	Nile cichlid	*Oreochromis niloticus*	TY

TY= throughout the year

During the study period 20 threatened fish species (IUCN, 2003) have been found in Kaptai lake. Among 20 species 16 were found to be available, 4 rarely available and 34 were not available during the study period. Availability of three categories critically endangered, endangered and vulnerable fishes from Kaptai lake are presented in Table 5.

Table 5. A list of threatened (critically endangered, endangered and vulnerable) fish species available in the Kaptai lake

Biodiversity status according to IUCN Bangladesh (2003)	Scientific name	Local name	Present biodiversity status of Kaptai lake		
			Available	Rarely available	Not available
Critically endangered	*Labeo nandina*	Nandina			√
	Labeo boga	Bhangon/Bata		√	
	Labeo pangusia	Ghoramuikha			√
	Puntius sarana	Sarputi/sorolputi		√	
	Rita rita	Rita			√
	Channa barca	Piplashol			√
	Tor tor	Mohashol			√
	Sisorr habdophurus	Chenua/sisor			√
	Bagarius bagarius	Beghair			√
	Pangasius pangasius	Pangus			√
	Eutropichthys vacha	Bacha	√		
	Clupisoma gaura	Gaura			√
Endangered	*Labeo calbasu*	Kalbasu	√		
	Labeo gonius	Ghonia	√		
	Labeo bata	Bata/Vangon bata	√		
	Osteobrama cotio	Dhela	√		
	Bengalae langa	Along/Sefati			√
	Chela laubuca	Kashkhaiya/Laubuka			√
	Crossocheilus latius	Kalabata			√
	Notopterus chitala	Chital	√		
	Barilius bendelisis	Hiralu/Joia			√
	Barilius vogra	Khoska/Chedra			√
	Botia dario	Rani/beti/Betia			√
	Botia lohachata	Rani/putul/beti			√
	Batasio tengara	Tengra	√		
	Raimas bola	Bhol/vole			√
	Rasbora rasbora	Darkina			√
	Aorichthys seenghala	Guizza air/Air			√
	Ompok bimaculatus	kani/Boali pabda		√	
	Ompok pabda	Modhu pabda	√		
	Ompak pabo	Pabda			√
	Silionia silondia	Shilong			√
	Chaca chaca	Chaka/chaga			√
	Dermogynys pusillus	Ekthota			√
	Scatphagus argus	Bistara			√
	Badis badis	Napti koi			√
	Channa marulius	Gajar	√		
	Microphis deokata	Kumirer khil			√
	Ctenops nobilis	Neftani			√
	Mastacembelus armatus	Baim/ shalbaim	√		
Vulnerable (VU)	*Notopterus notopterus*	Foli	√		
	Anguilla bengalensis	Bamos/baobaim			√
	Cirrhinus reba	Raikh/bata/Vagna		√	
	Puntius ticto	Titpunti	√		
	Sperata aor	Ayre/aor	√		
	Channa orientalis	Telotaki/chang			√

Macrognathus aral	Tara baim			√
Chanda nama	Chanda			√
Pseudembasis ranga	Rangachanda			√
Nandus nandus	Meni/bheda			√
Mystus cavasius	Golsa /golsatengra	√		
Ailia coila	Kajuli	√		
Plotosus canius	Gang magur /Kanmagur			√
Monopterus cuchia	Kuicha	√		

Considering threatened species, 30% were found available, 7% rarely available and 63% were not available during the study period (Fig. 1).

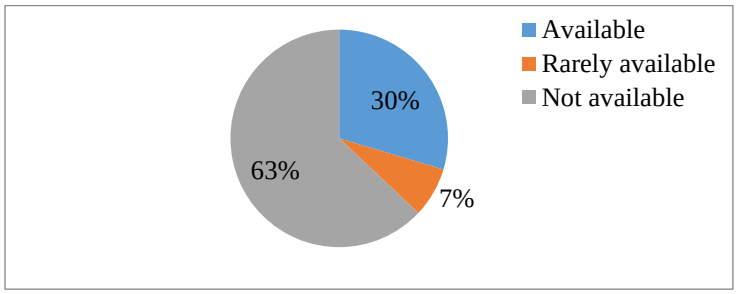

Fig. 1. Availability of threatened fish species from Kaptai lake

Biodiversity status of critically endangered fish species in Kaptai lake

Three (3) critically endangered fish species were found in Kaptai lake. Among them 1 species (*E. vacha*) was found available (8.33%), 2 species (*P. sarana and L. boga*) were rarely available (16.67%). On the other hand, 9 species (*B. bagarius, S. rhabdophurus, C. barca, T. tor, R. rita, C. gaura, L. nandina, L. pangusia, P. pangasius*) were not available (75%) during the study period (Table 5 and Fig. 2).

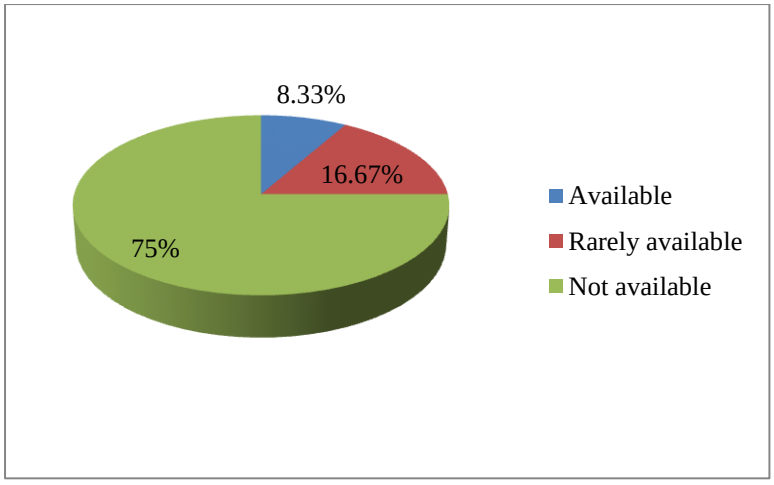

Fig. 2. Percentage of critically endangered fish species

Biodiversity status of endangered fish species in Kaptai lake

Ten (10) endangered species were found in the Kaptai lake where 9 species (*C. marulius, M. armatus, O. pabda, B. tengara, L. bata, L. calbasu, L. gonius, O. cotio, N. chitala*) were found available (32%) and 1 was rarely available (4%). On the other hand, 18 species (64%) were not available (*O. paba, S. silondia, C. chaca, D. pusillus, M. deokata, S. argus, B. badis, C. nobilis, A. seenghala, R. bola, B. Lohachata, B. bendelisis, B. vogra, B. elanga, C. laubuca B, Dario, R. rasbora* and *C. latius*) (Table 5 and Fig. 3).

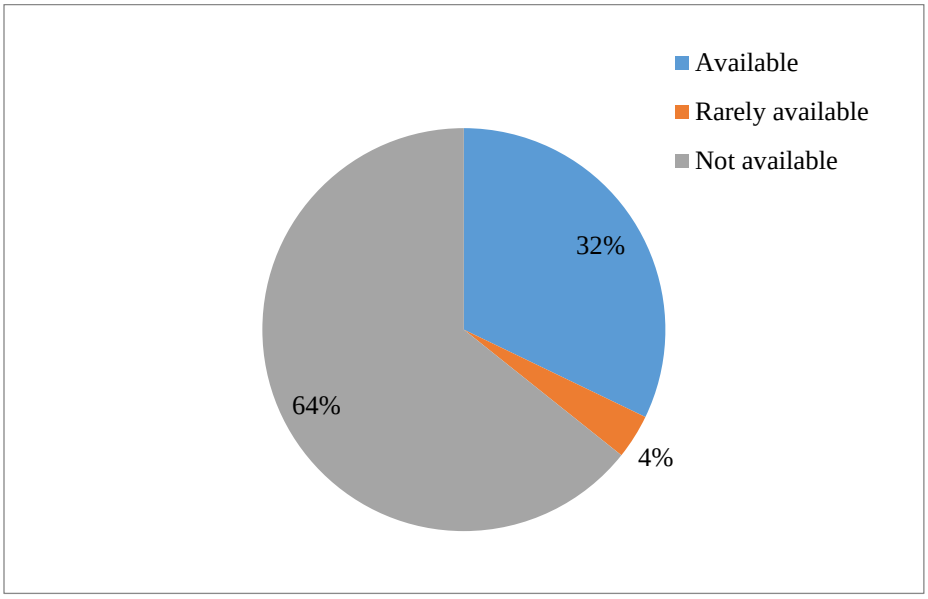

Fig. 3. Percentage of endangered fish species

Biodiversity status of vulnerable fish species in Kaptai lake

According to the Red list of ICUN Bangladesh, 2003 Seven (7) vulnerable species were found in Kaptai lake of which 6 were available (43%) and 1 rarely available (7%). It was also observed that 7 species not available (50%) during the study period (Table 5 and Fig. 4).

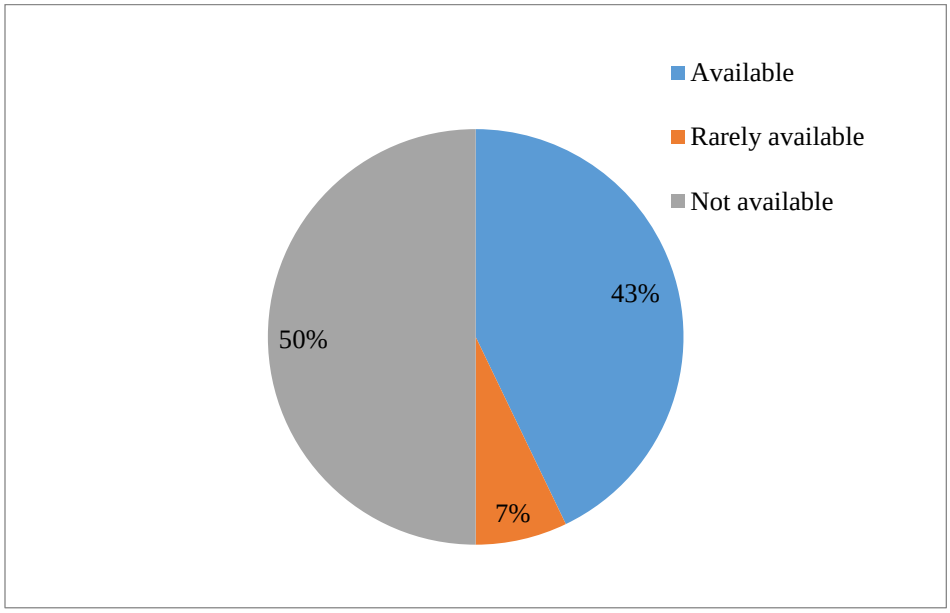

Fig. 4. Percentage of vulnerable fish species

From Kaptai lake a total of 20 threatened fish species were indentified during the study period, out of 54 threatened fishes as reported by IUCN Bangladesh (2003). Among 20 threatened fish species there were 7 vulnerable, 10 endangered and 3 critically endangered species. Alam (2004) recorded a total of 73 species of fish belonging to 47 genera, 25 families, two species of prawn and 1 species of dolphin from Kaptai lake. Kachki (*C. soborna*), Chapila (*G. chapra*), air (*M. aor*), Foli (*N. notopterous*), Nilotica (*O. niloticus*), Kuncho chingri (*M. lamarii*) and Ghoria (*L. gonious*) were dominant in the past and also in the present study. In the present study, among 20 threatened fish species 16 species (29.62%) were found available. Some of the threatened fish species were found in good quantities during the study period indicating these fishes may not be threatened in this lake. Rahman and Hasan (1992) observed that a total of 49 species of indigenous and 5 exotic fishes existed in Kaptai lake. Halder *et al*. (1991)

recorded a total of 71 fish species including 5 exotic fish and 2 species of prawn from Kaptai lake. Although foli (*N. notopterous*), air (*Sperata aor*), kajoli (*A. coila*), punti (*Puntius ticto*) were vulnerable but they were found available in Kaptai lake. Therefore, these species although threatened in the context of Bangladesh, may not be threatened for Kaptai lake. *Silonia silondia, Bagarius bagarius, Tor tor, Otolithoides pama, Clupisoma goura* are critically endangered or extinct species not found in Kaptai lake. *Setipinna phasa, Ompok bimaculatus, P. sophore, P. sarana, Chanda nama, C. reba* fish species were very rare in Kaptai lake.

Ten exotic fish species have been found from Kaptai lake such as *Hypophthalmicthys molitrix. Ctenopharyngodon idella, Cyprinus carpio, Puntius gonionotus, Oreocromis niloticus, O. mossambicus, Pangasius hypopthalmus* and *Mylopharyngodon piceus, Aristichthys nobilis* and *clarias gariepinus*. Among them *P. ginionotus* and *H. molitrix* were found less than others species during the study period. From the observation of availability of fishes in different landing centers/markets, it was found that 88.6% of the total fish were transported to Rangamati town from Kaptai Lake, Rangamati region and other 11.4% from outside of Rangamati region. The fish composition in different fish markets is presented in Table 6.

Table 6. Market shares in main fish species in different fish markets of Rangamati town

Sources of fish in the markets	Fish	Bonorupa bazar (%)	Rijab bazar (%)	TNT bazar (%)	Tobolchori bazar (%)	Vetvedhi bazar (%)	Average
Rangamati region (88.6%)	Indian major carps	45	45	44	43	45	44.4
	Catfishes	13	13	12	11	12	12.4
	Tilapia	5	6	6	5	7	5.8
	SIS	9	6	8	5	10	9.6
	Thai Koi	5	5	5	6	3	4.8
	Shrimp	2	5	2	2	4	3
	Others	7	5	11	9	6	8.6
Outside of Rangamati (11.4%)	Hilsa	6	7	8	6	7	6.8
	Carps (Indian and exotic)	4	3	3	4	2	3.2
	Others (including marine fish)	2	2	1	1	1	1.4
	Total	100	100	100	100	100	100

Virtually most of the fish (88.6%) were brought from different areas of the Rangamati districts and adjacent districts like Chittagoag, Cox' Bazar, Fenietc the rest (11.4%) were brought from external source in Bonorupa bazar, Rijab bazar, TNT bazar, Tobolchori bazar, Assambosti bazar and other fish markets from local sources. Main source of these fishes were different Kaptailake, creeks, ponds, beels and rivers of Rangamati district and adjacent districts in Rangamati. Hossain (2009) studied that 29% of fish supplied in the markets were carps, 28% SIS, 2% hilsha, 24% catfish, 4% prawn/ shrimp, 3% tilapia, 2% koi, and 8% others. About 90% of fishes have been transported from the rural areas of the district and adjacent district like Netrokona, Jamalpur and Krishoregonj. The rest 10% comes from external sources in Mechhua bazar, Natun bazar, Railway market and Pourashova bazar. Whereas (100%) of the fish species were brought from different area of the district and adjacent district in Keyotkhali bazaar, K.R. market, Shesmor bazar, and Sutiakhali bazar.In this study a total of 100 fish species were found in the landing centers of Rangamati town out of 260 freshwater fishes. Chowdhury and Iqubal (2007) carried out an investigation on the fish species availability in the fish landing centers of Dhaka. They observed a total of 98 inland and marine water fish and crustacean species and out of 98, 87 species belonged to fin fish. Among the finfish species, 52 were freshwater species.

A total of 13 marine fish species were recorded. Among the marine fish species 5 species were found in winter, 2 species in summer and the rest 6 species all the year round. In case of winter season, fish supply is comparatively higher than other season because the sea remains calm in winter season (Ali *et al.,* 2004). A total of 9 shellfishes were observed in the landing centers of Rangamati town. Chowdhury and Iqubal (2007) reported that 11 shellfishes were observed in the landing centers of Dhaka city. They were also found 13 exotic freshwater fish species round the year as they were being cultured by commercial fish farmers.

Seasonal variation of fish species

Seasonal variation in the abundance of different species of fish in the Kaptailake is shown in the Fig. 5. Water level in Kaptai decreased in Junuary than other month. Abundance of fish increased during November and gradually shows declining trends onward from January. Once again it exhibits gradual rise from April. Fish abundance was low in December and January (Fig. 5).

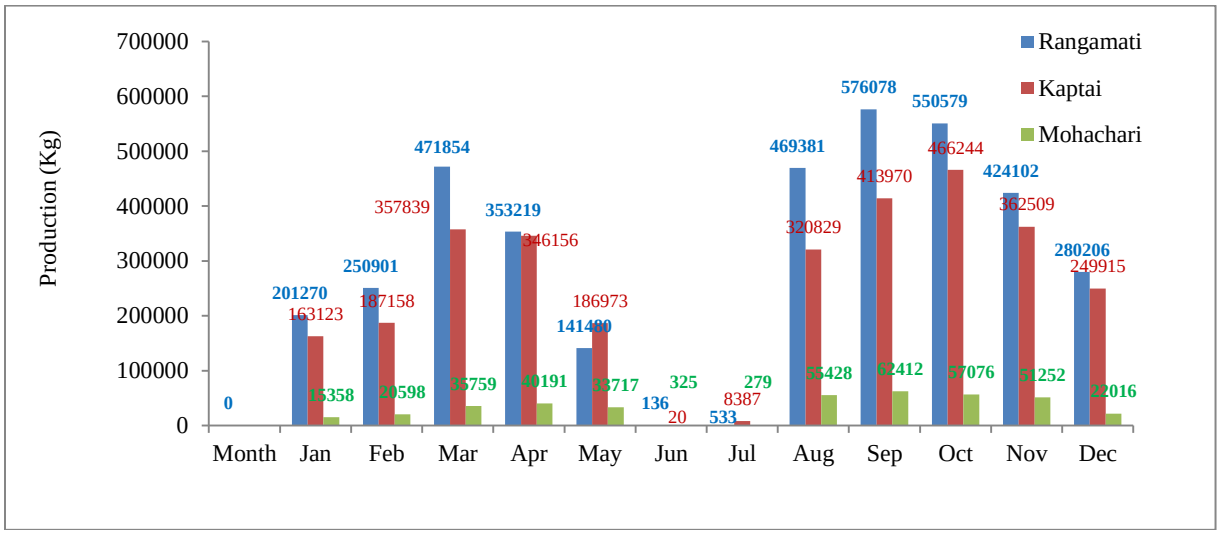

Fig. 5. Monthly variation of fish production in different landing centers

The highest number of fish species was found in Rangamati fish landing center and lowest number in Mohalchari fish landing center. The present study covered twelve months. Among this 12 month in November availability of fish was high and lowest in January. In September fish production in Rangamati is 5,76,078 kg, Kaptai 4,13,970 kg and in Mohalchari 62,412 kg. In January 2,01,270 kg in Rangamati, 1,63,123 kg in Kaptai and 15,358 kg in Mohalchari fish landing center. Fish availability decreased gradually from December to February and gradually increased from March to April. From May, fishing in Kaptai lake for an indefinite period has been banned to conserve the fish species every year. During this period, mother fishes lay eggs while fish fries are also released in lake. Mohsin (2009) studied on the seasonal abundance of fin fishes in the Pabda River at Rajshahi District, Bangladesh. Maximum 67 species were recorded in the month of August, September and December of 2009 and in May and June of 2010; whereas the lowest number of fish species (65) was observed in April 2010.

Conclusion

The study preliminary attempts to understand the status and current worries of fish diversity of Kaptai lake, Bangladesh. Loss of many commercially important fish species is the current alarming issue and its conservation is the only solution for this problem. Though this lake have been conserved by many rules and regulations but due to the lack of proper scientific data-base, it is becoming more difficult to select proper management and conservation strategy. However, present study has revealed some recommendations like ensuring water flow, developing fishermen's awareness, preventing indiscriminate fishing of larvae and juveniles, effective implementation of existing fisheries laws and declaration of fish sanctuary to save diversity of Kaptai lake. Extensive research is required to prepare better data-base information on biodiversity and fisheries with abundance problems aiming to develop practical rule and regulations.

Acknowledgements

We express our heartfelt gratitude to the local retailer, aratdar, fishermen of fish market and fish landing centers for their extensive support during sample collection and we also express thanks to all staff of the Bangladesh Fisheries Research Institute (BFRI), Riverine Sub-Station, Rangamati for their assistance during laboratory and field works.

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