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CURRENT STATUSOF FISH DIVERSITY OF "KAMANDANGABEEL" OF KOKRAJHAR DISTRICT, ASSAM INDIA, WITH A BRIEF NOTE ON IT'S THREAT AND CONSERAVTION

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ABSTARCT: The Kamandangabeel of Kokrajhar district is located in lower reach area of mighty river Brahmaputra Assam. The present study revealed the presence of 53 species of fishes during investigation period for 2015 belonging to 17 family, which indicates the rich fish diversity. The fish species were recorded under 10 orders of which 35.48% was identified as Cypriniformes, 40.3% as Siluriformes, 26.9% as Perciformes, 7.6 % as Channiformes, 3.8 % as Osteoglossiformes; 5.7 % as Synbranchiformes, 1.9 % Tetraodontiformes. The study also portrays the IUCN status of fish diversitybased on CAMP report (1998). Thefish diversity is declining around the globe owing to various anthropogenic activities like overfishing, pollution and other anthropogenic factors like conversion of wetland areas into agricultural land, encroachment and natural hazards etc. and the study area exhibits such prevalence too in the beel which have been identified asmajor threat. There has been found 1 endangered, 2 near threatened, 6 vulnerable and the result suggests for proper measures such as strict implementation of fishery laws and regulation , environment act for sustainable use of aquatic resource with some control strategies towards fish diversity.
Key words: Fish diversity, IUCN, Kamandangabeel, Assam, Decline, cause, Fisheries

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INTRODUCTION

North-east region is one of the bio-diversity hotspot area from fisheries point of view since time immemorial. The region harbours a wide range of climatic condition with congenital geographic location. The state of Assam is also rich in-terms of varied water-bodies. There are 3,513 (registered and unregisteredbeels in Assam comprising an area of more than 1012.31 sq Km which constitute 1.29 % of the total geographical area of the state [1] .The entire Brahmaputra valley is endowed with a large number of freshwater lakes locally called beels or ox-bow lakes, marshy tracts, seas and seasonally flooded plains and hundreds of riverine sandbars and islands.The valley is an ideal wetland ecosystem providing habitat for a large variety of endangered species of fish along with other animals and plants such as medicinal plant. As many as 690 numbers of lakes and ponds covering an area of 1,5,494hactre which includes 0.20 percent of the total geographical area of the state and 15.30 % of the total area under wetlands[1]. Assam and other parts of N.E. region is recognized as one of the hot spots of fresh water fish biodiversity. 197 food, sports and ornamental fish species are reported from the region of which 185 are reported from Assam. Lower reach of Brahmaputra river is a lucrative source of fish diversity and it's comprehensive documentation of fishery resources has an utmost importance in fishery biology from taxonomic view as it may provides a baseline to researchers. Wetlands are facing serious threat such as siltation, encroachment by the fringe villagers and the ultimately closure of outlets on the connection of the wetland from the main river system.

Several wetlands are being converted into closed type of wetlands, which have affected the reproductive strategies of several species of riverine fishes. The major causes of depletion of wetland fish biodiversity are: Eutrophication Siltation, Cloud burst: wetland to agriculture conversion, invasive species of fish, poaching, ollution, fish disease and turbidity. The notable works on beels of Assam were reported by several workers from different point of view viz. Fish and fishery status of Deeporbeel- A Ramasar site in Assam[2], Physico-chemical parameters and Ichthyo-faunal diversity of the DeobaliJalah in Nagaon, Assam [3], Fish diversity of wetland, river, pond in North-east India[4], Ichthyo-faunal diversity of Kapla-beel of Assam[5], An overview of the wetlands , rivers and fishes in northeast India with a brief note on their present status using GIS Tools[6].

Study area:

Kokrajhar district is situated on the North bank of the mighty Brahmaputra river in lower Assam (fig.1) The district has many water bodies like beels, ponds, rivers, streams,swamps and marshylands making ideal habited for fishes.

Fig 1: Map of kokrajhar district showing the study area

Among these water bodiesbeels are noteworthy in the production of fishes. Investigations were conducted on the Kamandangabeel of Kamandanga village located in Gossaigaon Tehsil which is the sub divisional head quater of Kokrajhar district Assam. It is 23 km from Gossaigaon town of Kokrajhar district. Itlies between the coordinates $26^{o}38^{/}$N and $89^{0}80^{/}$ E. It is about 1 km long and surrounded by human population one side, it is 'U' shaped covered by planktons.

Aims and objective

1. To document fresh water fishes in kamandangabeel, kokrajhar, Assam
2. To study the abundance and to ascertain the conservation status of freshwater fishes from the study area.
3. To suggest some measures for conservation of the fresh water fishes for sustainable use.

MATERIALS AND METHODS

Fish samples were collected every month during one year from different sites of the beel and also from the landing sites and market in the vicinity of the beel. Fishes were also collected with the help of local fisherman at various location.

The fishes were collected from the beels by using different types of 'Nets' and 'Gears' commonly used in beel fisheries. Fishes caught alive or in fresh condition had been preserved in 9-10% formalin solution[8].For fishes of medium ranges (10-13 cm) an incision on the abdominal wall top one size of the midventral line is made. For observation, measurement and finally identification were done following Talwar and Jhingran, [7], Jayaram, [8] and Dey [9].

RESULT AND DISCUSSION

During the investigation period of one yaer in the Kamandangabeel of Kokrajhar district, 53 species were identified and the available species of fish along with local names has been incorporated in table 1. The number and percentage of species on order and family wise have been presented in table 2 and table 3 respectively. The collected species of fishes includes exotic species, common carps, major carps, cat fishes, snake headed fishes, hump fishes, eels, chandas, minor carps etc. were recorded from the beel. Exotic fishes like grass carps, silver carps and common carps have been reported in the said beel. The flood water have also brings soil nutrients, other fauna and flora to the beel during rainy season. 53 species were recorded in the Kamandangabeel, *Labiorohita, Labiobata, Labiogonius, Labiodero, Cirrhinusmrigala, Catlacatla,Wallagoattu, Amblypharyngodonmola, etc.* are commercially important group.

Table 1. Fish diversity of Kamandangabeel along with it's abundance and IUCN status

Order	Family	Species	Local name	Abundance	IUCN status
Cypriniformes	Cyprnidae	*Amblypharyngodonmola*	Moa	++	LC
		Cirrhinusmrigala	Mirika	+++	LC
		Cirrhinusreba	Rohu	++	LC
		Labeorohita	Rohu	+++	Lc
		Labeocalbasu	Kaliajora	++	LC
		Labeobata	Bhagon	+++	LC
		Labeogonius	Khuri	++	LC
		Catlacatla	Bhokua	++	LC
		Hypopthalmichthysmolitrix	Silver carp	++	LC
		Cyprinuscarpio	Common carp	++	NA
		Ctenopharyngodonidella	Grass carp	++	NA
		Puntiussophore	Puthi	+++	LC
		Puntiusticto	Kaniputhi	+++	LC
		Rasborarasbora	Dorikona	+++	LC
		Esomusdanricus	Dorikona	++	LC
		Daniorerio	Laupati	+++	LC
		Puntiusconconius	saruputhi	+++	LC
		Puntiussarana	seniputhi	+++	LC
		Puntiusjavanicus	Java puthi	++	LC
		Labeodero	Naro	++	LC
		Botiaderio	Baghmach	+++	LC
Siluriformes	Bagridae	*Mystustangra*	Tingorah	++	LC
		Mystusvittatus	Singorah	++	LC
		Mystusbleekari	singorah	+++	LC
		Mystuscavasius	Borsingorah	++	LC
		Rita rita	Lithamach	+++	LC
		Aoricthysaor	Ari	+++	LC
	Siluridae	*Ompakpabda*	Pavo	+	NT
		Wallagoattu	Borali	+++	NT
	Schilbadae	*Eutropiichthysvacha*	Basa	++	LC
		Ailiacoila	Kjali	+	NT
		Pangasiuspangasius	Pangas	+	LC
	Sisoridae	*Bagariusbagarius*	Garua	+	NT
	Claridae	*Clariusmagur*	Magur	+++	LC
	Heteropneustidae	*Heteropneustesfossilis*	Singi	+++	LC
Symbranchformes	Mastacemalidae	*Macroognathusaral*	Turi	+++	LC
		Macrognathuspancalus	Turi	+++	LC
		Mastacembelusarmatus	Bami	+++	LC

Perciformes	Symbrancidae	*Monopteruscuchia*	Cuchia	++	LC
	Ambassidae	*Chandanama*	Chanda	+++	LC
	Nandidae	*Nandusnandus*	Randhalni	++	LC
		Badisbadis	Gedgedi	++	LC
	Anabantidae	*Anabas testudineus*	Kawoi	++	LC
	Belontidae	*Trichogasterfasciatus*	Kholihona	+++	LC
Channiformes	Channidae	*Channagaschua*	Cheng	+++	LC
		Channamarulius	Sal	++	LC
		Channapunctatus	Goroi	+++	LC
		Channastriatus	Sol	++	LC
Osteoglossiformes	Notoptaridae	*Chitalachitala*	Chital	++	NT
		Notopterusnotopterus	Kanduli	++	LC
Clupeiformes	Clupidae	*GudusiaChapra*	Karoyi	++	LC
Tetradontiformes	Tetradontidae	*Tetradoncutcutia*	Gangatop	+++	LC

+ = 25 %, ++ = 50%, +++ = 75 %, ++++ = 100%

EN=Endangered, Vu=Vulnerable, LRnt=Lower risk near threatened, Lc= Least concern, NA= Not- accessed, NT = Near threatened, LRnc =Lower risk

Table-2: Number and percentage composition of different orders of fishes

Order	**Percentage**	**No. Of species**
Cypriniformes	40.3%	21
Siluriformes	26.9%	14
Perciformes	11.5%	7
Channiformes	7.6%	4
Osteoglossiformes	3.8%	2
Clupeiformes	1.9%	1
Tetradontiformes	1.9%	1
Symbranciformes	5.7%	3

Table-3: Number and composition of different families of fishes from in Kamandangabeel

S. No.	**Family**	**No. Of species**
1.	Cyprinidae	21
2.	Bagaridae	6
3.	Siluridae	2
4.	Schilbadae	3
5.	Sisoridae	1
6.	Claridae	1
7.	Heteropneustidae	1
8.	Mastacembalidae	3
9.	Symbrancidae	1
10.	Ambassidae	1
11.	Nandidae	2
12.	Anabantidae	1
13.	Belontidae	1
14.	Channidae	4
15.	Notoptaridae	2
16.	Clupidae	1
17.	Tetradontidae	1

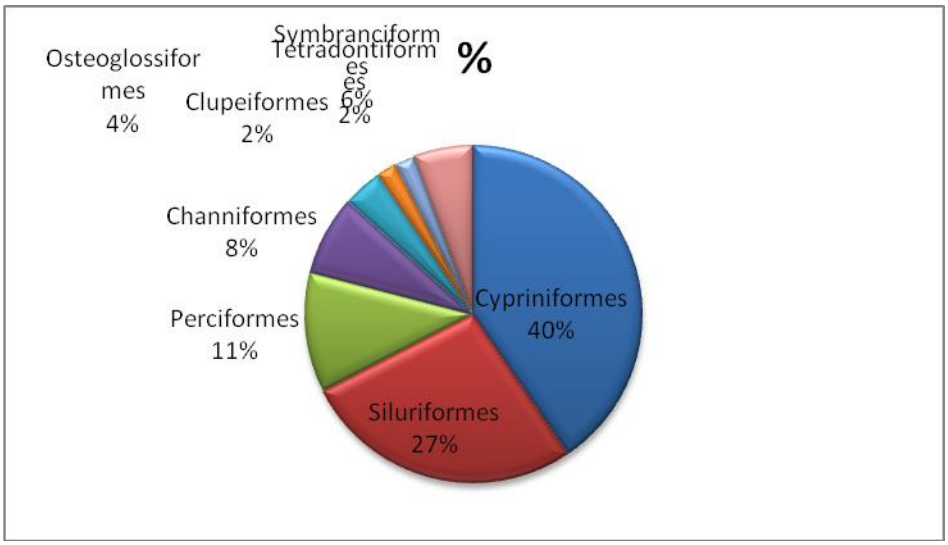

Fig-2: A pie diagram showing different composition of orders of fishes from in Kamandangabeel

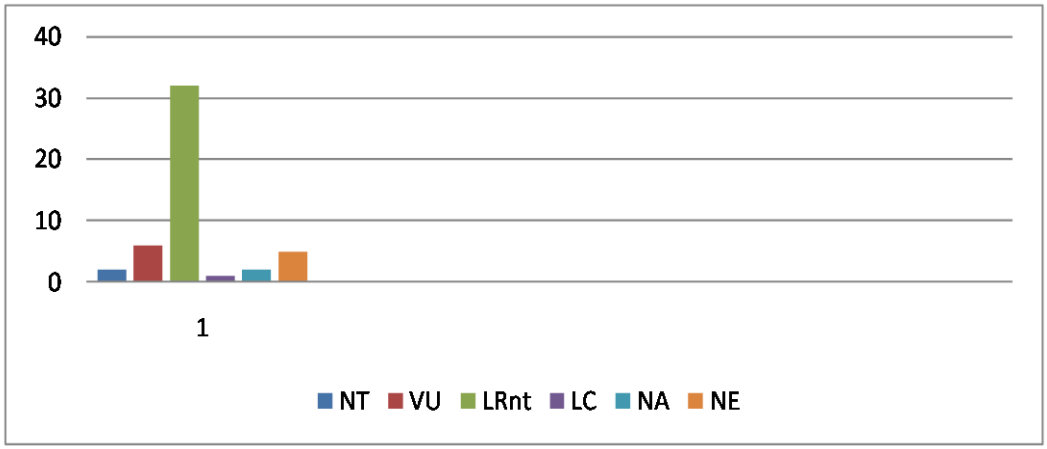

Fig- 2: Bar diagram showing the comparison of fish diversity in IUCN status

Threats and conservation of wetland

Half of the world's wetlands have disappeared since 1900. Development and conversion continue to pose major threats to wetlands, depicts their value and importance. Wetlands everywhere on the world face a high pressure of conversion for commercial development, drainage schemes, overfishing, siltation, pesticides discharges from intensive agriculture, toxic pollutants from industrial wastes etc.

1. **Siltation:** Siltation is the pollution of water most often caused by the soil erosion. It is the increased accumulation of fine sediments on bottoms where they are undesirable.
2. **Eutrophication:** Eutrophication is characterized by excessive plant ad algal growth due to the increased availability of one or more limiting growth factors needed for photosynthesis. Eutrophication lowers the dissolved oxygen, which harms the aquatic biodiversity.
3. **Illegal fishing:** Illegal fishing is a major cause of wetland fish diversity degradation. Poachers destroys the fish diversity by fishing with destructive gears in the breeding season, catching juvenile, overfishing.
4. **Expansion of agriculture area:** As the population demand is the increasing, the people occupy the area of beel for the agricultural purpose for which the wetlands are heavily pressured and converted to crop lands.
5. **Flood:** Occurrence of flood is a frequent phenomenon in lower Assam posing a major threat to wetlands by causing soil-erosion and siltation. It helps in introduction of exotic species of fishes for which existence of native fishes is a new threat.

6. **Pollution:** Pollution in wetlands is a growing concern affecting drinking water sources and loss of bio-diversity. Drainage and run off from chemically fertilized, pesticide used crops, industry sends excess nitrogen, phosphorous and other toxins like mercury to water sources are major identified pollutant of the beel.
7. **Deforestation:** Removal of vegetation in the beels leads to soil erosion. Wetland plants are susceptible to degradation if rejected to hydrological changes and pollution inputs and other activities like grazing of domestic animals etc.

CONCLUSION

The study was a preliminary attempt to assess the fish diversity of Kamandangabeel with a view to study the fish abundance and it's causes for declining. The wetland has witnessed a somewhat declining trend and somecontrol measures like preventing water pollution, ensuring nursery, feeding and breeding ground of fish, fishermen's awareness with local community and NGOs are need of hour.Wetlands should be conserved by sustainable use for the benefit of mankind.

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