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Original Article

Vertebrate Biodiversity in and Around Ahiran: An Important Wetland of Murshidabad, West Bengal, India

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Abstract

Wetland ecosystems are one of the most biologically productive ecosystems in the world providing the key habitat environments for mammals, birds, reptiles, amphibians and fish. In recent times the wetlands are facing tremendous anthropogenic pressure, which can greatly influence the population structure. Sustainability of wetland ecosystem is necessary for various important functions such as food storage, water quality continuation and providing habitat for different species of flora and fauna. An inventory of wetlands of any region is a pre-requisite for their conservation and management. Ahiran Lake, a wetland of Murshidabad district, West Bengal, (approximately 400 hectare, 24° 26′ N to 24° 30′ S and 87° 58′ E to 88° 02′ W) serves as a habitat of large populations of resident and migrant water birds, fish, amphibian, reptiles and mammals. But information about the vertebrate diversity, composition and structure of the community in this wetland is scarce. In the present investigation documentation and assessment of the vertebrate diversity of Ahiran lake is conducted. Our study revealed 40 species of fishes, 56 species of birds, 6 species of amphibian, 8 species of reptiles, 2 species of mammals are frequently found at Ahiran wetland. The baseline documentation will provide useful data and new insights to establish and improve management systems for sustainable development of wetlands.

Keywords: Vertebrate; Biodiversity; Ahiran Lake; Murshidabad; Wetland.

Introduction

Biodiversity has become a major concern to the biologist against the backdrop of rapid decline in the natural population of aquatic fauna. Biodiversity encompasses genetic, species and ecosystem levels of biological organization with structural, compositional and functional components. Wetlands, locally known as 'Beels' are the most common and an integral feature of the fluvial landscape of West Bengal. Wetlands are those areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support and that under normal circumstances, do support a prevalence of vegetation typically adopted for life in saturated soil conditions. Wetland generally includes swamps, marshes, bogs and similar areas (Acharya and Adak, 2009). Wetland is a complex natural system that harbors a wide variety of flora and fauna, all of great economic, aesthetic and scientific importance (Das, 2015). Wetlands are not wasteland at all they are valuable natural wonderlands that keep the environment in a balance state (Mondal and Roy, 2014; Chakraborty and Nur, 2009). Wetlands of India, estimated to be 58.2 million hectares, are important repositories of aquatic biodiversity (Nath and Deka, 2012; Deka, 2015). The occurrence of food plant is was very well synchronized with a large number of migratory and resident birds, fishes, amphibians and reptiles in the wetland. High diversity and abundance of avian flora indicated intensive use of the wetland which was due to structural diversity of vegetation provided by broadleaved species (Mitsch and Gosselin, 1986). Presence of birds is a good indicator of the health of wetland. India is one of the global hotspots for birds with over 1340 bird species (13% of world species) recorded from the country

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(Manakadan & Pittie, 2001), of which 310 species are dependent on different fresh and salt water wetlands (Kumar et al. 2005). The conversion of wetland habitat to agricultural India is one of the global hotspots for birds with over 1340 bird species (13% of world species) recorded from the country (Manakadan & Pittie, 2001), of which 310 species are dependent on different fresh and salt water wetlands (Kumar et al. 2005). The conversion of wetland habitat to agricultural land or other commertial purpose is threatening the bird populations (Chowdhury and Nandi, 2014). According to Bird Life International (2001), the wetland of this area lies in Biome - 11 (Indo-Malayan tropical dry zone). Thirteen big fresh water wetlands, out of 23 (>100 hectare) in West Bengal, are present in different blocks of this district. The wetlands of this region are generally palustrine (floodplains, seasonal waterlogged, marsh), lacustrine (Lakes) and riverine types. All these wetlands are directly or indirectly connected with the different rivers like Ganga, Babla, Jalangi, Bhairab etc. Wetlands are one of the most threatened habitats of the world. Wetlands in India, as elsewhere are increasingly facing several anthropogenic pressures. Thus, the rapidly expanding human population, large scale changes in land use/land cover, burgeoning development projects and improper use of watersheds have all caused a substantial decline of wetland resources of the country. Significant losses have resulted from its conversion threats from industrial, agricultural and various urban developments. These have led to hydrological perturbations, pollution and their effects. Unsustainable levels of grazing and fishing activities have also resulted in degradation of wetlands. The current loss rates in India can lead to serious consequences, where 74% of the human population is rural and many of these people are resource dependent. Healthy wetlands are essential in India for sustainable food production and potable water availability for humans and livestock. They are also necessary for the continued existence of India's diverse populations of wildlife and plant species; a large number of endemic species are wetland dependent. Most problems pertaining to India's wetlands are related to human population (Prasad *et al.* 2002). Many species of fishes, amphibians, reptiles, birds and mammals depend on the wetland habitat for breeding, foraging and for their shelter supported by the diverse plant species. One of the best known functions of wetlands is to provide habitat for birds which use wetlands for breeding, nesting and rearing of young ones, besides using them as a source of drinking water, for feeding, resting, shelter and social interaction (Pathak and Sarma, 2013, Bhyuia, 2014). The direct and indirect benefits derive from wetlands are numerous. Direct benefits are fishing, water supply, irrigation, agriculture, tourism, soil erosion control etc. Indirect hydrological and economical benefits are of great economic value such as ground water recharge, flood control through holding, water quality improvement, wildlife habituate etc. Ahiran beel is also known as Chander beel, a wetland situated on Ahiran Mouza of Suti Police Station, J.L. No. 102, dagh no. 2875, Murshidabad district, West Bengal (Mondal and Roy 2014). Ahiran is a perennial fresh water lake of Ganges river is located between 24° 26' N to 24° 30' S and 87° 58' E to 88° 02' E, about 60 k.m. north-west of Berhampore town. The lake is ox bow in shape and east side of the beel NH-34 and Eastern Railway route connecting Kolkata with North Bengal and North-East India. It is very close to Feeder canal of Farakka Barrage and Aligarh Muslim University, Murshidabad Campus. Ahiran beel provides a unique habitat to aquatic flora and fauna, as well as numerous local birds includes migratory birds from cold areas of different parts of China, Russia, Central Asia, Tibet and from the entire range of the Himalaya (Mistry, J and Mukherjee, S. 2015). In Murshidabad, this Ahiran beel is important fishing ground. Once this beel had abundant of native fish species, prawn, snail, crabs and turtles. Due to over exploitation, indiscriminate destructive fishing practices, soil erosion, pollution from domestic and agrochemical wastes, some important wild fishes have disappeared. On March 20th, 1987 United Nations stated "sustainable development is development that meets the need of the present without compromising the ability of the future generation to meet their own need" (Reddy and Char, 2004; Nagesh *et al,* 2006). In brief, securing economic development, social equity and justice, and environmental protection is the goal of sustainable development. Although these three factors can work in harmony, they can often found to conflict with one another (Gibbs, 2000; Kumar and Meenakumari, 2002).

Materials and Methods

25 consecutive surveys were executed from November 2012–March 2015. Bird species were observed visually using binoculars of different ranges and their photographs were taken using a Sony DSC HX 100 V camera for identification. Surveys started during the peak hours of their activity, in the morning, from 0500–1100hr and in the evening, from 1600–1800hr on a regular basis in different groups. Fishes were collected from the fishermen and photographed. The fish and amphibians are preserved for further

identification. Reptiles and mammals were identified from photographs. The animal local names at Ahiran region were also recorded for future reference.

Observations

In the observations the local name of Ahiran region was emphasized, so that the animals can be located in future with the help of local people for the purpose of sustainable management. Two species of mammals *Canis aureus* (Sheal) and *Herpestes javanicus* (Beji) are frequently found in Ahiran. Besides there are 40 species of fishes, 56 species of birds, 6 species of amphibian and 8 species of reptiles.

Vertebrate Fauna

FISH: The wetland contains wild fishes and also major and minor carps. Catfishes are available to this wetland. Carps are not introduced to this wetland, so there question arise how carps are available in this beel. Proper answer of this question is during monsoon period (July to September) the beel get inundated, most of the villages of Suti-1 block surrounding the beel are also flooded. Carps are cultured in the pond of villages. The flooded water from the various ponds contains both major and minor carps flows down to this beel. As a result, the beel harbors major and minor carps beside wild fishes.

Amphibia and Reptiles: The species *Batagur baska* is introduced by release from Forest Department, which are seized from trafficking in Farakka or Malda station.

Table 1: Fishes of ahiran beel with local name

Local Name of Fish at Ahiran Region	Scientific Name
Rui	*Labeo rohita*
Kalbaus	*Labeo kalibasu*
Catla	*Catla catla*
Mirka	*Cirrhinus mrigala*
Silver (Exotic and introduced fish)	*Hypophthalmichthys molitrix*
Bata	*Labeo bata*
Sor punti	*Puntius sarana*
Tit punti	*Puntius ticto*
Sophori punti	*Puntius sophore*
Kanchon punti	*Puntius conchonius*
Mourala	*Amblypharyngodon mola*
Pata khalisha	*Colisa fasciatus*
Guri khalisha	*Colisa lalius*
Gol chanda	*Chanda ranga*
Kath chanda	*Chanda nama*
Shol	*Channa striata*
Gajar (Shal)	*Channa marulius*
Lata/Sati/Chimri	*Channa punctatus*
Chang	*Channa gachua*
Bele	*Glossogobius giuris giuris*
Bhut bele	*Eliotris fusca*
Vyada	*Nandus nandus*
Koi	*Anabas testudineus*
Bot koi	*Badis badis*
Chuno Mach	*Aplocheilus panchax*
Darika	*Esomus danricus*
Chital	*Notopterus chitala*
Folui	*Notopterus notopterus*
Deshi pabda	*Ompok pabda*
Kuchia	*Monopterus cuchia*
Kalo tangra/Bojre Tangra	*Mystus vittatus*
Paloa tangra	*Mystus cavasius*
Shingi	*Heteropneustes fossili*
Magur	*Clarias magur*
Boal	*Wallago attu*
Tyapa	*Tetraodon cutcutia*
Gunte	*Lepidocephalus guntla*
Balichata	*Nemachilus botia*
Guchi	*Mastacembelus aculiatus*
Kakila	*Xenontodon cancila*

Table 2: Amphibians and reptiles of ahiran beel with local name

Local Name of Amphibia	Scientific Name	Local Name of Reptiles	Reptiles
Kuno Bang	*Bufo melanostictus*	Keute	*Naja naja*
Sona Bang	*Euphlyctis hexadactyla*	Gosap	*Varanus bengalensis*
Sona Bang	*Pedostibes tuberculosus*	Hele	*Natrix piscator*
Sona Bang	*Hoplobatrachus tigerinus*	Kochhop	*Trionyx gangeticus*
Sona Bang	*Limnonectes limnocharis*	Roktochosa	*Calotes versicolor*
Jhi Jhi Bang	*Euphlyctis cyanophylyctis*	Saper Masi	*Eutropis carinata*
		Saper masi	*Lygosoma albopunctata*
		Jol Dhora	*Enhydris enhydris*

Table 3: Avifauna in ahiran beel with local name and common name

Common Name	Local name at Ahiran Region	Scientific Name
Purple Swamp hen	Kayem	*Porphyrio porphyrio*
White-breasted water hen	*Dahuk*	*Amaurornis phoenicurus*
Purple heron	*Lalkak* *	*Ardea purpurea*
Indian Pond heron	*Kochbok*	*Ardeola grayii*
Pheasat-tailed jacana	No local name, first time from Murshidabad	*Hydrophasianus chirurgus*
Bronze-winged jacana	*Jolpipi*	*Metopidius indicus*
Little Grebe	*Pandubi*	*Tachybaptus ruficollis*
Common kingfisher	*Choto machranga*	*Alcedo atthis*
White-throated kingfisher	*Machranga*	*Halcyon smyrnensis*
Pied Kingfisher	*Fotka*	*Ceryle rudis*
Little Cormorant	*Panitor*	*Phalacrocorax niger*
Great Cormorant	*Boro Panitor*	*Phalacrocorax fuscicollis*
Little egret	*Bok*	*Egretta garzetta*
Cattle egret	*Gobok*	*Bubulcus ibis*
Cotton pygmy-goose	*Balihas* *	*Nettapus coromandelianus*
Wire-tailed swallow	*Tarlyaja*	*Hirundo smithii*
Red-wattled lapwing	*Hatiti*	*Vanellus indicus*
Blue-winged leafbird	*Horbola /Sobuj bulbul*	*Chloropsis cochinchinensis*
Intermediate egret	*Bok*	*Mesophoyx intermedia*
Asian Openbill	*Samukkhol/Samkhol*	*Anastomus oscitans*
Common Coot	*Daukhol/Balihas**	*Fulica atra*
Black-headed Ibis	*Lohajang* *	*Threskiornis meloanocephalus*
Grey Heron	*Sada kak**	*Ardea cinerea*
Darter	*Goyar* *	*Anhinga melanogaster*
Greylag Goose	*Rajhas*	*Anser anser*
Gadwall	*Saral* *	*Anas strepera*
Northern Pintail	*Boro dighor**	*Anas acuta*
Wood Sandpiper	*Gotra*	*Tringa nebularia*
Northern Shoveler	*Khuntehas* *	*Anas clypeata*
Eurasian Wigeon	*Boro rangamuri**	*Anas penelope*
Chestnut-tailed Starling	*Chorpakhi*	*Sturunia malabarica*
Garganey	*Giriahas* *	*Anas querquedula*
Pied cuckoo	*No local name first record from Murshidabad*	*Clamator jacobinus*
Rosy Starling	*No local name first record from Murshidabad*	*Sturnus roseus*
Ashy prinia	*Nilche lalgirdi*	*Prinia socialis*
Indian Silver bill	*Patafutki / Tuntuni*	*Lonchura malabarica*
Green bee-eater	*Banspati*	*Merops orientalis*
Black drongo	*Finge*	*Dicrurus macrocercus*
Laughing dove	*Kanthi ghughu*	*Streptopelia decaocta*
Red-vented bulbul	*Bulbul*	*Pycnonotus cafer*
Brahminy Starling	*No name. First time recorded from Murshidabad*	*Sturnus pagodarum*
Indian Robin	*Kalishyama*	*Saxicoloides fulicata*
Oriental Magpie Robin	*Doel*	*Copsychus saularis*
Jungle Babbler	*Chatare/ Satvai*	*Turdoides striatus*
Asian Pied starling	*Goslikh*	*Sturnus contra*
Common mynah	*Jhut shalik*	*Acridotheres fuscus*
Asain Koel	*Kokil*	*Eudynamys scolopacea*
Black-rumped flameback	*Kaththokra*	*Dinopium benghalense*
Rose-ringed Parakeet	*Chandana*	*Psittacula krameri*
Spotted Dove	*Chiteghughu*	*Streptopelia chinensis*
Hoopiee	*Mohanchura*	*Upupa epops*
Common pochard	*Rangamuri**	*Anas ferrina*
Paddy field pipit	*Dhanibhurui*	*Anthus novacseelanduiae*
Duscy leaf Warbler	*Tuntuni*	*Phylloscopas fuscatus*
Blacknecked stork	*Lohajung* *	*Ephippiorhynchus asiaticus*

Cirrhinus mrigala

Clarias batrachus

Labeo rohita

Labeo calbasu

Notopterus notopterus

Notopterus chitala

Colisa fasciata

Colisa lalius

Lepidocephalus guntia

Nimaichilus botia

Nandus nandus

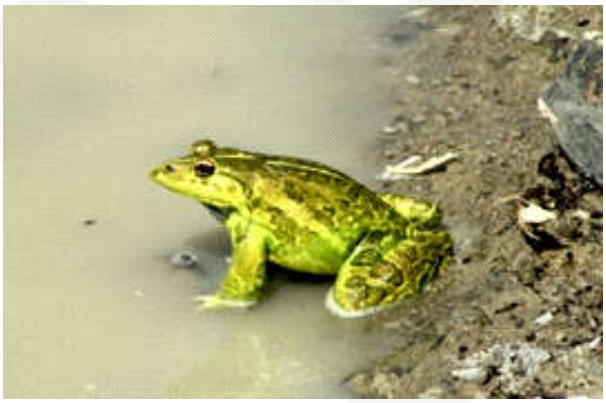
Tetraodon cutcutia

Wallago attu

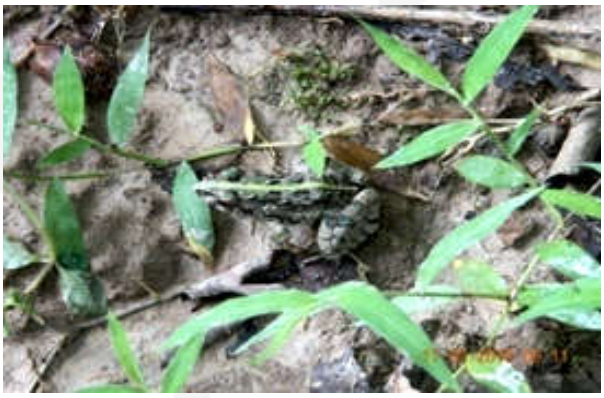
Xenentodon cancila

***Bufo melanostictus* Schneider**

***Euphlyctis hexadactyla* (Lesson)**

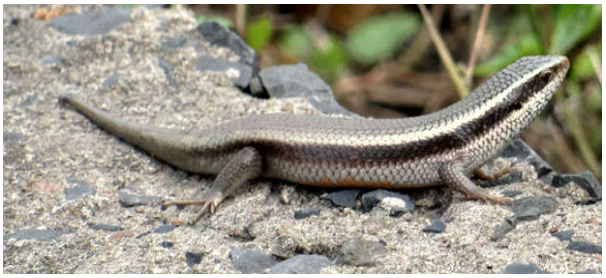


***Hoplobatrachus tigerinus* (Daudin)**



***Limnonectes limnocharis* (Gravenhorst)**

***Pedostibes tuberculosus* Gunther**



Mabuya mabouya

Calotes versicolor

Sarkidiornis melanotos

Dendrocygna javanica

Alcedo atthis

Ceryle rudis

Ciconus nigra

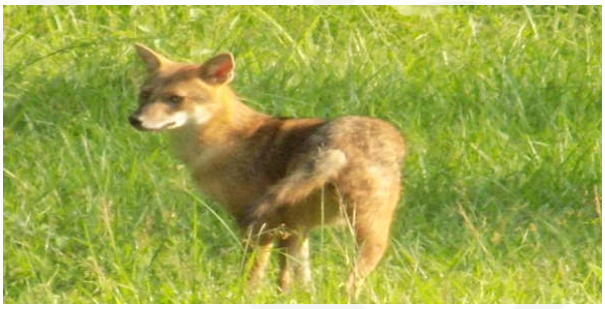
Ephippiorhynchus asiaticus

Ardia purpurea

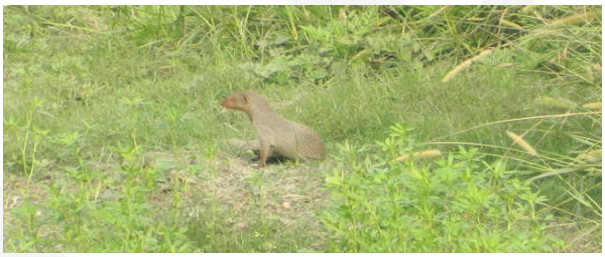
Halcyn smyrensis

Egretta garzetta

Ardia cinerea



Canis aureus



Herpestes javanicus

Birds

Ahiran beel harbor large populations of local and migratory water birds. Migratory birds displayed a definite pattern for arrival and departure from the wetland that is species specific. The peak of winter population of migratory birds was observed during the month of December to February.

Current Threats to the Biodiversity of Ahiran Beel

Threats to Fish Population

One of the major threats to Ahiran beel is overexploitation of its fish resources. It is currently estimated that there are about 30 fishermen involved in fishing. The majority of fishermen use gill nets between 1 to 2 inch mesh size. Fishermen also used small boat for transport of nets and related material and used bua jal (small lift net), sieve net (used in kata fishing), dharma jal and cast net to catch fishes. Due to indiscriminate killing of fries, fingerlings and gravid fish, the population is under heavy pressure. Killing of gravid fishes causes heavy loss of eggs per day during the breeding season. Agricultural activities also become the most dangerous practice as it causes harm to the fish fauna. They used artificial fertilizers, insecticides and pesticides for agricultural purpose that causes water pollution so fish face a greater risk of extinction. Few years ago large number of prawns was available to this beel but now a days prawns are absent species to this beel. *Nandus nandus*, *Wallago attu*, *Labeo bata*, *Glossogobius giuris guiris*, *Ompok pabda* are becoming rare each and every day.

Threats to Migratory Birds

The migratory birds come to this beel seasonally. These migratory birds faced several anthropogenic threat that affected feeding and breading habitat directly. Livestock grazing and cleaning of cattles,

using fishing net and small boat for fishing by fishermen are important threats to water birds. Sounds from automobiles on busy NH-34 road and Ahiran Halt bus stand also disturbs birds. The birds are also victims of poaching and some times the outsiders from the nearby villages like Basantapur, Ramdova, Sarla come to kill birds for fooding purpose. Local people also used nets, traps and hunting guns to kill the birds. Water hyacinth (E*ichhornia crassipes*) has covered the water surface of the beel, so the migratory birds faces an problem of their feeding areas.

Habitat Loss

The local people make plot of land for the cultivation of various crops (mainly boro rice) in the lake by filling up the shallow part of the lake, as a result the habitat area for the biotic fauna and flora is being reduced.

Lake Water Pollution

Water pollution of Ahiran Lake is a vital problem. Excessive use of pesticides and chemical fertilizer in the surrounding agricultural field go to the lake water through rain, so the lake water polluted). On the other hand 'Ghosh community' people on the south-west side of the beel clean their cattles mainly in water of the lake, which also pollutes water of the lake. The water pollution has a great harmfull impact on flora and fauna of this wet-land, so the biodiversity of the lake reduced.

Conclusion

We have seen that Ahiran beel provide many benefits to society and acts as a hotspots of aquatic fauna and migratory birds. This wet-land also plays a vital role to build up a healthy ecological system. It helps in development of agriculture in the locality by helping a lot in the irrigation system. Many families are directly and indirectly dependent on the beel. Although currently it lost its diversity in both fauna and flora including migratory birds, the existing species can conserved by conservation of the beel. It is also important to restore the wet-land for ensuring livelihood of surrounding communities. If consciousness of the people and kind attention of Panchayet and management authority increased, the wet-land must turn into important tourist spot, important source of government income and forms a perfect ecological system.

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References

1. Acharya S. and Adak, T. Journal of Soil and Water Conservation. 2009; 8(4): 25-30.
2. Barik, N.K. and Sarma, K.K. 'Beel Fisheries Resource Management and Impact on Livelihood Status of People in Majuli Island of Assam'; J.Inland Fish. Soc. India. 2006; 38(1): 35-42.
3. Bhuiya, S. I. 'Towards Sustainable Co-management Organization: A Case Study of the Baikka Beel, Moulvibazar, Bangladesh' Journal of Fisheries. 2014; 2(2): 119-124.
4. Chakraborty, B.K. and Nur, N.N. 'Study on Aquatic Biodiversity of Medha Beel in the Northern Region of Bangladesh' Journal of crop and weed. 2009; 5(2): 4-11.
5. Chowdhury, M. and Nandi, B. (2014). *Avifauna in five wetlands of Diara and Barind region of Malda District of West Bengal, India.* Journal of Threatened Taxa . 2014: 6(4): 5660–5666.
6. Das, I. (2015), 'Degradation of Wetland Environment: A Case Study of Dora Beel of Kamrup District,Assam' IOSR Journal of Humanities and Social Science. 2015; 20(1): 23-29.
7. Deka, R. M. 'Kapla Beel and its Impact on Socio-economic Condition of Dependant People' Asian Journal of Science and Technology. April 2015; 6(04): 1282-1284.
8. Gibbs J.J. 'Wetland Loss and Biodiversity Conservation'; Conser. Biol. 2000; 14(3): 314-317.
9. Kumar, A., J.P. Sati, PC. Tak & R.B. Alfred. *Handbook of Indian Wetland Birds and Their Conservation.* Zoological Survey of India. 2005; 472.
10. Manakadan, R. & A. Pittie. Standarized common and scientific names of the birds of the India subcontinent. *Buceros.* 2001; 6(1): 1–37.
11. Mondal, A. and Roy, D. ,(2014), 'An Environmental Study of Ahiran Lake of Murshidabad District' JECAS. December 2014; 3(12). ISSN No:2319-5606.
12. Mistry, J. and Mukherjee, S. (2015); 'Status and Threats of Water birds in Ahiran Lake' Murshidabad,West Bengal,India,International Journal of plant,animal and environmental sciences. 2015; 5(2): 59-64.
13. Nath, B. and Deka, C. 'A Study on Fish Diversity, Conservation Status and Pathak, U and Sarma, D. C. 'A Critical Study of the Bio-resources of Khaamronga Beel- A Wetland for Sustainable Development for the People of Thakurkuchi Village of Chandrapur

Area of Assam' Indian Journal of Fundamental and Applied Life Sciences. 2012; 3(2): 245-251. ISSN: 2231-6345(online).

16. Prasad, S. N. *et al.* 2002. Conservation of wetland of India – a review. *Tropical Ecology*. 2002; 43(1): 173-186. Reddy M.S. and Char, N.V.V. (2004), 'Management of Lakes in India' 10 March, 2004.