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HUNDUBA BEEL: THE UNIQUE WETLAND OF LAHORIGHAT REVENUE CIRCLE OF MORIGAON DISTRICT, ASSAM IN CONTEXT OF BIOTIC RESOURCES

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ABSTRACT

A floristic survey on macrophytes of Hunduba beel under Lahorighat Revenue Circle of Morigaon District, Assam was carried out from March 2013 to May 2015 .It is the largest wetland of Morigaon district of Assam covering an area of 164 hectors . A total 75 species of macrophytes were recorded from the study area. At the same time nearby villages were visited to collect information regarding the wetland resource utilization. The present work is done to create awareness for better conservation of the biotic resources as well as to focus the socio economic condition of the local people of the area.

KEYWORDS: Hunduba Beel, Morigaon District, Biotic Resources, Aquatic Flora

INTRUDUCTION

Wetlands are locally called beel in Assam. Hunduba Beel is located at Laharighat revenue circle in between two PWD road connecting Bhuragaon and Laharighat with Mrigaon Town. It is a tectonic lake and once directly connected with the river Brahmaputra. On the course of time the direct link was failed to continue but during rainy season it still comes in contact with its original stream. It covers an area of 164 hectors. The average dept is 4 meter. It is a freshwater perennial wetland located in Morigaon District of Assam, India. Geographically it lies between $26^0$21′50″ (N) latitude and $92^0$15′08″ (E) longitude at an elevation of 189ft in the district. The beel is surrounded by 18 villages like Hunduba Gaon, Batalimari, Naharkati, Kushtoli, Gorarpar, Besamari, borohibondha, Banmari, Bhukuamari Pam, Balijan, Jengorbori, Kacharibori, Buwalguri, Pukalagi, Dunga Par, Tabtaka , Baralimari and inhabited mainly by farmers and fishermen. More than 5000 people depend directly or indirectly on the wetland for their livelihood.. It is the granary of flora and fauna. Diversity of aquatic plants provides feeding and breeding ground for aquatic fauna including avian fauna. These are integral part of flood plain ecosystem and play important role as natural kidney. Being recycling centre beel can provides sufficient nutrient to the aquatic animal. The local people have long been associated with plant resources. At present, fishing in Hunduba beel is not open for all being it remain under leshi. The local people near by the beel are deprived of from fishing which is against socioeconomic development of local people.

Biswas k & Calder C C (1937) previously worked on common water and marsh plants of India. Later on Subramanyam (1962), Vyas (1964), Baruah (2004), Barooah & Mahanta (2006) also reported on different aspects of hydrophytes of freshwater bodies. Sarma and Saikia (2008) studied the utilization of wetland resources by the rural people of Nagaon District. Pathak & Sarma (2013) also reported on The Bioresources of Khaamronga Beel of Chandrapur Area of Assam. But there are scanty reports on the aquatic angiosperms of Morigaon district of Assam. The present study was therefore undertaken to investigate the aquatic angiosperms of Hunduba beel and their uses. The work is done to create awareness for better conservation of the biotic resources as well as to focus the socio economic condition of the local

people of the area.

METHODS

Extensive field surveys were conducted every month during March 2013 to May 2015 to record the macrophytes occurring throughout the wetland. At the time of collection their ecological groups were also recorded. Collected specimens were processed through the conventional techniques (Jain & Rao 1977). Identification of specimens was done with the help of standard literatures and by consulting the Herbarium of the Botany Department of Gauhati University and also the Herbarium of the Botany Department of Cotton College, Guwahati, Assam. Resource utilization data were collected from people of nearby villages through survey methods using pre set questionnaire specially designed for the study. The survey is carried out on a random basis.

RESULTS

The beel has a rich biodiversity with a vertically stratified macrophytes consisting of 48 emergent species, 9 free floating, 11 rooted with floating leaves, 4 free submerged, 3 rooted submerged. Out of total 75 species except one rest are vascular plants. Most of the people near by the beel are dependent on this beel for their day to day necessities. The main occupations of them are fishing, agriculture, cattle rearing etc. They also use the wetland for many of their cultural and ritual practices as well. All most all identified species were found to have utilization for various purposes like as vegetables, medicinal, fertilizer, fodder, raw material for making ornamental artifacts, religious functions etc.

Table 1: Macrophytes of Hunduba Beel with their Ecological Groups and Uses

Sl. No.	Name of the Plants	Family	Ecological Groups	Uses
1	*Aeschynomene aspera* Linnaeus	Fabaceae	Emergent	Stem used in making cork, hats, toys, beads and fishing hook- 'Punga' in fishing aids.
2	*Alpinia nigra* Gaerm, Burtt	Zingiberaceae	Emergent	Ropes made from leaf sheath are used in 'Goru Bihu'. Leaves used to make rice cake. Tender shoot used as vegetables.
3	*Alternanthera philoxeroides* (Mart.) Grisebach	Amaranthaceae	Emergent	Tender shoots used as vegetables and fodder. Paste is also applied on wounds of cattle.
4	*Alternanthera sessilis* (Linnaeus) DC.	Amaranthaceae	Emergent	Twig used as vegetables, cattle food and in jaundice.
5	*Arundo donax* Linnaeus	Poaceae	Emergent	Stem used in religious aspect.
6	*Azolla piñata* R. Brown	Azollaceae	Free floating floating	Entire plant used as biofertilizer.
7	*Bulbostylis barbata* (Rottb) C.B. Cl.	Cyperaceae	Emergent	Whole plant as fodder.
8	*Centella asiatica* (Linnaeus) Urban.	Apiaceae	Emergent	Entire plant used in curries and in chronic dysentery
9	*Ceratophyllum demersum* Linnaeus.	Ceratophyllaceae	Free submerged	Whole plant's past is used in insect biting.
10	*Ceratopteris thalictroides(* Linnaeus) Brongniart, Bull	Pteridaceae	Rooted submerged	Plant paste with turmeric used in skin diseases
11	*Chara fragilis* Desvaux	Characeae	Free submerged	Entire plant food for fish.
12	*Colocasia esculenta* (Linnaeus) Schott.	Araceae	Emergent	Rhizome, leaves, petiole, ostAs vegetables and food for pig. Leaves along with petiole are used in

				preparation of Hukoti (paste of dry fish). Young leaves with petiole used in encourage in breast milk production.
13	*Commelina benghalensis* (Linnaeus) Scholl.	Commelinaceae	Emergent	Leaves juice is applied to stop bleeding.
14	*Commelina diffusa* Burman f.	Commelinaceae	Emergent	Stem with leaves used as fodder. Stem juice is applied to stop bleeding.
15	*Cyperus corymbosus* Rottboell	Cyperaceae	Emergent	Root and stem's paste applied on affected bone for fast relief of pain.
16	*Cyperus globosus* All.	Cyperaceae	Emergent	As fodder.
17	*Cyperus pilosus* Vahl.	Cyperaceae	Emergent	Immature plant is used as fodder.
18	*Eclipta prostrata* Linnaeus	Asteraceae	Emergent	Aqueous extract of the herb is used to cure pain and in jaundice. Paste is also used in wounds and skin disease of cattle. Leaves were also used as ink in past.
19	*Eichhornia crassipes* (Martius) Solms	Pontederiaceae	Free floating	Entire plant used as manure in areca nut, mustard, potato field, and in any tree. Dried plants used as fuel, in making bags. Green plants are used as fodder for cow, buffaloes, and pig.
20	*Enhydra fluctuans* Loureiro	Asteraceae	Emergent	Twig used as vegetables.
21	*Fimbristylis bisumbellata* Forssk.	Cyperaceae	Emergent	Used as fodder.
22	*Grangea maderaspatana* Linnaeus	Asteraceae	Emergent	It is used as medicines.
23	*Hydrilla verticillata* (Linnaeus f.) Royle	Hydrochariataceae	Free submerged	Entire plant used as food for fish, fertilizer, and water purifier.
24	*Hygroryza aristata* (Retzius) Nees ex Wight& Arn.	Poaceae	Rooted floating	Whole plant is a good fodder.
25	*Hymenachne acutigluma (*Steudel*)* Gilliand	Poaceae	Emergent	Entire plant is a very good fodder.
26	*Hymenachne assamica* Hith.	Poaceae	Emergent	Entire plant is used as fodder.
27	*Ipomoea aquatic* Forsk.	Convolvulaceae	Emergent	Tender leafy shoots used as vegetables. Leaves extract is taken orally to control bleeding during child birth and in religious functions with 'mah Halodhi'.
28	*Ipomoea carnea* Var.fistulosa.	Convolvulaceae	Emergent	Dried stems are used as fire wood and in making fencing.
29	*Jussiea repens* Linnaeus	Onagraceae	Emergent	Twig used as fodder. Leaf juice is used in skin diseases.
30	*Kyllinga brevifolia* Rottboell. Dscr. Icon. Rar.	Cyperaceae	Emergent	Whole plant used as fodder.
31	*Leersia haxandra* Swartz.	Poaceae	Emergent	Tender leaves used as fodder.
32	*Lemna minuta* Kunt	Lemnaceae	Free floating	Entire plants are food for fish and ducks. It is also used as green manure in paddy field.
33	*Lemna perpusilla* Torrey	Lemnaceae	Free floating	Entire plants used as bio fertilizer. Food for fish and duck.
34	*Lindernia antipoda* (Linnaeus) Alston Hel.	Scrophulariaceae	Emergent	Whole plant used in dysentery and as fodder.

35	*Ludwigia octavalvis* (Jacq.) Raven Hel	Onagraceae	Emergent	Leaves juice is used to expel worm, in dysentery and fever
36	*Marsilea quadrifolia* Linnaeus	Marsileaceae	Emergent	Tender shoots are used as vegetables and fodder.
37	*Mentha aquatic* Linnaeus	Lamiaceae	Emergent	Leaves used in stomach and intestinal complaints.
38	*Mikania micrantha* Kunth	Asteraceae	Emergent	Leaves and twig used as vegetable, fodder and as medicine.
39	*Monochoria hastata* (Linnaeus) Solms.	Pontederiaceae	Emergent	Tender petioles, leaves and inflorescence are used as vegetables
40	*Najas indica* (Willdenow) Chamisso	Najadaceae	Free submerged	Whole plant is food for fish.
41	*Nymphaea nouchalli* Burm. F.	Nymphaeaceae	Rooted floating	Flower, rhizomes and petioles are cooked as vegetables and ripe fruits are eaten raw. Seeds are also edible.
42	*Nymphaea pubescens* Willd.	Nymphaeaceae	Rooted floating	Flower, rhizomes and petioles are used as vegetables and ripe fruits are eaten as raw. Seeds are also edible. Flowers used in religious purposes.
43	*Nymphaea rubra* Roxb. Ex Salibs .	Nymphaeaceae	Rooted floating	Flower, rhizomes and petioles are used as vegetables and ripe fruits are eaten raw. Seeds are also edible.
44	*Nymphoides cristatatum* (Roxb) O. Kuntze	Menyanthaceae	Rooted floating	Fruit, the rhizome, petioles are used as vegetables.
45	*Nymphoides indicum* (L.) O.	Menyanthaceae	Rooted floating	Fruits are taken as raw.The rhizome, stolon, petioles are used as vegetables.
46	*Oenanthe javanica* (BL) DC	Apiaceae	Rooted floating	As fodder. Plant extract is also used in fever.
47	*Ottelia alismoides* (Linnaeus) Persoon	Hydrocharitaceae	Rooted floating	fruit, whole plant is used as fodder by fishes and insects.
48	*Oxalis debilis* Kunth	Oxalidaceae	Emergent	Whole plant used as vegetables and as appetizer.
49	*Paspalidium geminatum* (Forssk.) Stapf	poaceae	Emergent	It is used as fodder grass.
50	*Pistia stratiotes* Linnaeus	Araceae	Free floating	Whole plant used as bio fertilizer. Leaves Juice is used in asthma and skin diseases.
51	*Polygonum barbatum* Linnaeus	Polygonaceae	Emergent	Leafy twig used as medicine. Plant extract are also used as poison to catch fish in hole.
52	*Polygonum hydropiper* Linnaeus	Polygonaceae	Emergent	Entire plant extract used as insecticides and as poison to catch fish in hole.
53	*Portulaca oleracea* Linnaeus	Portulacaceae	Emergent	Tender shoot used as vegetables and fodder.
54	*Potamogeton nodosus* Poiret	Potamogetonaceae	Rooted floating	Used as fish food.
55	*Ranunculus sceleratus* Um.	Ranunculaceae	Emergent	Used externally for rheumatism. Irritating to skin i.e. causes pain and burning sensations.
56	*Rorippa palustris* (Linnaeus) Besser	Brassicaceae	Emergent	As vegetables and fodder.
57	*Rumex maritimus* Linnaeus	Polygonaceae	Emergent	As vegetables and fodder.
58	*Sagittaria sagittifolia* Linnaeus	Alismataceae	Emergent	Used as fodder. Leaves extract is used as antiseptic and used as antidote for insect bites.

59	*Sagittaria guayanensis* Humboldt, Bonpland and Kunth	Alismataceae	Emergent	Used as fodder.
60	*Salvinia cucullata* Roxburgh. Ex Bory	Salviniaceae	Free floating	As fertilizer.
61	*Salvinia natans* Allioni Hoffm.	Salviniaceae	Free floating	Used as fertilizer.
62	*Schoenoplectiella articulata* (Linnaeus) Lye	Cyparaceae	Emergent	Dried plant is used for making mattress or gadi, as fuel. Dried inflorescence are also used for making flower stand.
63	*Schoenoplectus grossus* (L.f.)Palla	Cyparaceae	Emergent	Used for making a mat. Seedlings are used as fodder.
64	*Schoenoplectus juncoides* (Roxburgh) Lye	Cyparaceae	Emergent	As fuel, dred inflorescences are also used for making flower stand.
65	*Scirpus lateriflorus* Gmel.	Cyperaceae	Emergent	As fodder.
66	*Setaria glauca* (Linnaeus) P. Beauvois	poaceae	Emergent	Inflorescence used as insect irritator and as ornamental
67	*Spilanthes calva* Wall, ex Dc.	Asteraceae	Emergent	Tender shoot used as vegetables with black piper in cough and cold.
68	*Spirodela polyrrhiza* (Linnaeus) Schleiden	Lemnaceae	Free floating	Used as fodder for fish and duck.
69	*Trapa natans* Linnaeus	Trapaceae	Rooted with floating leaves	The fruits are eaten raw as they are rich in starch.
70	*Utricularia aurea* Linnaeus	Lentibulariaceae	Rooted floating	Ecologically the plant is a good oxygenator of water and is used by fishes for food.
72	*Vallisneria natans (*Lour) Hara.	Hydrocharitaceae	Rooted submerged	Whole plant used as food for fish and hence largely used in aquarium. Also used as fertilizer and water purifier.
73	*Vallisneria spiralis* Linnaeus	Hydrocharitaceae	Rooted submerged	Entire plant used as ornamental. Largely used in aquarium. Also used as fertilizer and water purifier.
74	*Wolffia arrhiza* Linnaeus. Wimm.	Lemnaceae	Free floating	Entire plant used as bio fertilizer and fodder for fish and duck.
75	*Xanthium strumarium* Linnaeus	Asteraceae	Emergent	Seed paste is used to cure pain. Seedling used as vegetables as plain or with ‘khar’. The plant is also burned in time of “jak diya” in ‘Goru Bihu’.

DISCUSSIONS AND CONCLUSIONS

Hunduba beel is one of the macrophytes rich wetlands of Assam. The beel has high potentiality to develop to be a ecological tourist spot conserving the biotic resources and its vastness. Presently, the beel is under tremendous threats of anthropogenic activities. Due to human settlement growing on the both side of the beel increasing the pressure on the beel water and its inhabitants. Use of beel water for irrigation is a regular feature in the beel. The beel has been gradually converted to commercial fishery and the lease holders nurture only the commercially valuable fish species. They always neglect the macrophytes due to lack of knowledge of their ecological value. Diversity of aquatic macrophytes has been diminished due to large scale destruction for fishing and over exploitation by nearby people and unskilled labours of lease holder. So there is an urgent need to undertake constructive measures towards protection and management of this wetland and its macrophytes, not only for human being but for the environmental sustenance also. The rural inhabitants should be

given proper training and make them aware about the importance of the wetland ecosystem and ecological value of macrophytes by conducting awareness programs, camps, workshops etc. Proper management of wetlands not only harbour the aquatic organisms but also become as a beautiful tourist spot. Development of tourist spot is the way of economic uplift men for local people.

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