Wetland Resource Of Goalpara District, Assam.

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Abstract:
Wetlands constitute one of the most important ecosystem of the earth. It acts as a cleaner of polluted water, prevent floods and recharge groundwater aquifers. Furthermore wetlands play major role in the landscape by providing unique habitats for wide variety of flora and fauna. Wetlands include swamps, bogs, marshes, fens and other wet-ecosystems throughout the world under many names

Wetlands are the storehouses of aquatic resources. They contain a wide range of floral and faunal resources in Goalpara districts there are 165 wetlands of medium and smaller size occupying almost 7% of the area in the district. In this paper an attempt has been made to assess the floral and faunal resources available in the wetlands of the district.

Keywords: aquatic, fauna, flora, wetland.

Introduction:
The relationship between human history and wetland is very old. They are found in every continent except Antarctica. They cover about 6 percent of the global land surface. Wetlands are found in arid regions as in land salt flats, in humid cool regions as bogs and fens, and in temperate and subtropical and tropical coastlines as salt marshes and mangrove swamps.
Wetlands have been defined by different people and agencies for different purpose based on objectives and needs. According to definition offered by the International Union for Conservation of Nature (IUCN) 'all the submerges or water saturated lands, natural or man-made, in land or coastal, permanent or temporary, static or dynamics, vegetated or non-vegetated which necessarily have a land-water interface'.
Wetland provide for a wide range of flora and fauna and are very closely associated with the life and living of the people around in the third world environmental context. They act as natural reservoirs of water and generally regulate the fluvial processes operating within their environs.
In Assam there are 3513 wetlands covering an area of 101231hectres. Goalpara district is also rich in wetlands where there are 165 wetlands occupying 7% of its geographical area. This wetlands of the district are the storehouses of aquatic resources, they contain a wide range of floral and faunal resources. The people around the wetlands depend on them for a variety of purposes. So in this paper an attempt has been made to assess the wetland resources in the district.

Methodology:
To assess the floral and faunal resources a survey schedule has been prepared and visited 20 wetlands located in 5 Revenue Circle, taking four from each randomly. The wetlands are selected from different location in the Revenue Circle of the district.

Floral Resources:
Wetlands form habitats of aquatic plants. The rooted plants are usually found in the shallower parts of the wetland. The central part i.e. the deepest part of the wetland is free from vegetation of the higher order but full of minute floating plants or phytoplankton. Phytoplanktons are not visible through naked eyes. They are responsible for occasional greenish colour of water of the wetland. In the deepest part some special varieties of plants like *Nelumbo nucifera, Nymphaea sellata, Marshilla* sp. etc. are found. The density of vegetation generally decreases from the periphery to the center of wetland. In the central part certain free-floating plants occur. The bank of the wetland remains full of vegetation, if not interfered by human activities.

In the wetlands of Assam, some plants exhibit the characteristic of both the rooted and floating roots. These types of plants are very fast-growing. The branches of these plants grow in all direction expanding thereby their territories. The plants of the wetlands in the district may be grouped into the following categories:

(1) **Free-Floating hydrophytes:** The free-floating aquatic plants are found abundantly in all the wetlands of Assam. These plants include Soru Puni (*Lemna minor L*),Barpuni(*Pistia stratiotes L*), Meteka (*Eichhornia crassipes*)and Azolla sp. Among these, Sorupuni, Barpuni and Azolla sp are consumed by fish, birds and insects , while meteka is not edible for them. This species of hydrophytes grow very fast and becomes too thick to obstruct sunlight. Consequently, aquatic plants, algae, fungi and some varities of fishes may suffer from dearth of food and even die in extreme situations.

(2) Rooted plants with floating leaves: These types of plants have long stems with leaves floating on water**.** The roots originate in mud. As the water levels goes up, the stem also grows to keep pace with the rising water. For example Padum (*Nelumbo nucifera*) and Bhetful (*Nymphaea stellata, Marshilea sp.)* are found in all the wetlands of the district. These two species grow when the bed of the wetland have sufficient amount of mud.

(3) **Rooted and submerged plants**: These types of plants have roots have roots floating on water. In deep water, the roots remain floating, while in shallow water they reach the ground. These type of plants are found in all wetlands of Goalpara district.

Table 1 shows the aquatic flora found in Goalpara.
The following aquatic plants are found to have more ecological and economic importance.

Barpuni (*Pistia stratiotes L*): Barpuni is found in all of the wetlands of Assam. It is a free-floating but rapidly growing species. Its roots are very and short and therefore moves easily with the current of water. It can rapidly grow to cover the surface within a short period. The aquatic fauna, especially the fishes consume the green leaves as food. The villagers who practice pisciculture collect this plant species and put them in their domesticated ducks too. Thus this species plays an important role in pisciculture.

Table 1: Wetland flora of Goalpara

Local name	**Scientific name**	Wetlands of occurrence
1.Barpuni	*Pistia stratiotes L.*	All
2.Sarpuni	*Lemna minor L.*	All
3. Meteka	*Eichhornia cressipes*	Some
4.Padum phul	*Nelumbo nucifera*	Some
5.Bhet phul	*Nymphaea stellata(Marsila sp)*	Some
6.Sital pati doi	*Clinogyne/dichotoma salisp*	Some
7.Jethipetia bon	*Monochoria hastacfloka prest*	All
8.Gaba nal	*Arundo/ doex Linn*	All
9.Kalmou	*Ipomoea aquatic Forsk*	All
10.Helouchi	*Enhydra fluctuans Lour*	All
11.Dhakla	*Blachnum orientale*	All
12.Bhekuri tita	*Solanum indicum L.*	Some
13.Nilajee bon	*Mincoso pudica Fabaceae*	All
14.Kata khutra	*Amaranthus spinosus L*	All
15.Doron	*Leucas linifolia*	All
16.Ranga Doron	*Leonoras sibiricus L (Hemiaceae)*	All
17.Manimuni	*Centella asiatica*	All
18.Jilmil	*Chenopodium album*	Some
19.Bhebeli lata	*Paederia foetida*	Some
20.Ulu bon	*Imperata cylindrica*	Some
21.Dal ghah	*Hymenachna assamica*	All
22.Singra/Singar	*Trapa bispinosal (Roxb)*	Some
23.Pani saral	*Cerato phyllum demersum L.*	Some
24.Nikheri	*Trapa notans L.*	Some

Sarupuni (*Lemna Minor L*): Like Barpuni, Sarupuni, is also found in all the wetlands of Assam. It is often found with Barpuni. However, it can grow rapidly when it exists alone. It is good food for the fishes and aquatic birds , especially the ducks. This species is also collected by villagers to feed their domesticated ducks.

Meteka (Eichhornia cressipes): This species is harmful for other aquatic animals and plants. It can degenerate the wetland ecosystem preventing sunlight to penetrate the water. It is a very fast growing plant whose roots grow deeper into the water. Its leaves are board and its stems may reach a length of 100 cm. These plants grow netting each other and therefore do not move in slow moving water. When it grows and expands, the other smaller plants including algae and fungi cannot survive. Under such conditions fish does not get sufficient food because of dearth of small green plants. Many of the aquatic birds do not visit the wetland covered by water hyacinth because of shortage of free surface water where they can move and search for necessary food. Although the species is harmful for wetland ecosystem, it can be used as food for cattle's .This plant is therefore collected particularly during floods as fodders for animals.

Padum Phul (*Nelumbo nucifera*): This species is more all less found in all the wetlands of Assam. The roots of the plant are extended to the muddy bed of the wetlands. The leaves and flower remains above the water. This plant generally grows to the depth of 2.5 m. The tender leaves of this plant are eaten by some fishes and some aquatic birds. Padum plant grows in those wetlands where there is sufficient amount of mud deposits. September-October is the flowering period of these plants . The flowers of these plants are offered in pujas, particularly in Biswa puja and Durga puja. Flowers are collected from the wetlands and sold in the market. The seeds of these plants are used as fruits. It is very tasty and nutritious and has a great demand in the market.

Sital Pati Doi (*Clinogyne/Dichotoma salisb*): This plant is found in water saturated soil on the bank of the wetlands and rivers. In Goalpara district, This plant grows on the river Jinari near Dubapara and Patirpara villages. For the growth of the plant dam soil is required. The plant can resist food; even in high flood the plant survives. In the rainy season, the lower part of the plant remains underwater often to a depth of one metre. Its systematic cultivation is done by a specific group of people who settled in the area coming from Bangladesh. They have required skills for making Sital pati, a cottage industrial item used as cover over the beds. It is also used for bags. In hot summer, people use pati on the beds for a cooling effect. Depending on the availability of these plant pati industries has developed in the Dubapara and Patipara localities. The village patipara =, where there are 270 households with a population of 2060,solely depend son pati making. A medium quality pati of the size of 4x6 costs Rs 200-500, while the good quality costs upto Rs 1000 and even more. A co-operative society has been formed by some local youths for marketing the finished products. This society collects paties at cheaper rates and sends them even to some cities like Delhi, Kolkata and Bombay. In order to make pati, matured stems of sital pati are collected and boiled in

water during inter. Then seethes are prepared to knit paties of different designs. Sometimes colours are also used. According to the local people, every household of the village produces at least 100 pieces of patis annually. Thus as many as 27,000 paties are produced yearly in this locality. As no government agency is directly or indirectly involved in marketing the finished products, the producers are compelled to sell their products at a lower price in the nearby markets of Goalpara, Dudhnoiand and Dhupdhara.

Local sources reveal that the raw pati doi from one hectare of land can be used to produce paties costing around Rupees One lakh. But no modern method of cultivation and processing has been adopted as yet. The village people have undertaken this profession traditionally since long. The cultivation of these plants may be extended to other low lying areas of the district conveniently. If scientific techniques are used in making pati, the district may be leading producers of this unique commodity which has a growing market in the state and other parts of the country as well.

Kalmou(*Ipomoea aquatica*): Kalmou is a floating plant found in all the wetlands of Assam. The main characteristics aspect of this plant is that it floats when the water level is high and it roots reaches soil when water dries up. For such special adaptive ability this plant never dies. Generally it spreads its branches in the rainy season. Newly grown branches i.e. leaves and stems are used by the people. They collect the plant and sale in the local markets. Kalmou is available throughout the year, but it is abundantly found in rainy season only.

Helonchi(Enhydra Fluctuans Lour): Helonchi also a floating plant found in almost all the wetlands of Assam. During the rainy seasons when water level rises up its leaves and stems float, while the roots remain under the water without reaching the ground below. But near the bank, the roots reach the soil. This plant grows luxuriantly in water-saturated damp soil and water bodies. People generally use it as tender stems and leaves as vegetables. As it has medicinal value , there is demand for it mainly in urban markets. The village people usually collect helonchi from the nearby wetlands whenever they need it. Some people grow this plant in their fisheries to keep the water cool during summer. Further, the roots of this plant provide homes for micro-organisms to be consumed by fishes.

Dhekia(*Blechnum orientale*): This species is found on the bank of wetlands. Slightly higher land with no stagnant water is favorable for the growth of this plant species. This species grows more rapidly during rainy season from April to July. In this season, the small immature leaves are collected by the villagers and use them as vegetables. This vegetable has very high demand in the market. This species does not easily die even in flood as its roots can adapt to the wet situation and do not get decomposed easily.

Ullubon (*Blechnum Cylindrica*): This particular species is also found on the bank of the wetlands and rivers. This plant is economically beneficial for villagers, as mature plant of this species are used for roofing purposes. The dried plants when used for roofing last for a considerably long time (up to 10 years). The immature leaves are used as fodder> The matured leaves are generally harvested in the months of December-January and dried for use. It has high demand in the both rural and urban markets and nowadays it is costly.

Dal (*Hymenachna assanica*): Dal is also found in the wetlands of Assam. It grows in the shallower muddy parts of the wetlands. Roots of this plant reach the muddy part of the bed and its stems and leaves attain height up to 1.5 meters in rainy season. The elongated grassy part is collected by the villagers to use as fodder. The village people believe thet consumption of this grass increase the capacity of milk production of the cows and buffaloes. Generally in winter there is no scarcity of food for cattle in the district. But during floods most of the grass gets destroyed except the grass in the wetlands. Therefore, villagers solely depend on fodder like dal ghah available in the wetlands during the season.

Singra/Singari(*Trapa bispinosa*): This species is found in some wetlands of Assam. Roots of this plant are extended to the mud water. The leaves and flowers remain above the water level. The seeds of this plant are used as fruits.

Faunal resources

The wetlands of Goalpara support many aquatic fauna, out of which fish and birds play an important role in the economy of the district. The wetlands of smaller size fish and certain edible insects to the nearby villagers only during the rainy season. The medium and large wetlands on the other hand supply these resources throughout the year.

The following table gives the names of some of the fishes available in the wetlands of Goalpara.

Table 2: Some fishes found in the wetlands of Goalpara

Local Name	Scientific Name
1. Rou	*Labeo rohita*
2. Bhokua	*Catla catla*
3. Mirika	*Cirrhiaus mrigala*
4. Kurhi	*Labeo gonius*
5. Magur	*Clarius batrachus*
6. Singi	*Heteropkeustes fossilizes*
7. Chital	*Notopterus chitala*
8. Barali	*Wallago attu*
9. Aari	*Aorichthys seenghala*
10. Tingara	*Mystus tengra*

11. Lachie Bhangon	*Cirrhinus reba*
12. Kanduli	*Notopterus notopterus*
13. Boroliya	*Aspidoparia worav*
14. Moa	*Amblypharyngodon mola*
15. Puthi	*Puntius spp.*
16. Goroi	*Channa punctaha*
17. Sal	*Channa marulius*
18. Sol	*Channa straitus*
19. Kaoi	*Anaabas testudineus*
20. Kholihana	*Colisa fasciata*
21. Turi	*Mastacemblus pancalus*
22. Kuchia	*Macrognathus armatus*

For example, there are 42 species of fish including carp, live fishes, cat, fishes etc. Some of these fishes are of high commercial value and also found in considerable quantities (Kalita, 1990). There are as many as six major fish collection centres namely Dudhnoi, Jaleswar, Golapara, Balbala, Lakhipur, and Matia in the district, besides many small centres. The availability of fishes in these centres varies from season to season. Being an urban center, Goalpara received more amount of fishes than other centres. All the collection centres receive fishes like Rohu (*Labeo rohita*), Bhokua (*Catla catla*), Mirika (*Cirrihinous mrigala*), Kurhi (*Labeo gonius*) etc. abundantly in all seasons. These fishes are friendly with local environment and live on eating algae, fungi and small insects in different depths of water. Besides these, Kurhi (*Labio gonius*), Chital (*Notopterus chitala*), Aari (*Aorichthyus seenghala*), Barali (*Wallago attu*) etc are also found in summer season. These fishes are sold at a high price in the market. Magur (*Clarius batrachus*) and Singi (*Heteropneustes fossilis*), fishes are found in all seasons and sold at a high price. This two species live together as they require same natural condition for growth. The wetlands, particularly the marshy ones are good natural habitats for this fish (Lahan, 1983).

Numerous local varieties of small fishes are found in the wetlands of Assam. These fishes are available in the local markets. A huge quantity of small fishes are consumed everyday, the lion's share of which comes from the wetlands. The small fishes are Tengara (*Mustsu tengra*), Lachie Bhangon (*Cirrhinus reba*), Kanduli (*Nototpterus notopterus*), Boroliya (*Aspidoparia worav*), Moa (*Amylongodon mola*), Puthi (Puntius spp.), Goroi (*Channa punctata*), Kaoi (*Annabus testuidineus*), Kholihona (*Colisca fasciata*), Turi (*Mastacembelus pancalus*) etc.

Moroever the aquatic fauna, which are consumed by the people of the district, are Prawn, Kuchiya (Macrognathus armatus), tortoise (*Trianiyan gangeticum*), Khamukh (*Pila globasa*), Kekora (*Cancer cancer*), Frog (*Bufomelanotictus*) and aquatic birds.

Prawn: Different varieties of prawn are found in large number in the wetlands of Assam. This fish is more or less found almost throughout the year. Its availability is more during the rainy season. In this season, they are caught up with the help of thick net in the outlets of the wetlands. The most favourable factor for its growth is the muddy bottom of the wetlands where they an get sufficient amount of microscopic organisms as their food and can save themselves from other carnivorous animals by penetrating into the mud. The price of prawn in local markets ranges from Rs. 60-100 per kg.

Kuchiya (*Macrognathus armatus*): This species is found abundantly in the wetlands of Assam. Kuchiya selects thick muddy bottom of wetlands as their habitat and makes holes in the mud and appears to the open water in search of prey. Generally, they select small fishes and insects as their food. The peculiar characteristics of these species are that it never dies even in drought season. In drought season, it goes downward and downward making the hole deeper to reach the sub-surface water. When the level of underground water increases it slowly comes upward. This species has a high demand in the market with a relatively high price.

Tortoise (*Trianiyan gangeticum*): Two varieties of tortoise are found in the wetlands of Assam. The smaller one is found in large number which is known as Dura, while the bigger one is found occasionally. The species is very slow moving on land and people get the advantage to trap them easily when they come out from wetlands to the agricultural fields in search of food. This is the reason why the number of species is decreasing day by day.

Shamukh (*Pila globasa*): All the wetlands of Asssam are the storehouse of different varieties of Shamukhs (mollusca) from very small to medium size. This particular species play an important role in wetland ecosystem. The aquatic birds including migratory birds use them as their food. That is why where there is mollusca there will be more aquatic birds. But nowadays mollusca is also facing threat not from the aquatic birds but from the tribal people of the nearby villages who use them as food. Because of this there is a decreasing trend of mollusca for which birds visiting the wetlands are also decreasing in number.

Kekora (*Cancer cancer*): *Kekora* is also found in all the wetlands of Assam. They live in water eating small fish and other aquatic fauna. Sometime they live under the soil making a deep hole. Other aquatic fauna cannot easily kill them because of their special defense mechanism. But human beings, particularly the tribal people are the main consumer of this species.

Frog: Different varieties of frogs are found in the wetlands of Assam. The smaller variety of frogs which is known as *Panibhakuli* spends its whole life cycle in water whereas, the others spend only their larval stage in water and occasionally go to water in search of food or shelter. Most of the larva at water become prey of fish and aquatic birds. So this species is an

integral part of wetland ecosystem. But now it has been observed that the tribal people have started killing them at night with the help of light and sticks for flesh. They take away the legs abandoning the upper portion of body on the spot.

Aquatic Birds: Wetlands are the best habitats for many species of aquatic birds. Some birds stay permanently in the wetlands and make their next there, while others spend the day in wetlands for food. The aquatic flora and fauna including fish, insect, larva available in the wetlands are used by the birds as their food. These birds play an important role in the wetland ecosystem. They indirectly help the farmers by consuming a large number of insects, which live on crops. Moreover, the more the birds visit the wetlands the more will be the dropout (excreta), which the fishes use as food. But now people of the surrounding villages have started hunting birds for flesh either by gun or by applying poisons. Therefore, birds are afraid of visiting the wetlands. These types of harmful practices have adversely affected in wetland ecosystems. Aquatic birds like swans, ducks, cranes, storks, geese, cormorants, grebes, plovers, sand pipers, gulls, terus, egrets, herons, garzeta, water beetle, water scorpions, whirling bee etc are found in the wetlands of the district.

Conclusion: The wetlands of the districts are the storehouse of aquatic flora and fauna. In this paper, 22 species of fish have been identified but there are more than 42 species. Moreover, there are 24 species of floral resources in the district. Besides these the wetlands are the best habitats for many species of aquatic birds.

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