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Degradation of Wetland Environment in Assam with Special Reference to Goalpara District

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Abstract: ***Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. Wetlands are an integral part of the environmental system of an area. They provide habitats for a wide range of fauna and flora and are very closely associated with the life and living of the people particularly in socio-economic context. They act an natural reservoirs of water and generally regulate the fluvial processes operating within their environs. With the rise of human population and consequent spread of settlements and economic activities, however, the wetlands in almost all parts of the state are increasingly under serious anthropogenic pressure and threats. Here in this paper an attempt has been made to analysis the problems face by the wetland due to human interference and consequences of the problems for survival of wetlands in Assam taking special reference from Goalpara district.***

Keywords: degradation, encroachment, siltation, wetland

1. Introduction

Wetlands constitute one of the most important ecosystem on the earth. They are valuable as sources, sinks and transformers of a multitude of chemical, biological and genetic materials. Wetlands are sometimes described at the "Kidneys of landscape" for the function they perform in hydrological and chemical cycle and as the downstream receivers of wastes from both natural and human sources. They have been found to cleanse polluted water, prevent flood and recharge ground water aquifers. Furthermore, wetlands play major role in the landscape by providing unique habitats for a wide variety of flora and fauna.

Assam is rich in wetlands of various type and size. There are 3513 wetlands covering an area of 101231.60 hectare. Historically these wetland have been acting as nodes of the natural drainage system and provided a variety of resources to the people living around.

Like the any other districts of the Brahmaputra valley in Assam, the Goalpara district is also rich in wetlands where there are 165 wetlands of various type and size. The district has a geographical area of 1824 sq.km. of which 63.96 sq.km. (nearby 3.50 per cent) are constituted by the wetlands. But during the recent period, human activities like expansion of settlements, modernization of agriculture, cattle rearing and certain constructional activities in the wetland fringes, excessive fishing and floral resource exploiting have contributed to their degradation. This has resulted in a large number of ecological and economic problems such as lass of bio-diversity, flood and siltation, water pollution, scarcity of animal feeds and poverty among the fishing communities. It is very important to note that no systematic study has so far been made to address the status of wetland in Assam. This study therefore, attempts to analysis the causes and consequences of degradation of wetland in Assam with social reference to Goalpara district.

2. Methodology

To access the causes and consequences of degradation of wetland environment, primary as well as secondary data has been collected. To collect primary data, a survey schedule was prepared and relevant information like encroachment, siltation, overfishing, birds hunting, eco-degradation...etc. collected selecting four major wetlands of the district. For secondary data, self-visited many offices like Assam Remote Sensing Application Centre Guwahati, different revenue circles and block development offices of the district. All collected data was analysed and conclusion been made.

Location

The district Goalpara is located in between 25°33'N latitude to 26°12' N latitude and 90°7' E latitude to 91°5'E longitude. It comprises an area of 1824 sq.km. Its northern boundary is caused by the river Brahmaputra while in south there is Garo hills and in eastern there is Kamrup district and in western boundary there is the Dhubri district adjacent to Bangladesh border. The rivers which are flowing throughout the district originate in the Garo hills and flows from south to north direction according to the slope. The wetlands are located unevenly in the district but concentration is more near the Brahmaputra river.

Geology and Physiography

According to physical history, the area comes into existence in the Pre-Cambrian period and the plain area was made up in the Tertiary period. The hills and hillocks situated in the area comprises of igneous rock. These hillocks are extended part of Meghalaya plateau. Meghalaya plateau is a drifted part of Gondowana land. According to physiography the area can be divided into three physiographic divisions from south to north. In south there is Southern hills region near Meghalaya plateau, a broad plain region in the middle of the district and flood plain region in the north near the Brahmaputra river.

Degradation of wetland environment

The wetland eco-system, though highly efficient is very fragile and easily disturbed by human interference. Toxic substances produced as a result of human activities may run off with water to be accumulated in the wetlands. This will poison the water and kill all living organisms. Agricultural practice on the banks as well as the shallower parts of wetlands and cattle rearing produce not only siltation, but also makes the water murky. This results in decreased available sunlight for the micro-flora, thereby diminishingly the bio-productivity of the wetland. Extensive fishing methods too kill or generally damage the micro-flora resulting in poorer crop in the next year encouraging man to indulge in more intensive fishing which leads to the destruction at the wetland ecosystem within a remarkably short time. Major causes of degradation of wetland environment are manmade and natural. Manmade causes are encroachment, overfishing, bird hunting, setting up of brick industry, ecological degradation and developmental works by Government Natural causes of degradation of wetland environment are siltation, draught and flood. These causes are discuss in detail with the help of field study undertaken in Goalpara district of Assam.

In Goalpara district there are 165 wetlands of various size and shape covering an area of 63.96 sq.km. To understand the intensity of degradation four wetlands have been selected according size and location are Urpad which is largest in the district, Kumri, Hashila and Saitara-Naitara.

Encroachment

Encroachment is one of the major factors for the degradation of wetland environment. It has been observed in the district that most of the villagers encroach wetlands for agricultural purpose on individual capacity. Wetlands are generally surrounded by agricultural fields. Most of the cultivated slowly fill-up parts of the wetland and start cultivation. Moreover, for the purpose of fish production villagers encroach wetlands and transform them into fisheries. These types of activities have baldy damage the ecosystem and organic continuity of wetlands.

It is observed that at present the average size of wetland in Goalpara is 35.77 hectares which was 62.86 hectares in 30 years back. The smaller wetlands get reduce more rapidly than the medium and bigger ones. Most of the encroachers belong to immigrant group of people. They encroached wetlands for the purpose of fishing and Boro rice cultivation. Fishing is the main occupation of the people living on the banks of the wetlands. But now they practice Boro rice cultivation in the shallower parts of the wetlands because of population pressure and poverty. The density of population is very high in the villages. For example Chandamari village located on the south bank of Urpad beel is thickly populated in which there are 372 households having a population of 1966 according to 2001 census. According to villagers, about 90 per cent people earn their livelihood as fisherman and do fishing at Urpad beel. But now most of them have encroached the shallower parts of the beel for Boro rice cultivation. They consider Boro rice cultivation in the wetlands as their additional income which helps them in maintaining their big family, having more than 6 persons on an average. Previously fishing was the main occupation of the villagers but now due to increase in family size, they cannot maintain their family properly as a consequences of which they have encroach the wetland for cultivation. Same situation prevail in the villages located on the bank of Kumri, Hashila, Saitara-Naitara and other beels of the district. The rate of encroachment is very high in all the wetlands of the district. It is observed that within a period of 30 years 43 per cent of the wetland area has been reduced.

Overfishing

Wetlands are rich in fish resources. All the wetlands irrespective of size supply some amount fish to the surrounding villages. The bigger wetlands like Urpad, Kumri-Hashila and Saitara-Naitara of Goalpara district are highly productive in his regard. There are 22 villages with a population of 25,060 in the areas around these four wetlands. Most of the people of these villages are to a great extent, dependent for their livelihood on the fish resources of the wetlands. There are some families who are solely dependent on wetland products for their sustenance. The number of such families is 110 in the case of Saitara-Naitara, 127 in Kumri and 465 in Urpad Beel with a total population of 5010. Some families use country boats for fishing in the wetlands. There are more than 250 boats engaged in fishing activities in these three wetlands. Among the poor fishing communities, population growth is very high which ultimately puts pressure on the wetland environment.

Fishermen use very thick net to catch fish of all size and breeds. They use drums to make a peculiar sound in the boat while catching fish. This type of sound disturbs the fishes and birds. As a result many of the birds fear to visit the wetlands. The excreta of the birds are sources of food for the fish. Decrease in number of birds is one of the factor for gradual decline in fish production. It is important to note that sometime monsoon arrives late in this region and drought like situation prevail. The wetlands are dried-up upto some extent which favours fisherman to catch fish easily in shallow water. Excessive fishing in breeding season has lead to decrease in fish production subsequently. Moreover, revenue and forest department also leases out some of the wetland every year. The leases operate fishing activities in al the seasons of the year for which production of fish is decreasing day by day. Now nobody is there to protect the wetlands as they are treated as nobody's properly. As a result, the wetland environment is deteriorating very fast.

Bird Hunting

Bird hunting in the wetlands is one of the important causes of degradation of wetland environment. Poaching of birds including migratory birds by the villages in the wetlands of the district is a common phenomenon. Wetlands are important habitats for a large variety of resident and migratory birds. But it has been seen that aquatic birds are trapped by various techniques and sold in the markets. Some people kill birds by using guns. As the number of

wetlands is more in the district, birds visiting the area are also large in number. Sounds of flying birds can be easily heard everywhere in the early winter morning. The birds usually visit different wetlands from the morning till the evening as their routine activity before going back to their night shelters. The villagers select the morning time to kill or trap birds as the birds remain a little careless in the morning time when they eagerly search for food. Another type of Bird-poaching takes place in the months from May to July during the breeding period. In this season, resident birds build their nests in the wetlands. Many of the tribal people traditionally kill birds at night. In traditional killing process, a group of people ten to twelve in number, use light, fire and sound of drum, bell or metal and march to the wetlands. After hearing noises the birds start flying to save themselves from imminent danger and come nearer the source of light where they are beaten to death. This type of traditional practice is more common among the Boro community.

Brick Industries

It has been sent that brick industries are coming up close to the wetlands all over the district. If one visits the district through the national highway he/she will be able to see small brick industries springing up in the fringes of the wetlands. There are more than 100 small brick industries operating presently in the district with traditional Bhatti system without obtaining any clearance from competent authorities like Pollution Control Board (P.C.B.). The brick industries generally start their operation in the month of November and continue up to February before the pre-monsoon rainfall begins. In this season water level of the wetlands goes down. Moreover, an extra amount of evaporation of water takes place because of burning bricks on the banks of wetlands. This type of process causes serious harm to the aquatic plants and animals. Sometime the smaller wetlands get completely dried up causing death to all creatures living in the wetland. In the case of bigger wetlands, when water level goes down fisherman take the advantage for excessive fishing, as a consequence of which fish production in subsequent year declines.

Eco-degradation

The growing menace of human civilization has baldy disrupted the organic continuity of wetlands. A large portion of the wetlands have already been encroached for agricultural purpose. Pesticides and chemical fertilizers are indiscriminately used in cultivation which has contaminated the water of the wetlands. To assess the use of pesticide and chemical fertilizer relevant information from 205 households from the villages located near the wetlands namely Urpad, Kumri and Saitara-Naitara of Goalpara district have been collected, out of 205 families 140 families apply pesticide and chemical fertilizer in agriculture. The amount of fertilizer used in cultivation by each family varies from 10-100 kg. In the rainy season, the residuals of fertilizer and pesticides get dissolved in water and flow to the wetlands and thus contaminate the water. This causes death to micro-organisms. Moreover, aquatic plants and animals including fished also suffer from this kind of contamination. The water of wetlands also turns blue-green in colour with maximum floating weeds. In such a situation, fisher folk have to do their fishing through a thin elongated patch using local country boats because of the present of thick floating green cover. Normally availability of fish is indicated by the birds present in the wetland. Large the number of birds the more is the amount of bird droppings made available to fishes. But due to water pollution and other human induced disturbances the migratory birds have now ceased to visit the wetlands in large number. Thus interference on wetland eco-system by human beings directly or indirectly contributes to the overall degradation of the wetlands.

Unfriendly development works

Development works like construction of roads, railways etc. also stand as a major problem for sustenance of the wetlands. To prepare plans for such development the technicians carry out survey in the proposed area generally in winter. Moreover, they do not have required local knowledge and idea relating to the adverse effect of the developmental works. They prepare a schemes without proper field experience for which the schemes prove defective after execution. Most of the works of the District Rural Development Agency (DRDA) may be cited as examples in this regard. This government agency constructed village links roads haphazardly within a very short time. The roads are defective. Sometime culverts are constructed as outlets of water in every 200 or 300 metres at a regular interval. In such a process, culverts may be laid in the highland also and in doing so the natural water courses are ignored. These types of defective works sometime block the outlets or inlets of the wetlands. While constructing roads and railways the presence of smaller wetlands are completely ignored and these are often filled-up by earth. The bigger wetlands are also sometime partially filled-up. For example, the Kumri beel near the Brahmaputra river is partially affected by earth filling for the construction of railways through the district. Moreover, birds have ceased to visit the wetland for several years because of the presence of hundreds of railway labours working near the wetland. Such developmental activities are thus found to disturb the wetland environment to a considerable extend.

Siltation

Siltation is a major natural factor responsible for negative change in the wetland environment. The amount of silt deposited in the wetlands is directly related to the rate of deforestation in the concerned water shade. The rate of deforestation is very high in Assam since 1990. Deforestation is associated with interrelated factors like high population growth and economic compulsion, cross-border terrorism, smuggling and international trade activities etc. In North-East India, particularly in Assam, the role of deforestation was negligible until 1970. Gradually it has been increasing mainly because of large-scale immigration of people from the neighbouring countries. During the recent years, because of extremist activities also the state is losing its forest cover. In a period of fifteen year (1990-2005) the reserve forest of Assam and a part of Garo hills have been badly affected by illegal trading of forest products.

Assam receives heavy rainfall during the summer season; the intensity of rainfall in this period is too high to erode the top soil in the deforested lands. The eroded materials are carried down by the swift-flowing tributaries of the Brahmaputra river as both suspended and bed loads. But when the rivers are over-flooded them the suspended loads travel with the flood water. The over-floods and after three or four days the suspended sediments get deposited in the beds of the wetlands. Through this process the wetlands are becoming shallower and shallower. This has provided opportunities to the nearby people to encroach the wetlands.

The above discussion reveals the major causes and consequences of wetland degradation which can be sum up as follows: Human induce degradation and natural degradation. Human induce degradation are encroachment over-fishing, birds hunting, brick industries, eco-degradation and unfriendly development works. Siltation is a natural process but its intensity depend on human activities. Major consequences of wetland degradation are reduction of wetland area, small wetlands are transformed into agricultural fields, reduction of fish production and also extinction of some fish species disturbs the food chain in the wetland ecosystem and a variety of algae, fungi and microscopic plants which play important role in photosynthesis die because of polluted water.

Remedial measure

A master plan should be prepared and executed to protect the wetland on the following points:

i. Stop encroachment of the wetland.
ii. To ensure preservation of ecosystem of the wetland.
iii. Mass awareness of people to protect the wetland.
iv. To enrich its flora and fauna.
v. Plantation should be done in the surrounding of the wetland to stop further erosion.
vi. Formation of rules and regulation to protect the wetland.
vii. Motivation of public living nearby wetlands.

3. Conclusion

The plan will be successful when Government will pay attention towards the preparation and execution of the plan. But participation of people to make it a success is vital. As the rural folk is directly benefited by practicing agriculture, catching fishes and poaching birds, attention is to be made to motivate the villagers. Proper education should be imparted to allow them to live harmoniously with the nature to maintain a balance of existing ecosystem. Government N.G.O. as well as public should come forward today to save the wetlands.

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