



Water Quality Analysis in Wetland Of Goalpara District, Assam

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Abstract:

Water is regarded as one of the most exploited natural resources of the earth. Wetlands are the natural depression on the earth which acts as a host of several aquatic flora, fauna, fisher folk and aquatic birds. But nowadays, wetland ecosystem whether it is in urban or rural areas is facing danger due to water pollution. Because of population pressure, the demand of water whether it is in rivers, lakes, ponds etc. raised greatly causing deterioration in the quality of water. In Assam, as well as in Goalpara district, the quality of wetland water is deteriorating day by day. The resource potentiality of wetland depends on the quality of water. So in this paper an attempt has been made to analyze the quality of wetland water in the district with the help of dissolved oxygen [DO] and biological oxygen demand [BOD] test in laboratory.

Keywords:

Biological oxygen, dissolved oxygen, pollution, water quality.

Introduction:

Water is regarded as one of the most exploited natural resources of the earth since the dawn of human civilization. The ever increasing population pressure in the river basins around the lakes, rise in the standard of living, growing industrialization and water power generation etc., have raised the demand for water greatly on one hand and indiscriminate dumping of domestic and industrial effluents in the water bodies on the other have caused deterioration in the quality of water available in the fresh water bodies. Nevertheless, the most affected water bodies on the earth are the rivers and the inland lakes. As a result of untreated discharge of domestic, industrial and agricultural wastes, urban garbage, the quality of water in the river and the lakes gets change quite significantly. (Bhargava 1986).

In Assam, the wetland water is getting slowly polluted through increasing deposition of silt and residues of chemical fertilizers used in agricultural fields in the wetlands during the rainy seasons. The intensity of pollution may, however, increase in future due to deforestation in the surrounding hills and high plains. It needs no mention that all the aquatic plants and animals need pollution free water for their proper growth and development. Therefore, evaluation of water quality may go a long way in understanding the resource potentiality of any kind of water body. In order to analyze the quality of water in the wetlands, Dissolved Oxygen [DO] and Biological Oxygen demand [BOD] test have been carried out in laboratory.

Methodology:

For these test, three wetlands have been selected from Goalpara district: Urapad, Kumri and Saitara-Naitara. Samples were collected on the 25th, 26th and 27th July, 2018, in the morning between 11 to 12 A.M. Water samples for Dissolved Oxygen [DO] and Biological Oxygen Demand [BOD] analysis were collected in special BOD bottles of 100 ml. Before collecting the samples, the sampling bottles were washed several times with the water to be sampled.

Analysis:

Dissolved Oxygen (DO) : All aerobic organisms require free oxygen for respiration. Oxygen is freely present in air and terrestrial plants and animals can easily get it. In water, however, free oxygen is available in dissolved form in small amount. This quality is far too little as compared to oxygen content in air, being 8-10 mg per liter. The saturation level of dissolved oxygen (DO) is 14-15 mg per litre at 0°C in fresh, clean water. With the rise in temperature, the capacity of dissolving oxygen by the water is reduced and reaches 0 mg per litre at 100°C. In aquatic ecosystems, except during active photosynthesis period in daytime, DO is unusually a critical factor and at times it may cause oxygen deficiency and death of aquatic organisms. DO of water is primarily regulated by its free interchange at the water and atmosphere interface, production through photosynthesis and consumption by plants, animals and decomposer organisms in their respiration. In all aquatic ecosystem, there are diurnal changes in DO viz. at night minimum and at mid-day, maximum. There are also variation in DO at different

water depths because the oxygenation from air takes place at the surface and photosynthetic recharging of oxygen also takes place in the photic zone. Estimation of DO gives an insight into the nature of prevailing conditions. For example, in presence of organic matter load or sewers, or presence of heterotrophs, the DO level drops down considerably even though there may be reasonable turbulence or wave action (Ambash, 1992).

Biological Oxygen Demand (BOD) : If there is a heavy load of organic matter in the water, there will be a good growth of decomposer organism on them which would demand oxygen heavily for their respiration. This demand would exceed the oxygen production and recreation rate leading to DO deficiency. The level of organic matter pollution is indicated by fluctuation of DO. Another method of studying pollution load is through the analysis of biochemical oxygen demand (BOD) that the decomposer organism makes in a polluted aquatic system. More BOD means the presence of more organic waste or sewage pollution. For BOD estimation, water sample are incubated for certain period to assess oxygen consumption. Generally incubations done for 5 days at 20°C and such results are expressed as BOD 5 (denoting incubation of 5 days). BOD does not give any indication of toxic wastes and non-biodegradable substances which do not form the usual food of decomposer organisms (Ambash,1992).

Result :

Following table shows the result of DO and BOD test of 9 samples done in the laboratory.

Sample station	DO (mg/L)			BOD (mg/L)		
	1	2	3	1	2	3
1. Urapad Beel	7.2	7.5	8.1	1.3	1.5	1.5
2. Kumri Beel	8.1	8.3	8.7	1.5	1.6	1.6
3. Saitara-Naitara Beel	7.5	7.5	7.9	1.4	1.5	1.5

Source : Laboratory Analysis

From the table above it is clear that the water quality of the wetlands is by and large satisfactory. The DO level ranging between 7.2-8.7 mg/L is also satisfactory (standard 5.0 mg/L). The BOD level is also found to be highly satisfactory. It ranges from 1.3-1.6 mg/L. The standard of BOD is 3.0 mg/L above which it is indicative of organic pollution.

Conclusion:

Although result of dissolved oxygen and biological oxygen demand test is satisfactory, but interference of human activities are deteriorating wetland environment in the district day by day. It has been observed that encroachment of wetlands for agricultural purpose and practice of over-fishing in the wetland is causing pollution in the wetland water of the district.

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