

EFFECTS OF pH, TDS (TOTAL DISSOLVED SOLID) AND TSS (TOTAL SUSPENDED SOLID) ON AQUATIC ORGANISMS OF DUWANI AND BOMANI WETLAND OF KAMRUP METRO DISTRICT OF ASSAM, INDIA

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ABSTRACT

Hydrogen potentiality (pH), TDS (total dissolved solid) and TSS (total suspended solid) is the physical parameter of water. According to United States Environmental Protection Agency (US EPA 1986) total dissolved solids are the inorganic salt , organic matter and other dissolved materials in water. The amount of TDS in a water sample is measured by filtering the sample through a 2.0 um pore size filter evaporating the remaining filtrate and then drying what is left to the constant weight 180 degree celsius (APHA 1992). Water normally contains solid materials both dissolved and suspended forms. The acceptable TDS value in water is 500ppm. The TDS value of Duwani and Bomani wetland is below 50 ppm. In duwani wetland TDS is 33ppm and Bomani wetland it is 35ppm.

The TSS (Total Suspended Solid) is a direct measurement of the concentration of suspended material present in a water sample. The tolerance limit of TSS is 100ppm. Both the wetland Duwani and Bomani crossed the tolerance value. In Duwani wetland TSS is 180ppm and Bomani wetland TSS is recorded 297ppm. The TDS and TSS also play important role in the aquatic life cycle of plants and fishes. In aquatic ecosystem TDS and TSS both the minerals provide the productivity power of plants and fishes. Most aquatic life freshwater fish can't be tolerate high TDS because they are not adapted to saline water, like marine fish. In this paper we have identify the cause and consequences of the wetland ecosystem and TDS and TSS impact on aquatic organism .

keywords:- Analysis of TDS and TSS, freshwater fish, ecosystem and sustainability.

INTRODUCTION

The wetlands are the natural relief features of the earth. The wetlands are biologically productive ecosystems and rich in diversity of species. All the characteristics of water, which influence the growth, production and reproduction of fishes are collectively termed as water quality (CIFRI, 2000) considered here. In healthy wetland ecosystem the physical parameter of water pH, TDS and TSS effect play important role. The wetlands are view transitional habitat between shallow and deepwater systems. Wetlands are the major features of landscape in almost all parts of the world (D.Deka 2,013). The value of wetlands for fish, aquatic plants and wildlife protection has been known for several decades. According to International Union for the Conservation of Nature and Natural Resources (IUCN), as " All submerged or water saturated lands, natural or man made, inland or coastal, permanent or temporary, static or dynamic, vegetated or non- vegetated, which necessarily have a land water interface are called wetlands." In the study area Duwani and Bomani wetlands is geographically located in the North Eastern part of India, Eastern part of Kamrup Metro district of Assam. The present status of Bomani and Duwani wetlands are polluted by the industrial pollution. But before 30 years back both the wetlands are rich in ornamental and local fishes and various types of shrubs. The industrial pollution is totally destroy the water bodies of the wetlands. various physical properties of water is not in sustainable condition. The basic physical parameter pH (Hydrogen potentiality), TDS (Total Dissolved Solid) and TSS (Total Suspended Solid) are the most important elements of water. This three elements are play important role in the overall ecology the wetlands. The effect of pH, TDS and TSS is directly related to the general growth circle of the aquatic animals. Because the overall water environment is depend on pH value and TDS,TSS play the processes of nutrition and food production of wetlands.

OBJECTIVE OF THE STUDY

The main objectives of the study is to investigate pH and TSS of duwani and Bomani wetland of Kamrup Metro, Assam

METHODOLOGY

Primary data have been collected for this study. Soil and water have been tested in the laboratory (NEOLAND TECHNOLOGIES-RG BARUAH ROAD,GUWAHATI)Water and soil quality of the wetlands have analyzed and discussed in analysis part.

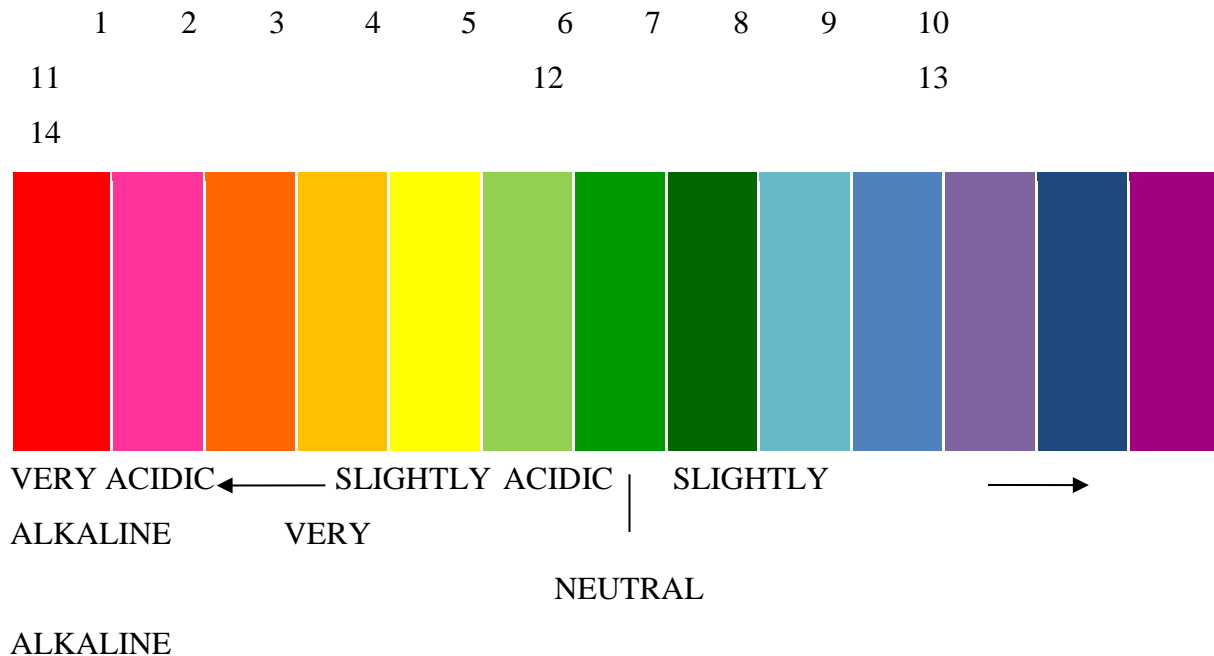
STUDY AREA

Duwani and Bomani wetland is located in Kamrup Metro district of Assam. Both wetlands are very important for geo environmental prespectives.

ANALYSIS

pH:-Hydrogen potentiality is an important elements for aquatic life . Because it helps the survival of their life circle. Normally pH is determined the quality of water and water purity in water which indicates more or less overall water environment. pH is known as the negative logarithm of H^+ ion concentration in water. Therefore the meaning of the name pH is the strength of hydrogen molecule. The pH values on a pH scale varies from 0 to 14.

- The solution with a pH value varying from 0 to 7 on pH scale are called acidic solutions.
- The solutions with a pH value ranging from 7 to 14 is known as basic solutions.
- On the other hand pH scale solution with a potential of hydrogen value equal to 7 are known as neutral solutions.



POTENTIAL OF HYDROGEN (pH) SCALE

In the study area the Bomani and Duwani wetland the result of pH value is 6.56 and 6.59. which the quality of water is acidic. This acidic water is unsustainable for survive of aquatic

fishes and plants. Due to the heavy industrial waste release by the two large scale manufacturing industries. Both The cement industry and aluminium industries release chemical and fly ash is directly impact on the wetland ecosystem and environment. In both the wetlands are rich in aquatic fishes but due to the industrial pollution some species are now in endangered. Local ornamental and other fishes namely Gundusia chapra, Humped feather back, Olive carp, Rasbora, Common Rasbora, Indian Carplet, Winged Rasbora (Family Balitoridae), Striped Loach and Dwarf Tengra .

TDS (Total Dissolved Solid):-According to United States Environmental Protection Agency (US EPA 1986) total dissolved solids are the inorganic salt , organic matter and other dissolved materials in water. The amount of TDS in a water sample is measured by filtering the sample through a 2.0 um pore size filter evaporating the remaining filtrate and then drying what is left to the constant weight 180 degree celsius (APHA 1992). Water normally contains solid materials both dissolved and suspended forms. The acceptable TDS value in water is 500ppm. The TDS value of Duwani and Bomani wetland is below 50 ppm. In Duwani wetland TDS is 33ppm and Bomani wetland it is 35ppm. This TDS value is identified that the quality of water is not sustainable for the survival of aquatic animal and plants. Due to the heavy industrial waste the wetland ecosystem is totally damaged.

TSS (Total Suspended Solid):- The TSS (Total Suspended Solid) is a direct measurement of the concentration of suspended material present in a water sample. The tolerance limit of TSS is 100ppm. Both the wetland Duwani and Bomani crossed the tolerance value. In Duwani wetland TSS is 180ppm and Bomani wetland TSS is recorded 297ppm. The TDS and TSS also play important role in the aquatic life circle of plants and fishes. In aquatic ecosystem TDS and TSS both the minerals provide the productivity power of plants and fishes. Most aquatic life freshwater fish can't be tolerate high TDS because they are not adapted to saline water, like marine fish.

SL No.	Parameter	Value	Value	Acceptable Value (USPH)
		DUWANI WETLAND	BOMANI WETLAND	

1	pH	6.59	6.56	6.0-8.5
2	TDS (ppm)	33	35	500 (ppm)
3	TSS (ppm)	180	297	100 (ppm)

Source : Data collected and analysed by author.

* USPH- United States Public Health Drinking Water Standard

* ppm-parts per million

CONCLUSION

The natural environment of wetlands is threatened by the anthropogenic activities. The greatest concern in the context of wetland ecosystem is loss and modification of habitats, which is catastrophic in nature since it causes irreversible environmental degradation. Wetland (beels) of Assam have been polluted primarily from two sources-(i) Industrial effluents and household waste disposal and (ii) use of agro- chemicals in the nearby cropland (M.C. Bhuyan, 1987). In the study area the heavy manufacturing industrial effluents has been polluted the wetland ecosystem. The discharge of industrial effluents from the Star cement and Halco aluminium industry both the wetlands of the study region cause large scale fish mortality, low fish production and obstruct free migration of fishes. On the other hand, the whole wetland ecosystem is collapse due to the heavy industrial pollution. The cement and aluminum industries are regularly release heavy metal and other harmful materials and gases. The wetland ecosystem is totally damaged. The pH, TDS and TSS value is not in acceptable range

Therefore an effective conservation policy, financial and technological support are requirements of the hour to utilize the vast potential resources present in the wetland ecosystem. On the basis of the study, some observations are made- (i) It is necessary to reduce the growth of floating and submerged vegetation for more fish production in the wetlands, (ii) proper demarcation of wetland boundary is necessary and, in this regard, encroachment should be stopped, (iii) Control the industrial activities is near from the wetlands and effective policy should be implemented for reducing industrial pollution. The duwani and Bomani wetlands are also rich in culturally since from Dimoria dynasty. During Magh bihu uruka the community fishing festival is celebrated since from dynasty period. The locals have been keeping this tradition since ancient times. Currently, many species of fish are extinct from the

wetlands due to pollution. Gradually, this traditional fishing festival will disappear. At some point, Duwani and Bomani wetlands will be recorded only in the pages of history.

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