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Physicochemical and Biological Characteristics of Two Wetlands in Dhampur

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ABSTRACT

Wetlands serve as important natural resources and play a major eco-hydrological role in environmental management. A methodical study has been carried out to estimate physico-chemical characteristics of the selected wetlands of Dhampur which is situated 17 km away from bank of Ramganga River. It is one of the tehsil of district Bijnor, Uttar Pradesh India and comes under Moradabad division. We conducted investigation to evaluate the physicochemical and biological characteristics of wetlands in Dhampur. During investigation, ten physico-chemical water quality parameters have been analyzed. In Dhampur around 6 wetland are present where water is combining with soil. It is present in saturated form by surface of ground water. Hydrological cycle is most important example of wetland. In the study of wetland we measure the properties of water like physical or chemical property as turbidity pH value and temperature.

Keywords: Physico-chemical, Biological , Wetland, Hydrological Cycle

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INTRODUCTION

Wetland are referred to as an area which cover by the water or where water are combined with soil. Weather saturation which is present in form of hydrological cycle largely determine how soil developed and the type of plant and animals [1].

Wetland relates to aquatic and second of the terrestrial species.

Categories of wetland-In our environment wetland are form of two different categories which is related to the hydrology water chemistry. It is very extensively because of provincial and limited difference in soil [2]. The two different conditions which is- 1-Coastal or tidal wetlands, 2-Inland or non-tidal wetlands

Coastal or tidal wetlands– Coastal wetlands are constituted of freshwater and saltwater ecosystems which are situated in coastal watersheds where the water flows into the ocean. In this type of wetland plants have greatly adapted to an environment. Some type grass like algae that adapted the saline.

Inland or Non-tidal wetlands- It is also related to dry land and most common on food plants along rivers and stream. It is based on the isolated depression surrounded by dry land. In this type of wetland ground water

intercept the soil shell. Where rainfall adequately saturated the soil. It is also include the marshes wet meadows produces by herbaceous plants.

Hydrological cycle- Hydrological also known as water cycle in this cycle continues circulate of water in air and the surface of and below earth condensation process must occur in this process. In this cycle energy exchange influence climate water evaporate than its release climate energy and warms the environment [3]. There are many processes to define in hydrological cycle.

In Hydrological cycle 7 step are present which is based on in this process.

1. Condensation
During Hydrological cycle this process must occur in which continuous processes occur or transformation occurs water vapour to liquid water.

2. Deposition
It is related to the thermodynamic process in which phase transition occur that is gas transform in to solid. It is also known DE sublimation.

3. Evaporation
In this way converting of water from liquid to gas. In this process ground water in to over laying atmosphere.

4. Percolation
In this process under the influence of gravity water flows horizontally by the soil and rock.

5. Precipitation
In this process precipitations occur inform of rain also include snow hail fog. Condense water vapour falls to the earth surface.

6. Sublimation
State changes directly from solid to vapour during sublimation.

7. Transpiration
In this process releasing of water vapour from plant and soil into air in gas.

ABOUT DHAMPUR

In Bijnor district, Dhampur is a board of municipal in the UP. It is located 17 km away from river 'Ramganga'. The distant between dhampur and National Capital (New Delhi) is approx. 200 km. Dhampur is primarily famous due to Dhampur sugar mill (DSM).

The area of Dhampur 149 km square and the density approx. 150/Km square. The population of Dhampur is approx 60,000.

In Dhampur, 6 wetland are present. Our Indian government follows many ways for water conservation in this area. A wetland survey is generally based the ecological system in our environment. Government also invests the money for conducting the wetland survey. We find many types of properties that are physical and chemical properties.

MATERIALS AND METHODS

Water samples of two wetlands in Dhampur were collected for different physico-chemical parameters subsequent standard methodology of evaluation. Three samples of each were collected, estimated and mean of these values is reported [4]. A blank sample was also carry out for all titrations. Each chemicals of anal R grade were used. The specifications of instruments are Century CP 901 pH meter and RI Conductivity meter. The estimated parameters are smell, pH, Temperature, Hardness, Turbidity, Dissolved oxygen, Conductivity, Alkalinity, BOD and COD. When we go for collecting the water sample [5]. Firstly we locate the number of water sources in a particular area. We keep plastic bottles. The bottles are filled with water sample. In this way we collect all water samples. As per standard, the samples can't be analyzed immediately [6,7]. They are stored at zero degree centigrade to stop any change in the composition of water.

pH Value
Its refer power of hydrogen or measure the concentration of H+ ion. The range of pH from 0 to 14 with pH of 7 neutral. Below pH 7 is acidic & above pH 7 is considered basic. The pH-7 is considered neutral. The solubility of the metals & Non-metals depend upon the pH of the solution.

Temperature
Its measured in degree Celsius and tell about the temperature of our environment. It is also related to cold and hot environment.

Hardness
Water contaminated with Ca or Mg salts is called hard water as it gives hardly any lather with soap. When impurities are in form of bicarbonate salts, they are easily removed by boiling. The slight hard water 60mg/l is almost soft water. The 60mg/l to 100mg/l the water becomes moderately hard water. 101mg/l to 180mg/l the water becomes hard water. 180 onward the water becomes very hard [8].

Turbidity
It is the large number of individual particles which caused by fluid of haziness. It is measured in NTU. These points are most useful for treatment of wetland survey.

Dissolved oxygen
Dissolved oxygen is the quantity of gaseous O_2 present in dissolved state. Now discuss about dissolved oxygen in water sample. First up all what is dissolved oxygen? The type of and quantities of life in a aquatic system is determined by oxygen. It is the most important parameters in water quality. The main sources of dissolved oxygen to the water are directly obtained from the atmosphere. Measuring the dissolved oxygen. It is measured using a DO meter. The measurement of field at the same time each day. In this measurement the DO concentration measured in mg/lit and percentage saturation [9].

Winkler method is most useful for the treatment of dissolved oxygen in this type of method. The stoppered bottles filled with sample and quickly add 2 ml of manganese sulphate to collected water, no bubble come in the bottle. Now add 2 ml of alkali iodide reagent in the equal mode if the O_2 is present the sample will turn a brownish orange cloud of precipitate appear. After seating ppt bottom add 2 ml of concentration H_2SO_4 by using pipette the ppt dissolved at this point sample is fixed.

Conductivity
The conductometric analysis is done by using digital conductivity meter. It is a solid state instrument designed to provide the precise conductivity measurements. The instruments are ideal for monitoring salt contents in natural water, treated water, waste water, drinking water, brine solution, sea water and soluble salts in soil [10].

Alkalinity
The Alkalinity is produced in water system due to the presence of alkaline salts. The alkalinity may be due to OH ions, or due to carbonate ions or bi-carbonate ions. The alkalinity causes hazardous outcome on the fauna and flora of the system.

Biochemical oxygen demand
It is described as the quantity of dissolved O_2 essential by the aerobic bacteria for the oxidation of organic matter below aerobic situation.

Chemical oxygen demand
It is defined as the total of O_2 put away below particular condition in the oxidation of organic and oxidisable inorganic matter, corrected for the control of chlorides.

RESULT AND DISCUSSION

Site-wise calculated values of physico-chemical parameters and W.H.O. standards are in Table 1. The analysis and comparison with standards revealed facts concerning the wetland quality at Dhampur. Wetland water is alkaline due to higher values of pH and alkalinity. The range of conductivity is 1.963-1.997 µS/cm. The calculated values of hardness are 335- 378 mg/l and the wetland water is extremely hard and unhealthy for usage. The amount of dissolved oxygen is 2.9-3.1 mg/l, water is found to be deficient of O_2. The calculated range of bod and cod are 8.2-9.8 mg/l and 23-28 mg/l correspondingly. The values suggest high concentration of organic pollutants and presence of high quantity of chemical pollutants as well in wetland water of study region.

Table 1: Calculated values of physico-chemical parameters and WHO standards

S. No.	Parameters	Wetland site 1	Wetland site 2	WHO Standard
1	pH	7.55	7.75	8.0
2	Temperature	21	23	-
3	Conductivity	1.963	1.997	0.300
4	Turbidity	25	27	5.0
5	Hardness	335	378	100.0
6	Alkalinity	153	168	100.0
7	DO	3.1	2.9	5.0
8	BOD	8.2	9.8	6.0
9	COD	23	28	10.0
10	Smell	Algae like	Algae like	-

CONCLUSION

On the basis of above discussion, it may be finished that wetland of Dhampur is extremely alkaline, very hard, extremely contaminated with organic and also very much contaminated with mention to all physico-chemical parameters estimated. The people exposed to wetland study are prone to health hazards of contaminated water and quality management of wetlands are desired in the study region. In this study, these wetlands are not good for our ecosystem.

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