ASSESSMENT OF PHYSIOCHEMICAL PARAMETERS OF SURFACE WATER

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Abstract - *A surface water in Jabalpur Madhya Pradesh in order to know the quality of water for people The study was intended to assess physiochemical parameters of different location of consumption, recreation and other purposes.*

This assessment deals with the study of the environmental parameters on the water quality of surface water. There are various ways to assess the quality of water used for drinking, industrial use and irrigation . Water Quality Index, indicate the water quality in terms of a number, for a useful representation of overall quality of water for people or for any other use as well . Water Quality Index was determined by various physiochemical parameters like PH, conductivity, Total Dissolved solids (TDS), acidity, Alkalinity, Hardness, Turbidity, Temperature, biochemical oxigen demand (BOD) and Dissolved Oxygen(DO). These parameters were compared with water quality standards to indicate pollution in surface water.But now there is a need to develop a proper guideline based on social, religious, scientific and environmental efficient techniques during to achieve the aim of sustainable development of water resources in terms of quantity and quality.

Key Words: Physiochemical parameters, water quality index (WQI), surface water quality , biochemical oxygen demand (BOD), chemical oxygen demand (COD), TOC , TSS , TDS , TS , DO.

INTRODUCTION

All biological and chemical reactions occur in water is essential for the maintenance of human life. Most of the human activities involve the use of water.It may be noted that human early habitation and civilization sprang up along the banks of Rivers. Although the surface of our planet is nearly 71% water and only 3% is fresh. Of these 3% about 75% is in glaciers and polar icebergs, 24% in groundwater and 1% is available in the form of fresh water in ponds suitable for consumption (Dugan, 1972).Due to increasing industries and on the other hand exploding population demands of water supply have been increased tremendously. Moreover a few part of this limited quantity of water is polluted by sewage, industrial chemicals and human waste. Fresh water which is a limited vital resource needs to be protected, conserved and should be used wisely by human. According to the National Environmental Engineering Research Institute, Nagpur, India, about 70 % of the available water in India is polluted . surface water is the main resource for domestic purposes in the study area. So it is very important to estimate the superiority of surface water in the various area.

LITRATURE REVIEW

According to Sharma et al (2011)

He has done a study on Ganga river water in haridwar Uttar Pradesh(INDIA). During main festive occasion, cases of water borne diseases like diarrhea, dysentery, cholera, jaundice, typhoid and many other types of liver and gastro intestinal disorder increases due to burden on civic facilities, on account of enhanced pressure of tourist/pilgrims in Haridwar. The pilgrims also bring a lot of offering in the form of flowers, clothes, old icons of GOD and GODDESS, besides last remains (ashes) of their loved ones-to dispose in the River

According to Shankar and Joshi(1997)

pointed out lack of management, improper dumping of waste leads to pollution and conveys a bad impression for tourist visiting the holy city of Haridwar.

METHODOLOGY FOR THE MEASUREMENT

- pH,
- Turbidity
- conductivity
- Total Dissolved Solids (TDS)
- Biochemical Oxygen Demand (BOD)
- Dissolved Oxygen (DO)
- Chemical Oxygen Demand
- Chloride
- Alkalinity

Plastic bottles of 1.5 liter capacity with stopper were used for collecting samples. Each bottle was washed with 2% Nitric

acid and then rinsed three times with distilled water. The bottles were then preserved in a clean place.The bottles were filled leaving no air space, and then the bottle was sealed to prevent any leakage. Each container was clearly marked with the name and date of sampling.

RESULT AND DISCUSSIN

Temperature:

Temperature affects Chemical and Biological activities. If temperature increases by 10°, biological activities are doubled. Hence, for water supply, the temperature should be between 10° - 25° C and greater than 25° C is objectionable.

Conductivity:

Conductivity is the amount of and the type of salts present inn water. If the conductivity is high than water is more salty.

Turbidity:

Large amount of fine suspended matters make the water to appear cloudy or turbid in appearances. Turbidity depends upon the fineness and concentration of particles present in water. In natural body, turbidity interferes with light penetration and hence reduces the photosynthetic reaction (which gives oxygen to the water).

pH:

It represents the presence of H^+ ions concentration. Acidic water causes corrosion and alkaline water cause incrustation of pipes and alkaline water cause difficulty in chlorination.

Total Dissolved Solids (T.D.S.):

Total Dissolved Solids may be considered as salinity indicator for classification of Surface water. The TDS in surface water is due to the presence of Calcium, Magnesium, Sodium, Potassium, Bicarbonate, Chloride and Sulphate ions. As prescribed limit of TDS for drinking water is 500 mg/l, all the water samples have TDS concentration well below the prescribed limit.

Alkalinity:

It is defined as, the quantity of ions in water that will react to hydrogen ions. It means, alkalinity is the ability of water to neutralize acids. If algae are present in water, the water becomes alkaline (pH 9 - 10).

Chloride Content:

Chloride, which is a compound of chlorine with other element, are present mostly in natural water, agricultural or irrigation discharge and range of concentration are very wide. Most of the River and lakes have chloride concentration is less than 50 mg/L. The presence of chloride

in high quantity indicates pollution of water due to sewage or industrial water. Chlorides are not detrimental to health but the salt intake for people suffering from heart or kidney ailment has to be restricted.

Dissolved Oxygen (D.O.):

Dissolve oxygen is probably the most crucial and important water quality variable in fresh water bodies. It is required for respiration of water species and in no case it should be less than 4 mg/L. DO level less than saturation level indicates oxygen deficiency.

Bio-chemical Oxygen Demand (B.O.D.):

The bio-chemical oxygen demand also indicates the amount of organic compound in water as measured by the volume of oxygen required by the bacteria to metabolize it under aerobic condition. For more organic matter, more oxygen is required by bacteria for its decomposition. This results in release of organic nutrients in water bodies resulting in death of organisms thriving on water.

RESULTS

SAMPLE	RESULTS
S1	7.4
S2	7.34
S3	8.1
S4	8.34
S5	7.97
S6	10.2

Table 1: pH value at different location

SAMPLE	RESULTS
S1	110
S2	115
S3	102
S4	114
S5	106
S6	109

Table 2: turbidity value at different location

SAMPLE	RESULTS
S1	73
S2	82
S3	86
S4	89
S5	79
S6	77

Table 3: alkalinity value at different location

SAMPLE	RESULTS
S1	96
S2	84
S3	105
S4	103
S5	95
S6	98

Table 4: chloride value at different location

SAMPLE	RESULTS
S1	8.0
S2	7.8
S3	7.2
S4	7.4
S5	7.6
S6	8.2

Table 5: DO value at different location

SAMPLE	RESULTS
S1	110
S2	115
S3	102
S4	114
S5	106
S6	109

Table 6: TDS value at different location

SAMPLE	RESULTS
S1	177
S2	187.5
S3	176
S4	180.2
S5	179.8
S6	163.3

Table 7: conductivity value at different location

SAMPLE	RESULTS
S1	1.6
S2	1.8
S3	1.4
S4	1.2
S5	1.7
S6	2

Table 8: BOD value at different location

Parameter	Average Observed values (Vn)	Standard values (Si)	Unit weight (Wi)	Quality rating (Qi)	(Wi x Qi)/ ∑Wi
pH	7.37°	6.5-8.5	0.133	74.0	11.49
Temperature	21.45°	Max. 25°	0.04	85.50	3.99
Conductivity	168.43	750	0.0013	22.40	0.034
Turbidity	6.39	5-10	0.133	85.20	13.233
T.D.S.	104.70	500	0.002	20.90	0.048
Alkalinity	93.71	200	0.005	46.80	0.273
Chlorides	26.93	250	0.004	10.77	0.043
D.O.	7.80	Min. 5	0.2	70.80	16.54
B.O.D.	1.72	Max. 3	0.33	57.30	22.08
			∑Wi= 0.846	WQI =	67.385

Table9: Water Quality Index

CONCLUSIONS

The present study involves monitoring of few selected physicochemical parameters of water quality at selected sample site of various tals in Jabalpur. On the basis of study it was observed that due to receiving of domestic waste water or sewage, industrial water and due to some humal activity for polluting water are very harmful for human and animals also. pollution load is increaseing and it affects the water quality and environment adversely.

All values of parameters are in within the permissible limit but if the pollution load will be increased and the water body seriously affected if proper management will not be taken timelyIn the present study six sample sites were selected and water samples collected in different locationhave been considered. The physicochemical parameters were identified from the laboratory of shri ram groupe of institution, Jabalpur, from the experimental work data interpretation was done and finally conclusion is derived with some recommendations

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