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A REVIEW ON ASSESSMENT OF WATER QUALITY IN RURAL AREAS AROUND INDUSTRIES

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Abstract— Quality of water is equally important to the quantity available. While considering of total percentage of water present on earth as 97% in ocean and 3% as a fresh water with considering glacier. Out of which 2 % as fresh water in the form of surface and subsurface water bodies and it usable for the human consumption. So when we consume water its quality measurements are necessary and management should be done in systematic path. Water quality is directly related to the physical, chemical, biological and radiological property of water These properties of water are affected because of the pollution of water due to various human activities. Depend on the activities; disposal of pollutant in the water bodies are done that changes the standard quantity of parameters in water. The quality of water usually describe according to its physical, chemical and biological characteristics. Rapid industrialization and indiscriminate use of chemical fertilizers and pesticides in agriculture are causing heavy and varied pollution in aquatic environment leading to deterioration of water quality and depletion of aquatic biota. Due to use of contaminated water human population suffers from water borne diseases. It is therefore necessary to check the water quality at regular interval of time.

Keywords—*Water characteristics, Industrial waste, Irrigation, Drinking water*

I. INTRODUCTION

Groundwater is used for domestic and industrial water supply and irrigation all over the world. In the last few decades, there has been a tremendous increase in the demand for freshwater due to rapid growth of population and the accelerated pace of industrialization. Human health is threatened by most of the agricultural development activities particularly in relation to excessive application of fertilizers and unsanitary conditions. Rapid urbanization, especially in developing countries like India, has affected the availability and quality of groundwater due to its overexploitation and improper waste disposal, especially in urban areas. According to WHO organization, about 80% of all the diseases in human beings are caused by water. Once the groundwater is contaminated, its quality cannot be restored by stopping the pollutants from the source. It therefore becomes imperative to regularly monitor the quality of groundwater and to device ways and means to protect it. Water quality index is one of the most effective tools1-4 to communicate information on the quality of water to the concerned citizens and policy makers. It, thus, becomes an important parameter for the assessment and management of groundwater. WQI is defined as a rating reflecting the composite influence of different water quality parameters. WQI is calculated from the point of view of the suitability of groundwater for human consumption. The objective of the present work is to discuss the suitability of groundwater for human consumption based on computed water quality index values. There is certain way to find out quality of water in the form of index on the basis of following categories:

a. Human well-being – includes health and Population
b. Ecosystem well-being – includes assessment of air and water quality.

II. Assessment of ground water quality:

As the ground water sources are safe and potable for drinking, irrigation and other useful purposes of human being. Hence the studies of characteristics of underground water to check its fitness for the use is necessary.

III. Parameter to be studied:

For the assessment of ground water quality of the samples collected from tube wells and bore wells the following drinking water parameters are analyzed 1.pH 2.Turbidity 3.D.O.,4.B.O.D. 5. C.O.D. 6.Total Dissolved Solids 7.Total Hardness 8.Chlorodes 9.Temperature 10.Alkalinity.

1.pH

pH is the measure of the acidity of a solution of water. The pH scale commonly ranges from 0 to 14. The scale is not linear but rather it is logarithmic.

For example, a solution with a pH of 6 is ten times more acidic than a solution with a pH of 7. Pure water is said to be neutral, with a pH of 7. Water with a pH below 7.0 is considered acidic while water with pH greater than 7.0 is considered basic
or alkaline.

2.Turbidity

Suspension of particles in water interfering with passage of light is called turbidity. Turbidity is caused by wide variety of Suspended particles. Turbidity can be measured either by its effect on the transmission of light

which is termed as Turbiditymetry or by its effect on the scattering of light which is termed as Nephelometry. As per IS: 10500-2012 the acceptable and permissible limits are 1 and 5 NTU respectively.

3.Dissolved Oxygen (D.O.)

D.O. is the dissolved gaseous form of oxygen. It is essential for respiration of fish and other aquatic organisms. D.O. enters water by diffusion from the -product of photosynthesis by algae and plants. The concentration of D.O. in epilimnetic waters continually equilibrates with the concentration of atmospheric oxygen to maintain 100% D.O. saturation .Excessive algae growth can over saturate (greater than 100% saturation) the water with D.O. when the rate of photosynthesis is greater than the rate of oxygen diffusion to the atmosphere. Hypolimnetic D.O. concentration is typically low as there is no mechanism to replace oxygen that is consumed by respiration and decomposition. Fish need at least 35 mg/L of D.O. to survive.

4.Biochemical Oxygen Demand (BOD)

BOD is the amount of dissolved oxygen required in mg/l for stabilizing the biodegradable organic matter by microorganism of the sample under aerobic conditions and the oxidation of certain inorganic materials.(e.g. iron, sulphites)Typically the test for BOD is conducted over a five day period, and determined by standard method.

5.Chemical Oxygen Demand (COD)

COD is a measure of the oxygen required for the chemical oxidation of organic matter with the help of strong chemical oxidant. High COD may cause oxygen depletion on account of decomposition of microbes to a level detrimental to aquatic life. COD determination has an advantage over BOD determination in that the result can be obtained in about 5 hours as compared to 5 days required for BOD test.

6.T.D.S

Difference of total solids and suspended solids is used to determine the filterable solids by the help of filtrate and following the procedure as above. In water sample it can also be estimated from conductivity measurement. The acceptable and permissible limits As per IS: 10500-2012 is 500 and2000 mg/l respectively.

7.Total hardness

As per IS: 10500-2012 Desirable limit and Permissible limit for hardness is lies between 200 to 600 mg/l respectively. The effect of hardness is Scale in utensils and hot water system in boilers etc. soap scum's Sources are Dissolved calcium and magnesium from soil and aquifer minerals containing limestone or dolomite. The Treatment of hard Water is Softener Ion Exchanger and Reverse Osmosis process. The degree of hardness of drinking water has been classified in terms of the equivalent CaCO3 concentration as follows: Soft - 0-60mg/l, Medium - 60-120 mg/l, Hard - 120-180 mg/l, Very hard - >180 mg/l.

8.Chloride

All type of natural and raw water contains chlorides. It comes from activities carried out in agricultural area, Industrial activities and from chloride stones. Its concentration is high because of human activities. As per IS: 10500-2012 Desirable limit for chloride is 250 and 1000 mg/l in Permissible limit.

9.Temperature

The fluctuations in temperature of different stations may be due to the influence of environmental temperature due to that point of time.

10.Alkalinity

Alkalinity is the sum total of components in the water that tend to elevate the pH to the alkaline side of neutrality. It is measured by titration with standardized acid to a pH value of 4.5 and is expressed commonly as milligrams per liter as calcium carbonate (mg/L as CaCO3). Alkalinity is a measure of the buffering capacity (ability to resist changes in pH) of the water, and since pH has a direct effect on organisms as well as an indirect effect on the toxicity of certain other pollutants in the water, the buffering capacity is important to water quality. Commonly occurring materials in water that increase alkalinity are carbonates, bicarbonates, phosphates and hydroxides. Limestone bedrock and thick deposits of glacial till are good sources of carbonate buffering. Lakes within such areas are usually well buffered.

Drinking Water Standards:

Parameter	BIS	WHO
PH	6.5-8.5	7.0-8.0
Temperature		
Total Dissolve Solids(mg/lit)	500	1000
Total Hardness as CaCO3(mg/lit)	300	100
Chloride (mg/lit)	250	250
Alkalinity	200	-
Turbidity	5 NTU	-
COD (mg/lit)	-	-
BOD (mg/lit)	5	-
DO (mg/lit)	5	-

IV. Conclusion

Water quality is dependent on the type of the pollutant added and the nature of mineral found at particular zone of bore well. Monitoring of the water quality of ground water is done by collecting representative water samples and analysis of physico-chemical characteristics of water samples at different locations. Contamination of ground water is mainly observed due disposal of wastes by humans and mostly due to industrial waste disposal. Most of the factories which are situated at rural locations do not take the treatment of the waste generated and dispose it without treatment. It causes pollution of the ground water in the surrounding area. This water is mainly used for irrigation purpose by the farmers. If such polluted water is used it causes deterioration of the soil and also affect the crop yield. So, it is an alarm for an

agricultural country like India to take this issue seriously and to make compulsion of remedial measures to reduce the ground water pollution due to waste disposal .

V. Feature Scope

Water quality of any locality influenced by the industrial waste disposal can be checked by measuring the above mentioned parameters and according to characteristics the water quality can be assured. To decide the quality of ground water methods like water quality index can be applied. If the water found contaminated then advanced and economical treatments according to the suitability to reduced the pollution can be suggested and applied correspondingly.

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