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Analysis of Water Quality of Saryu River U.P. India

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Abstract

In present investigation we deals with the water quality of Saryu river. Water quality depends upon the rapid urbanization and industrialization in this study the analysis of the water quality is done on the basis of physic-chemical characteristics of water Environmental Protection Agency (EPA) had make some limits for the amount f contaminant dissolve of drinking water. Water quality depends upon the human uses, ecosystem geology and disposal of sewage the current work deals with the analysis of water samples were tested in laboratory for different water quality parameter as per Is 10500:2012. River Saryu is regarded as fresh perennial water body and getting polluted by discharge of different physical and chemical pollutant the main outcome of this study will lead to the finding of exact quality of water.

Keywords: Geology Perennial, Water Quality, Potable.

Introduction

The water quality depends upon the rapid increase in population and industrialization and getting more and more polluted day by day water which is utilized by mankind is universal solvent. Only 2.4% of total global water is found as the fresh water of which only a small water of which only a small amount of water can be utilized. EPA has set some limits for percentage of contamination in drinking water. It has two standard, primary and secondary. Primary standards deals substance the affect the human health and secondary standard are those quality which effect the turbidity odour and taste. The water is not fit only drinking due to rapid urbanization and industrialization its get polluted by the waste discharge from petroleum workshop railway workshop, dairy, laundries waste dispose of pathological labs domestic source, hospital were discharged in river Saryu.

Treated water is more adaptable because undesirable components remove from it. The main source of infectious disease is the presence of bacteria. To know the quality of water as per standards it is require testing the drinking water source time to time. It is necessary to know the amount of contamination if water is not meets the standard of safe water. In present investigation the an analysis water quality of Saryu river has been done by evaluating the pysico-chemical characteristics of the water.

Material and Method

Firstly the map of Ayodhya city was studied to select the location site for sample collection from these sites the water sample were collected in such a way that pH and do (Dissolve oxygen) was measured on the spot of collection sites and other testing could be performed within 48 hours. The five samples from different sites had been collected.

Water Sample Testing

Each of the sample which has been collected from different sites were tested for TDS (Total dissolve solid), suspended solid Alkalinity, Chloride content, Turbidity hardness

BOD (Biological oxygen demand), COD Chemical oxygen demand, Do dissolve oxygen, pH value was followed by testing procedure for analyzing physic-chemical characteristics COD, Turbidity and pH value was determined with turbidity meter, COD analyser and pH meter respectively the calculation of total dissolve solid and suspended solid were measured by using the oven drying method. By using the simple titration using the titrating solution required reagents as per the property to be determine the value of total alkalinity chloride content, hardness dissolve oxygen BOD and acidity. By comparing the result obtained by analyzing the sample with the Indian standard value given by TS 10500:2012 to determine the drinking quality of water and its suitability for usage.

Table 1 Limit as per IS: 10500-2016

Test	Permissible limit	Acceptable limit
Total alkalinity	600	200
Electrical		
Conductivity	2500 umoh/cm	800umoh/cm
Dissolved Solid	2000	500
Chloride content	1000	250
Hardness	600	300
Ph	No relaxation	6.5-8.6
Turbidity	10	5

Observation of Test on Water Sample

There were total 12 test were made on the 5 samples collected from the different sites of Ayodhya city. The results are listed in the given table.

Table 1
Physico-Chemical Characteristics of Saryu River

Parameters	Sampling Sites				
	Site1	Site2	Site3	Site4	Site5
pH	7.7	7.8	7.6	7.5	6.0
Total Solids, mg/L	1870	1160	970	860	1600
Total Dissolve Solids, mg/L	331	691	300	521	998
Turbidity (NTU)	37	28	92	83	87
Hardness mg/L	113	112	121	731	225
Cd'mg/L	19.22	35.05	21.06	29.65	120.245
Mg^mg/L	15.33	19.49	24.84	17.53	25.31
Fre CO2 mg/L	87	77	91.5	73.6	119
Total Alkalinity,mg/L	523	561	401	312	952
Dissolved Oxygen, mg/L	4.07	2.09	6.8	4.06	6.0
BOD, mg/L	94	141	44.3	133.13	2136
COD, mg/L	45.4	413	59.3	36.4	218

Result

The water quality was further analyzed according to each parameter for each select site.

Total Alkalinity

Total alkalinity was found to be within the acceptable limit on each site which seems to be safe according to this parameter.

Total Dissolve Solid

Total dissolve solid was found to be above acceptable limit.

Electrical Conductivity

Found above the acceptable limit.

Chloride Content

Chloride content of the sample collected from each site are found to be within the acceptable limit limit seems to be safe according to this parameter.

Hardness

Hardness was exceeding at site IV but other sites the hardness is within the limit. If hardness was increasing up to limit of which need of treatment of water.

pH

Value fluctuates between 7.5-7.7 including the site (V) which is 6.0 the water is found to be alkaline pH of river water lies with in the acceptable range.

Aim of The Study

The Physico-Chemical analysis of water of saryu river and analyzing the quality of water of the awadh region

Conclusion

In the present study it reveals that the value of the water is alkaline which fluctuate between 6.0 – 7.0 due to the sewage and industrial effluent in rainy season diluted in the water and because of increase in pH value of surface water reduces the hydrogen ion concentration which related to the metabolic activity of autotrophous and phytoplankton's which utilized the CO_2 during photosynthesis. The other parameter which are increasing from the permissionable limit like TDS and TSS (Total suspended solid) is due to the rapid increase in population increases the disposable waste in water. The low value of dissolve oxygen is due to the higher growth of microorganism and bacteria which utilize oxygen for their metabolic activity which was found between 2.07 – 6.60 mg/L the biological oxygen demand (BOD) value were recorded between 44.5-214.6 mg/L

However, BOD values were recorded from 44.5-214.6 mg/L. the value of DO might be due to higher growth of bacteria, which utilized oxygen for their metabolic activities as reported by Roy et al. (1984), Badge and Verma (1985). The maximum chemical oxygen demand (COD) value of 452 mg/L was observed at DI. COD values had been found to be much higher than BOD values which were to presence of chemically oxidisable carbonaceous matter as well as inorganic matters like nitrates, sulphides and reduced metal ions coming from industrial effluents, washing, bathing (detergents and soap) and other activities. Rana, 1997; Prasad and Saxena, 1980 and Gunalc, 1991, have reported the some observations. It would be apparent from an

examination of Table 1, that water quality of river Saryu has undergone a remarkable change, which may directly be attributed to increase in industrial units and population of the cities (Ayodhya and Faizabad). Increased human interferences may be caused deterioration of water quality of river Saryu. Hardness but are okay to use according to all other parameters. Therefore these source can become an alternatives force for this region.

The water of this region is hard water and is also a little bit acidic in nature at some places but apart from this the overall quality of water of Saryu is good. River water cannot be consumed directly and need to be treated before use the permissible limit of hardness and need to be treated before use or an alternative source need to be found in nature but overall water quality is good of Saryu river in Ayodhya.

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