Research Paper

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Preliminary Investigations of Ground Water Quality in Gorakhpur City, Uttra Pradesh, India

Environmental Science

KEYWORDS : Ground water quality, Total alkalinity, Total hardness, Total Dissolved solids, Gorakhpur

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ABSTRACT

Ground water samples were collected from different area in Gorakhpur City and analysed for different water quality parameters viz. Temperature, pH, Total dissolved solids, Acidity, Alkalinity and total hardness. TDS found to be varies from 249 to 958 mg/l which indicates the significantly higher amount of TDS. The value of hardness ranges between 84 to 375 mg/l which is within the limit according to WHO.

INTRODUCTION

The availability of good quality of water is an indispensible feature for preventing diseses and improving quality of life. Natural water contains different types of impurities are introduced in to aquatic system by different ways such as weathernig of rocks and leaching of soils, dissolution of aerosol particles from the atmosphere and from several human activities. Including mining, processing and the use of metal based materials [1]. The increased use of metal-based fertilizer in agriculture revolution of the government could result in continued rise in concentration of metal pollutions in fresh water reservoir due to the water run off. Also faucal pollution of water causes water born diseases which has led to the death of million of people [2].Pollution of water is due to increased human population, industrialization, use of fertilizers in the agriculture and man made activity [3-4].Ground water quality assessment is important in order to ensure sustainable safe use of water. Water quality index, based on some very important water quality parameters, can provide a simple indicator of water quality at a certain location and time. Water is considered as one of the nutrients although it yields no calories yet, it is an important constituent of our diet. It is essential for all chemical and biological processes taking place in human body. A daily consumption of two litters of water by a person weighing sixty kilograms is preferred [5]. A correct balance of physic-chemical and bacteriological quality makes water potable. Supply of safe drinking water is on high priority list for safe guarding health of people. The need of proper management and conservation of water resources is essential to avoid future water problems. Due to rapid increase in population, industrialization and human activities deterioration in water quality is observing now a days. The lakes, wells and bawaries in city which were constructed for meeting the drinking water supply are being used as dumping places for waste and waste water. The old civic discipline to avoid the contamination has now disappeared.

MATERIALS AND METHODS

Gorakhpur occupies the north eastern corner of the state of Uttar Pradesh. It is located between Latitude 26º 13' N and 27º 29' N and Longitude 83º 05' E and 83º 56' E.

Ground water samples were collected from 8 different sampling point. The samples for the routine analysis of parameters were collected in 500ml polyethylene bottles. All the sampling containers were washed and rinsed thoroughly with the groundwater to be taken for analysis. pH and conductivity (μ mhos/cm) were determined at the site. The samples were analyzed using standard method, APHA 1995 [6]

Table 1:- WHO standard of various parameters.

S. NO	PARAMETERS	WHO Standard (mg/l)
1.	pH	6.5
2.	TDS (mg/l)	500
3.	Acidity (mg/l)	--
4.	Total Alkalinity (mg/l)	120
5.	Total Hardness (mg/l)	500

Table 2: - Water quality parameters of drinking water in Gorakhpur City

Parameters	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7	Station 8
Temperature	31	27.5	32.5	29.0	30.5	28.2	31.3	32.8
pH	6.8	8.5	7.5	7.1	8.4	7.9	7.8	7.9
TDS (mg/l)	342	342	377	452	249	958	320	668
Acidity (mg/l)	14	34	36	12	29	13	32	16
Total Alkalinity (mg/l)	68	47	57	38	77	83	53	40
Total Hardness (mg/l)	84	278	375	135	332	212	210	254

RESULTS AND DISCUSSION

The temperature ranges between 27.5 to 32.8ºC. The pH value of the study sites varied from 7.1 to 8.5 which indicates that ground water is slightly alkaline.

According to WHO the desirable limit of TDS in ground water for drinking purpose is 500 mg/l. TDS found to be varies from 249 to 958 mg/l which indicates the significantly higher amount of TDS. It might be due to ground water pollution . The alkalinity value in the ground water varied from 38 to 83 mg/l which is well within the limit according to WHO. Hardness is due to the presence of bicarbonate, chloride and sulphate of magnesium and calcium. The value of hardness ranges between 84 to 375 mg/l which is within the limit according to WHO.

CONCLUSIONS

Ground water is extensively used for water supply in Gorakhpur City. The present study was undertaken with an aim to analyze certain physico-chemical parameters in the ground water samples in Gorakhpur City. Most of the parameters analyzed have shown that they are within the permissible limits for drinking water.

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