International Journal of Advance Research in Science and Engineering
Volume No.07, Special Issue No.01, April 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354

Drinking Water Quality Assessment in Gorakhpur City

[1]Anurag KumarSrivastava,[2]Sneha Gupta

[1]M.Tech. Student, [1]Civil Engineering Department, MMMUT,Gorakhpur (India)

[2]Assistant Professor, [2]Civil Engineering Department, MMMUT, Gorakhpur,(India)

ABSTRACT

Water is a very important natural resource essential for life & it constantly cycles between the ground and atmosphere. In order to determine the quality of water for public use & other purposes,Ground water is considered as one of the purest types of water accessible in nature and takes care of the general demand of provincial and urban populace. With the development of industry the ground water is made vulnerable for sullying because of expansion of waste materials. Squander materials from the production lines permeate with rain water and achieve aquifer bringing about disintegration of ground water quality. An area of Gorakhpur (Zone 1, 2, & 3) drinking water sample in Gorakhpur city has been investigated. Water samples have been collected from six different sites including Zone 1 (Basaratpur&Gorakhnath), Zone 2 (PadariBazar &Asuran), Zone 3 (Gida&Nausad).Physical parameters (pH, DO, TDS, Turbidity etc.) and Chemical parameters (Nutrients etc.) have been analysed."

Keywords:-Physical-Chemical Parameters etc.

I.INTRODUCTION

In India, water is a scarce and valued resource that requires protection and conservation. The impact of climate change is considerable and 65% of India receives an average annual rainfall of less than 500mm/a. Thus, drought is a big concern and freshwater resources are under severe pressure. In addition, the demand for water has increased dramatically over the years as a result of an increasing population and urbanisation. India's existing water resources available for use consists of 77% surface water, 9% groundwater and 14% re-use of return flows. Seventy four percent of India's rural communities depend entirely on groundwater. Groundwater or boreholes are a source of water for approximately 1.5 billion people globally. Previously, groundwater did not receive much attention and was considered an unimportant water resource but with increasing water demand, decreasing available river flows and increasing surface water pollution, groundwater has become the most feasible option for water supply. There are widespread problems associated with the quantity and quality of water in India and these are compounded by the loss of almost half of the natural wetlands.

The term water quality is used to describe the chemical (phosphates and nutrients) and physical (temperature, pH, conductivity).

Waste water is a global problem that has become a very important issue but is also a difficult environmental problem to solve. Many of India's water resources have become polluted due to effluent discharge, sewage effluents and mine and agricultural activities. Domestic waste water is defined as consisting of 90% of waste

water by volume that arises from domestic and commercial activities and premises and may include sewage, household waste from bathing, washing and toilets.

II.MATERIALS & METHODOLOGY

Description of the study sites

Gorakhpur is a city located along the bank of Rapti river in the north-eastern part of Uttar Pradesh. It is rich in small water bodies and most of the agricultural lands are dependent on these for water sources. For the present study, an urban water bodies for different zone of Gorakhpur were selected. These water bodies are located at the north-eastern part of Gorakhpur city. Selected sites have been divided into different zones as given below.

Sampling Details and Analysis:-

Six samples have been collected from six different sites:

ZONE 1- Basaratpur (S1)&Gorakhnath (S2) Water Sample

ZONE 2- Padari Bazar (S3)&Asuran (S4) Water Sample

ZONE 3- Gida (S5)&Nausad (S6) Water Sample

Table-1 Drinking Water Quality Parameters & Units According to IS: 10500

Sr. No.	Parameters	Units	Limits as per IS:10500	Instrumentation Method
1	PH at 25˚C	-	6.5-8.5	Digital pH-meter
2	Electrical Conductivity	µs/cm	Not Specified	Digital Conductivity-meter
3	Turbidity	NTU	5	Digital Turbidity meter
4	Total Dissolved Solids	mg/l	500	Gravimetric method
5	Total Hardness as $CaCO_3$	mg/l	300	Titrimetric method (with EDTA)
6	Total Alkalinity as $CaCO_3$	mg/l	200	Titrimetric method (With N/50 H_2SO_4)
7	Chloride as Cl	mg/l	250	Titrimetric method (With N/35.5 AgNO3)
8	Sulphate as SO_4	mg/l	200	Spectrophotometric method

9	Fluoride as F	mg/l	1	SPANDS Method
10	Nitrate as NO_3	mg/l	45	Spectrophotometric method
11	Iron as Fe	mg/l	0.3	By1,10 phenanthroline method
12	Ammonia as NH_3	mg/l	0.5	Distillate Method
13	Phosphate as PO_4	mg/l	Not Specified	Stannous Chloride Method
14	Sodium as Na	mg/l	Not Specified	Flame Photometric Method
15	Potassium as K	mg/l	Not Specified	Flame Photometric Method
16	Calcium as Ca	mg/l	75	Titrimetric method (with EDTA)
17	Magnesium as Mg	mg/l	30	By calculation Method
18	Hexavalent chromium as Cr^{6+}	mg/l	0.05	DiphyenylCarbazide Method
19	Copper as Cu	mg/l	0.05	Neocuprine Method
20	Dissolved Oxygen (D.O.)	mg/l	Not Specified	Winkler Azide Method

III.RESULTS &DISCUSSION

Sr. No.	Parameters	Units	S1	S2	S3	S4	S5	S6
1	pH at 25˚C	-	7.5	7.40	7.44	7.61	7.34	7.12
2	Electrical Conductivity	µs/cm	413	464	425	457	369	856
3	Turbidity	NTU	0.6	0.5	0.9	0.5	0.6	0.4
4	Total Dissolved Solids	mg/l	278	306	376	432	392	443
5	Total Hardness as $CaCO_3$	mg/l	134	196	240	290	290	450
6	Total Alkalinity as	mg/l	122	112	170	190	150	395

	$CaCO_3$							
7	Chloride as Cl	mg/l	47	48	154	119	114	180
8	Sulphate as SO_4	mg/l	22	4	68	63	64	43
9	Fluoride as F	mg/l	0.23	0.33	0.67	0.41	0.54	0.50
10	Nitrate as NO_3	mg/l	8.5	32.5	13	9	42	37
11	Iron as Fe	mg/l	0.10	0.05	0.12	0.17	0.12	0.13
12	Ammonia as NH_3	mg/l	< 0. 5	< 0.5	< 0. 5	< 0.5	< 0. 5	< 0.5
13	Phosphate as P	mg/l	0.06	0.05	0.04	0.03	0.06	0.04
14	Sodium as Na	mg/l	28	39	42	36	22	31
15	Potassium as K	mg/l	1.4	1.9	2.6	1.8	1.2	1.5
16	Calcium as Ca	mg/l	40.08	60.92	76.95	92.18	92.98	140.28
17	Magnesium as Mg	mg/l	8.26	10.69	11.66	14.58	14.09	24.3
18	Hexavalent chromium as as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
19	Copper as Cu	mg/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
20	Dissolved Oxygen (D.O.)	mg/l	4.9	4.5	4.6	4.1	4.3	4.7

Water resources are limited in India and its quality affects human and environmental health. For this reason constant monitoring and management is essential. Urbanisation affects water quality and causes fluctuations in parameters for example sewage discharges from businesses, informal settlements, agricultural activities, seepage and leachates due to broken pipes or septic tanks. Rainfall is also responsible for fluctuations in water quality and parameter concentrations as a result of atmospheric washout. Pollution of water resources include: suspended solids (sediment), various chemicals and metals, physical pollutants (temperature, phetc.). These pollutants can cause environmental degradation (such as eutrophication) and pose risks to human health (water borne diseases). Monitoring is therefore essential to ensure that the quality of the water comply with quality standards. Water quality standards are certain criteria that are used to quantify or indicate the level of permitted pollution/parameter concentration. Pollutants/parameters of concern that usually tend to fluctuate in concentration and effect environmental and human health are physical parameters such asTurbidity, pH,

temperature and EC. These parameters will fluctuate due to season changes (rain and temperature fluctuations) and increasing levels of pollution such as discharging of sewage, seepage and leaching.

IV.CONCLUSIONS

The investigation of drinking water tests being gathered from the better places of Gorakhpur city and all water quality parameters (pH, electrical conductivity, turbidity, add up to alkalinity, add up to hardness, chloride, nitrate, fluoride, press and TDS are inside as far as possible according to IS:10500 Code. In Gorakhpur city, the parameters investigated have demonstrated that they all are inside as far as possible for drinking water .It is alright for individual.

REFFERENCES

[1] IS: 10500 Guidelines for drinking-water quality.

[2] PriyankaChaudary, Status Of Physico-Chemical Parameter Of Ground Water Of Gorakhpur City U.P. (India),INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH VOLUME 4, ISSUE 12, DECEMBER 2015 ISSN 2277-8616

[3] Pacheco J, Cabrera S (1997). Groundwater contamination by nitrates in the Yucatan Peninsula, Mexico.Hydrogeol. J., 5(2): 47-53.

[4] Prasad NBN (1984). Hydrogeological studies in the Bhadra River Basin, Karnataka, India: University of Mysore, Ph.D thesis, p. 323.

[5] Rao, N. S. (2006.). Seasonal variation of groundwater quality in a part of Guntur District, Andhra Pradesh, India.413-429.