

A Study of Water Quality In Residential And Industrial Area Gida Sector 5 And Sector 13

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Abstract-The study of water quality in residential and industrial area was carried out in GIDA SECTOR 13 and closed populated villages of GIDA SECTOR 5 to assess the some groundwater quality parameters of selected India Mark-II and shallow depth hand pumps. A total number of 8 samples collected such as S1, S2, S3, S4, S5, S6 S7 and S8 and were tested for pH, total hardness, alkalinity, acidity, chloride, Total Dissolved Solids and fluoride and the results are compared with IS 10500:2012. The study was carried out during September, October November 2016 and February, March 2017. All collected samples subjected to test for Physical and chemical analysis.

Key words- Physico-chemical analysis, Ground water, Control

I. INTRODUCTION

Water is God-gifted present to humans and it is necessary for all kinds of living organism on the earth. The absence of water cannot imagine any things about life. If we study of ancient history we find that most of developed and famous historical cities grow near bank of river because requirement of water for survive. Human are totally depends on water for different type of activities. But due to globalization and industrialization the requirement of water for their working activities and therefore pollution of surface water and ground water also increased. Pollution of water raise a question mark on existence of life. Near-about all water bodies are get polluted including ground Water. The contaminated water can easily mixed in fresh water and losses the originality of water. Ground water resource plays a very important role for drinking by hand pump or pipe water supply system. Ground water resource widely consumed by Urban and Rural areas by use of different type of water supply system. Disposal of industrial effluents and domestic sewage in river causes a reduction in water quality. Due to disposal of effluents in river, gradually deteriorate ground water. Ground Water pollution is irreversible. Once ground water polluted it is difficult to treat. Polluted water bodies lose the aesthetical nature. No any substitute matters are available which can replace with water.

After the revolution of industrialization, GIDA (Gorakhpur Industrial Development Authority) was established at

Gorakhpur district in 1989. After establishment of GIDA, many industries are growing in GIDA industrial area such as, Pulp and Paper, Distillery, Iron and Steel, Plastic and Thermacol, Textile industries etc. these industries generating huge quantity of liquid waste which directly drained in to Ami river and some parts of liquid waste are dumped in ground. It is serves as irrigation canal at origin point. Ami River receives industrial effluent at Khalilabad and GIDA at Sahajanwa which highly contaminate the Ami River.

GIDA divided into different sectors for different purposes such as residential, commercial and industrial sectors. Sector 5 and sector-13 located between two river basins i.e. Rapti and Ami River.

II. LITERATURE REVIEW

Promod Kumar Vishwakarma (2010) was studied the water quality of Ami River and observed the monthly variation during August 2009 to February 2010. He was selected the nine sampling stations along length of river and analyses physic-chemical and biological characteristics of collected sample. He was occurred that untreated industrial effluents drained into Ami River, which highly contaminates the river water. Uday Bhan Prajapati and Anil K. Driwedi (2011) were studied the impact of industrial waste on water quality of Ami River and observed the seasonal variation of water quality of Ami River. They were selected the five sampling station along length of river and statistical analysis of selected parameter were done. Ayush Kumar Rai (2015) was studied the ground water quality at one side of and only two ground water sample at each stations i.e. (one sample Shallow depth and one India Mark-II hand pump) taken of Ami River basin.

III. TESTING AREA

For the study of analysis of water quality in residential and industrial area we had selected the GIDA Sector-5 Gorakhpur (latitude 26.76 and longitude 83.37) and GIDA Sector 13 Gorakhpur (latitude 26.76 and longitude 83.37). In this study eight sample are collected around sorounding areas.

IV. METHODS AND METHODOLOGY

The effluent from industrial area contaminates the Ami River; also polluted the ground water of enclosed area of Sahajanwa and GIDA related all sectors. The ground water collected from India Mark-II hand pump (Recognized by State Govt.) and Shallow Depth hand pump at seven sample collected in plastic bottle with properly washed with acid and rinsed with distilled water. The ground water samples were taken continuously pumped to ensure that collected sample showing actual ground water quality. The

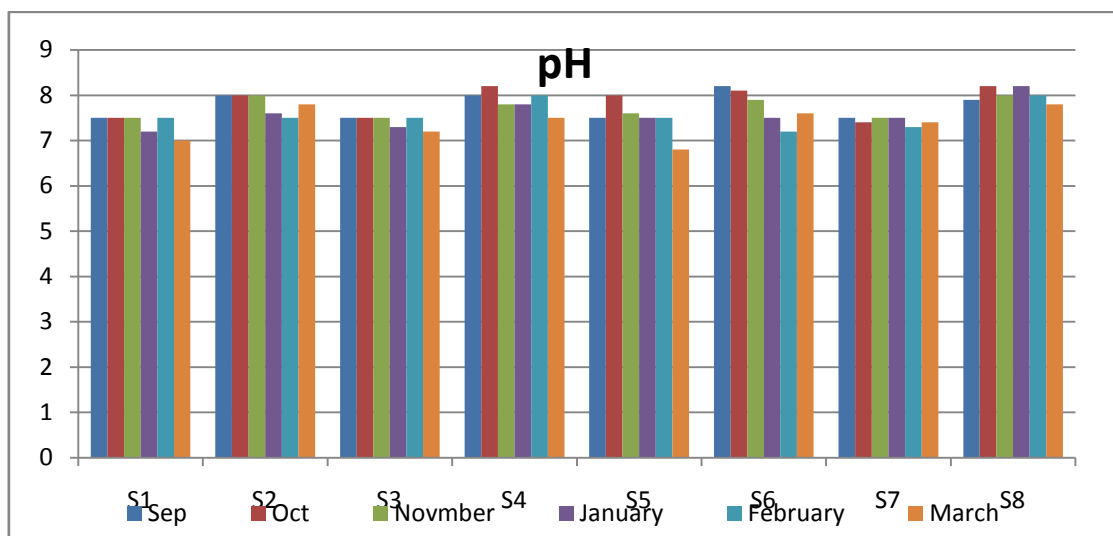
V. RESULTS AND DISCUSSION

A. pH

pH is important parameter which measure alkaline or acidic nature of water sample, which measures the

stations. To compare the observed value of ground water sample with IS 10500-2012. All collected sample subjected test and methods for pH (Colorimetric Method), Turbidity (Nephelometric Method), Hardness (Titration Method), Chloride (Titration Method), Alkalinity (Titration Method), Acidity (Titration Method). The entire reagent and other chemical were prepared with proper precaution. The collected all samples were transported to BIT Gida Gorakhpur.

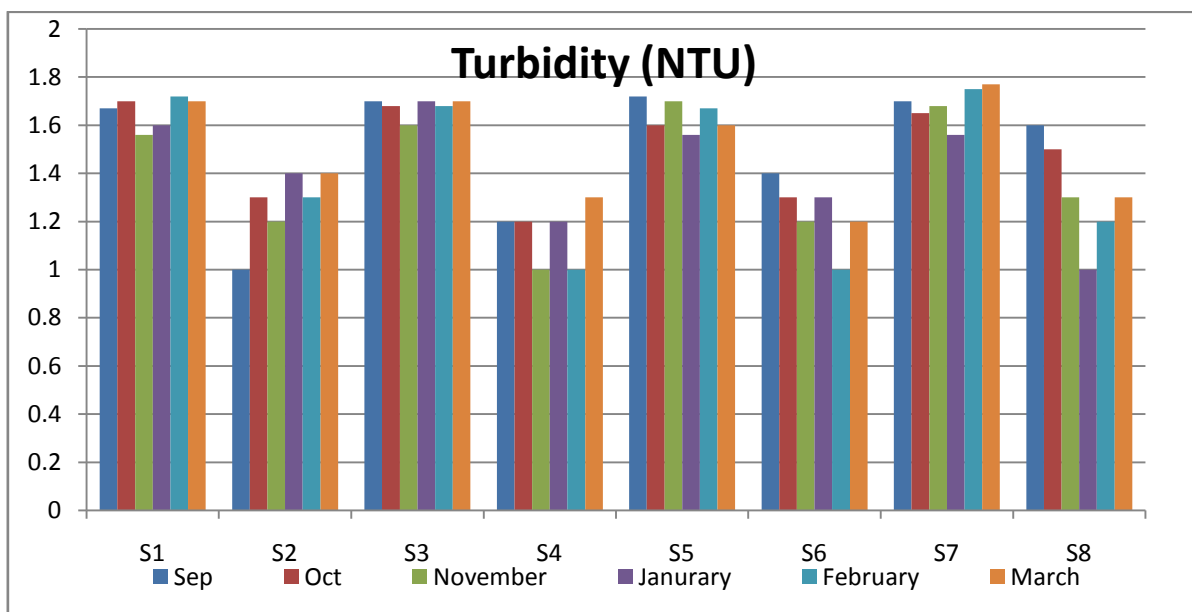
limiting chemical composition for aquatic life. The pH ranges of all collected samples are observed within 7.5 to 8.5 i.e follows the permissible limit of IS 10500:2012.



B. Turbidity

Turbidity is measures the opacity of water and it is caused by suspended organic matter like clay particles,

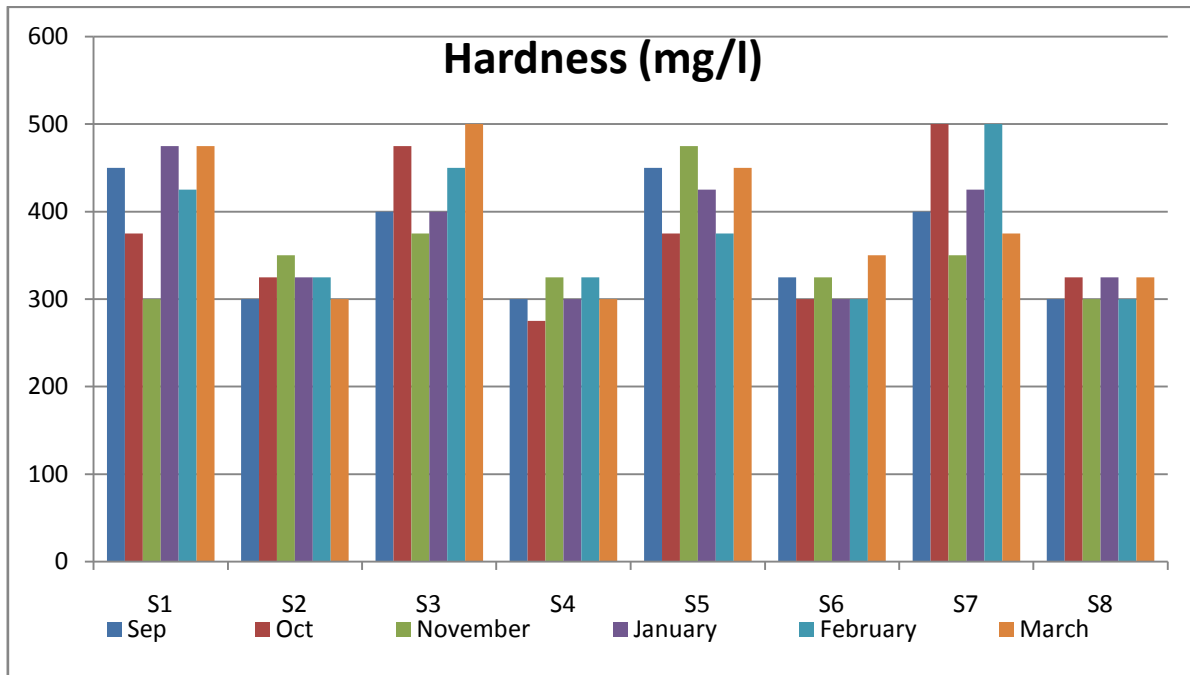
corrosive elements, tiny plants etc. The turbidity ranges are observed within 1 to 2 NTU.



C. Hardness

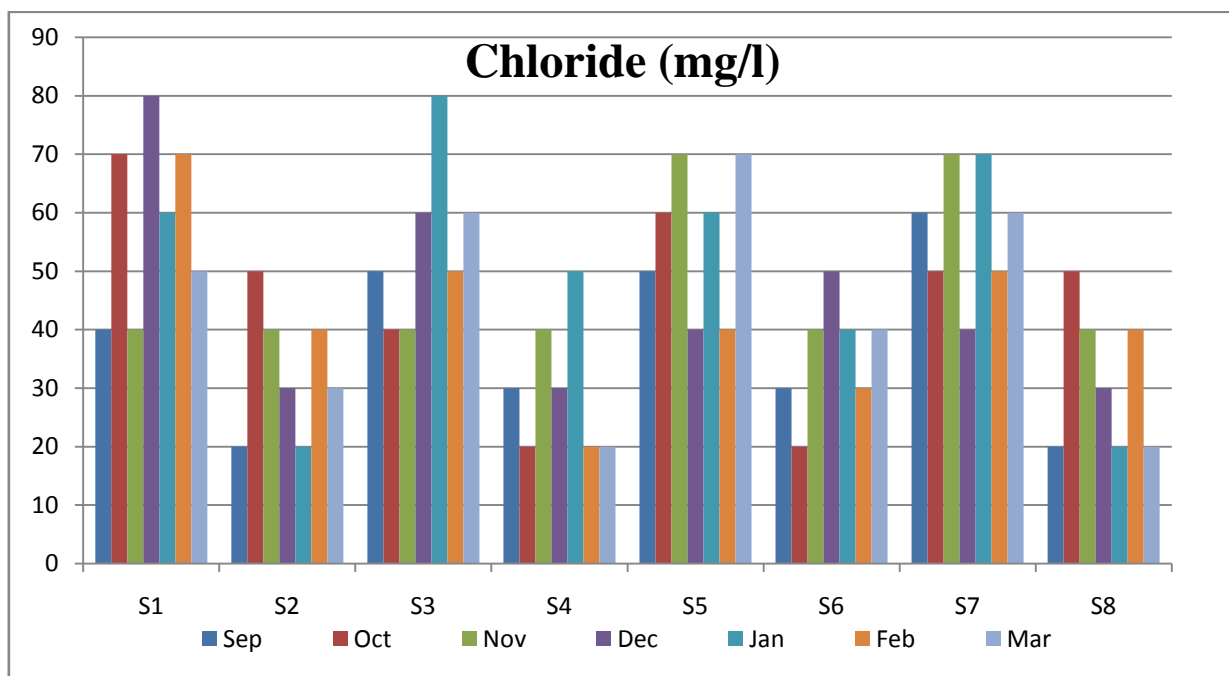
Hardness is measures the presence of carbonate and bicarbonate of Ca^{+} and Mg^{+} ions in water. It is causes

greater soap consumption, boiler scaling, incrustation, corrosion, food became tasteless. According IS 10500:2012 permissible limit of hardness is 200 mg/l but observed values of all samples within 217 to 426 mg/l.



D. Chloride

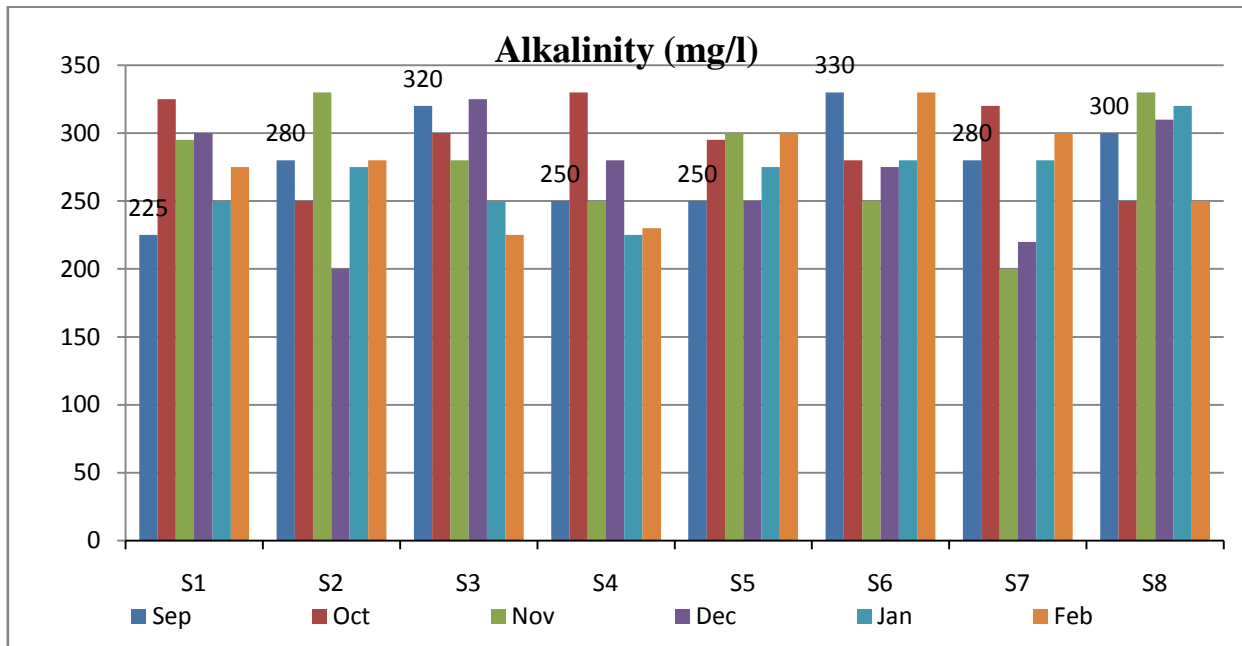
Chloride in water is responsible for domestic sewage, industrial effluents, and agricultural waste. It is commonly present in form of sodium chloride i.e. common salt. The permissible limit of chloride is 250 mg/l and observed values of all samples within 33 to 91 mg/l which is follows the IS specification.



E. Alkalinity

Alkalinity is measure alkaline matter present in water like carbonates, bicarbonates and hydroxides. It is helpful

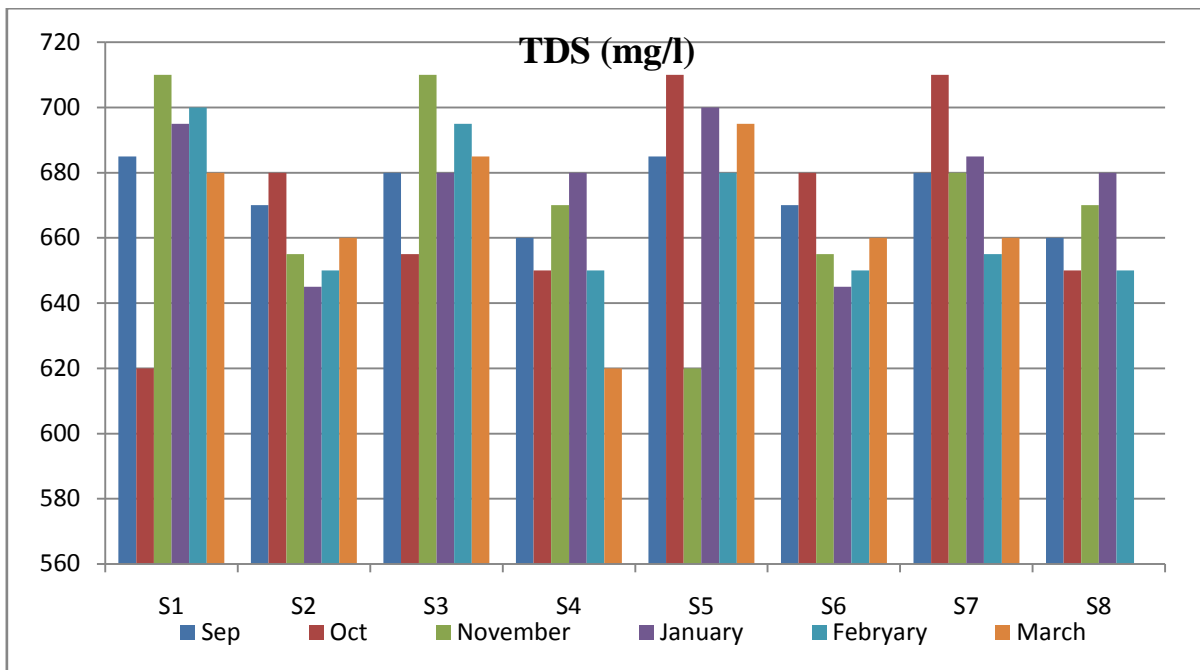
for neutralization of acidic compound in water. The alkalinity of all samples occurred within range of 186 to 296mg/l. The permissible limit of alkalinity 200 mg/l and some samples are not follows the IS specification.



G. Total Dissolved Solids

TDS is measured the total solid matter present like suspended and dissolved solid. In water TDS may responsible for carbonate and bicarbonate of Ca⁺ and Mg⁺ ions. About 55 to 65% these organic matter is responsible

for T.D.S. and remain other organic matters like, Na, K, Mn, CO₃⁻, HCO₃⁻, Cl⁻, salt etc. The permissible limit of TDS is 500 mg/l given in IS 10500:2012 and TDS of all samples occurred within range of 293 to 481 mg/l.



VI. CONCLUSIONS

The above results indicates the domestic and industrial effluents drained into Ami River which highly contaminates the surface water as well as ground water. pH, Hardness, turbidity, Chloride and Fluoride content, Iron content, TDS data of ground samples follows the IS 10500:2012 specifications but some samples are crosses the permissible limit. Hardness and alkalinity of all

samples crosses the permissible limit of IS 10500:2012. Due to discharge of domestic and industrial effluents into Ami River and dumped in ground surface, which contaminate the surface as well as ground water and organic matter reaches in ground water through infiltration.

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