Research Article

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Assessment of ground water quality of several villages of bhiloda taluka (North Gujarat) India

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Abstract

Ground Water Quality of several villages of Bhiloda taluka have been studied during pre monsoon 2008.149 samples were collected from different sources. Several parameters including Temperature, Ph, Hardness, Calcium, magnesium, total alkalinity, TDS, have been tested. From 149 sources 30 sources were found unfit and not suitable for drinking purpose.

Key-Words: Water Quality, Parameters, Chemical analysis.

Introduction

Water is the very basic necessity of human life. Man needs water for domestic as well as industrial purposes. Water is not just useful but it is indispensable for every walk of human life. We extract water from rivers, lakes, even from small channels utilizing them for various purposes. Since ancient times, man is using one more major source of water - *groundwater*. Water is present within the rock systems beneath the earth's surface, which we define as groundwater. Because of its local and regional existence, groundwater has become a prime source and its utilization is increasing day by day.

The use has increased demand, which leads to extraction (and sometimes over-abstraction) of groundwater resources. The overexploitation of groundwater has had impacts on all water resources, in different ways. Groundwater sources are depleting progressively in many areas, with an imbalance between recharge and discharge. Thus, for the sake of sustainability of water resources, there is need for planning these resources at local as well as regional level. Such planning will include all parameters related to ground and surface water, in terms of both quantity and quality.[1]

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Material and methods

Ground water samples of 100 villages located in Bhiloda taluka of sabarkantha district were collected as per the standard methods recommended by APHA. Before water sampling, all the double-stoppered polythene containers were cleaned and rinsed thoroughly with water samples to be analyzed. The physico-chemical analysis was done using the standard methods[2-3]

Results and Conclusion

Turbidity

It was observed that the values of Turbidity are within the limits. These values are within the prescribed limit of BIS.

pH

The pH is measure of the intensity of acidity or alkalinity and the concentration of hydrogen ion in water. It was observed that the pH values are within the limits.

Total Hardness

The total hardness of water is due to presence of cations, Ca^{2+}, Mg^{2+}, Fe^{2+}, Mn^{2+} and anions,HCO^{3-}, $SO4^{2-}$, Cl^{-}, $NO3^{-}$. Some evidence indicates that water hardness plays role in heart diseases in human. It was observed that 14 samples are not found within the limits.

Calcium

It was observed that the values of Calcium are within the limits.

Magnesium

It was observed that 17 samples are not found within the limits.

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Total alkalinity

The major portion of alkalinity in natural water is caused by hydroxide, carbonate and bicarbonate. Alkalinity in itself is not harmful to human beings. It was observed that the values of Total alkalinity are within the limits.

Chlorides

Excessive chloride concentration increase rates of corrosion of metals in the distribution system. This can lead to increased concentration of metals in the supply. It was observed that 1 sample is not found within the limits.

DO

It was observed that 4 samples are not found within the limits.

BOD

It was observed that the values of BOD are within the limits.

Nitrates

It was observed that 26 samples are not found within the limits.

Nitrites

It was observed that the values of Nitrites are within the limits.

Sulphate

It was observed that the values of Sulphate are within the limits.

Fluoride

It was observed that 5 samples are not found within the limits.

Iron

It was observed that the values of Iron are within the limits.

TDS

TDS is sum of the cations and anions concentration. A high content of dissolved solids elevates the density of water, influences osmoregulation of fresh water organism, reduces solubility of gases (like oxygen) and reduces utility of water for drinking, irrigation and industrial purposes.It was observed that **7** samples are not found within the limits.

The present investigations has led us to conclude that the quality of water samples subjected to Study was acceptable from majority of physico-chemical parameters; the water needs to be treated before using it in domestic applications by various means. Ground water contains high amount of various ions, salts etc. so if we were using such type of water as potable water then it leads to various water-borne diseases.

References

1. Cruta Jayant Kulkarni (2007). The Hydrogeological study of a part of Dharampur Tehsil, Valsad District, Gujarat, India. Pp-1-2.
2. APHA (1995). Standards Methods for Examination of Water and Waste Water, 19th Edn. American Public Health Association Washington D.C.
3. Trivedy R.K. and Goel P. K. (1984). Chemical and biological method for water pollution studies. Enviro media publication. Karad, India.

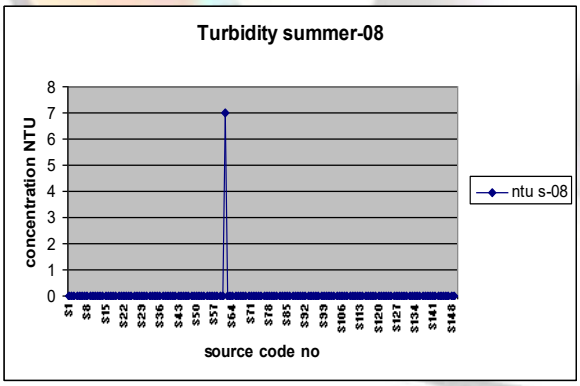

Fig. 1: Concentrations of Turbidity in summer 2008

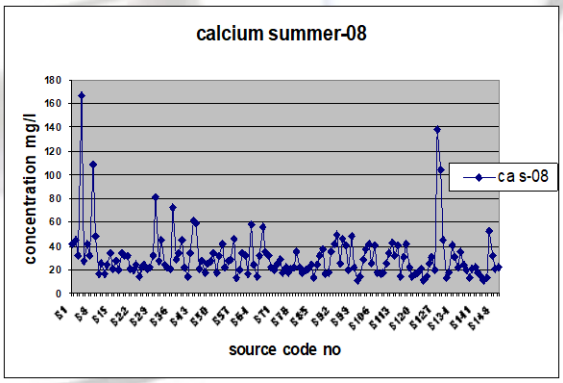

Fig. 2: Concentrations of Calcium in summer 2008

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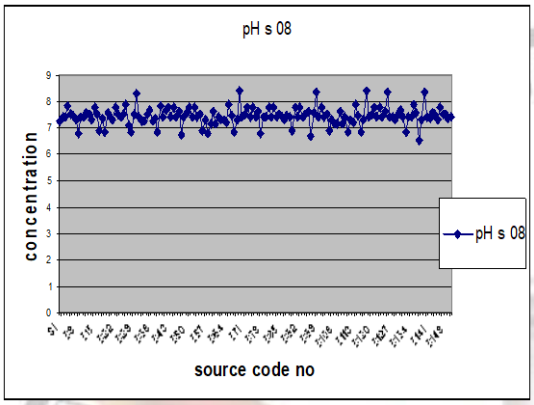

Fig. 3: Concentrations of pH in summer 2008

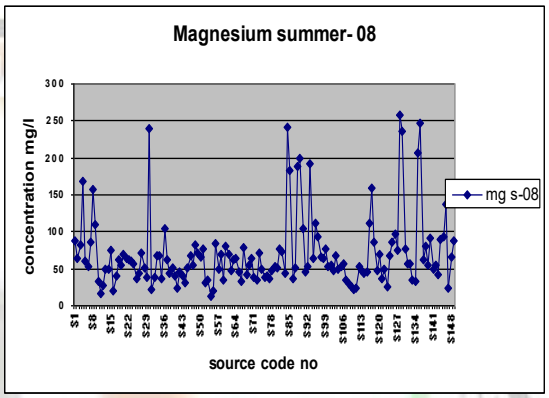

Fig. 4: Concentrations of Magnesium in summer 2008

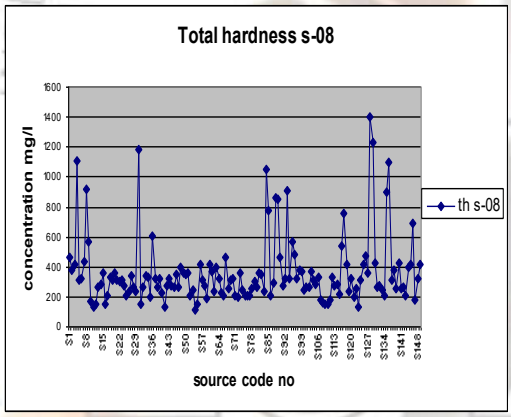

Fig. 5: Concentrations of Total hardness in summer 2008

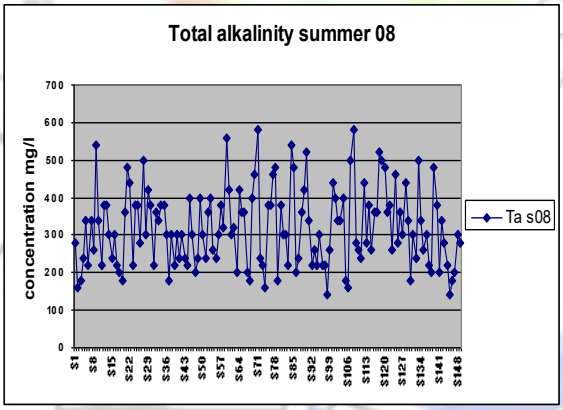

Fig. 6: Concentrations of Total alkalinity in summer 2008

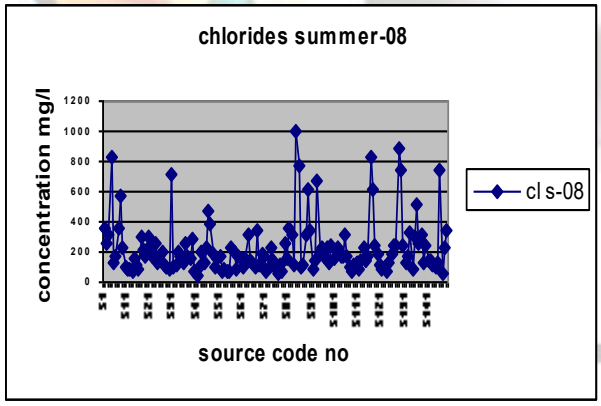

Fig. 7: Concentrations of chlorides in summer 2008

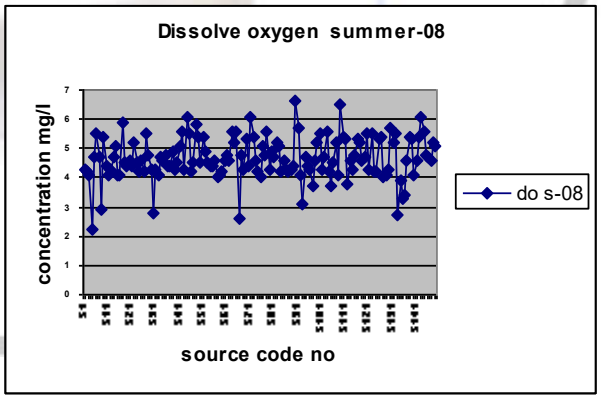

Fig. 8: Concentrations of Dissolve oxygen in summer 2008

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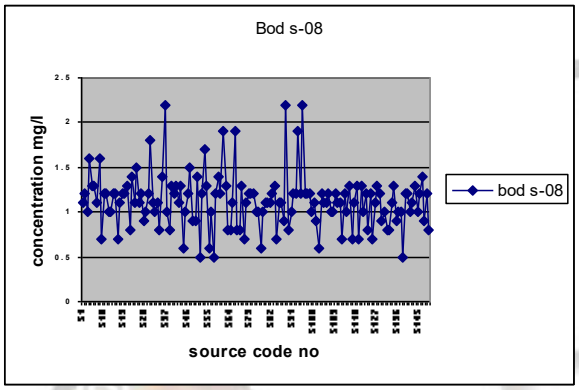

Fig. 9: Concentrations of Bod in summer 2008

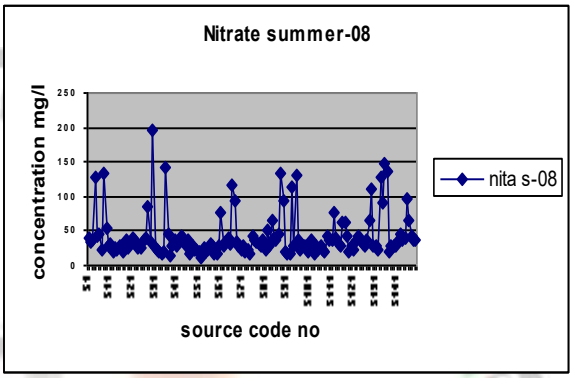

Fig. 10: Concentrations of Nitrate in summer 2008

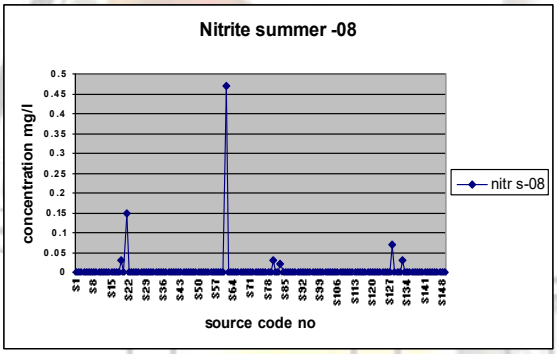

Fig. 11: Concentrations of Nitrite in summer 2008

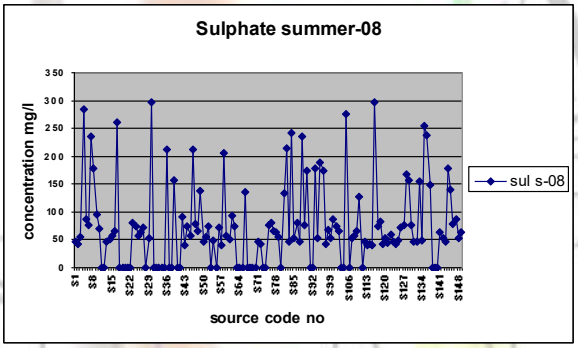

Fig. 12: Concentrations of Sulphate in summer 2008

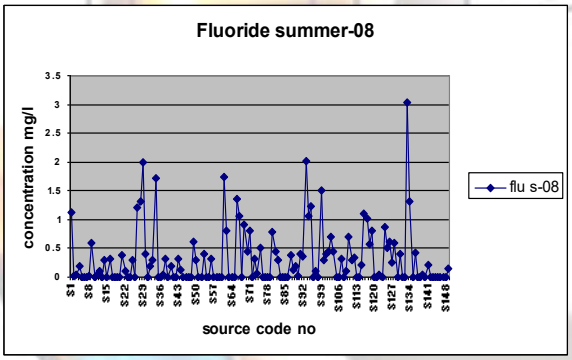

Fig. 13: Concentrations of fluoride in summer 2008

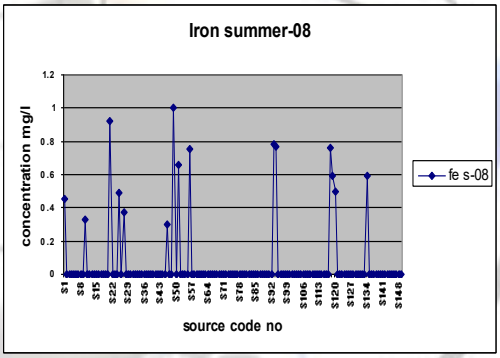

Fig. 14: Concentrations of iron in summer 2008

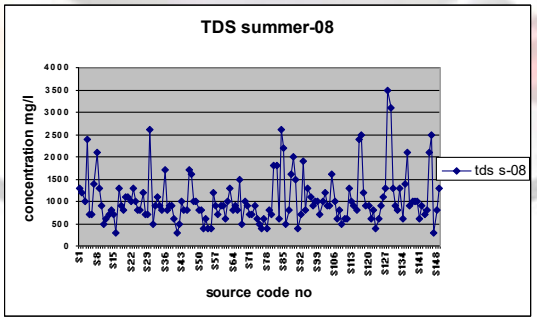

Fig. 15: Concentrations of TDS in summer 2008