

GROUND WATER QUALITY OF BHIMA RIVER BASIN NEAR JEWARGI TALUKA GULBARGA DISTRICT

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Abstract

The present work is aimed at assessing the groundwater quality characteristics of Jewargi taluka. The groundwater samples of all the 10 Locations are collected and analysed for physico-chemical analysis. The following parameters have been analysed. pH, Total Hardness, Total Dissolved Solids, Chloride, Alkalinity, Dissolved Oxygen. The estimated values are compared with Bureau of Indian Standards (BIS) drinking water standards. It revealed that the water samples analysed from the study areas are within the permissible standard limits and it is observed from the study that the ground water of bhima river basin is safe for domestic and irrigation purpose with respect to physico-chemical characteristics.

Keywords: - Ground water, Physico-Chemical, pH, dissolved oxygen

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1. INTRODUCTION

In general the term ground water refers to the water that occurs below the surface of the earth. The main source of ground water is infiltration. The infiltrated water after meeting the soil moisture deficiency percolates deeply and becomes ground water. The ground water is free from pollution and is very useful for domestic use in small towns and isolated forms.

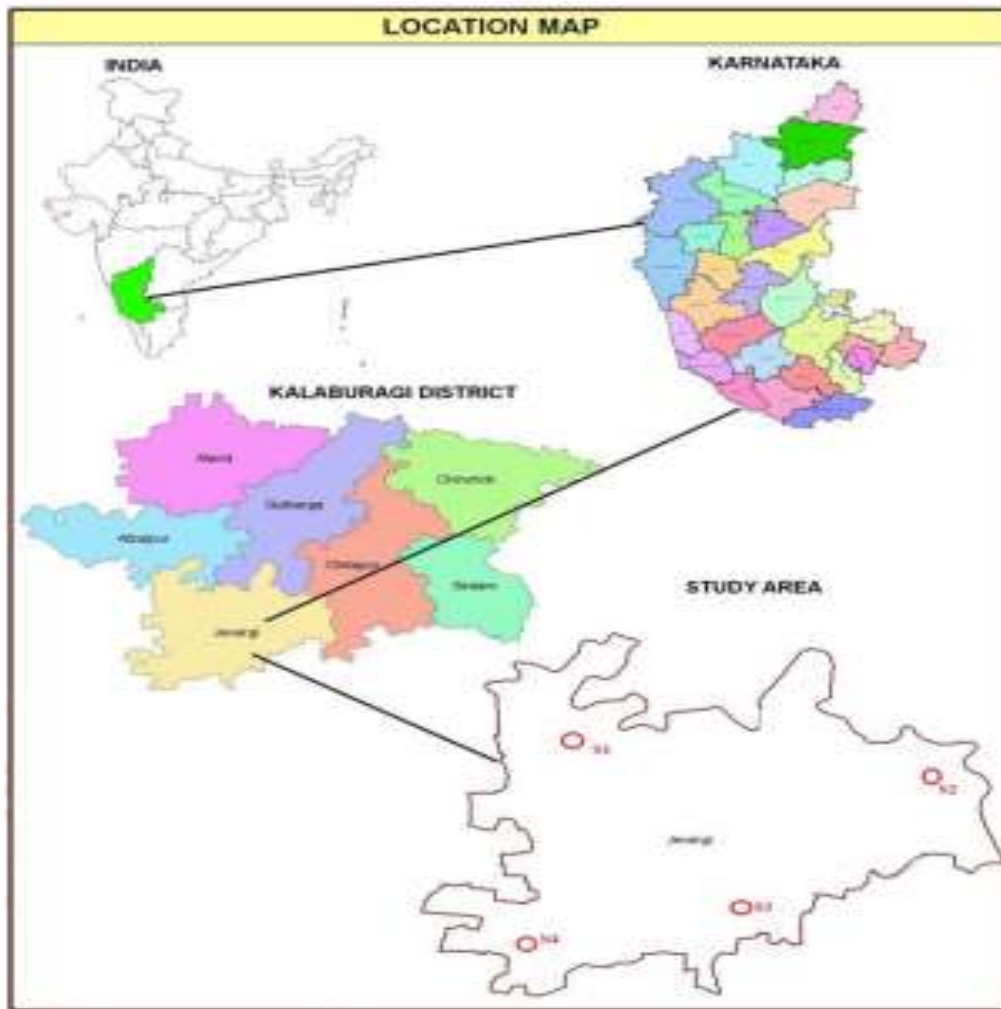
Nearly one third of the country is drought prone. In the very near future, water will be a scarce resource and therefore, needs to be harnessed in the most scientific and efficient manner. The surface water is subjected to various threats like discharge of effluents from different industries in the vicinity, encroachment of surface water sources like pond, river, stream etc. Groundwater is the major source of drinking water in both urban and rural India. The demand for water has increased over the years and this has led to water scarcity in many parts of the world. Exploitation of groundwater reservoir is a viable source of drinking water and for domestic use is safer and economical than surface water, as groundwater is not only found almost everywhere but also generally uncontaminated. As a result groundwater investigation has assumed top priority in recent years.

People all around the world face serious water shortage because of the over exploitation of groundwater (for domestic, industrial and agricultural purposes). It is estimated that around seven billion people out of the projected 9.3 billion in the entire world will face water shortage, and out of these, 40% will suffer acute water crisis. Considering the threat of freshwater scarcity looming large over the horizon, the government has taken several initiatives to make people aware about the pressing need to conserve and augment this precious resource.

1.1 Study Area

This study is concentrated on Bhima river basin jewargitaluka, Gulbarga district where ground water had higher contamination of salts. Javari is located at 17.02°N 76.77°E. It has an average elevation of 393 meters (1,289 ft). The town is spread over an area of 4.25 square kilometres (1.64 sq mi). As of the 2001 India census, Jewargi had a population of 19,174 people. Jewargi has an average literacy rate of 53%, lower than the national average of 59.5 percent. The survey is conducted in the study area of the Jewargi taluka with the help of a layout plan of the region. The study area comprised of different parts of Bhima river basin of jewargitaluka. The sampling points are located in such a way that, they are uniformly distributed along the river of the study area. 10 sampling locations are fixed up for sampling. and, bore wells are considered for sampling.

Water samples are collected from each sampling point and are analysed for the parameters called, pH, Dissolved Oxygen, TDS, Alkalinity, Hardness, Chlorides, Fluorides, Iron, Sulphates, Calcium and Nitrogen as per the standard procedures. The groundwater quality monitoring in Bhīma river basin jewargitaluka is carried out with an objective to detect and evaluate changes in groundwater quality in space and time. The rainfall in this taluke ranges from about 210 to 900 mm and the rainfall pattern broadly follows the physiographic diversions, high rainfall (about 3000 to 4830 mm) occurs in the malnad and coastal areas and decreases sharply towards east Sub-humid to semi-arid climate prevails from west to east and southwest to northeast. The District of Gulbarga is drained mainly by Krishna River.



Map 1(a) Location of Jewargi Taluka under Karnataka State

1.2 Objectives

1. To find out the Physical and Chemical characteristics of groundwater samples.
2. Compare results with BIS standards for potability.

2. LITERATURE REVIEW

Shivasharanappa et al,(2012) studied the physico-chemical characteristics of ground water of Bidar city and its industrial area. The results analyzed by Correlation and Regressions, have been used to suggest models for predicting water quality. The analysis reveals that the groundwater quality status of the study area is good, but it also needs to be protected from the perils of contamination by giving certain degree of treatment.

F.J. Thakor et al., (2013) studied the Water quality index of Pariyej Lake Dist. Kheda – Gujarat. The W.Q.I. values in the investigation were reported to be less than 75 (67.20, 68.43 and 70.37) for different season indicating that the water quality is poor and not totally safe for human consumption.

Dr.Shashikanth R. Mise, Muhammadsaifaadil R. Attar, (2014) Ground water quality index of Bijapur city, karnataka, India. The study revealed that Total Hardness Magnesium and Total Dissolved Solids are exceeding the permissible standards. The water quality index of the samples is found out to be 72.60 which is lies in C grade poor quality of water.

3. MATERIALS

Samples were collected using grab sampling technique. Two liters of water samples are collected from each sampling point and immediately transported to the laboratory of AIET Gulbarga for analysis.

All the samples were tested in the laboratory to determine physico-chemical parameters such as Total Dissolved Solids (TDS), Chloride, Alkalinity, Dissolved Oxygen (D.O.).

The methods adopted for the determination of the above parameters are as shown in table. 3.1

Table 3.1: Methods/Instruments Adopted

Parameter	Method/Instrument adopted
pH	pH meter LI 120
Total Hardness	EDTA Titrimetric method
Dissolved Oxygen	Winkler's method
Chloride	Titration
TDS	Volumetric method
Alkalinity	Titrimetric method

4. RESULTS AND DISCUSSION

The water quality results of 10 bore wells of covering the study area that is, The Physico-chemical characteristics of all the parameters have been analysed and tabulated in the below table 4.1

Table 4.1: Physical-chemical Characteristics of Groundwater

Sampling Points	pH	TH mg/L	D.O. mg/L	Chloride mg/L	TDS mg/L	Alkalinity mg/L
1	6.5	328	7.32	184	1466.50	460
	6.5	340	6.81	92	1508.50	320
3	6.5	340	6.82	199	1270.50	340
4	7.5	320	6.38	161	1491.75	260
5	6.5	360	6.40	113	1472.75	320
6	6.4	388	6.20	131	854.22	340
7	6.3	412	6.03	123	1187.35	448
8	6.5	353	7.1	149	1031.37	288
9	7	340	6.59	139	1100.45	312
10	7.5	368	6.8	137	897.57	284
Max	7.5	412	7.32	199	1508.50	460
Min	6.3	320	6.03	92	854.22	260
Mean	6.9	366	.67	149	1181	360

The analysis of Physico-chemical parameters is compared with BIS standards and is shown below table 4.2

Table 4.2: Water Quality Parameters with Their Permissible Limit as Per BIS Standards

Parameters	Standards
pH	6.5- 8.5
TH	300-600 mg / L
D.O	6-10 mg / L
Chloride	250-1000 mg / L
TDS	500 -2000 mg / L
Alkalinity	200-600 / L

5. CONCLUSION

After the careful study of analysis interpretation and discussions of the numerical data following conclusions have been drawn for the groundwater characteristics of bhima river basin of jewargitaluka.

The pH values of the samples indicate that the water is slightly alkaline in nature. Most of the bore wells yields saline water with high dissolved solids.

Water is very hard in almost all the sampling points. The analysis reveals that the some ground water characteristics are within the permissible limit and fit for drinking.

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