Indian J. Res. Found., (2019) 7, 27-29. ISSN 2454-6577

INDIAN JOURNAL OF RESEARCH FOUNDATION
www.indianjournal.net

RESEARCH ARTICLE

Assessment of groundwater quality on the basis of electrical conductivity in rohtak district of haryana

Vidisha[a*], Kumari Manisha[b], Mamta[b]

[a]*Department of Geography, CDRJ college, Butana-131 302, Sonipat District, Haryana, India*
[b]*Department of AYUSH, District Ayurvedic office, Government of Haryana, Jhajjar-124 103, Haryana, India*

Received 3 March 2019; Accepted 10 April 2019
Available online 12 April 2019

Abstract

The present study deals with the Electrical Conductivity (EC) value of ground water. Ground water quality plays an important role in deciphering uses of water for drinking purpose. Due to poor quality of ground water in the major parts of the district, people living in villages depend mainly on the canal water supply for drinking purpose. On the basis of EC the district has four ground water quality zones. These are: fresh ground water, marginal ground water, saline ground water and highly saline ground water. The study is largely based on secondary data source. The base map of the study area has been prepared by using survey of India map. Data of EC values of ground water of June 1988 and June 2014 was obtained from ground water cell, Rohtak. Arc GIS 9.3 was used for preparing maps. Interpolation technique was used for preparing maps. Objective of the study is to access the ground water quality based on Electrical Conductivity (EC) value. As per the analysis, the area falls under fresh water zone increased from 305.71 Sq. Kms. In June 1988 to 460.19 in June 2014. Area under Marginal fresh and marginal category has been also increased from 574.14 Sq. Kms. And 441.45 Sq. Kms in June 1988 to 673.3 Sq. Kms. and 452.99 Sq. Kms respectively in June 2014. Saline water has been decreased from 343.24 Sq. Kms in June 1988 to 132.14 Sq. Kms in June 2014.

Keywords

Electrical Conductivity

Ground Water

Rohtak Arc GIS 9.3

Interpolation Technique

Introduction

Ground water is one of the earth's most widely distributed resources and its role in the existence of life needs hardly elaboration. Ground water extraction for the various purposes has made a major contribution for the improvement of social and economic life of people.

If we see the global water supply and demand, less than one percent of all the water on our planet is fresh and available for use. The estimates suggest that the earth's hydrosphere contains a huge amount of water, but 97.5 per cent of this is saline water, and only 2.5 per cent is fresh water. Out of available fresh water, 68.7 per cent is

*Corresponding author Tel. +91 8607672921
E-mail : vidishabv@gmail.com

Published by GM SOFTWARE

in the form of ice and permanent snow cover in polar and high mountainous region. Fresh ground water comprises 29.9 per cent of fresh water resources. Only 0.26 per cent of the total amount of fresh water on the earth is concentrated in lakes, reservoirs and river system.

As population increase, more water would be required for agriculture, industry and domestic use. India is the largest user of ground water in the world. It uses an estimated 230 cubic kilometers of ground water per year over a quarter of the global total. More than 60 per cent of irrigated agriculture and 85 per cent of drinking water supplies are dependent on ground water. Ground water acts a critical buffer against the variability of monsoon rains. For example, a rainfall deficit in 1963-66 decreased India's food production by 20 per cent but a similar drought in 1987-88 had very small impact on food production largely due to the widespread use of ground water by that time. An increasing number of aquifers are reaching unsustainable levels of exploitation. If current trends continue, in 20 years about 60 per cent of all India's aquifers will be in a critical condition says a World Bank report, Deep Wells and Prudence.

Ground water quality plays an important role in deciphering uses of water for drinking purpose. Due to poor quality of ground water in the major part of district, villages mainly depend on canal water supply for drinking purpose. Through the water is present in abundance in the district but the real problem is with quality of water. Therefore, delineation of ground water quality areas is an important aspect in resource management of the district.

Objective

To assess the Groundwater quality on the basis of EC value

Study area

Rohtak district of Haryana lies between 28° 40'N to 29° 05'N latitudes and 76°13'E to 76° 51'E longitudes and comprises of five blocks names Rohtak, Sampla, Meham, Lakhan Majra and Kalanaur. Total geographical area of the district is 1668.47 sq. km. It is located in the south-eastern part of Haryana state and constitutes a major part of eastern Haryana plain. It has a sub-tropical location lying about 600 kilometers north to the Tropic of Cancer.The district area falls in Yamuna sub basin of Ganga basin, and is mainly drained by the artificial drain No. 8 which flows from north to south. Jawaharlal Lal Nehru feeder and Bhalaut sub Branch are main canals of the district. Plain and some undulating sandy dunes mark the overall topography of the district. The average elevation of the city is about 220 meters above mean sea level. There is gentle slope of about 19 cm. per kilometers from north-east to south-west. The topography of the District is saucer shaped. The soils of the district are classified as solemnized (arid brown) and sierozem.

Data basic and methodology

The present study is based on secondary sources of data. The data for the present study has been collected from different sources. Data related to quality of ground water is taken from ground water cell of Agriculture Department of the district. Pre monsoon data of 1988 and 2014 is collected from ground water cell Rohtak. GIS technique has been used for preparation of maps.

Result and discussion

The natural chemical composition of ground water is influenced predominantly by type & depth of soils and subsurface geological formations through which ground water passes. Ground water quality is also influenced by contribution from the atmosphere and surface water bodies. Quality of ground water is also influenced by anthropogenic factors.

About 10 million years ago the area of Rohtak district was submerged under ocean hence originally the quality of ground water is saline. In general the ground water quality on the basis of electrical conductivity is classified into four categories as shown below:

Rohtak District: Ground water Quality

EC Value in micro mhos/ cm	Quality
< 2000	Fresh
2000-4000	Marginal Fresh
4000-6000	Marginal
> 6000	Saline

Source: Agriculture Department; Ground Water cell, Rohtak.

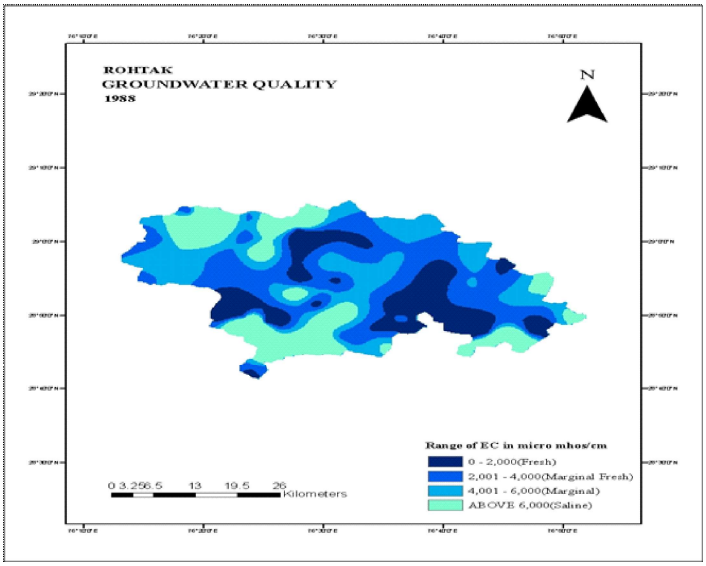

Fig 1 Source: Ground water cell, Rohtak.

In june 1988 (Fig 1), out of total area only 307.71 sq. Kms. comes under fresh category and rest 574.14 sq Kms, 441.45 sq kms and 343.24 sq kms. Marginal fresh, marginal and saline quality respectively. The fresh water is available in pockets, mainly along the canals and drains and near the water bodies. In june 2014 significant change has been observed in fresh water category because area comes under fresh water category is more than the result of june 1988. It was increased from 305.71 Sq. Kms. In june 1988 to 460.19 Sq. Kms. In june 2014.

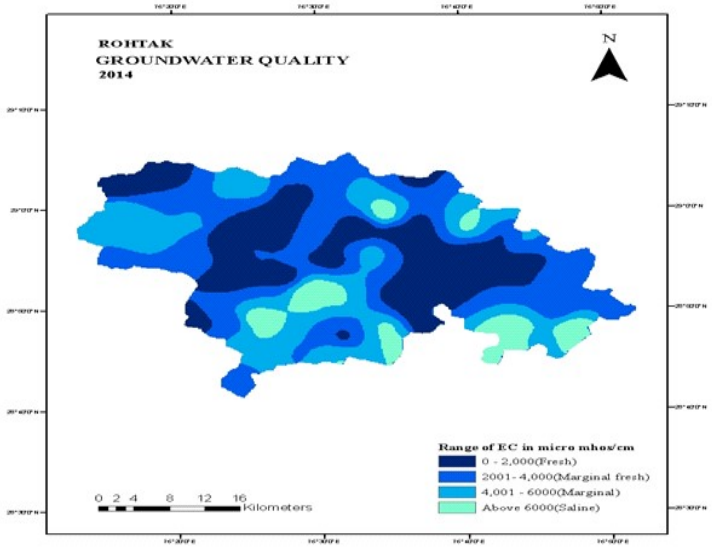

Fig 2 Source: Ground water cell, Rohtak.

Marginal fresh and marginal category has been also increased from 574.14 Sq. Kms. and 441.45 Sq. Kms. In june 1988 to 673.3 Sq. Kms. and 452.99 Sq. Kms. In june 2014. Saline water has been decreased from 343.24 Sq. Kms. In june 1988 to 132.14 Sq. Kms. In june 2014.

Conclusion

We have assessed the ground water quality. We took EC value as the indicator of water to measure the quality we found in this study that fresh water have been increased with 154.48 Sq. Kms. Marginal fresh and marginal water quality have been also increased with 104.37 Sq. Kms. And 11.54 Sq. Kms. respectively. This study shows that the saline water area have been decreased with 202.1 Sq. Kms.

References

[1] Arya V. S., S. Sultan, Rao. G.S., Hooda R.S. *Sub-Soil Water Quality Studies Using Remote Sensing and Geographic Information System. Inter. J. Sci. Tech.,* 2011.

[2] Bhagyaswri, *Spatio-Temporal Analysis of Child Sex Ratio in Rohtak City 2001-2011*, 2015.

[3] C. Subhash, *Land Use Change and Water Depletion (A Village Wise Study of Narnaul Block),* 2009.

[4] D. Meena, S. Pardeep, S. Jitender, *Spatial and Temporal Distribution in Ground water of Rohtak Municipality Area, Inter. J. Eng. Res. Development*, 2011.

[5] Dharmjeet, *Ground water Quality and its Impact on the Cropping Pattern,* M. Phil., Dissertation, M.D. University, Rohtak, India, 2007.

[6] Gulab, *Impact on Water Logging and Salinity on Agriculture and Socio-Economic Status in Rohtak and Jhajjar Districts*, *Inter. J. Res. Appl. Sci. Eng. Tech*., 2012.

[7] Khan S. A, *Ground water Information Booklet Rohtak District Haryana*, India, 2007.

[8] K. Pardeep, *Problem of Water Logging in Rohtak District*, M. Phil., Dissertation, M.D. University, Rohtak, India, 2015.

[9] S. Devender, *Ground water Assessment: A Case Study of Sonepat District*, Haryana, India, 2016.

[10] S. Sultan, S. Prem, K. Rajesh, S. Sunita, *Ground water Quality Analysis of Safidon and Julana Blocks of District Jind, Haryana*, *J. Water Res. Prot.*, 2012.

[11] Sunita, *Determinants of Ground water Depletion in Panipat District*, M. Phil., Dissertation M.D. University, Rohtak, India, 2011.

[12] Vidisha, *Ground water Condition in Rohtak District (June1974-June2014*), M. Phil., Dissertation, M.D. University, Rohtak, India.