

STUDY OF GROUND WATER QUALITY OF RAHATA TALUKA

Prajakta Rajendra Lokhande¹, Gulave Vandana Bhausheb², Prajwal Rajendra Lokhande³

¹ Lecturer, Department of Chemistry, Arts Science and Commerce College Rahata, Maharashtra, India.

² Lecturer, Department of Chemistry, Arts Science and Commerce College Rahata, Maharashtra, India

³ Student, Department of Microbiology, P V P College Loni, Maharashtra, India

ABSTRACT

Abstract Present paper focused quality of water samples from bore wells, dam in order to find out contaminants and physical and chemical parameter present in water from selected villages. The natural quality of ground water tends to be contaminated by human activities due to pesticides, chemical fertilizers in rural areas so there is need to check out water quality from different locations for human welfare. The parameters studied were p^H , Total hardness, TDS (Total Dissolved Solids), Sodium, Magnesium, Calcium. EMF (electromotive force). Electrochemical conductance, Temperature The Ion concentrations were expressed in mg/L. The study of different water samples reveals that study of quality of ground water. Six sample were selected for study.

Keyword: - Hardness, TDS, PH, EC, physio chemical parameters.

Introduction:

“Water is life” and very important for existence of living organisms on the earth. Therefore it is very necessary and useful to check out quality of water in our area around us in our environment. The utilization of ground water for domestic, industrial and irrigation purpose increases day by day¹⁻³. Sources of water is mainly rainfall which increases level of water in the ground. But due to different parameters present in different places changes water quality which water percolates into the soil. As water is universal solvent and in the fields of agriculture is the important factor for pollution of water as it is use various chemicals on crops in very large quantity. Today the ground water contamination is widely taking place because of either natural reasons or human actions⁴⁻⁵. Thus it requires to regular monitoring of water quality to various ways and means to maintain it. Assessment of water quality parameter in different areas. From this we can also be compare water ingredients in irrigated area and dry area⁶⁻¹⁰.

Study Area:

Rahata Tehsil is centrally located in the irrigated zone of Ahmednagar district. The distribution of rainfall in Rahata and Sangamner Tehsil is uneven and average rainfall is 920 mm. The Tehsils receives its most of rains from southwest monsoon season, here the maximum temperature is 28⁰c to 41⁰ C and sometimes it is so cooled in winter and sometime it goes upto 45⁰ C during summer season. Rainfall, canal, dug wells, bore wells are the important modes of irrigation being use in these tehsil

Objectives:

The main objective of present study the physico-chemical characteristics of ground water in different villages from our area.

1. To find out physical and chemical characteristics of ground water.
2. To recognize ground water quality for irrigation.

Data Sources and Methodology:

Primary information used for the research paper six villages is selected for this field work and sampling collection in the primary information and samples have been taken from bore wells from six villages from different areas.

Materials and Methods:

- Ground water samples were collected during the month of March 2023 from randomly selected Six villages located in downstream area of Rahata and a dry region. Collected water samples from Villages as Astagaon, Rahata, Kelwad, Pimpalas, Ekrukhe, Sakuri. Collected samples are filled in sterilized cleaned plastic polythene bottles and preserved according to standard method.

Experiment:

1. Water samples were collected in cleaned polythene container and preserved. The pH value of the ground water sample under investigation is measured using Elico pH meter was standardized by buffer 4.0 pH and 9.2 pH
2. Total Hardness of water sample was determined by complex metric titration using EDTA by using Erichrome Black T as an indicator.
3. Sodium, potassium, calcium were estimated using flame photometer .
4. Electrical conductance determined by conductometer.

Table 1: Analysis data of bore- well samples from different locations.

Sr. No	Parameter / Sample	Sample 1- Astagaon	Sample 2 Rahata	Sample 3 Kelwad	Sample 4 Pimpalas	Sample 5 Ekrukhe	Sample 6 Sakuri
1	pH	8.80	6.90	7.90	6.62	8.30	7.76
2	Total Hardness (mg/L)	506	398	450	260	442	276
3	Sodium (mg/L)	230.7	113.02	180.4	170.1	96.3	92.3
4	Potassium (mg/L)	98.4	45.0	20.4	26.8	86.0	14.2
5	Calcium (mg/L)	75.6	46.2	42.0	72.4	72.3	30.3
6	EMF(V)	76	89	94	108	118	128
7	TDS (mg/L)	550	528	420	190	570	612
8	Temperature (⁰ c)	18	18.3	18	18.1	18	18
9	Electrical Conductance (EC) $\mu\text{mho/cm at } 25^{\circ}\text{C}$	1356	1102	1142	1303	1526	1297

Result and Discussion:

Water quality indicated by experimental study

1. The pH of water samples in the study area ranged from 6.62 to 8.80. The pH of water sample was slightly alkaline.
2. The Total hardness of ground water is larger than desirable limit (300 mg/L). The desirable limit for alkalinity is 200mg/L the value of water samples varied from 260mg/L to 506mg/L.
3. The Sodium content water samples varied from 92.3 mg/L to 230.7 mg/L.
4. The temperature of ground water sources is measured is 18⁰c
5. The electrical conductivity value of water samples in the study area varied from 1102 to 1356 µmho/cm.
6. The TDS of water samples ranges from 190mg/L to 612 mg /L.
7. The calcium content water samples varied from content ranges from 30.3mg/L to 75.6 mg/L.
8. The potassium content water samples varied from 14.2mg/L to 98.4m

The analysis data suggest that ,the water samples have large amounts of total hardness, TDS, total alkalinity and sodium.

Conclusion:

The physico-chemical information obtained by analyzing the water samples determined that ground water quality in study area is moderately safe for irrigation and drinking purpose with some variations. In general, it varies from village to village. This qualitative variation in ground water may be result of variation in geographical background. Thus it is suggested that ground water in irrigation area should be analyzed before using it for irrigation.. Thus the quality of ground water in study area should be improved slightly and maintained properly.

References :

1. Upahde B. K., Shelke S. S & Thorat D. G. (2008): Physico Chemical parameter of bore well water near Pravara canal Loni (M.S.) India, Int. J. Chem. Sci. 6(3), 1422-1426.
2. Gadhawe A. G., Thorat D. G & Uphade B. K. (2008): Water Quality parameters of ground water near Industrial Areas Shirampur (M.S.), Rasayan J. Chem. Vol.1, No.4 (2008), 853-855.
3. Mali V, Rangar K. K., Kumbhar D. A and Lavate R. A (2018): Life Sciences Int. Jou, Physico chemical analysis of bore well water samples of Jath City, M.S. India, Int. J. of Life Sciences, Special Issue, A10: 12-16.
4. Thitane, S. N., Meshram D. C and Pondhe G. M. (2010): Water Quality Index of Pravara river for drinking purpose at Sangamner in Ahmednagar District M.S. India, Journal of Environmental Science and engineering, 4(5).
5. Roy R, (2019): An introduction to water quality analysis, International Research Journal of Engineering and technology, 6(1).
6. Aware D. V., Navgire M. E. and Aher H. R. (2013): Assessment of the Water Quality Index of water body at Pravarasangam, Maharashtra, 2 (11).
7. Sonkar S & Janardhan Gadekar D. J. (2021): Physico-Chemical Characteristics of Ground Water in Rahata Tehsil of Ahmednagar District, M.S., India, Int. J. Sci. Res. in Chemical Sciences, 8(1), 4-8.
8. Kharake A. C. and Raut V. S (2021): An assessment of water quality index of Godavari river water in Nashik city, Maharashtra, Applied Water Science, 11:101
9. Rusydi A. F. (2018): Correlation between conductivity and total dissolved solid in various type of water: A review, Earth and Environmental Science **118**, 12019
10. Das S, Pardeshi S. D. (2018): Integration of different influencing factors in GIS to delineate groundwater potential areas using IF and FR techniques: a study of Pravara basin, Maharashtra,

India, Applied Water Science, 8:197

11. Somawanshi R. B., Kadlag A. D., Deshpande A. N., Tamboli B. D., Kadu P. P and Bhakare B. D (2012): Laboratory Methods for analysis of soils, irrigation water and plants. 1-307.

