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Regression Analysis Of Ground Water Quality Of Rural Areas Of Akot-City Using Physico – Chemical Parameters

Dr. Sanjay V. Kolhe
P.G.Department of Chemistry, Shri Shivaji Art's, Commerce & Science College, Akot
Dist. Akola 444101
Affiliated to Sant Gadge Baba Amravati University, Amravati (M.S.)

Abstract:- Ground water is one of the most useful water sources. Water is second to oxygen as being essential for life. People can survive days, weeks, or even longer without food, but only about four days without water. Contamination of such water sources is a big problem creating health hazard. In this study Samples will be collected from different areas like College area, Krushnarpan colony, Gokul Nager, Sawra Manchanpur, Akot MIDC, Appaswami Colony, Shivaji square, and Jaystambha square of Akot City. In these study different parameters like PH, Temperature, Total Dissolved Solid, Alkalinity, Hardness, Suspended Solid, Dissolved Solid, Chloride, Turbidity, ions, and MPN, will be analyzed. After examination and testing of different Physico-Chemical and Biological parameters (using WHO and INDIAN STANDARDS), the suitability of ground water for drinking and domestic purposes, could be found.

Keywords: *Water quality; pH, conductivity; DO, BOD, COD, faecal coliform.*

I. INTRODUCTION

Water is essential in human life. The main reason of water contamination is urbanization and industrialization. In rural areas where the water sources like dam, canal, or river is not available, ground water is explored for agricultural purposes. As per current analysis, this is observed that the ground water get polluted drastically because of increased human activities, because of which, water borne diseases has been seen which a cause of health problems a lot. Therefore, basic concentration is needed to monitor the quality of water as well as to find out various sources which increased ground water pollution. This paper basically focused to examine the water quality of various potable water sources viz. ground water at Akot City. During experimentation, Physico and Chemical parameters of water will be tested to get good quality of water.

II. LITERATURE REVIEW

Sandeep K. Pandey and Shweta Tiwari[1] have carried out, Physico-chemical analysis of ground water of selected area of Ghazipur city, In this study they have analyzed different parameters like pH, T.D.S., D.O. and CO2 etc. A comparison with ICMR standard shows that the water is nearly suitable for drinking purpose. M.R.Mahananda, B.P.Mohanty & N.R. Behera[2] have carried out, physico-chemical analysis of surface and ground water of Bargarh district, Orissa, India. The present work has been conducted by monitoring two types of ground water i.e. dug well water and bore well water of 10 wards of the town as well as 3 types of ponds, viz. temple pond, small community pond & large community pond of the town. In this study Various parameters like Temp , pH, TSS, and TDS , Alkalinity , DO , COD , Nitrate, Chloride, Sodium, Potassium, Phosphate, Fluoride, Total Coli forms. By observing the result it can be concluded that the water quality are below the pollution level for ground water, But in case of surface water, the water quality of small community pond are above the permissible limit. Arunabh Mishra and Vasishta Bhatt[3] have carried out, Physico-Chemical and Microbiological Analysis of Under Ground Water in V.V Nagar and Nearby Places of Anand District,Gujarat, India They have analyzed different parameters like pH, TDS, hardness, conductivity, dissolved oxygen and chemical oxygen Demand, MPN. It is conclude that the quality of water samples was acceptable according to physico-chemical analysis while as per Bacteriological standards, the water needs to be treaded before using it in domestic purposes. Murhekar Gopalkrushna H.[4] have carried out, Assessment of Physico-Chemical Status of Ground Water Samples in Murtizapur city. In this study various parameters analyzed like , temperature, pH, TDS, turbidity, (DO), total alkalinity (TA), total hardness (TH), calcium (Ca++) magnesium (Mg++), sodium (Na+),potassium (K+), chloride (Cl), fluoride (F-), nitrate, sulphate and phosphate Of Open Well and Bore well was determined. It was found that the ground water was contaminated at few sites Whereas at other site the water quality standards and the quality of water is good and it is fit for drinking purpose.[5,6,7] .D. P. Gupta,

Sunitaa & J. P. Saharanb[8] have carried out, Physiochemical Analysis of Ground Water of Selected Area of Kaith City (Haryana)India. Ground water samples were collected from different locations. In this study various parameters analyzed like pH, Color , Odor , Hardness, Chloride, Alkalinity, TDS etc. and compare the results against drinking water quality standards laid by Indian Council of Medical Research (ICMR) and World Health Organization (WHO). It is found that some of the water samples are non-potable for human being. And after that they conclude the quality of ground water is suitable for drinking purposes or not.

III. IMPURITIES OF GROUND WATER

Ground water may get contaminated by organic and inorganic chemicals, radioactive material and micro-organisms. Although only a small portion of the Nation's total ground water resource is thought to be contaminated, but the potential effect of this contamination is significant. Contamination found in ground water is associated with adverse social, environmental and economical impact. During experimentation, Turbidity, Total solids and suspended solids, Organic Matter, Hardness, Alkalinity, Sulfate, Fluoride, Iron, Nitrate and Nitrite, Sodium, Calcium, Dissolved Oxygen, Biochemical Oxygen Demand, Chemical Oxygen Demand.

IV. OBJECTIVE OF THE PRESENT WORK

- To carry out the physico-chemical & biological characterization of water samples collected from different areas of Akot City.
- Study of water quality of analyzed water samples.
- To know the suitability of Ground water as a potable water

V. METHODOLOGY TO BE ADOPTED

- Environmental laboratory inside the Chemistry Department is identified for this work.
- Sterilized and disinfected sample bottle will be used for sampling purpose.
- Analysis of various parameters will be carried out in the laboratory as per referred literature.
- Water quality parameters of collected water sample will be compared with the standard values of water parameter.
- Analysis of water sample will be done to investigate its utility in various sectors

VI. RESULTS AND OBSERVATION

Fig. 1 Analysis of Temperature

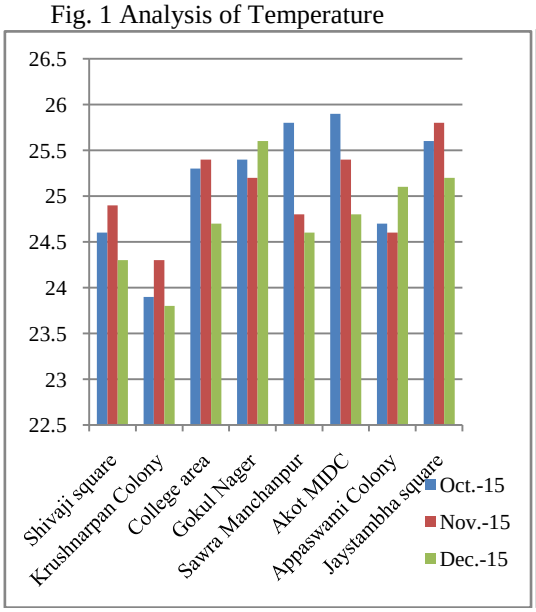


Fig. 2 Analysis of Dissolved Oxygen

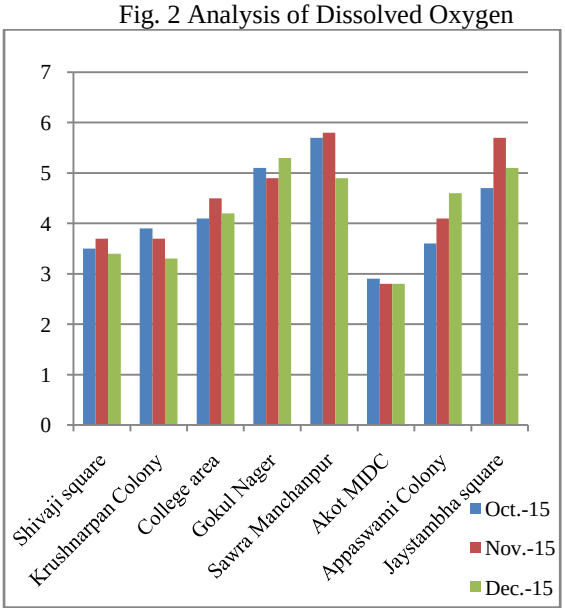


Fig. 3 Analysis of Total Dissolved Solids

Fig. 4 Analysis of pH

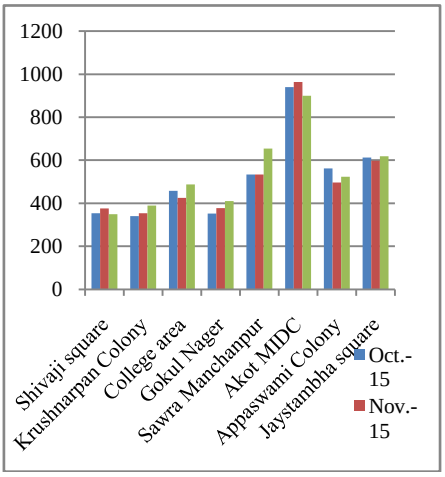


Fig. 5 Analysis of Turbidity

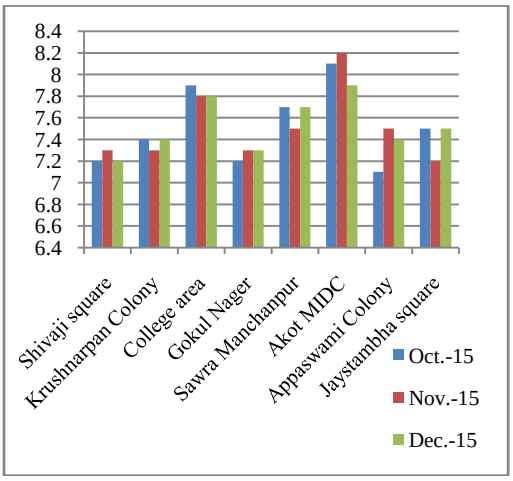
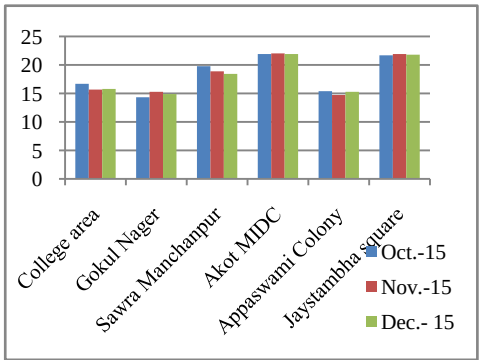
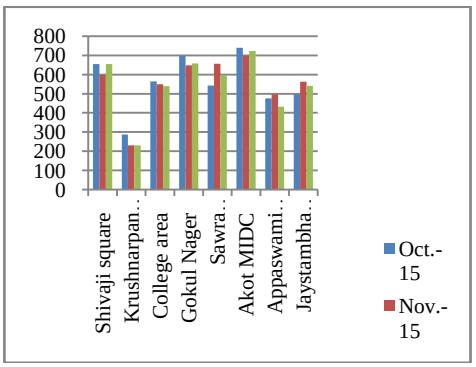


Fig. 6 Analysis of Total Hardness





VII. DISCUSSIONS

1. Temperature varies in the range of 24.3 to 25.9^{0}C .Maximum temperature is found in Shivaji Square due to presence of Effluents.
2. The PH Values varies from 7.3 TO 8.2. The Desirable limit of Indian Standard is 6.5 to 8.5. It is observed that the values of PH are in the Desirable limit.
3. Dissolved Oxygen ranges from 2.8 to 5.8 mg/lit, D.O. indicating the pure symptoms.
4. The values of Total Dissolved Solid range in between 340 to 940 mg/lit, and all the values are in Desirable limit of Indian Standard, Because of high Dissolved Salts of Ca and Mg and it requires cation and anion analysis.
5. The value of Turbidity varies from 4 to 22 NTU. It is observed that in most of the areas turbidity is above the Permissible limit of I.S. and it is due to Colloidal and extremely fine dispersion.
6. Alkalinity ranges from 264 to 432 mg/lit. All the values of Alkalinity are in the Permissible limit of I.S. Alkalinity is the cause of Carbonate and Bi –carbonate.
7. The value of Chloride ranges from 17.5 to 222 mg/lit. It is observed that the all values of Chloride are below the Desirable limit I.S.
8. Calcium values are ranges between 40.1 to 165.1 mg/lit and it is found that the all values are in the Permissible limit of I.S.
9. The value of Magnesium varies from 16.5 to 118.6 mg/lit. It is observed that the all values of Magnesium are above the Desirable limit of I.S. and Magnesium is directly related to hardness.
10. Total Hardness ranges between 230 to 740 mg/lit, maximum values of Total Hardness are below Permissible limit of I.S. Except in Akot MIDC area the values of Total Hardness are above the Permissible limit of I.S. From observation it is concluded that this area falls in hard water category, it means it contains Calcium & Magnesium ions.

11 The minimum numbers of Coliforms is found to be 9/100 ml in Krushnarpan colony area and maximum in Jaystambha Square from human beings and other homeotherms.

CONCLUSION

During study, samples were taken from different areas of Akot city such as Krushnarpan colony, Gokul Nager, Sawra Manchanpur, Akot MIDC, Appaswami Colony, Shivaji square, and Jaystambha square of Akot City. Based on different parameter like PH, Temperature, Total Dissolved Solid, Alkalinity, Hardness, Suspended Solid, Dissolved Solid, Chloride, Turbidity, ions, and analysis has been carried out. The parameter analysis is discussed above in detail.

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