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A Review on Assessment of Ground Water Quality in Bhosari MIDC Area, Pune

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Abstract: ***Water is finite and essential resource for survival but as time passes availability of water resources getting lesser and the water quality is deteriorating due to its over exploitation. Water Quality is essential parameter to be studied before supply to human being. For Rural and Urban areas, ground water is the major source from which 94% of drinking water demand is met. The primary goal of the study was to identify the ground water quality and analyze the sustainability for drinking purpose. For the purpose around sample are taken from open well, bore well, hand pump in Bhosari MIDC area. The sample are studied and analysed for different physico-chemical parameter which are (1)pH (2)Phosphate (3) Sulphate (4)Total hardness (5)Nitrate (6)Chloride (7)Turbidity (8)DO (8)BOD (9)COD (10)Iron (11)MPN***
Keywords: Water quality assessment, Ground water, Physico-chemical, Drinking water, Permissible limit.

I. INTRODUCTION

The importance of water in human life it is required for agriculture, industry, and human existence. The physico-chemical characteristics are dependent on the healthy water ecosystem. Pollution of surface water and ground water has increased due to increasing industrialization, urbanization, agriculture activity, and various human activities. The chemical and physical characteristics of water are referred to as its quality. Water can be used for recreation, drinking, fishing, agriculture, or industry. Each of these designated uses has distinct defined chemical, physical, and biological standards required to fulfil the corresponding purpose. The most widely distributed and abundant substance in nature is water. There are 1400 million billion litres of water in total, however the majority of this water is not used for drinking since it is 97% sea water and just 3% fresh water, of which 2% is trapped in the polar ice caps and glaciers, and only 1% is available for portable use. The use of ground water for human beings depends on the quality of residual water. Over the next few decades, there will be a significant increase in the need for freshwater to meet the demands of growing populations, expanding economies, changing lifestyles, and changing consumption patterns. Groundwater estimation for drinking and irrigation is now a crucial project for managing groundwater quality in the present and the future. About 25% of the fresh water in the world comes from groundwater, which is extensively used for a variety of purposes. For studies on public health, the analysis of groundwater's physical and chemical properties is crucial. these studies are also a key aspect of environmental pollution studies. WHO organization says that water causes about 80% of all diseases in human beings. This study's objective is to determine the physico-chemical analysis of groundwater.

II. OBJECTIVE

A. To check whether the quality of water complies with standards and to check suitability for designated purpose.
B. To obtain quantitative information on the physical, chemical, and biological characteristics of water.
C. To determine whether groundwater is fit for human consumption.

III.LITRETURE REVIEW

A. Shradha S.Honrao, Mrs.Aruna Sharma (2018) "Groundwater Suitability for Drinking and Agricultural usage in MIDC Area Chakan, Pune" International Research Journal of Engineering and Technology vol.5

Shradha S.Honrao et.al. [1] . The suitability of the groundwater for drinking was assessed. In this work, samples of bore water obtained from the MIDC region were analysed to determine the amounts of the physicochemical parameters pH, TH, TDS, Cl^-, $SO4^{2+}$, Fe, As, BOD, MPN, $Cr6^+$, Cd, Hg, F, Na^+,Mg^{2+},K^+, and Cl^-. From this study, it is observed that the groundwater in the research region is not suitable for direct consumption due to high levels of TDS, TH, Fe, F, Cl, and SO4 levels. Heavy metals including As, Gr, Hg, and Cd are much below the allowable levels.

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B. Kumar nitin,ChoubayA.K.,KumarSandeep (2013) "Quality assessment of municipal supplied water for drinking purpose" Department of geology and environmental science vol. p.p 2375-237

Kumar nitin et.al. [2] for Physico-Chemical parameters like temperature, pH, electric conductivity, Sodium, Potassium, Calcium, Magnesium, Silica, Iron, Bicarbonate, Chloride, Sulphate, Nitrate, Phosphate, dissolved Oxygen, biological Oxygen demand & chemical Oxygen demand.

These parameters were analyzed by collecting water samples at 4 different locations of reservoir from July-2005 to Jan-2006. From this study, it is observed that there is a seasonal variation in concentration of Physico-Chemical parameters & some of parameters are beyond permissible limit, which shows degradation of water quality due to pollution.

C. Omran .A.,(2011) "Factor Influencing Water Treatment Management Performance In MALASYIA "., International Journal Of Engineering ,vol.9, P.P53-P.P- 62.

Omran .A. (2011) et.al. [2] pollution analysis of water in lime industry area by Shaskikant R, Reveals the facts that lime is used in industrial & mining, waste water treatment.

It neutralizes acid waste, adjusting pH, removes Phosphorous, fluorine, Magnesium & organic matter & it precipitates heavy metals. In fact lime treats potable & industrial water supplies including drinking water which disinfects bacteria. Because of this the contamination occurs in a water supply system and it makes water polluted. Another research work deals with the physico chemical analysis of characteristics of bore wells at Himalaya Vishwa residential area

D. Mane.A . V., Pardeshi .R .G., Gore .V.R., Manjreakar.S.S , Walve .R .L and Sutar .G .N ., (2015) " Water Quality And Sediment Analysis Of Selected Location Of Pavana River Of Pune District , Maharashtra"., Journal Of Chemical And Pharmaceutical Research , Vol.5 , P.P-91- P.P-102

Mane A. V. (2015) et.al. [3], it is observed that values of most of the parameters are within the WHO permissible limit. The ground water is very rich in iron (>0.3 mg'l) & is not suitable for drinking & laundering.

So many factor like the absence of scientific drainage system, poor sanitary system, presence of stagnant water, unhygienic conditions e.tc, are causing water quality degradation & these causes have to be eliminated to maintain the quality of water & get relief from the fatal diseases.

E. Radhakrishnan, R., Dharmaraj, K. and Kumari, R. 2007. A comparative study on the physico-chemical and bacterial analysis of drinking,borewell and sewage water in the three different places of Sivakasi, Journal of Environmental Biology, 28(1): 105-108.

Radhakrishnan et.al. [4] Here observed values are 7.00 mg/L and 53 mg/L for the given sampling stations. This is within the standard limit given by Indian standards. Magnesium concentration observed was in the range from 2.00 mg/L to 18 mg/L. Hardness is nothing but the combined effect of all the parameters/minerals which are dissolved in the water body i. e. salts like calcium and magnesium.

Depending on hardness of water it is decided that the water is suitable for domestic use or not. Hardness was observed in the range from 29.00 mg/L to 153mg/L, higher values of hardness were found may be due to mixing of sewage water and industrial effluents in to the river water.

F. S D Jadhav, M S Jadhav, 2020, Water quality analysis at selected sampling stations of Pavana River of Pune District, (Maharashtra) International Journal Of Chemical and Life sciences Volume 9, Issue 1, Pp : 2075-79

S D Jadhav et.al. [6] By studying the river water quality for these ten parameters it is observed that, pH of the river water is in the range from 5.76 to 7.76.

It shows that at sampling station no. 5 the river water is below the Indian standards i.e. acidic in nature. Generally, in natural water pH range is in between 6.00 to 8.00.

This is an important term as far as solubility point is concerned. At sampling station no. 7 the observed pH is 7.76, this higher value suggests the mixing of domestic load in to the river water body. In the given water sample, the observed range of DO was in between 2.8 mg/L to 4.9 mg/L. As per Indian standards the desirable limit of DO is 7.6 -7.00 mg/L. But in our case DO level is below the Indian standards.

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IV.METHODOLOGY FLOWCHART

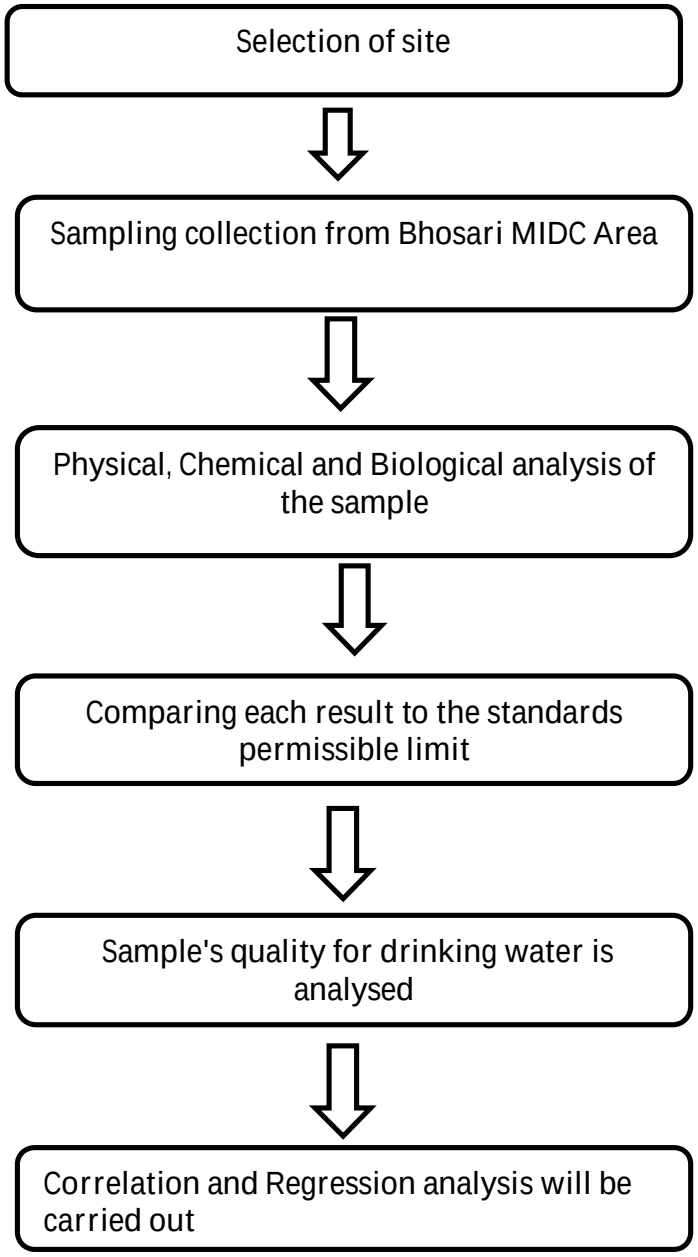

Fig -1: SCHEMATIC DIAGRAM OF METHODOLOGY

V. CONCLUSION

1) The groundwater's suitability for drinking was evaluated. In this study, the concentrations of the physicochemical parameters PH, Phosphate, Sulphate, Total hardness, Nitrate, Chloride, Turbidity, dissolved oxygen, BOD, COD, Iron were determined in bore water samples taken from the MIDC region Bhosari.

2) The groundwater in the research region is not suitable for direct consumption due to high levels of TDS, TH, Fe, F, Cl, and SO4 levels, according to the study's findings.

3) The examination of physico-chemical parameters for drinking purposes yielded data showing that the majority of the parameters were within the World Health Organization's acceptable range (WHO)

4) Without treatment, groundwater samples are unfit for human consumption.

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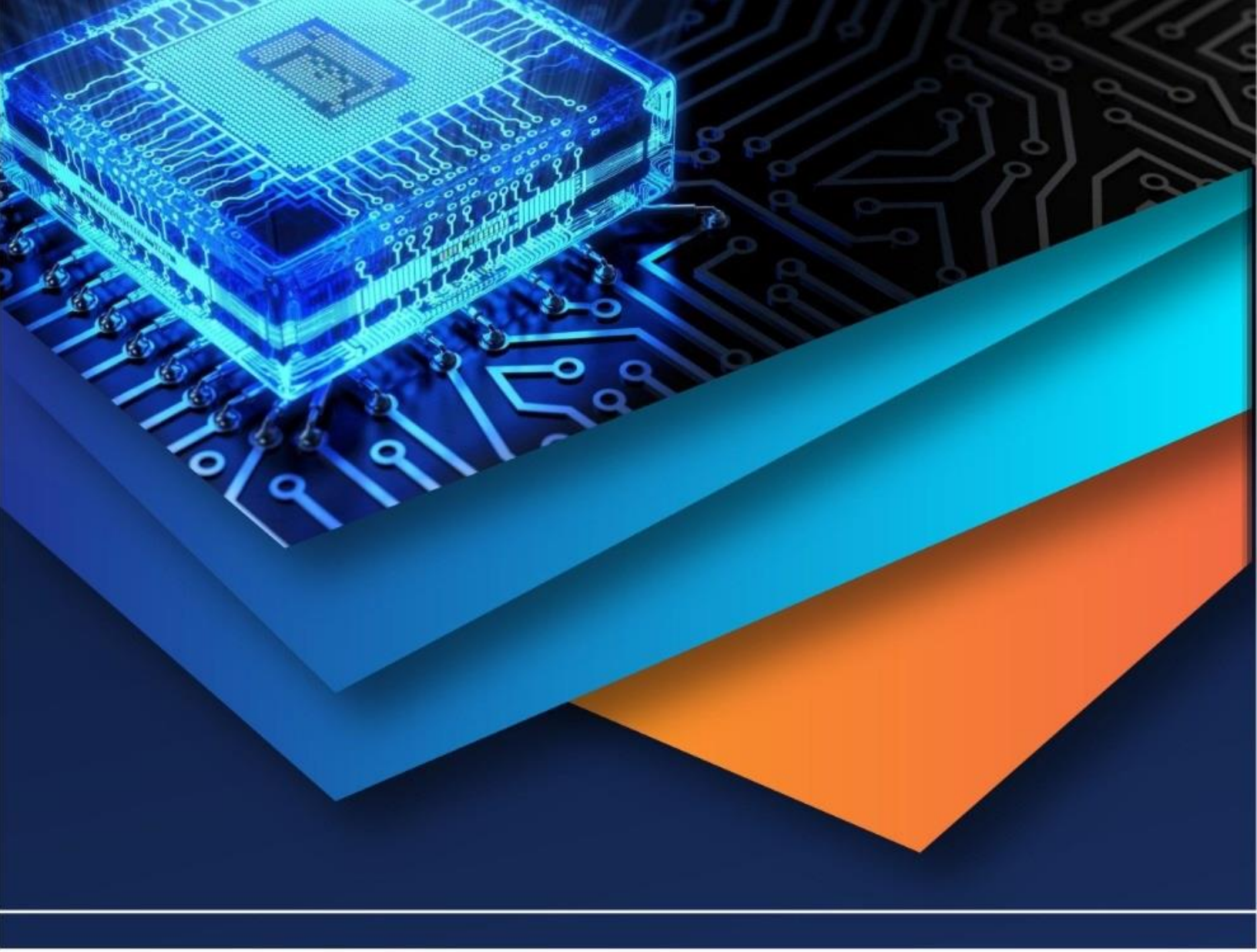

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