

A Review On: Groundwater Suitability For Drinking And Agricultural Usage In Midc Area Chakan, Pune

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Abstract- The aim of this research is to carry out quality of groundwater source as irrigation and drinking purpose, ground water were collected from different location from bore well, hand pump and for drinking water different parameters like pH, TH, TDS, Cl, SO₄, Fe, As, BOD, MPN, Cr⁶⁺, Cd, Hg, and F. after checking parameter, water quality for irrigation suitability will use method like Sodium Adsorption Ratio(SAR), Soluble Sodium Ratio(SSR), Residual Sodium Carbonate(RSC).

Keywords- Groundwater quality, physic-chemical parameter, groundwater quality assessment. MIDC area Chakan.

I. INTRODUCTION

Ground water is the major source of water for drinking, agricultural, and industrial desires. The availability of water determines the location and activities of humans in an area and our growing population is placing great demands upon natural fresh water resources. In recent year's climate change and government regulation, the surface water available for drinking and irrigation is decreasing in MIDC area Chakan, and hence, groundwater is becoming more and more important for human and agriculture. Groundwater assessment for drinking and irrigation has become a necessary and important task for present and future groundwater quality management. The aim of this study is to determine the physico-chemical analysis of groundwater sources of MIDC area Chakan, compare with levels obtained with the WHO drinking water directive.

II. METHODS AND MATERIALS

2.1 Sample collection and analysis

Chakan is situated in Pune district in Indian state of Maharashtra. Its co-ordinates are 18.75°N 73.85°E. It has an average elevation of 646 meter (2119feet) and lies at the bank of the Chakan river.

Groundwater sample are randomly collected from areas around MIDC area Chakan. Total of 12 ground water sample were collected from bore well, hand pump. The groundwater sample were collected in cleaned and washed

bottles and brought to the laboratory for analysis. The samples were analyzed for various water quality parameter viz. pH, Total Hardness, Fluoride, Chloride, Sodium, Carbonate, Bicarbonate, Phosphate, Sulphate, Iron, cadmium, Mercury, Chromium, Arsenic.



Sr.	Sampling location	Type of water	Sampling point
1	Phase I	Bore well	S1
2	Phase I	Bore well	S2
3	Phase I	Bore well	S3
4	Phase I	Bore well	S4
5	Phase II	Bore well	S5
6	Phase II	Hand pump	S6
7	Phase II	Bore well	S7
8	Phase II	Bore well	S8
9	Phase III	Hand pump	S9
10	Phase III	Bore well	S10
11	Phase III	Bore well	S11
12	Phase III	Bore well	S12

2.2 Methods

The important parameter for determination of soil alkalinity or alkali hazards in the use of ground water for agricultural applications are:

SAR(Sodium Adsorption Ratio):

Irrigation water containing large of sodium is of special concern due to sodium's effects on the soil and poses a sodium hazard. Sodium hazard is usually expressed in terms of SAR (Sodium Adsorption Ratio). SAR calculated from the ratio of sodium to calcium and magnesium. SAR expressed as follows :

$$SAR = \frac{Na^{2+}}{\sqrt{(Ca^{2+}+Mg^{2+})/2}}$$

SSP(Soluble Sodium Percent):

It is also evaluate sodium hazard. SSP calculated from the ratio of sodium to the cation. SSP expressed as follows:

$$SSP = \frac{\text{Soluble } Na^{2+} \text{ concentration}}{\text{Total cation concentration}} \times 100$$

RSC(Residual Sodium Carbonate):

It also calculated hazards effect on carbonate and bicarbonates on water quality and classified the water for irrigation purposes in terms of residual sodium carbonate (RSC). RSC expressed as follow:

$$RSC = (CO_3^{2-} + HCO_3^-) - (Ca^{2+} + Mg^{2+})$$

III. DISCUSSION

Due to increasing industrial area in Chakan, waste water come from industries also increases and even if it contains harmful chemicals we can use it for irrigation purpose by adopting SAR, SSP, RSC methods.

IV. CONCLUSION

Based on the analysis of groundwater, it has been possible to understand the chemical quality of groundwater in the study area and evaluate its suitability for drinking and irrigation purpose.

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