e-ISSN 2320 –7876 www.ijfans.org
Vol.11, Iss.11, Nov.2022

WATER QUALITY IN AINAPUR VILLAGE, GADHINGLAJ TAHSIL

A. G. Godghate

Department of Chemistry,
Dr. Ghali College, Gadhinglaj-416502, (Maharashtra), India
*E-mail :ashvinrgodghate@gmail.com

ABSTRACT

Present work deals with water analysis of Ainapur villages of Gadhinglaj Tahsil Kolhapur district from Maharashtra.Water analysis was done in the Month of Nov- Dec. Water samples were collected from various sources such As River Water, Bore Well & Dug Well. The parameters Like, pH, E.C., Total Alkalinity, Total Hardness, Calcium Hardnessand Magnesium Hardness were analyzed adopting the Standards procedures. These values were compared with standard values provided by WHO, BIS and ICMR.
Keywords: Water Bodies, Physicochemical parameters, Water quality and Suitability.

INTRODUCTION

Water supplies have been contaminated and overgrown with algae as a result of overexploitation. Environmental pollution degrades the quality of our surroundings generally and puts our health and wellbeing at risk (Godghate, 2019 and Sachinkumar, R., et.al 2015).All living things require water to survive; without it, there would be no life. The majority of metabolic processes happen in a water medium. Water constantly contains life wherever it is found in nature. Therefore studying the water is like studying life. All of the demands that humans have for survival and existence are dependent on water supplies. Many pollutants contaminate groundwater and other water sources, rendering them unfit for human consumption.

Due to the water's suitability for a variety of uses, groundwater quality is just as vital as its quantity. Analysing water quality is a crucial component of groundwater investigations. Physical and chemical parameters, which are significantly impacted by geological formations and anthropogenic activity, determine how the quality of groundwater varies in a given area. The safest water for drinking and domestic use among the many water sources is reportedly groundwater (Jadhav et.al 2012).

In order to better understand quality of water, a study of water bodies from the village of Ainapur of Gadhinglaj Tahsil in the Kolhapur district's has been undertaken.

EXPERIMENTAL

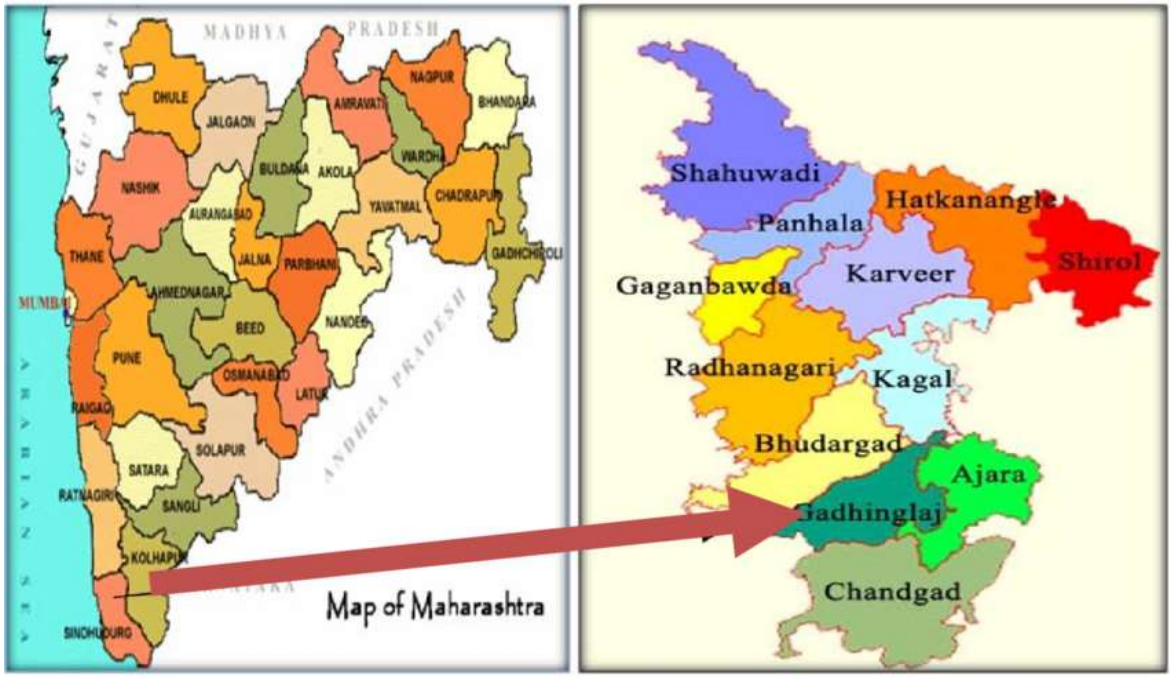
Materials and Methods:

Study area: According to Census 2011 information the location code or village code of Ainapur village is 567976. Ainapur village is located in Gadhinglaj tehsil of Kolhapur district in Maharashtra, India. It is situated 8km away from sub-district headquarter Gadhinglaj and 71km away from district headquarter Kolhapur.

Water samples of various source (River- R1, Dug Well- D1 and Bore Well- W1) from different location of Ainapur villages of Gadhinglaj Tahsil was collected.

e-ISSN 2320 –7876 www.ijfans.org
Vol.11, Iss.11, Nov.2022

Collection Sites:



Analysis of Physicochemical Parameters:

Samples of water have been collected in one litre polythene bottlefrom Ainapur villages and brought to laboratory for further analysis. For the analysis of Physico-chemical Parameters, the standard procedures of Trivedi and Goal (1984) were adopted.

RESULT AND DISCUSSION

The results of physicochemical parameters are presented in Table 1 whereas table 2 indicated the water quality standards of WHO, BIS & ICMR.

pH

It is governed by the equilibrium among carbonates, bicarbonates and carbon dioxide (Chapman 1996.It determines how acidic or alkaline a body of water is. The pH range that has been measured ranges from 7.67 to 8.36. The WHO (1993) suggested that the pH range for drinking water and aquaculture be between 6.5 and 9.2. As the pH was within the acceptable range, all of the water bodies can be used for drinking and domestic purpose.

Electrical Conductivity:

The differences in the concentration of dissolved particles, ion mobility, and nutritional status of water bodies cause variations in electrical conductivity.E.C. values ranges from 0.13 to 0.47 mhos. The River water sample (R1) had the lowest values, and the Bore well water had the highest levels.

Total Alkalinity

It is essential to know the buffering capacity of water.It must be present in more amounts in water to neutralize acids. It is a tool to measure the productivity of water.The total alkalinity values recorded between 28 to 60 mg/lit. The declined values were found at River water and inclined at Dug well water sample.The increasing breakdown of organic waste may be the cause of the fluctuating alkalinity throughout the year. According to Spence's classification from 1967, the water in every reservoir was nutrient-rich. All of the reservoirs are thus once more determined to be appropriate for freshwater farming.

Total Hardness

The primary cations in water, including calcium, magnesium, manganese, and strontium, provide hardness. The carbonates and bicarbonates of calcium and magnesium also contribute to hardness. The hardness content varies from 90 to 280 mg/lit. River water (R1) had lower values than bore well water (R1), which had greater values (B1).

As per Kannan (1991), water hardness from 00 to 60 mg/L is soft, 61 to 120 mg/L is moderately hard, 121 to 180 mg/L is hard and above 180 mg/L is very hard. All water samples were in moderately hard to hard range. According to WHO (1993) guidelines, water of all the reservoirsfound within the permissible limit and suitable for drinking purpose.

Calcium Hardness

Bore well water B1 had the greatest average value (92.23 mg/L), and river water R1 had the lowest average value (29.67 mg/L). One of the crucial elements that organisms need is calcium. It supports the preservation of soil and plant cell structure. Although water only supplies a small percentage of the calcium needed by the body, according to Srinivas et al. (2000), calcium is physiologically necessary for the body in modest amounts.

Due to the production of a thin coating of scale, small calcium concentrations are advantageous in minimising the corrosion in the pipes. At higher pH levels, it precipitates as CaCO3, which lowers its concentration. There are no harmful effects of calcium on human health. In washing, a higher calcium concentration is not desirable.

Magnesium Hardness

The Bore well water sample B1 has the greatest concentration of magnesium (45.62 mg/L). The current investigation's magnesium content was within WHO guidelines. More magnesium concentrations were found in tube wells and ring wells than in the other sources, suggesting that magnesium may have entered the ground water system through the soil structure.

Chlorides

It is a crucial nutritive component of all living things. It exists in natural water as a result of salt deposits dissolving into ions. In natural water, chlorides are typically present at lower concentrations. Chloride concentrations range from 11.36 to 14.2 mg/lit. Rivers Water had the highest values, whereas Dug well water (D1) had the lowest (R1). According to Goel (2006), all values are within the acceptable range for irrigation purposes and were all under the desired level of 250 mg/lit as per WHO (1993) criteria.

CONCLUSION

The water bodies in the current study were within the WHO, BIS, and ICMR permitted limits for pH, Total Alkalinity, Total Hardness, and Chlorides. As a result, all bodies of water are useful for domestic, agricultural, drinking, and aquaculture purposes.

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Table 1: Physico-chemical parameters of various water bodies of Ainapur Village

Sr. No.	Parameters	River Water	Dug Well Water	Bore Well Water
1	pH	8.31	8.36	7.67
2	E.C. (mhos)	0.13	0.43	0.47
3	Total Alkalinity (mg/lit)	28	60	50
4	Total Hardness (mg/lit)	90	234	280
5	Calcium Hardness (mg/lit)	29.67	75.38	92.23
6	Magnesium Hardness (mg/lit	14.66	38.54	45
7	Chlorides (mg/lit)	14.2	11.36	8.52

Table 2: Drinking water standards of WHO (1961), BIS (1991) & ICMR (1975)

Sr. No.	Parameters	WHO	BIS	ICMR
1	pH	6.5-8.5	7-8	7-8.5
2	E.C.	300	300	300
3	Total Alkalinity (mg/lit)	75	----	----
4	Total Hardness (mg/lit)	500	500	300
5	Calcium Hardness (mg/lit)	75	75	75
6	Magnesium Hardness (mg/lit	50	50	50
7	Chlorides (mg/lit)	200	200	250-1000