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Analysis of Water Quality Wagholi Area

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Abstract: The main goal of this study is to determine the various chemicals and substances present in water. This water used for drinking purpose in village Wagholi, Pune. The project aims at analysing the drinking water in Wagholi town of pune. The water sample was collected from different places of Wagholi area. The quality of water is of vital concern for the mankind since it is directly linked with human welfare. Different physico-chemical parameter the water samples was analyzed. The analysis concludes that the water of Wagholi village is hard water. The hardness of water is found to be exceeding its limits. Hence water needs to be treated for thehardness.

Index Terms: Water quality, pH, Total Hardness

I. INTRODUCTION

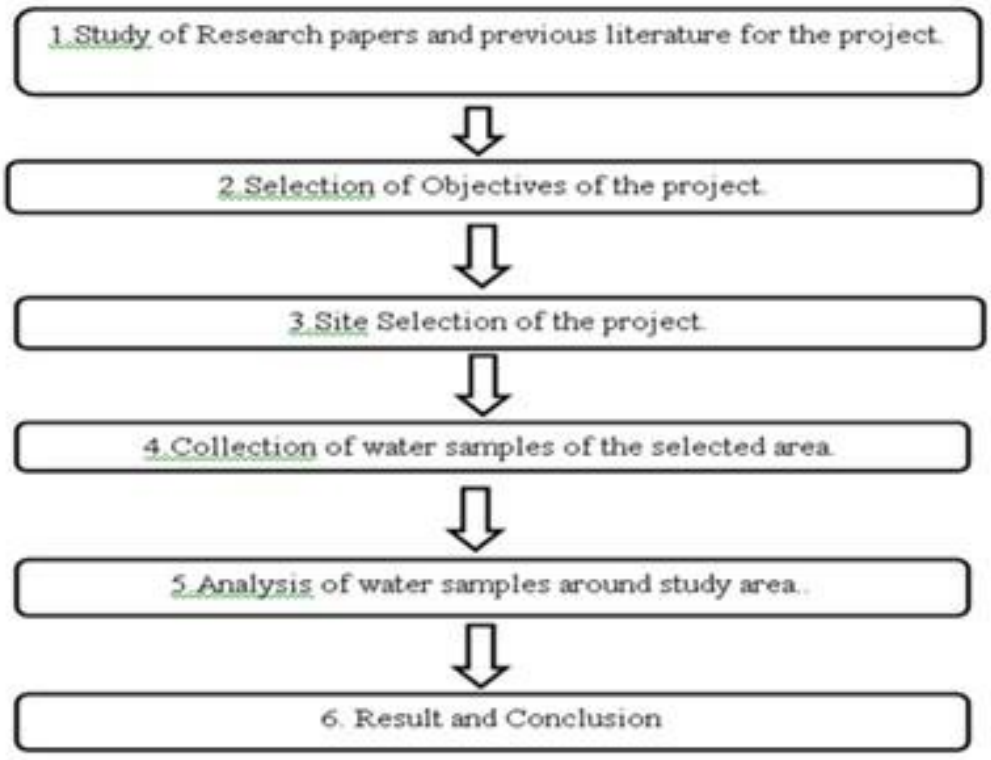
Water is very essential part of all living organisms. Due to rapid population growth, industrialization and urbanization, the quality of surface water and ground water is decreased. Now days no any source of pure, healthy and sate water is available. The main use of water is for drinking purpose, cooking, household work, and irrigation. Water used on large scale for different industries as a coolant and for steam generation. Water should be free from the various contaminations viz. Organic and Inorganic pollutants, Heavy metals, Pesticides etc. as well as all its parameter like pH, Total Hardness, Electrical Conductivity, Total Alkalinity, Calcium, Magnesium, Carbonate, Bicarbonate, Total Dissolved Solid, Sodium Potassium, Nitrate, DO should be within a permissible limit according to WHO. The drinking water should be analyzed regularly because it affects human health and caused various water borne diseases. The present study of physico-chemical parameters of drinking water involves analysis of various characteristics of ground water. Ground water from open well and bore well has an important role in rural areas especially in those areas where other sources of water like river, lake, dam and canal is not considerable. The quality of water is of vital concern for the mankind since it is directly linked with human welfare. Use of water for human being depends upon ambient water quality . Universally, requirement for freshwater will continue to rise significantly over the coming decades to meet the needs of increasing populations, growing economies, changing lifestyles and evolving consumption patterns. These studies are also main part of pollution studies in the environment. According to WHO organization, about 80% of all the diseases in human beings are caused by water. The aim of this study is to determine the physico-chemical analysis of groundwater sources as compare with levels obtained from WHO drinking water directive.

The objectives of this research are as given below

1. To find out the hardness present in water from various samples.
2. To find whether any Micro-Biological Parameters are present in samples.
3. To find whether any Arsenic and Flouride is present in drinking water samples.

II. *METHODOLOGY*

The water of different areas of Wagholi village was collected in Jan 2023. The samples were collected from JSPM campus, Wagheshwar lake Wagholi, Kesnand phata, Gadewasti, Petrol pump and an under construction site in town. The samples were collected in high density polyethylene and glass containers. The containers were rinsed twice by the same water sample and then the water sample filled in it. The water samples were analyzed for Colour, Temperature, pH, Odour, Total Dissolved Solid (TDS), Total Alkalinity, Biological Oxygen Demand,Chemical Oxygen Demand,Turbidity,Total Hardness (TH),Dissolve Oxygen, Total Coli form using standard techniques. A.R. grade reagents were used for preparation of all solutions.



FLOW CHART FOR METHODOLOGY

III. DETERMINATION OF PHYSICAL AND CHEMICAL QUALITIES OF WATER

COLOR AND ODOR

The water color of samples collected from various locations was clear. The water samples were also odorless.

TEMPERATURE

Temperature is the measure of hotness or coldness of a body. The average temperature of the samples was found to be about 26.55 degree Celsius. This value is within the standard value of 24 to 30 degree Celsius.

TURBUDITY

Turbidity is the cloudiness or haziness of water caused by particles dissolved or suspended, organic particulate matter, chemicals. The permissible limit of turbidity is 5 NTU of BIS 1994 & BIS 2012 respectively. . The average value is found to be 2.23 for samples collected from Wagholi.

TOTAL DISSOLVED SOLIDS (TDS)

Total dissolved solids represent the total concentration of dissolved substances made up of inorganic salts such as calcium, potassium, carbonates, nitrates, sulfates etc. & small amount of organic matter. These minerals are mainly added into water bodies through human activities such as agricultural practices, urban and industrial waste water discharge.

pH VALUE

pH is a measure of acidity or alkalinity of a solution. Generally, most of the water bodies has a slight alkaline pH due to the existence of carbonates, bicarbonates and is greatly influenced by carbon dioxide, alkalinity, hardness etc. of water. The average value of the pH is found to be 7.79 for samples collected from Wagholi.

TOTAL HARDNESS

Total hardness is a measurement of the mineral content in a water sample mainly comprising of alkaline earth elements such as Calcium, Magnesium and also some other ions such as Aluminium, Iron, Manganese etc. The total hardness found was around 928 mg/L.

FLUORIDE

Fluoride occurs naturally on earth crust and is released in the environment from the weathering of rocks into the soil, water & air. All water bodies on Earth contain an appreciable amount of fluoride. Naturally, some groundwater & natural springs contain high levels of fluoride.

IV results and discussion

Data Collection

Sample No . 1 – JSPM College Sample No . 2 – Wagheshwar Temple Sample No. 3 – Kesanand Phata Sample No. 4 – Petrol Pump

Sample No .5 – Gade Wasti

Sample No.6 – Under Construction Site

Sr. No.	Parameters	Standards Values as per IS:10500: 2004	Sample 01	Sample 02	Sample 03	Sample 04	Sample 05	Sample 06
1	PH	6.5-8.5	7.14	8.31	8.14	7.7	7.88	7.62
2	Odour	unobjectionable	Nil	Nil	Nil	Nil	Nil	Nil
3	Temperature	Acceptable	26 oC	27.2oC	26.6oC	26.3 oC	26.5oC	26.7oC
4	Colour	5-25	clear	clear	clear	clear	clear	clear
5	Turbidity	5-10	1	2.3	3.1	2.6	1.6	2.8
6	Total Hardness in terms of CaCO3	300-600	1468	1326	1645	1760	1455	1860
8	Total Dissolved Solids	500-2000	806	853	948	1309	841	1612
9	DO	7.5	4	6	3.98	4.8	3.8	4.59
10	Alkalinity	20-200	64	72	83	95	68	70
12	BOD	30	0	1	0	1	0	3
13	COD	250	7	12	10	13	5	13
14	E.Coli	Absent	Absent	Absent	Absent	Absent	Absent	Absent

Table 1 PHYSICO-CHEMICAL PARAMETERS FOR WAGHOLI AREA

The water samples analyzed for physico-chemical parameters of ground water presented in table concludes that;

- The pH values of water sample ranges in between 7.14 to 8.31 against the standards of WHO and IS 10500:2004.
- The turbidity of ground water samples were obtained after analysis of water samples has values from 1 to 3.1 NTU. All determined values of water samples show very less values of turbidity than permissible values of WHO.
- The total hardness of water represents primarily the total concentration of $Ca^{2+}$and Mg^{2+} ions in terms of CaCO3.The analyzed water samples contain total hardness within the range 1326 – 1860 mg/l. Water sample 1 has highest hardness i.e. 1860 mg/l.
- Presence of Calcium and Magnesium mainly causes hardness in water. The water that contains hardness above 200 ppm is not useful for drinking purpose. The water samples analyzed here was hard water since hardness of all the samples is above 1000 mg/l.

V.CONCLUSION

- Physical parameters like temperature, odour, colour was found to be satisfactory. The general standard for drinking water were compared and it is found that these parameters are within the permissible limits.
- Except the hardness the results obtained is showing that water is safe enough.
- The hardness of water is found to be exceeding its permissible limits. Hence water needs to be treated for hardness.

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