

## Study and Analysis of Parameters of Physico-Chemical Groundwater Sources of Dayapur and Anjangaon Surji Tahsil (2020-2021)

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### ABSTRACT

The present observation is focused at the determination of Physico-chemical parameters, along with pH, Hardness, Chloride, Alkalinity, Total dissolved solid (TDS), Test, Odor, Colour of groundwater samples from specific sampling points. In the existing observation water samples had been gathered from the tahsil (Daryapur, Anjangaonsurji) and numerous villages below the tahsil for analysis of sampling and interpretation. The results found out that the common value of all parameter, pH value turned into analyzed as 8.0, Parameters consist of total dissolved solid (TDS) 1343 mg/l, total hardness turned into 195 mg/l, chloride turned into 356 mg/l, Alkalinity turned into 152 mg/l of groundwater sample. The groundwater is the maximum critical natural useful resource used for ingesting via means of many humans across the world, particularly saline areas. The important objective of this observe is to recognize the groundwater great reputation of tahsil (Daryapur, Anjangaonsurji) accompanied by way of means of endeavors to investigate the spatial dissemination of groundwater quality boundaries to see areas with the incredible extraordinary for ingesting inside the notice region. This paper offers basic information for data about the relationship among land use and groundwater quality. An overall of 199 groundwater samples had been gathered and analyzed for measure pH, Total Hardness, TDS, Chloride, Alkalinity and physical parameters like test, odor and color of groundwater sample.

Keywords: Physico-chemical, groundwater, tahsil, pH, chloride, alkalinity, total hardness, TDS.

### INTRODUCTION

The most important compound of the environment is water. In human life water plays an important role. The Drinking water in the atmosphere is must be safe and it's dependent on the Physico-chemical parameters. In total there may be 1400 million billion liters of water, however maximum of this water is not used for ingesting functions, due to the fact ninety seven percent is sea water and most effective 3% is consumable water out of which 2% occupied inside the polar ice caps and glaciers only one percent of water is available for drinking use. For agricultural functions water available in ground is utilised in village areas in particular in those areas in specific other sources of water get polluted notably due to human activities. Consequently, it's miles essential to check the first-rate of wells and bore wells, hand pump's water at everyday time periods because of using unfit water for drinking causes or humans suffer from a wide range of water borne diseases.

Groundwater contamination has grow to be one of the most serious issues inside the global within the last many years. Water pollution now not handiest influences water first-class however additionally threatens human fitness, economic development, and social prosperity. Because of increased industrialization, urbanization, agricultural pastime and most of human sports has day to day increases the pollution of surface water and groundwater. "However because of the extended human population, increasing industrialization, lot of use of fertilizers in agriculture and man-made thing it's far highly polluted with unique risky contamination causing agents. Consequently it is important that

the odor of infected water need to be checked at an everyday time, because of use of infected consuming water, the human population suffers from severe water borne illnesses. It is complex to understand the natural phenomena absolutely due to the fact the chemistry of water well-known shows a excellent deal about the metabolism of ecosystems and explains the overall hydro-natural relationship”.

Drinking water great requirements describes the high-quality parameters set for ingesting water (wiki). Ground water is the predominant sources of ingesting water. 65% of human body made with the aid of water, human beings consumed out of the total water via, extra than half of it's miles fed on for commercial interest and simplest a small share is used for ingesting purposes. “In human life Ground water plays important role. The effect of industrialization and urbanization leads to contamination of the water”. “Water is one in all the foremost necessary and superabundant compounds of the ecosystem. All living organisms on the planet want water for his or her survival and growth. As of currently only earth is that the planet having concerning 70% surface of earth is roofed by water, Majority of water offered on the earth is saline within the nature only three percent of exists as contemporary water. water has become a scare trade goods because of over exploitation and pollution”. “With starting of life on the earth, there was no pollution and water however speedy urbanization and industrialisation have culminated into air, land pollution”. “These days water pollutants is the largest hassle for humans, characterized by deterioration of the water great due to various human activities that makes water unfit for drinking and residential use purposes. the most assets of pollution are chemical fertilizers associated pesticides entering into an untreated waste and industrial effluents into rivers and streams running on the point of the cities and alternative lowlands. several dangerous diseases are attributable to the usage of impure water”. Safe water supplies play an important role in reducing the prevalence of many communicable water-borne diseases. Diseases related to infected water, but excessive public fitness problems in India. In unique areas of India, the physico-chemical parameters of the various bodies of water were examined. The good quality of drinking water could be very important in improving people's lifestyles and saving them from disease. In today's world, household water uses are commonly referred to as domestic water. This water is managed so that it can be safely used as drinking water and for various purposes. The quality of the water and its suitability for use are determined by its taste, smell, color tone and the concentration of natural and inorganic substances.” “Some of the inorganic substances come in the form of heavy metals. Heavy metals tend to accumulate in human organs and the nervous system and impair their normal functions. In recent years, heavy metals such as lead (Pb), arsenic (As), magnesium (Mg), nickel (Ni), copper (Cu) and zinc (Zn) have received a lot of attention because they cause health problems, Various scientific methods and tools have been developed to assess water pollution”.

These strategies include evaluating various parameters consisting of pH, turbidity, conductivity, total suspended solids (TSS), total dissolved solids (TDS), total natural carbon (TOC) and heavy metals. These parameters can have an influence on the intake. Water quality if its values are in better concentrations than the safe limit values set with the help of the World Health Organization (WHO) and other regulatory authorities. A specified physical and chemical evaluation of water turned into achieved via way of means of accumulating water samples from Daryapur and Anjangaonsurjitahsi. In our study 36 ground water samples collected from villages of Daryapur tahsil and 163 samples from villages of Anjangaonsurjitahsil were collected.

## **METHODOLOGY**

In this context paper aims to analyze the Physico-chemical parameters of water samples. Collected from different sources in Daryapur and Anjangaonsurjitahsil belongs to vidarbha region. These are located 50 km towards west from distinct head quarters Amravati.

Collection of total 199 groundwater samples from different sources and different villages in plastic bottles with maintaining sterile condition. The water samples had been added into the laboratory for the opinion of diverse Physico-chemical parameters which includes TDS, pH, total hardness, alkalinity, chloride had been predicted within the laboratory through the usage of Indian standard procedure (Titration method U.V. visible spectrophotometer)

**Physico-chemical properties of water odor, colour, and taste:** -The colour of sample is transparent and colorless and the odor of sample water is odorless and the taste of samples found to be acceptable except which having TDS is more found in salty taste.

**pH:** - pH of the answer is taken as negative logarithmic of Hydrogen ions for plenty sensible practices. pH is a most important parameter of water, In a pH scale from 1 to 7 is the range for acidic medium and seven to fourteen is the variety for alkaline medium and seven are impartial especially ingesting water pH levels from 6.5 to 8.5. The pH scale normally levels from zero to fourteen.

**Alkalinity:** -It consists mainly of a combination of carbonate ( $\text{CO}_3$ ) and bicarbonate ( $\text{HCO}_3^-$ ), the alkalinity acts as a stabilizer of the pH, the alkalinity and the materials in the water. It is determined in the presence of the standard with the help of the dilute HCL titration of phenolphthalein and methyl orange indicators. The acceptable limit of alkalinity is two hundred mg / l, and the absence of a change in the source of water, an alkalinity up to six hundred mg / l is suitable for drinking. It becomes difficult with the help of a titration approach with the help of 0.02 N  $\text{H}_2\text{SO}_4$  acid and methyl orange. 50 ml of water sample titrated for  $\text{H}_2\text{SO}_4$  reacts to the termination factor and adapts the color from yellow to orange. Note the amount of acid.

**Total hardness:** -Hardness of water is a critical attention in figuring out the suitability of water for home use, it basically contributed through calcium and magnesium. 50 ml of water sample titrate in opposition to EDTA answer until blue end point. Before that upload a pinch of indicator. And the ideal value for Total hardness is 200-600 mg/l within the permissible limit.

**Chloride:** - It's far measured through titration method through the use of silver nitrate titrant solution and potassium chromate upload 50 ml of water sample, the colourless water pattern will become yellow Then fill the burette in silver nitrate its solution upload in precipitate then shade will become yellow to reddish become shade and shape precipitate.

**Total Dissolved solid (TDS):** -Water is an excellent solvent and easily removes up impurities easily.. Pure water is tasteless, colourless and odorless hence, it's far referred to as the popular solvent. The dissolved solid refers to any minerals, salt, metal, cation or anion dissolved in water. TDS consist of inorganic salt mainly sodium bicarbonates, chloride calcium, magnesium, sulfate and potassium. And a few small quantity of organic matter which can be Dissolve in water as consistent with proper limit for TDS is two hundred and 500 mg/l in permissible limit.

## **RESULT AND DISCUSSION: -**

The nature of assets relies upon the executives of water assets; this would incorporate anthropogenic release just as characteristic properties of area.

The water samples from ground water sources had been gathered from distinctive villages. In morning hours among eight to twelve am in a sterile plastic bottle. Total of 199 samples had been gathered out of which 32 samples had been determined defected. Out of those 199 samples 36 samples had been gathered from Daryapur Tahsil and 163 from Anjangaon Tahsil having their TDS (total dissolved solids) is greater than 2000 ppm sample gathered from exclusive ground and exclusive villages sources inclusive of, dug well, hand pump and bore well from public water sources in Daryapur and Anjangaon surji. The water sample had been without delay of numerous physicochemical parameters

inclusive of TDS, pH, Alkalinity, Chlorides, Total Hardness had been estimated in laboratory via way of means of the usage of Indian standard procedure (titration method) (18-19) out of those water samples all parameters close to approximately is on limit besides general dissolved solid (TDS) maximum of the Daryapur and Anjangaonsurji Tahsil containing soil is salinity affected that's why listen present many stable inclusive of minerals springs carbonate deposits salt deposits out of those 199 water samples 32 samples having affected. Here we only display the name of villages which having limit above desirable limit, it method best display the defected water sample and their villages with parameter.

Sr.No	Name of affected water village	TDS	Chloride	Total Hardness
1	Daryapur	2410	-	-
2	Tonglabad	4390	2486	-
3	Golegaon	2110	-	-
4	Lasur	2900	1326	-
5	Pimplod	2950	1200	-
6	Pimplod	3260	1390	-
7	Yeoda	2300	-	-
8	Adulabazar	4810	1940	-
9	Lasur	3280	1644	-
10	Saundali	3380	2152	-
11	Nandeda BK	2890	1510	-
12	Kasarkheda	2930	-	-
13	Chandola	3150	1084	-
14	Sonkheda	3180	1160	-
15	Bhukheda	3120	-	-
16	Zingla	3510	-	-
17	Samsherpur	2470	1260	-
18	Sarfabad	3180	2180	-
19	Sarfabad	2510	-	-
20	Malkapur	2620	1220	-
21	Malkapur	2490	1080	-
22	SayedGaon	2170	-	-
23	GhodaGaon	2550	-	-
24	Hingni	2240	-	-
25	Lakhanwadi	2710	-	-
26	Lakhanwadi	2210	-	-
27	Sakhri	2500	-	-
28	Sakhri	3750	-	-
29	Taroda	6280	3780	-
30	Kamlapur	4470	2724	-
31	Warudkhu.	-	-	700
32	Chincholishi.	-	-	840

**Table 1.** List of water affected village by TDS, Hardness, Total dissolved solid of daryapur and anjangaontahsil.

TDS: -Total dissolved stable is an vital parameter for consuming water and water for use for different functions past the prescribed limit, it imparts a peculiar taste to water and decrease its

portability. The water sample having TDS more than 2000 then it is unfit for drinking purpose. Because, the desirable limit of TDS is 200-500 mg/l in permissible limit. The taste of these water samples was salty maximum TDS found in more in Tarodavillages. Here we observe TDS found more than 2000 ppm in 30 villages. Out of 199 villages the average value of TDS observed to 1343.

The discovered values of Physico-chemical parameters of experimental ground water samples are supplied in TDS is definitely correlated to K concentrations of groundwater indicating they have an effect on of agricultural activities and wastewater leakage, where it's miles recognized that potassium ion originates from agricultural fertilizer and wastewater.

During the observe of Physico-chemical parameters of taken samples the commentary became discovered as all samples are colourless and samples are odorless, the taken sample additionally tasted via way of means of their taste but, taste happens salty. Due to saline water incorporate enormous quantity of dissolve salt, the maximum not unusual place being the salt all of us understand so properly sodium chloride. (NaCl).

pH: - Measure the intensity of the acidity or alkalinity of the water. All chemical and organic reactions are based directly on the pH of the water system. "pH is an essential parameter in water frame seeing that maximum of the aquatic organisms are tailored to a median pH and do now no longer face up to abrupt changes. pH is maximum critical in figuring out Corrosiveness of water. The lower the pH, the more corrosive the water". In our study not any one sample shows pH more than 8.5 and the average value of pH observed to 8.

Chloride: - "Chloride concentration is an indicator of wastewater pollution and also has a laxative effect. The goal of air source or seawater pollution is to increase the understanding of chloride in groundwater. Other major events, excessive temperature, domestic sewage, septic tanks, and occasional rainfall may also exceed chloride". The porosity and permeability of the soil also play a key role in increasing the chloride concentration. In our study we found 16 villages having value more than desirable limit and out of which Taroda villages show the maximum chloride 3780.

The overall hardness of water represents mainly the entire attention of  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$  ions in phrases of  $\text{CaCO}_3$ . The analyzed water samples incorporate overall hardness in the variety a thousand to 2000 mg/l. Water pattern of two villages was discovered greater than desirable limit. Using hard water as drinking water can have adverse consequences for the digestive system.

### **CONCLUSION: -**

In this study, the values of groundwater quality are determined via way of means of majoring Physico-chemical parameters including pH, TDS, Chloride, Alkalinity, and Total Hardness from all samples accrued from exclusive villages of Daryapur and Anjangaon Surji Tahsil.

In present have a look turned into determined out of 36 water samples in Daryapur Tahsil sixteen samples have affected and alternatively out of 163 samples from Anjangaon Surji sixteen samples have affected. Both Daryapur and Anjangaon Tahsil incorporate salinity affected regions subsequently right here concluded that salinity containing soil having greater TDS and this groundwater affected samples isn't healthy for ingesting purposes, so ingesting unfit water is dangerous for human beings in addition to animals, and birds. Out of 199 villages 30 villeges water sample display the affected in TDS, sixteen villages discovered in Chloride and a pair of villages discovered in hardnes affected.

It is risky for aquatic existence. Safe ingesting water is important to preserve existence and a satisfactory (good enough secure and accessible) deliver have to be to be had to all.

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