

Analysis of water by Physico-Chemical methods taken from Latur area, Maharashtra

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ABSTRACT

The water taken from four different sources like Well, Bore-well, River & Reservoir pond in different places of Latur, Shirur Anantpal, Deoni and Udgir from Maharashtra. Where from each source water sample are studied for Physico-chemical parameter where analysis for period of February -2021.

This water analysed for Physico-Chemical Parameters Such as pH, Electrical Conductivity, Calcium, Magnesium, Total Hardness, Carbonate, Chloride, Total Dissolved Solid, Sodium, sodium absorption ratio. Also all parameters were compared with WHO standards of water quality. This water is situated for domestic, Irrigation and Agriculture as well as drinking purpose.

Keywords: Fresh water, Physico -Chemical Parameters.

INTRODUCTION:

Water is one of the most important of natural source; it is important to all living organism, human health & economical development. Human and Ecological used of fresh water depends upon ambient water quality. The quality of drinking water should be checked at regular time interval because due to use of contaminated drinking water, human population suffers from several of the born diseases. The water samples are collected from Latur, Shirur Anantpal, Deoni and Udgir. With longitude & Latitude 19°32'02.0"N & 74°48'06.0"E respectively.

METHODS AND MATERIALS:

The fresh water sample collected from Well, Bore-well, River, Reservoir pond February -2021 in Latur, Shirur Anantpal, Deoni and Udgir. The water samples were collected in four polythene bottles. Which were cleaned with acid, water, followed by rinsing twice with distilled water. The water samples are chemically analyzed [5].

The pH and EC was measured by using digital PH meter and EC meter [6]. Total hardness, calcium, magnesium were measured by EDTA titration methods [7]. Total alkalinity was determined by volumetrically by silver nitrate titrimetric methods using potassium chromate as indicator [8]. Sulphate was determined nephtholometrically using ELICO-52 Nephtholometer [9]. The Physico -chemical analysis was

carried out according to standards methods. [10,11, 12] Nitrate was determined by Phenol Disulfonic method [13].



Figure 1 - Location of Maharashtra in India Figure 2- Location of Latur Distric in Maharashtra



Figure3-Location of Latur, Shirur Anantpal, Deoni and Udgir

Figure 4- Image of Reservoir pond Manjra Dam, Latur.

RESULTS AND DISCUSSION:

ANALYSIS OF WATER USING PHYSICO-CHEMICAL PARAMETERS

	Well (S1)	Bore-Well (S2)	River (S3)	Reservoir pond
Parameters	Test Values/Unit	Test Values/Unit	Test Values/Unit	Test Values/Unit
PH	7.56 unit	7.48 unit	7.71 unit	7.52 unit
E.C	1.12mmhos/cm2	2.1 mmhos/cm2	2.72 mmhos/cm2	0.39 mmhos/cm2
Calcium	167.3ppm	210.1ppm	212.3 ppm	168.3 ppm

Magnesium	136.3 ppm	162.4 ppm	170.1 ppm	147.1 ppm
Sodium	42.3 ppm	42.3 ppm	46.2 ppm	36.5 ppm
Potassium	0.2 ppm	0.4 ppm	0.3 ppm	0.1 ppm
Bi-	4.2 meq/L	8.2 meq/L	9.6 meq/L	5.6 meq/L
Chloride	7.3 meq/L	14.2 meq/L	18.7meq/L	9.8 meq/L
Sulphate	26.5 ppm	45.3 ppm	36.9 ppm	32.4 ppm
S.A.R	4.2 ----	4.12 ----	3.12 ----	4.17 ----

pH – pH is an important factor which indicates acidic neutral and alkaline nature of water or any compound, pH value is lower during rain season may be due to dilution of water and increases pH value during post monsoon and summer season may be due to dissolved in a mineral. The pH range is 7.48 to 7.71, The pH of Well water is 7.56, pH of Bore-well water 7.48, pH of river water 7.71 and pH of Reservoir pond water is 7.52 recorded. The resulting pH value is indicate water are alkaline, this pH value with in permissible limit as per prescribed by WHO.

Electrical Conductivity – Is a measure of water capacity to transmit electrical current and also it is tool to access purity of water, Electrical conductivity id measure of water capacity to convey (14). Electrical current electrical conductivity increase with increase in TDS, most of salt are water capable of conductivity current present study electrical conductivity are measure Well water 1.12, Bore-well water 2.01, River water 2.72, Reservoir pond water 0.39. Minimum values are recorded for Reservoir pond 0.39 and maximum value recorded for River water 2.72. Those values are within the permissible limit as per prescribed by WHO.

Calcium and magnesium - CL & MG are very common element those element are essential to human health, calcium is fifth most abundant natural element and magnesium is eight both element are presenting natural water, the most common source of calcium and magnesium in ground water is through the erosion of rocks such as lime stone dolomite and minerals, calcium values Well water 167.3ppm, Bore-well water 210.1ppm, River water 212.3 ppm and Reservoir pond water 168.3ppm are recorded. The maximum value of calcium is River water 212.3ppm and minimum value of calcium is Well water 167.3ppm are recorded. Magnesium value well water 136.3 ppm, Bore-well water 162.4ppm, River water 170.1ppm and Reservoir pond water 147.1 ppm recorded and Minimum value of magnesium recorded well water 136.3 ppm and Maximum value of Magnesium recorded River water 170.1 ppm.

Sodium – In presence investigation the value of sodium present in surface water like River 46.2ppm, Reservoir pond water 36.5ppm and sodium present ground water like Well 42.3ppm, Bore-well water 42.3ppm. Sodium gradually released from rock sodium belongs to a group of chemical called as alkaline Earth-metal. Sodium helps us maintain blood pressure control and kept normal muscles function. The

maximum value of sodium present 46.3ppm River water minimum present in Reservoir pond water 36.5ppm. Those value are within permissible limit as per by WHO.

Potassium -Potassium is an essential nutrient for humans. The most common source of potassium in drinking water are water treatment systems, such as ion exchangers (water softeners) that use potassium chloride. Potassium plays a critical role in many vital cell functions. In present investigation, the values of sodium present in water become Well water 0.2 meq/L, Bore-well water 0.4 meq/L, River water 0.3meq/L and Reservoir pond water 0.1 meq/L is determine. Those values are within the permissible limit as per prescribed by WHO.

Bicarbonates – Bicarbonate is present in all body fluids and organs. It plays a major role in the acid-base balances in the human body. The bicarbonates in maximum 9.6 meq/L and Minimum 4.2 meq /L are observed. These values are within the permissible limit as per prescribed by WHO

Chloride – Chloride is an important parameter accessing water quality. It controls the salinity of water and osmotic trace on biotic community (15). Higher chloride concentration during summer season. Due to high Temperature and Higher Evaporation chloride is a highest organic wastes the chloride value Well water 7.3 meq/L, Bore-Well water 14.2 meq/L, River water 18.7 meq/L and Reservoir pond water 9.8 meq/L. These values are within the permissible limit as per prescribed by WHO (200Mg/L). .Then above sources of water are safe .they do not effect of human body.

S.A.R. - In present investigation the SAR values were in Well water 4.2, Bore-well water 4.12, River water 3.12 and Reservoir pond water 4.17 are recorded. Those values are within the permissible limit as per prescribed by WHO.

CONCLUSION:

The present investigation study to found that water source like Well, Bore-Well, River and Reservoir pond of a Latur area in Shirur Anantpal, Deoni and Udgir. Those water parameter compare to WHO Standard Value to result found that, the water is safe and pure. It can be also using for Drinking purposes, Domestic, Agricultural Irrigation purposes. This water no any effect on human body.

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