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## AN ASSESMENT OF PHYSICO CHEMICAL PARAMETERS OF DRINKING WATER IN PIMPALGAON KHAND DAM AKOLE TEHSIL, MAHARASHTRA. INDIA.

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### ABSTRACT

This Paper deals with the Physico - chemical Parameters of Drinking water in Pimpalgaon Khand dam Akole Tehsil, dist-Ahmednagar, Maharashtra . To determined the Physico - chemical Parameters like pH, Electrical Conductivity, Calcium, Magnesium, Total Hardness, Carbo-

nate, Bicarbonate, Chloride, Total Dissolved Solid, Sodium, sodium absorption ratio in water. Also all parameters were compared with WHO standards of water quality.

**KEYWORDS** :Physico- chemical analysis, water.

### INTRODUCTION

Water is one of the most important compounds to the ecosystem. Better quality of water described by its Physical, Chemical and Biological characteristics. Due to increased human population, use of fertilizers in agriculture and Man-made activity are change in Physico-chemical property of water. Water is a transparent fluid which forms the world's streams, lakes, oceans and rain. Freshwater reservoir is located

at Pimpalgaon Khand, Akole Tehsil, dist-Ahmednagar, Maharashtra . With Latitude and Longitude of 19.439189N and 73.984240E respectively. The reservoir is constructed in the JUN 2015.

### WATER SAMPLING

The water samples dam water was collected in polythene bottles .which were cleaned with acid water, followed by rinsing twice with distilled water. The water samples are chemically analyzed [1]. The analysis of water was done using procedure of standard method.

Figure 1 - Location of Maharashtra in India      Figure 2- Location of Ahmednagar

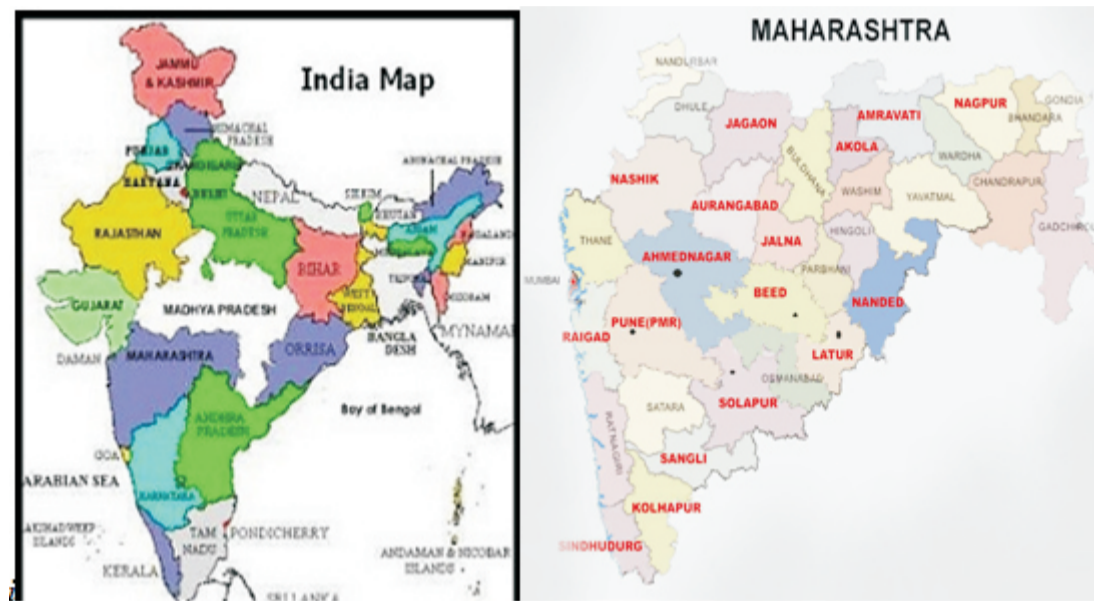


Figure 3 – Location of Akole in Ahmednagar



#### METHODOLOGY

The pH and EC was measured by using Eutech –cybernetics PH meter and EC Scan meter [2]. Total hardness, calcium, magnesium were measured by EDTA titration methods[3]. Total alkalinity was determined by volumetrically by silver nitrate titrimetric methods using potassium chromate as indicator. [4]. Sulphate was determined nephelometrically using ELICO-52 Nephelometer [5]. The Physico-chemical analysis was carried out according to standards methods. [6, 7, 8,] Turbidity and TDS were observed with the help of digital water kit [9]. Iron was determined by spectrophotometer. Nitrate was determined by Phenol Disulfonic method[10]

**RESULTS AND DISCUSSION****ANALYSIS OF DRINKING WATER USING PHYSICO-CHEMICAL PARAMETERS**

1. Parameters	Test Values/Unit
2. PH	7.46 unit
3. E.C	0.27 mmhos/cm <sup>2</sup>
4. Calcium	95.7 ppm
5. Magnesium	103.9 ppm
6. Sodium	18.2 ppm
7. Potassium	0.1 ppm
8. Bi-carbonate	5.00 meq/L
9. Chloride	2.00 meq/L
10. Sulphate	16.9 ppm
11. S.A.R	3.10 ----

**pH-**

It is one of the most important parameter in water chemistry and is defined as  $-\log [H^+]$ . Which indicates acidic and alkaline nature of water. The pH was alkaline values ranges from 7.3 to 8.8. The pH value is 7.46 records. The factors like air temperature bring about changes the pH of water. Most of bio-chemical and chemical reactions are influenced by the pH.

**Electrical Conductivity**

The electrical conductivity of water estimates the total amount of solids dissolved in water. The electrical conductivity of the water depends on the water temperature. The electrical conductivity of water increases by 2-3% for an increase of 1 degree Celsius of water temperature. Many EC meters nowadays automatically standardize the readings to 25°C. The same electrical conductivity values can be measured in low quality water (e.g. water rich with Sodium, Boron and Fluorides) as well as in high quality irrigation water (e.g. adequately fertilized water with appropriate nutrient concentrations and ratios). Since the electrical conductivity is a measure to the capacity of water to conduct electrical current, it is directly related to the concentration of salts dissolved in water, and therefore to the Total Dissolved Solids (TDS). The dam water electrical conductivity is 0.27. The electrical conductivity is safe to using drinking and other used.

**Calcium and magnesium**

Calcium and magnesium are both essential to human health. Calcium and magnesium are very common elements. Calcium is the fifth most abundant natural element, and magnesium the eighth. Both elements are present in all natural waters. The most common source of calcium and magnesium in groundwater is through the erosion of rocks. Magnesium in drinking water may have a laxative effect. However, the human body tends to adapt to this laxative effect with time. The maximum Calcium value 95.7 ppm are record. The maximum Magnesium value 103.9 ppm are record. Permissible limit of magnesium content for drinking purpose is 50 mg/l and maximum limit is 150 mg/l. The maximum values are found to be below the desirable limit.

#### **Sodium**

Sodium is an essential mineral for humans. We all need a small amount of sodium to keep our bodies working properly. Sodium helps us maintain blood pressure, control fluid levels, as well as keep normal nerve and muscle function. According to the Canadian Community Health Survey, in 2004, each Canadian consumed approximately 3 grams (3000 mg) of sodium every day. If the sodium concentration in your drinking water is 20 mg/L, drinking up to 2 litres of water per day will add 40 mg of sodium to your diet, about 2% of a teaspoon of salt. All water samples are different quantity of sodium. The quantity of sodium in water is 18.2.

#### **Potassium**

Potassium is an essential nutrient for humans. The most common source of potassium in drinking water is water treatment systems, such as ion exchangers (water softeners) that use potassium chloride. In water, potassium has no smell or colour, but may give water a salt taste. Adverse health effects from exposure to increased potassium in drinking water are unlikely in healthy people. Rivers contain about 2-3 ppm potassium. Above drinking water source potassium contain about 0.1 ppm. They are not harmful to human body. Higher concentration of potassium may cause kidney disease.

#### **Bicarbonate**

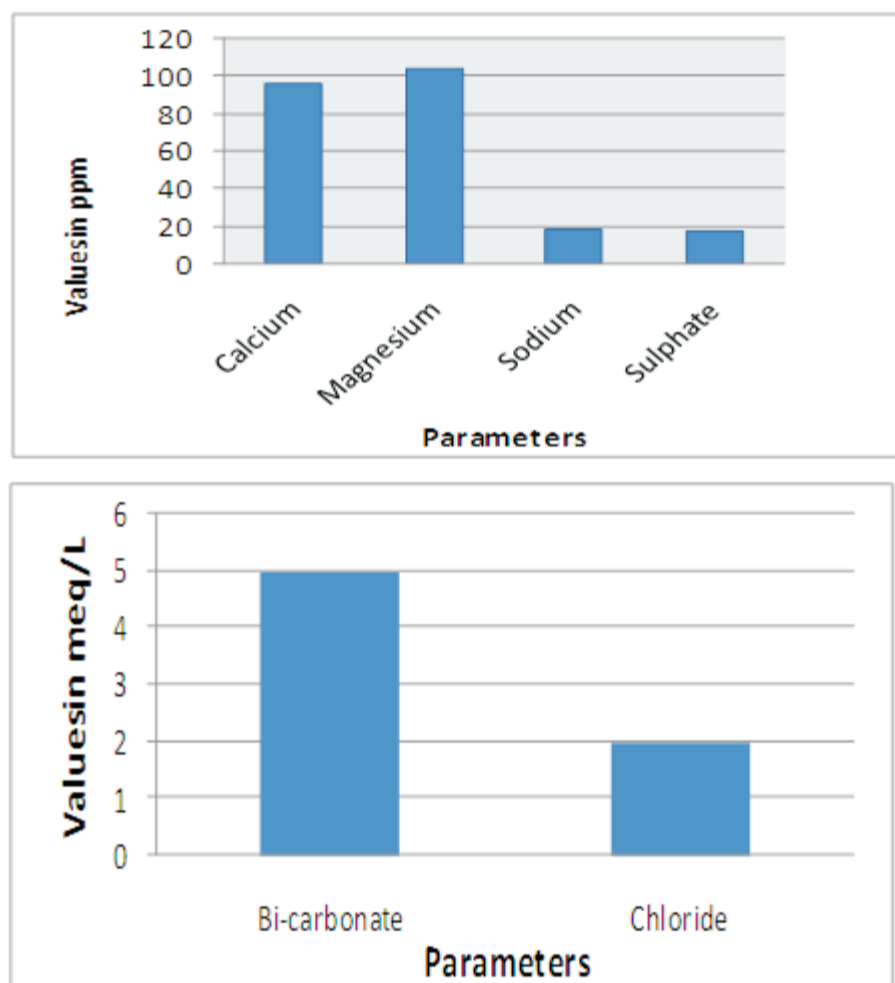
Bicarbonate is present in all body fluids and organs. It plays a major role in the acid-base balances in the human body. The first organ where food, beverages and water stay in our body is the stomach. Thus at least half a gram of bicarbonate is secreted daily in our stomach. This rate of gastric bicarbonate secretion is 2-10% of the maximum rate of acid secretion. On neutralization by acid, carbon dioxide is produced from bicarbonate. The very small quantity of bicarbonate present in above drinking water source. They contain about 5.00 meq/L.

#### **Chloride**

Chloride is an important parameter in assessing the water quality. The values of chlorides range from 2.00 meq/L. In the present study minimum quantity of chloride present in water source. Then above sources of water are safe. They do not affect human body.

#### **S.A.R. –**

Sodium adsorption ratio (SAR) is a measure of the suitability of water for use in agricultural irrigation, as determined by the concentrations of solids dissolved in the water. In present investigation the SAR values were 3.10. These values are within the permissible limit as per prescribed by WHO.



#### CONCLUSION–

It is found that the water of Pimpalgaon Khand dam Akole Tehsil, dist-Ahmednagar, Maharashtra, are permissible limits prescribed by WHO. It is pure; it can be used for drinking purpose, domestic use and agriculture purpose. These water no any toxic effect on human body.

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