

“ANALYSIS OF PHYSICO-CHEMICAL PROPERTIES OF WATER TAKEN FROM ULTAPNI WATER SOURCES, MAINPAT AREA OF SURGUJA DIVISION OF CHHATTISGARH, INDIA.”

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Abstract:-

Some natural phenomena stir own brain as they defy the normal natural laws like we all know that water flows downward from upward but there is a place in Chhattisgarh where water flows upward from downward. This region was discovered by locals few years back. This region called Ultapani[1]. Even a large variation in climatic condition has been arising curiosity in everyone therefore it has been felt to find out the scientific aspects of these phenomena. What is the reason that water flows from bottom to top at this place, to find out, first of all we have to study the physico-chemical properties of the water here because there are many chemical elements in the water like Chloride, Nitrate, Calcium-Carbonate. ,Calcium, Magnesium, Iron, Fluoride, Sulphate, Oxygen, Hydrogen etc. The reason for this can be the excess or deficiency of these chemicals, So in our research we will try to reach a conclusion by studying the physical-chemical properties of the water coming out of this self-flowing water source.

Keywords: Water source, Self flowing water, Ultapani, Conductivity, pH-value, Chloride, Nitrate, Calcium-Carbonate. ,Calcium, Magnesium, Iron, Fluoride, Sulphate, Physico-Chemical properties etc.

Introduction: -

In Surguja district, Mainpat is a block in the northern region of Chhattisgarh state in India and is located about 55 kilometers from Ambikapur showing in Fig.1. The geographical distance of the Mainpat is 35 km from Darima airport and about 55 km from district headquarter Ambikapur in Surguja division. The height of the Mainpat hill is about 3560 feet from its base.

In this block, there is a place called Ultapani, in village Visarpani, which is situated 5 km before Mainpat Kamleshwarpur chowk on the 3 km right side of the Ambikapur–Mainpat road. The altitude of the Ultapani, village Visarpani is 1085 meter above sea level in the world map, latitude of the Ultapani surface water source is located at $22^{\circ}52'40''$ N and longitude at $83^{\circ}16'51''$ E. On field visit survey, we found that the groundwater level is very near to earth surface on the village Visarpani. In this area, there is a dense forest nearby, in some portion of the Mainpat large number of geographical changes are observed.



- **Conductivity** :- Conductivity is a measure of water's capability to pass electrical flow. This ability is directly related to the concentration of ions in the water[2]. These conductive ions come from dissolved salts and inorganic materials such as alkalis, chlorides, sulfides and carbonate compounds [3]. Compounds that dissolve into ions are also known as electrolytes [4]. The more ions that are present, the higher the conductivity of water.
- **pH-value** :- pH is a determined value based on a defined scale, similar to temperature. This means that pH of water is not a physical parameter that can be measured as a concentration or in a quantity.[5],[6]. pH is a measure of how acidic/basic water is. The range goes from 0 to 14, with 7 being neutral. pHs of less than 7 indicate acidity, whereas a pH of greater than 7 indicates a base. pH is really a measure of the relative amount of free hydrogen and hydroxyl ions in the water. Water that has more free hydrogen ions is acidic, whereas water that has more free hydroxyl ions is basic. Since pH can be affected by chemicals in the water, pH is an

important indicator of water that is changing chemically. The pH of water determines the solubility (amount that can be dissolved in the water) and biological availability (amount that can be utilized by aquatic life) of chemical constituents such as nutrients (phosphorus, nitrogen, and carbon) and heavy metals (lead, copper, cadmium, etc.). For example, in addition to affecting how much and what form of phosphorus is most abundant in the water, pH also determines whether aquatic life can use it. In the case of heavy metals, the degree to which they are soluble determines their toxicity. Metals tend to be more toxic at lower pH because they are more soluble[8].

Material & Methods:-

In this research, we are using the experimental method as a method, our research area from where the water is continuously flowing up to about 200 meters by coming out on its own. During our research, we took the sample of water flowing here and studied the Physico-chemical properties of that water sample like conductivity, pH value, presence and quantity of chloride, nitrate, calcium, carbonate, magnesium, iron, fluoride, sulphate etc. which are as follows-

Table -01. Physical Properties of water of Ultapani.

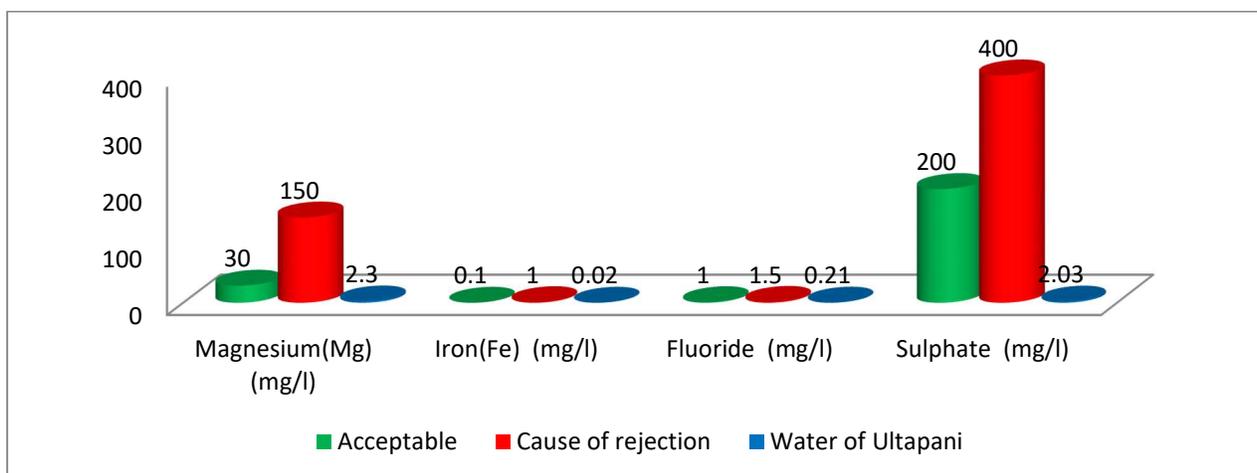
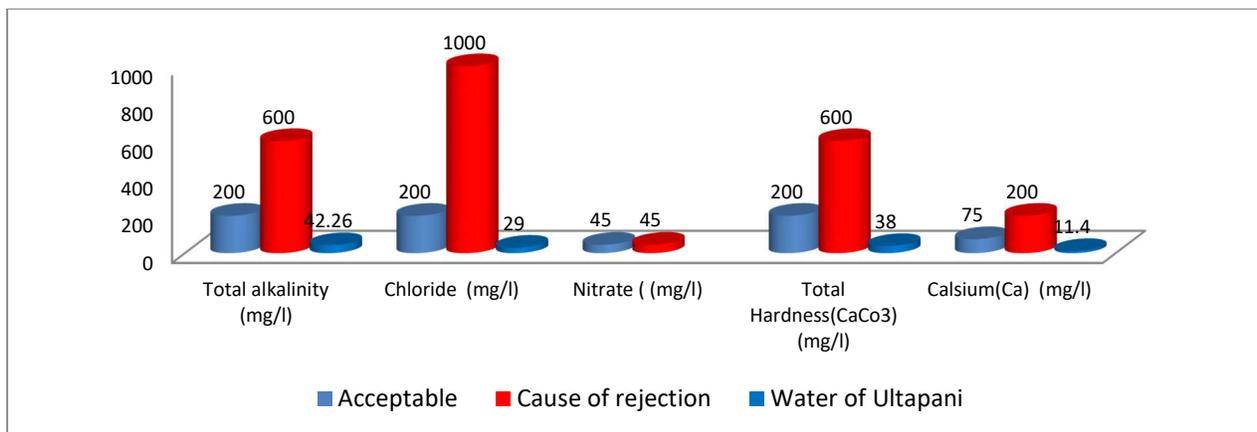
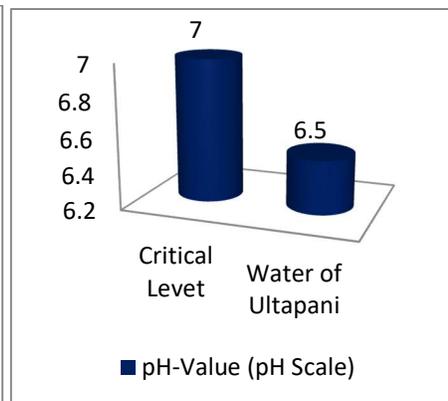
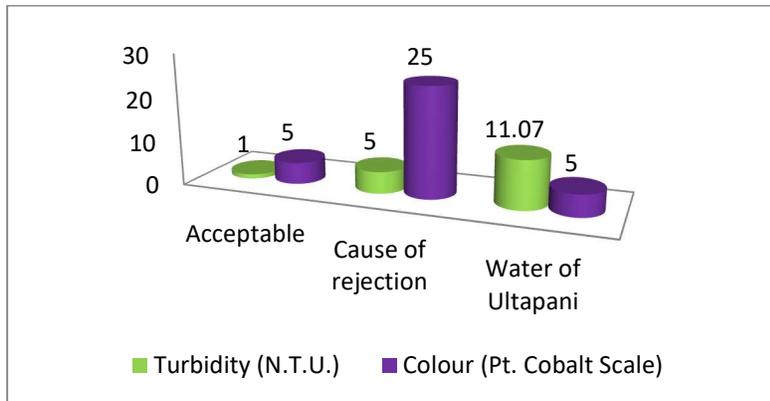
Physical Properties	Unit	Acceptable	Cause of rejection	Result
Turbidity	N.T.U.	1	5.0	11.07
Colour	Pt. Cobalt Scale	5.0	25	5.0
Conductivity	Micro mhos/cm	-	-	79.68
pH-Value	pH Scale	6.5-8.5	<6.5-9.2>	6.5

Table -02. Physical Properties of water of Ultapani.

Physical Properties	Unit	Acceptable	Cause of rejection	Result
Total alkalinity	mg/l	200	600	42.26
Chloride	mg/l	200	1000	29.00
Nitrate	mg/l	45	45	
Total Hardness(CaCo ₃)	mg/l	200	600	38.00
Calcium(Ca)	mg/l	75	200	11.40
Magnesium(Mg)	mg/l	30	150	2.30
Iron(Fe)	mg/l	0.1	1.0	0.02
Fluoride	mg/l	1	1.5	0.21
Sulphates	mg/l	200	400	2.03

Result & Discussion:-

The turbidity of the water coming out of Ultapani is slightly higher than normal. The conductivity of the hot water found here is much higher than that of distilled water, the pH-value is much lower than normal, so the water here would be acidic. The amount of Chloride, Nitrate, Calcium carbonate and Calcium is also much less than normal. Iron content is much less than normal. Similarly, the amount of Fluoride and Sulphate is also less than normal.



Conclusion:-

The turbidity of water flowing automatically upwards in Ultapani is more than normal, pH value is less than normal, hence the water here is slightly acidic. The amount of alkalinity and chloride in the water taken from Ultapani is very less. Nitrate was found to be absent, Calcium-Carbonate was found to be very less than normal, which means that the water found here has low hardness. The quantity of Mg, Fe, F and Sulphate in the water sample taken from Ultapani is also very less, on the basis of this it is very difficult to tell the reason for the water flowing up from the bottom. So now we have to study the soil and physical aspect here and compare it with the water samples of other places.

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