Physico-Chemical Analysis of Water from Gavarapalem Area in Anakapalli City, Visakhapatnam District, Andhrapradesh.

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ABSTRACT

Water is essential to life. The provision of water of adequate quantity for human use and consumption is not only a pre-requisite for development but also a major contribution towards the improvement of health, hygiene and welfare of people. They added that access to safe water reduces water-borne and water-washed diseases. In ordered to assess the quality of water in post moon soon we have determined physico-chemical analysis in gavarapalem area of Anakapalli city, Visakhapatnam District of Andhrapradesh State, India in post moon soon time in 2017. In Physico-chemical analysis, various quality parameters are measured including pH, Specific Conductivity, Turbidity, Total hardness, Alkalinity, Calcium, Magnesium, Chlorides, Sulphates, Nitrates compared with Indian standards 10500: 2012 of water quality. The assessment of these parameters is essential to identify magnitude and source of any pollution load. These characteristics can identify certain condition for the ecology of living organisms and suggest appropriate conservation and management strategies.

Keywords: Water samples, physico-chemical analysis and Indian standards 10500: 2012.

INTRODUCTION

Water plays an essential role in human life. Although statistics, the WHO reports that approximately 36% of urban and 65% of rural Indian were without access to safe drinking water [1]. Fresh water is one of the most important resources crucial for the survival of all the living beings. It is even more important for the human being as they depend upon it for food production, industrial and waste disposal, as well as cultural requirement [2]. Human and ecological use of ground water depends upon ambient water quality. Human alteration of the landscape has an extensive influence on watershed hydrology [3]. Ground water plugs a vital role in human life. The quality of water is of vital concern for the mankind since it is

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directly linked with human welfare. It is a matter of history that facial pollution of drinking water caused water-borne diseases which wiped out entire population of the studied area [4]. Good quality of water resources depends on a large number of physico-chemical parameters and biological characteristics. To asses that monitoring of these parameters is essential to identify magnitude and source of any pollution load. These characteristics can identify certain condition for the ecology of living organisms and suggest appropriate conservation and management strategies. The present work is an attempt to measure the water quality of gavarapalem area in Anakapalli city, Visakhapatnam district, Andhrapradesh State, India in post moon soon time in 2017.

Table-1: List of Parameters and which can cause problems in operating wells

Name of the parameter	Types of Problems
pH	Below 4 will produce sour taste and higher value above 8.5 an alkaline taste
Turbidity	Reduce the microbial growth And restricts light penetration for photosynthesis
Total hardness	Roll in heart disease
Alkalinity	Gastrointestinal issues and skin irritations
Calcium and Magnesium (Ca^{2+}, Mg^{2+})	Corrosion mineral Scale
Chloride (Cl-)	Highly corrosive and create problems in boiler
Sulphate	Laxative effect when combined with Ca^{2++}, Mg^{2+}
Nitrate	Methemoglobenemia or blue baby desease
Total dissolved Solids	Beyond this palatability decreases and may cause gastrointestinal irritation.

Diseases causes the water pollution

MATERIALS AND METHODS

The Water Samples were collected from four different areas in the Morning Hours between 9 to 11am, in Polythene Bottles which were cleaned with acid water, followed by rinsing twice with distilled water. The water samples are chemically analyzed [5]. The analysis of water was done using procedure of standard methods.

Methodology

The Water samples were immediately brought in to Laboratory for the estimation of various Physico-chemical Parameters like Water Temperature, pH were recorded by using Thermometer and Digital pH Meter. Specific conductivities were measured by using digital conductivity meter. The TDS values were measured by using TDS meter. While other Parameters Such as Alkalinity, Hardness, Calcium Magnesium, Chloride, Sulphate and Nitrate were estimated in the laboratory by using spectrophotometric methods. The present study involves the analysis of water qality in terms of physico-chemical methods (6).

Area of the Sampling

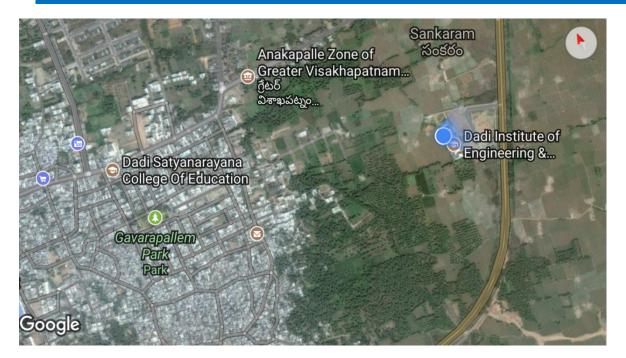For the analysis four different samples are taken

Fig.1: Google map of the Sampling areas

Sample 1: Dadi Institute of Engineering & Technology , Gavarapalem area (Anakapalli City) Pipe line Drinking water.

Sample 2: Dadi Institute of Engineering & Technology, Gavarapalem area (Anakapalli City) Ground water.

Sample 3: Gavarapalem park area (Anakapalli City) Pipe line Drinking water.

Sample 4: Gavarapalem park area (Anakapalli City) Ground water.

RESULTS AND DISCUSSION

The following results indicate the Physical &

Chemical analysis of water samples.

Table-2: Physical parameters of water samples

Physical analysis: Table 2 shows that the results of pH, conductivity, apparent colour, turbidity and total dissolved solid (TDS) tests are carried out on the water samples collected in gavarapalem area. In these results the pH of sample 2& 4 are crossed the Indian standards 10500:2012. So these samples have some alkaline in taste. The remaining parameters such as conductivity, colour, turbidity and total dissolved solid (TDS) are within the limits of Indian standards 10500:2012.

Chemical Analysis: Table 3 shows the results of Calcium, Magnesium, Total hardness, Chloride, Alkalinity, Sulphate and Nitrate contents of the water samples. In these results Calcium and Alkalinities

Parameter	Indian Standards 10500:2012		Sample-1	Sample-2	Sample-3	Sample-4
	Desirable limits	Permissible limits				
pH	6.5-8.5	No relaxation	7.64	9.35	8.13	9.45
Conductivity	0.005S	0.05S	0.0435mS	1.04mS	0.41mS	1.74mS
Colour	5	25	<1	<2	<1	<2
Turbidity(NTU)	5	10	2	3	2	2
TDS	500	2000	60	75	70	76
Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
Temperature	-----	----	27^0C	29^0C	27^0C	28^0C

of sample 2 and sample 4 are slightly more than the Indian Standards 10500:2012. The remaining contents such as Magnesium, Chloride, Hardness, Sulphate and Nitrates are within the limits of Indian Standards 10500:2012. While Figure. 1 is compared the results of chemical analysis with the Indian approved standards. The comparison demonstrated that the chemical contents of these water samples are favorably with the Indian approved standards 10500:2012.

Table-3: Chemical parameters of water samples (mg/l)

Parameter	Indian Standards 10500:2012		Sample-1	Sample-2	Sample-3	Sample-4
	Desirable limits mg/l	Permissible limits mg/l				
Calcium	75	200	17	350	100	250

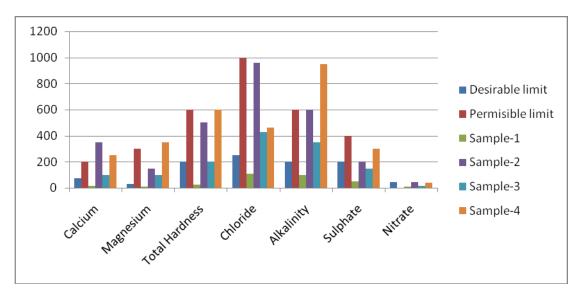| Magnesium	30	300	8	150	100	350
Total Hardness	200	600	25	500	200	600
Chloride	250	1000	110	960	430	460
Alkalinity	200	600	100	600	350	950
Sulphate	200	400	50	200	150	300
Nitrate	45	No relaxation	10	45	15	40

Fig.2: Comparison of Chemical parameters with Indian Standard limits

CONCLUSION

The sources of drinking water supply are public pipe borne water and underground supply system through sinking of boreholes and dug wells. However, underground supply system (boreholes and wells) accounted for the highest source of drinking water supply. Only 10% of the population had access to constant supply of public pipe borne water. To assess the quality of water for these samples each parameter was compared with the standard desirable limits prescribed by Bureau of Indian Standards [7].

From the study it can be concluded that pipe line water is safe for drinking purposes from the point of view of levels of pH, EC, TDS, Ca^{2+}, Mg^{2+}, Cl^-, NO_3^-, SO_4^{2-} and alkalinity at the time of post moon soon.

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