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# Physico-Chemical Analysis of Ground Water of Village Amar Singh Ka Gada Of Ghatol Block, Banswara (Rajasthan)

**Kailash Machchhar[1], Santosh Kumar Verma[2], Kumud tanwar[3], Swati Singh[3] & Ashok Kumar kakodia[1]**

[1]Govind Guru Tribal University, Banswara, Rajasthan, India
[2]Govt. Girls College Neemkathana, Sikar Rajasthan, India
[3]Kanoria P.G. MahilaMahavidyalya, Jaipur Rajasthan, India

***ABSTRACT: The ground water quality is determined in Amar singhka Gada villages of Ghatol block that lays in Banswara southern parts of Rajasthan, where from village ground water samples are under studied for Physico-chemical status of ground water. In Physico-chemical analysis, various quality parameterare measured including pH, total dissolved solids (TDS), Fluoride($F^-$), Chloride($Cl^-$), Iron (Fe) and Nitrate ($NO_3^-$) concentration present in ground water. Also all parameters were compared with WHO standards of water quality.***

***Keywords:*** Ground water, physico-chemical analysis, Chloride, Nitrate, Fluoride, TDS, Ghatol block of Banswara.

## I. 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 an integral role in human life. The consequences of urbanization and industrialization leads to spoil the water for agricultural purposes ground water is explored in rural especially in those areas where other sources of water like dam and river or a canal is not considerable[4-6]. During last decade, this is observed that ground water get pollute harshly because of increased human activities. Consequently number of cases of water borne diseases has been seen which are cause to health threats. An understanding of water chemistry is the bases of the knowledge of the multidimensional facet of aquatic environmental chemistry which involves the source, composition, reactions and transportation of water. The constitution of water is of vital concern for the mankind since it is directly linked with human welfare[7-11].

## STUDY AREA:

Study area comprises of Banswara district of Rajasthan state. Banswara district is one of the thirty three district of Rajasthan state and their administrative headquarter is located in Banswara. It is a part of Udaipur division. Banswara district falls within South Rajasthan in India. Its area spread over a total geographical area of 5037 sq km. It is also known as "City of Hundred Islands". In our present research paper physico-chemical analysis was carried out for Amar Singh Ka Gada village of Ghatol block.

**WATER SAMPLING**

In present investigation different water samples were collected in polythene bottles which were cleaned with acid water, followed by rinsing twice with distilled water. The water samples are chemically analyzed. The analysis of water was done using procedure of standard methods.

## II. METHODOLOGY

The pH was measured by using Eutech--cybernetics pH meter. TDS was observed with the help of digital water kit. Iron was determined by spectrophotometer. Nitrate was determined by Phenol Disulfonic method.

## III. RESULT AND DISCUSSION

The results of study have been reported in the given table 1.

**pH:** There was no significant change in the pH value during the observation period ; the observed values were in the range 7.2 to 8.1. pH was alkaline values ranges from 7.2 to 8.1. The maximum pH was recorded 8.1 at site no. 7. The higher pH values observed suggests that carbon dioxide, carbonate-bicarbonate equilibrium is affected more due to change in physico-chemical condition.

**TDS:** The total dissolved solids fluctuate from 385 mg/l to 863 mg/l. The maximum value (863 mg/l) was recorded at site no. 4. From the results, it is clear that water samples of studied area are not suitable for drinking in terms of TDS.

**Chloride:** The values of chlorides range from 40 mg/l to 150 mg/l. The maximum value (150 mg/l) was recorded at site no. 11 while the permissible limit of chloride prescribed by WHO for drinking water is 200 mg/l.

**Nitrates:** The values of nitrate ranges from 10 mg/l to 30 mg/l. the maximum value (30 mg/l) was observed at site no. 6. The permissible value of $NO_3^-$ is 100 mg/l; above this concentration water becomes harmful and causes a disease namely methamoglobinemia in infants a condition known as "blue baby." The infant is being asphyxiated because oxygen cannot be transported by the blood. Prompt medical attention normally results in quick recovery of the infant.

**Fluoride:** The value varies from 0.700 mg/l to 1.500 mg/l. The maximum value 1.500 mg/l was observed at site no. 11 while the permissible limit of fluoride prescribed by WHO for drinking water is 1.45 mg/l. The fluoride levels around 0.5-1.0 mg/l reduce the risk of dental caries, while significantly higher levels may cause skeletal fluorosis, depending on water intake and the fluoride content of the diet.

| Source | Fluoride (mg/l) | Nitrate (mg/l) | Iron (mg/l) | Chloride (mg/l) | pH | TDS |
|---|---|---|---|---|---|---|
| WHO | 1.0 | 45 | 0.1 | 200.00 | 6.5-9.2 | 500 |
| ICMR | 1.0 | 20 | 0.1 | 200.00 | 7.0-8.5 | 500 |

**Table 2. Standard Values of different water quality parameters**

## VI. CONCLUSION

The results depicted in the paper attributed the quality assessment of ground water samples in the prescribed area. A study of ground water i.e. shallow tubewell was carried out by taking certain important parameters like pH, TDS, Nitrate, Cl-, F- etc. In this present investigation it was found that the maximum parameters were not at the level of pollution except few parameters like Fluoride and TDS in ground water. So ground water of village is not satisfying the requirement for the use for drinking. From different water quality parameters, it is suggested that further improvement is required to treat the water at these places.

## V. ACKNOWLEDGEMENTS

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**Table: I**

**Sampling Locations And Physico-Chemical parameters of Amar Singh Ka Gada**

| Site No. | Sample location | Source | Fluoride (mg/l) | Nitrate (mg/l) | Iron (mg/l) | Chloride (mg/l) | pH | TDS (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 1. | Near Atal Seva Kendra | Shallow Tubewell | 0.700 | 22.000 | 0.000 | 73.000 | 7.800 | 649.000 |
| 2. | Near Atal Seva Kendra | Shallow Tubewell | 0.800 | 12.000 | 0.000 | 62.000 | 7.800 | 644.000 |
| 3. | Near Kamala/ Nago House, | Shallow Tubewell | 0.900 | 15.000 | 0.000 | 40.000 | 8.100 | 585.000 |
| 4. | Near G S S S | Shallow Tubewell | 1.300 | 28.000 | 0.000 | 121.000 | 7.700 | 863.000 |
| 5. | Near G S S S | Shallow Tubewell | 1.110 | 27.000 | 0.000 | 62.000 | 8.000 | 720.000 |
| 6. | Near G S S S | Shallow Tubewell | 1.100 | 30.000 | 0.000 | 73.000 | 8.000 | 705.000 |
| 7. | Near Badala/ Hatiya House, | Shallow Tubewell | 1.100 | 20.000 | 0.000 | 41.000 | 8.100 | 532.000 |
| 8. | Near Goti/ Ditiya House, | Shallow Tubewell | 0.800 | 10.000 | 0.000 | 41.000 | 8.000 | 770.000 |
| 9. | Near Main Bus Stand, | Shallow Tubewell | 1.100 | 20.000 | 0.000 | 80.000 | 7.600 | 627.000 |
| 10. | Near Main Bus Stand | Shallow Tubewell | 1.100 | 11.000 | 0.000 | 70.000 | 7.200 | 628.000 |
| 11. | Near Aanganwari Kendra | Shallow Tubewell | 1.500 | 10.000 | 0.000 | 150.000 | 7.700 | 384.000 |