

## WATER QUALITY ASSESSMENT IN 4 DIFFERENT TALUKS OF SALEM DISTRICT

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### ABSTARCT:

Ground water is one of the most important fresh water resources available for human community. Early people recognized the importance of water from a quality and quantity point of view. The main objective of this report is under ground water research, In this project work we have estimated the quality of water samples of bore well, were collected from different taluks in salem city and they are (**Salem, Edappadi, Attur and Gengavalli**). The collecting of underground water samples and subjecting the samples to a characteristics of physicochemical analysis such as pH, total hardness, calcium, magnesium, chloride, nitrate, sulphate, alkalinity and total dissolved solids. In generally, the waters are available from various sources is contaminated with various impurities which need to be removed before it can be supplied to the public.

**Key points:** *Under groundwater, physicochemical, analysis.*

### INTRODUCTION:

Now the Sub-Surface water resources have become more important due to various reasons and the main thing is increasing in population. but the quality of surface water is better than underground water,

We are in the needs of sufficient amount of water for local settlements such as provinces, cities, town. The quality of water is more important. Water used as drinking water, should not contain any harmful microbiological and chemical substances. It should meet the water quality standards. Now the concept of drinkable water is very important for all societies in past and today.

Water quality is used to characterize the condition, so that we have to analysis based on the chemical, physical and biological properties of the water, generally according to suitability for a particular purpose. It is not possible to obtain completely pure water from the sources of water. And we find the various impurities, which may be present in the water.

In our current investigation, we test the physico-chemical test and the parameters are namely temperature, PH, total hardness, calcium, magnesium, chloride, nitrate, sulphate, alkalinity

,total dissolved solids. In according to our project we test the sub –surface water compared to the standard BUREAU OF INDIAN STANDARDS (**BIS**), in that it gives the results , that the sub –surface cannot used as a drinking water . But we can used as other purpose like agriculture, domestic purpose etc.

### MATERIALS AND METHODS:

#### SAMPLING STATION:

The sub-surface water sampling were collected from four sampling station at Salem district of tamilnadu .The salem city is surrounded by hills Nagarmalai on the north Jarugumalai on the south kanjamalai on the west Godumalai on the east and the shevari hill on the northeast kariyaperumal hills in the southwestern salem .Devoid of primary porosity but undered porous and permeable with the development of secondary fracturing , inducing relatively longer residence time of ground water .In parts of salem ,attur , edapadi and gengavalli , Red calcareous .

Samples were taken from bore wells covering almost all the area of Salem city including edapadi, attur, gangavalli, and ammapet. The samples were collected in plastic bottles and prior to sampling, all sampling bottles were rinsed and washed with respective ground water.

## WATER QUALITY ASSESSMENT OF DIFFERENT TALUKS IN SALEM.

Table :1

| Monitoring station s | Sample ID | Geographical location |
|----------------------|-----------|-----------------------|
| Salem                | S1        | N11 65 83 E 78 15 22  |
| Attur                | S2        | N11 40 20 E 78 47 10  |
| Edapadi              | S3        | N11 34 51 E 77 52 36  |
| Gangavalli           | S4        | N11 29 50 E 78 38 45  |

Table : 2

## RESULT AND DISCUSSION

| S . N O | CHARACTERISTICS OF PARAMETER | ACCEPTABLE | SALEM | ATTUR | EDAPADI | GANGAVALLI |
|---------|------------------------------|------------|-------|-------|---------|------------|
| 1       | PH                           | 7.0-8.5    | 8.65  | 8.4   | 8.2     | 8.5        |
| 2       | TDS                          | 500        | 1950  | 1450  | 1850    | 1750       |
| 3       | Total Hardness               | 200        | 660   | 600   | 750     | 700        |
| 4       | Chlorides                    | 200        | 700   | 275   | 325     | 300        |
| 5       | Sulphates                    | 200        | 375   | 155   | 195     | 175        |
| 6       | Nitrates                     | 45         | 24    | 10    | 41      | 7          |
| 7       | Calcium                      | 75         | 88    | 120   | 165     | 175        |
| 8       | Magnesium                    | 30         | 105   | 72    | 205     | 200        |
| 9       | Alkalinity                   | 200        | 700   | 275   | 325     | 300        |

## pH

pH is the indication of acidity or basic nature of a solution. pH is determined by the hydrogen ion concentrations in a solution. The BIS has suggested that the limit of pH in drinking water is 7.0–8.5 respectively. According to the BIS, the study areas taluka (Attur, Edapadi, ) have almost desirable limit of pH and the rest of the villages have above 8.5 pH. Excess amount of pH in the drinking water will affect the mucous membrane and water supply system (0.012%).

## Total dissolved solids

TDS comprise inorganic salts and some small amount of organic matter that are dissolved in water. Its generated from natural sources, sewage and nature of the soil. The concentration of dissolved matter in water is given by the weight of the material on evaporation of water to dryness followed by heating for 1h at 180 °C. The BIS (2012) has suggested that the desirable limit of TDS in drinking water is 500 mg/l and maximum permissible limit of TDS in drinking water is 2000 mg/l. In the study area, the TDS ranges from 1250-2000 mg/l. According to the Indian standard the study area, all taluka come under not permissible limit of TDS. Excess amount of TDS leads to brackish taste and scale formation (0.035%).

## Chloride

The permissible limit of the chloride is 250 mg/l. According to the BIS, the study area Vazhapadi had almost desirable limit of chloride and the rest of the areas have more than permissible limit. There are different sources of chloride in water, including agricultural runoff, rocks, wastewater from industries, and effluent wastewater from wastewater treatment. Chloride can make freshwater as contaminate. Excessive amount of chloride in drinking water will lead to heart and kidney diseases (0.04%).

## Nitrate

The acceptable value of Nitrate is 45mg/l. According to BIS, all areas come under safe zone. More amount of nitrate can cause more health issues like high-blood pressure, thyroid disorders, even severe cyanosis. Nitrates may be carried by precipitation and irrigation

and it reaches the ground water through infiltration. The wastages of humans and animals lead to nitrate contamination of water(0.002%).

### Calcium

Acceptable level of calcium in drinking water is 40-80 ppm. According to the BIS (2012), the all study areas are comes under the unsafe zone (0.033%).

### Magnesium

The drinking water specification in the BIS has suggested that the desirable limit of the magnesium in water is 30 mg/l and permissible limit in the absence of an alternate source is 100 mg/l. all the study areas are comes above the permissible limit. The source of high magnesium level in the groundwater is due to magnesite deposits and ultramafic rock occurrence of the area. Nature water contains magnesium and calcium, which leads to hardness of groundwater base (0.235%).

### Alkalinity

Alkalinity is refers to the hardness, because a main source of alkalinity is carbonate rocks. The BIS guideline has suggested that the total alkalinity of drinking water is 200–600 mg/l. In the study area, total alkalinity ranges from 225 to 700 mg/l. According to the BIS standard, the study area have an allowable limit of total alkalinity except sankari taluka. The excess amount of alkalinity value in surface water lead to acid rain and cause harmful to aquatic life (0.04%).

### Hardness

The hardness of water is deals with the presence of calcium and magnesium. In general, surface water is softer than ground water. The BIS suggested that the desirable limit of hardness in drinking water is 200 mg/l. In the study area, the hardness value ranges from 960 to 1100 mg/l. The study area, all the taluks comes under above permissible limit of hardness in drinking water. So it contain very hard water and not suitable for drinking purpose(0.114%).

### Conclusion

Water physicochemical of the Salem district highly reflects the quality and properties of water. The results of the investigation show that the following types of water dominates in the Salem district were total hardness, calcium, magnesium, chloride, nitrate, sulphate, alkalinity ,total dissolved solids. Only pH is under permissible limit. Rock water interaction is the main cause of the chemical composition. So water should be treated before reaches consumer for domestic purpose.

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