

# Ground Water Development & Management of Gandhinagar District

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**Abstract**— After formation of Gujarat state in may 1960, it is striving hard to improve its economy as well as regional development in all fields. To achieve agricultural and industrial development, all efforts are put to develop the water resources of state. For equitable development of entire state, major medium and minor irrigation schemes across the rivers of all the state are being taken up at all feasible storage sites. Gandhinagar is the capital of Gujarat state the problems of low water level and water quality standard is affected in the whole district. The piezometric well and artificial well data analysis by bar chart and using Golden Surfer Software. The study is useful to know effectiveness of artificial recharge in water level and water quality. Groundwater is one of the most valuable natural resources requiring systematic study for the development of the area. Gandhinagar has been selected as study area which have low water table and needs to improve water quality. The area is occupied mainly by alluvial plain and having coarse sandy loamy soil. Groundwater is the water present below earth's surface in soil pore spaces and in the fractures of rock formation. Groundwater deposit in aquifer when it can yield a usable quantity of water. Groundwater is present in virtually all landscapes. Generally it arise at mountainous, river, coastal, glacial, and dune. We have collect different data's of Gandhinagar like Average rainfall, Groundwater level, Groundwater Quality (TDS).

**Keywords:** Ground Water Development, (TDS)

## I. INTRODUCTION

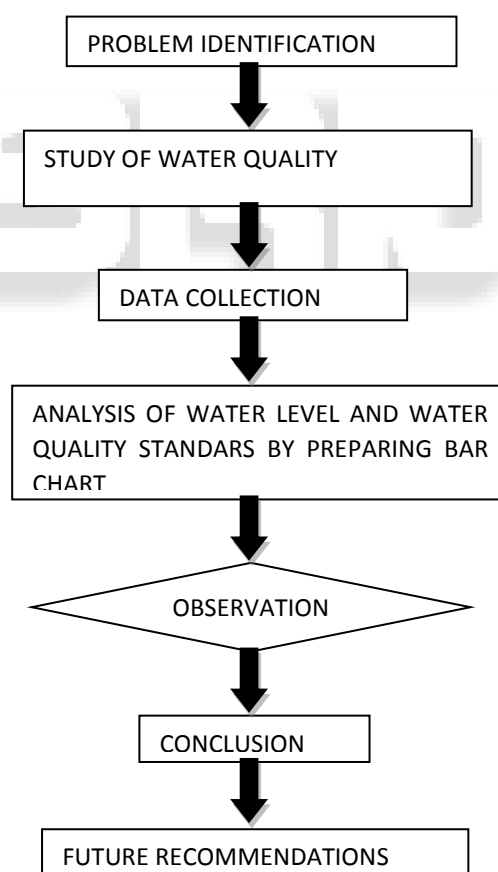
As rain is the main source of fresh water, any agent that threatens the downpour causes water scarcity. For most of the water problems among the people, the improper handling of irregular rainfall is a major cause. It is important to discover ways and means of saving water. The quantity of water that is actually recharged into the aquifer is very small than the requirement of water. As huge quantity of rainwater finds its way ultimately to sea through rivers, the only alternative is to harvest and conserve this precious gift of nature by Rainwater Harvesting. Artificial recharge is an innovative method of increasing the amount of water, which enters the ground water reservoirs. The concept has been widely spreading in the past few years. Artificial Recharge of surplus water and artificial storage of rainwater can modify the hydrological cycle.

Though Gandhinagar is the capital of Gujarat state the problems of low water level and water quality standard is affected in the whole district. The state government had restricted to bore a tube well below certain limit in Gandhinagar district. The problem of water lvl. And water quality in Gandhinagar district.

## II. STUDY AREA

Gandhinagar is the capital of Gujarat state. Located at Latitude (23° 13' 0" N) Longitude (72° 41' 0" E). The district has an area of 2,163, 48 km<sup>2</sup>, and a population of 13,87,478 of which 5,99,539 were urban (2011 census).The district includes four talukas - Gandhinagar, Kalol, Dehgam and Mansa and it has 287 villages. Gandhinagar district is bounded by the districts of Sabarkantha to the northeast, Kheda to the southeast, Ahmedabad to the southwest, and Mehsana to the northwest. The city is situated on the banks of the Sabarmati River, in north-central-East Gujarat. According to the Bureau of Indian Standards it is under seismic zone-III.

## III. METHODOLOGY



## IV. DATA COLLECTION AND ANALYSIS

- Water level and water quality data of pre monsoon and post monsoon from year 2000 to 2020.
- Water level and water quality data of recharge wells pre monsoon and post monsoon.

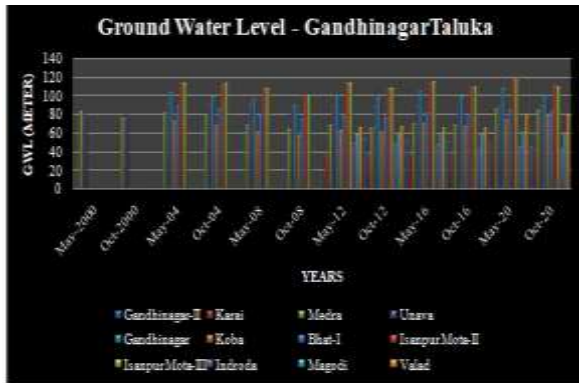


Fig. 1: Ground Water Level of Gandhinagr Taluka from 2000 To 2020

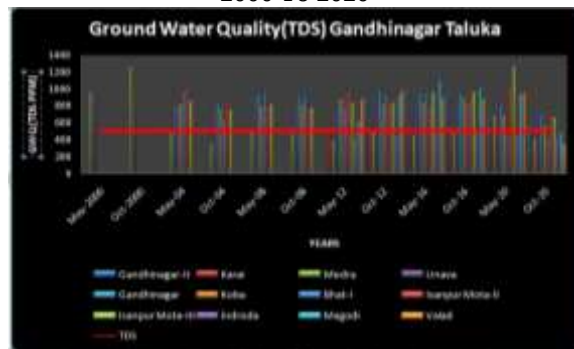


Fig. 2: Ground Water Quality of Gandhinagar Taluka from 2000 To 2020

| YEAR | PRE-MONSOON | POST-MONSOON | DIFFERENCE | %DIFFERENCE |
|------|-------------|--------------|------------|-------------|
| 2012 | 41.84       | 37.63        | 4.19       | 10.01434034 |
| 2016 | 41.96       | 38.08        | 3.88       | 9.246901811 |
| 2020 | 43.82       | 38.33        | 5.49       | 12.52832579 |
|      |             | AVERAGE      |            | 10.59658931 |

Table 1: Comparison of Average Water Level for Pre Monsoon and Post Monsoon

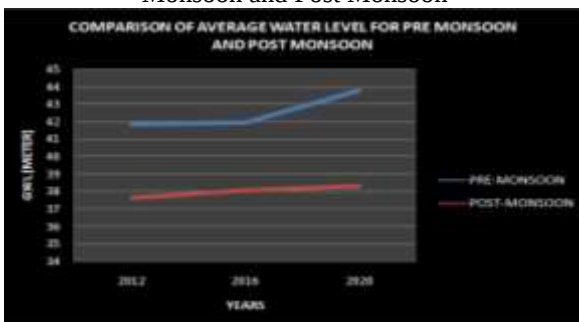


Fig. 3: Comparison of Average Water Level for Pre Monsoon and Post Monsoon

| YEAR | PRE-MONSOON | POST-MONSOON | DIFFERENCE | %DIFFERENCE |
|------|-------------|--------------|------------|-------------|
| 2012 | 876.45      | 953.77       | -77.32     | -8.82       |
| 2016 | 888.16      | 956.93       | -68.77     | -7.74       |
| 2020 | 957.04      | 819.38       | 137.66     | 14.38       |
|      |             | AVERAGE      |            | -0.72       |

Table 2: Comparison of Average TDS for Pre Monsoon and Post Monsoon

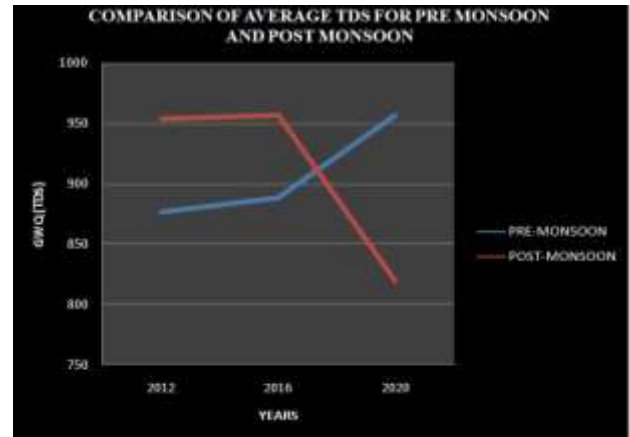


Fig. 14: Comparison of Average TDS for Pre Monsoon and Post Monsoon

## V. CONCLUSION

- It has been observed the study area having good aquifer to absorb ground water.
- Because of annual recharge, water table is increased but it observes that TDS is decreased.
- It has been observed that pre monsoon and post monsoon data of the TDS value is more than the desirable value which are alarming for the health.
- As per data analysis ground water level is increased by 10.59% and TDS increased by 0.72%

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## REFERENCES

- Charles R. Fitts, Groundwater science, Academic Press 2 Addition,, 2013
- Santhos Kumar Garg, Environment Engineering vol.1, Khana Publication, 1 JAN 1977.
- We collected surface water data from state water data centre gandhinagar and ground water data from geohydrologist kherva.