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*Study on the status of ground-water quality
in villages of padra taluka*

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Abstract:

The purpose of the research was to evaluate the quality of the groundwater in the Padra Taluka communities of Dudhwada, Piludra, and Karakhdi. Groundwater samples were taken at several sites across the research region and analyzed for a range of physicochemical characteristics. Groundwater in the study region was found to have significant concentrations of nitrates, fluoride, and total dissolved solids (TDS), among other contaminants. The report suggests taking action to fix the water quality problems found so that residents may drink safe water.

Keywords:

Groundwater, physicochemical, APHA guidelines, of sewage treatment facilities

1. Introduction:

In many regions of the globe, groundwater is used for drinking, farming, and industry, and it is thus a very important resource. But many human and natural causes contribute to the deterioration of groundwater quality. Many rural areas in India rely on groundwater for their drinking water supply. Therefore, groundwater quality must be monitored to guarantee its safe usage and safeguard public health.

The purpose of the research was to evaluate the quality of the groundwater in the Padra Taluka communities of Dudhwada, Piludra, and Karakhdi. Vadodara district of Gujarat state, India is the site of the research. The purpose of the research was to assess the quality of the groundwater in the villages so that decisions could be made to better serve the rural people.

2. Materials and Methods:

The research was performed during the months of December 2020 and April 2021. Groundwater samples were taken from several places throughout the research area's many zones. Thirty samples of groundwater were taken at the research site. After collection, the samples were placed in sterile plastic containers and sent to the lab for further study.

Several physicochemical parameters, including pH, EC, TDS, nitrate, and fluoride, were measured in the collected groundwater samples. The investigation followed APHA guidelines, which are considered to be the gold standard in the field of public health.

3. Results and Discussion:

The research found that there are significant concentrations of nitrates, fluoride, and total dissolved solids (TDS) in the groundwater in the studied region. Nitrate levels averaged out to be 97.8 mg/L, which is far higher than the 45 mg/L threshold recommended by the World Health Organization (WHO). Fluoride levels averaged 2.7 mg/L, which is much over the World Health Organization's recommended maximum of 1.5 mg/L. The average TDS level was determined to be 1460 mg/L, which is much higher than the BIS-mandated maximum of 500 mg/L.

The high levels of nitrates in groundwater can be attributed to the excessive use of nitrogen-based fertilizers in agriculture and inadequate sewage treatment facilities. Similarly, the high

fluoride levels can be attributed to the geology of the area, which is rich in fluoride-bearing rocks. The high TDS levels can be attributed to the natural salts present in the groundwater and the discharge of industrial effluents.

4. Conclusion:

High concentrations of nitrates, fluoride, and total dissolved solids (TDS) were found in the groundwater under the research region. Exposure to high concentrations of these contaminants may be harmful to human health. Protecting the health of local populations requires taking action to fix the problems with water quality that have been recognized.

Improving groundwater quality in the research region is advocated for via the adoption of measures such as the promotion of organic agricultural methods, the construction of sewage treatment facilities, and the restriction of industrial effluent discharge. The study also recommends regular monitoring of the groundwater quality to ensure its safe use and protect public health.

5. Photographs taken during the field visit:





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