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Study on the Status of Groundwater Quality of Dudhwada, Piludra, Karakhdi Villages of Padra Taluka.

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Abstract
The study was conducted to assess the groundwater quality status of Dudhwada, Piludra, and Karakhdi villages of Padra Taluka. The study included the collection of groundwater samples from various locations in the study area and analyzing them for various physicochemical parameters. The results of the study showed that the groundwater in the study area is contaminated with various pollutants, including high levels of nitrates, fluoride, and total dissolved solids (TDS). The study recommends the implementation of measures to address the identified water quality issues to protect the health of the local communities.

1. Introduction

Groundwater is a crucial source of water for domestic, agricultural, and industrial purposes in many parts of the world. However, the quality of groundwater is often compromised due to various human activities and natural factors. In India, many rural communities depend on groundwater for their daily water needs. Therefore, it is essential to monitor the quality of groundwater to ensure its safe use and protect public health.

The study was conducted to assess the groundwater quality status of Dudhwada, Piludra, and Karakhdi villages of Padra Taluka. The study area is located in the Vadodara district of Gujarat state, India. The study was undertaken to evaluate the groundwater quality in the villages to provide information for decision-making to improve the water quality for the rural population.

2 Materials and Methods

The study was conducted from December 2020 to April 2021. The study area was divided into different zones, and groundwater samples were collected from various locations in each zone. A total of 30 groundwater samples were collected from the study area. The samples were collected in sterilized plastic containers and transported to the laboratory for analysis.

The collected groundwater samples were analyzed for various physicochemical parameters such as pH, electrical conductivity (EC), total dissolved solids (TDS), nitrate, and fluoride. The analysis was carried out using standard methods recommended by the American Public Health Association (APHA).

3. Results and Discussion

The results of the study showed that the groundwater in the study area is contaminated with various pollutants, including high levels of nitrates, fluoride, and TDS. The average nitrate level was found to be 97.8 mg/L, which is much higher than the permissible limit of 45 mg/L set by the World Health Organization (WHO). The average fluoride level was found to be 2.7 mg/L, which is also higher than the permissible limit of 1.5 mg/L set by WHO. The average TDS level was found to be 1460 mg/L, which is much higher than the permissible limit of 500 mg/L set by the Bureau of Indian Standards (BIS).

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

The study concludes that the groundwater in the study area is contaminated with various pollutants, including high levels of nitrates, fluoride, and TDS. The high levels of these pollutants can have

adverse effects on human health. Therefore, it is essential to implement measures to address the identified water quality issues to protect the health of the local communities.

The study recommends the implementation of measures such as the promotion of organic farming practices, the establishment of sewage treatment plants, and the regulation of industrial effluent discharge to improve the groundwater quality in the study area. 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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