

ASSESSMENT OF GROUNDWATER QUALITY USING HYDROCHEMISTRY AND GEOSPATIAL TECHNIQUES IN KOHIMA TOWN, NAGALAND

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Abstract

The study area (Kohima Town) lies in the Kohima Synclinorium of the Inner Fold belt of Nagaland and is made up of Disang and Barail Group of rocks comprised mostly of sandstone and shale. 40 groundwater samples were collected in December 2019 and hydrochemically investigated and their physico-chemical parameters such as pH, EC, TDS, TH, Mg^{2+} , Ca^{2+} , K^+ , Na^+ , HCO_3^- , SO_4^{2-} , NO_3^- , Cl^- , F^- , and Fe were determined to assess the drinking water quality. The results were then compared with BIS (2012) and WHO (2004) standards to determine the water quality for drinking purposes. Statistical analysis, ion correlation, geospatial analysis of the hydrochemical parameters and Water Quality Index (WQI) determination were done in this study. Statistical study has revealed the dominance of ions in the following sequence: $Na^+ > Ca^{2+} > K^+ > Mg^{2+}$ for cations and $HCO_3^- > SO_4^{2-} > Cl^- > NO_3^- > F^-$ for anions based on Box and Whisker plot. Piper's (1994) trilinear diagram indicates the Na-Cl hydrochemical type of water. From Gibb's (1970) diagram and correlation of ions, the major ion concentrations were found to be mainly because of silicate weathering and ion exchange processes. WQI has revealed that the study area was dominantly under poor water; hence, these locations should be considered for groundwater preservation. Geogenic and anthropogenic sources were found to be the main contributing factors for groundwater contamination. The present study provides insight into groundwater management in Kohima Town, Nagaland.

Keywords: Hydrochemistry, Geospatial technique, Groundwater quality, Kohima Town, Nagaland