

ASSESSMENT OF GROUNDWATER QUALITY IN AND AROUND CHIEPHOBOZOU TOWN, KOHIMA DISTRICT, NAGALAND

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Abstract

The present study area (Chiephobozou town), is located between latitude 25°47.489'N to 25°49.123'N and longitude 94°07.846'E to 94°09.602'E in Kohima district, Nagaland. The study area comprises of the Disang and Barail Group of rocks that are part of the Tertiary rocks of Nagaland.

Hydrogeo-chemical investigation of groundwater in the study area has been carried out based on 30 samples collected during pre- and post-monsoon periods in 2021. The samples were analyzed for evaluating their physico-chemical parameters such as pH, alkalinity, total hardness, iron, TDS, chloride, nitrate, bicarbonate, calcium, magnesium, sodium, potassium and sulphate. The obtained results have been compared with values of the World Health Organization (WHO, 2004) and the Bureau of Indian Standards (BIS, 2012) to assess the quality of groundwater for drinking purposes. Most of the tested water samples were found to be within permissible limits except for iron whose value for pre-monsoon and post-monsoon was 66.67% and 53.33% respectively which is above the permissible limit. Water Quality Index (WQI) shows that the waters are unsuitable for drinking purpose owing to high iron concentration resulting from the local geological formations in the area. The dominance of cation and anion have the trends in the order of Na>K>Ca>Mg and $\text{HCO}_3 > \text{SO}_4 > \text{Cl}$ for both pre- and post- monsoon. Piper trilinear diagram has revealed that 6.7% of Ca- HCO_3 , 13.3% of Na-Cl, 13.3% of Na-K and 66.7% of mixed type for pre- monsoon and 33.4% of Ca- HCO_3 , 13.3% of Na-Cl, 13.3% of Na-K and 40% of mixed type for post-monsoon. According to Gibbs diagram, the predominant samples fall in the rock-water interaction dominance field for both the pre-monsoon and post-monsoon periods.

Keywords: Hydrogeochemistry, Water Quality Index, Piper and Gibbs diagrams, Chiephobozou town, Kohima district, Nagaland.