



Groundwater Quality Assessment and Hydro-geological Investigation in Atal Nagar, Chhattisgarh, India

K. Panigrahi and Bhumika Das*

*School of Engineering and IT, MATS University Raipur- 492002(CG), India
(*Corresponding author; Email: drbhumika@matsuniversity.ac.in)*

Abstract

In the study area, the primary source of water is groundwater, which is used for a number of purposes including drinking, domestic, and industrial purposes. pH, turbidity, conductivity, total dissolved solids (TDS), alkalinity, total hardness, calcium, magnesium, sodium, potassium chloride, fluoride, sulphate, iron, and nitrate were all measured for fifteen groundwater samples. In the study region, the groundwater is neutral to slightly alkaline. Most of the water sample is hard-very hard in nature. All the sample shows TDS value less than 1000 indicates the study area is suitable for drinking and irrigation purpose. According to Piper's diagram classification, the majority of the samples belong to the CaMgHCO₃ hydro-chemical facies. The Gibb's diagram depicts the majority of samples fall into the evaporite dominant zone in $[Cl/(Cl + HCO_3)]$ against TDS plot, suggesting that evaporite mineral dissolution is the dominant process regulating ground water and geochemistry of water. The $[Na / (Na + Ca)]$ v/s TDS plot shows rock-water interaction and chemical weathering of rock-forming minerals which cause high fluoride concentration in groundwater of the study area. Agricultural practises, anthropogenic activities, ion exchange, and weathering have all contaminated groundwater in the study area.

Keywords: Ground Water Quality, Hydro-geochemistry, Drinking Water, Contamination. Atal Nagar, Chhatisgarh
