

## HYDROGEOCHEMISTRY OF GROUNDWATER IN BASARA AREA, ADILABAD DISTRICT, ANDHRA PRADESH, INDIA

A. Narsimha and V. Sudarshan

*Department of Applied Geochemistry, Osmania University, Hyderabad, India*

*E-mail: adimallanarsimha@gmail.com , drvsudarshan@yahoo.com*

### Abstract

Groundwater is a significant resource in India for domestic, irrigation and industrial needs. Hydrogeochemical investigations were carried out in selected villages of south-western parts of Adilabad district, where groundwater is the main source of drinking water. The study area is occupied by pink and grey granites of Archaean age. 34 groundwater samples were collected from hand/bore pumps and analyzed for pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS), Total Hardness (TH), Calcium ( $\text{Ca}^{2+}$ ), Magnesium ( $\text{Mg}^{2+}$ ), Sodium ( $\text{Na}^+$ ), Potassium ( $\text{K}^+$ ), Carbonate ( $\text{CO}_3^{2-}$ ), Bicarbonate ( $\text{HCO}_3^-$ ), Chloride ( $\text{Cl}^-$ ), Sulphate ( $\text{SO}_4^{2-}$ ), Nitrate ( $\text{NO}_3^-$ ) and Fluoride ( $\text{F}^-$ ). The results revealed that the mean concentration of cations (in mg/l) is in the order  $\text{Na}^+ > \text{Ca}^{2+} > \text{Mg}^{2+} > \text{K}^+$  while for anions (in mg/l) it is  $\text{Cl}^- > \text{HCO}_3^- > \text{SO}_4^{2-} > \text{NO}_3^- > \text{CO}_3^{2-} > \text{F}^-$ . Fluoride concentration is recorded in the range of 0.06 to 4.33 mg/l. Nearly 41% of groundwater in the study area has more than 1.00 mg/l of fluoride which is the desirable limit and 20% of the groundwater has more than 1.5 mg/l of fluoride which is the permissible limit for drinking purposes. Nitrate concentration is found in the range of 0.4 to 80 mg/l with mean 22.07 mg/l. 20% of the groundwater has more than 45 mg/l of nitrate which is not suitable for drinking purpose. The total dissolved solids (TDS) of the groundwater ranges from 150 to 1355 mg/l in the study area and most of the groundwater falls in freshwater category. The concentration of different ions in the groundwater is shown in the distribution maps.

**Keywords:** Major ion geochemistry, Groundwater, Granitic terrain, Fluoride, Nitrate, Basara, Andhra Pradesh, India.