

## Hydrogeochemical evaluation of groundwater quality in Manair River basin, Telangana, India

RAMA MOHAN KURAKALVA<sup>1,2</sup>, GUDDETI SRAVYA SAI<sup>1,2</sup>, ESWARA VENKATA RAVI KISHORE VEMANA<sup>3,4</sup> AND DEVENDER KUMAR<sup>1,2</sup>

<sup>1</sup>CSIR- NATIONAL GEOPHYSICAL RESEARCH INSTITUTE, HYDERABAD, 500007

<sup>2</sup>Academy of Scientific and Innovative Research (AcSIR)

<sup>3</sup>Academy of Scientific and Innovative Research

<sup>4</sup>CSIR-National Geophysical Research Institute

Presenting Author: krenviron@ngri.res.in

In recent years, groundwater consumption has significantly increased in rural and urban areas for drinking utilization, and extensive agricultural usage that has led to an increase in groundwater dependency, which may contribute to the deterioration of water quality. Therefore, it is vital to evaluate the quality of groundwater to ensure the protection of public health. This study aims to understand the hydrogeochemical processes and evaluate the groundwater quality in Manair River basin. Groundwater samples were collected from 72 wells in a grid pattern to cover the entire study region of Manair River basin, Telangana. The water samples were measured in-situ for pH, EC, TDS using portable meters while major anions and cations are determined using Ion chromatography. The pH value of groundwater varies from 6.38 to 7.52 with an average value of 6.94 indicating the slightly alkaline to acidic nature of the studied aquifer. The abundance of major cations is found in order follows  $\text{Na}^+ > \text{Ca}^{+2} > \text{Mg}^{+2} > \text{K}^+$  whereas anions are  $\text{HCO}_3^- > \text{Cl}^- > \text{NO}_3^- > \text{SO}_4^{2-} > \text{F}^-$ . The dominant hydrogeochemical facies is mixed Ca-Na-HCO<sub>3</sub> type and few of the samples are falling under mixed Ca-Mg-Cl type, Mg-HCO<sub>3</sub> type and Na-Cl type. Fluoride in groundwater found in the range of 0.1 - 2.26 mg/L, whereas nitrate found elevated levels of nitrate and 50% of samples have found beyond the WHO permissible limit of 50mg/L. In conclusion, the Manair River basin's groundwater quality is mainly controlled by natural processes and anthropogenic activities. The findings of this study will help local bodies and stakeholders to supply protected groundwater for drinking usage and planning for its sustainable management.