

Geochemical Modelling in integration with Hydrochemistry to infer groundwater vulnerability in Faridabad District, a industrial Hub of NCR Delhi

KUMARI RINA^{1,2}, P.S. DATTA³, SAUMITRA
MUKHERJEE^{1*}

¹School of Environmental Sciences, Jawaharlal
Nehru University, New Delhi-110067

²Central University of Gujarat, Gandhinagar,
Gujarat-382030

³Independent Consultant on Water and Environment,
Rohini, New Delhi- 110085

After Green revolution, many parts of India are facing groundwater pollution problem in response to agricultural intensification, urbanisation, and industrialisation as well as due to high population growth. One such area is Faridabad district, in National Capital Region Delhi which is also the ninth largest industrial estate in Asia. To reduce the population stress and relocate the economic activities, concept of NCR originated to keep pace with increasing migration and to achieve environmentally sustainable development in the region. In the present study different graphical plots, Piper plot, saturation index values (using PHREEQC) and GIS is used to create the database for analysis of spatial variation in respective water quality parameters as well as to decipher the hydrogeochemical process occurring in the area. It was observed that in addition to the natural processes such as carbonate and silicate weathering, dissolution and ion exchange, leaching of agrichemicals and disposal of waste from various activities is the major factor influencing the groundwater quality. Due to inadequate availability of surface water supply, no pricing exists for groundwater extraction; groundwater overexploitation has resulted in a widespread decline in the water table and intermixing of fresh and contaminated water. The freshwater crisis in this area can be managed by the strict enforcement of regulatory measures restricting unplanned and indiscriminate water abstraction and fertilizer application as well as waste disposal from industries.