

Groundwater Quality Assessment Using Water Quality Index and Geographical Information System Techniques: A Case Study of Busan City, South Korea

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Abstract : The quality of groundwater was evaluated by major ions concentration around Busan city, South Korea. The groundwater samples were collected from 40 wells. The order of abundance of major cations concentration in groundwater is $\text{Na} > \text{Ca} > \text{Mg} > \text{K}$, in case of anions are $\text{Cl} > \text{HCO}_3 > \text{SO}_4 > \text{NO}_3 > \text{F}$. Based on Piper's diagram $\text{Ca}(\text{HCO}_3)_2$, CaCl_2 , and NaCl are the leading groundwater types. While Gibbs diagram suggested that most of groundwater samples belong to rock-weathering zone. Hydrogeochemical condition of groundwater in this city is influenced by evaporation, ion exchange and dissolution of minerals. Water Quality Index (WQI) revealed that 86 % of the samples belong to excellent, 2 % good, 4 % poor to very poor and 8 % unsuitable categories. The results of sodium absorption ratio (SAR), Permeability Index (PI), Residual Sodium Carbonate (RSC) and Magnesium Hazard (MH) exhibit that most of the groundwater samples are suitable for domestic and irrigation purposes.

Keywords : WQI (Water Quality Index), saturation index, groundwater types, ion exchange

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