

GEOCHEMICAL DISTRIBUTION OF GROUNDWATER WITHIN AND AROUND AGO IWOYE, SOUTHWEST NIGERIA.

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Abstract

The need for assessment of suitability of groundwater resources for drinking and irrigation purposes become pertinent in the face of continuous increasing global pollution threats of groundwater. This work assesses the physical and chemical characteristics of the local groundwater resources around Ago Iwoye, southwest, Nigeria, to determine its suitability for drinking and irrigation. Results showed that water samples have generally low total dissolved

solids with range values of 90-534mg/l. pH ranges from 4-7.9 while total hardness varies from 20-221 mg/L CaCO₃ (soft to slightly hard). Ranges of the concentrations of cations for the study area were 1.5-26.5Mg/l, 1.3-15.8Mg/l, 6-48.4Mg/l and 1-8Mg/l for Ca, Mg, Na and K respectively while anion showed ranges of 35-161Mg/l, 24-1463Mg/l and 1.69-36.8Mg/l for HCO₃, Cl and SO₄ respectively.

All the water samples in the study area based on cations and anions fall within safer zone for drinking and irrigation purposes except for Cl and HCO₃ which showed higher values in 10% and 35% of water respectively. The results of Sodium Absorption Ratio (SAR), Magnesium Absorption ratio (MAR), Permeability Index (P.I), Soluble Sodium Percentage (SSP), Residual Sodium Bicarbonate (RSBC), and Kelly ratio (KR) range between 2.15-14.43, 10.49-86.9%, 4.15-22.57%, 28.8-72.02%, -2.1 -2.41 and 0.41-2.41% respectively. All the water samples are excellent for irrigation with regards to all the parameters except MAR and KR which showed hazard in 30% and 50% of water respectively.

All the trace elements analyzed have values below the recommended standard limit except barium in only one sample with value of 909mg/l. The values of pollution index for all sites fall below 1 which confirmed suitability of most of the water samples for both drinking and irrigation purposes. This work showed that the geology appears to have greater influence on the chemical transformation of the groundwater resources especially major elements, compared to any possible effects due to the anthropogenic activities.

Keywords: Water; Quality; Irrigation; Geochemistry; Pollution