

Integrated water resources management of the Idemili River and Odo River drainage basins, Nigeria

E. I. OKORO, B. C. E. EGBOKA, O. L. ANIKE & A. G. ONWUEMESI

Department of Geological Sciences, Nnamdi Azikiwe University, PMB 5025 Awka, Nigeria
reallizkay@yahoo.com; boniegboka@yahoo.com

Abstract Adequate water supply is a pre-requisite for the sustainable development of any economy. In many parts of Nigeria, such as Anambra State, functioning water supplies are totally lacking leaving the population in water scarcity. Poor waste disposal/management exacerbates water management issues resulting in the contamination of available water supply sources. Socio-economic consequences of poor water management also abound, increasing poverty and affecting women and children most. Field and laboratory studies aimed at assessing the sustainable integrated water resources management of the Idemili River and Odo River drainage basins in southeastern, Nigeria, were carried out for sustainable water development of the area. The water table occurs at depths of 7 to 108 m while the calculated aquifer parameters of transmissivity and hydraulic conductivity range between 0.48 and 19.50 m²/day and 0.06 to 3.75 m/day, respectively. The pH of the water resources of the basins is 5.6–7.0 indicating slight acidity. Major ions such as Mg²⁺, Ca²⁺, Cl⁻, NO₃⁻ and SO₄²⁻ occur at concentrations within the WHO recommended permissible limits. High concentrations of Fe²⁺ ranging from 0.01 to 0.9 mg/L were observed in the groundwater of the basins and were attributed to the inherent geology of the area. The areas of high head in the aquifer coincided with areas of groundwater recharge and intensive gully erosion/landslide development associated with the dominant Awka-Umuchu-Orlu escarpment. These areas are recommended for water catchment structures for rainwater harvesting, artificial recharge and gully/landslide control measures. Sustainable water projects for the domestic water supply to the rural poor are recommended based on the quantity/quality of the water resources of the basins.

Key words Nigeria; water quality; geophysical methods; hydrogeochemistry