Vulnerability of Groundwater to Pollution in Akwa Ibom State, Southern Nigeria, using the DRASTIC Model and Geographic Information System (GIS)

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Abstract : Groundwater vulnerability to pollution was assessed in Akwa Ibom State, Southern Nigeria, with the aim of locating areas with high potentials for resource contamination, especially due to anthropogenic influence. The electrical resistivity method was utilized in the collection of the initial field data. Additional data input, which included depth to static water level, drilled well log data, aquifer recharge data, percentage slope, as well as soil information, were sourced from secondary sources. The initial field data were interpreted both manually and with computer modeling to provide information on the geoelectric properties of the subsurface. Interpreted results together with the secondary data were used to develop the DRASTIC thematic maps. A vulnerability assessment was performed using the DRASTIC model in a GIS environment and areas with high vulnerability which needed immediate attention was clearly mapped out and presented using an aquifer vulnerability map. The model was subjected to validation and the rate of validity was 73% within the area of study.

Keywords : groundwater, vulnerability, DRASTIC model, pollution
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