

Environmental Sustainability: How Relevant Is Spatial Information System to Groundwater Quality Assessment?

**Adebayo ELUDOYIN(United Kingdom), Lanre AJIBADE, Oyenike ELUDOYIN,
Abidemi AGBOOLA, Olugbanga OYEKU, Nigeria**

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SUMMARY

The global trend of improvement in information acquisition, processing and presentation has proven valuable in many environmental issues, even in least developed countries. Problems, however, occur when the methodologies are unclear, data unreliable or results not well presented. In Nigeria, researchers have exploited spatial technology to ensure clearer presentation of their observations. The groundwater environment is nonetheless one of the few sectors whose monitoring is yet unclear with spatial information system, hence this case study. This study presents the results of groundwater chemistry from different land use scenarios in Nigeria. Specific objectives are to evaluate the spatial variability in groundwater quality; provide a template for groundwater quality mapping and estimation; and highlight the roles of geospatial information technology to provide informed decisions in this regard. Data examined in this study are locations (x, y coordinates) of groundwater sources and the chemical characteristics (including pH and conductivity) of the water samples from these sources in Ilorin, Akungba-Akoko and Lagos between 2008 and 2009. Data were analysed for spatial variability using relevant geographical information and statistical software. The study showed that spatial variability in groundwater chemistry is proportional to the landuse, and that variability in groundwater quality is less significant ($p>0.05$) in neighbouring locations than the far distant ones. Further study extends to the evaluation of more physico-chemical parameters and regions.