

DEVELOPMENT OF A GROUNDWATER QUALITY MAP OF ILESA WEST LOCAL GOVERNMENT AREA, OSUN STATE NIGERIA- A GIS APPROACH

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ABSTRACT

The spatial distribution of the physico-chemical groundwater quality was assessed with a view to generating a groundwater quality map for Ilesa West local government area (LGA). Well points were selected using stratified random sampling to represent all the 10 wards of the LGA. Water samples were collected from 69 points for a period of one year covering the rainy and dry seasons. The samples were analyzed in the laboratory for pH, electrical conductivity (EC), temperature, total dissolved solids (TDS), chloride, sulphate, nitrate, sodium, potassium (K), calcium, magnesium, hardness, alkalinity and bicarbonate using standard methods. The groundwater quality map was developed using the raster calculator, interpolation technique and water quality index in Arc GIS 10.1 software. Generally, the concentrations of the parameters were within the maximum permissible limits except for pH, TDS, EC and K. The map revealed that the groundwater resources belong to the good water quality based on World Health Organisation (WHO) and Nigeria Industrial Standard (NIS) rating scale except for the South East region that was poor in quality rating. The groundwater in the study area is generally acidic and soft. The study concluded that the effect of human activity and land use may have greatly influenced the concentration of some parameters thus a further study on effect of land use and routine monitoring of the sources were recommended.

Keywords: Ilesa West, Groundwater quality, GIS, WQI, Water quality map.