1.9 Assessment of Groundwater in the State of Khartoum Using Water Quality Index

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Annually the State of Khartoum faces vertical and horizontal extension due to rapid growth in population. 50% of its total water supply comes from groundwater resources. For this reason, the main objective of this research is to assess the quality of groundwater in the State of Khartoum for drinking and domestic purposes using a technique of water quality index (WQI) beside the normal investigation of the physical and chemical properties, statistical analysis, and GIS interpolation. There are different formulae for calculating water quality index (WQI) of which two methods were used in this study, National Sanitation Foundation Index (NSF-WQI) and Weighted Arithmetic Index (WA-WQI). This was carried out by collecting groundwater samples from 53 boreholes scattered in Khartoum, Omdurman, Khartoum North districts. Physical and chemical analysis was carried out using the standard methods. Nine of them were used to calculate their water quality index. The findings of this study revealed that out of 53 boreholes studied using the two methods mentioned above, found that 86.5% water samples were fit for human consumption, were 13.5% of them found to be unfit for human consumption. This technique is easy, economic, and a quick way to assess the quality of water and facilitates communication with lay person, citizens, and decision makers. This fact renders water quality index (WQI) as a useful tool which summarizes data in a single index to be used to understand the state of groundwater quality. It can be applied as well to other water resources.