



Water Scarcity and Sustainable Management in the Nile River Basin of Democratic Republic of Congo: An African Perspective

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Abstract

The Nile River Basin in Democratic Republic of Congo (DRC) faces significant water scarcity challenges, with limited data and poor management practices contributing to this issue. Hydrological models were developed using historical rainfall and streamflow data, while a participatory rural appraisal was conducted to understand local perceptions and practices regarding water resource use. The hydrological model projects an average annual decrease of 10% in surface water availability by due to climate change impacts. Socio-economic analysis revealed that over 60% of the population relies on groundwater for drinking, irrigation, and livestock purposes. Water scarcity is a critical issue affecting both rural livelihoods and environmental sustainability in the DRC Nile Basin. Integrated management strategies are recommended to address these challenges effectively. Implementing water harvesting structures, improving agricultural practices, and enhancing community awareness about sustainable water use can help mitigate future water shortages. The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African Geography, Nile Basin, Sustainable Water Management, Groundwater Extraction, Climate Change Adaptation, Hydrological Modelling, Water Scarcity Analysis*

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