



# Water Scarcity and Sustainable Management in the Nile Basin of Burkina Faso: An African Perspective

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## Abstract

The Nile River Basin in Burkina Faso faces significant water scarcity issues, with limited rainfall and rapid population growth exacerbating these challenges. A stochastic dynamic economic model was employed to simulate future water availability, demand, and supply across different agricultural sectors. Uncertainty analysis incorporated robust standard errors and confidence intervals. Model projections indicate that by , the Nile Basin will experience a 10% reduction in annual rainfall, leading to a projected 20% decrease in water availability for agriculture. The study underscores the need for immediate adaptive management strategies and policy interventions to mitigate future water scarcity impacts on Burkina Faso's agricultural sector. Implementing early warning systems, promoting efficient irrigation practices, and diversifying crop cultivation are recommended to enhance resilience in the face of climate change. The empirical specification follows  $Y = \beta_{0+\beta}^{-} p X + varepsilon$ , and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** Nile River, Burkina Faso, Water Scarcity, Sustainable Development, Stochastic Modelling, Hydrology, Economic Geography

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