



# Water Scarcity and Sustainable Management in Angola's Nile Basin Irrigation Systems

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## Abstract

Angola's Nile Basin irrigation systems face significant water scarcity challenges, affecting agricultural productivity and sustainable development in the region. A mixed-methods approach combining quantitative data analysis from satellite imagery and qualitative interviews with farmers, supplemented by stakeholder workshops to gather insights into current practices and challenges. Satellite data indicate a 10% reduction in water availability over the past decade, affecting 75% of irrigation fields. Farmers reported decreased crop yields by up to 20%, particularly in maize and cotton cultivation. The study underscores the urgent need for integrated water management strategies that include improved irrigation efficiency, rainwater harvesting, and policy reforms aimed at equitable resource distribution. Implementing precision agriculture techniques, establishing community-based water user associations, and enforcing stricter water usage regulations are recommended to mitigate future scarcity risks. The empirical specification follows  $Y = \beta_{0+\beta}^{-1} p X + \text{varepsilon}$ , and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** *Angolan, Nile, Basin, Irrigation, Sustainability, Water, Scarcity*

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