



# Methodological Evaluation of Regional Monitoring Networks in Uganda: A Randomized Field Trial for Cost-Effectiveness Assessment

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## Abstract

In Uganda, regional monitoring networks are crucial for environmental management, yet their cost-effectiveness is not well understood. A randomized field trial will be conducted to assess the performance and costs of different monitoring network configurations. Data collection methods include sensor readings, stakeholder interviews, and financial records analysis. The preliminary findings suggest that a hybrid network configuration combining automated sensors with manual data collection yields the lowest operational costs while maintaining high accuracy levels. This study provides empirical evidence on the cost-effectiveness of regional monitoring networks in Uganda, offering valuable insights for policymakers and practitioners. Based on the findings, recommendations will be made to optimise network configurations and enhance resource allocation for environmental monitoring. The empirical specification follows  $Y = \beta_{0+\beta} p X + \text{varepsilon}$ , and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** *African geography, Randomized trials, Cost-benefit analysis, Environmental monitoring, Network evaluation, Sampling methodologies, Geographic Information Systems (GIS)*

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