



Bayesian Hierarchical Model for Evaluating Municipal Water System Reliability in Nigerian Cities

Afolabi Olayemi¹

¹ Department of Agricultural Economics, University of Ilorin

Published: 27 March 2007 | **Received:** 19 November 2006 | **Accepted:** 26 January 2007

Correspondence: aolayemi@hotmail.com

DOI: [10.5281/zenodo.18843327](https://doi.org/10.5281/zenodo.18843327)

Author notes

Afolabi Olayemi is affiliated with Department of Agricultural Economics, University of Ilorin and focuses on Agriculture research in Africa.

Abstract

Municipal water systems in Nigerian cities often face challenges related to reliability due to factors such as aging infrastructure, supply disruptions, and inadequate maintenance. The proposed methodology will utilise Bayesian statistical techniques to account for spatial heterogeneity and temporal variations in water supply systems. The model will incorporate data from multiple sources including government records, community feedback surveys, and automated meter reading (AMR). The Bayesian hierarchical model provides a robust framework for assessing and improving municipal water system performance in Nigeria, offering insights into areas needing targeted interventions. Policy recommendations include prioritising infrastructure upgrades in high-failure-rate regions, enhancing community engagement to improve AMR data quality, and implementing regular maintenance schedules based on model predictions. The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, reliability assessment, Bayesian statistics, hierarchical modelling, urban water systems, stochastic processes, Monte Carlo simulation*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ **REQUEST FULL PAPER**

Email: info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

Submit at: app.parj.africa



Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge