African Forest Management (Forestry)

Forecasting Adoption Rates in Municipal Water Systems Using Time-Series Models: An Evaluation of Nigerian Practices

Felix Ogunyemi[1]

[1] University of Abuja

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Correspondence: fogunyemi@yahoo.com

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Author notes

Felix Ogunyemi is affiliated with University of Abuja and focuses on Agriculture research in Africa.

Abstract

This study focuses on municipal water systems in Nigeria, highlighting challenges such as inadequate infrastructure and financial constraints. We employed ARIMA (AutoRegressive Integrated Moving Average) model to forecast adoption rates over a five-year period, incorporating data from municipal records in Nigeria. The ARIMA model predicted an average annual increase of 5% in the adoption rate for water treatment technologies, with robust standard errors indicating the reliability of these forecasts. Our findings suggest that timely investment and policy support can significantly enhance the uptake of advanced water management solutions. Local governments should prioritise funding for maintenance and upgrading of existing systems to improve water quality and quantity. Municipal Water Systems, ARIMA Model, Adoption Rates, Nigeria The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African Geography, Time-Series Analysis, ARIMA Models, Econometrics, Infrastructure Development, Financial Constraints, Adoption Rates Measurement*

ABSTRACT-ONLY PUBLICATION

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

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