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Methodological Evaluation of Municipal Water Systems in Nigeria Using Time-Series Forecasting for Adoption Rate Measurement,

Uche Iheanacho[1], **Osita Nwelakwo**[2], **Ikechi Obinna**[3,4], **Chinedu Maduka**[5]

[1] Department of Agricultural Economics, National Centre for Technology Management (NACETEM)

[2] Obafemi Awolowo University, Ile-Ife

[3] University of Benin

[4] National Centre for Technology Management (NACETEM)

[5] Nigerian Institute of Social and Economic Research (NISER)

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Correspondence: uiheanacho@hotmail.com

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Author notes

Uche Iheanacho is affiliated with Department of Agricultural Economics, National Centre for Technology Management (NACETEM) and focuses on Agriculture research in Africa.

Osita Nwelakwo is affiliated with Obafemi Awolowo University, Ile-Ife and focuses on Agriculture research in Africa.

Ikechi Obinna is affiliated with University of Benin and focuses on Agriculture research in Africa.

Chinedu Maduka is affiliated with Nigerian Institute of Social and Economic Research (NISER) and focuses on Agriculture research in Africa.

Abstract

The study aims to evaluate municipal water systems in Nigeria, focusing on their adoption rate over a decade. A longitudinal study employing time-series forecasting methods such as ARIMA (AutoRegressive Integrated Moving Average) to predict adoption trends in Nigerian municipalities. The analysis revealed a fluctuating adoption rate, with a notable increase from onwards, suggesting improved water system efficiency and sustainability measures implemented by municipal authorities. Despite variability, the study confirms the effectiveness of time-series forecasting methodologies for predicting future trends in municipal water systems adoption in Nigeria. Municipalities should continue to implement and monitor water system improvements based on forecasted data to enhance service delivery and public health outcomes. The empirical specification follows $Y = \vec{\beta_{0+\beta}} \, p \, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Geographic, longitudinal, time-series, forecasting, adoption, methodology, water systems, Nigeria*

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