



Methodological Evaluation of Water Treatment Facilities Systems in Nigeria Using Time-Series Forecasting Models

Chinedu Obioha¹

¹ Babcock University

Published: 01 December 2018 | **Received:** 08 August 2018 | **Accepted:** 17 October 2018

Correspondence: cobioha@hotmail.com

DOI: [10.5281/zenodo.18705924](https://doi.org/10.5281/zenodo.18705924)

Author notes

Chinedu Obioha is affiliated with Babcock University and focuses on Engineering research in Africa.

Abstract

This study addresses a current research gap in Engineering concerning Methodological evaluation of water treatment facilities systems in Nigeria: time-series forecasting model for measuring cost-effectiveness in Nigeria. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A structured analytical approach was used, integrating formal modelling with domain evidence. The results establish bounded error under perturbation, a convergent estimation process under stated assumptions, and a stable link between the proposed metric and observed outcomes. The findings provide a reproducible analytical basis for subsequent theoretical and applied extensions. Stakeholders should prioritise inclusive, locally grounded strategies and improve data transparency. Methodological evaluation of water treatment facilities systems in Nigeria: time-series forecasting model for measuring cost-effectiveness, Nigeria, Africa, Engineering, comparative study This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. The maintenance outcome was modelled as $Y_t = \beta_0 + \beta_1 X_t + u_t + \varepsilon_t$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *African Geography, Time-Series Analysis, Forecasting Models, Cost-Effectiveness, System Dynamics, Econometrics, Water Resources Management*

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