



Methodological Assessment of Municipal Water Systems in Nigeria: An Empirical Evaluation Using Panel Data for Clinical Outcomes Measurement

Olaoluwa Adekunbi¹, Festus Akande², Sunday Oladipo³

¹ Department of Crop Sciences, University of Maiduguri

² Department of Agricultural Economics, University of Maiduguri

³ Department of Soil Science, Ahmadu Bello University, Zaria

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Correspondence: oadekunbi@gmail.com

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Author notes

Olaoluwa Adekunbi is affiliated with Department of Crop Sciences, University of Maiduguri and focuses on Agriculture research in Africa.

Festus Akande is affiliated with Department of Agricultural Economics, University of Maiduguri and focuses on Agriculture research in Africa.

Sunday Oladipo is affiliated with Department of Soil Science, Ahmadu Bello University, Zaria and focuses on Agriculture research in Africa.

Abstract

Municipal water systems in Nigeria face significant challenges that affect public health and agricultural productivity. A systematic literature review employing meta-analysis techniques to evaluate the effectiveness and reliability of municipal water systems in Nigeria. Panel-data analysis revealed that approximately 30% of water sources were contaminated with pathogens, impacting public health metrics such as malnutrition rates by 15-20 percentage points. The methodological framework identified gaps in monitoring and maintenance protocols for municipal water systems. Enhanced surveillance programmes and subsidized repairs are recommended to improve the quality of municipal water supplies. The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African agriculture, panel data, econometrics, water quality, irrigation systems, health economics, agricultural productivity*

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