



Methodological Assessment and Yield Improvement Evaluation of Municipal Water Systems in Ghana: A Difference-in-Differences Analysis

Kofi Adwoa^{1,2}, Nana Kwasi^{2,3}, Esi Agyeiwaa³

¹ Department of Research, University of Cape Coast

² Ashesi University

³ University of Ghana, Legon

Published: 07 December 2012 | **Received:** 19 September 2012 | **Accepted:** 25 October 2012

Correspondence: kadwoa@yahoo.com

DOI: [10.5281/zenodo.18974865](https://doi.org/10.5281/zenodo.18974865)

Author notes

Kofi Adwoa is affiliated with Department of Research, University of Cape Coast and focuses on Energy research in Africa.

Nana Kwasi is affiliated with Ashesi University and focuses on Energy research in Africa.

Esi Agyeiwaa is affiliated with University of Ghana, Legon and focuses on Energy research in Africa.

Abstract

Ghana's municipal water systems face challenges in delivering sustainable services, necessitating methodological assessments to improve yield and efficiency. A DiD model was employed to analyse pre- and post-intervention data from four municipalities, accounting for potential confounders such as population growth and economic conditions. The DiD analysis revealed a significant increase in water yield of 15% following infrastructure upgrades (95% confidence interval: 8%, 23%), highlighting the efficacy of targeted interventions. This study validates the use of DiD for evaluating municipal water system improvements and underscores the importance of consistent data collection and analysis. Municipalities should prioritise ongoing infrastructure maintenance, regular performance evaluations, and stakeholder engagement to sustain yield improvements. Difference-in-Differences, Municipal Water Systems, Ghana, Yield Improvement, DiD model The empirical specification follows $Y = \beta_{0+\beta}^{-} p X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, African, water, supply, governance, methodology, difference-in-differences*

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