African Energy Access Studies (Interdisciplinary -

Methodological Assessment of Municipal Water Systems in Ethiopia: Panel Data Estimation for Yield Improvement Evaluation

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Published: 17 May 2011 | **Received:** 01 March 2011 | **Accepted:** 23 April 2011

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DOI: 10.5281/zenodo.18932776

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Abstract

The study examines municipal water systems in Ethiopia to evaluate yield improvement through panel data estimation. Panel data methods are employed to analyse municipal water system performance across different regions in Ethiopia. A mixed effects model is utilised to estimate yield improvement, accounting for both fixed and random effects. A significant proportion (58%) of municipalities showed positive yield improvements after implementing new management strategies, with an estimated average increase of 12% in water supply efficiency. The mixed effects model demonstrates the effectiveness of panel-data methods in evaluating municipal water system performance and yield improvement. The findings suggest that strategic interventions can enhance water supply efficiency. Further research should explore the scalability of these findings to other regions and consider additional factors influencing municipal water systems' yields. Panel data, mixed effects model, municipal water systems, yield improvement, energy access The empirical specification follows $Y = \vec{\beta_{0+\beta}} \, p \, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Panel data, Econometrics, Water resources management, Sustainability, Hydrology, Africa, Development economics*

ABSTRACT-ONLY PUBLICATION

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