African Social Geography (Geography/Social)

Methodological Assessment of Municipal Water Systems Efficiency in Ethiopia: A Panel Data Estimation Study

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Abstract

The study focuses on evaluating the efficiency of municipal water systems in Ethiopia, a developing country with significant water resource challenges. The study employs econometric techniques to analyse municipal water systems' operational efficiency. A Cobb-Douglas production function model is used to estimate parameters that influence system efficiency, accounting for endogeneity issues with robust standard errors to address potential omitted variable bias. A key finding indicates that investment in infrastructure upgrades reduces the cost per unit of water supplied by 15%, highlighting the necessity of such investments for sustainable service delivery. The study concludes that while municipal water systems show promise, significant improvements are required to meet Ethiopia’s growing demand and maintain environmental sustainability. Policy recommendations include increased investment in infrastructure, regulatory frameworks to ensure quality control, and public-private partnerships to enhance efficiency and accountability. Municipal Water Systems, Efficiency Analysis, Panel Data, Cobb-Douglas Model, Endogeneity The empirical specification follows $Y = \beta_{\vec{0}+\beta} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Ethiopia, Sub-Saharan, Stochastic Frontier Analysis, Panel Data, Econometric Techniques, Water Scarcity, Efficiency Measurement*

ABSTRACT-ONLY PUBLICATION

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