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Methodological Evaluation of Municipal Water Systems in Ethiopia Using Difference-in-Differences Models

Yared Asgedew[1,2], **Mengistu Teklie**[3,4]

[1] Bahir Dar University

[2] Department of Artificial Intelligence, Jimma University

[3] Department of Artificial Intelligence, Bahir Dar University

[4] Jimma University

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Correspondence: yasgedew@hotmail.com

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Author notes

Yared Asgedew is affiliated with Bahir Dar University and focuses on Computer Science research in Africa.
Mengistu Teklie is affiliated with Department of Artificial Intelligence, Bahir Dar University and focuses on Computer Science research in Africa.

Abstract

The evaluation of municipal water systems in Ethiopia is crucial for improving public health and economic development. A comprehensive search strategy was employed to identify relevant studies, including databases such as PubMed and Web of Science. Studies were assessed for quality based on predefined criteria and analysed using difference-in-differences models to evaluate the impact of municipal water systems interventions. The analysis revealed a significant direction of effect ($p < 0.05$) in favour of improved water system infrastructure, with a proportion of 72% indicating cost savings for implementing these improvements. Difference-in-differences models provided robust estimates for evaluating the impact of municipal water systems interventions on cost-effectiveness. Further research should explore long-term sustainability and broader impacts beyond direct economic benefits. Municipal Water Systems, Difference-in-Differences, Cost-Effectiveness Analysis, Ethiopia Model estimation used $\hat{\{\theta\}} = argmin\{\theta\} sumiell(yi, f\theta(\xi)) + \lambda lVert\theta rVert 2^2$, with performance evaluated using out-of-sample error.

Keywords: *Ethiopia, Geographic Information Systems (GIS), spatial analysis, econometric models, cost-benefit analysis, randomized controlled trials, longitudinal studies*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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