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Methodological Evaluation of Municipal Water Systems in Kenya Using Quasi-Experimental Design to Measure Risk Reduction

Olara Cherono[1], **James Ole Monyongi**[2], **Nelly Kinyanjui**[3,4]

[1] Department of Soil Science, Moi University

[2] Strathmore University

[3] Department of Crop Sciences, Strathmore University

[4] Moi University

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Correspondence: ocherono@hotmail.com

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Author notes

Olara Cherono is affiliated with Department of Soil Science, Moi University and focuses on Agriculture research in Africa.

James Ole Monyongi is affiliated with Strathmore University and focuses on Agriculture research in Africa.

Nelly Kinyanjui is affiliated with Department of Crop Sciences, Strathmore University and focuses on Agriculture research in Africa.

Abstract

The effectiveness of municipal water systems in reducing health risks associated with contaminated water sources is a critical area for research and policy development in Kenya. A quasi-experimental design was employed to compare pre- and post-intervention data from municipal water supply systems in urban areas of Kenya. Data were collected through surveys and microbial testing of water samples. The analysis revealed a statistically significant reduction ($p < 0.05$) in the prevalence of waterborne diseases post-system improvements, with an estimated effect size of 24%. This study provides robust evidence that municipal water system upgrades can effectively reduce health risks associated with contaminated water sources. Policymakers should prioritise continuous monitoring and upgrading of municipal water systems to maintain high levels of public health protection. Municipal Water Systems, Quasi-Experimental Design, Risk Reduction, Health Benefits, Urban Areas The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Kenya, Quasi-experimental design, Methodology, Public health, Water quality assessment, Randomization, Sampling techniques*

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