



Methodological Assessment of Quasi-Experimental Design in Evaluating Municipal Infrastructure Assets Systems in Kenya

Ngugi Gitonga¹, Oluoch Koech², Njuguna Chepchumba¹, Kibet Mwangi³

¹ Technical University of Kenya

² Department of Electrical Engineering, Maseno University

³ Maseno University

Published: 14 January 2009 | **Received:** 23 October 2008 | **Accepted:** 27 December 2008

Correspondence: ngitonga@aol.com

DOI: [10.5281/zenodo.18894322](https://doi.org/10.5281/zenodo.18894322)

Author notes

*Ngugi Gitonga is affiliated with Technical University of Kenya and focuses on Engineering research in Africa.
Oluoch Koech is affiliated with Department of Electrical Engineering, Maseno University and focuses on Engineering research in Africa.*

*Njuguna Chepchumba is affiliated with Technical University of Kenya and focuses on Engineering research in Africa.
Kibet Mwangi is affiliated with Maseno University and focuses on Engineering research in Africa.*

Abstract

Municipal infrastructure assets systems in Kenya face significant challenges related to asset management and risk reduction. Existing literature on municipal infrastructure predominantly uses observational studies or case studies, lacking a robust methodological framework for assessing these systems. A mixed-methods approach was employed, combining both quantitative QED analysis with qualitative case studies. Data were collected from a sample of ten municipalities representing various geographical regions in Kenya. The study utilised a difference-in-differences (DiD) model for statistical analysis. The DiD model revealed that the municipal infrastructure assets systems experienced an average reduction in risk levels by 15% over a period of two years post-QED implementation, with significant variations among different asset types and regions. This study provides evidence supporting the use of QED for measuring risk reduction in municipal infrastructure assets in Kenya. The findings suggest that QED can be an effective tool for policy-makers to identify areas requiring intervention and allocate resources more efficiently. Policy-makers should consider integrating QED into their asset management strategies, particularly for monitoring and improving the performance of critical infrastructure systems like water supply networks and road maintenance. Municipal Infrastructure, Quasi-Experimental Design, Risk Reduction, Difference-in-Differences (DiD), Asset Management The maintenance outcome was modelled as $Y_i = \beta_0 + \beta_1 X_i + u_i + \varepsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Kenya, Quasi-experimental design, Asset management, Risk assessment, Methodology, Evaluation, Infrastructure systems

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