

A Randomised Field Trial for Cost-Effectiveness Diagnostics of Municipal Infrastructure Asset Management Systems in Senegal

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ABSTRACT

Background: Municipal infrastructure asset management systems (IAMS) in many African nations face chronic underfunding, yet rigorous evidence on the cost-effectiveness of different diagnostic and intervention approaches remains scarce. This creates significant challenges for engineering departments prioritising limited maintenance budgets.

Purpose and objectives: This working paper presents a methodological evaluation of a randomised field trial designed to measure the cost-effectiveness of diagnostic protocols for municipal IAMS. The primary objective is to determine which diagnostic approach yields the most reliable asset condition data per unit of expenditure.

Keywords: *Municipal infrastructure, Asset management, Sub-Saharan Africa, Randomised controlled trial, Cost-effectiveness analysis, Diagnostic evaluation, Developing countries*

Article Highlights

- Clustered randomised field trial compared three diagnostic protocols for infrastructure assessment.
- Risk-based sampling protocol showed significant cost savings versus full physical survey.
- Community-participatory method had higher measurement error for technical parameters.
- Findings support structured, risk-based diagnostics for municipal engineering departments.

Methodological Note

Analysis used a generalised linear model with cluster-robust standard errors to estimate cost differentials between diagnostic protocols.

This trial provides empirical evidence for optimising asset management diagnostics in resource-constrained settings.

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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