



Methodological Assessment of Municipal Water Systems in Uganda: A Randomized Field Trial on Yield Improvement Validation

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Abstract

Ugandan municipal water systems face challenges in delivering adequate supplies to urban populations, necessitating methodological improvements for yield assessment. A two-phase approach was employed: first, a literature review and expert consultation to identify key performance indicators; second, a randomized field trial involving 12 urban areas across Uganda, with yield measurements collected over six months using standardised protocols. The field trial revealed an average yield improvement of 30% in tested systems when employing the enhanced methodology compared to existing practices. This suggests robustness and applicability of the new method. The randomized field trial validated the efficacy of the newly developed methodology for municipal water system yield assessment, offering a practical tool for policy makers and practitioners. Policy makers should integrate this enhanced methodology into their monitoring frameworks to improve resource allocation and service delivery in urban water systems. Model estimation used $\hat{\theta} = \operatorname{argmin}\{\theta\} \operatorname{sumiell}(y_i, f\theta(\xi)) + \lambda \operatorname{Vert}\theta \operatorname{Vert}^2$, with performance evaluated using out-of-sample error.

Keywords: *Sub-Saharan, African, Networks, Modelling, Simulation, Analysis, Geospatial*

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