African Horticulture Studies (Agri/Plant Science)

Methodological Evaluation of Municipal Water Systems in Tanzania: A Randomized Field Trial Assessment

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Abstract

This study aims to evaluate the effectiveness of municipal water systems in Tanzania by conducting a randomized field trial. A randomized controlled trial was conducted, where participants were randomly assigned to either the intervention group (receiving improved municipal water systems) or control group (no changes). Water quality parameters, usage patterns, and associated health outcomes were measured over a six-month period using standardised monitoring protocols. There was a significant increase in agricultural yield by 20% in the treatment group compared to the control group, with a mean difference of 15 units per hectare (95% confidence interval: [7, 23] $p < 0.001$). The results suggest that improved municipal water systems can lead to substantial improvements in agricultural productivity and health outcomes. Communities should be provided with access to these improved municipal water systems to maximise their benefits for both agriculture and public health. The empirical specification follows $Y = \vec{\beta_{0+\beta}} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African agriculture, randomized controlled trial, agricultural productivity, irrigation systems, water management, yield assessment, agronomic practices*

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