



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

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Abstract

Tanzania faces challenges in agricultural productivity due to unreliable water supply systems. A randomized field trial was conducted, with 100 farmers randomly assigned to receive municipal water or a control group. Data on crop yields were collected over two growing seasons using precision agricultural techniques. Average maize yield increased by 25% in the municipal water system group compared to controls (mean = 4.8 t/ha vs. 3.9 t/ha, $p < 0.05$). The randomized field trial demonstrated that municipal water systems can significantly improve crop yields. Further studies should be conducted with larger sample sizes and in diverse geographical regions to validate these results. municipal water systems, agricultural yield, Tanzania, precision agriculture

Keywords: *African agriculture, irrigation systems, randomized trials, yield assessment, methodological evaluation, sustainable water management, agricultural productivity*

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