African Animal Welfare Studies (Agri/Animal Science)

Methodological Evaluation Framework for Municipal Water Systems in Uganda Using Difference-in-Differences Analysis: Impacts on Yield Improvement Assessment

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Published: 04 May 2009 | **Received:** 21 November 2008 | **Accepted:** 08 March 2009

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DOI: 10.5281/zenodo.18888846

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Abstract

Municipal water systems in Uganda have been implemented to improve agricultural productivity by providing consistent and reliable irrigation water sources. A DiD model will be employed to assess the differential effects of municipal water systems before and after their introduction compared to control areas without such systems. Uncertainty in the estimates will be quantified using robust standard errors. This study provides evidence for the effectiveness of municipal water systems in enhancing agricultural yields in Uganda, offering a robust framework for policy and investment decisions. Investment in municipal water systems should be prioritised to support smallholder farmers, especially those located in arid areas with limited natural resources. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, irrigation, agricultural productivity, difference-in-differences, econometrics, sustainability, water resource management*

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