



# Methodological Evaluation of Secondary Schools Systems in Uganda Using Difference-in-Differences Analysis

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### Abstract

This study addresses a current research gap in Computer Science concerning Methodological evaluation of secondary schools systems in Uganda: difference-in-differences model for measuring yield improvement in Uganda. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A structured analytical approach was used, integrating formal modelling with domain evidence. The results establish bounded error under perturbation, a convergent estimation process under stated assumptions, and a stable link between the proposed metric and observed outcomes. The findings provide a reproducible analytical basis for subsequent theoretical and applied extensions. Stakeholders should prioritise inclusive, locally grounded strategies and improve data transparency. Methodological evaluation of secondary schools systems in Uganda: difference-in-differences model for measuring yield improvement, Uganda, Africa, Computer Science, replication study This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. Model estimation used  $\hat{\theta} = \underset{\theta}{\operatorname{argmin}} \{ \sum_{i=1}^n \ell(y_i, f_{\theta}(\xi_i)) + \lambda \|\theta\|_2^2 \}$ , with performance evaluated using out-of-sample error.

**Keywords:** *Sub-Saharan, stratification, econometrics, randomized controlled trials, clustering analysis, propensity scores, mediation analyses*



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