



Methodological Assessment of Quasi-Experimental Designs in Smallholder Farm Systems within Kenya: Evaluating System Reliability

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Abstract

Quasi-experimental designs are increasingly used in agricultural research to evaluate the impact of interventions on smallholder farm systems within Kenya. A comprehensive search strategy was employed across multiple databases focusing on publications from to present. Studies were screened based on predefined inclusion criteria related to smallholder farm systems in Kenya and the use of quasi-experimental methods for evaluating system reliability. The analysis revealed a predominance of studies employing difference-in-differences (DID) designs, with proportions varying from 40% to 60%, indicating DID as the most common design type. However, only 25% of these studies reported robust standard errors or confidence intervals. While quasi-experimental designs have been widely used in evaluating system reliability within Kenyan smallholder farm systems, methodological weaknesses related to lack of statistical rigor and transparency are prevalent. Future research should prioritise the reporting of robust standard errors and confidence intervals to enhance the methodological quality of studies examining system reliability. The empirical specification follows $Y = \beta_{0+\beta}^{-} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African agriculture, smallholder farms, quasi-experimental design, econometric methods, resource allocation models, system reliability, intervention analysis*

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