African Fisheries Science (Fisheries/Aquatic)

Framework for Methodological Evaluation of Smallholder Farms Systems in Uganda Using Multilevel Regression Analysis for Adoption Rates

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Published: 11 March 2000 | **Received:** 20 January 2000 | **Accepted:** 24 February 2000

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DOI: 10.5281/zenodo.18713048

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Abstract

Smallholder farms in Uganda face varying levels of adoption to modern agricultural practices, necessitating a robust methodological framework for evaluation. The proposed framework will utilise multilevel regression models to account for both individual farmer behaviors and contextual influences from village-level factors. The analysis will include hierarchical data structures, ensuring that variation within and between farms is appropriately accounted for. This framework provides a comprehensive methodological approach for understanding and influencing adoption dynamics within Ugandan agricultural systems. The use of multilevel regression analysis should be encouraged to enhance the accuracy and reliability of adoption rate estimations, thereby informing targeted interventions aimed at promoting sustainable farming practices among smallholders. The empirical specification follows $Y = \vec{\beta_{0+\beta}} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African context, multilevel modelling, smallholder farming, agricultural adoption, regression analysis, spatial econometrics, qualitative research methods*

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