African Security Studies (Interdisciplinary - Social/Political focus)

Methodological Assessment and Time-Series Forecasting of Smallholder Farm Systems in Uganda: Evaluating System Reliability

Mulumba Nkatha[1]

[1] Makerere University, Kampala

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Correspondence: mnkatha@yahoo.com

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Author notes

Mulumba Nkatha is affiliated with Makerere University, Kampala and focuses on Computer Science research in Africa.

Abstract

Smallholder farming systems in Uganda face significant challenges related to resource management and market integration, necessitating methodological assessments and advanced forecasting techniques for enhancing system reliability. This systematic literature review employs rigorous search strategies across multiple databases focusing on scholarly articles published since . Methodological rigor is assessed using predetermined inclusion and exclusion criteria, ensuring a comprehensive evaluation of existing research. The analysis reveals that while some studies employ robust statistical models for forecasting system reliability, there remains variability in the application of these methods across different regions and contexts within Uganda. The findings suggest that integrating advanced time-series forecasting techniques can significantly improve the reliability of smallholder farm systems by providing actionable insights into resource management and market integration strategies. To maximise the impact of forecasting models, future research should focus on developing localized forecasting frameworks tailored to specific regions in Uganda. Additionally, enhancing data collection methods would facilitate more accurate and reliable predictions. Model estimation used $\hat{\{\theta\}} = argmin\{\theta\} sumiell(yi, f\theta(\xi)) + \lambda lVert\theta rVert 2^2$, with performance evaluated using out-of-sample error.

Keywords: *Sub-Saharan, Agrarian, Evaluation, Systematic, Literature, Spatio-Temporal, Modelling*

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