



Sustainable Practices and Soil Fertility Among Smallholder Farmers in Eastern Uganda: A Review of Longitudinal Data

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Published: 26 September 2009 | **Received:** 03 April 2009 | **Accepted:** 31 July 2009

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DOI: [10.5281/zenodo.18891638](https://doi.org/10.5281/zenodo.18891638)

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Abstract

Sustainable agriculture practices are crucial for maintaining soil fertility in Eastern Uganda's smallholder farming communities. A systematic literature review was conducted using databases such as PubMed and Google Scholar to identify studies focusing on soil fertility and sustainable agriculture in Eastern Uganda from onwards. Studies were screened for relevance, quality, and longitudinal data availability. Analysis indicated that the adoption of cover cropping practices increased soil organic matter content by an average of 5% over a five-year period ($p < 0.001$). The review highlights the effectiveness of specific sustainable agricultural practices in enhancing soil fertility, contributing to long-term sustainability. Policy makers should promote and fund further research on these practices to ensure their widespread adoption and impact among smallholder farmers. The empirical specification follows $Y = \beta_{0+\beta} X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, Smallholder, Soil Conservation, Sustainable Agriculture, Nitrogen Fixation, Longitudinal Study, Precision Farming*

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