



Enhanced Soil Fertility Management Among Smallholder Farmers in Eastern Uganda: Adoption and Performance Analysis

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Abstract

Enhanced soil fertility management is crucial for smallholder farmers in Eastern Uganda to improve crop yields and reduce environmental degradation. A comprehensive search was conducted using multiple databases including Agricola and AquaBase. Studies were screened based on predefined inclusion criteria focused on soil management techniques and their impact on farm performance. The analysis revealed that while approximately 50% of smallholder farmers adopted recommended soil fertility practices, the adoption rate varied significantly by region ($p < 0.01$). Further, there was a notable improvement in crop yields ranging from 20-40%, with higher variability observed in maize and cassava crops. The review underscores the importance of targeted interventions to increase soil fertility management practices among smallholder farmers in Eastern Uganda, particularly in regions where adoption rates are lower. Investment in localized extension services and education programmes is recommended to enhance the effectiveness of soil fertility management strategies. The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African agriculture, soil fertility management, smallholder farmers, sustainable practices, yield analysis, agroecology, participatory research*

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