African Land Degradation Studies (Environmental/Earth Science)

Analysing Long-term Zero-Grain Intercropping Effects on Agricultural Productivity in Northern Ghana Villages,

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Abstract

Zero-grain intercropping involves planting different crops in a single field without soil disturbance between crops. This method is often used to enhance biodiversity and reduce soil erosion. Agricultural yield data from five villages were collected annually using a standardised yield assessment protocol. Data analysis employed a mixed-effects model to account for spatial and temporal variability. Maize yields increased by an average of 12% over the study period, with sorghum showing a consistent growth rate of 8%, indicating potential benefits from intercropping strategies. The intercropping system demonstrated positive impacts on crop productivity in Northern Ghana villages, suggesting its suitability for sustainable agricultural practices. Further research should explore the economic feasibility and scalability of zero-grain intercropping systems across different farming contexts. Zero-grain intercropping, agricultural productivity, mixed-effects model, yield assessment, Northern Ghana The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Geographical Indicators, Intercropping Systems, Soil Conservation, Biodiversity Enhancement, Sustainability Studies, Experimental Design, Climate Change Adaptation*

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