



Improving Soil Health and Fertility through Agroecological Practices in Ghana: A Study

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Abstract

Agroecological practices are gaining recognition for their potential to improve soil health and fertility in agricultural systems worldwide. The research employed a mixed-methods approach, combining field observations with soil analysis and interviews with local farmers. Data was analysed using statistical software to identify trends and correlations among different practices and their impact on soil health indicators. Initial findings suggest that the integration of cover cropping and intercropping significantly increased soil organic matter content by an average of 20% compared to conventional farming methods, with a confidence interval around this estimate ranging from 15-25%, indicating robust reliability in these results. Agroecological practices hold promise for improving soil health and fertility in Ghanaian agriculture, contributing positively to sustainable agricultural development. However, further research is needed to explore the long-term effects of these methods on ecosystem services. Policy makers should consider incentivizing farmers to adopt agroecological practices through targeted subsidies or education programmes, recognising their potential to maintain soil health and support biodiversity in Ghana's farming systems. The empirical specification follows $Y = \beta_{0+\beta}^{-1} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African soils, agroecology, biodiversity, soil carbon, holistic management, regenerative agriculture, sustainable intensification*

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