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

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Abstract

Soil health in Ghana is crucial for sustainable agriculture, yet traditional farming practices often lead to soil degradation and reduced fertility. A mixed-method approach was employed, combining soil analysis (using a Pearson correlation coefficient model for nutrient correlations) with farmer interviews and participatory workshops. Soil samples were collected from 20 plots across three regions in Ghana, and data on agroecological practices were gathered through structured questionnaires. Soil organic matter content increased by an average of 15% after implementing agroecological interventions such as cover cropping and intercropping. This trend was observed in all study areas with a significant correlation ($r = 0.72$, $p < 0.05$). Agroecological practices can significantly improve soil health in Ghanaian agricultural settings, leading to enhanced crop productivity and environmental sustainability. The methodology developed should be replicated across more regions to validate its effectiveness and scale up agroecological interventions for broader adoption. Soil Health, Agroecology, Ghana, Mixed-Methods Approach

Keywords: *Geographical Indicators of Africa, Agroecology, Soil Conservation Techniques, Participatory Rural Appraisal, Ecosystem Services Assessment, Indicator-Based Monitoring, Sustainable Agriculture Models*