African Ocean Biology (Earth/Environmental Science)

Indigenous Plant-Based Sustainable Agriculture Interventions and their Impact on Yield Variability and Soil Fertility in West African Villages, Uganda

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Abstract

Sustainable agriculture interventions are crucial for improving crop yields and soil health in marginalized communities, particularly those with limited access to modern inputs such as fertilizers or pesticides. Agricultural trials were conducted across multiple sites, employing a randomized block design to assess the impact of various indigenous plants on crop yields and soil nutrient levels. Soil samples were analysed for key macronutrients using a standard pH meter. Indigenous plant species demonstrated significant variability in their contributions to yield improvement, with some varieties showing a 20% increase in maize yields compared to conventional farming practices. The study underscores the potential of indigenous plants as sustainable alternatives for enhancing agricultural productivity and soil health in marginal environments. Further research should focus on scaling up successful interventions and exploring additional plant species that could complement existing agricultural systems. Indigenous Plants, Sustainable Agriculture, Yield Variability, Soil Fertility Restoration The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African savanna, agroforestry, biodiversity, soil conservation, indigenous crops, yield variability, sustainable intensification*

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