African Urban-Rural Linkages (Interdisciplinary - Social/Geography/Policy)

Implementing Climate-Smart Agriculture in Northern Nigerian Villages: Soil Fertility and Biodiversity Indices Assessment

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Abstract

Climate-smart agriculture (CSA) is a set of practices designed to enhance agricultural productivity while reducing greenhouse gas emissions and increasing resilience to climate change in developing countries. In Nigeria, CSA techniques are being implemented in northern villages to improve soil fertility and biodiversity indices. A comparative design was employed, with two groups: one group adopting CSA practices and another using traditional farming methods. Soil samples were collected from each village at three different depths for analysis of key indicators such as organic matter content, pH levels, and microbial biomass. Biodiversity indices were assessed through the number and diversity of plant species observed in the field. The study found that CSA techniques significantly increased soil organic matter content by an average of 20% compared to traditional farming methods (95% confidence interval: +17% to +23%). The results suggest that implementing CSA practices can be effective in improving agricultural sustainability and biodiversity in northern Nigerian villages. Future research should focus on long-term impacts of CSA and explore the socio-economic factors influencing farmers' adoption of these techniques. Climate-Smart Agriculture, Soil Fertility, Biodiversity Indices, Northern Nigeria The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, CSA practices, agroecology, soil health indicators, biodiversity indices, carbon sequestration, sustainable intensification*

ABSTRACT-ONLY PUBLICATION

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