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Modeling Climate Change and Soil Health Impacts on the Production of Exotic Cayenne Peppers in Coastal Region of Nigeria

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The coastal regions of Nigeria face increasing threats from climate change, including rising temperatures, erratic rainfall patterns, poor soil chemistry and sea-level rise, all of which have profound implications for soil health and agricultural productivity. This study employed advanced climate projection models integrated with soil health simulation tools to assess the potential impacts of climate change with focus on temperature dynamics on the domestication of exotic Cayenne pepper varieties, commonly imported into Bayelsa from other regions of the country due to vulnerable coastal zones. Fluctuations in temperature were correlated with key soil health indicators. The study also utilized crop response models to simulate growth dynamics of selected exotic pepper cultivars under variable environmental stressors. Findings indicate that declining soil quality and rising temperatures could significantly reduce pepper growth performance unless adaptive soil and crop management strategies are implemented. The results emphasize the need for site-specific interventions and climate-resilient agro-based practices to sustain exotic pepper production and ensure food and economic security in Nigeria's coastal agro-ecological zones

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