



Climate Smart Agriculture Practices and Maize Yield Enhancement in Mozambique's Coastal Regions: A Two-Year Impact Study

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Abstract

Climate change poses significant challenges to agricultural productivity in coastal regions of Mozambique, particularly affecting maize yields. Climate Smart Agriculture (CSA) practices are being promoted as a viable solution to mitigate these impacts. The research employed a randomized controlled trial design, with 50 randomly selected farmers implementing CSA practices while another group continued conventional farming methods. Data was collected through quarterly surveys and field assessments. CSA practices led to an average maize yield increase of 12% compared to the control group ($p < 0.05$), with higher yields observed in areas with more consistent rainfall patterns. The study confirms that CSA practices can significantly enhance maize yields in Mozambique's coastal regions, particularly when combined with adaptive management strategies tailored to local conditions. Government and development agencies should invest in capacity-building programmes for farmers on implementing CSA practices, while also advocating for climate-resilient infrastructure investments. Model estimation used $\hat{\theta} = \text{argmin} \{ \theta \} \text{sumiell} (y_i, f\theta(\xi)) + \lambda l \text{Vert} \theta r \text{Vert} 2^2$, with performance evaluated using out-of-sample error.

Keywords: *African Geography, Climate Change Adaptation, Integrated Farming Systems, Precision Agriculture, Yield Modelling, Sustainable Land Management, Remote Sensing Technology*

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