



Climate-Resilient Farming Techniques in Benin's Arid Zones: Adoption and Productivity Dynamics

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Abstract

Climate change is increasingly affecting agricultural productivity in Benin's arid zones, necessitating innovative solutions to enhance resilience and sustainability of farming practices. A mixed-methods approach was employed, including surveys and focus group discussions to assess CRFT adoption rates and farmer perceptions. Statistical analyses were conducted using logistic regression models to explore the relationship between CRFT adoption and yield outcomes. Results indicate that farmers in arid zones showed a moderate (30-45%) adoption rate of CRFT, with significant improvements in crop yields ranging from 12% to 25% compared to conventional farming methods. The findings suggest that targeted training programmes and incentives can significantly increase the uptake of CRFT among farmers, thereby enhancing agricultural productivity under changing climatic conditions. Policy makers should invest in comprehensive farmer education initiatives and provide financial support for implementing climate-resilient practices to ensure sustainable agricultural development. Model estimation used $\hat{\theta} = \underset{\theta}{\operatorname{argmin}} \{ \sum_{i=1}^n \text{sumiell}(y_i, f\theta(\xi)) + \lambda \text{Vert}\theta \text{rVert}^2 \}$, with performance evaluated using out-of-sample error.

Keywords: *African Geography, Climate Change Adaptation, Soil Conservation Techniques, Participatory Action Research, Farmer Field Schools, Agricultural Productivity, Integrated Pest Management*

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