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Enhancing Cotton Yield through Adoption of Climate Smart Agriculture: A Case of Smallholder Farmers in Bariadi District, Tanzania

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Abstract

Climate variability threatens cotton farming in Tanzania, highlighting the need for sustainable strategies to boost smallholder productivity and resilience. This study aimed to establish the effects of Climate Smart Agriculture (CSA) practices on cotton yield among smallholder farmers in Bariadi District, Simiyu Region, Tanzania. Specifically, the study sought to determine the effects of CSA practices on cotton yield among cotton smallholder farmers. A cross-sectional research design was employed, and data were collected using structured questionnaires from a sample of 384 smallholder cotton farmers. Descriptive analysis revealed varied levels of CSA adoption, with intercropping, soil and water conservation, and integrated pest management being among the most practiced. The Ordinary Least Squares (OLS) regression analysis was used to estimate the effects of CSA practices and selected socio-economic factors on cotton yield. The results showed that adoption of intercropping, integrated pest management, soil and water conservation techniques, efficient irrigation methods, and access to CSA-related training had statistically significant positive effects on cotton yield. Moreover, farm size and having alternative sources of income particularly government employment and commercial work were also positively associated with increased cotton production. The study concludes that CSA practices significantly contribute to higher cotton yield and potentially enhance household income. Therefore, it is recommended that local government authorities and Ministry of Agriculture strengthen agricultural extension services and prioritize regular on-farm training and demonstration programs to improve farmers' awareness and practical adoption of CSA practices.

Keywords: *Climate Smart Agriculture, cotton yield, smallholder farmer*

