Digital Agriculture Tools Adoption and Yield Enhancements Among Smallholder Farmers in Mozambique's Agricultural Zones, 2000s Context

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Abstract

Digital agriculture tools have been increasingly adopted by smallholder farmers globally to enhance productivity and efficiency in agricultural practices. A mixed-methods approach was employed, including surveys and interviews to gather data from 150 randomly selected smallholder farmers across three major agricultural regions in Mozambique. Adoption rates of digital tools were found to be higher among younger farmers (aged 25-40) compared to older groups at 78% vs. 63%, respectively, with a significant increase in maize yields by 15% for adopters using soil moisture sensors. Digital agriculture tools have demonstrated potential as a viable solution for increasing productivity among Mozambique's smallholder farmers. Policy makers should prioritise the provision of digital infrastructure and training programmes to promote wider adoption of these technologies in rural areas. Model estimation used $\hat{\{\theta\}} = argmin\{\theta\} \, sumiell(yi, f\theta(\xi)) + \lambda lVert\theta rVert 2^2$, with performance evaluated using out-of-sample error.

Keywords: *African Agriculture, Geographic Information Systems (GIS), Participatory Action Research, Precision Farming, Smallholder Farmers, Sustainable Agricultural Practices, Yield Gains*

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