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Examining Adaptive Strategies of Smallholder Tomato Farmers in Response to Climate Change in Mpumalanga Province, South Africa

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Abstract

Climate change presents significant challenges to smallholder tomato farmers in South Africa, threatening productivity, livelihoods, and food security. This study investigates the adaptive strategies employed by smallholder tomato farmers in Mpumalanga Province to cope with climate variability. Using a cross-sectional, mixed-methods design grounded in pragmatism and deductive reasoning, the study integrates quantitative and qualitative approaches to provide a holistic understanding of adaptation practices. Quantitative data will be collected from smallholder tomato farmers during the 2024/2025 production season, while qualitative insights from key informants will contextualize the findings. A stratified random sampling approach by districts, followed by simple random sampling within strata, will target 200–250 farmers, with sample size determined using Cochran’s formula for unknown populations (Cochran, 1977). Data analysis will employ descriptive and inferential statistics including correlation coefficients, chi-square tests, and multiple linear regression complemented by thematic analysis of qualitative data. The study seeks to identify effective adaptation strategies, examine their determinants, and provide evidence-based recommendations to strengthen resilience among smallholder tomato farmers. Findings are expected to inform policy development, extension services, and the implementation of climate-smart agricultural practices.

Keywords: Adaptation Strategies, Climate Change, Climate-Smart Agriculture, Smallholder Farmers, Tomato Production