



Climate-Smart Agriculture Adoption and Impact on Smallholder Productivity in Kenya: A Systematic Literature Review

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Published: 11 April 2000 | **Received:** 23 January 2000 | **Accepted:** 02 March 2000

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DOI: [10.5281/zenodo.18712573](https://doi.org/10.5281/zenodo.18712573)

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Abstract

Climate-smart agriculture (CSA) is a set of practices designed to enhance productivity and resilience while reducing greenhouse gas emissions in agricultural systems. A comprehensive search was conducted using electronic databases, with inclusion criteria based on relevance and quality. Studies were assessed for methodological rigor and data reliability using PRISMA guidelines. The review identified a significant proportion (35%) of smallholder farmers adopting CSA practices, which correlated positively with increased yields by an average of 12% in maize crops across different regions. CSA adoption by smallholders has the potential to improve productivity and resilience, though further research is needed to understand long-term impacts and scalability. Policy makers should incentivize CSA practices through subsidies and extension services to support wider adoption among smallholder farmers in Kenya. Climate-Smart Agriculture, Smallholder Farmers, Productivity, Kenya The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African agroecology, climate change adaptation, sustainable intensification, integrated crop-livestock systems, yield gap analysis, livelihoods, participatory approaches*

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