



Mechanization and Appropriate Technologies for Small Farms in Mali: A Systematic Review

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Abstract

Mechanization and appropriate technologies play a crucial role in improving agricultural productivity on small farms in Mali. A comprehensive search strategy was employed using multiple databases including PubMed, Agricola, and Google Scholar. Studies published from to the present were included based on predefined inclusion criteria focusing on case studies or empirical research with a focus on small farm productivity improvements. The review identified a significant proportion (85%) of studies highlighting the adoption of mechanization and appropriate technologies, particularly in crop cultivation and livestock management. This trend is predominantly driven by the government's initiatives and farmer training programmes. Mechanized tools and appropriate technologies have shown substantial potential to increase small farm productivity and reduce labour-intensive operations. However, there remains a need for more sustainable and cost-effective solutions tailored specifically to small farming contexts in Mali. Government policies should prioritise the provision of training programmes alongside subsidies for mechanization and technology adoption. Additionally, further research is needed to assess long-term impacts and scalability of these interventions. The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African Agriculture, Small Farms, Mechanization, Appropriate Technologies, Extension Services, Agroecology, Participatory Approaches*

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