African Silviculture (Forestry)

Mechanization and Appropriate Technologies for Small Farms in Mali

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Abstract

Mechanization in small-scale farming practices is increasingly recognised as a critical factor for improving productivity and sustainability in Mali's agricultural sector. A mixed-method approach combining quantitative surveys with qualitative interviews was employed to assess the impact of mechanized tools and technologies on farm productivity and resource use among small-scale farmers in Mali. Results from the survey indicate that the adoption of combine harvesters has led to a significant increase in cereal crop yields by approximately 15% compared to non-adopting farms, with an average yield gap reduction of 20% across all surveyed regions. The findings underscore the potential for mechanization as a viable strategy for increasing agricultural productivity on small farms, particularly when tailored to local conditions and resources. Policy makers are recommended to support further research into the long-term sustainability of these technologies and to develop targeted extension programmes aimed at promoting technology adoption among small farmers in Mali. Mali, small-scale farming, mechanization, appropriate technologies, productivity enhancement The empirical specification follows $Y = \vec{\beta_{0+\beta}} \, p \, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African geography, Small-scale farming, Mechanization, Appropriate technology, Sustainable agriculture, Mixed-methods, Participatory research*

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