African Swine Science (Agri/Animal Science)

Mechanization and Appropriate Technologies for Sustainable Small Farms in Mali

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Abstract

Mechanization and appropriate technologies are crucial for enhancing productivity on small farms in Mali, where traditional farming methods often lead to inefficiencies and environmental degradation. A mixed-methods approach was employed, combining quantitative data from field surveys with qualitative insights through focus group discussions and interviews. The survey collected information on farm characteristics, production outputs, and resource utilization patterns using a Likert scale questionnaire designed to assess the impact of technology adoption. The findings indicate that the implementation of mechanized solutions such as power tillers and solar-powered irrigation systems significantly improved crop yields by an average of 25% compared to non-mechanized farms, particularly in maize production. Additionally, there was a notable reduction in labour costs by approximately 30%, which positively influenced farmers' decision-making regarding technology investment. The study underscores the potential of mechanization and appropriate technologies as viable pathways for enhancing agricultural sustainability on small farms in Mali. Encouragement should be given to small-scale farmers to adopt these technologies through targeted support programmes, including financial incentives and training sessions. Moreover, policymakers need to prioritise the development of infrastructure supporting these technologies to facilitate wider adoption. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, Agricultural, Sustainable, Farming, Systems, Mechanization, Agroecology, Tithe-Methods*

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