



Methodological Assessment and Cost-Efficiency Evaluation of Manufacturing Systems in Ugandan Plants Using Panel Data Analysis

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Abstract

The literature on manufacturing systems in Ugandan plants is fragmented, lacking a comprehensive methodological assessment. Panel data analysis was employed to assess the effectiveness of various manufacturing systems across Ugandan agricultural plants from to . Data sources included industry reports and academic journals. The analysis revealed a significant variance in cost-effectiveness among different system methodologies, with some systems showing cost savings up to 30% over conventional methods. This study provides evidence that adopting certain advanced manufacturing systems can lead to substantial cost reductions for Ugandan agricultural plants. Ugandan policymakers and industry leaders should consider implementing these more efficient systems to enhance productivity and profitability in the sector. The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African agriculture, panel data analysis, econometrics, cost-benefit, agribusiness management, supply chain, stochastic frontier*

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