



# Methodological Framework for Evaluating Manufacturing Plant Systems Adoption in Uganda Using Multilevel Regression Analysis

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**Published:** 25 October 2011 | **Received:** 31 August 2011 | **Accepted:** 08 October 2011

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**DOI:** [10.5281/zenodo.18924905](https://doi.org/10.5281/zenodo.18924905)

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## Abstract

The adoption of manufacturing plant systems in Uganda has been a topic of interest for researchers aiming to enhance productivity and environmental sustainability. Despite efforts by various stakeholders, consistent data on system adoption rates are scarce due to methodological challenges. The study employs multilevel regression analysis, leveraging data from existing surveys on manufacturing operations in Uganda. This method allows for the examination of both individual-level (plant managers) and organisational-level (industry sectors) influences on system adoption. This theoretical framework provides a robust methodological foundation for future empirical studies on manufacturing system adoption in Uganda, offering insights into the complex interplay between technological readiness and economic incentives. Future research should validate these findings through empirical data collection and analysis, potentially expanding the scope to include additional factors such as regulatory compliance and environmental impact assessment. The empirical specification follows  $Y = \beta_{0+\beta} p X + \text{varepsilon}$ , and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** *Sub-Saharan, multilevel, regression, sustainability, innovation, framework, productivity, context*

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