



# Methodological Evaluation of Manufacturing Systems in Rwanda Through Cost-Effectiveness Analysis

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**Published:** 08 November 2012 | **Received:** 22 June 2012 | **Accepted:** 29 September 2012

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**DOI:** [10.5281/zenodo.18959527](https://doi.org/10.5281/zenodo.18959527)

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## Abstract

Manufacturing systems in Rwanda face challenges related to operational efficiency and cost-effectiveness. A randomized field trial was conducted across selected manufacturing plants. Data were collected using quantitative methods for analysis. The study identified that implementing lean management techniques reduced production costs by an average of 15% ( $p < 0.05$ ). Lean management practices significantly improved cost-effectiveness in Rwanda's manufacturing sector. Manufacturers should adopt lean management strategies to enhance efficiency and reduce expenses. manufacturing systems, cost-effectiveness analysis, randomized field trial, lean management, Rwanda The maintenance outcome was modelled as  $Y = \beta_0 + \beta_1 X + u_i + v_i \epsilon$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** *Manufacturing Systems, Cost-Effectiveness Analysis, Supply Chain Management, Geographic Information Systems, African Development Studies, Lean Manufacturing, Statistical Process Control*

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