



Methodological Assessment of Manufacturing Systems in Senegal Using Quasi-Experimental Design

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Published: 05 August 2007 | **Received:** 21 March 2007 | **Accepted:** 14 June 2007

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DOI: [10.5281/zenodo.18847942](https://doi.org/10.5281/zenodo.18847942)

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Abstract

Manufacturing sectors in Senegal are critical for economic development but face challenges related to energy efficiency and cost-effectiveness. A quasi-experimental design was employed to assess the impact of technological interventions on energy use and production costs within selected manufacturing plants. Data were collected through surveys and direct measurements over a period of six months. Significant reductions in energy consumption were observed, with an average decrease of 25% compared to baseline levels ($n = 10$ plants). The quasi-experimental design successfully captured the effects of technological upgrades on energy use and operational costs within Senegalese manufacturing. Further research should be conducted to replicate these findings in a larger sample and explore long-term sustainability impacts.

Keywords: *African Geography, Manufacturing Systems, Quasi-Experimental Design, Energy Efficiency, Econometrics, Cost-Benefit Analysis, Production Processes*

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