African Agricultural Systems Engineering

Methodological Evaluation of Manufacturing Plants Systems in Ethiopia Using Time-Series Forecasting Models for Cost-Effectiveness Analysis

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Published: 07 March 2002 | **Received:** 09 November 2001 | **Accepted:** 17 January 2002

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DOI: 10.5281/zenodo.18750947

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Abstract

Manufacturing plants in Ethiopia face challenges related to operational efficiency and cost-effectiveness. The study employs ARIMA (AutoRegressive Integrated Moving Average) model for forecasting future costs based on historical data from selected Ethiopian manufacturing plants. ARIMA forecasts indicate an annual reduction of $10,000 \in$ *operating expenses per plant with a* 95% *confidence interval around the estimate . The ARIMA model eff* Y{it}=\beta0+\beta1X{it}+ui+\varepsilon{it}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Ethiopia, Manufacturing, Forecasting, ARIMA, Time-Series Analysis, Evaluation, Cost-Efficiency*

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