



Methodological Assessment of Manufacturing Systems Yield Improvement in Ethiopian Plants: A Randomized Field Trial

Kebede Gebreab¹, Fikru Asfaw^{2,3}, Tekle Yohannis Berhane^{4,5}

¹ Department of Interdisciplinary Studies, Addis Ababa University

² Department of Advanced Studies, Addis Ababa University

³ Adama Science and Technology University (ASTU)

⁴ Department of Interdisciplinary Studies, Adama Science and Technology University (ASTU)

⁵ Department of Advanced Studies, Haramaya University

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Correspondence: kgebreab@outlook.com

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Author notes

Kebede Gebreab is affiliated with Department of Interdisciplinary Studies, Addis Ababa University and focuses on Energy research in Africa.

Fikru Asfaw is affiliated with Department of Advanced Studies, Addis Ababa University and focuses on Energy research in Africa.

Tekle Yohannis Berhane is affiliated with Department of Interdisciplinary Studies, Adama Science and Technology University (ASTU) and focuses on Energy research in Africa.

Abstract

Manufacturing systems in Ethiopia are pivotal for economic growth but face challenges related to efficiency and yield. The study employed a mixed-methods approach including qualitative interviews and quantitative data analysis of production yields. A randomization test was conducted to ensure the validity of results. A notable finding from the randomized field trial indicated that implementing advanced automation systems in plant B resulted in an average yield increase of 15% over conventional methods, with a confidence interval for this effect (95%) at $\pm 2.5\%$. This suggests significant potential for productivity gains. The study supports the hypothesis that strategic interventions in manufacturing systems can lead to substantial yield improvements, particularly through automation technologies. Manufacturing enterprises should consider adopting advanced technological solutions and conducting periodic yield assessments to optimise their operations. The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African Geography, Ethnography, Methodology, Sustainability, Anthropology, Development Studies, Yield Analysis*

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