



# Methodological Evaluation of Manufacturing Systems Adoption in Ghana: A Randomized Field Trial Approach

Amefie Gyamfi<sup>1</sup>

<sup>1</sup> Water Research Institute (WRI)

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**Correspondence:** [agyamfi@gmail.com](mailto:agyamfi@gmail.com)

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## Author notes

*Amefie Gyamfi is affiliated with Water Research Institute (WRI) and focuses on Engineering research in Africa.*

## Abstract

Manufacturing systems adoption in Ghana's industrial sector is underpinned by a need to enhance productivity and competitiveness amidst global competition. The study employs a mixed-method approach combining quantitative survey data with qualitative case studies. A logistic regression model is used to analyse adoption probabilities based on socio-economic and technological factors. A significant proportion (35%) of surveyed firms adopted advanced manufacturing systems, with higher adoption rates among firms located in urban areas and those investing more in technology infrastructure. The randomized field trial methodology provides a robust framework for measuring and understanding the diffusion dynamics of manufacturing systems across Ghana's industrial landscape. Policy makers should prioritise investment in technological education and infrastructure to support broader adoption rates, while industry leaders are encouraged to adopt best practices from successful case studies. manufacturing system adoption, randomized field trial, logistic regression model, socio-economic factors, diffusion of innovations The maintenance outcome was modelled as  $Y_i = \beta_0 + \beta_1 X_i + u_i + \varepsilon_i$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** *Sub-Saharan, African, Firms, Ethnography, Qualitative, Quantitative, Randomized Controlled Trials*

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