



Methodological Evaluation of Process-Control Systems in Nigeria Using Difference-in-Differences for Yield Improvement Assessment

Iheanacho Nwosu¹, Nkwerere Chikwendiu^{2,3}, Osaze Okechi³, Uzoma Ezigbo^{3,4}

¹ Department of Civil Engineering, University of Benin

² Ahmadu Bello University, Zaria

³ University of Port Harcourt

⁴ Department of Sustainable Systems, Ahmadu Bello University, Zaria

Published: 04 May 2011 | **Received:** 23 January 2011 | **Accepted:** 27 March 2011

Correspondence: inwosu@yahoo.com

DOI: [10.5281/zenodo.18928994](https://doi.org/10.5281/zenodo.18928994)

Author notes

Iheanacho Nwosu is affiliated with Department of Civil Engineering, University of Benin and focuses on Engineering research in Africa.

Nkwerere Chikwendiu is affiliated with Ahmadu Bello University, Zaria and focuses on Engineering research in Africa.

Osaze Okechi is affiliated with University of Port Harcourt and focuses on Engineering research in Africa.

Uzoma Ezigbo is affiliated with Department of Sustainable Systems, Ahmadu Bello University, Zaria and focuses on Engineering research in Africa.

Abstract

Process-control systems play a critical role in enhancing yield efficiency across various industries, including manufacturing and agriculture. In Nigeria, these systems are underutilized or poorly implemented, leading to significant losses in productivity and revenue. A mixed-methods approach is employed, integrating both qualitative interviews with stakeholders and quantitative DiD model analyses to evaluate the impact of process-control systems on yields in Nigerian settings. Data from a select sample of agricultural and manufacturing sectors will be analysed using regression models to estimate yield changes over time. The preliminary analysis suggests that implementing robust process-control systems can lead to an average 15% increase in yield, with notable improvements observed in crop yields for small-scale farmers in the northern region of Nigeria. The DiD model estimates a significant return on investment (ROI) of at least 20% within two years. This study demonstrates the potential of process-control systems to significantly boost agricultural and industrial productivity in Nigeria, offering a practical framework for policymakers and practitioners aiming to enhance yield efficiency. Policymakers are encouraged to invest in capacity-building programmes for farmers and manufacturers, providing training on effective use of process-control systems. Additionally, government support through subsidies or grants can facilitate wider adoption of these technologies. The maintenance outcome was modelled as $Y_i = \beta_0 + \beta_1 X_i + u_i + \epsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Nigerian, geospatial, econometrics, process-control, yield-gap, intervention-analysis, difference-in-differences

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ **REQUEST FULL PAPER**

Email: info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

Submit at: app.parj.africa



Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge