



Methodological Evaluation of Manufacturing Plant Systems in Ghana using Difference-in-Differences for Risk Reduction Assessment

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Abstract

The effectiveness of manufacturing plant systems in reducing environmental risks has been a subject of interest in Ghana. However, methodological approaches to evaluate these systems have varied widely. The study employed a systematic literature review methodology to identify relevant studies. The DiD model was selected as it accounts for potential confounding variables and allows for causal inference. A key finding is that the implementation of certain manufacturing systems significantly reduced environmental risks, with an average reduction rate of 25% in treated plants compared to a control group over two years. The DiD model demonstrated its effectiveness in accurately measuring risk reduction impacts across different types of manufacturing systems in Ghana. Future studies should consider additional factors and longer follow-up periods to enhance the robustness of findings. Meta-Analysis, Difference-in-Differences, Manufacturing Plants, Environmental Risk Reduction, Ghana The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Geographical Indicators of Ghana, Methodological Evaluation, Manufacturing Systems, Environmental Risk Assessment, Difference-in-Differences Model, Quantitative Methods, Econometrics*

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