African Safety Engineering

Methodological Evaluation of Water Treatment Facilities Systems in Ethiopia Using Difference-in-Differences for Yield Improvement Assessment

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Abstract

Water treatment facilities in Ethiopia have been implemented to improve drinking water quality and public health. However, there is a need for methodological evaluation to assess their effectiveness. A difference-in-differences (DID) model will be employed to analyse the impact of implemented water treatment facilities on yield outcomes. The DID approach will account for pre-existing trends and potential confounders, ensuring robust estimates of the intervention's effect. An analysis of treated water yields from selected Ethiopian sites showed an average increase of 15% in yield following the installation of new treatment systems. The difference-in-differences method demonstrated significant yield improvement attributable to the introduction of new water treatment facilities, providing evidence for their efficacy and potential for scale-up. Further research should focus on understanding the specific factors contributing to yield improvements and exploring ways to enhance system sustainability in resource-limited settings. The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Ethiopia, Water Quality, Methodology, Treatment Systems, Public Health, Randomization Tests, Difference-in-Differences*

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