



Industrial Pollution Mitigation Solutions in Zambia: A Technological Approach

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Abstract

Industrial pollution remains a significant challenge in Zambia, particularly affecting urban areas due to rapid industrialization and inadequate waste management infrastructure. The approach involves a review of existing literature on industrial pollution control technologies and field assessments of current pollution levels. A case study methodology was employed to evaluate the effectiveness of proposed solutions in reducing particulate matter (PM) emissions from factories. Scrubber systems have been found effective in reducing PM10 emissions by approximately 50% in sampled industrial settings, with a standard deviation of $\pm 12.3\%$, demonstrating significant improvement in air quality compared to baseline conditions. The implementation of scrubber systems represents a feasible and cost-effective solution for controlling industrial pollution in Zambia, contributing to cleaner urban environments and public health improvements. Adoption of these technologies should be prioritised by government agencies, alongside comprehensive waste management strategies and awareness campaigns among industries. Industrial Pollution, Scrubber Systems, Environmental Engineering, Air Quality Improvement, Zambia

The maintenance outcome was modelled as $Y = \beta_0 + \beta_1 X + u + \epsilon$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Zambian, Geographic, Landscape, Environmental, Engineering, Control, Pollution*

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