



Sustainable Technologies for Industrial Pollution Control in Zambian Industries

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Abstract

Industrial pollution remains a significant environmental challenge in Zambia, where industries are major contributors to air, water, and soil contamination. A comprehensive literature review was conducted alongside expert interviews to identify current technologies, followed by a survey of industry practices in Zambia. A cost-benefit analysis was performed using econometric models to assess the feasibility of implementing recommended solutions. The preliminary research indicates that adoption rates for existing sustainable technology are low, with only 25% of industries currently utilising best available control technologies (BACT). Despite challenges in implementation, the study concludes that strategic investment and policy support can significantly enhance industrial pollution control efforts. Policymakers should prioritise incentives for adoption of sustainable technologies, while industry leaders are encouraged to adopt cleaner production methods. The maintenance outcome was modelled as $Y = \beta_0 + \beta_1 X + u + \varepsilon$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Zambian, Sustainable, Industrial, Pollution, Control, Engineering, Geochemistry*

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