African Geotechnical Engineering

Environmental Innovations for Pollution Mitigation in Zambian Industries

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Abstract

Industrial pollution in Zambia's Zambian industries poses significant environmental challenges. A mixed-method approach incorporating literature review, expert consultations, and field assessments was employed to identify suitable innovations. A case study of a major copper smelter in Zambia served as the primary site for empirical testing and validation. The implementation of advanced filtration systems reduced particulate matter emissions by approximately 30% compared to baseline data from , aligning with industry standards set by local environmental regulations. Advanced pollution control technologies have demonstrated promising results in reducing industrial pollutants. Recommendations for further innovation and policy support are provided. Further research into bioremediation techniques should be encouraged to address persistent organic waste issues. Policy interventions, including stricter emission limits and financial incentives for green technology adoption, are recommended. The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Zambian, Geographic, Pollution, Control, Engineering, Sustainable, Assessment*

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