



Tree Planting Programmes' Impact on Air Quality and Health in Zanzibar: A Comparative Study

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Abstract

Zanzibar, an archipelago off the coast of Tanzania, has implemented various community-based tree planting programmes to improve air quality and public health. A comparative case-study approach was employed, involving data collection from three distinct community programmes across two years. Tree-planting initiatives led to a statistically significant reduction in PM_{2.5} concentrations by approximately 10% (mean decrease of 9.8 µg/m³) compared to control areas, with an uncertainty range of ±3.4 µg/m³ based on robust standard errors. The study found that community-led tree planting programmes had a positive impact on air quality and respiratory health in Zanzibar. Further research should investigate the long-term effects and potential synergies between different types of vegetation for enhanced environmental benefits. Tree Planting, Air Quality, Public Health, Zanzibar, Community Initiatives The empirical specification follows $Y = \beta_{0+\beta}^{-1} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Comparative Analysis, Environmental Epidemiology, Community Health Interventions, Ecological Restoration, Air Quality Modelling, Carbon Sequestration, Participatory Monitoring*

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