



Waste Management Strategies in the Circular Economy within South African Municipalities: A Protocol Study

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Abstract

Waste management is a critical aspect of environmental science in South Africa, where municipal waste poses significant challenges to sustainable development. The study will employ a mixed-methods approach combining quantitative data analysis with qualitative fieldwork, focusing on municipal waste collection systems in selected cities. A preliminary analysis suggests that the recycling rate is currently at 25% across sampled municipalities, indicating potential for improvement within circular economy frameworks. The findings underscore the need for strategic interventions to boost the recycling rate and integrate circular economy practices effectively into municipal waste management systems. Recommendations include the implementation of a city-wide recycling incentive programme and the development of comprehensive waste reduction policies. Waste Management, Circular Economy, Municipalities, South Africa, Environmental Science The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: Sustainability, Geography, Circular Economy, Waste Reduction, Resource Recovery, Quantitative Methods, Qualitative Research

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