



Waste Management Practices in South African Municipalities: A Longitudinal Study of the Circular Economy Paradigm

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Abstract

This study examines waste management practices in South African municipalities over a decade-long period, focusing on their alignment with the principles of the circular economy. A longitudinal study design was employed, involving quantitative data collection from municipal reports and qualitative interviews with stakeholders. Data were analysed using thematic analysis to interpret trends over time. The findings indicate that while there has been a significant increase in the implementation of waste reduction measures (e.g., recycling programmes), the proportion of municipalities adhering to circular economy principles remains below 30%. Challenges such as funding and public awareness are major barriers. Despite initial improvements, municipal efforts towards becoming more circular have not been consistent across all areas. The study highlights a need for sustained policy support and community engagement to achieve broader adoption of circular economy practices. Recommendations include enhanced financial incentives for municipalities that demonstrate progress in waste reduction and recycling, alongside increased public education initiatives to foster better waste management habits. The empirical specification follows $Y = \beta_{0+\beta}^{-} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African Geography, Circular Economy, Waste Management, Sustainable Development, Resource Recovery, Life Cycle Assessment, Participatory Methods*

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