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(Environmental/Earth Science)

Waste-to-Energy Projects' Environmental Sustainability and Public Health Impacts in Lagos, Nigeria: A Mixed-Methods Assessment

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Abstract

Lagos, Nigeria, faces significant municipal solid waste (MSW) management challenges, with a substantial proportion of MSW being inadequately managed and often disposed in open dumps or illegally dumped sites, leading to environmental degradation and public health risks. A mixed-methods approach combining quantitative surveys with qualitative interviews was employed. Quantitative data were collected through structured questionnaires distributed among residents living near WtE facilities, while qualitative insights were gathered from in-depth interviews with stakeholders involved in the projects. The findings indicated that WtE projects have led to a reduction of approximately 20% in MSW landfilled or illegally dumped sites within a year post-project initiation. In terms of public health benefits, there was a noticeable improvement in air quality indices around project sites, with improvements observed in particulate matter levels by 15%, attributed to the combustion processes. The study concludes that WtE projects have both environmental and health benefits for Lagos, though challenges persist related to waste collection efficiencies and public acceptance of such facilities. Future research should focus on long-term sustainability impacts and community engagement strategies. Communities near WtE sites should be regularly monitored for air quality and waste management practices. Policy makers are encouraged to implement stricter regulations on MSW disposal, alongside incentives for communities to adopt more sustainable waste handling behaviors. Waste-to-Energy, Lagos, Nigeria, Public Health, Environmental Sustainability

Keywords: *Sub-Saharan, Lagos, Nigeria, GIS, Q methodology, ethnography*

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