African Transportation and Urban Planning (Technical aspects)

Microplastics Reduction Strategies in Urban Dakar: An Analysis of Local Water Biodiversity Impacts

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Abstract

Urban Dakar faces significant challenges in waste management, particularly concerning microplastics in local water biodiversity. Senegal's urban environment is characterized by rapid industrialization and population growth, leading to increased pollution from municipal waste. The research employs a multi-disciplinary approach, integrating data analysis, field surveys, expert interviews, and case studies. Comparative methodologies include the assessment of existing waste management systems and their effectiveness in reducing microplastics. Microplastic concentrations were found to be higher downstream from industrial zones compared to upstream areas, indicating localized pollution sources. Specific findings include a 30% reduction in microplastics observed after implementing new filtration systems at wastewater treatment plants. The study concludes that strategic interventions such as improved waste sorting and recycling programmes are effective in mitigating microplastic contamination in urban water ecosystems of Dakar. Recommendations include the implementation of comprehensive waste management policies, public education campaigns on reducing single-use plastics, and increased investment in advanced wastewater treatment facilities.

Keywords: *Sudanic, Urbanization, Ecosystems, Sustainability, Bioremediation, Anthropocene, Biodiversity*

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