# *Unveiling Government Strategies for Waste Reduction from development of a dynamic optimization framework.*

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As urbanization continues to accelerate in Ouagadougou, Burkina Faso, efficient management of urban solid waste has become crucial. Urban solid waste has a significant impact on the environment and sustainable development, especially with legislative efforts focused on waste preservation to mitigate climate change. By integrating solid waste reduction and recovery systems into the integrated municipal waste management framework in Ouagadougou, numerous health, socio-economic, and environmental benefits can be realized. The objective of this study is to enhance previous research on the life-cycle assessment of waste recovery by incorporating an analysis of the municipal waste boundary system, with a specific focus on recycling, which offers additional environmental advantages. Ultimately, optimizing the integrated waste management and recovery system can yield accurate results in terms of minimal carbon footprint and cost, thereby aiding in the improvement of government strategies for urban waste reduction. In this paper, we present the methods and findings of developing a systematic optimization framework for the analysis of communal waste using mathematical modeling. This approach relies on calculations in the basic model and employs Python and CPLEX algorithms to solve the optimization problem. An environmental life-cycle analysis revealed an average minimum daily per capita carbon footprint of 8.06 kg CO2eq (rounded value) and an average minimum economic cost of 900 USD. This research proposes further investigation into optimizing the selection of solid waste recycling and recovery projects, prioritizing the agricultural sector, reducing the use of environmentally polluting technologies such as motorcycles, and reinvigorating environmental reduction initiatives.

Keywords : Urban Waste Reduction, Government Strategies, economic cost, carbon footprint, Optimization, python, CLPEX ;