

Scaling up sustainable practices. Replicability of waste circular actions from Lacor Hospital to Gulu City (Uganda)

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Introduction

Appropriate waste collection and treatment systems are needed in developing countries to protect people and the environment (Azevedo et al., 2021; Iyamu et al., 2020; UN-Habitat, 2010). The lack of funding, national policies, and the common absence of educational programs on waste management activities hinder the transition towards sustainable solid waste management (SWM) systems in Sub-Saharan African countries (Debrah et al., 2022; Muheirwe et al., 2022).

On these grounds, importing effective and appropriate SWM strategies and initiatives is a priority for sustainable development. The present study aims at analysing effective SWM strategies to be introduced in Uganda: a country that suffers poor SWM system (Castellani et al., 2022). Gulu Municipality and Lacor Hospital, the second largest hospital in Uganda, were chosen as case study due to the circular SWM practices already in place in the hospital complex. Assessing waste flows in the hospital compound, highlighting adopted sustainable practices, would support the replicability of virtuous SWM methods in the municipality of Gulu.

The research conducted aims at identifying replicable strategies in SWM, ensuring the spread of circular actions in the municipality of Gulu and in other developing contexts, scaling up best practices in SWM. The adopted method included an assessment of SW generation and management in the hospital area and in Gulu Municipality. Material flow analysis (MFA), governance analysis, and adapted "Wasteaware" benchmark indicators were used to compare the two interconnected systems. The novelty of the research stands in analysing interconnected developing contexts in order to assess sustainable practices to be replicated from a local scale to a municipal or regional scale. The investigation supports waste management planners and practitioners in the implementation of effective and appropriate programs, promoting the spread of waste sustainable practices to other African cities.

Methods

The methodology employed to compare SWM system at Lacor Hospital and in the municipality of Gulu involved a baseline assessment of municipal solid waste (MSW) generation and management in the two contexts. Lacor Hospital and Gulu's SWM systems were analysed considering two different dimensions: a physical aspect and a governance component (UN-Habitat, 2010). Primary data collected during field visits (waste characterization, waste flows assessment, interviews with local technicians) and technical reports provided by the hospital staff were the main information sources for the analysis at the hospital. The analysis for Gulu Municipality was based on official reports provided by local authorities, and questionnaires and interviews submitted to residents and municipal officers during the field visits. MSW management systems were compared through a "traffic light" colour coded system adapted from the "Wasteaware" benchmark indicators developed by Wilson et al (2015).

Results and discussion

The hospital complex of Lacor Hospital is a peculiar context as it is well delimited, both in physical terms and in terms of governance. This allows to effectively assess waste flows and adopted valorisation actions. MSW production at Lacor Hospital is equal to about 2.5 t d⁻¹. Separate collection of valuable waste fraction is in place. Collected non-hazardous plastic (PET bottles and hard plastic) is delivered to a local recycling centre, where it is processed into valuable products (tiles, chairs, and vases). Glass waste is shredded to replace sand as a building material. Scraps from the carpentry, as well as paper, are sent to a near orphanage, where they are burned in wood-burning stoves for cooking. Unsorted MSW are disposed of in the municipal unsanitary landfill, located about 10 km from the hospital complex.

MSW production in the municipality of Gulu is equal to about 130 t d⁻¹. However, collection rate is very low. Only 20% of produced waste is collected and disposed in the municipal landfill, whereas the remaining waste is open dumped or open burned, accumulating near collection points or illegal dumps. Appropriate waste management is hindered by a lack of fundings for fuel, vehicles maintenance, and collection equipment.

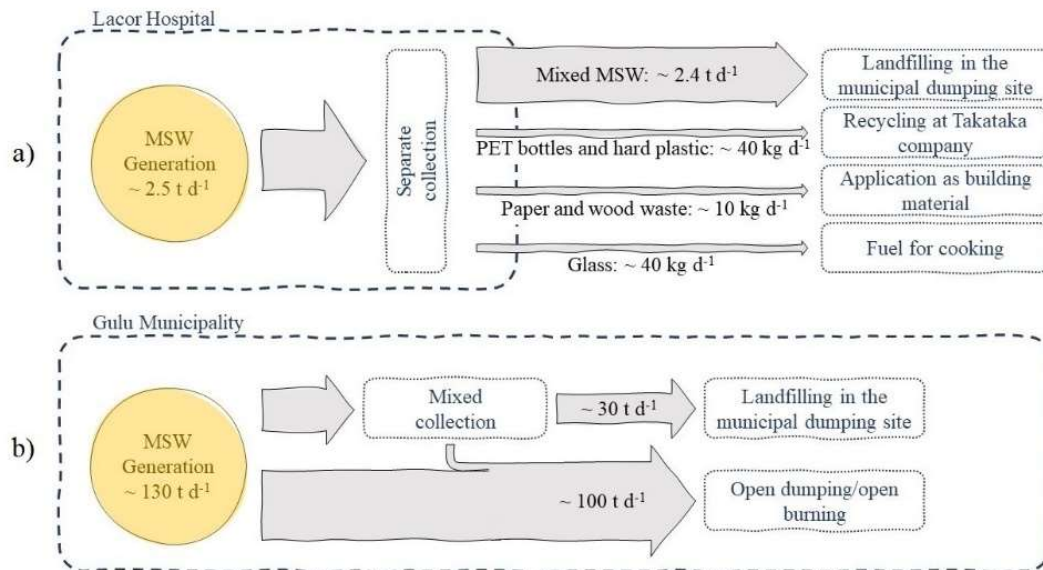


Figure 1. Qualitative MFA for Lacor Hospital (a) and Gulu municipality (b).

The comparison between Lacor Hospital and Gulu's SWM systems highlighted the circular actions replicable in the whole municipality. Preliminary results show that Lacor's virtuous model could be replicated in the municipality of Gulu introducing separate collection and recyclables valorisation. Existing local initiatives are fundamental in the introduction of sustainable practices: recycling routes already implemented by Lacor Hospital could be exploited to start source-collection campaigns aimed at collecting clean source-separated recyclable materials which could be valorised by existing activities, generating economic and environmental benefits.

Conclusions

The hospital compound can represent an incubator area of pilot actions for waste valorisation. The early outcomes of the research underlined that Lacor Hospital represents a virtuous example for the municipality of Gulu in SWM. Separate collection practices and recyclables valorisation actions could foster the development of circular waste management strategies in the Municipality and in other African realities, decreasing the amount of waste sent to the municipal landfill, producing valuable products, generating new sources of income, and avoiding waste open dumping.

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