

Opportunities for Improving Organic Waste Systems: Kaduwela Case Study



From urban waste to
sustainable value chains:
Linking sanitation and
agriculture through
innovative partnerships

This fact sheet presents the key findings from the report Organic Waste System Assessment: Kaduwela Municipal Council. This is the first of four reports as part of the project From Urban Waste to Sustainable Value Chains: Linking Sanitation and Agriculture Through Innovative Partnerships, funded under the Knowledge and Linkages for an Inclusive Economy (KLIE) Grants Program of the Australian Department of Foreign Affairs and Trade (DFAT). This project is a partnership between the Institute for Sustainable Futures at the University of Technology Sydney (UTS-ISF), the International Water Management Institute (IWMI), Janathakshan (GTE) Ltd, Sabaragamuwa University of Sri Lanka (SUSL) and the Sri Lankan Department of Agriculture (DoA).

The objective of this study was to identify feasible organic waste streams that may be available to create new organic waste value chains, such as agricultural inputs.

Municipality of Kaduwela

- *The Kaduwela Municipal Council (KMC) is a suburb of Colombo District in Sri Lanka's Western Province with a land area of 87.7 km² and a total population of 264,451 in 2018 distributed over 56,997 residential households. It represents 4% of the population of Western Province (11% that of Colombo District) and operates one out 17 composting facilities in Western Province.*
- *Solid waste management in Kaduwela is typical of municipal urban areas across Sri Lanka. Solid waste is segregated at source then collected and processed by Council at a waste management facility. The organic fraction of solid waste is composted for sale.*
- *Septage is generated by onsite sanitation systems, as is the case in most urban areas in Sri Lanka. Institutions involved in septage management include Council, private desludging businesses and the National Water Supply and Drainage Board.*
- *Analysis of the current system highlights opportunities to optimise operation of the waste management facility, expand the facility to process higher volumes of waste, and add value by mixing dried faecal sludge with organic waste compost to improve its nutrient content and sale value.*
- *Identifying opportunities for Kaduwela can inform other urban areas in Sri Lanka seeking to improve waste management and generate value from waste.*



Solid waste collection and management

The Kaduwela Municipal Council (KMC) is responsible for collection of the majority of solid waste, including from households, businesses and institutions. KMC has been encouraging waste segregation between biodegradable (organic) and non-biodegradable waste since 2008, a practice which was adopted by all Sri Lankan municipal councils (MCs) in late 2016. A small amount of organic waste is also collected from selected hotels and restaurants informally by pig farmers.

KMC takes the collected waste to a MC managed waste recycling centre. The centre includes composting, pilot scale biogas production, selling of recyclables and selling waste for fuel and to private operators.



Key facts and figures:

- Most waste within the council area is generated by households. Significant amounts of biodegradable waste are also generated by supermarkets, vegetable markets, hotels and restaurants.
- Data collected from KMC records shows a total daily solid waste collection of 71 tonnes (4% of total waste collected by Western Province), which is lower than the estimated volume of 200 tonnes per day based on Sri Lankan data.
- Approximately 60% of collected waste is biodegradable.

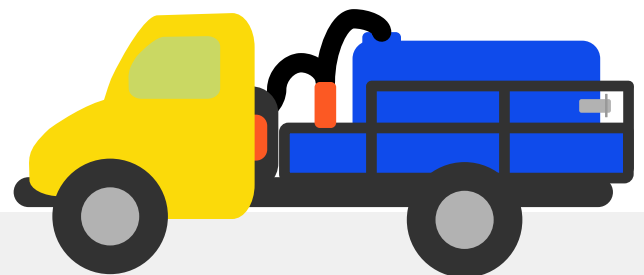
Key challenges:

- The waste recycling centre is not able to process all of the collected waste. The compost plant processes 10 tonnes per day (although designed to process 20 tonnes / day) and the biogas plant processes 7 tonnes.
- Approximately 60% of the collected biodegradable waste (25 tonnes / day) and almost all of the non-biodegradable waste (25 tonnes / day) is transported by private operators to produce compost or be landfilled on private lands, for which the council pays a tipping fees of LKR 166,500 (USD 850) per day.
- KMC generates revenue from waste collection fees and sales of recyclables and compost, but this only covers approximately 20% of ongoing costs.

Septage collection and management



Onsite sanitation systems (OSS) serve the sanitation needs in KMC as there is no existing sewer system. Desludging of these systems and septage transportation service are provided on demand, mostly by private sector operators (98% of the collected volume) and a small amount by municipal services from two district offices in the municipality (Kaduwela and Battaramulla District Offices).



Key facts and figures:

- An estimated 181 m³ is collected daily by both private and public operators, but daily volumes vary significantly between 60 m³ and 445 m³ (November 2019 to January 2020 data).
- Collectors commonly use one of the pumping stations of the Jayawadanagama Housing Scheme Sewerage system to discharge the collected septage, which incurs a disposal fee (LKR 150/m³ for the municipality and LKR 225/m³ for the private sector operators).
- Septage is transported through the sewerage network and discharged offshore, without further treatment.

Key challenges:

- Jayawadanagama pumping station is often overloaded as it was not originally designed to accept the current volumes of septage.
- KMC generates revenue from septage collection services, which covers approximately 27% of ongoing costs. Septage management is not managed as a stand-alone part of the KMC budget, which may limit the capability of KMC to invest in the improvement of sanitation services.

Future directions for improved organic waste value chains

The development and expansion of organic waste value chains has multiple benefits, by recovering the value of solid waste and septage resources. This can minimise the environmental burden of biodegradable solid waste and septage, improve services for citizens, create new economic opportunities and provide valuable agricultural inputs to farmers. The following high level opportunities to improve organic waste value chains have been identified for Kaduwela, and may provide insights for other regions. These opportunities will be further explored through ongoing partnership activities, including a demand assessment, political economy analysis and stakeholder workshop.



Optimisation

The current operations of the compost plant could be optimised through effective space utilisation and improved composting practices, so the plant can process the volumes of the designed capacity. Improved source segregation practices could minimise contamination. This can be supported by training and capacity development of the workforce and improving coordination between actors.



Expansion

The capacity of the compost plant could be expanded to process the collected volumes of biodegradable waste, minimising the need and expense of private composting and landfilling. There are potential opportunities to explore public-private partnerships.



Value adding

Value addition to composting, such utilisation of dried septage sludge to create a value-added compost product could increase the marketability of the product.

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