

The SHINE Model

The SHINE Model has been developed based on the needs and realities of solid waste management in Rwanda. It revolves around cost-efficiency, life cycle thinking and full-cost accounting and has been piloted successfully in three Rwandan cities, Bugesera, Rwamagana and Muhanga. The model bases on five pillars:

- **S**ource Separation at Household
- **H**igh Quality Composting
- **I**ntegrated Logistic
- **N**urturing Bio-cycles
- **E**fficiency on costs



Source Separation at Household

Efficient waste management starts with separating different waste streams – organics, recyclables like plastics and dry paper, and residuals – at household level. Doing this enables waste service providers to collect clean recyclable materials as well as unpolluted organics. Separation of waste at household level also is an integral part of the Integrated Solid Waste Management Strategy (2022) of Rwanda.

Recyclable	“Recycled” products
Paper	Toilet paper made of recycled paper
Bottles	PET or HDPE flakes for export or reuse
Organic waste	Compost

Engagement with communities as well as incentives are essential for successful household level waste separation. Through raising awareness, citizens come to understand the environmental and economic benefits of waste sorting. At the same time, households that successfully

sort their waste can be further incentivized to do so through lower waste management fees.

The important factor for continued sorting by households is that citizens also experience a reliable service provision, i.e. waste collection, where waste management providers come to collect waste at the agreed time and day, and keep the sorted waste in separate streams. If citizens notice that collected waste is mixed again motivation will naturally sink fast. This implies that awareness raising for waste sorting at household level only makes sense if the waste “supply” chain can support separated waste streams, which necessitates political will and buy-in from the local municipalities.

High Quality Composting

Although organic waste makes up around 85% of the total waste volume of Rwandan households¹, it remains a waste stream that is hard to valorize. Sorting waste at household level does however provide waste collectors with “clean” and largely contamination-free organic waste, which can be turned into compost.

The SHINE Model promotes decentralized composting facilities with only basic infrastructure, including paved grounds, roofing, water supply and exclusively locally built manual processing equipment. The compost sales can cover both the (small) capital expense for the infrastructure, as well as the operational expenses to run the facility, provided that the district provides land for the operation. The facility operator will also have an incentive to monitor the organic waste collected at households by the waste service providers.

The key to successfully selling compost in Rwanda has been to involve the Rwanda Agricultural Board (RAB) and the Rwanda Standards Board (RSB), e.g. to adopt

¹ National Integrated Solid Waste Management Strategy, 2022



the RSB standard for compost from source-separated waste and to set up laboratory testing structures for continuous quality control.

Integrated and Localized Logistics

Logistical solutions for separate waste collection are very localized, even between similar-sized Rwandan cities different solutions might make sense, depending on factors like the terrain, the local state of infrastructure or average household sizes. Logistics include not only the vehicles used, but also the optimal collection routes to achieve the most efficient collection routine.

In general, organic waste can be collected separately from recyclables and residuals. While organic waste can be collected in bulk using tricycles, the residuals and recyclables can be collected in trucks with “big bags”, allowing for a first separation of different recyclables.

Nurturing Biocycles

Rwandan farmers and smallholders are always looking for high quality compost to boost local food systems and reduce reliance on synthetic fertilizers – which compost can however never replace fully. In addition, compost improves the soil structure, enhances its nutrient content and promotes healthy plant growth.

In rural areas the SHINE model actively promotes home composting. As opposed to urban households, 70% of Rwandan rural households already separate their organic waste and compost it

Efficient Use of Financial Resources

Municipal solid waste management depends on the available financial resources, which in practice are always extremely limited. This necessitates high levels of cost efficiency and a good understanding of the different costs of collection, transport, treatment and disposal.

The mentioned household level waste separation is imperative from a cost efficiency perspective, as organic waste and recyclables can be treated separately, greatly reducing the tipping fees the waste service provider pays per tonne of disposed waste at the landfill. At the same time, compost can be sold at 30-100 RWF/kg, with higher prices for recyclables like HDPE and PET, which

all support covering parts of the costs of the municipal waste management operations.

SHINE in Practice – What Works & What Doesn't

Bugesera

Bugesera's composting facility is managed by a private operator appointed by the community committee and overseen by the district administration. While the operator manages daily operations, the district provides technical support, creating a successful collaborative model. This success is largely driven by the active participation of the community's households who separate their waste into three waste streams: organic; recyclables; and residuals. This enables the production of high-quality compost and the valorisation of recyclable waste. GIZ currently explores strategies to reduce operational costs and assesses the potential for this model to become a sustainable income source for private operators interested in managing similar facilities. The collaborative approach promotes local ownership and accountability while creating opportunities for private operators to generate additional income.

Rwamagana

The composting in Rwamagana is managed by *Terimbere Muhinzzi Mwulire*, a farming cooperative, and carried out on open plots in the urban area. This has not been a huge success though. Due to a low sense of process ownership – from waste separation to collection to actual composting – the compost quality turned out low, meaning little interest from potential buyers and low revenue for the cooperative's members.

Muhanga

The composting facility is fully managed by a private operator under a contract agreement with the district. The operator oversees daily site management, waste collection from households and the market and sorting into two streams: organic and non-organic waste. This model creates opportunities for individuals to earn income through composting operations while supporting waste minimisation at dumpsites. However, the operator has noted that the investment costs are relatively high compared to the financial returns, showing the need to identify ways to improve profitability and long-term sustainability.

Published by:
Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Registered offices
Bonn and Eschborn, Germany

Address
Postcode and town, country
T +49 61 96 79-0
F +49 61 96 79-11 15
E info@giz.de
I www.giz.de/en

Rwanda, 2025

Author:
Waste & Circular Economy Project Rwanda

Photo credits:
Waste & Circular Economy Project Rwanda

giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH