BRIEFING NOTE

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THE SASCOST MODEL FOR ASSESSING COSTS AND BENEFITS OF MUNICIPAL WASTE SEPARATION AT SOURCE: VERSION 2: INCORPORATING SOCIO-ECONOMIC AND ENVIRONMENTAL IMPACTS

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KEY FINDINGS

The CSIR has developed a model for comparing the costs and benefits of different options for implementing a Separation at Source (S@S) recycling programme. It can be used by municipalities as a Decision Support Tool to identify the most cost-effective option in different suburbs; based on the specific context of each suburb. Version 1 of the model focuses on financial costs and benefits. This briefing note provides an update on Version 2, which incorporates socio-economic and environmental impacts..

INTRODUCTION

Municipalities across South Africa are currently considering the implementation of separation-at-source (S@S) of recyclable waste as a means of:

- increasing the diversion of waste away from landfill – due to growing constraints on available landfill airspace, and
- supporting much needed local job creation and enterprise development – due to high levels of unemployment, particularly amongst the youth

At the same time, the National Waste Management Strategy (NWMS) sets targets for metros, secondary cities and large towns to implement S@S. However, implementing S@S can be costly, especially if the incorrect infrastructure is adopted by a municipality or business. In addition, S@S is likely to give rise to a range of socioeconomic and environmental impacts; both positive and negative. There is limited information available on the costs of implementing S@S in South Africa, as compared to the potential benefits. In addition, there are various options for the collection of source separated recyclables, each with their own costs and benefits. The costs and benefits of each option (including the socio-economic and environmental impacts) will differ between municipalities, and even between suburbs within the same municipality, depending on the local context. As such, a "onesize-fits all" approach will not be appropriate for all suburbs. There is therefore a clear need for decision support to assist municipalities in evaluating the trade-offs between the different systems, and to identify an appropriate option for implementation.

MAIN RESULTS

The SASCOST Model Version 1

To assist municipalities in assessing and comparing the costs and benefits of different options for the collection of source-separated recyclables, based on each municipality's unique context, the CSIR has developed a Decision Support Tool (the SASCOST model).

Using context specific information, the model can assist municipalities in identifying the most cost-effective option for implementing S@S in each suburb, and/or evaluating S@S tenders from private businesses.

The focus of the model is currently on paper and packaging waste from households. The four collection options currently compared in the model are as follows:

1. Post-separation at a dirty MRF
2. Separate collection of general waste and recyclables in a truck-and-trailer
3. Collection of source-separated recyclables in a separate vehicle
4. Allowing informal sector to access 'rich bags' of recyclables

Version 1 of the model focuses on the financial costs and benefits of each option; specifically:

- communication costs
- container costs
- costs of collection and transport to MRF
- costs of sorting at the MRF
- costs of transporting residual fraction from MRF to landfill
- income from sale of recyclables

- savings from reduced collection, transport & disposal to landfill.

Version 2: Bringing in socio-economic and environmental impacts

In a project funded by DST through the Waste RDI Roadmap, an expanded version of the SASCOST model has been developed, incorporating socio-economic and environmental impacts.

Specifically, the following impacts are now incorporated in the model:

1. Impacts of informal collectors on the viability of a S@S programme
2. Impacts on employment and livelihoods
3. Additional/avoided emissions from collection and transport
4. Avoided social and environmental externalities from landfill disposal
5. Landfill airspace savings and increased lifespan.

These impacts are valued in monetary terms so that they can be included within the economic cost-benefit framework of the model. This allows for trade-offs between financial, socio-economic and environmental impacts to be easily assessed using a common metric. The model can therefore be used by municipalities to make more informed decisions in identifying the most appropriate option for implementing S@S; from an integrated sustainability perspective.

Preliminary results suggest that the case for S@S improves significantly when socio-economic and environmental impacts are considered; while there is also a change in terms of which specific options are more attractive. When only considering financial impacts, most options yield net costs, with the separate vehicle option generally the most costly; while in some cases the truck & trailer option gives rise to net benefits.

When socio-economic and environmental impacts are included, there is a big swing towards all options now yielding significant net benefits; with the separate vehicle option now becoming the most attractive. However, these results are dominated by the benefits associated with downstream, indirect and induced job creation. Even excluding these benefits, however, S@S does appear more favourable when socio-economic and environmental impacts are considered, as compared to when only financial considerations are taken into account (see Table 1).

Table 1: Indicative model results for net cost/benefit of S@S per tonne of recyclables recovered, based on hypothetical input values

	Post separation	Truck & Trailer	Separate vehicle	Rich bag
Financial costs and benefits only	736.22	(296.83)	3 500.38	1 908.39
Socio-economic and environmental impacts included	(9 849.88)	(7 683.03)	(14 795.48)	(8 677.72)
Downstream, indirect and induced job creation excluded	(360.76)	(625.33)	647.65	811.40

WAY FORWARD FOR THE SASCOST MODEL

In future versions, the model will be expanded further to incorporate a broader range of collection options; other waste sources and streams, such as organics; as well as various downstream technology options for each waste stream. It could therefore be developed into a decision-support tool for integrated waste management more broadly. We are also currently exploring options to provide the SASCOST model to municipalities at little to no cost.

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