

# LESSONS LEARNED FROM SEPARATION AT SOURCE IMPLEMENTATION IN NEWCASTLE

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## ABSTRACT

A waste separation at source (S@S) pilot study was conducted in two areas in the Newcastle Local Municipality. The aim was to draw on the lessons learned from implementing waste S@S in a municipality to inform and provide guidance on replicating similar studies in other municipalities. To understand the the perceptions and expectations of the community before the project commenced, a questionnaire was distributed in the selected two areas namely Schuinshoogte (middle-to high-income area) and Siyahlala-la (low-income area). The findings highlighted that not everyone were aware of S@S at the start of the project but the majority of the respondents from both study areas indicated their willingness to participate in the study. A post-project questionnaire was distributed in the same areas to understand the successes and failures of the project. The results showed that people are willing to participate in S@S going forward. However, there were hindering factors mentioned by the community including poor communication and lack of knowledge of separating waste in the low income area, not receiving black plastic bags from the municipality for mixed waste collection, and lack of plastic gloves for the service provider to handle the waste. The service provider was asked to weigh the separated waste in order to estimate the amount of waste diverted from the landfill site by this S@S project. The outcome gave a good indication of increasing diversion over time as the kilograms of collected recyclables gradually increased over a period of time partly due to increased participation by households but also due to the efforts of the service provider to collect more recyclables. It is recommended that communication and education should be ongoing between the community and the municipality. A good working relationship between the service provider and the municipality is vital.

**KEYWORDS:** separation-at-source, recyclables, service provider, community engagement



## INTRODUCTION

Municipal solid waste management in South Africa is still dominated by disposal of waste to landfill. Economic growth and industrialization result in increasing waste generation for the municipality to manage (Zhang, 2022). The unseparated waste that is discarded contains recyclable materials posing a threat to the environment (Abbasi et al, 2020) as the landfills are running out of space to receive waste and are under pressure due to increasing waste volumes associated with population growth, urbanisation, and economic growth. The 2012 National Waste Management Strategy set a target of 25% diversion of recyclables from landfills for reuse, recycling, and recovery by 2016. Furthermore, all metropolitan municipalities, secondary cities and large towns must have initiated separation at source programmes, but the majority of the South African municipalities are still not implementing large scale waste S@S initiatives. Many tools have been developed and are readily available for municipalities struggling with waste minimisation, reuse, recovery and diversion from the landfill site including: 1). Toolkit: Reducing the food wastage footprint (FAO, 2013), 2). Working with waste: Guideline for waste collection in high density and unserved areas (Department of Environmental Affairs and Tourism, n.d.-a), 3). Working with Waste: Guideline on Recycling of Solid Waste (Department of Environmental Affairs and Tourism, n.d.-b), 4). SALGA Good practice guide to: Waste Transfer Stations, Material Recovery Facilities and Buy-back Centres (SALGA, 2013b), 5). Municipal Perspective: Integrated Waste Management (SALGA, 2013a), 6). Guidelines for National Waste Management Strategies: Moving from Challenges to Opportunities (Hyman et al., 2013). 7). Cooperative good practice guide in the waste recycling sector: A guideline for cooperatives by cooperatives (CSIR, 2015), 8). Municipal waste management - good practices (CSIR, 2011), 9). Guidelines on separation of waste at source (DEA, n.d.), 10). A guide to Separation of waste at source (Environmental Affairs and Development Planning, Western Cape Government, 2019).

The United Nations Environment Programme (UNEP) South Africa has partnered with Department of Forestry, Fisheries and Environment (DFFE), Newcastle Local Municipality, the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (KZN EDTEA), the Council for Scientific and Industrial Research (CSIR) and Chama-cha Waste pickers to pilot a waste S@S project in Newcastle LM. The aim of the project was to test the roll-out of S@S in two communities (one middle- to high-income and one low-income); and to document the lessons learned with the intention of potentially replicating similar projects in other municipalities. The lessons learned also informed the development of a guideline to assist other municipalities to avoid pitfalls experienced in Newcastle. Hence, the paper aims to report the lessons learned during this pilot project.

## Background to the Newcastle pilot study

The project benefited from sponsorships for the clear bags, printing of communication materials and a training workshop which included accredited training on Covid-19, S@S and the business elements of implementing S@S by UNEP. There was also support by DFFE through the secondment of one staff member to oversee the operations of the pilot study in Newcastle including the printing of the survey questionnaires and liaison between DFFE, UNEP, CSIR, Chama-cha and the municipality. DFFE staff also assisted with the pilot study activities including the door-to-door survey interviews. The contents of the communication material were provided by DFFE.

Newcastle LM hosted the launch of the project; provided a facility for the sorting of the waste; and assisted the service provider with collections on an ad-hoc basis to avoid service interruptions due to vehicle breakdowns.

The service provider Chama-cha did not receive any payment for their involvement in the project other than for the sale of the recyclables. Chama-cha distributed the clear bags to households; were involved in ongoing communication and awareness raising of communities; and collected the recyclables from the study area. They also accepted recyclables dropped off by community members at the sorting facility and engaged with the informal collectors to establish a workable solution for co-existence.



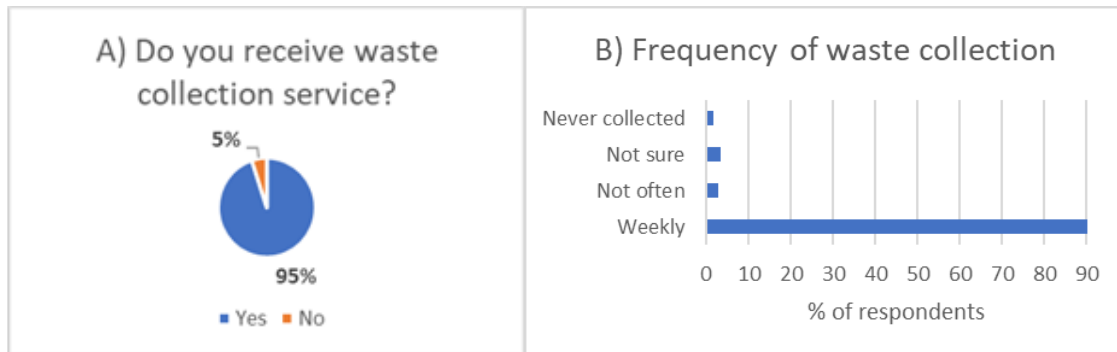
## Methods

Documenting the lessons learned from the pilot study involved observations, two household surveys as well as a meeting with the service provider, ward councillors and other actors involved in the planning and execution of the pilot study.

Observations were done before the roll-out of the pilot study and again towards the end of the pilot study. The project team walked the streets early on the regular waste collection day and observed the content of the black bags put out for collection by the municipality as well as the content of the clear bags earmarked for recyclables. The actions of the Chama-cha team collecting the recyclables were also observed and documented. A photographic record of these activities was included in the report as well as the guideline that was developed.

## Results and discussion

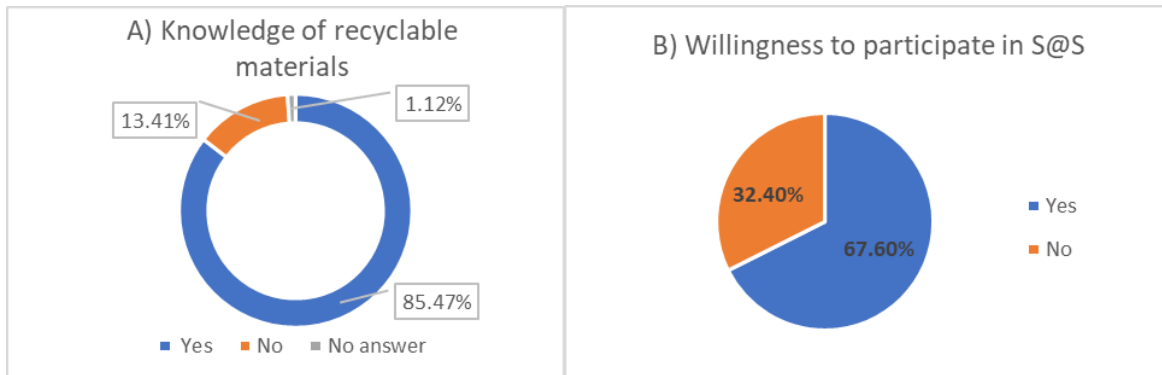
Most respondents (95%) have indicated that they do receive a regular and reliable waste collection service and 90% have reported weekly collections (Figure 1). The municipality have confirmed that contingency plans are in place to ensure that no waste is left uncollected on collection days. This is an important finding since literature (Alhassan *et al.*, 2020) suggest that lack of access to regular and reliable waste collection services may contribute to a lack of interest in separating waste in the communities. Alhassan *et al.* (2020) further stated that providing waste collection alone may not be sufficient to encourage participation in S@S, the availability of sorting and drop-off centres may also add value.



**Figure 1: Reported waste collection service (A) and frequency (B) in Newcastle Municipality**

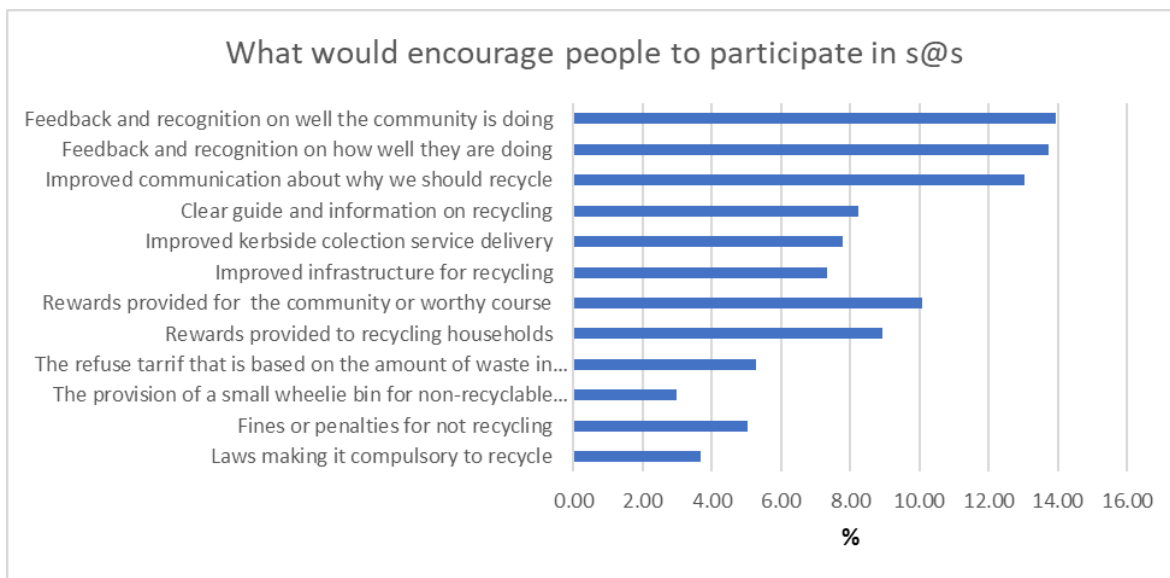
Most respondents (85%) have indicated that they know which material are recyclable and 67% of respondents were willing to participate in the pilot study (Figure 2). The willingness of the community to participate in S@S shown by the results plays a key role in the success of the S@S project as it was the same in a study conducted in Ghana (Alhassan *et al.*, 2020). In addition to the willingness, household behaviour can directly affect the implementation of the S@S (Zheng *et al.*, 2020). This finding adds value to the implementation of the S@S since the S@S is regarded as the most effective way of reducing and diverting waste to the landfill site (Zhang, 2022). The two incentives that were most often mentioned that will encourage households to participate in the study is if bags are provided and if the recyclables are collected at the kerbside. Kerbside collection of recyclables was noted by Strydom (2018) as a key driver for household recycling behaviour in large urban areas of South Africa as the willingness to take recyclables to collection points decrease with increased distances to drop-off points (Strydom, 2018).





**Figure 2: Knowledge of respondents on recyclability of materials (A) and Willingness to participate in S@S (B), Siyahlala La**

In addition to the provision of plastic bags and collection service as encouragement for taking part in S@S, participants were asked to select from a list of factors those that they think would motivate people to separate their recyclables from the general waste (Figure 3). Getting feedback and recognition of their effort was the most mentioned factor followed by improved communication about how they should do the actual sorting and separation. Abbasi et al, (2020) also reached a similar conclusion where educational messages were proven to motivate the community to participate in S@S. The community also mentioned that the provision of rewards either in monetary terms or any other means would motivate them to participate in the S@S. These results concur with the findings from a study conducted in the City of Johannesburg (Nahman et al, 2017) and in China (Zhang, 2022). Other factors mentioned by the community includes enforcement of recycling by making it a legal obligation for residents to separate waste, issuing fines to those people who do not separate their waste, or charging lower tariffs to the people who separate their waste. Zhang (2022) also found that implementing government policies that regulate S@S does improve the participation of the community in recycling and S@S. Furthermore, Moh and Manaf (2017) found that mandatory S@S in waste management policies also plays a significant role in encouraging participation in S@S.

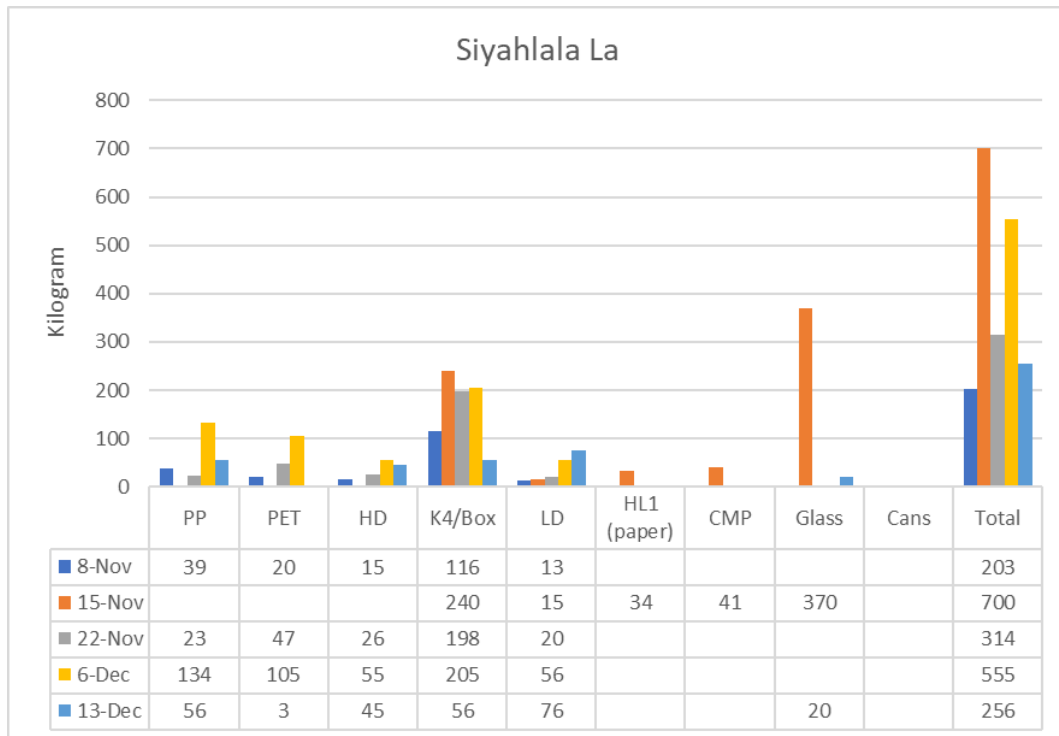


**Figure 3: Factors that may motivate people to participate in S@S by number of respondents from Siyahlala La**

A total of 4 807 kg of recyclables (excluding cans) with a resource value of about R5 725.70 was diverted from landfill over a 6-week period with 5 collections from Siyahlala La (Figure 4)

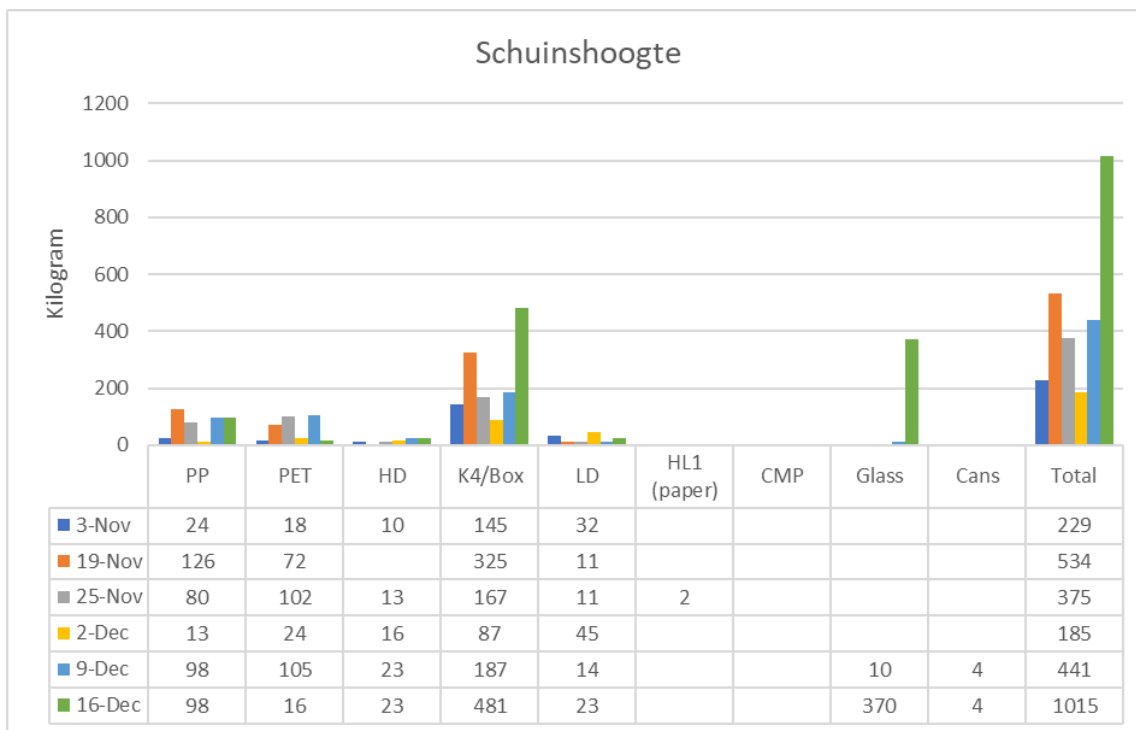


and 6 collections from Schuinshoogte (Figure 5). Approximately 57.82% (2 779kg) of recyclables were collected from Schuinshoogte and 42.2% (2 028kg) from Siyahlala La. It should be noted that since the Chama-cha staff also selectively pick recyclables from the black bags in the study areas, the data is not an accurate reflection of the success of the household participation in the pilot study. However, it does give an accurate reflection of the waste diverted from landfill by Chama-cha during the pilot study. The scrap metal and cans collected is handed to the waste pickers and therefore not reported on a weekly basis. This helps to prevent competition between Chama-cha and the local waste pickers. The waste pickers take turns to go to the Chama-cha sorting centre to get the collected cans and scrap metals.



**Figure 4: Recyclables collected from Siyahlala La (Data: Chama-cha)**





**Figure 5: Recyclables collected from Schuinshoogte (Data: Chama-cha)**

## Learning

The following learning points emerged from the Newcastle S@S pilot study:

1. A reliable and consistent municipal waste collection service is essential for a S@S initiative to succeed. Municipalities making use of black bags for waste collection should be aware that clear bags are likely to be used for mixed waste if black bags are not provided. Recyclables find its way into clear bags if black bags are provided in parallel to clear bags.
2. Different communication strategies are required for different areas within the same municipality. In the case of Newcastle, the middle- to high-income residents suggested sharing information on the municipality website, whereas the low-income residents suggested community meetings for initial information sharing. A survey at the start of the project will therefore provide valuable insights into the preferences of the communities as far as engagement is concerned. The door-to-door background survey had the added benefit that it also served as an excellent awareness raising exercise.
3. The messages used in the communication with different stakeholders are key. Details on the project must be communicated to political leaders and community members to facilitate buy-in. Issues to be included in the communication are the following:
  - a. What are the objectives of the initiative?
  - b. Why is it necessary and important?
  - c. Who is involved, and who benefits?
  - d. What is required of communities?
  - e. What should be included in the clear bag?
  - f. When will the bags be collected and by whom?
4. Involving a local business that employs members of the low-income community encourages community participation and builds trust and confidence in the project.
5. The service provider will go the extra mile to maximise recovery of materials from the study area through increased household participation and cherry-picking of materials if it benefits the business and increases their income secured through the sale of the materials
6. A formal contract is not required between the municipality and service provider if no money exchanges hands. In the absence of a formal contract, the municipality has little control over the activities of the service provider and no means to enforce performance targets. In the Newcastle study there was no contract, but this was not an issue and worked well due to the work ethic and



- integrity of the service provider and the trust relationship that exists between the Chama-cha as service provider and the municipality as well as the community.
7. Political buy-in for S@S initiatives is very important. Ward Councillors are important role-players for mobilising communities to participate but also to receive feedback from communities. Councillors have contact details of community members and are able to assist with awareness raising and education, but they also receive complaints if there are service failures which provides a valuable feedback line to the implementers of the initiative.
  8. Timing of the roll-out of S@S is key. The roll-out in Newcastle coincided with the run-up to the local government elections. Community members are suspicious of any new initiatives implemented in the run-up to elections, the attention of municipal staff is diverted away from normal operations to assisting with campaigns and infrastructure for the elections; changes in political leadership may result in protest action causing service interruptions to the detriment of the S@S initiative, and changes in the ruling party may upset the political buy-in received before the change.

## CONCLUSIONS

The S@S pilot study was a success in the Newcastle municipality due to several factors that worked well together. The key contributions to the success of the project in the Newcastle municipality includes the willingness of Chama-cha to provide the recyclables collection service without having a contract with the municipality. Due to the business-oriented attitude of Chama-cha, more recyclables were diverted from the landfill site than what is separated by the community. This approach increased the income generation potential from the sale of material. Ongoing communication and awareness raising of the community on collection days also contributed to the success. The personality of the service provider and established relationship between the service provider, the municipality and the local community members were key success factors. Although it seems unlikely for such a relationship to be replicated in other municipalities, the learning points outlined are applicable to municipalities across South Africa irrespective of their size or geographical location.

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## REFERENCES

Abbasi, A., Araban, M., Heidari, Z., Alidosti, M., & Zamani-Alavijeh, F. (2020). Comparing the impact of educational messages based on an extended parallel process model on solid waste separation behaviors in female students: A four-group randomized trial. *Waste Management*, 117, 1-8.

Alhassan, H., Kwakwa, P. A., & Owusu-Sekyere, E. (2020). Households' source separation behaviour and solid waste disposal options in Ghana's Millennium City. *Journal of environmental management*, 259, 110055.

CSIR (Council for Scientific and Industrial Research). (2011). *Municipal waste management - good practices* (Edition 1). Council for Scientific and Industrial Research (CSIR). [http://www.csir.co.za/nre/docs/Waste\\_Management\\_Toolkit.pdf](http://www.csir.co.za/nre/docs/Waste_Management_Toolkit.pdf)

CSIR (Council for Scientific and Industrial Research). (2015). *Cooperative good practice guide in the waste recycling sector: A guideline for cooperatives by cooperatives*. <http://www.sagreenfund.org.za/wordpress/wp-content/uploads/2016/05/CSIR-Co-operative-good-practice-guide.pdf>

Department of Environmental Affairs (n.d) Guidelines on separation of waste at source  
Department of Environmental Affairs and Tourism. (n.d.-a). *Working with waste: Guideline for waste collection in high density and unserved areas*. <http://sawic.environment.gov.za/documents/231.pdf>



Department of Environmental Affairs and Tourism. (n.d.-b). *Working with Waste: Guideline on Recycling of Solid Waste*. <http://sawic.environment.gov.za/documents/232.pdf>

FAO. (2013). *Toolkit: Reducing the food wastage footprint*. <http://www.fao.org/docrep/018/i3342e/i3342e.pdf>

Hyman, M., Turner, B., & Carpintero, A. (2013). *Guidelines for National Waste Management Strategies: Moving from Challenges to Opportunities* (T. Cieux (ed.)). [http://www.unep.org/ietc/Portals/136/Publications/Waste Management/UNEP NWMS English.pdf](http://www.unep.org/ietc/Portals/136/Publications/Waste%20Management/UNEP%20NWMS%20English.pdf)

Moh, Y. and Abd Manaf. L., (2017). Solid waste management transformation and future challenges of source separation and recycling practice in Malaysia. *Resources, Conservation and Recycling*, 116, 1-14.

Nahman, A., Oelofse, S.H.H., Haywood, L.K., Funke, N.S., Strydom, W.F., Polasi, L.T., Ramukhwatho, F.R., Muswema, A.P., Matinise, S.N., Sakoane, Z.W., Nohayi, N., Murambadoro, M.D., De Wet, B., (2017). Participation in separation@source in the City of Johannesburg: Why is it low, which instruments can be used to improve it, and how can it be better measured. Final report and evidence-based implementation plan. CSIR report, Pretoria.

SALGA. (2013b). *SALGA Good practice guide to: Waste Transfer Stations, Material Recovery Facilities and Buy-back Centres*.

Strydom, W.F. (2018) Applying the Theory of Planned Behaviour to Recycling Behaviour in South Africa. *Recycling* 3, 43. doi:10.3390/recycling3030043.

Western Cape Government. (2019). *A Guide to Separation of Waste at Source* (Issue September). [https://www.westerncape.gov.za/eadp/files/atoms/files/WCape Govt Municipal S%40S E-Guide\\_ 10 -9 -19Final.pdf](https://www.westerncape.gov.za/eadp/files/atoms/files/WCape%20Govt%20Municipal%20S%40S%20E-Guide_10-9-19Final.pdf)

Zhang, Y., Wang, G., Zhang, Q., Ji, Y., & Xu, H. (2022). What determines urban household intention and behavior of solid waste separation? A case study in China. *Environmental Impact Assessment Review*, 93, 106728.

Zheng, J., Ma, G., Wei, J., Wei, W., He, Y., Jiao, Y., & Han, X. (2020). Evolutionary process of household waste separation behavior based on social networks. *Resources, Conservation and Recycling*, 161, 105009.

