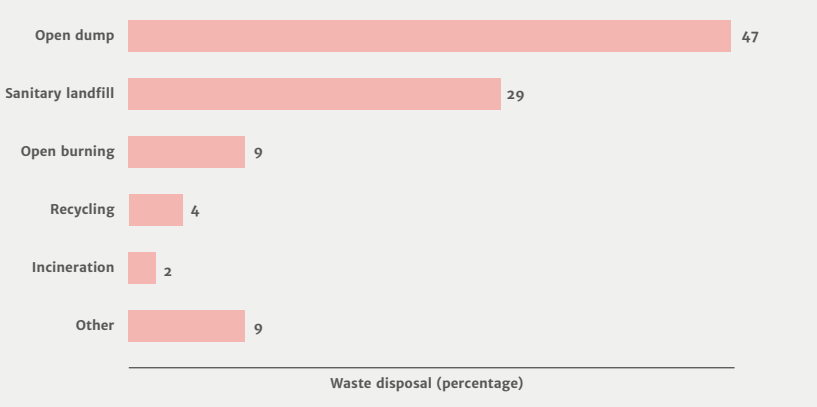
Chapter 5

Africa: Private waste service failure and alternative vision

By Vera Weghmann

Effective waste management is essential for public health and for maintaining a sustainable environment. If not properly managed, waste can pose serious health problems and pollute our waters, soils and air. Figures from 2012 reveal that the waste collected in Africa was only 55 per cent of the total waste generated.[1] Consequently, residents are forced to deal with the waste themselves, often through illegal dumping and open burning. Open burning is a major contributor to high levels of air pollution in Africa. In 2013 an estimated 712,000 people in Africa died as a consequence of dirty air, which was a 36 per cent increase from 1990.[2] Illegally dumped waste clogs rivers and drains, which causes floods. Stagnant water is also a breeding ground for mosquitos and other insects that can spread malaria, the Zika virus or the dengue fever. A lot of waste ends up in the sea via rivers, which carry trash over long distances. According to Greenpeace, 12 million tonnes of plastic are entering the world's oceans every year. Ten of the most polluting rivers in the world are responsible for 90 per cent of plastic in the oceans, and two of these rivers are located in Africa, namely the Nile and the Niger.[3]

Even if the waste is collected, many African countries struggle to effectively deal with it. Many cities have only one official landfill site for the whole city, which often overflows and poses serious health and safety concerns. For instance, Nairobi, Kenya has only one legal dumpsite, Dandora, which was declared full in 1996. More than 30 years later it is still operating. Dandora is an open landfill, surrounded by residential areas. The dumpsite puts the health of nearby residents at risk. The Nairobi River, running right across the dumpsite, carries polluted water



Source: Hoornweg, D.; Bhada-Tata, P. (2012) What a Waste : A Global Review of Solid Waste Management. World Bank. In: UNEP (2018) Africa Waster Management Outlook.P.37

downstream where it is used for irrigation of food products and as drinking water. But most of the waste in Nairobi does not even end up in the official landfill.[4] Instead, private waste collectors dump the collected waste at one of the over 70 illegal dumpsites scattered throughout the city.[5]

Overwhelmed by the size of the waste problem, many African countries have turned to the private sector. However, as this essay will outline in detail, privatisation is not the solution for effective waste management. The essay will thus illustrate how workers and communities successfully resisted the privatisation of waste management in Egypt, leading to remunicipalisation of waste management in its three biggest cities, namely Cairo, Alexandra and Giza. Subsequently, we point to Africa's zero-waste potential. The next section reflects on the valuable contribution of the informal sector to waste management, and on the potential and challenges of formalising the informal sector. Finally, the advantage of publicly run waste management services is outlined. We conclude by drawing out the main lessons learned from Africa's experiences with waste management privatisation and its alternatives.

The failure of privatisation

Right from the beginning, the experiences with privatised waste management in Africa demonstrated its failure. Cameroon was among the first countries in Africa to privatise part of its waste management services. Already in 1969, Douala outsourced the management of its municipal waste and Yaoundé followed 10 years later. In its evaluation of the waste management privatisation, the United Nations Environment Programme classified it as a 'failed PPP'.[6] The performance of waste company *Hygiène et Salubrité du Cameroun* (HYSACAM) had been poor and eventually the company withdrew entirely in 1991 when economic crises and structural adjustment destabilised the country.[7] The waste catastrophe perpetuated and in 1994 the World Bank intervened with an emergency programme to clean up the two cities and especially the open dumps. However, despite these problems, HYSACAM was contracted again in 1998 and public-private partnership (PPP) was expanded to 17 more cities across the country. Yet again, HYSACAM's performance remained wanting. Five years into the contract the company still could not access 60 per cent of the neighbourhoods, as the pathways were too narrow for their equipment and informal workers continued to serve these areas.[8] After nearly 50 years of privatised waste services, an efficient and effective waste management system has yet to be introduced in Cameroon.[9]

A major problem with privatised waste services is that the privatisation is only taking place in areas deemed profitable. Poorer urban areas as well as rural areas see waste piling up. For example, Tunisia has a long history of privatised waste services, strongly promoted by the World Bank and other development institution. In 2010, UN-Habitat praised Tunisia for its 'successful experience with [waste management] privatization'.[10] However, if the service functioned well in the city of Sousse only 10 per cent of rural areas' waste was being collected. This is very significant given that in 2018 over 30 per cent of Tunisia's population lived in rural areas.[11] Similarly, in Dar es Salaam, Tanzania the privatisation of waste

services has improved coverage in the capital, but poorer neighbourhoods are left out. Consequently, 70 per cent of the waste in Dar es Salaam is either disposed informally, illegally dumped into waterways and fields, or burned.[12]

Another common side effect of privatised waste management is the side-lining of informal waste workers. Informal waste workers are contributing significantly to waste management in Africa by doing most of the recycling. For example, in Dar es Salaam, Tanzania's informal waste workers are estimated to recycle 80 per cent of plastic bottles, which are then sold to national factories for processing and sale to national and international markets.[13] In South Africa, approximately 80 to 90 per cent of the paper and packaging waste are recovered by the informal sector, thereby saving municipalities millions of dollars every year in freed landfill space. Despite the fact that the informal waste workers deliver such a vital environmental service, when the private company Averda took over the Genesis landfill near Johannesburg in September 2016 it attempted to exclude them. Many of the informal workers had been working at the landfill for 17 years. The company used intimidation to prevent the informal workers from accessing the grounds. In June 2018 Averda hired a private security company, called the Red Ants, which raided the homes of the informal workers outside of the landfill and violently attacked them, resulting in 19 people hospitalised, four with serious injuries.[14]

The struggle against privatised waste management in Cairo

In Egypt, in the 1940s the Zabaleen Christian community on the outskirts of Cairo set up a very sophisticated waste management system. Consisting of approximately 70,000 people, this community is believed to sort 15,000 tons of waste daily, which represents two-thirds of Cairo's overall waste. Over time, this waste management system has achieved recycling

rates of 85 per cent.[15] By means of comparison, the average recycling rate of municipal waste in the EU-27 and Norway in 2014 was 43 per cent, with Germany achieving the highest rate with 64 per cent.[16] Pigs are an essential component of the Zabaleen recycling and sorting system, as they feed on the food waste. The Zabaleen community consumes some of the pigs themselves, and others are sold to hotels and other touristic locations in Egypt. This serves as a source of extra income and a form of savings.[17] The Zabaleen waste management system demonstrates that it is possible to create a circular economy even in megacities such as Cairo.

Despite the effectiveness of the Zabaleen waste management system, the government decided to privatise waste management in Cairo in the early 2000s following privatisations in Alexandria and Giza (see Table 1). The privatisation efforts came as part of a wider gentrification process as the government pursued a hidden agenda in terms of securing access to land for urban development projects and land speculation activities. The Zabaleen settlement, which became known as 'Garbage City', was seen as a lucrative urban investment opportunity due to its geographical proximity with Cairo's historical – and hence touristic – quarters. As such, the privatisation reflects the government's ambition to relocate the Zabaleen out of the city centre and into new suburban settlements.[18]

The private companies were only able to recycle some 20 per cent of the waste,[19] compared to the Zabaleen's earlier 85 per cent.[20] Unlike the Zabaleen, the private companies did not collect the waste from the narrow streets or tall buildings. Instead, they set up central collection points and expected residents to deposit their waste into large bins at these points. Residents were charged for the waste collection service through their electricity bills, effectively giving the private companies 'ownership' over the collected waste. Most of the companies promised to give the Zabaleen some 50 per cent of the garbage in return for their help in sorting. However, this represented only a fraction of the income the Zabaleen had earned before. In other words, through the privatisation

the Zabaleen lost their livelihood. Some Zabaleen saw as much as a 75 per cent drop in earnings as a result.[21]

Residents and the Zabaleen resisted the privatisation. In Giza, hundreds of Zabaleen demonstrated in February 2003 to campaign against the influx of foreign companies. In Cairo, just six months after starting operations, the private companies Urbaser and FCC incurred municipal fines of US$2 million due to citizen complaints of irregular collection and inadequate street sweeping. Moreover, hundreds of citizens in Cairo and Giza filed lawsuits against the government for adding the collection fees onto their electricity bills. Consumers won the case and the ruling ended the billing system in Giza, Cairo and Alexandria. Eventually, the Egyptian government was forced to accept that their privatisation experiment had failed.[22] When the 15-year contracts with the private companies came to an end in 2017 and 2018 the government chose not to renew them. Instead, a 'new' system drawing on Zabaleen door-to-door collection was gradually implemented.[23] In all three cities, the waste collection services were remunicipalised. Alexandria was the first city to remunicipalise the waste service as the private company Veolia terminated the contract in 2011, four years earlier than planned (see Table 1). Public company Nahdet Misr, a subsidiary of the state enterprise Arab Constructors, started to operate the waste management services in Alexandria in December 2011. Nahdet Misr partnered with the informal sector, officially subcontracting them for the waste collection services.[24]

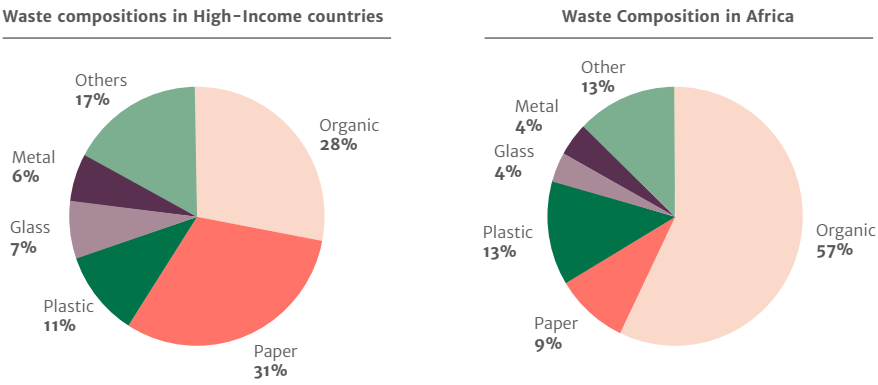
City	Year of privatisation	Value of contract	Length of contract	Company	Remunicipalisation
Alexandria	2000	$446 million	15 years	CGEA Onyx, a division of Vivendi, which later became Veolia Environment	In 2011 Veolia terminated the contract (4 years early). The public sector company Nahdet Misr which is a subsidiary of the state owned enterprise Arab Contractors is now in charge of the waste management
Giza (Dokki, Agouza and Imbaba districts	2002	$7.6 million	15 years	FCC and Urbaser	
Cairo (eastern and western zones)	2003	$25 million a year	15 years	FCC and Urbaser	Contract terminated and was not renewed
Cairo (North)	2002	$11.5 million a year	15 years	AMA Arab Environment Company (AAEC)	Contract terminated and was not renewed

Table 1. Waste remunicipalisation in Egypt

Source: Van Niekerk, S. and Weghmann, V. (2019) Municipal Solid Waste Management in Africa and Arab Countries. Ferney-Voltaire, France: PSI.

Africa's zero-waste potential

The Zabaleen demonstrate that there is a huge potential for zero-waste programmes in Africa, as the waste composition is characterised by a high percentage of organic waste due to the preparation of fresh food, and the limited use of packaging in sold goods. The World Bank estimates that in Africa 57 per cent of waste is organic, 13 per cent is plastic, 9 per cent is paper or cardboard, 4 per cent is glass, 4 per cent is metal, and the remaining 13 per cent is other materials.[25] This is very different from the waste composition in high-income countries, where only 28 per cent of the waste is organic (see Graphs 1 and 2). Organic waste has been reused for centuries. Like the Zabaleen in Egypt, the method of feeding organic waste to animals has been applied in other cities, for example in Sousse in Tunisia, Moshi in Tanzania and, to a lesser extent, in Nairobi, Kenya. Also, in the Ugandan capital Kampala, the Kasubi-Kawala neighbourhood set up a waste management system for 75 per cent of organic waste, which involves feeding animals, composting and making biofuel out of



Source: Hoornweg, D.; Bhada-Tata, P. (2012) What a Waste : A Global Review of Solid Waste Management. World Bank. Page 20 and 21

municipal organic waste. Most strikingly, Bamako, Mali has managed to achieve an estimated 85 per cent municipal waste valorisation rate by feeding waste to animals and by reusing it through a traditional method called '*terreautage*', whereby unprocessed waste is sold to crop farmers and partially composted waste is sold to vegetable farmers.[26]

The island of Zanzibar in Tanzania is also currently piloting an integrated municipal waste management system with the aim of becoming a zero-waste island. In Zanzibar more than 80 per cent of the waste is of the wet organic type, so composting is key. The pilot programme started in September 2017 in a low-income area of Zanzibar called Shauri Moyo, where 200 households are participating. Selected households received bins and plastic bags to sort the waste into wet, dry and hazardous waste. Eight workers – mostly women – from the local Shauri Moyo Waste Management Society were given the responsibility of educating the households on waste segregation, collection and processing. This local partner is an informal worker-led organisation, but salaries are paid by the Zanzibar Urban Municipal Council.[27] The workers receive a monthly salary and they can make extra income from selling the compost as well

as dry waste such as metal, plastics, glass and carton paper. The project was launched by the Zanzibar Environmental Management Authority and the public interest research and advocacy organisation Centre for Science and Environment in India, together with the local municipal councils of Zanzibar.[28]

Formalisation of waste services

The work that informal waste workers do is unhygienic, it bears severe health and safety risks and is severely precarious; yet they make a significant – but rarely recognised – contribution to waste management systems in Africa. There is no reliable data on the number of informal waste workers on the continent and there are great variations between countries. In South Africa, there would be at least 90,000 informal waste workers.[29] In Nigeria, roughly 10,000 informal waste workers would be working in Lagos alone.[30] In comparison, Morocco's figure would be much lower with only 7,000 informal waste workers in the whole country.[31]

The example of Egypt shows that the failure of privatised waste management services led to the inclusion of informal waste workers into the formal economy. This formalisation of an already established and highly sophisticated waste management system represents an opportunity to enhance working conditions and pay for the informal workers while also increasing the satisfaction of residents with the service. Likewise, Zanzibar's attempt to become a zero-waste island through an integrated waste management system builds on the integration – and thus formalisation – of the informal economy.

However, formalisation becomes a problem when informal workers are incorporated into the formal system at lower wages and with poorer working conditions than municipal waste workers. This happened, for instance, in Dakar, Senegal. By the late 1990s waste services had begun to collapse and rubbish began to accumulate in the streets and public spaces

of Dakar. In reaction to this, a youth movement called *Set/Setal* ('Be Clean/ Make Clean') emerged. This movement involved youth cleaning and beautifying their own neighbourhoods in Dakar. By 1990, the Set/Setal youth had been recruited into a city-wide participatory system. These youth were incorporated into the city waste management system but at a lower rate of pay and without benefits. The youth became responsible for collecting and loading garbage onto the dump trucks bound for the city's outskirts. Although paid a daily rate, they were not given other protections and benefits, despite becoming the backbone of the waste management system for the city at that time.[32]

Another problem with the formalisation of informal workers arises when only a fraction of the informal waste workers gains formal employment. This poses the question of what happens to the other informal waste workers, whose livelihoods are at risk if they lose access to the waste. As such, formalisation can deepen inequalities between a formally employed workforce and informal waste workers.

Public alternatives

Algeria is demonstrating what can be achieved through a publicly run waste management system. There is very little private sector involvement in the waste management system in Algeria, with only parts of a few cities having chosen to privatise their waste collection. Since 2002, Algeria has adopted an integrated waste management programme that is part of its wider commitment to sustainable development. Algeria is a country where climate change has been high on the agenda for decades because of increasing desertification due to climate change. Algeria's waste infrastructure is financed by the central government and the management of waste collection and disposal is funded by the 'junk removal tax', whereby each household pays a fee to the municipality.[33] The waste collection rate is among the highest in Africa. In urban areas, roughly 90 per cent of the waste is collected while this rate is at 65-70 per cent

in rural areas, which is extraordinarily high for Africa (e.g. as compared with 10 per cent rural waste collection in neighbouring Tunisia). Despite the success of its publicly run waste management programme, Algeria is planning to open to the way for more private sector involvement, as strongly suggested by the international donor community.[34]

Rwanda is routinely praised for its cleanness. At the 2018 World Economic Forum, UN Environment Programme Head Eric Solheim called the capital Kigali the 'cleanest city on the planet' in terms of lack of rubbish on the streets and green initiatives.[35] Umuganda – the one–day-a-month tradition of compulsorily community work – is the secret behind Kigali's cleanness. The communal labour of Umuganda has a long tradition in the region that is nowadays Rwanda. Umuganda has been practiced since pre-colonial kingdoms and it was an integral part of the patron–client relationship.[36] Literally translated, it means 'coming together in common purpose to achieve an outcome'. Residents pick up rubbish, clear land for community gardens or help to build new roads, classrooms or residential toilets for families that lack them. It is a day of cleaning up but also an opportunity to catch up with the community. Umuganda is compulsory: At least one person over 18 years of age per household must attend. Residents are divided into neighbourhood work teams, with 20 to 150 families in each group. Non-attendance at Umuganda, without an approved excuse from the local council, can lead to fines of RWF 5,000 (US$6), which is a significant amount of money for most people in Rwanda but an insignificant sum for the rich.[37] Following Kigali's example, Dar es Salaam has also held a once a month cleaning day campaign in 2016.[38] The initiative requires all Tanzanian citizens to participate in regular cleaning activities of public spaces. While some observers see Umuganda as a creative contribution to a functioning public waste management system based on traditional methods, others see it as a form of forced labour.

Conclusion: lessons learned

The privatisation of waste management only perpetuates the difficulties in delivering effective waste services: i) it leaves most residents excluded from the service (as the private companies usually only cover the wealthier areas in cities where people can afford to pay for the service); ii) it puts profit before the environment; and iii) it is a very expensive way to run the service.

Africa has a great zero-waste potential by way of establishing a circular economy, because a large proportion of the waste is organic. In fact, traditional methods such as feeding waste to animals or using it to fertilise the soil have been used for centuries. This type of local knowledge should be encouraged. Unfortunately, as the experience of waste privatisation in Egypt demonstrates, privatisation discourages local and integrated waste management mechanisms.

Informal waste workers make a significant but rarely recognised contribution to waste management systems in Africa. Privatisation of waste management often leads to informal waste workers losing access to the waste – in other words, they lose access to their livelihoods. A publicly owned and managed waste management system bears the opportunity to enhance circular-economy waste management by formalising the informal waste workers and by building upon their knowledge and expertise. The Zabaleen's circular economy system that achieved a recycling rate of 85 per cent in Egypt or Zanzibar's efforts to become a zero-waste island are cases in point.

An integrated and publicly owned and managed waste management system can achieve great results. Algeria has achieved one of the highest collection rates in Africa in the virtual absence of private sector involvement. It established an integrated waste management system that serves the entire population, and in particular the rural population. This

stands in stark contrast to private waste management systems known to cream off profitable city areas while neglecting the rest of the population.

Note: This chapter is based on a recent 2019 report published by Public Services International entitled 'Municipal Solid Waste Management Services in Africa and Arab Countries' written by Sandra Van Niekerk and Vera Weghmann.

ABOUT THE AUTHOR

Vera Weghmann is a Research Fellow for the Public Services International Research Unit (PSIRU) at the University of Greenwich, UK. She is also a member of the Centre for Research on Employment and Work (CREW). Before joining the University of Greenwich in September 2017, she completed her PhD at the Centre for Study of Social and Global Justice at the University of Nottingham, UK. Her research focuses on public services, in particular waste management, energy policy, energy democratisation, remunicipalisation and public ownership as well as independent trade unionism.

Endnotes

1 United Nations Environment Programme (2018) Africa Waste Management Outlook. Nairobi: UNEP.

2 OECD (2016) The cost of air pollution in Africa. Available at: *https://www.oecd-ilibrary.org/development/the-cost-of-air-pollution-in-africa_5jlqzq77x6f8-en*

3 Greenpeace (2017) 'How does plastic end up in the ocean?' 22 August. Available at: *https://www.greenpeace.org.uk/plastic-end-ocean/*

4 Ministry of Environment and Natural Resources and UNDP (2016) A Circular Economy Solid Waste Management Approach for Urban Areas in Kenya, p. 28. Available at: *http://www.undp.org/content/undp/en/home/librarypage/environment-energy/mdg-carbon/NAMAs/nama-on-circular-economy-solid-waste-management-approach-for-urb.html*

5 UNEP (2018) Africa Waste Management Outlook. Nairobi, Kenya: UNEP.

6 UNEP (2018) Africa Waste Management Outlook. Nairobi, Kenya: UNEP, p. 169.

7 Achankeng, E. (2003) Globalization, Urbanization and Municipal Solid Waste Management in Africa. Available at: *http://www.wiego.org/sites/default/files/publications/files/Achankeng_Globalization_Urbanization_MSWMgmt_Africa.pdf*

8 Achankeng, E. (2003) Globalization, Urbanization and Municipal Solid Waste Management in Africa. Available at: *http://www.wiego.org/sites/default/files/publications/files/Achankeng_Globalization_Urbanization_MSWMgmt_Africa.pdf*

9 UNEP (2018) Africa Waste Management Outlook. Nairobi, Kenya: UNEP, p. 169.

10 UN-Habitat (2010) Solid Waste Management in the Worlds Cities. Available at: *https://unhabitat.org/solid-waste-management-in-the-worlds-cities-water-and-sanitation-in-the-worlds-cities-2010-2*

11 Statistics available at: *https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS?locations=TN*

12 UNEP (2018) Africa Waste Management Outlook. Nairobi, Kenya: UNEP, p. 81.

13 Oyake-Ombis, L. (2017) Awareness on environmentally sound solid waste management by communities and municipalities in Kenya, p. 34.

14 See: *https://globalrec.org/2018/07/07/violent-assault-of-waste-pickers-near-genesis-landfill-johannesburg/*

15 UNEP (2018) Africa Waste Management Outlook. Nairobi, Kenya: UNEP.

16 Egyptian Streets (2016) 'Cairo Leads European Cities in Recycling', 27 July. Available at: *https://egyptianstreets.com/2016/07/24/cairo-leads-european-cities-in-recycling/* (accessed 17/04/18).

17 RT Documentary (2016) 'Zabbaleen: Trash Town. A whole community in Egypt that lives on rubbish', 15 May. Available at: *https://www.youtube.com/watch?v=Dos7WsoC528* (accessed 17/04/18)

18 Fahmi, W. and Sutton, K. (2019) 'Cairo's Contested Garbage: Sustainable Solid Waste Management and the Zabaleen's Right to the City'. Sustainability, 2: 1765-1783.

19 Brinkley, H. (2019) Hardin's imagined tragedy is pig shit: A call for planning to recenter the commons. Planning Theory. Vol. 19, iss. 1, pp. 127-144.

20 Egyptian Streets (2016) Cairo Leads European Cities in Recycling, 27 July. Available at: *https://egyptianstreets.com/2016/07/24/cairo-leads-european-cities-in-recycling/*

21 NewsWeek Middle East (2017) 'Cairo's Treasures of Trash', 24 May. Available at: *http://newsweekme.com/cairos-treasures-trash/* (retrieved 17 April 2018).

22 Wael Fahmi, W. and Sutton, K. (2010) 'Cairo's Contested Garbage: Sustainable Solid Waste Management and the Zabaleen's Right to the City'. Sustainability, 2 (6).

23 Egypt Today (2017) 'Cabinet allocates LE 300 million for Cairo waste collection', 5 October. Available at: *https://www.egypttoday.com/Article/1/26112/ Cabinet-allocates-LE-300-million-for-Cairo-waste-collection* (retrieved 17 April 2018).

24 Elgazzar, R., El-Gazzar, R. and El-Gohary, M. (2017) Understanding the Dilemma of the Municipal Solid Waste Management System in Alexandria, Egypt: Could ICT Improve the System? International Federation for Information Processing, pp. 816–822.

25 Hoornweg, D.; Bhada-Tata, P. (2012) What a Waste : A Global Review of Solid Waste Management. Urban development series. Knowledge papers no. 15. World Bank. Washington, DC

26 Wilson, D., Rodic, L. et al. (2012) 'Comparative analysis of solid waste management in 20 cities'. Waste Management & Research, 30(3): 237 –254.

27 Magazeti ya Tanzania (2018) 'Zanzibar has become the first island in East Africa to have a decentralised waste management model'. Magazeti ya Tanzania, 3 July.

28 Centre for Science and Environment (2019) Pilot Project Decentralized Solid Waste Management. Available at: *https://www.cseindia.org/pilot-project-decentralized-solid-waste-management-9604*

29 WIEGO (2018) 'WIEGO strongly condemns violent assault of reclaimers near Genesis landfill'. Available at: *https://www.wiego.org/resources/wiego-strongly-condemns-violent-assault-reclaimers-near-genesis-landfill*

30 Sesan, T. (2018) Inside the Cleaner Lagos Initiative. Lagos, Nigeria: Heinrich Boll Stiftung. Available at: *https://ng.boell.org/2018/01/15/inside-cleaner-lagos-initiative*

31 See: *https://oxfordbusinessgroup.com/analysis/waste-not-international-financing-supports-modernisation-waste-management-infrastructure-and*

32 See: *https://lematin.ma/journal/2018/chiffonniers- inconnus-luttent-discretement-contre-changements-climatiques/286324.html*

33 See: *https://www.retech-germany.net/fileadmin/retech/05_mediathek/laenderinformationen/Algerien_RA_ANG_WEB_0_Laenderprofile_sweep_net.pdf*

34 See: *https://www.retech-germany.net/fileadmin/retech/05_mediathek/laenderinformationen/Algerien_RA_ANG_WEB_0_Laenderprofile_sweep_net.pdf*

35 IPPmedia (2018) 'Kigali rated the cleanest city in Africa', 27 April. Available at: *https://www.ippmedia.com/en/features/kigali-rated-cleanest-city-africa*

36 Bates, S. (2012) From the Ground Up: The Historical Roots of Umuganda in Rwandan Economic and Political Development. Master of Arts in Liberal Studies. Skidmore College. Paper 83.

37 See: *http://perilofafrica.com/umuganda-rwandas-day- community-cleaning/*

38 UCL (2017) Transforming Solid Waste Management in Dar es Salaam. Available at: *https://www.ucl.ac.uk/ bartlett/development/sites/bartlett/files/2017_swm_ report.pdf*