



9 Conclusions and the way forward





Conclusions and the way forward

What the reader can expect

This final chapter brings together the key messages that have emerged from the preceding chapters of the Africa Waste Management Outlook. These messages provide the basis for a set of recommendations on what needs to be done to address the waste management challenges facing Africa and suggestions on how this can be achieved.

Key messages

- Safe and sustainable solid waste management has obvious environmental, social and economic benefits for Africa. These include reducing or eliminating the environmental and human health impacts associated with poor waste management; minimizing the volumes of solid waste disposed of to land; recovering valuable resources from the waste and reintroducing these into local and regional economies; and improving livelihoods of formal and informal waste sector workers.
- Yet, despite these obvious benefits, African countries continue to dispose in excess of 90 per cent of the waste they generate to land, often to uncontrolled dumpsites with associated open burning.
- On average, 57 per cent of the MSW generated in Africa is biodegradable organic waste, the bulk of which is dumped. Disposal of organic waste results in the generation of greenhouse gases that contribute to climate change, and leachate that has the potential to pollute ground and surface water.
- With an average collection rate of only 55 per cent, MSW collection services in most African countries are inadequate, often only provided to high-income residential communities or central business districts. Indiscriminate dumping of waste in urban areas is common across Africa, creating increased risk of disease, flooding and environmental pollution.
- Recycling has emerged across Africa, driven more by poverty, unemployment and socio-economic need than by public and private sector design. While the African Union has outlined an aspiration that “*African cities will be recycling at least 50 per cent of the waste they generate by 2023*”, only 4 per cent of MSW is thought to be currently recycled in Africa.
- Informal waste pickers are active in recovering valuable resources from waste at little to no cost to the public and private sectors. These informal waste pickers save municipalities significant amounts of money by diverting waste away from landfill towards reuse and recycling. They also provide direct benefit to the private sector, by delivering a flow of secondary materials into the recycling economy. They are therefore a valuable link between the service- and value- chains in Africa. However, a large percentage of the recovered resources are exported out of Africa to international end-use markets, resulting in the loss of jobs and resources for Africa.

Key messages (continued)

- Africa is set to undergo a major social and economic transformation over the next century as its population explodes, cities urbanize and consumer purchasing habits change. This is expected to lead to exponential growth in waste generation, which will put considerable strain on already constrained public and private sector waste services and infrastructure. In fact, the rate of growth in waste generation in Africa is expected to be so significant that any decrease in waste generation expected in other regions globally will be overshadowed by Africa.
- Changing consumer behaviour has resulted in increasing plastic consumption in Africa. With growing plastic consumption and weak MSW collection systems, Africa is at risk of increasing leakage of plastic into the environment, resulting in many countries moving to ban plastic bags and other single-use plastic items. If Africa does not put measures in place to mitigate the flow of plastic (and other waste) into the ocean, increasing pollution is likely to negatively impact coastal economies.
- Reliable, extensive and up-to-date waste data remains a critical challenge for Africa, compromising any attempts to meaningfully move waste up the hierarchy away from disposal to prevention, reuse, recycling and recovery. Without reliable data, investment in much needed waste services and infrastructure remains high-risk.
- While data may be limited, preparing this Outlook has highlighted the power of citizen science in documenting the state of waste in Africa, including many of the photos used in this book.

A vision for Africa

“Extending regular and reliable waste collection services to all. Safe disposal of residual waste to sanitary engineered landfills, while maximizing the recovery of secondary resources from these waste streams through social and technological innovations appropriate for Africa.”

– Africa Waste Management Outlook 2018



Recommendations: Changing the paradigm of “waste”

There is an urgent need for African countries to address the current waste management challenges and to prepare themselves for the expected growth in waste generation in the coming century. This will require social and technological innovation, and investment in services and infrastructure in the waste and secondary resources sector never before seen in Africa.

There is a long way for Africa to go to achieve the vision of “safe disposal of residual waste to sanitary engineered landfills, while maximizing the recovery of secondary resources from these waste streams through social and technological innovations appropriate for Africa”. This vision for Africa does not ask countries to do anything that has not been asked of them before. The message that has emerged from the preceding chapters is for governments, in partnership with the private sector, non-governmental organizations and civil society, to provide comprehensive city cleansing services; extend waste collection services to all; eliminate uncontrolled dumping and open burning; and increase waste flows towards reuse, recycling and recovery. However, the reason for achieving this vision for Africa is clearer now than it has ever been, and the authors hope that the preceding chapters have provided a very clear picture of why this needs to be done, and why it needs to be done now.

The reuse, recycling and recovery of end-of-life products has the potential to create significant socio-economic opportunities for Africa. Growing a secondary resources economy in Africa could inject at least an additional US\$8 billion every year into the economy from secondary resources that are currently being thrown away as waste to dumpsites and landfills. Africa needs to realize the opportunity that secondary resources represent for the continent. Achieving the vision of this Outlook means that secondary resources could be released back into the African economy, growing and strengthening local manufacturing, creating jobs, addressing unemployment, and building local and regional economies. And if done responsibly and sustainably, at the same time minimizing the environmental and human health impacts associated with the current poor solid waste management practices seen across the African continent.

While there is currently limited understanding or agreement on the appropriate waste technology roadmap to achieve this vision, a combination of small-scale, low-cost, decentralized, community-driven initiatives and larger-scale, higher-cost, centralized

public-private initiatives may be required to address current and expected future solid waste management. Rough calculations suggest that rolling out large-scale recycling and recovery technology in Africa, typically used in developed countries, could cost the continent between US\$6 billion and US\$42 billion in the short-term, increasing to between US\$17 billion and US\$125 billion in 2040 depending on the alternative waste treatment technologies adopted. The resource value currently locked up in Africa’s waste is significant, which should be attractive to public and private sector investors, assuming the technologies are appropriate for Africa, and are not in conflict with the goal of a secondary resources economy.

The African Union has set an ambitious aspiration that by 2023 African cities will recycle at least 50 per cent of the waste they generate. The authors fully support this goal and believe that even higher rates can be achieved by focusing on (i) the diversion of organic waste away from landfill towards composting, bioenergy recovery and higher value product recovery, followed by (ii) refurbishment, repair, reuse and recycling of mainline recyclables such as plastic, paper, metal, glass, tyres and e-waste. It is recommended that an “African regional strategy for secondary materials management” be developed, implemented and resourced, with clear actions and goals for countries and cities. A strategy that creates opportunities for both small-scale, bottom-up, community based approaches as well as larger-scale, advanced treatment technologies. A serious debate regarding the appropriateness of large-scale thermal treatment technologies, such as incineration, must be had as part of the development of this strategy, given the high organic waste (moisture) content and high resource value within Africa’s waste streams. The success of such a strategy will require an enabling governance environment combined with supporting data, infrastructure, institutional capacity, financial provisions and monitoring and control mechanisms. Measures to reduce the risks associated with investment in Africa must be addressed at the continental and national levels and an enabling environment created for public-private partnerships. The establishment of regional secondary resource economies will be important to such an African strategy, and countries will need to find ways to support and enable such regionality while at the same time ensuring that they do not further facilitate waste trafficking and illegal dumping of hazardous waste in Africa.

What needs to happen

The Africa Waste Management Outlook fully supports the recommendations of the Global Waste Management Outlook, in particular –

1 Bring waste under control

The first priority for Africa is to address the public health imperative, by ensuring that all citizens have access to proper waste management services. Comprehensive, reliable and regular city cleansing and controlled disposal of waste is the foundation of every integrated waste management system.

Action imperatives include –

- Extend *city cleansing services* (street cleaning) across all cities and towns.
- Eliminate “*indiscriminate dumping*” or “*fly-tipping*” in open spaces.
- Extend affordable and appropriate *waste collection and removal services* to all residents, starting with densely populated areas.
- Eliminate *uncontrolled dumping* and *open burning* of waste.
- Ensure the *controlled disposal* of all waste as a first step towards sanitary engineered landfilling for residual waste.
- Eliminate *illegal trafficking* of hazardous waste.
- Separate hazardous waste from other waste at source, in particular health care risk waste and household hazardous waste.
- Promote *waste prevention* and cleaner production, particularly within business and industry.

Proposed Goal: All citizens have access to adequate waste collection services and environmentally sound management of all waste by 2030. Uncontrolled dumping and open burning of waste has been eliminated.



2 Harness the opportunities of ‘waste as resource’

The second priority for Africa, to be addressed in parallel, is to unlock the socio-economic opportunities of waste as resource, by moving waste up the waste management hierarchy away from disposal towards waste prevention, reuse, recycling and recovery.

Action imperatives include –

- Maximize *reuse, repair and refurbishment* of end-of-life products.
- Maximize waste *recycling and recovery*.
- Integrate existing small-scale informal and formal entrepreneurial activities within mainstream waste management.
- Implement appropriate, sustainable *alternative waste treatment technologies* for residual waste that cannot be designed out or sustainably recycled.
- Ensure *social inclusion* in the opportunities created.
- Incentivise the establishment of *local and regional end-use markets* to ensure maximum benefit for the African continent.

Proposed Goal: African countries are diverting at least 50% of the waste they generate towards waste reuse, recycling and recovery by 2030, and measures are in place to encourage waste prevention.



How this needs to happen

Achieving the above objectives may place increased strain on institutions in Africa, both financially and technically. The following, are therefore key to achieving the objectives of this Outlook –



1 Capacity-building and awareness-raising

Awareness:

- There is an urgent need to raise awareness and change public attitude towards waste generation, waste management, uncontrolled dumping and open burning of waste, along with the associated health and environmental impacts.
- This will enable civil society to actively participate in all aspects of waste management in their communities.
- Civil society and non-governmental organizations have an important role to play in empowering communities to engage in sound waste management practices.

Training and education

- Training needs to be focused at two levels –
 - A “bottom-up” approach that involves customized training programmes for different tiers of waste management staff (municipalities and private companies), raising their awareness and providing them with the technical knowledge to implement and manage sustainable waste management programmes and effectively enforce legislation.
 - A “top-down” approach designed to build understanding of the importance of sound waste management at the political and senior government levels.
- Skills in project costing and cost recovery for waste services and infrastructure in government agencies in charge of waste logistics and management must be strengthened.
- Institutions such as UNEP and the South African Ministry of Science and Technology have already launched initiatives to introduce graduate courses in waste management in a number of African universities.

Graduates will be equipped with advanced know-how to tackle waste issues in an integrated manner.

- These initiatives should encourage other African universities and training institutions to follow suit to help promote sound waste management throughout the continent, through various modalities of training and education.

Partnerships and collaboration

- Partnerships between governments and private sector organizations could be a positive approach to building robust waste services and infrastructure for tackling waste problems.
- Governments need to explore how such partnerships are incentivized through such things as an enabling policy environment, economic incentives and land allocations.
- Collaboration with developed countries is important to accelerate appropriate technology and knowledge transfer, guided by the needs of Africa, not technology vendors.

Informal sector integration

- The informal sector, as major actors in MSW collection and recycling, should be recognized and supported. Formal and informal waste management systems must be integrated.
- Government, NGOs and private companies have a role to play in linking the informal sector with markets for secondary materials
- As with the formal sector, the informal sector should be enabled through appropriate training, including health and safety training.



2 Improved evidence for informed decision-making and implementation of solutions

Data collection and analysis

- Measures must be put in place to facilitate regular collection, verification and analysis of data on the amount, sources, types and composition of solid waste (both general and hazardous) generated, recycled and landfilled.
- The use of weighbridges should become standard practice to facilitate regular reporting of reliable waste data.
- This data and information should be freely available and used for, among other things, benchmarking, planning, monitoring and evaluation, and research purposes.
- Data must be collected on the economic, social and environmental costs of not addressing waste management (cost of inaction).
- Reliable data on waste composition, waste streams and waste quantities is essential to enable structured and innovative financing in African countries and communities.

Research, development and innovation capability

- Greater investment in research, development and innovation (RDI) needs to be made at the regional and national level to give effect to various waste RDI strategies in Africa, including the AU-EU Agenda.
- The African Union and the European Union published a document entitled “*Building a joint European and African research and innovation agenda on waste management: Waste as a resource: recycling and recovery of raw materials (2014-2020)*” (EU 2014) aimed at boosting collaborative research and innovation in solid waste management between Africa and Europe.
- Research partnerships between African research institutions, and between African and other international research institutions, need to be strengthened, by creating funding opportunities for collaboration.



3 Strengthened policies, monitoring and enforcement capacities

Legislation and enforcement

- Waste policies and legislation must be introduced where absent and strengthened where weak.
 - Where waste legislation does exist, it needs to be harmonized across the region to ensure that weaknesses in legislation in one country are not exploited; recognizing that what works well in one country or one municipality may not necessarily work well in another.
 - Fragmentation in legislation needs to be addressed and mechanisms should be created to manage implementation and effective enforcement.
 - Governments should put in place favourable policies and appropriate incentives to promote waste reuse, recycling and recovery.
 - Waste separation-at-source should be promoted to make waste recycling and recovery easier and affordable, and to ensure collection of clean recyclable waste streams with higher value.
 - Strong institutions and an enabling governance environment that facilitates partnerships between government, the private sector, civil society, consumers and the informal sector need to be put in place.
 - The transboundary movement of waste into Africa needs to be controlled through the domestication of international and regional conventions and treaties, to prevent Africa from being an easy target for illegal dumping of hazardous waste from outside the continent. At the same time, responsible, controlled movement of waste and secondary materials between countries in Africa needs to be supported to ensure safe management, treatment and disposal of waste and secondary resources at appropriate facilities and the development of regional secondary resource economies.
 - The adoption of advanced policy instruments such as economic instruments, including EPR, need to be considered and implemented where appropriate.
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4 Appropriate services and technologies

Appropriate services and technologies

- While a large range of alternative waste treatment technologies are available on the market, waste services and infrastructures must be carefully chosen in terms of their sustainability and appropriateness for local conditions, and should be implemented progressively. Cities and towns should start with low-technology, low-capital, labour-intensive and culturally acceptable technologies. Services and technologies that work well should be demonstrated.
- Culturally, there is a high tendency for waste reuse in Africa. This behaviour should be encouraged and maintained; single-use products should be discouraged where appropriate and where end-use markets do not exist.
- Facilities for the safe treatment and disposal of health care risk waste are urgently needed in Africa. This includes improving health care waste management bodies through introducing legal and institutional frameworks specifically designed for health care waste.
- The shift from uncontrolled dumping to sanitary engineered landfilling of residual waste must be a priority for the continent. The resultant increase in disposal costs at sanitary engineered landfills will create opportunities for the adoption, adaptation and localization of alternative waste treatment

technologies in Africa. This will in turn create numerous opportunities for job creation and income generation, including the integration of informal actors involved in waste collection and sorting.

- Certain municipal waste streams such as organic waste, construction and demolition waste, and paper and packaging waste, provide immediate opportunities for diversion from landfill towards value recovery.

Promoting investment

- African countries must create an enabling environment that attracts private investors into the waste sector. This includes reducing the risks associated with investment in Africa and raising investor confidence. Favourable regulations and policies must be explored, and institutions and governance strengthened. Moreover, mechanisms should be created to improve regional markets to achieve sufficient economies of scale for investment.
- The financial sustainability of waste management projects must be assessed before implementation, including ongoing operation and maintenance costs.
- Schemes must be tailored to diverse geographical and socio-economic conditions.



THE SOLUTIONS

What needs to happen

Achieving the objectives of the Outlook may place increased strain on institutions in Africa, both financially and technically. The following, are therefore key to bringing about change:



WASTE MANAGEMENT: An entry point to sustainable development in Africa¹

Figure 2 Solid waste management: A key to delivering on the Sustainable Development Goals

KEY:		1	2	3	4	5	6
 = direct link to waste  = target that explicitly requires a basic level of waste management  = indirect link		Access for all to basic waste collection services	Stopping uncontrolled dumping and open burning	Managing all waste properly, particularly hazardous waste	Reducing waste and creating recycling jobs	Halving food waste from markets, shops and homes, and reducing food losses in the supply chain	Governance factors which underpin sustainable waste management
 1	No poverty	1.4					
 2	Zero hunger						
 3	Good health and well-being						
 4	Quality education						
 5	Gender equality						
 6	Clean water and sanitation		6.3				
 7	Affordable and clean energy						
 8	Decent work and economic growth						
 9	Industry, innovation and infrastructure						
 10	Reduced inequalities						
 11	Sustainable cities and communities	11.1 11.6	11.6	11.6			
 12	Responsible consumption and production			12.4	12.5	12.3	
 13	Climate action						
 14	Life below water						
 15	Life on land						
 16	Peace, justice and strong institutions						
 17	Partnerships for the goals						

Source: Adapted from Lenkiewicz (2016), Lenkiewicz and Webster (2017), Rodić and Wilson (2017)

Waste and the SDG aspirations for Africa

Access to basic waste collection services for all. Creating new income opportunities in waste prevention, reuse, recycling and recovery **(see chapters 3, 6 and 7)**

Preventing food losses and waste along the food supply chain and greater use of organic waste **(see chapters 3 and 5)**

Reducing human health impacts associated with uncontrolled dumping and open burning of waste; and informal picking of waste **(see chapter 5)**

Improved education and awareness to drive waste behaviour change and responsible waste management

Supporting women, particularly marginalised women, along the waste value chain and across the hierarchy; since women often bear most of the impact of poor waste management

Reducing the environmental impacts of poor waste management on fresh water resources, e.g. litter, nutrient pollution, blocking of stormwater drains, flooding **(see chapter 5)**

Harnessing the bioenergy opportunities from organic waste **(see chapters 6 and 7)**

Creating decent work for all in the waste sector, especially informal waste pickers. Harnessing the opportunities of waste prevention, and “waste as resource” in creating new economic opportunities **(see chapters 6 and 7)**

Driving innovative approaches to product design (minimise waste generation) and harnessing technological and social innovation in waste reuse, recycling and recovery **(see chapter 7)**

Reducing the impact of SWM, since the poorest are harmed the most by poor waste management **(see chapter 5)**

Ensuring access to waste services for all and improved waste collection and disposal, as better SWM is vital for healthy and resilient communities **(see chapters 3, 6 and 7)**

Shifting from waste to resource management to ensure more efficient use of resources, as we drive towards a circular economy **(see chapters 6 and 7)**

Reducing methane, CO₂ and black carbon generation from dumping and open burning of waste. Indirect emissions displaced by using secondary resource **(see chapter 5)**

Reducing the impacts of land- and ocean-based pollutants on the ocean and sea life, such as marine litter, micro-plastics. Extending collection to all and eliminating uncontrolled dumping would reduce waste, such as plastics entering the oceans **(see chapters 3 and 5)**

Reducing the impacts of poor solid waste management on land from things like uncontrolled dumping or poor landfill design and operation **(see chapter 5)**

Appropriate development, implementation and enforcement of waste policy, and good governance structures; producer responsibility **(see chapters 4 and 8)**

Working together: formal and informal, wealthy and poor, public and private **(see chapters 4, 6, 7 and 8)**