



SECTOR BRIEF ETHIOPIA:

Waste management and recycling



Current situation

The amount of waste in Africa is increasing, as is the need for recycling solutions. This creates opportunities for waste management and circular economy businesses in emerging economies in Africa, including Ethiopia, where waste and its management have become a growing concern. Challenges occur at every stage: collection, disposal, and recycling, as well as inefficiencies pose threats to public health and the environment. At the same time, recycling and environmental protection issues are increasingly coming into focus – especially in the country’s industrial parks and its capital city, Addis Ababa.

Waste management in Ethiopia is decentralized at the local level, but due to budgetary and infrastructure constraints, local authorities struggle to contain the increasing waste. In the past years, waste generation has increased from 9.700 tons/day in 2015 to 12.200 tons/day in 2020. It is estimated that the daily amount of waste will double from 2015 to 2030. The collection rates in the cities vary and range from 40 to 60 percent.

Municipal solid waste in Addis Ababa amounts to around 750.000 tons/year (2020), the average household waste per capita is 0.45 kg/day. The collected waste is dumped at landfills. Open dumping and burning are, despite being illegal, also common practices in both urban and rural communities. Most landfills in Ethiopia are open dump grounds without specific management systems. In Addis Ababa, 85 percent of the city’s collected garbage is disposed of at the Koshe landfill and the rest at the neighboring waste-to-energy facility, Reppie.

The Reppie waste incineration plant, the first project of its kind in Africa, was built in 2018 near the dump site. The project was part of a clean-up program being carried out at the landfill after a devastating landslide that hit the dumping ground in March 2017, killing at least 116 people. The project is the result of a partnership between the Government of Ethiopia and a consortium of international companies: Cambridge Industries Limited (Singapore), China National Electric Engineering, and Ramboll, a Danish engineering firm. The consortium was established to design, construct, and in some cases own waste-to-energy facilities customized for Sub-Saharan Africa. Reppie is the first of what the consortium hopes will be a series of such facilities in major cities across the region.

The Reppie plant is designed to reduce landfill waste, incinerating up to 1,400 tons of municipal solid waste per day – about 70 percent of Addis Ababa's garbage. The plant is designed to provide 20 MW of electrical power to the system and 30 percent of the electricity needs of the city's population while meeting global standards for compliance with air emissions. Due to technical difficulties, the plant is however, until today, not yet fully operational. For now, it is operating with only 70 percent spare capacity and receiving only 400 – 500 kg of mixed waste per day.

In Addis Ababa, the waste collection companies have an agreement with the Addis Ababa Waste and Sewage Authority (AAWSA) to include the collection fee with the water and sewage bills. But collection fees are low. They hardly cover operational costs and allow subcontractors to develop effective waste treatment initiatives.

There is only limited data available on recycling in Ethiopia. Recycling rates are estimated at around four percent. The recycling sector remains largely underdeveloped due to poor domestic recycling infrastructure and incentives. Currently, there are a few formal recyclers for plastic and paper recycling. In addition, there are numerous informal waste collectors that roam the cities' streets gathering recyclable materials, such as plastic bottles, cardboard, and metal scraps. Also, there are local initiatives and social enterprises that process waste by recycling, and two composting facilities are known to operate in Addis Ababa.

Managing Waste in Different Sectors

Construction and Demolition waste (C&D)

The construction industry plays an important role in the Ethiopian economy and continues to grow. Addis Ababa has designated areas for the disposal of construction and demolition waste, mostly in quarries. C&D debris is regulated by the Solid Waste Management (SWM) Proclamation No. 513/2007.

Industrial waste

Industrial waste is increasing because of the rapid development of the industrial sector. There are currently twelve industrial parks run by the Ethiopian Industrial Parks Development Corporation (IPDC). Furthermore, four Integrated Agro-Industrial Parks (IAIPs) were developed by the Government of Ethiopia and implemented by the Ministry of Trade and Industry with the support of UNIDO. All are fitted with wastewater treatment plants to treat industrial wastewater and sewage generated from the industrial parks. The Hawassa Industrial Park is fitted with a Zero Liquid Discharge (ZLD) system, with which most of the wastewater can be treated and reused within the industrial park, thus increasing water efficiency. There have been, however, complaints from the community in Hawassa that the ZLD system is not functional, and they see a need for a better monitoring system to be put in place.

Other IPs are fitted with conventional treatment plants, which treat and discharge the wastewater into the surrounding environment. The Hawassa Industrial Park is considered the country's first

eco-industrial park as its energy supply comes from hydroelectric power. However, while other industrial parks are equipped with wastewater treatment plants, none has a sustainable way of disposing of the sludge and salt.

Hazardous waste

The generation of hazardous waste is increasing along with the growth of the industrial sector and the consumption of goods containing hazardous substances. Hazardous waste is regulated by the Environmental Pollution Control Proclamation No. 300/2002 and the Management of Hazardous Waste and Control of Disposal Proclamation No. 1090/2018. However, the safe handling of hazardous waste is not always properly ensured and unsafe waste also ends up in open landfills.

E-waste

The development of the Ethiopian consumer economy has led to a significant increase in e-waste. E-waste in Ethiopia is typically mistreated through open burning to recover metals such as copper wires and the storage of disassembled e-waste. Only a few are refurbished and recycled, such as laptops and mobile phones.



Policy and regulations

Municipal waste management in Ethiopia is tasked to the Ministry of Urban Development and Housing (MoUDH) together with the Environment Protection Authority under the Ministry of Planning and Development (FDRE) and the Ministry of Health (MoH). The MoUDH is responsible for providing guidance to local governments for the formulation of waste management plans and regular monitoring. The FDRE is responsible for overseeing the formulation and implementation of policies, strategies, laws, and standards concerning the overall environment. Lastly, the MoH is involved in waste management from a public health perspective.

The government of Ethiopia has a policy and legal system in place for solid waste management that includes the national integrated urban sanitation and hygiene strategy, the SWM Proclamation No. 513/2007, and the Environmental Pollution Control Proclamation No. 300/2002. However, there are only a few initiatives that implement the 3R (reduce, reuse, recycle) and circular economy models are still evolving.



The development of extended producer responsibility (EPR) regulations is currently being developed. They will impose EPR for glass containers, tin cans, plastic bottles, and plastic bags as well as battery types and waste and electronic equipment.

Various regulations, guidelines, and initiatives have been developed over the past decade. However, the lack of monitoring and implementation capacities remains a challenge for enforcement.

- According to current regulations, municipalities, and provinces are responsible for collecting, transporting, and disposing of waste. SWM Proclamation No. 513/2007 stipulates that the collection, transportation, recycling, minimization, and dumping of waste in municipalities and cities is the responsibility of municipal and city authorities.
- The Hazardous Waste Management and Disposal Control Proclamation No. 1090 was implemented in 2018 to prevent the unsafe disposal of hazardous waste into rivers or dumps by stipulating penalties for individuals and businesses. The importation of hazardous waste is prohibited.
- In the SWM Proclamation No. 513/2007, Ethiopia bans either producing or importing easily decomposable plastic bags with thicknesses of less than 0.03 mm or any indecomposable plastic bag. However, both are still found almost everywhere in the country. The Ethiopian Environmental Protection Authority under the FDRE Ministry of Planning and Development is therefore pressing to completely ban the production and import of single-use plastic bags or at least to regulate single-use plastics and foam containers to protect the environment. The aim is to beat plastic pollution and raise people's awareness of the subject.

Currently, no laws or policies specifically target C&D waste. The SWM Proclamation No. 513/2007 mentions how C&D waste should be treated and disposed of. A clause in the Proclamation stipulates the responsibilities of C&D waste generators with respect to environmentally sound disposal. The generators can choose to subcontract or perform these tasks themselves.

The use of economic incentives and self-regulation instruments has so far not been implemented to any significant degree. Many factories have no internal policy on waste management.

Business opportunities

Ethiopia's pent-up demand for waste management offers a range of business opportunities. The country's goal of reducing, reusing, and recycling waste and the associated efforts require process know-how and equipment for almost all areas and stages of the disposal: from waste collection to sorting, treatment, and disposal of waste, the reduction of landfills, and the development of recycling structures, from emission control, landfill monitoring up to aftercare. This opens business opportunities for planning and consulting offices as well as for capacity-building, technology, and equipment providers.

Specific opportunities arise in the following areas:

Waste to energy

To ensure sustainable management of the waste generated in Addis Ababa, the state-owned utility Ethiopian Electrical Power (EEP) decided to build a modern waste-to-energy facility. The facility, the first of its kind in Africa, was completed in 2018 but is not yet fully operational due to technical problems including low solid waste quality and lack of a skilled workforce to operate the plant.

Industrial waste management

Although industrial parks are equipped with drainage, sewerage, sewage treatment plants, and wastewater treatment plants, there is a need for the development of environmentally sound business models and industrial wastewater sludge management strategies in the industrial parks. Opportunities lie in the collection, transport, and treatment of industrial waste.

Recycling organic waste by composting

Two composting plants are known in Addis Ababa. Due to a lack of financial incentives, private sector initiatives have so far been limited. However, the hospitality industry is likely to be interested in these services if businesses collect their organic waste to supply a composting facility. Initiatives that implement waste selection procedures at source and pay collection fees could be interesting business opportunities. Processed organic waste can find a market as fertilizer and animal feed.

Logistics for specific waste types

Business opportunities lie in the logistics of certain types of waste, including hazardous waste. Coverage of waste collection in cities is challenged due to transportation and logistics issues. The lack of baling of plastics poses a challenge to the transportation and storage of plastics. Affordable and locally available pressing machines could be one of the innovative ideas to tackle this challenge. Recycling systems are also still poorly developed.

Plastic waste recycling

With an average annual growth rate of 9.6 percent between 2012 and 2021, Ethiopia is Africa's fastest-growing importer of plastics technology. Business opportunities lie across the chain of recycling processes and with the development of innovative solutions, including digital solutions, and new and improved plastic and recycling technologies.

Hazardous, medical, and e-waste recycling

For companies specializing in hazardous, medical, and e-waste, there are various business opportunities in the treatment, recycling, and safe storage of hazardous waste.

Examples of circular economy initiatives

Building blocks from reused plastic

The Ethiopian-Kenyan company Kubik is a provider of environmental technology with offices in Ethiopia and Kenya. The company aims to use cutting-edge technology to recycle and reuse plastic waste into environmentally friendly, low-cost, and durable low-carbon building materials to create cheap housing, and public infrastructure that can help disadvantaged communities. Kubik and the Industrial Parks Development Corporation (IPDC) have reached an agreement that the company will lease space at the Adama Industrial Park to build a plastic waste recycling facility. The Natural Resources Stewardship Program (NatuReS) of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH is working with Kubik in capacitating small and medium-sized enterprises (SMEs) that provide raw material to Kubik in plastic identification, segregation, and business skills.

Solutions for paper recycling

Penda-Paper is a private paper recycling company based in Addis Ababa. Penda's mission is to build the first sustainable circular economy for wastepaper and cardboard in Ethiopia

and to contribute to the greening economy. Penda, along with Bakken & Bæck, a digital studio based in Oslo, Bonn, Amsterdam, and London, is also testing digitization solutions in paper recycling in Ethiopia to increase incentives for paper waste collection and simplify operations.

PET recycling

Based in Addis Ababa, COBA Impact Manufacturing is a local sister company of COBA Impact S.A. Switzerland. Working in partnership with Universal Plastic Factory, a manufacturing company for PET preforms and HDPE closures for water and carbonated soft drinks, COBA collects PET and HDPE to produce reusable flakes for export and polyester monofilament fiber for brooms and brushes. COBA Impact Manufacturing uses an extensive hot wash recycling for PET bottles and HDPE in Ethiopia. The plant started producing PET flakes in May 2015. When it comes to wastewater disposal, the company sets high standards that ensure that the discharged wastewater meets international standards.



Best practice – from practitioners

Upcycling to enhance the plastic value chain in Addis Ababa

With the aim of improving waste management in the city and reducing the amount of plastic ending up in urban waters, the Natural Resources Stewardship Program (NatuReS) of GIZ is supporting partnerships for circular value chains in Addis Ababa to increase the resilience of those affected by the crisis. The aim is to strengthen micro, small, and medium-sized enterprises within the plastics value chain by improving their income and employment opportunities. In line with this, the partnership carries out a capacity development activity related to skills and business opportunities in waste management exclusively for women coming from SMEs based in waste management. These activities include training in basic business skills and training in technical basket weaving from recycled PET straps by upcycling collected plastic waste that can be sold in local markets. The measures give women the tools they need to start a successful side business along the plastics value chain.

Link to the project: <https://nature-stewardship.org/where-we-work/ethiopia/#addis-ababa>

Valorization of organic waste from agro-processing

Integrated agro-industrial parks offer the infrastructure for the food processing industry and attract a growing number of companies, especially avocado oil processors. The large amounts of liquid and solid waste generated pose a major challenge for industrial parks. Two projects of the GIZ promoting the avocado value chain in Ethiopia have joined forces to support the sustainable development of these industries, funding research by local institutes and launching a consultancy. Innovative solutions that generate business models and thus can attract investments were explored and published in investment guidelines for the management of waste from agro-processing. Considerations were, for example, the conversion of the by-products of avocado processing to organic fertilizers or animal feed through composting or solar drying technologies.

Links to the projects: <https://www.giz.de/en/worldwide/69987.html> and <https://www.giz.de/en/worldwide/108907.html>

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Links and further information:

- Africa Business Network:
<https://www.bmwk.de/Redaktion/EN/Artikel/Foreign-Trade/africa-business-network.html>
- Africa Business Guide (in German):
<https://www.africa-business-guide.de/de/>
- German Energy Solutions Initiative:
<https://www.bmwk.de/Redaktion/EN/Artikel/Foreign-Trade/german-energy-solutions-initiative.html>
- Germany Trade & Invest (GTAI) international tenders and projects (in German):
<https://www.gtai.de/de/trade/ausschreibungen-projekte>
- Germany Trade & Invest (GTAI) customs and legal issues in the export business (in German):
<https://www.gtai.de/de/trade/zoll/zoll-und-rechtsfragen-im-exportgeschaef-271912>
- Germany Trade & Invest (GTAI) business opportunities through climate protection (in German):
<https://www.gtai.de/de/trade/specials/dekarbonisierung-wirtschaft>
- The Delegation of German Industry and Commerce for Eastern Africa:
<https://www.kenia.ahk.de/>
- Competence Center for Energy, Environment and Sustainable Economy for Eastern Africa:
<https://www.kenia.ahk.de/green-economy/competence-centre>
- German Water Partnership e.V. (GWP) (in German):
<https://www.africa-business-guide.de/de/wirtschaftsnetzwerk-afrika/partner/german-water-partnership>
- German RETech Partnership (in German):
<https://www.africa-business-guide.de/de/wirtschaftsnetzwerk-afrika/partner/german-retech-partnership>
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH – GIZ Büro Äthiopien & Djibouti:
<https://www.giz.de/en/worldwide/336.html>

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In order to support the sustainable engagement of German companies in emerging and developing countries, Germany Trade & Invest (GTAI), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and the German Chambers of Commerce Abroad (AHKs) as well as other partners combined their expertise in the German publication series “New Markets – New Opportunities”. The booklets show companies the economic potential of future markets as well as the funding and consulting opportunities offered by the German development cooperation.

“New Markets – New Opportunities: A Guide for German Companies” is supported by the Federal Ministry for Economic Cooperation and Development (BMZ). All issues are published on the websites of GTAI and GIZ. You can find selected issues for example on Ethiopia, also at

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