Mozambique

Inhambane

Inhambane city is the administrative capital of Inhambane Province and is located in the provincial centre. It is bordered by Inhambane Bay in the north and west, the Jangamo district and nearby Guiua River in the south, and the Indian Ocean in the east. The city is located at 23° 50' latitude and 35° 30' longitude, between the Indian Ocean and Inhambane Bay. It covers an area of nearly 192 square kilometres and has a population of 79,724 inhabitants (2017 census). The city is a tourist destination with an economy focused on commerce and tourism. It is divided into 22 main boroughs.*

Municipal solid waste management services are managed by the Municipal Council of Inhambane Environmental Sanitation and Salubrity Department. The city centre is kept fairly clean, thanks to the clearly defined collection routes and the planning of organised group activities. Efficient and sustainable management has been achieved as a result.

Source: * Conselho Municipal da Cidade de Inhambane, <https://www.cmci.gov.mz>

Information

Population*	79,724 (2017 census)
Population growth (annual %)	N/A
Area (km^2)*	192
Climate*	Wet tropical climate impacted by altitude
Main industries*	Chemistry (soap)
Currency**	USD 1: MZN 62.09 (Mozambican metical) (February 2019)
Other*	Inhambane is a cultural and touristic city. Beaches with attractive, crystal-clear waters put Inhambane on the map as a national and international tourist destination. Bantu and Portuguese cultures predominate, but Arabic, Indian, and Chinese influences are also present.

Sources: * Conselho Municipal da Cidade de Inhambane, <https://www.cmci.gov.mz> and Inhambane City Master Plan
** Oanda.com

Current SWM Situation

Item	Outline
Institutional System	
Legal system	● Laws or regulations related to municipal solid waste management: » Municipal Stance of the Municipal Council of Inhambane City for Waste Management (updated in 2016).
Policy/Plan	● No specific master plans or operation plans are in place for solid waste management in the city.
Implementation system	● Environmental Sanitation and Salubrity Department: responsible for municipal solid waste management in the city (street sweeping, collection, operation of the final disposal facility, and environmental education) and the drafting of management plans. ● Municipal solid waste: » Forty-four persons provide municipal solid waste services, including three technicians, 33 street sweepers and collectors, three inspectors, and five drivers who transport waste from the collection points to the final disposal facility. » Ministry of Health: responsible for supervision of hygiene and cleaning. » Ministry of Environment: responsible for solid waste management inspection. ● Three associations with 67 members also participate in the collection and street sweeping. Associação da Alma carries out selective collection and recycling.
Technical System	
Waste generation amount & characteristics	● Quantity of waste generated: 23.6 tons/day (estimate based on the number of borough residents who have access to cleaning services) (Source: Operation Plan, 2016). ● Waste collection: 15.6 tons/day (data based on truckload counts for the waste disposed at the final disposal facility).
Storage and discharge/ Collection and transportation/ Road sweeping	● The streets are swept in the city centre, densely populated suburbs, and main public areas. ● Waste is collected every day in the city centre. ● Collection coverage: almost 47% of the city (estimate based on daily activity). ● Number of collection vehicles: four dump trucks, including two Tata brand vehicles with 8.5 m^3 capacities and two Toyota and Hino brands with 4.5 m^3 capacities. Solid waste management services are delegated to the private sector.

Item	Outline
Intermediate treatment/ Recycling	● The city has no transfer stations. In Josina Machel Praia do Tofo borough, recyclable waste is separated. ● Important recyclable materials and commercially valuable materials include cardboard, bottles, plastic, and bottle caps. Some of the recycled materials are used for decorative objects while others, such as the bottles and plastics, are sold in Maputo. ● For treatment in the controlled landfill, organic waste is buried in preparation for later excavation for soil fertilisation in municipal green areas (because Inhambane soils are sandy and have low arability). ● The controlled landfill has two drying boxes for faecal sludge. Once deposited in boxes, the sludge goes through two evaporation processes. The liquid is exposed and filtered, allowing the dry and solid part to be removed and mixed with organic waste for compost production. The boxes are a new infrastructure and still at the experimental stage.
Final disposal	● There is one controlled landfill: » Owner: Municipal Council of Inhambane City. » Location: Guitambatuno borough in Inhambane city. » Area: 200 m^2. » Operation hours: from 6 am to 6 pm. » Quantity of disposed waste: 15.6 tons/day. » Data source: from truckload counts at disposal. » Installations: landfill liner, gate, and fence. » Operation: waste landfilling.
Financial system	● Total revenue for waste management service: 250,000 MZN/month. ● Total expenditure for waste management service: 7,484,010.30 MZN/year. ● The Municipal Council of the city charges a fee for waste collection through EDM (Electricity of Mozambique). The fee ranges from MZN 10 for household consumption to MZN 50 for commercial consumption and MZN 150 for tourism consumption. EDM charges a 25% commission on the collected garbage fee.
Environmental and social considerations	● Policies and laws are in place to grant support to the informal sector through work opportunities and training. ● Communities receive information on collection hours and methods for the proper disposal of waste through public consultations on commemorative dates and leaflets and stickers distributed to collective transport providers. Information is also propagated through Inhambane discussions on TVM (Television of Mozambique) and the Inhambane Province radio station.There are also city cleaning campaigns with community participation.
Donor support	● Wetterskip Fryslan, a Dutch company based in Friesland Province, Netherlands, provides support through the Frisian Urban Sanitation project. The FACE de Água e Saneamento association also provides major support. These two entities support waste collection through activities at different levels such as training through the promotion of environmental groups in primary schools, door-to-door awareness-raising in the boroughs, the construction of public baths in the urban area and in the 17 primary schools, controlled landfill construction in Inhambane, etc.
Areas for improvement (in order of priority)	● Waste collection in Inhambane city is provided using dump and non-dump trucks and tractors. Collection is a lengthy process, since the waste is first deposited manually into barrels or silos before being transferred into the trucks and later to the dump site. The collection process takes nearly 30 minutes per silo. The great challenge will be to replace the silos with skip loader containers and to replace the trucks with container trucks. The flexibility of renewed equipment will allow a great expansion of the service to uncovered areas and will improve the time management efficiency. ● It will be necessary to strengthen the technical sector by deploying one car and three motorbikes to monitor operations and improve plans. This measure will enable the real-time inspection of street sweeping, collection, and green area management, as well as interactions with borough structures and local partners in the solid and liquid waste management processes.

Waste Amount at Each Stage of Waste Flow*

Waste flow	Amount** (ton/day)	Remarks
❶ Waste generation	23.6	Waste generated at houses, offices, shops, restaurants, etc.
❷ Discharge to collection	N/A	Waste discharged for collection services.
❸ Self disposal	N/A	Disposal at generation sources, such as burning and burying.
❹ Recycling at source	N/A	Reuse of materials, composting, sold to recyclers.
❺ Collection and transport	15.6	Waste amount collected and transported.
❻ Clandestine dumping	N/A	Waste illegally disposed of in unknown location.
❼ Treatment	N/A	Material recycling, composting, incineration, etc.
❽ Recycling/Reduction	N/A	Recycled and/or reduced waste amount by material recycling, composting, incineration, etc.
❾ Residue	N/A	Residue from treatment facilities.
❿ Final disposal site	15.6	Waste amount brought into disposal sites.
⓫ Recycling	N/A	Recycled at disposal sites.
⓬ Final disposal	N/A	Waste amount finally disposed of at disposal sites.

* Based on the waste flow chart on page.

** Figures include estimated value.