

MOZAMBIQUE, MAPUTO



POPULATION
1.1 million
(2020)

Improving waste landfilling practices at Hulene landfill

Maputo, the capital city of Mozambique, has a population of 1.1 million and collects approximately 1200 t/d of municipal solid waste. The city relied solely on the Hulene landfill for waste disposal, situated 8 km from the city center in a densely populated area. However, Mozambican legislation enacted in 2014 necessitated the closure of all uncontrolled disposal sites. Despite this, the Hulene landfill remained operational as construction on a new sanitary landfill was yet to be completed.

Unfortunately, the Hulene landfill encountered serious issues, including inadequate operational practices and heavy rainfall, which resulted in a significant slope failure in 2018, causing casualties. In response to this crisis, Mozambique and Japan joined forces to rehabilitate the Hulene landfill using Japanese landfill technology transfer, centered on the "Fukuoka Method" concept. This method employs semi-aerobic waste landfill technology to effectively manage and treat solid waste. Between 2019 and 2020, the project was successfully carried out through a partnership between the Ministry of Land, Environment, and Rural Development, the Maputo Municipal Council, and the Japanese government. This collaborative effort resulted in a significant investment of 92 million meticaís (approximately 1.5 million USD). The project's primary objective was to improve landfill operations. In order to achieve this, the project team implemented terrace-like slopes with a gentle incline. Furthermore, gas drainage pipes were installed to prevent the accumulation of gases within the waste mass, which reduced the activity of anaerobic bacteria. Additionally, strict regulations prohibiting open fires were introduced, a practice previously common among informal waste pickers. To address the issue of leachate infiltration, a comprehensive leachate collection network and a stabilization pond were constructed, effectively minimizing the contamination of soil and groundwater.

This successful implementation of the Fukuoka Method at the Hulene landfill in Maputo serves as a valuable case study, showcasing how existing landfills can be enhanced to ensure greater safety and environmental sustainability, especially in regions with limited resources.

Improvement case in
Maputo, Mozambique



Source: Ministry of Environment, Government of Japan



IMPACTS TO ACHIEVE SDG 11.6.1

- A safe and more hygienic landfill with fast stabilization. Stabilized slopes resulted in reduced risks, use of the site becoming possible.
- Through the semi-aerobic structure, generation of the greenhouse gas methane is reduced.
- Fire control, contributing to the protection of the environment and prevention of air pollution.
- Reduced soil pollution due to leachate collection network.



Source: UN-Habitat



Source: NWS Stage

INSTITUTIONAL SUSTAINABILITY

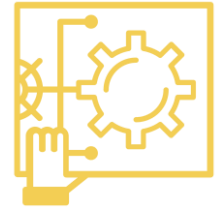


In addition to the pilot project for landfill rehabilitation, Maputo has taken significant steps towards institutional sustainability by developing its SWM Master Plan, with support from the Japan International Cooperation Agency (JICA). This plan outlines comprehensive strategies and measures for managing the city's solid waste effectively. Furthermore, the city has also benefitted from specialized training on Sanitary Landfill Management, offered by JICA, which covered a wide range of topics. These included the management of landfills for municipal solid waste, the functions and facilities of landfills, site management after landfilling completion, and the use of management record forms. This initiative demonstrates Maputo's commitment to enhancing its institutional capacity and ensuring the long-term sustainability of its waste management practices.

PLANNING & MONITORING

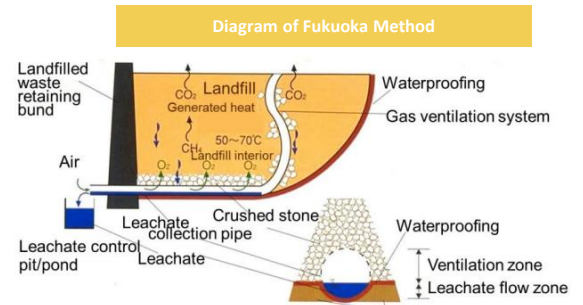


The project was meticulously monitored to assess the improvements in landfill operations and their environmental impact. With the support of JICA, the solid waste management authorities have enhanced their monitoring capacities, aligning with provisions outlined in their SWM Master Plan. This includes careful monitoring of the SWM Master Plan implementation and annual work plans. This focus on planning and monitoring underscores Maputo's commitment to ensuring that its waste management practices are not only effective but also sustainable in the long run.



APPROPRIATE TECHNOLOGY

- Stabilization of 150 m of slope through terrace-like slopes with inclination under 26° . Slopes were covered with laterite and gabion structures were installed.
- Installing gas drainage pipes, which act as a gas venting system, while creating semi-aerobic conditions in the waste masses, to prevent landfill fires caused by natural combustion.
- Installing a leachate collection network, and construction of a stabilization and evaporation pond, to reduce leachate infiltration into the soil.
- Operation practices included knowledge transfer on appropriate waste disposal using work faces and waste cells, maintenance of access roads, and adaptation of elements of the Fukuoka Method using low-cost material and or waste found in the site.



Source: Environmental Bureau, Fukuoka City, Japan

STAKEHOLDER INVOLVEMENT / INCLUSION OF INFORMAL WASTE SECTOR



The successful implementation of the project at the Hulene landfill in Maputo was made possible through a collaborative effort between key stakeholders, including the Ministry of Land, Environment, and Rural Development, the Maputo Municipal Council, the local community and the Japanese government. A particularly noteworthy aspect of this initiative was the involvement of informal waste collector families who had been displaced from the Hulene area following the collapse in February 2018. These families were temporarily resettled in two neighborhoods before being relocated to a definitive resettlement area in the Possulane neighborhood. Here, plans included construction of 300 houses, providing these families with a more stable and permanent living arrangement. This holistic approach, which not only addresses the environmental concerns at the landfill but also addresses the needs of the affected community members, highlights the importance of stakeholder involvement and collaboration in achieving sustainable solutions.



Source: Club of Mozambique



SOURCES

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- Club of Mozambique – <https://clubofmozambique.com/news/watch-japanese-funded-project-to-boost-safety-at-hulene-dump-aim-146491/>
- EJ Atlas – <https://ejatlas.org/print/wastepickers-in-maputo-mozambique-protest-overcrowded-and-deadly-conditions-and-delayed-relocation-from-the-hulene-dump-site>
- NWS Stage – https://nws.stage.ac/3rincs2021/docs/abstracts/C-4_056_Paulo_V_Queiroz_Sousa-210219.pdf



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