The Fukuoka Method in action at the Hulene Landfill, Mozambique

―Waste landfill improvement project―

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PLATE-FORME AFRICAINE DES VILLES PROPRES

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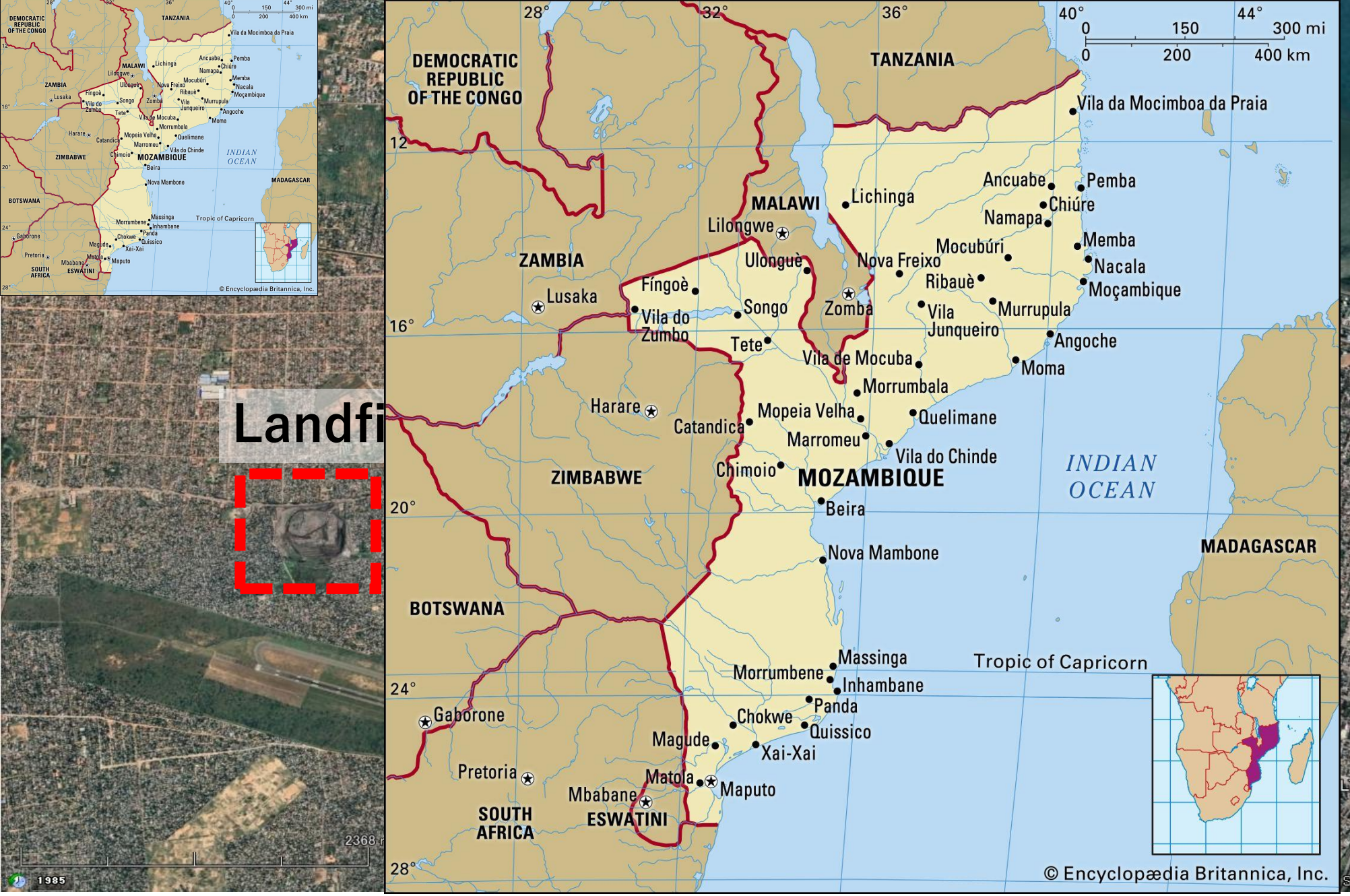
MUNICÍPIO DE MAPUTO
Povo Unido e Soberano

EX Research Institute Ltd.
Environmental and Regional Planning, Research and Consulting



Landfi

1985

POLANA CIMENTO "A"

Maputo

Estação de Trem

LTO MAE "B"

Google Earth

S 32° 35'44.34" E elev 52 m eye alt 10.63 km

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Hulene landfill outline

- Area: about 17ha (20 ha)
- Height: about 20 m (depth unknown)
- Slope: east→west
- Start of operation: circa 1970
- Operation hours: 24 h
- Waste received: about 1200 ton/day

Improvement Project
Nov 2019 until Jul 2020

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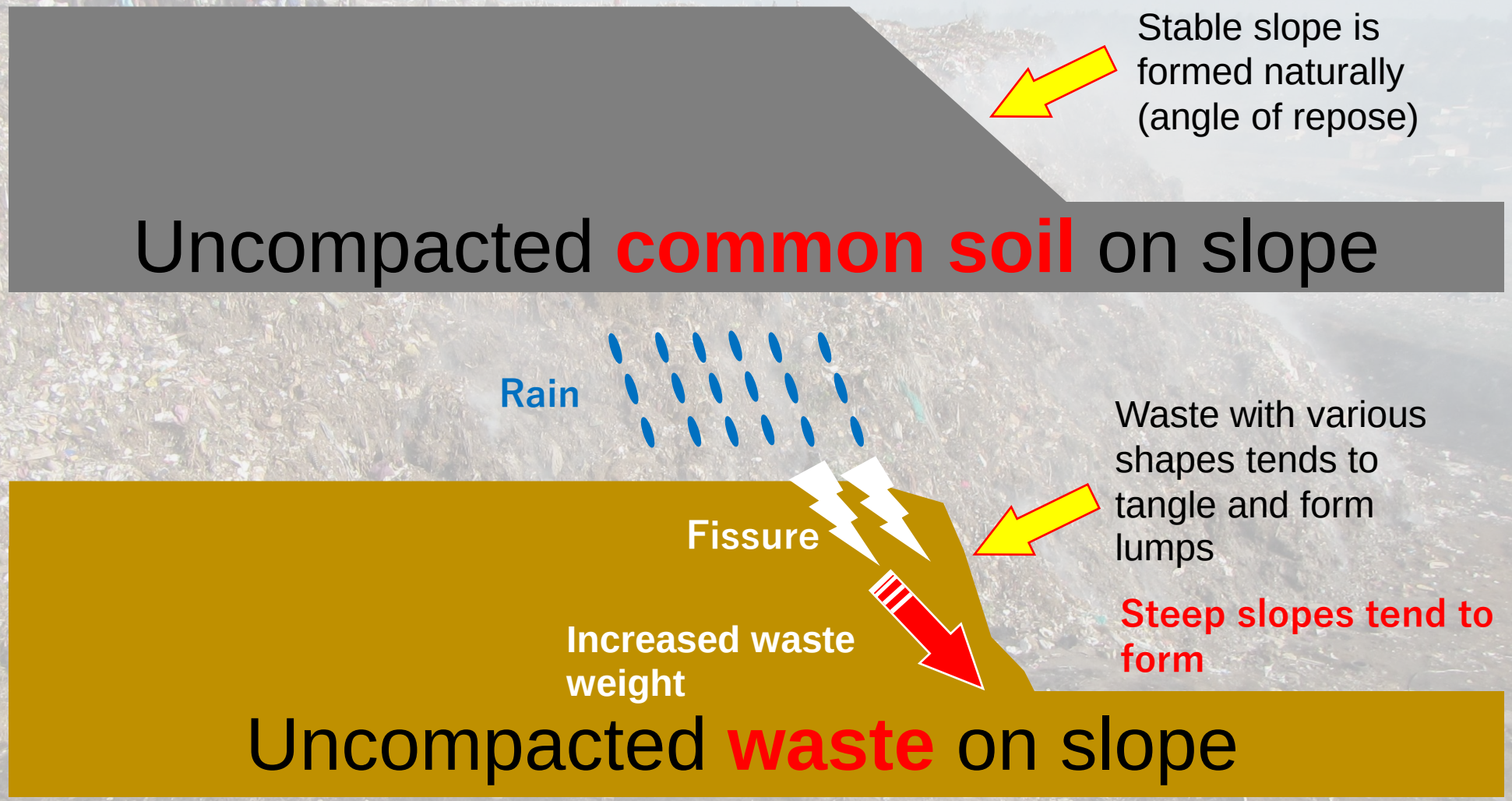
Slope failure mechanism at the Hulene landfill



Source：NPO SWAN-Fukuoka

Problems caused by improper operation of the Hulene dump before the improvements

1. Unhealthy
2. Safety (Risk of slope failure)
3. Methane generation
   i. Fire
   ii. Greenhouse gas
4. Soil and water pollution due to infiltration of untreated leachate

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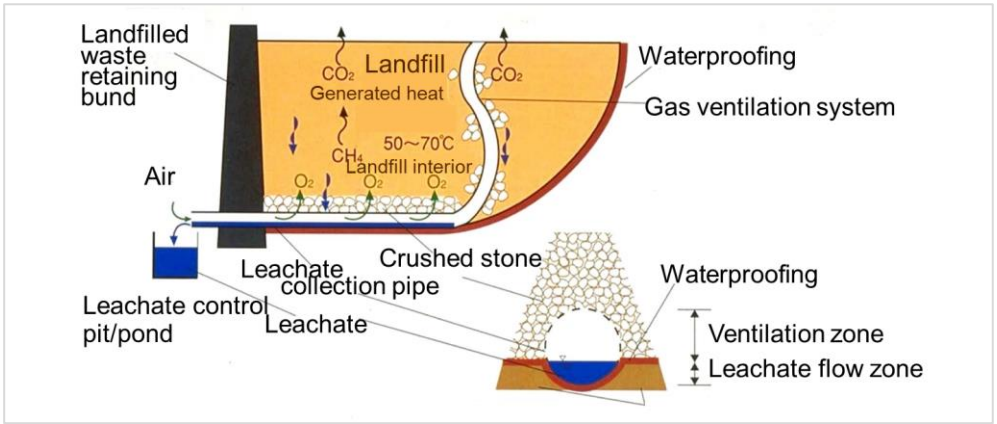
The benefits of the Fukuoka Method (semi-aerobic landfill structure)

1. A safe and more hygienic landfill with fast stabilization
   →Reduced risks, future use of the site becomes possible
2. Reduction in the generation of the greenhouse gas methane
   →fire control, contribution to the protection of the global environment
3. Applicable in landfills in operation
4. Low cost, simple
   →Applicable in developing countries



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Slope stabilization

Financed by the Government of Japan

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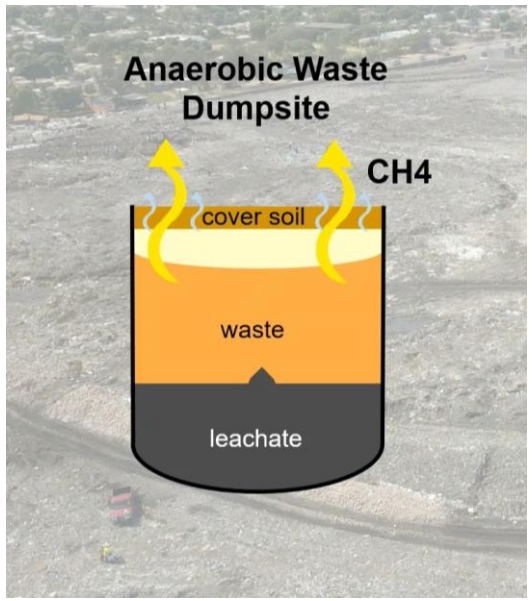
Suppression in the generation of methane

●Problem

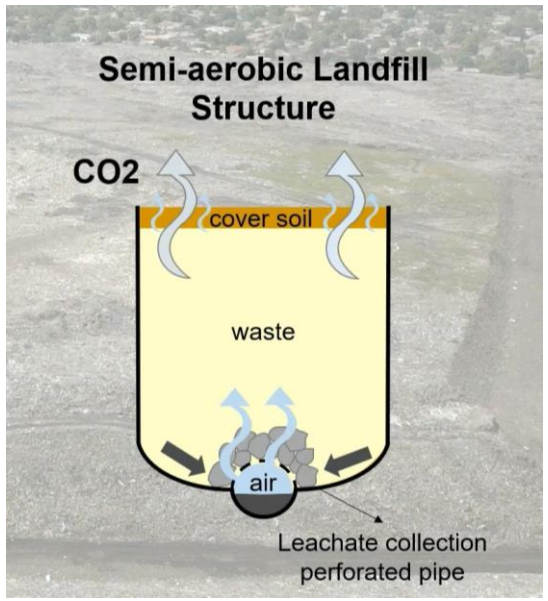
In conventional dumpsites, there is great generation of methane.

→occurrance of fires



◆Improvement

Through the semi-aerobic structure, methane generation is reduced.



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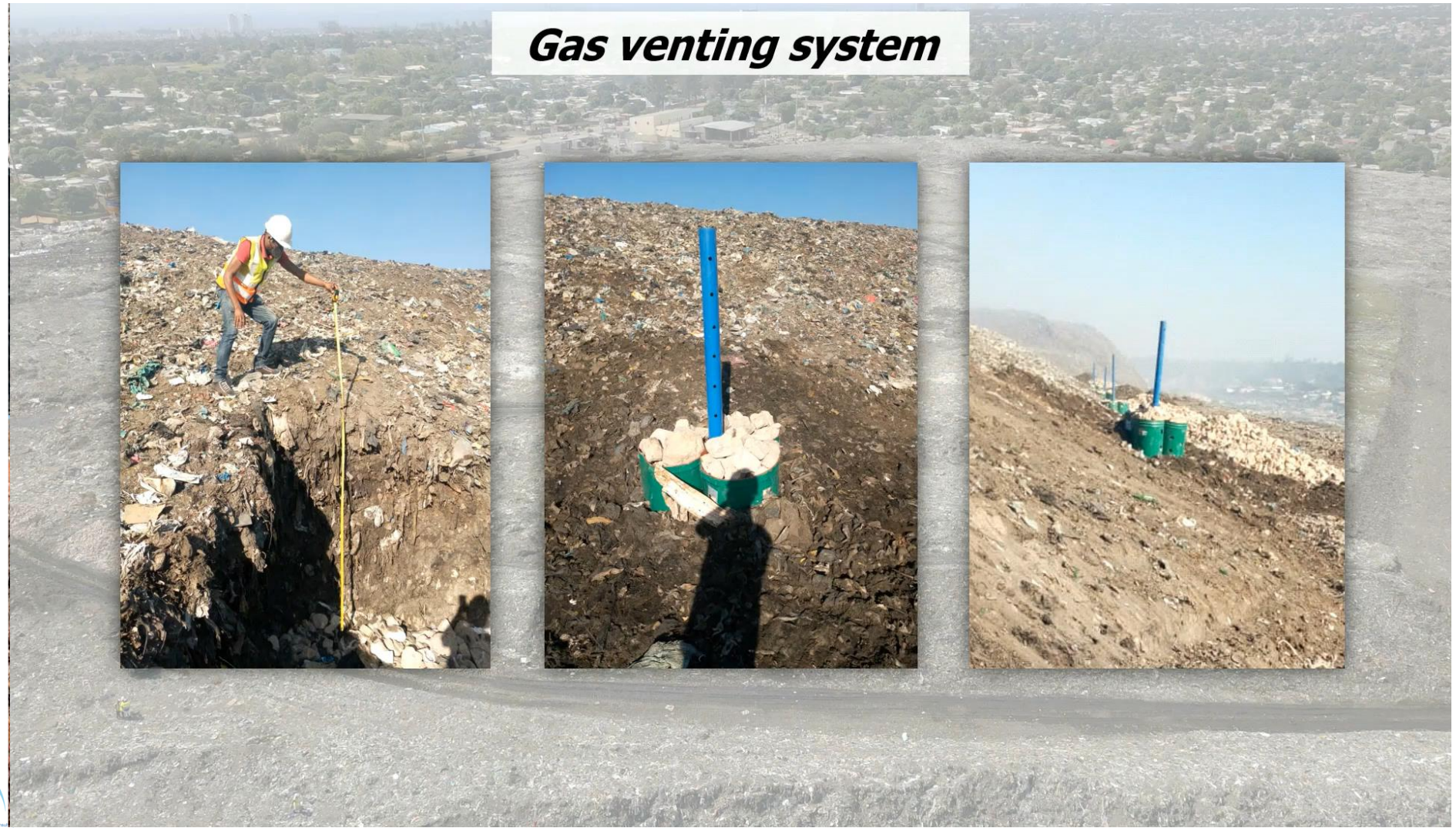
Application of the Fukuoka Method in existing landfills

- Even in the case of existing landfills where it is not possible to install leachate collection pipes at the bottom of the site, improvements can be achieved even with the partial application of the Fukuoka Method.
- By creating an aerobic environment near the ventilation pipes, vegetation flourishes.

→ Soil stabilization through vegetation



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Improvements at the Hulene landfill

Financed by the Government of Japan

Problem	Slope collapse	Fire	Soil/water pollution
Cause	Inadequate waste disposal (waste push-down, insufficient compaction)	• Large amount of methane generation due to waste decomposition activity by anaerobic bacteria • Use of fire by waste pickers	Insufficient leachate collection system and no installation for leachate treatment
Improvement	Stabilization of slope through terrace-like slopes with inclination under 26°	• By installing gas drainage pipes, semi-aerobic conditions were created in the waste masses, restricting the activity of anaerobic bacteria. • City officials called on the waste pickers not to use fire in the landfill	• By installing a leachate collection network, as well as a stabilization pond, leachate infiltration into the soil was reduced. • Through aeration, the quality of the leachate was improved

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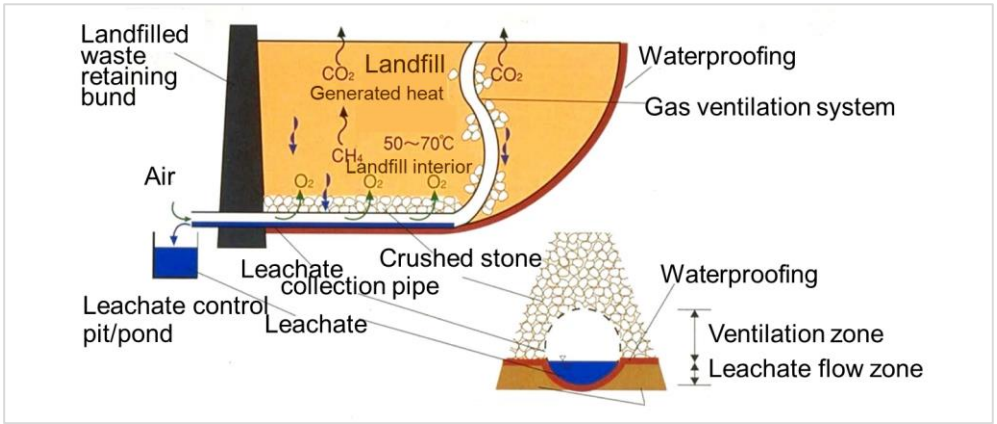

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