

Fukuoka City's Experience of the Fukuoka Method

2022.7.26 (Tue.)

FUKUOKA CITY

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Director, International Affairs Department

Characteristic Infrastructure in Fukuoka

**Most
growing city
in Japan**



Water supply

Water-conscious citizens/
Leakage prevention



Flood Control

Underground reservoir/
Drain pipes with reservoir function



Waste Management

Nighttime collection/W to E/
Fukuoka Method

Solid Waste Management in Fukuoka City

Nighttime door-to-door garbage collection



Waste to Energy



Fukuoka Method Landfill Sites



- Rare in Japan:
Only case in 20 major cities

- Citizen's satisfaction
98%

- Merits
 - Mitigate traffic jam
→ reduce energy consumption and GHG emissions
 - Helps prevent crime and mitigate disasters

- Annual power generated at 4 plants:
268 million kwh/yr
(Equivalent to power consumption of about 600,000 households)

- Annual CO₂ reduction:
129,000 t/yr

- PPP-related scheme (1 case)
- Jointly established & operated with neighboring municipalities (1 case)

- Standard Japanese landfill structure with semi-aerobic function jointly developed by Fukuoka City & Fukuoka University.
(approx. 70% of landfills in Japan)

- Overseas cases:
21 countries

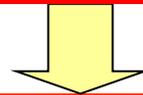
Development of the Fukuoka Method (Semi-aerobic Landfill Structure)



Landfill sites around 1970 in **Fukuoka City**

Japan, like many developing countries such as African countries today, used anaerobic landfills and open dumping until the 1960-70s.

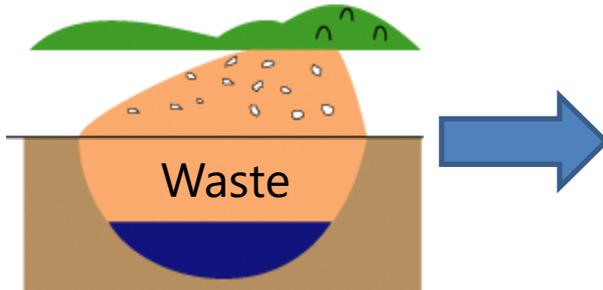
Environmental problems such as toxic leachate and foul odor



Joint experiments with Fukuoka University to improve landfills, aiming to purify leachate

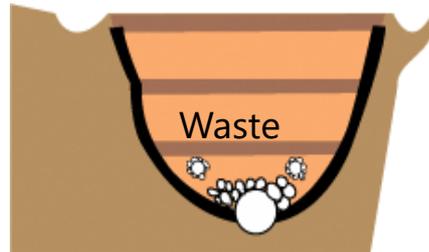
Three major landfill structures

① Anaerobic

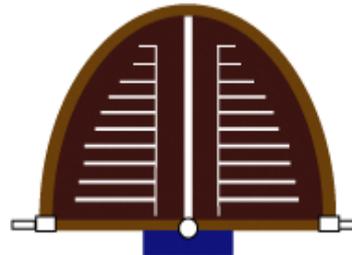


- High emissions of harmful substances such as CO₂, methane, etc.
- Waste is moistened in anaerobic conditions

② Aerobic

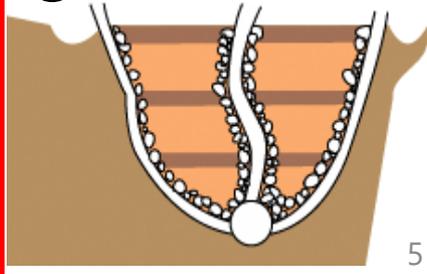


(Cross-section)



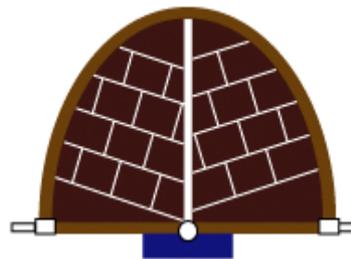
- Relatively low emissions of harmful substances such as CO₂, methane, etc.
- Easy treatment of leachate
- **High construction and maintenance costs**

③ Semi-aerobic



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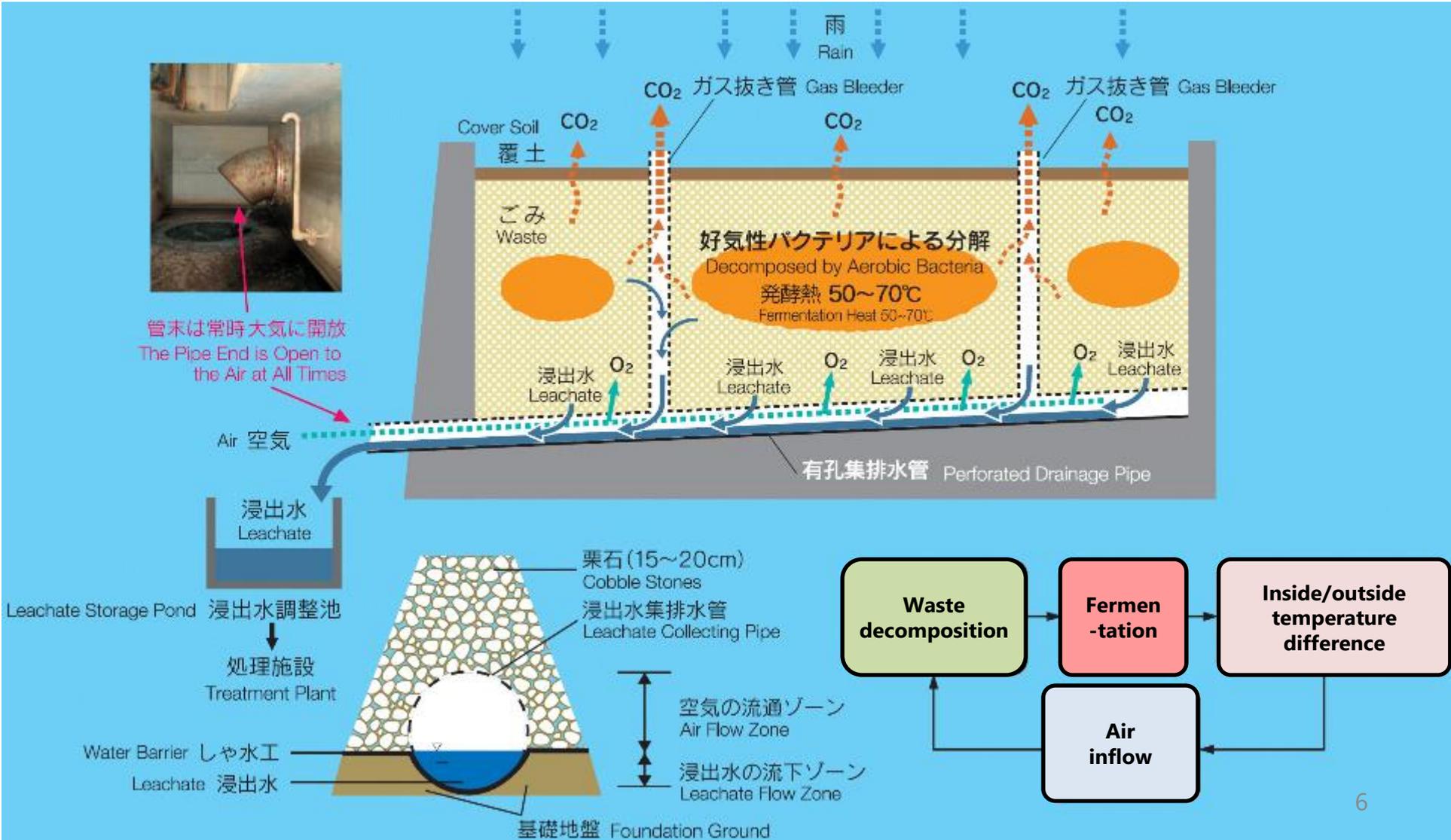
(Cross-section)



Fukuoka Method

- Relatively low emissions of harmful substances such as CO₂, methane, etc.
- Easy treatment of leachate
- **Low construction and maintenance costs**

Semi-Aerobic Landfill Structure Diagram



Fukuoka Method Project

① Design/development

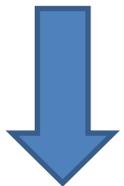


Design work



Improvement Work

② Operation and monitoring (O & M)



Technical instruction on receiving waste and landfill work



Monitoring

③ Closure/reuse of landfill site

Case 1-1) Project with CLAIR

CLAIR

2017~



Case 1-1) Project with CLAIR

CLAIR

2017~



100m × 100m pilot site



Case 1-2) Project with UN

UN Habitat project in Myanmar under Japanese grant aid conducting **urgent improvement of an open dumping site** to prevent fire disaster.

Large-scale fire
(April 2018)



April 2019

August 2019



March 2021



September 2020



January 2022



Case 1-2) Project with UN



Before improvement



Prevented collapse by making slope milder



Removed leachate through ditch



2019.11

Install of Gas Venting Pipes



2019.11



Access Road and Working Platform



2019.12



Nighttime Operation Inspection



2019年7月



2020年5月

Other projects collaborated with UN

Iran



Project Sign on site



Demonstration site

PRC



Survey of proposed construction site (2001)



Design Working (2002)



Gas monitoring(2004)



Slope forming before sheeting (2002)



Completed landfill site(2003)



During operation(2003)

Case 2) JICA long-term expert @Samoa

JICA



**Before improvement
(2001)**



**During project
(2003)**

**Left) Raw leachate
Right) Raw leachate after
improvement
(2005)**



Case 3) Other JICA program/study

JICA Partnership Program @Vietnam



Before improvement (2010)



During improvement (2011)



After improvement (2012)

Recovered vegetation

Short-term dispatch for survey

Islamabad, Pakistan



Case 4) Training in Fukuoka



Practical & effective training
on Fukuoka Method
& collection etc.

Partnered with
Fukuoka Univ. & city's
affiliated organ.



Case 5) Lecture at the WB event

MOU with World Bank in 2018



Key topics of engagement

- ✓ Transit-oriented development
- ✓ Innovation and start-up ecosystems
- ✓ Competitive and smart cities

Lectures in “Technical Deep Dives” etc.

: Knowledge acceleration training program [SWM-related activities]

- December 2020: A case study covering the ‘Fukuoka Method’ for six Ethiopian cities
- October 2020: First virtual Technical Deep Dive on Solid Waste Management
- November 2019: Technical Deep Dive on Solid Waste Management; (Nighttime trash collection and landfill management methods)



[Recommendation on Ethiopian SWM] p.101

The Japanese Fukuoka Method, a semi-aerobic technique for improving dumpsites that is already in use in Addis Ababa and Bahir Dar, **should be extended to other Ethiopian cities.**

However, the participants **should focus on the practical application of the method and hurdles** to be aware of, as learned during the training.

City Partnership Program



Fukuoka: One of six partnership cities with Tokyo Development Learning Center (TDLC)

; a program of the **World Bank** launched in 2004 in partnership with the Government of Japan.

The City Partnership Program (CPP) was launched in 2016, drawing on TDLC’s close connections with a number of Japanese cities. It is a critical component of our overall program that is leveraged across all TDLC activities.

The Session Commemorating the Establishment of Fukuoka Method Global Network

Join us!!
Resist here

How to watch : **The 13th Asian-Pacific City Summit HP**

→ (<https://apcs13th.fukuoka.jp/en/>)

* Pre-registration is required. Anyone is welcome to watch for free.



Day & Time : **3:30 p.m. - 4:30 p.m.** ^(JST) , **28 July** , 2022

Programme :

Part 1 Introducing the Fukuoka Method Global Network

- ◆ Fukuoka City Deputy Mayor's Greetings
- ◆ Guest Greeting
(Dr. Tsuyoshi Yamaguchi,
Environment Minister, video message)
- ◆ Introduction of the Fukuoka Method Global Network



▲ Pre-registar Homepage

Part 2 **keynote speech**

Theme : The importance of monitoring and evaluating the Fukuoka Method

- Ayako TANAKA, Professor of Faculty of Engineering, Fukuoka University

Panel discussion

Theme : The Importance of Learning Together

Panelist

- Yasushi MATSUFUJI, Professor Emeritus, Fukuoka University and Chairperson of the Board, NPO Solid Waste Management Advisors Network Fukuoka
- Ayako TANAKA, Professor of Faculty of Engineering, Fukuoka University
- THENG Lee Chong, Expert on waste management and Specialist

Moderator

- Sachiyo HOSHINO, Special Adviser to Regional Representative at UN-Habitat Regional Office for Asia and the Pacific-Fukuoka



Contributes to SDGs



**Making Sustainable Urban Development a Reality
through the 3Rs**



Overall Goal

- A plan for the improvement of the final disposal site is implemented.

Purpose

- A plan for FDS improvement will be proposed and developed utilizing the training contents.

Output : (5) A plan for improvement of the final disposal site will be developed.

(1) To provide an overview of examples of domestic and overseas FDS.

- SWM in Fukuoka / Japan
- Site visits (Incinerator, Recycle, PR facility, Nighttime Collection)
- Private recycle facilities
- Other cities study tour

(2) To describe design methods for semi-aerobic landfill.

- Planning and features of the Fukuoka Method
- Fukuoka Method cases of improvement & closure in developing countries; Samoa
- **On-site training (utilizing waste materials)**

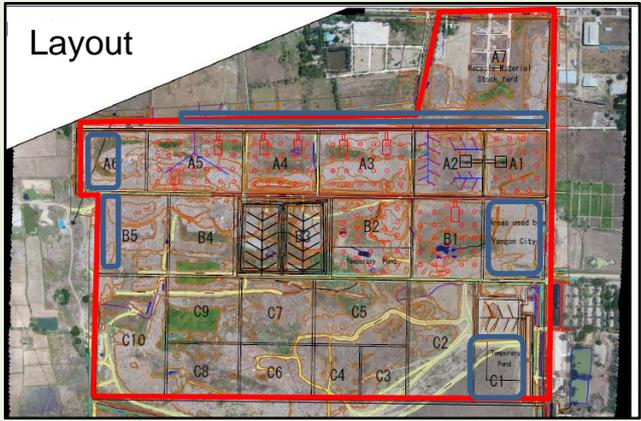
(3) To describe O&M practices for semi-aerobic landfill.

- **On-site study on the Fukuoka Method and leachate treatment**
- **O&M lectures incl. heavy machinery**

(4) To explain the environmental management of FDS.

- **Monitoring practice & evaluation**
- Clean Development Mechanism
- Issues description
- Action plan formulating & presentation

Major Activities



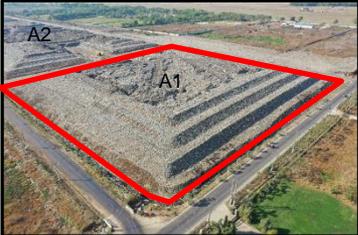
Outline of the project

- Duration: 2019 Apr. ~ 2023 Mar. ※Total 4 years (2-year extension)
- Total Cost: Approx. 600 million JPY
- Area: 100ha
- Contents: Fire prevention, improvement, design/development

<Project Results 2019 Apr. ~ 2022 Mar.>



※SWAN-Fukuoka 2019年8月



※UN Habitat 2021年3月

Section A Improvement of the existing landfill



※UN Habitat 2020年9月



※UN Habitat 2022年3月

Section B3 Newly-developed Fukuoka Method landfill area

<Instruction on site> 2019 Apr. ~ 2020 Feb.



2019年4月



2019年8月



2020年9月



2019年11月



2019年11月



2020年2月

<Instruction on Web> 2020 Mar. ~



2021年12月

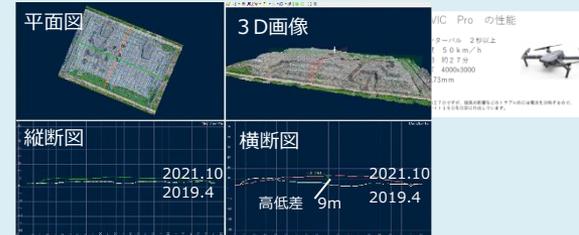


2021年11月



2022年5月

- Special lecture by Prof. Tanaka, Fukuoka Univ. on brief water monitoring
- Online drone maneuvering instruction by the landfill operator in Fukuoka City



Project Area until FY2021	○Improvement 54ha ○Newly- development 5ha	Fine prevention, improvement work etc.
Project area in FY2022	○Improvement 0.3ha ○Newly- development 1.9ha	Environmental monitoring, capacity development etc.