“The Fukuoka Method ” will save the Solid Waste Management Issues in the World

TICAD9 in Yokohama, JAPAN

Aug.2025

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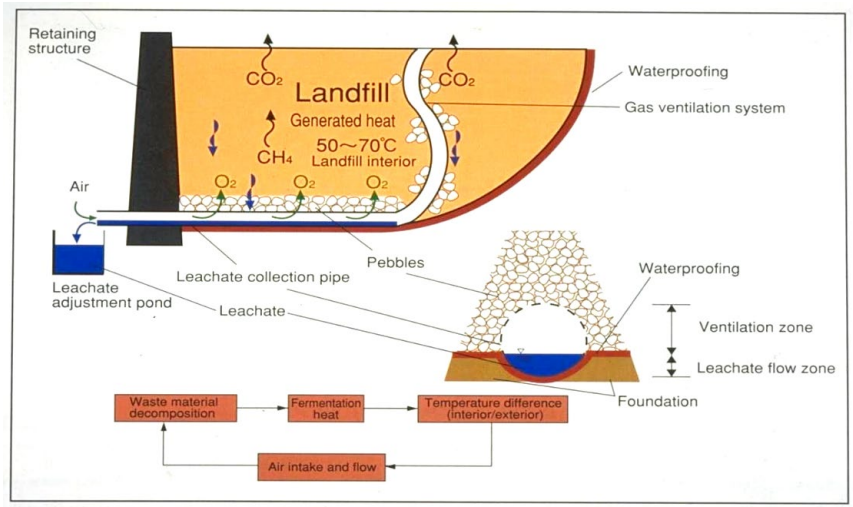
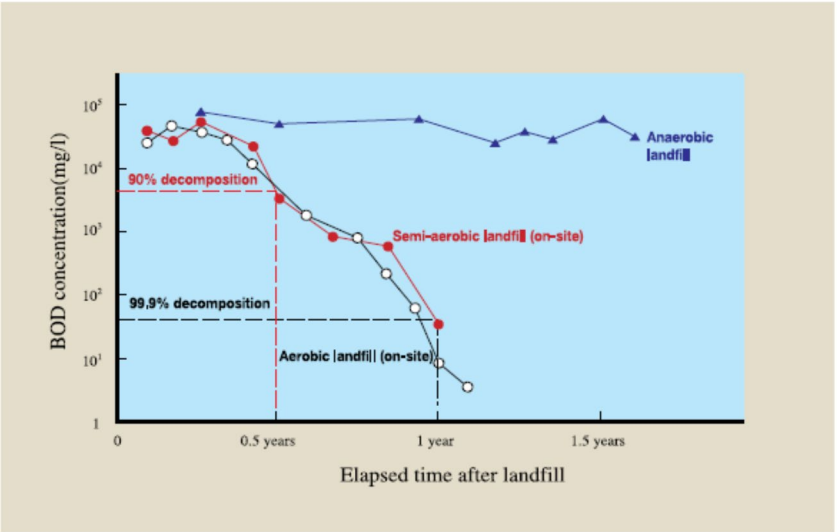
What is Fukuoka Method ?

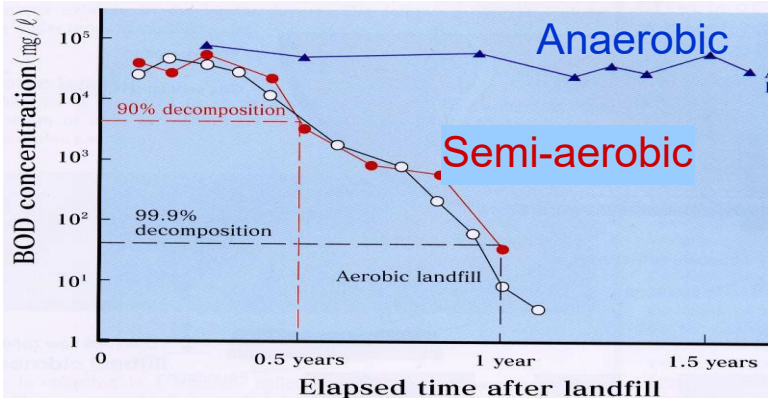
The Fukuoka Method is a semi – aerobic landfill technology developed jointly by Fukuoka University and Fukuoka city in 1970s, now a standard method for all local governments in Japan. By maximizing the aeration of waste, it increases the rate of biodegradation and greenhouse gases is reduced by 20~50 %.

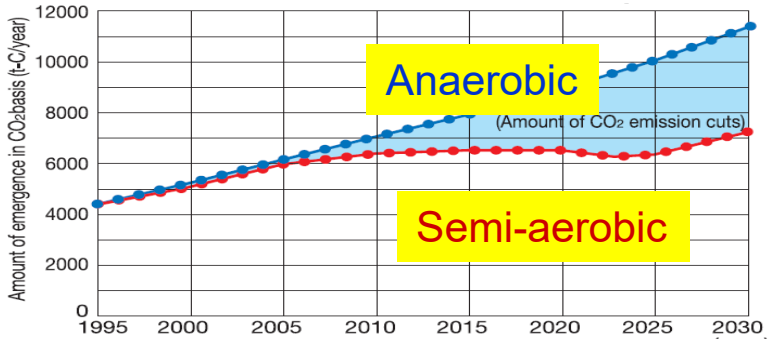




Advantages of F.M

1. To reduce by **1/100~200**
   Pollutant of Leachate
2. To reduce by **20~50%**
   Methane Emission
3. To reuse & recycle
   Completed Landfills





CDM by UNFCCC in 2011

Why is Fukuoka Method ?

- Low cost
- Low technology
- Environmentally friendly
  （UNFCCC approved in 2011）
- Re-use of land after completion
- Locally adaptable (materials, labor)
- Possible to implement the principles for new construction, for rehabilitation, improvement, for closure

History of SWM for 50 years in Japan and Discovery of Semi-aerobic Landfill Type (Fukuoka Method)

Hata Dumping Site,　Fukuoka ,JAPAN

1971

Landfills Field survey of gas and leachate in 1971

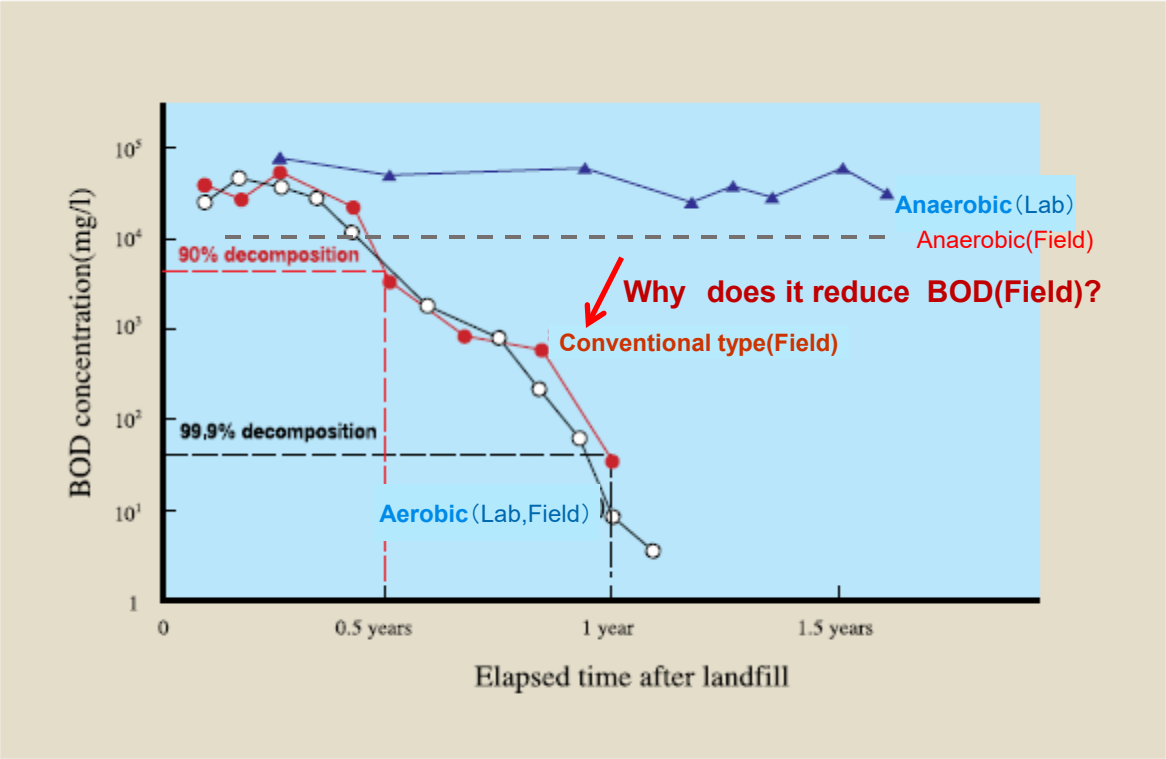
No.2 Lysimeter (Aerobic / Anaerobic landfills plant)
Experiment 1972

Pilot　Experiment of Aerobic Landfill Type in Fukuoka by National Project (1973～1975)

Leachate No . Ⅰ～Ⅲ.（Anerobic） No. Ⅳ （Aerobic）

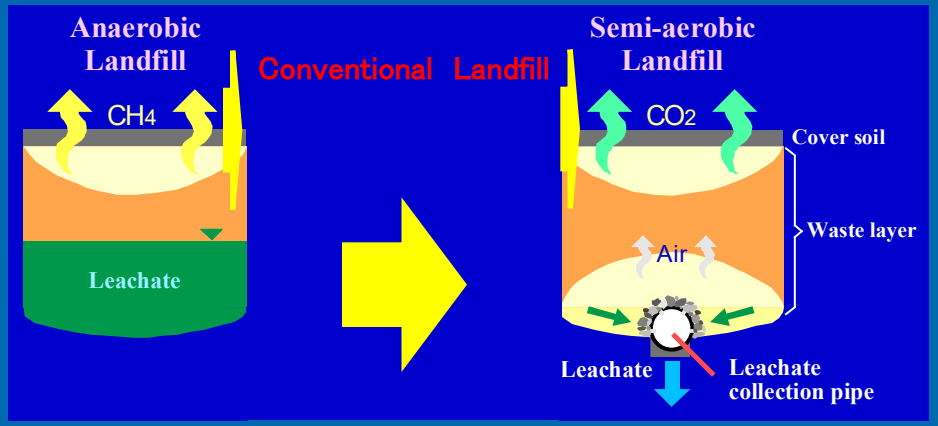
National Project 1974

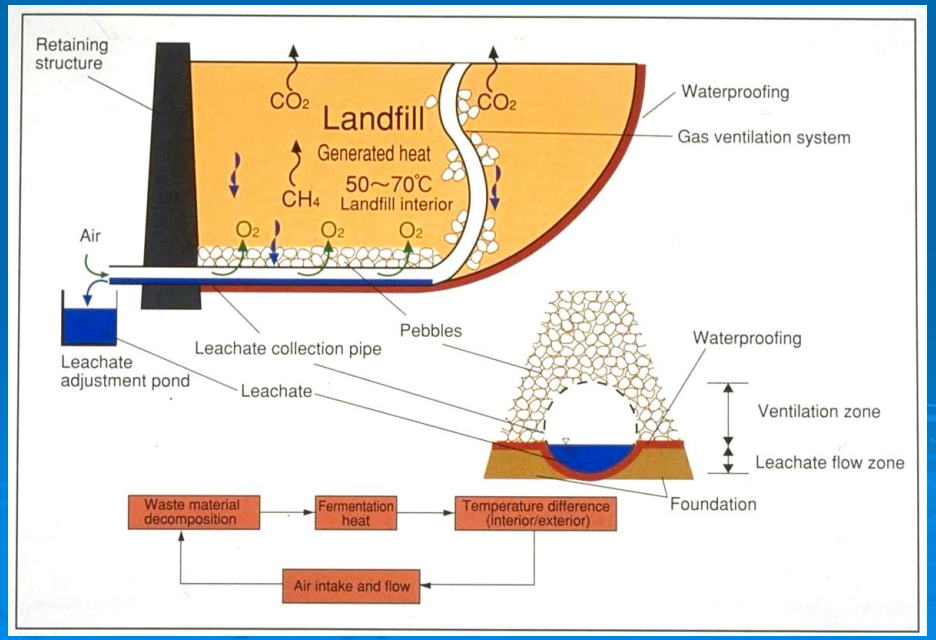
Why does it reduce BOD (Field)?



Mechanism of Semiaerobic Landfill Type

(Hypothesis)





1st Semi-aerobic Landfill Site in Fukuoka ,1975

Semiaerobic Landfill Concept was discovered through an aerobic landfill experiment

Basic Concept of Landfills;

Under Aerobic Condition of Landfills,
Landfills have not only Dumping Function
but also Treatment Function for Wastes

Semiaerobic
Concept

Fukuoka Method(1975)

1st Trial Improvement of Landfills based on Fukuoka Method in Malaysia （1988～1990）

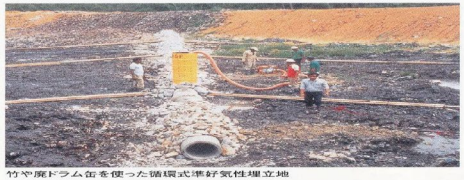
改善前のアンパンジャジャル埋立場（1988年）

改善中途の埋立地

改善されたアンパンジャジャル埋立場（1996年）

改善中途の埋立地

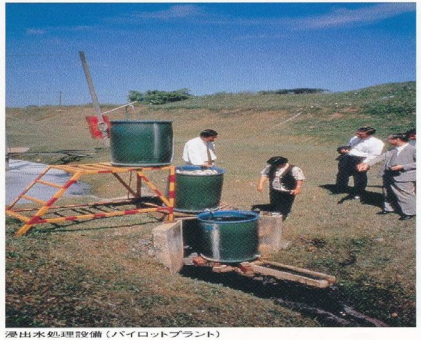
多目的酸化池での曝気（1996年）



竹や廃ドラム缶を使った循環式準好気性埋立地

廃ドラム缶を使ったガス抜き設備

ガス抜き設備の効果により、植生が回復

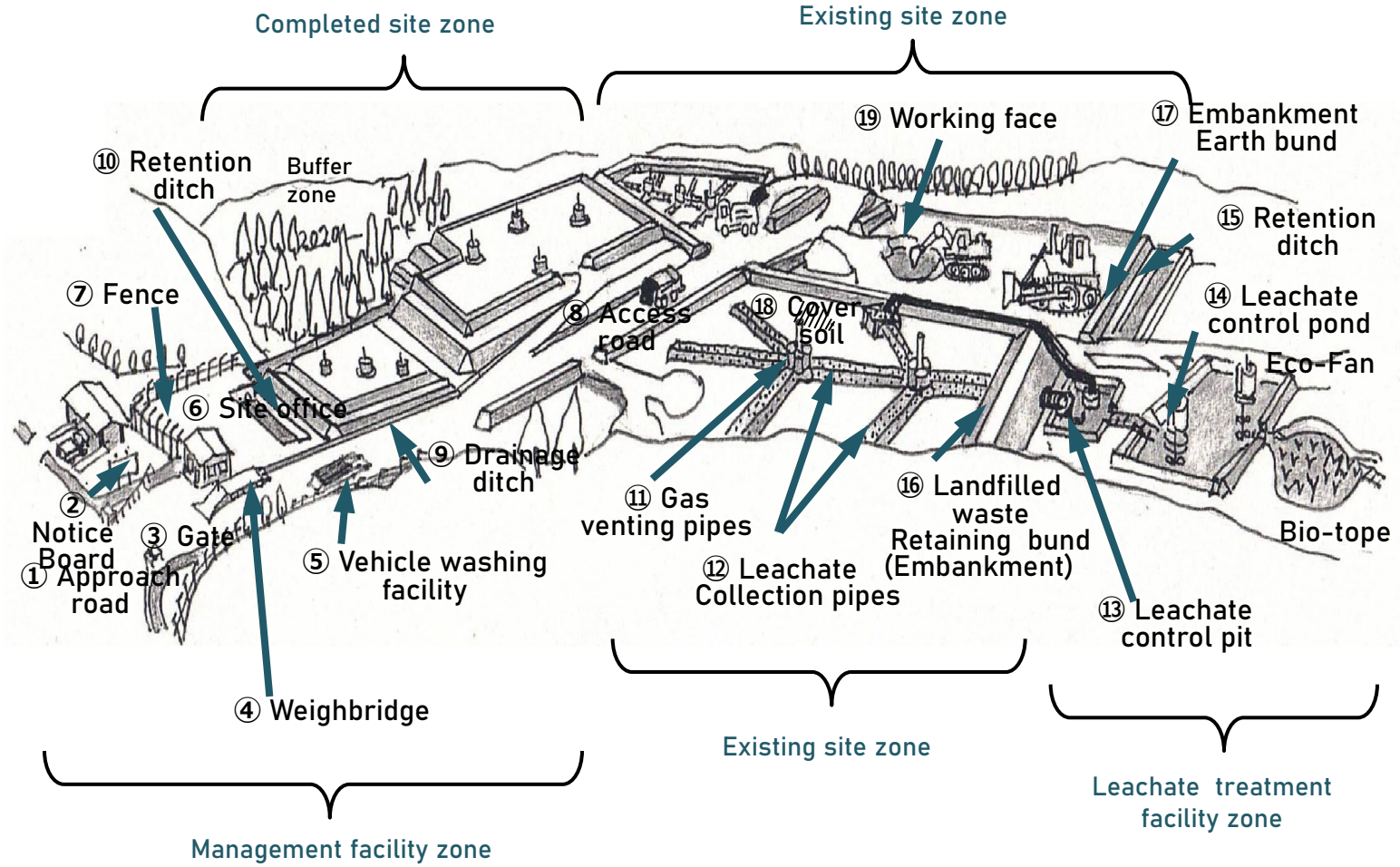


浸出水処理設備（パイロットプラント）

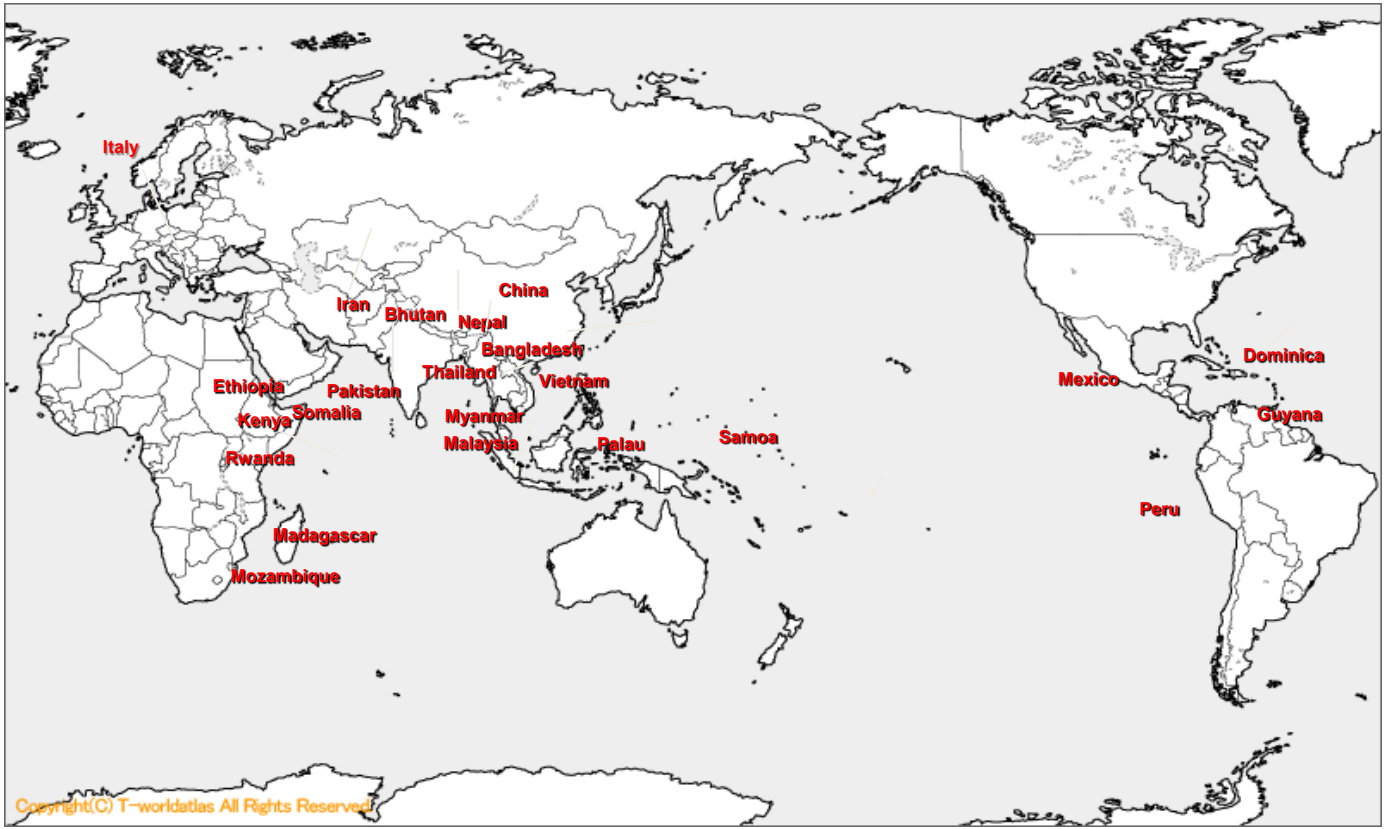
廃活性炭を使用した吸着処理

浸出水（1:原水、2:曝気槽、3:ろ過・吸着処理槽）

Main facilities at landfill site based on Fukuoka Method

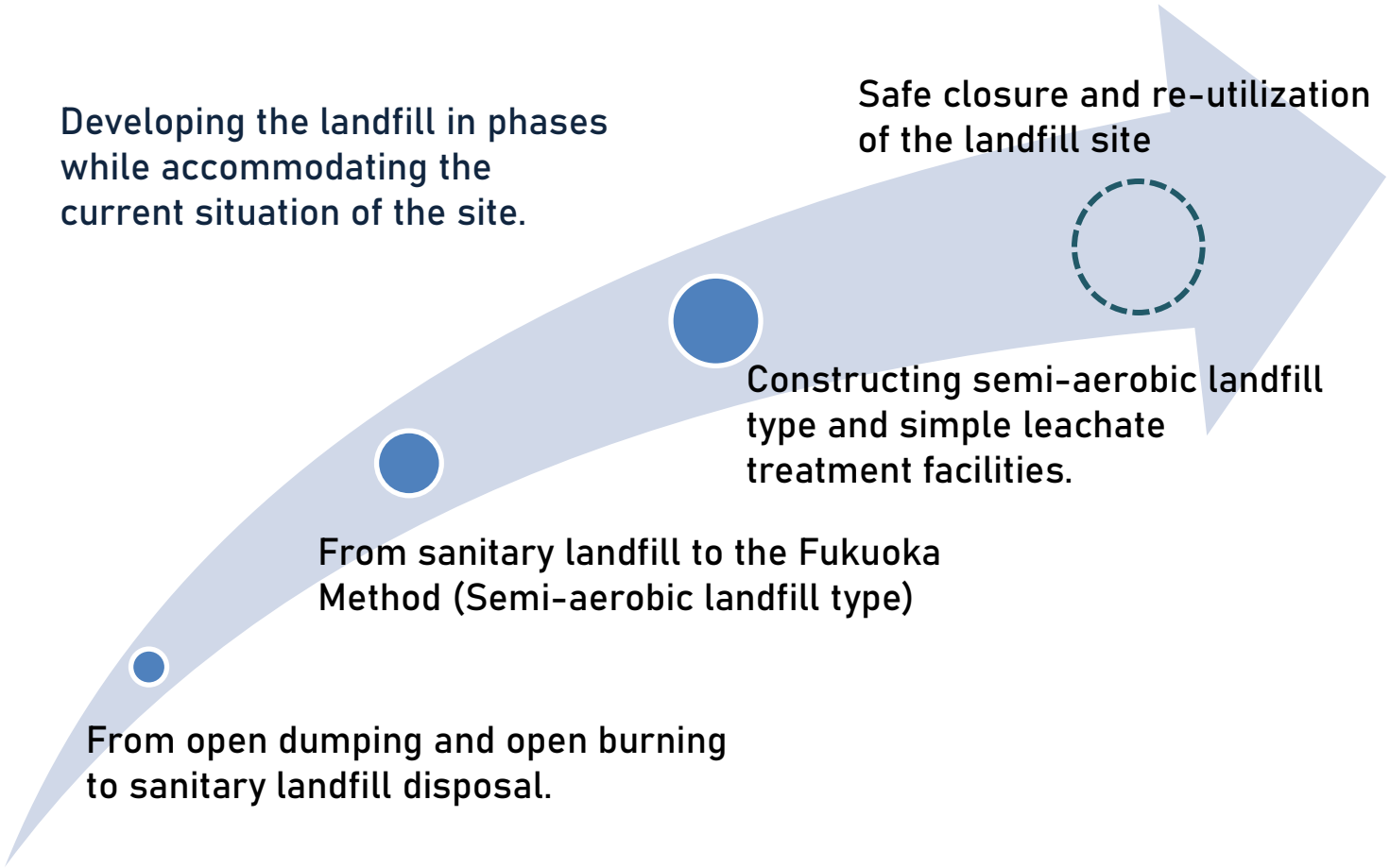


Fukuoka Method is becoming widespread around the world



On going 23 countries project

Improving the existing landfills step by step



Pilot Project by F.M in Kenya(2015)

Improving the existing landfills step by step in Yangon, Myanmar

Before

During improvement

Now

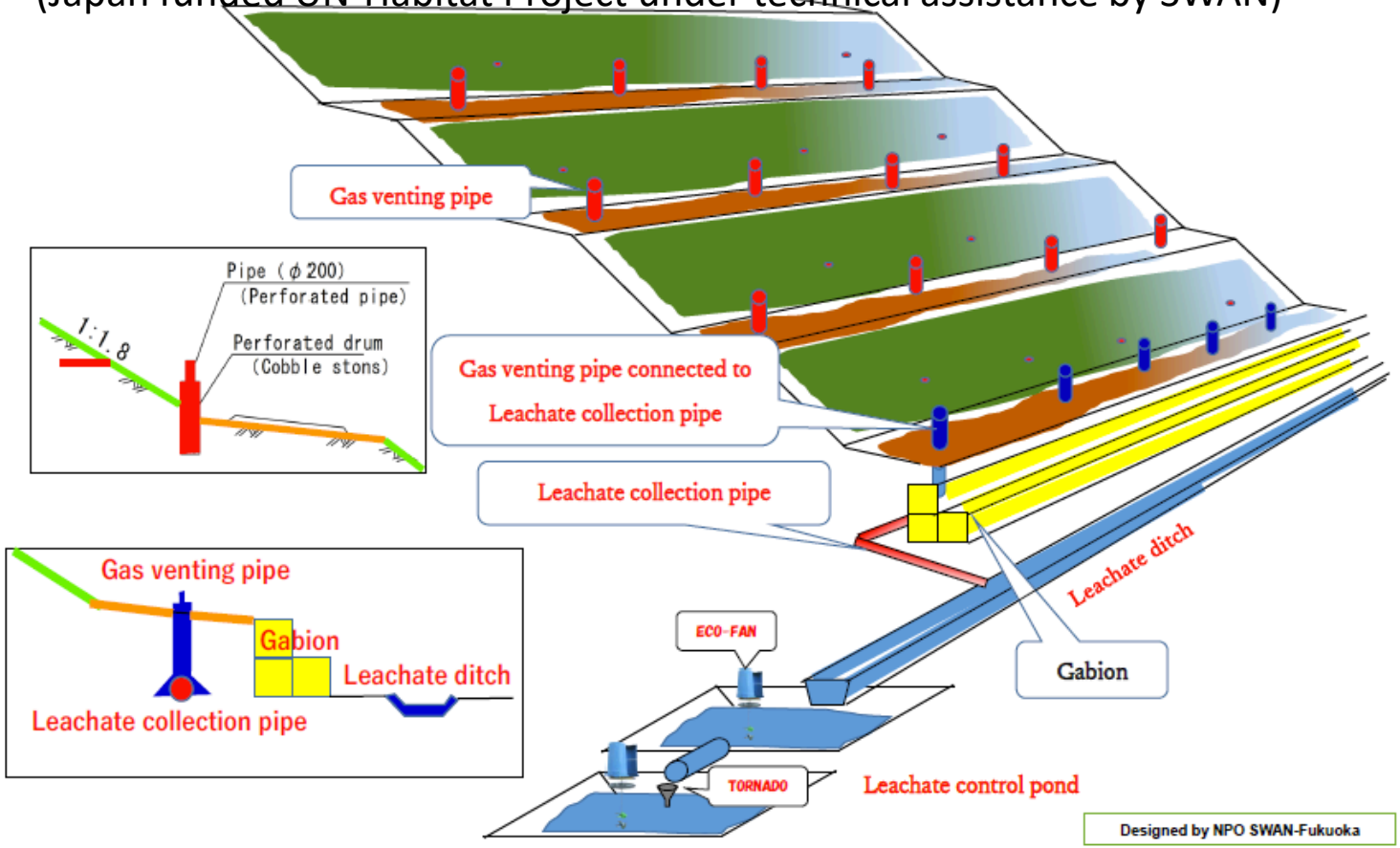
Plants are growing and the landfill's semi-aerobic conditions are maintained.

Ongoing project in Ethiopia
Addis Ababa city 2017-2023

Similar dump site collapse, slide, fire are increasing globally such as Mozambique, Myanmar, Indonesia, Sri Lanka, etc.

Our intervention for improvement and stabilization of the slide area of Koshe Dump site

(Japan funded UN-Habitat Project under technical assistance by SWAN)



4 ~6 months after project completion: July 2019

Kampala, UGANDA

2024,2025

Collapse of landfill slope and Fire

F.M. by online in Berbera,Somaria (2024)

Safe closure and re-utilization of the Completed landfill sites

Fukuoka in June 2019

Imazu Sports Park

Shoto-en
(Nursing home for the elderly)

Imazu Refresh Farm

Imazu Special Education School

Safe closure and Reuse of Completed Landfills in Fukuoka

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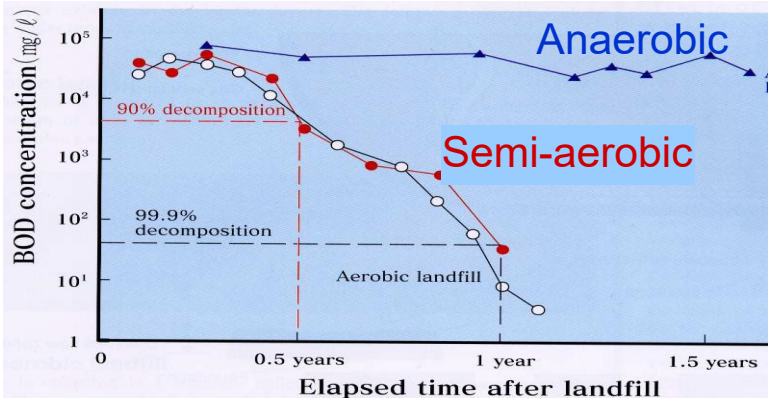

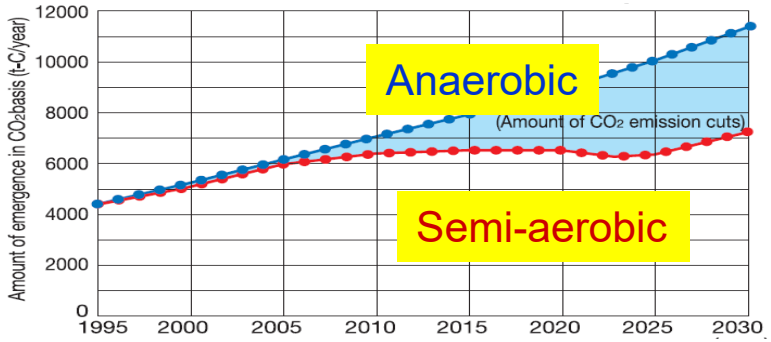

CDM by UNFCCC in 2011

Japan has declared to disseminate the “Fukuoka Method” to the world in the future !

at

The Maputo Declaration of TICAD 6,

The 2nd ACCP Yokohama Meeting in 2016,

The 3rd ACCP Tunis Action Guidance in 2022,

COP 27 in Egypt 2022 ,COP28 in Dubai 2023 and

WUF 12 in Egypt 2024

ACCP Meeting,TICAD9 in Yokohama, JAPAN and JCM Project in Tunisiya 2025

準好気性埋立構造の開発は道半ば！
Never Ending Story

- On-site training of Fukuoka Method
  by ACCP in Kenya 2005

Sustainable solid waste management contributing to peace and SDGs