

# **Sustainability Report in Japan**

**1. Sustainable Water Management Systems  
(Basin Management Systems)**

**2. Sustainable Energy & Material Management  
Systems**

**3. System Application to Bangkok**

**Shibaura Institute of Technology Study Team**

Prof., ZAJun Matsushita, Faculty of Systems Engineering

**Ms. Kaori Takeuchi, (SIT), Ms. Ayaka Suzuki (Architecture Consultant),  
Mr. Takayuki Ookubo (President, Cooperative Housing Coordinator/Consultant)**



# What is Sustainability all about in Asian Countries under Rapid Urbanization



**Kyoto and Osaka**



**Shanghai**



**Bangkok**



**Tokyo**



# Self-introduction: Jun Matsushita



**BONSAI (Five-leaves Pine Tree)**



# 【Flood Mitigation】

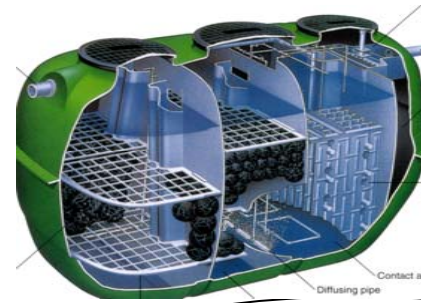


## Runoff Reductions

- On-site Storm Reservoirs

《Developer-Pay Principle》

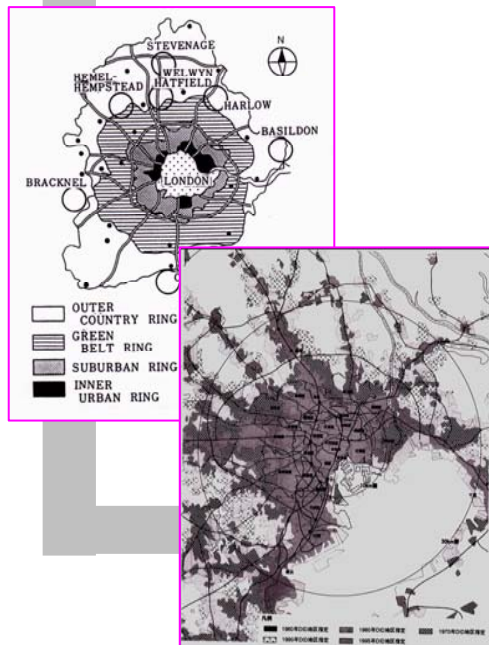
# 【Wastewater Control】



## Pollutant Reductions

- On-site Aerated Tanks
- 《Polluter-Pay Principle》

## Urban Control



# Basin Management Systems

## Water Saving/Recycling

- In-house Recycling
- 《Builder-Pay Principle》



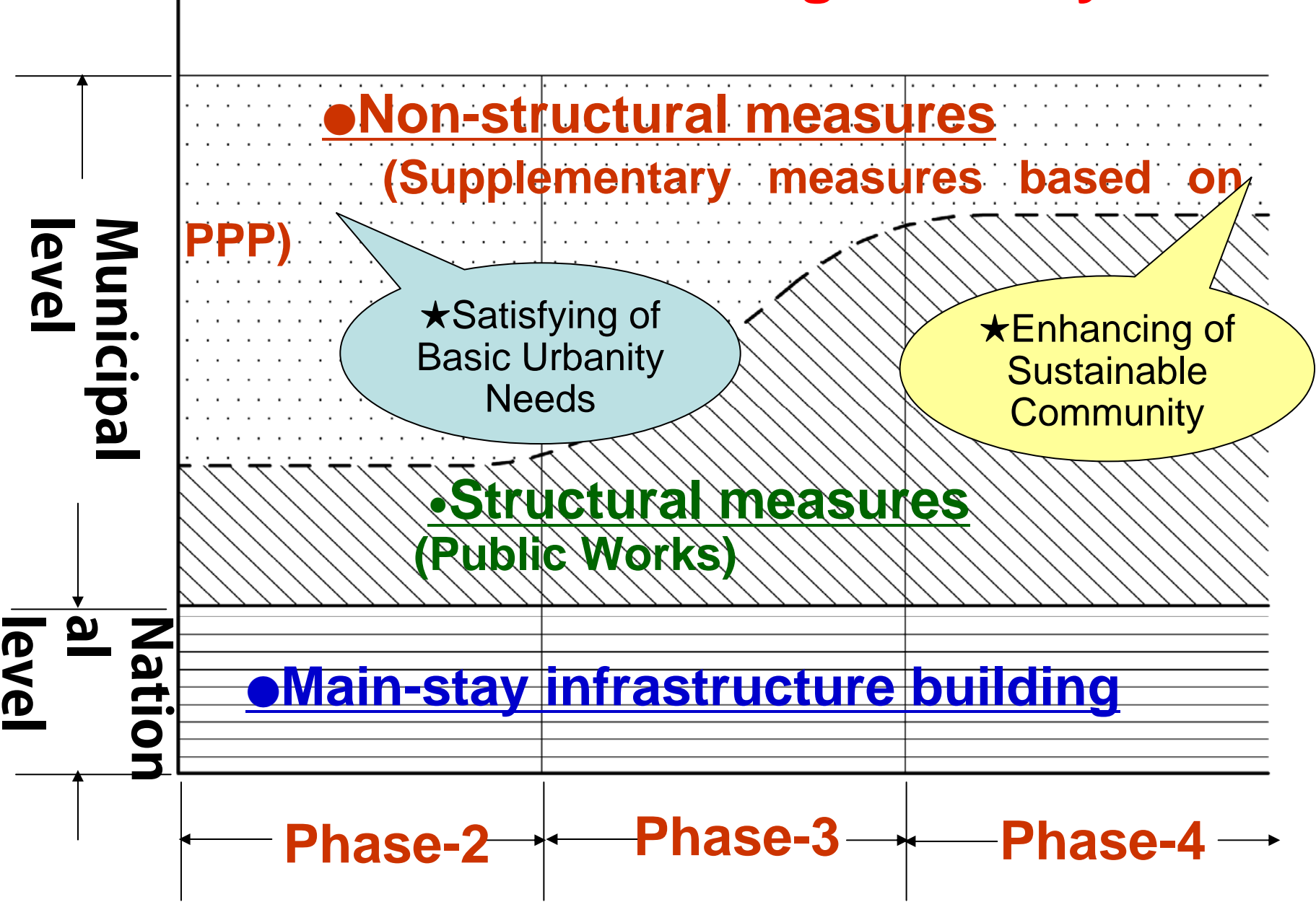
# 【Water-demand Control】

## Step-by-step Plan



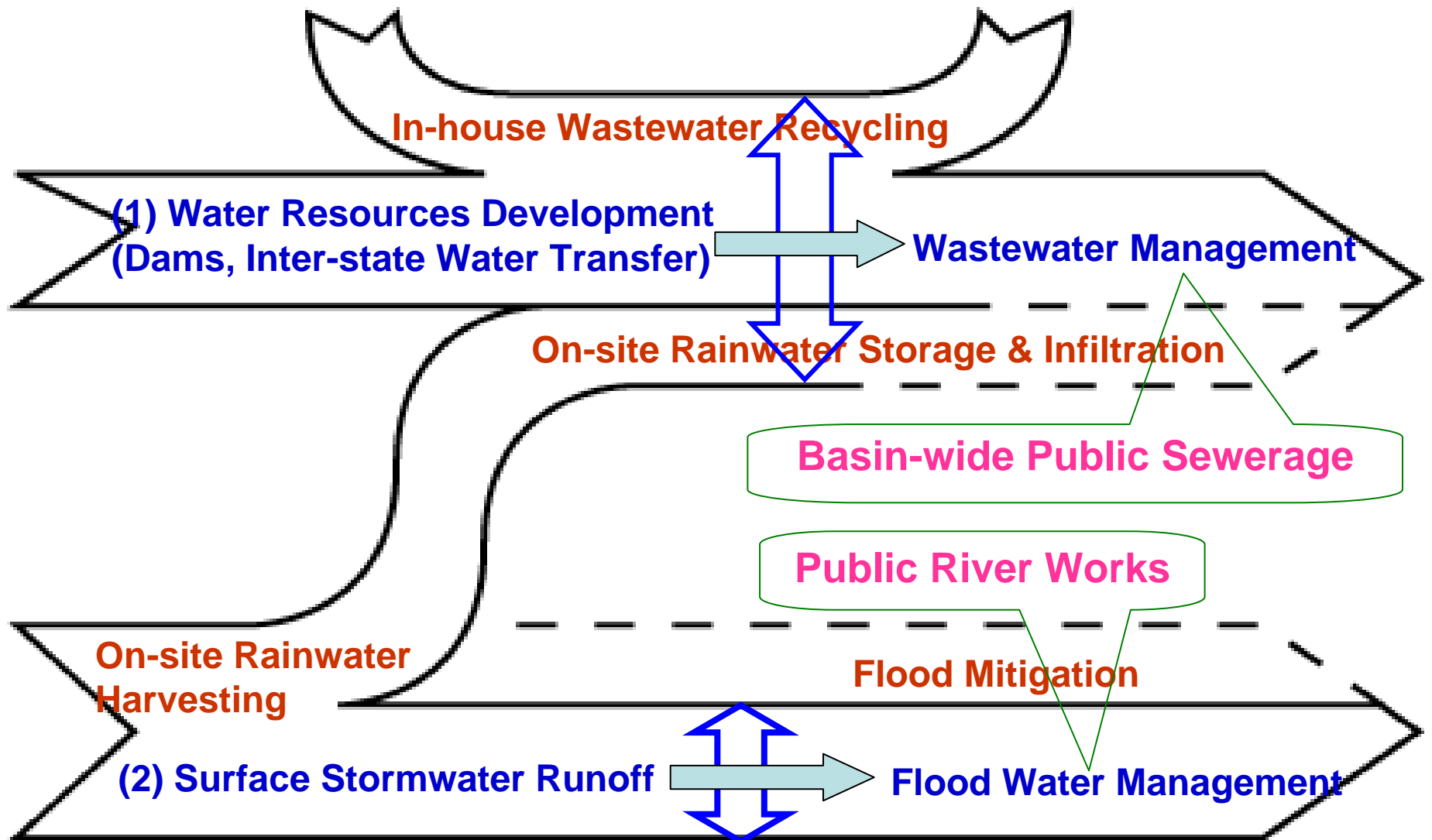


# Functions of Basin Management Systems





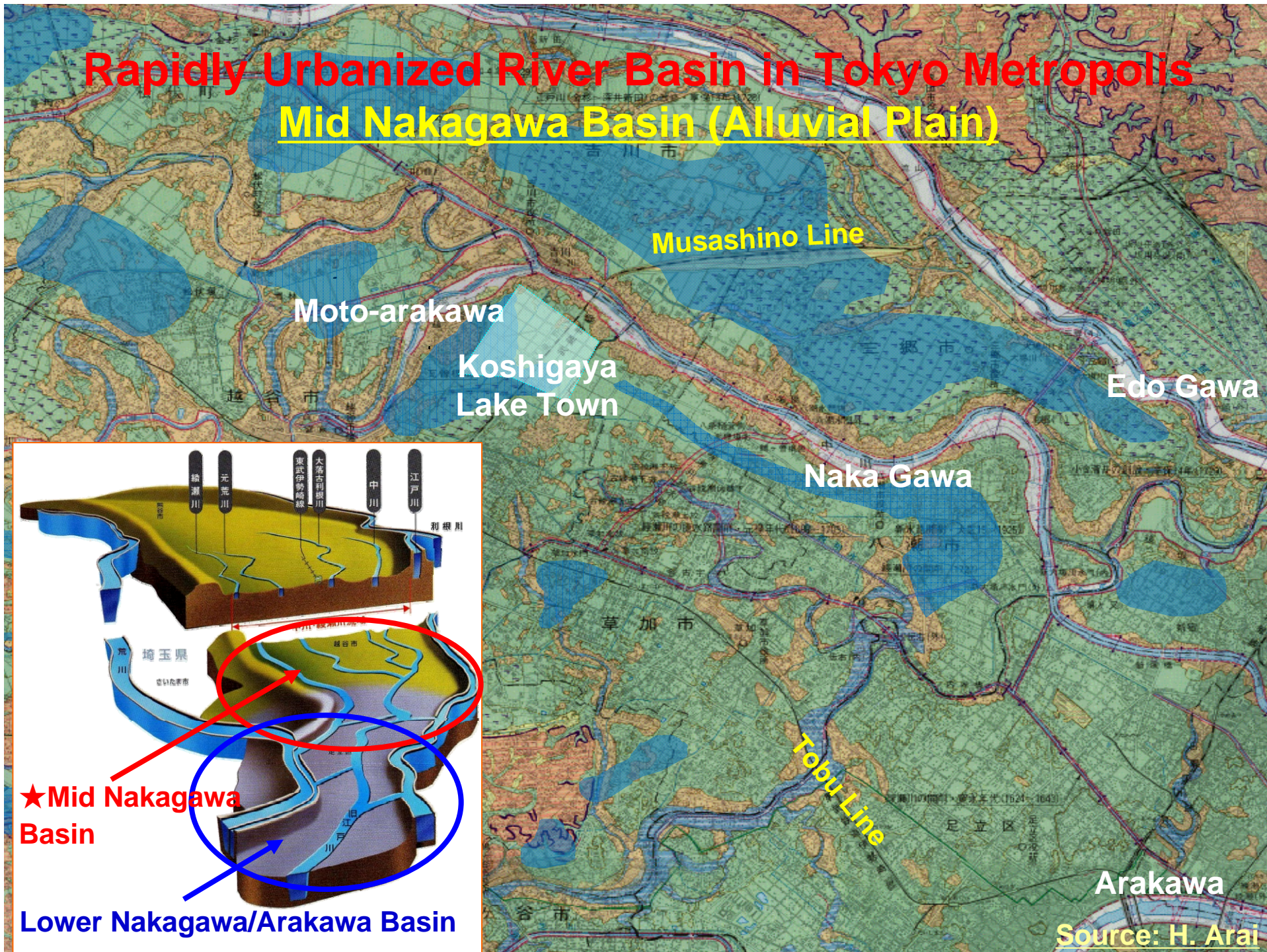
# Sustainable Water Management Systems (Basin Management Systems)





# Rapidly Urbanized River Basin in Tokyo Metropolis

## Mid Nakagawa Basin (Alluvial Plain)

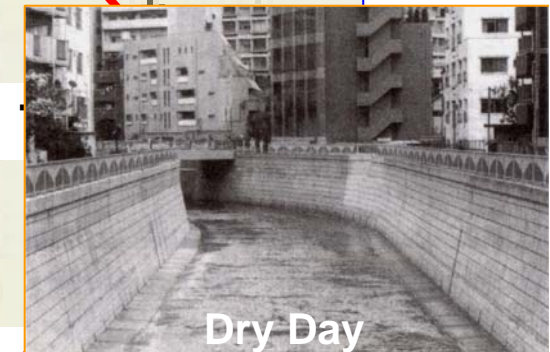
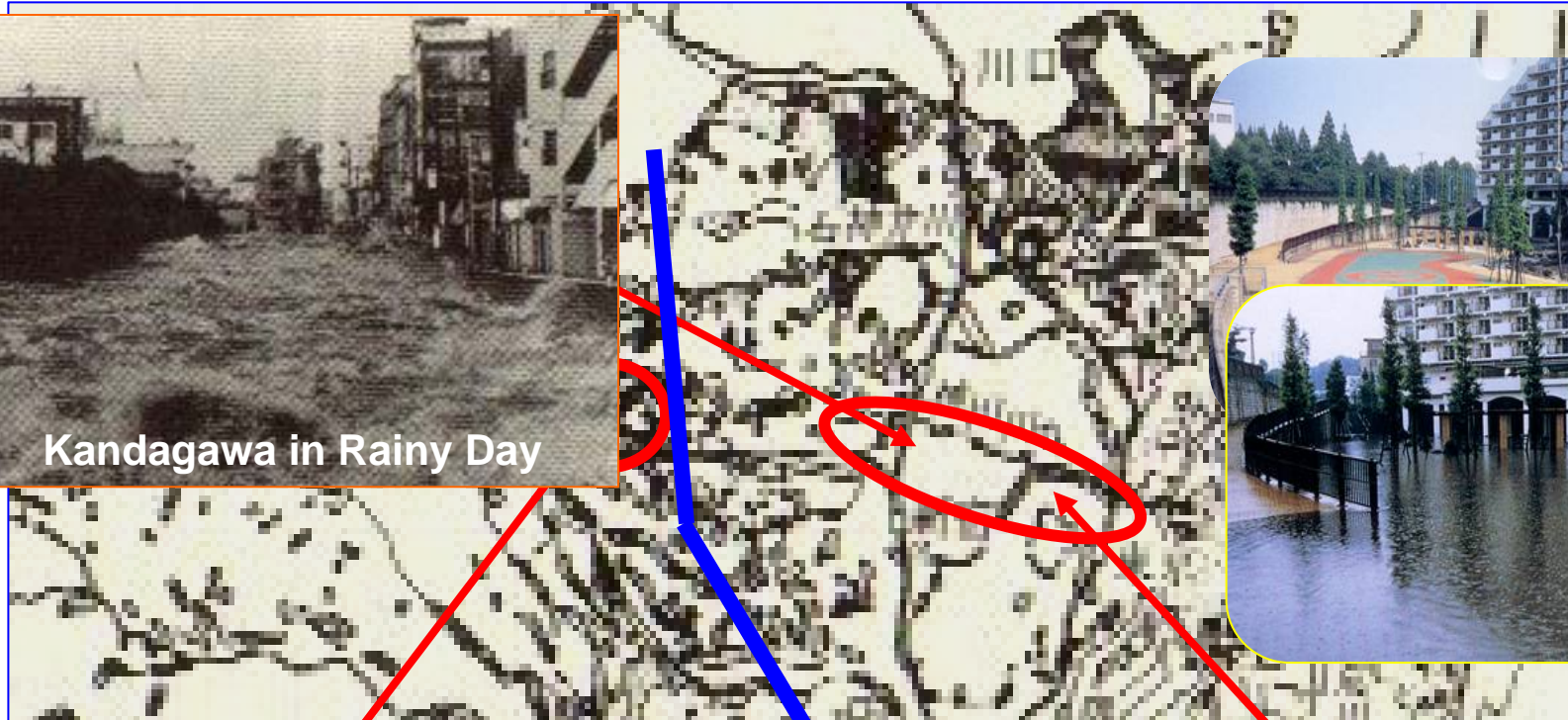




# Basin Management Systems in Kandagawa

## Lower Nakagawa/Arakawa Basin

Source: UR & TMG



ng (1950s-60s)



# Down-graded Nihonbashi-gawa Landscape

## Lower Nakagawa/Arakawa Basin

Source: N. Okura & S. Kon



Backside Waterfront



Future Image



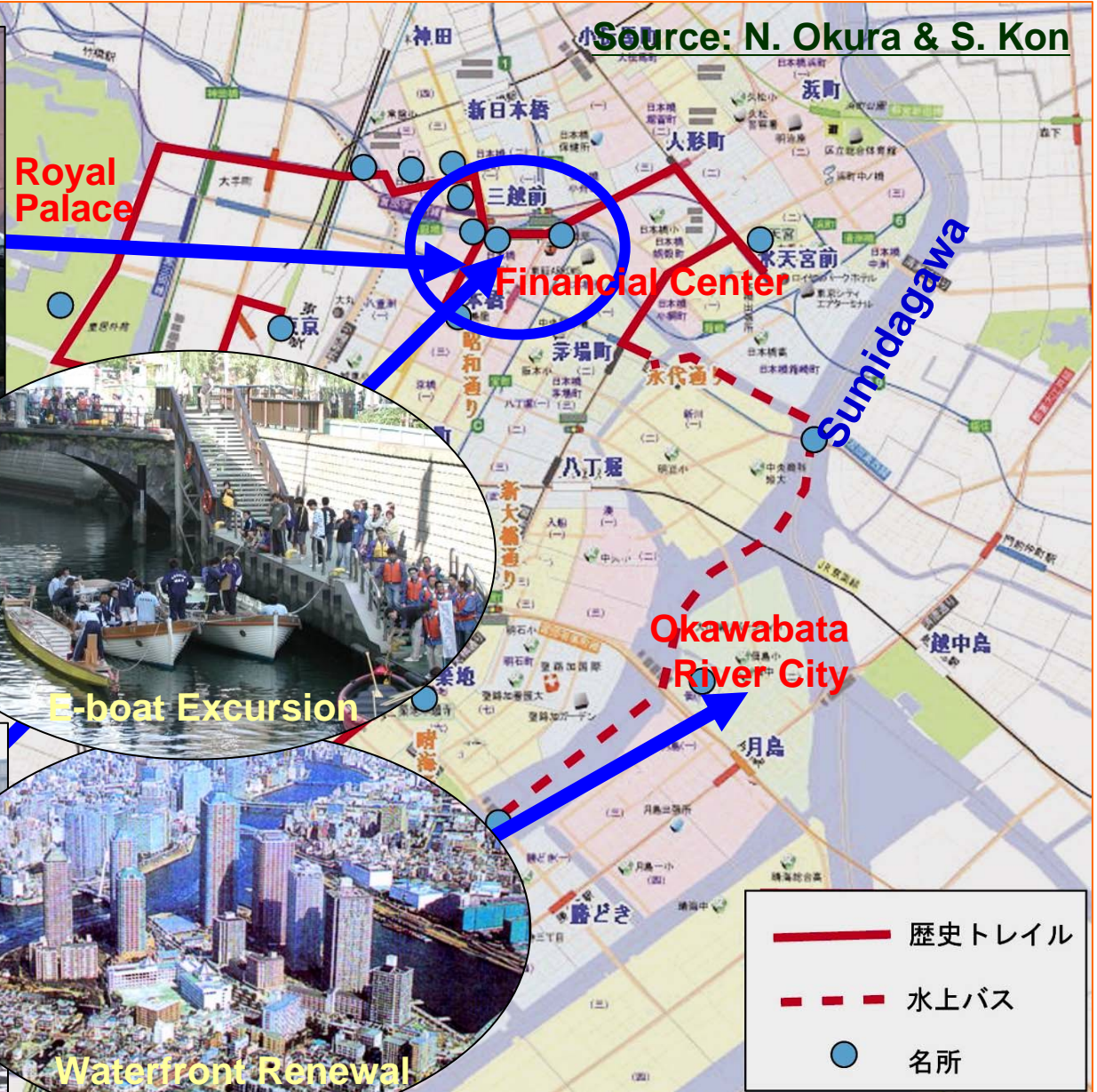
E-boat Excursion



Super-high Way since 1964

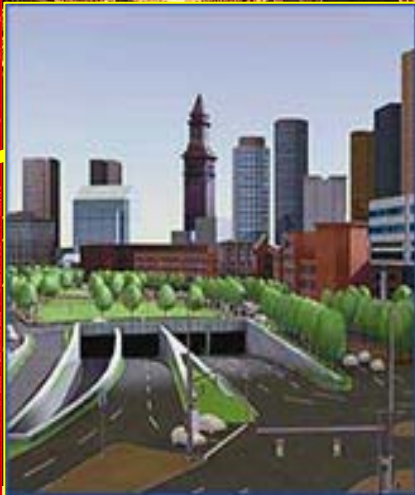
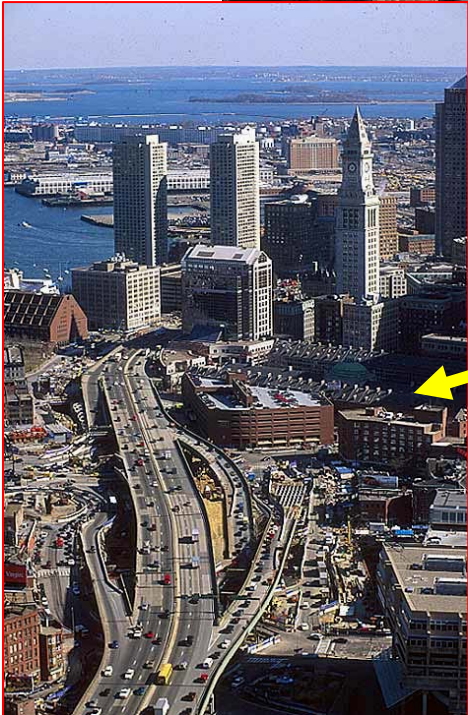


Waterfront Renewal





# Boston's Way of Urban Landscape Up-grading (Big Dig Project)





# 'Live Nagaike Project' in Tama New Town (Natural Water Cycle Rehabilitation Systems)



Ecological Park in Upper Basin



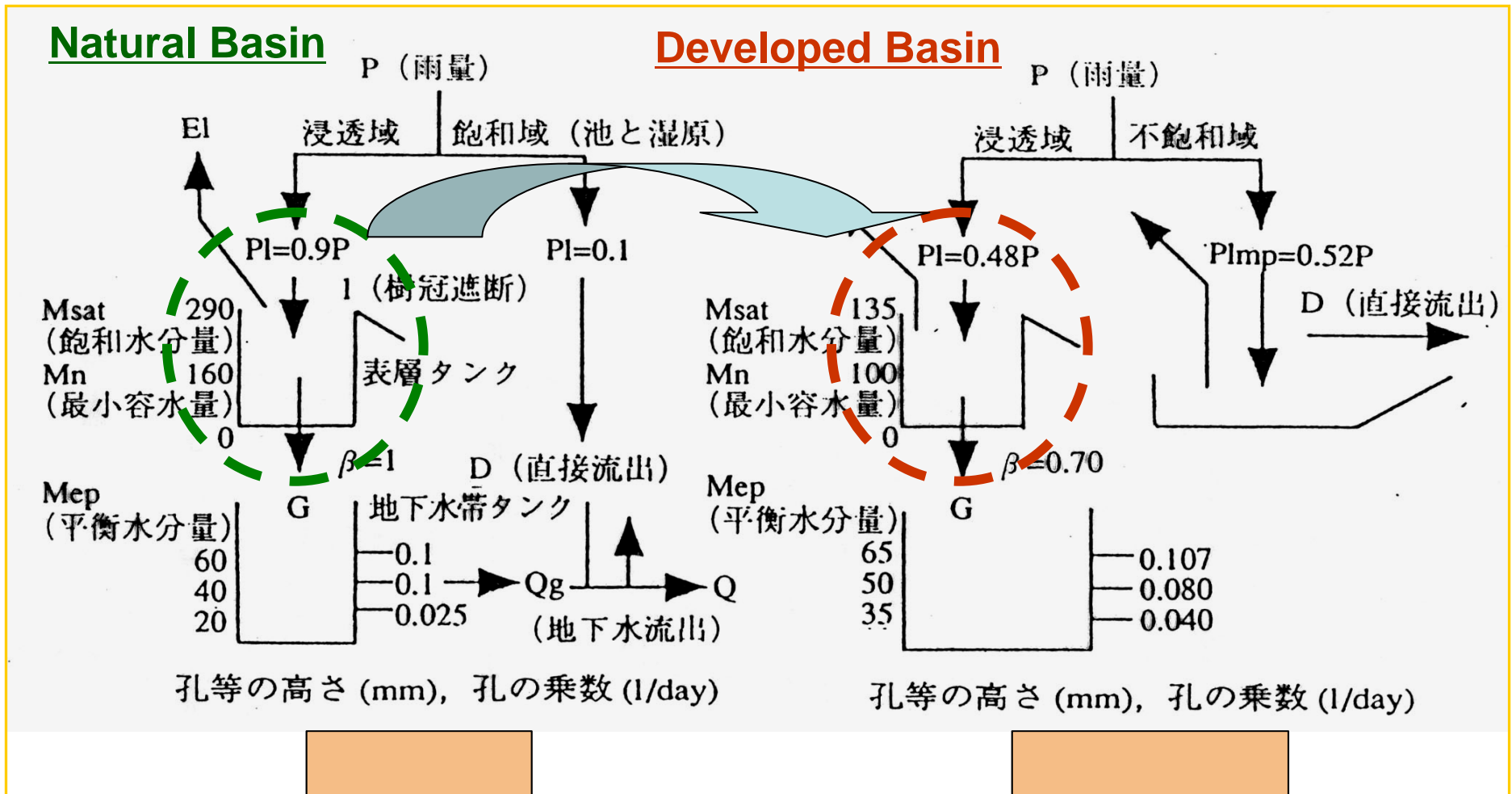
Eco-housing HUD 住都公園



NPO Activities



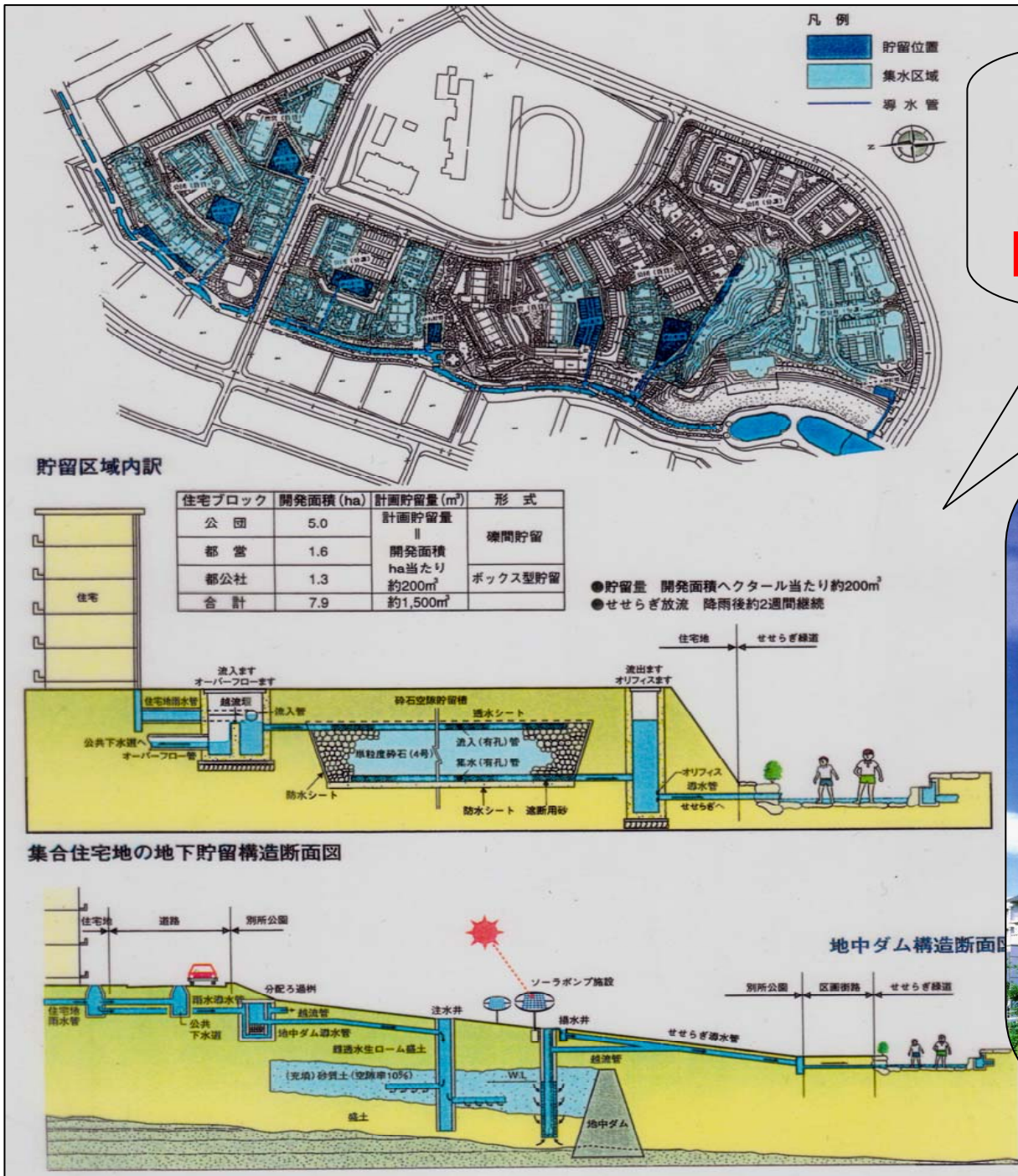
# Hydrological Change due to Land Reclamation (Tama New Town Area)



**Rainwater retention capacity** in the top soil is decreased from 290mm to 135mm by 53% through land reclamation.



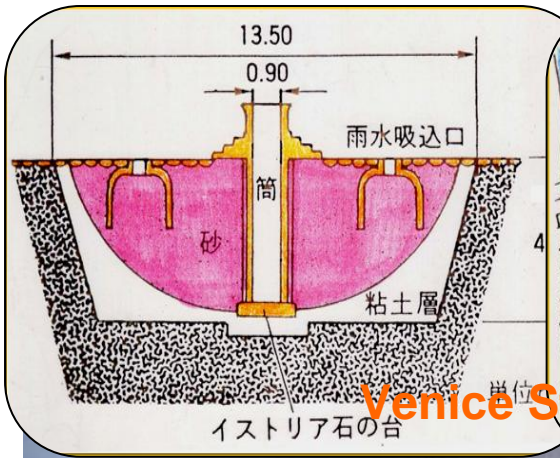
# Installation of Water/Material Recycle Systems



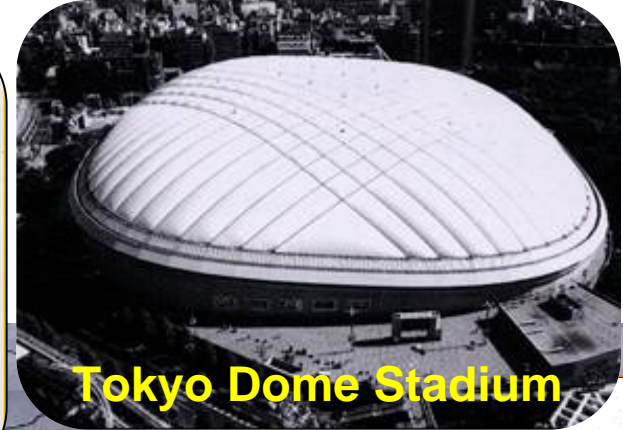
Source: UR Tokyo



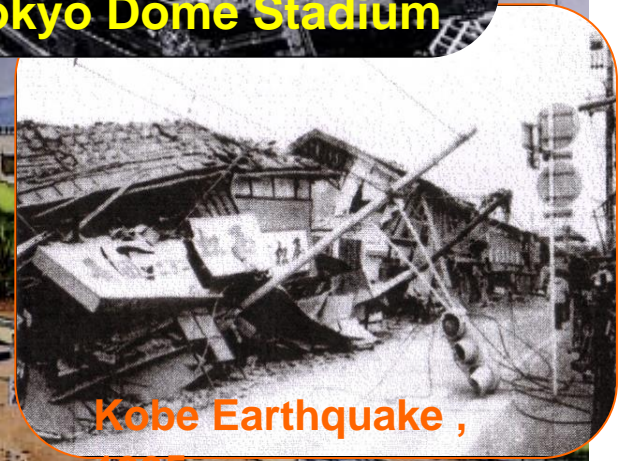
# Rainwater Harvesting System Model (River Revitalization Project in Hokusetsu New Town)



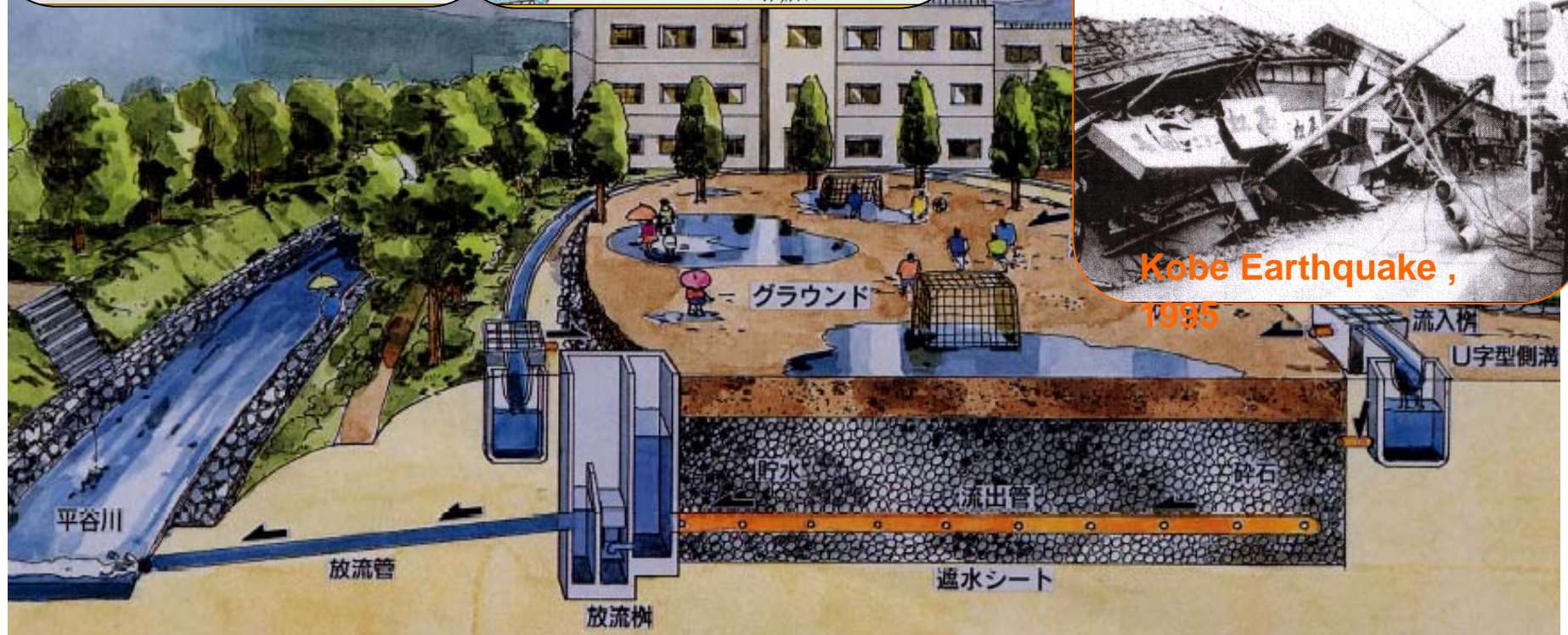
Venice Style



Tokyo Dome Stadium

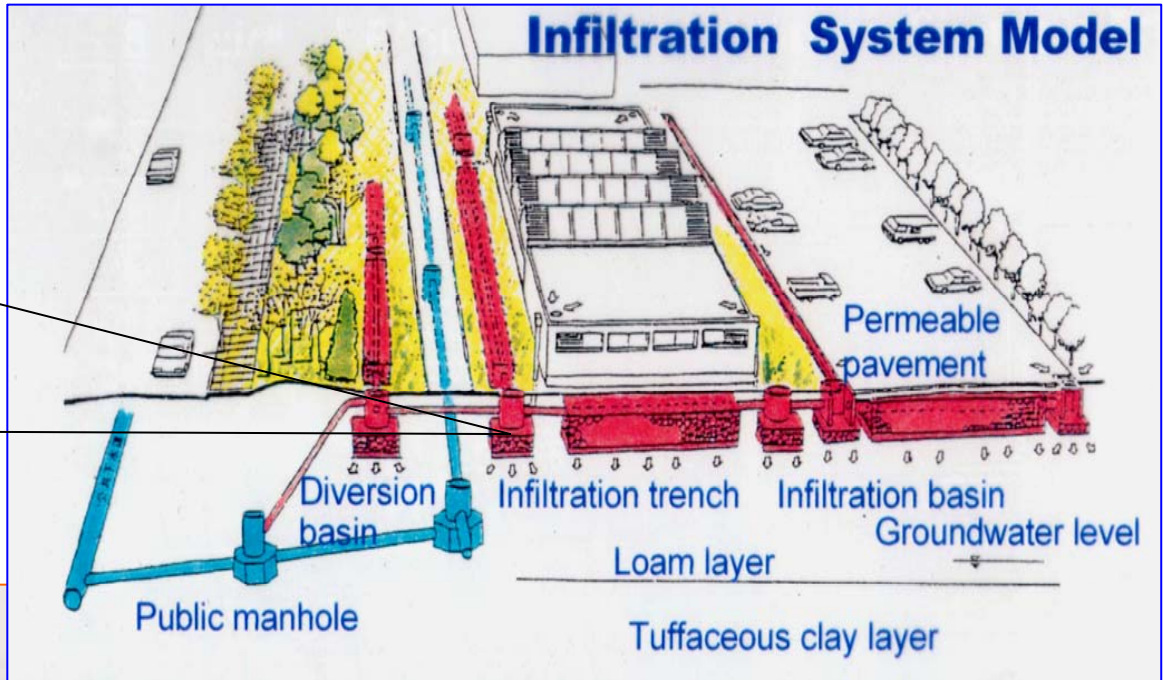


Kobe Earthquake, 1995

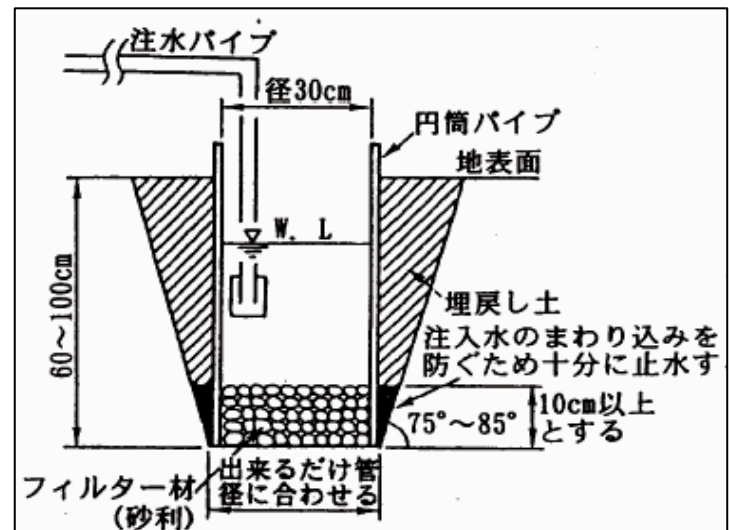
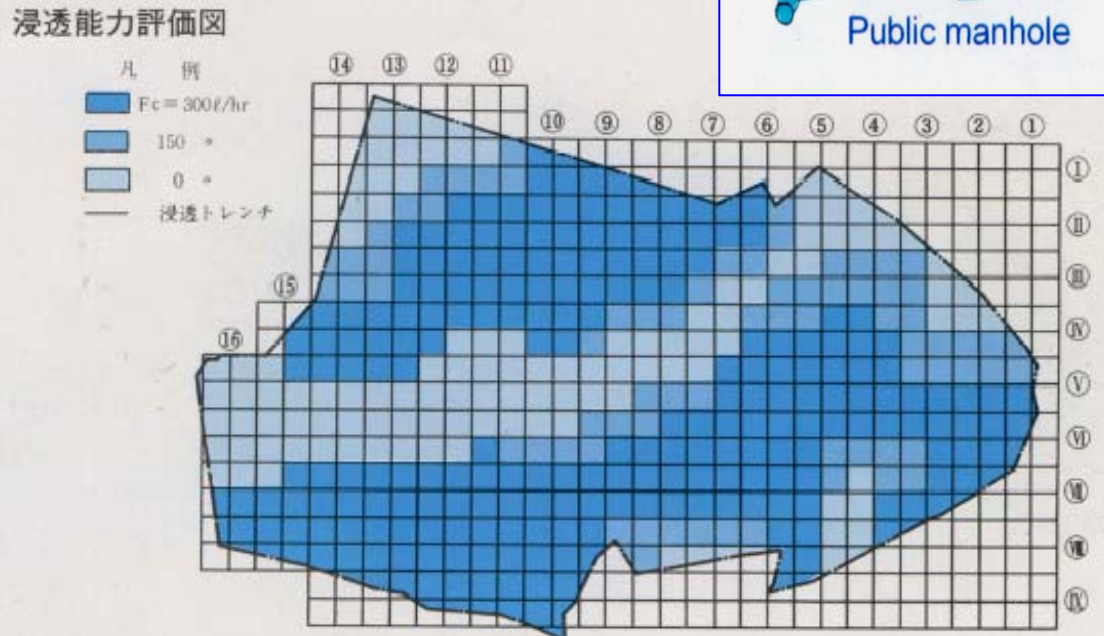




# Rainwater Infiltration System Model (Tsukuba Science City)

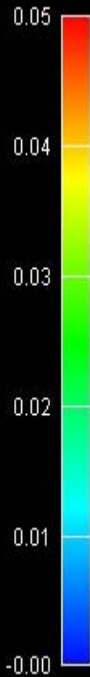


## Infiltration Capacity Map





# R/D on Top-soil Erosion Prevention System in Okinawa Isl. under Sub-tropical Climate



NO3-N(m  
Kabi  
Bay

Mou



Eco-Economy Cycle

ver Basin



Eco-Economy Balance



Nagura Bay (Coral Sea)



# Sustainable Energy/Material Management Systems



Traditional Recycle-oriented So  
in Japan

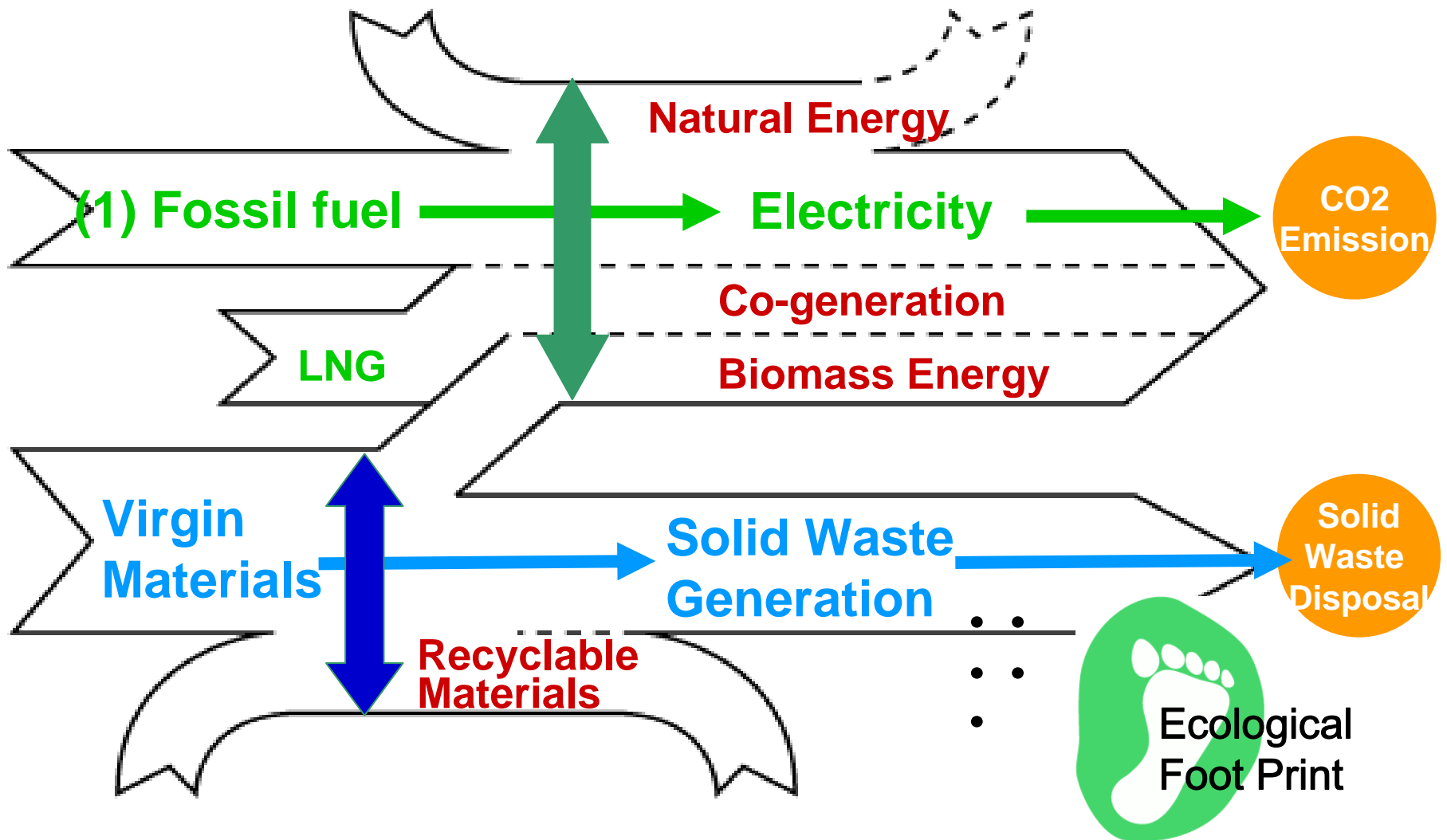




# Integration of Energy/Material Management System

## Function of the Integrated System:

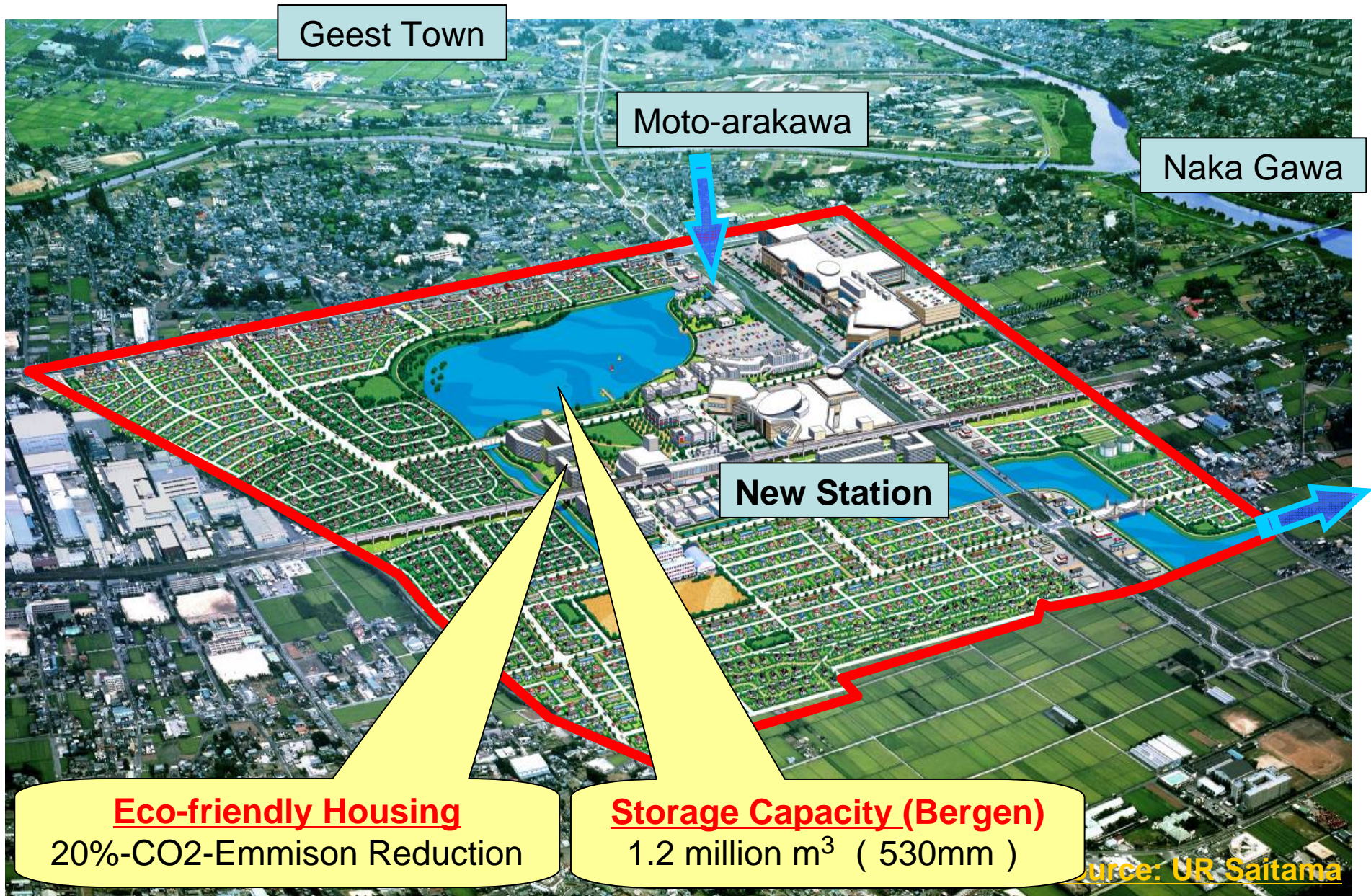
- (1) Reduction of CO2 emission by on-site type natural energy & biomass use
- (2) reduction of solid waste disposal by on-site type recycling system





# Koshigaya Lake Town Project

Mid Nakagawa Basin





# Eco-Oriented Housing (Sun City, Stadt von de Zon)





# Recent Up-graded Water Policy in NL



①keep (Vasthouden) , ②Store (Bergen)

**Municipal Government or Private?**

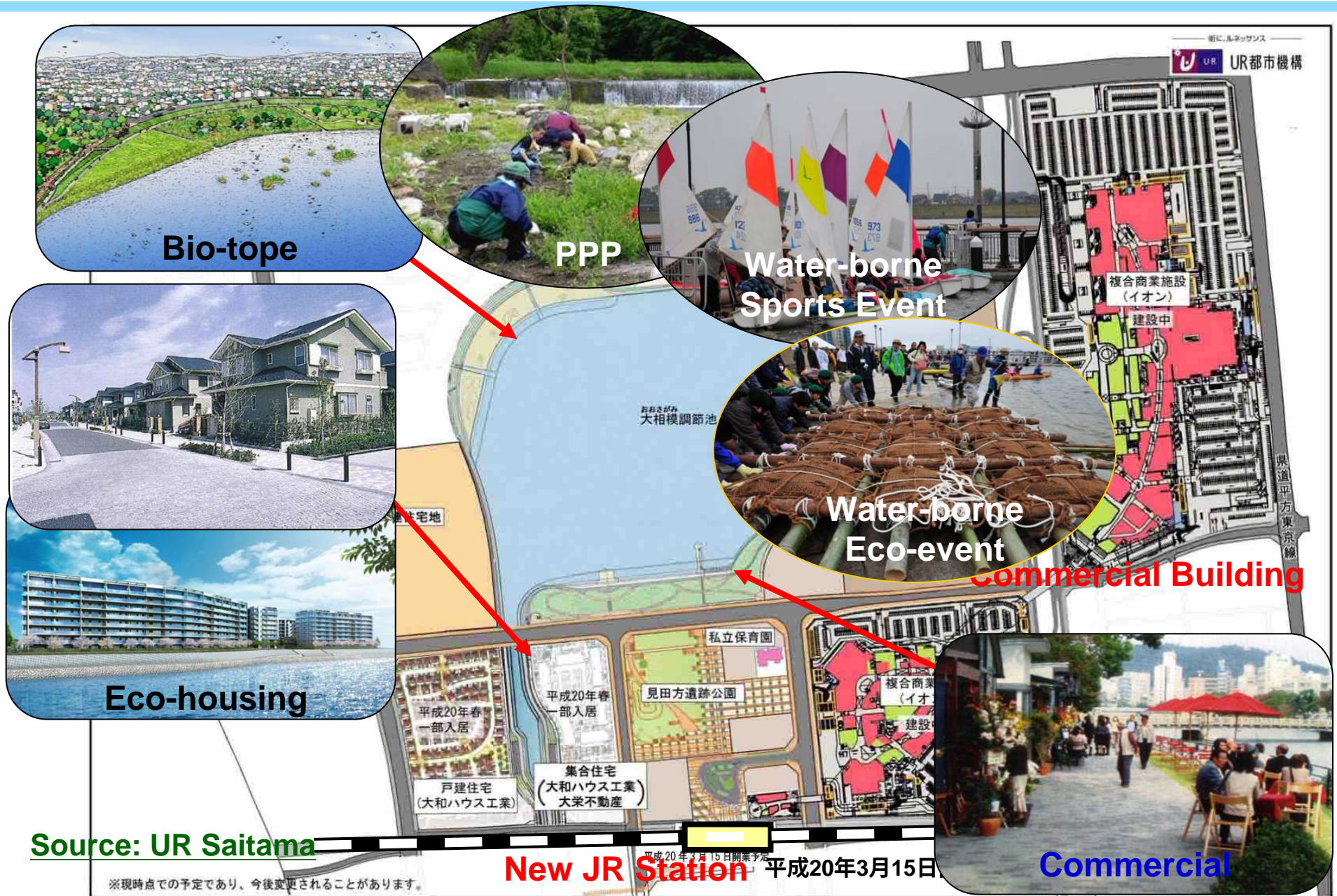
③Drain (Afvoeren)  
**National Government?**

Source: : M.



# Water Utilization (1<sup>st</sup> Phase, 2008)

Life-Link-Lake





# Eco-housing (20%-CO2-Emission Reduction Model)

Life-Link-Lake

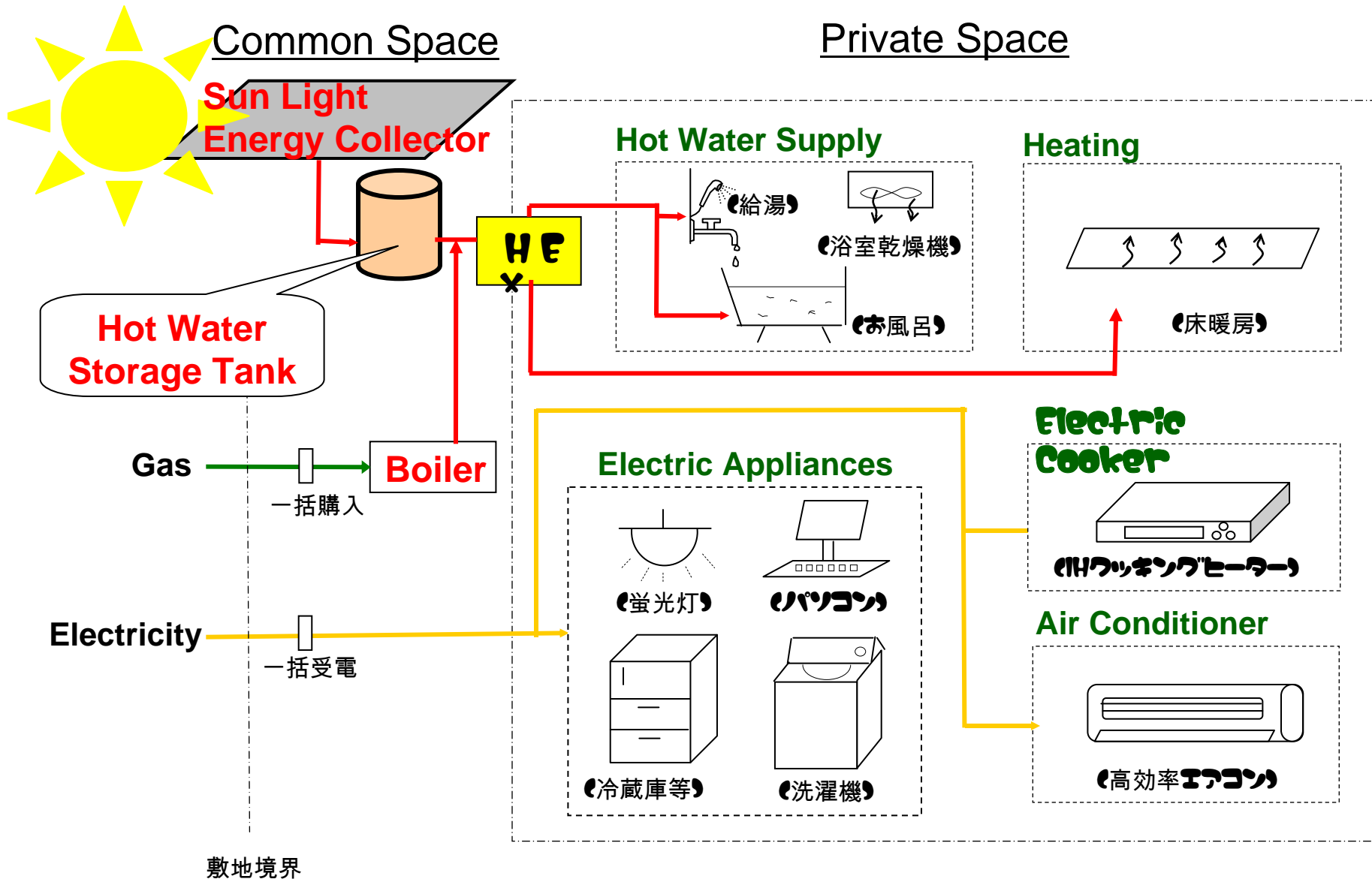


Source: Varme-24



# Collective Sun Light Energy Utilization System

Life-Link-Lake



Source: Varme-24



# Eco-element Full Package Model

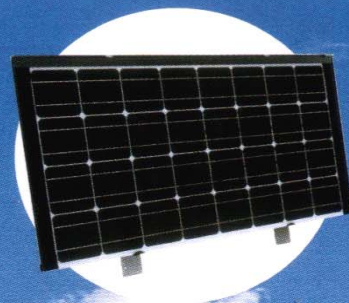
## (Mebukino-oka Eco-friendly House)

環境にやさしい。暮らしに心地よい。充実仕様の住まい。

クリーンな  
オール電化



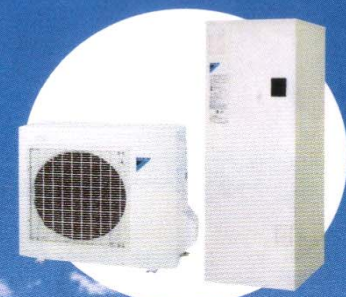
太陽の力で光熱費を節約  
太陽光発電システム



機能的でエコロジー  
IHクッキングヒーター



高効率の電気給湯機  
エコキュート



自然の恵みを効率利用  
雨水処理施設



生ゴミを減らす  
コンポスト



全区画  
緑化率35%以上



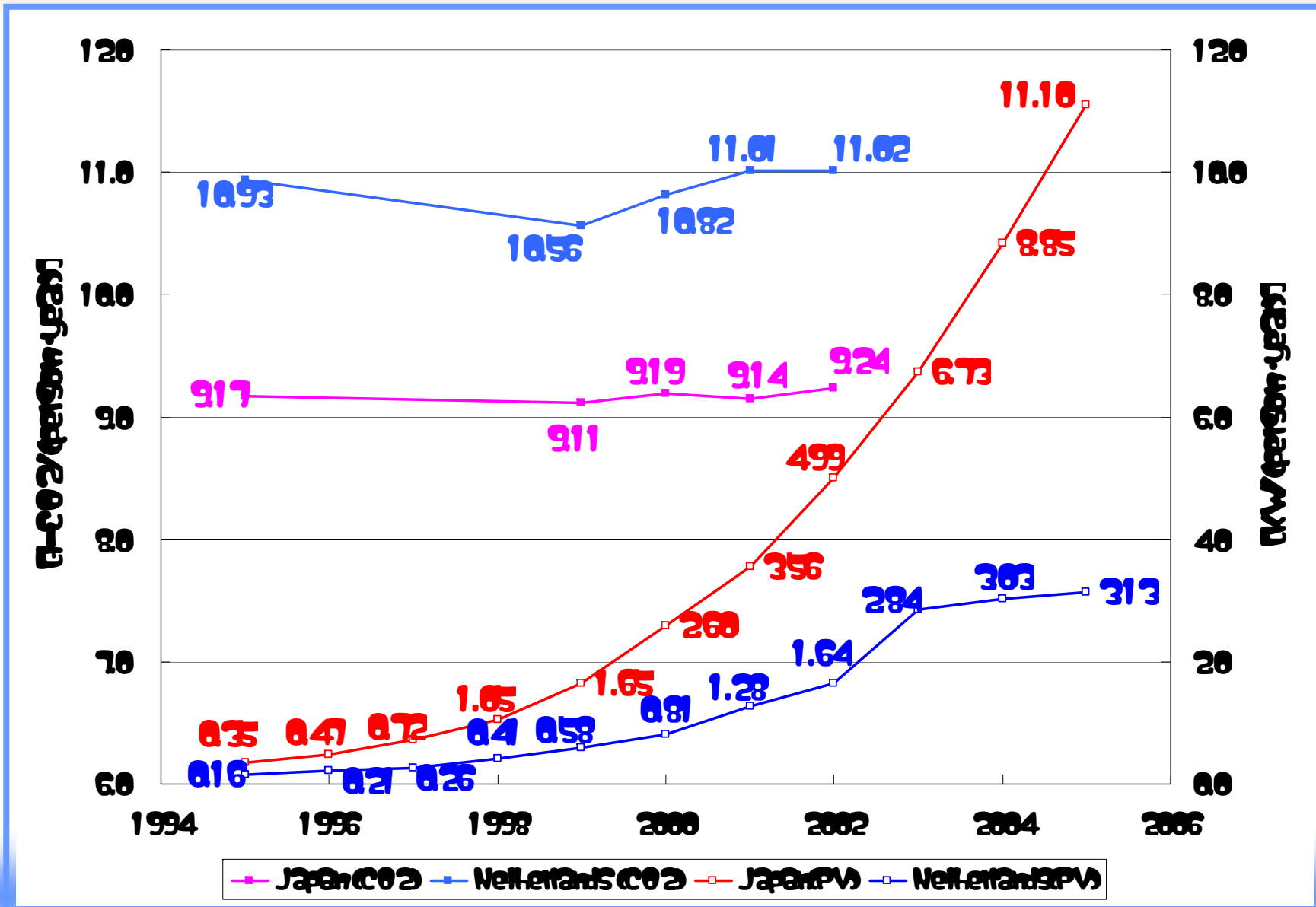
統一された  
街並デザイン



※掲載写真は、イメージです。実際とは異なる場合があります。



# Comparison of Electricity Consumption Between Two Countries





# Thai-Japan Technical Cooperation Flood-protection Project in Bangkok



JICA Expert,  
1981-83

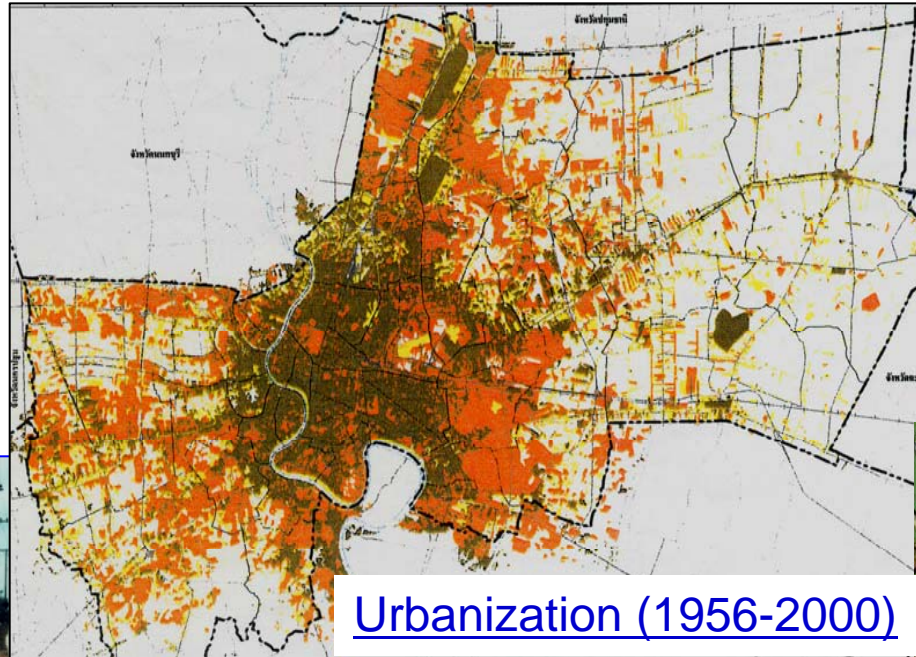


Head Office of Bangkok Metropolitan Administration (BMA)

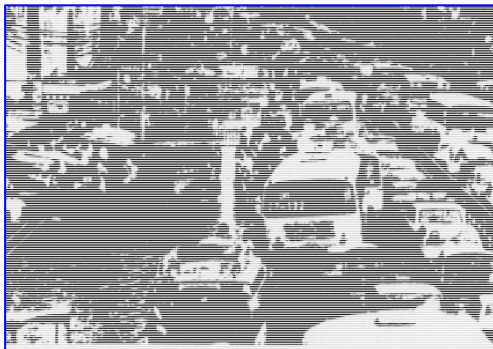


# Appropriate Flood-Mitigation Models under Rapid Urbanization

## Discordant Development

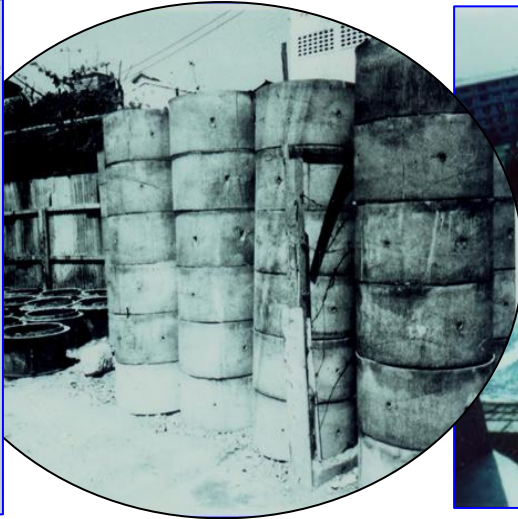
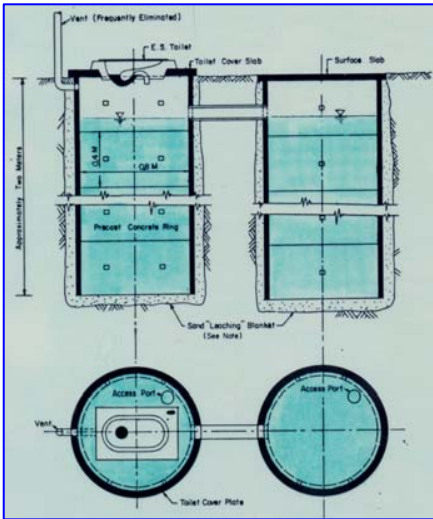


## Flood- Mitigation





# Appropriate Flood-Mitigation Models under Rapid Urbanization



Sewerage system

Communal Wastewater TP

Septic Tank

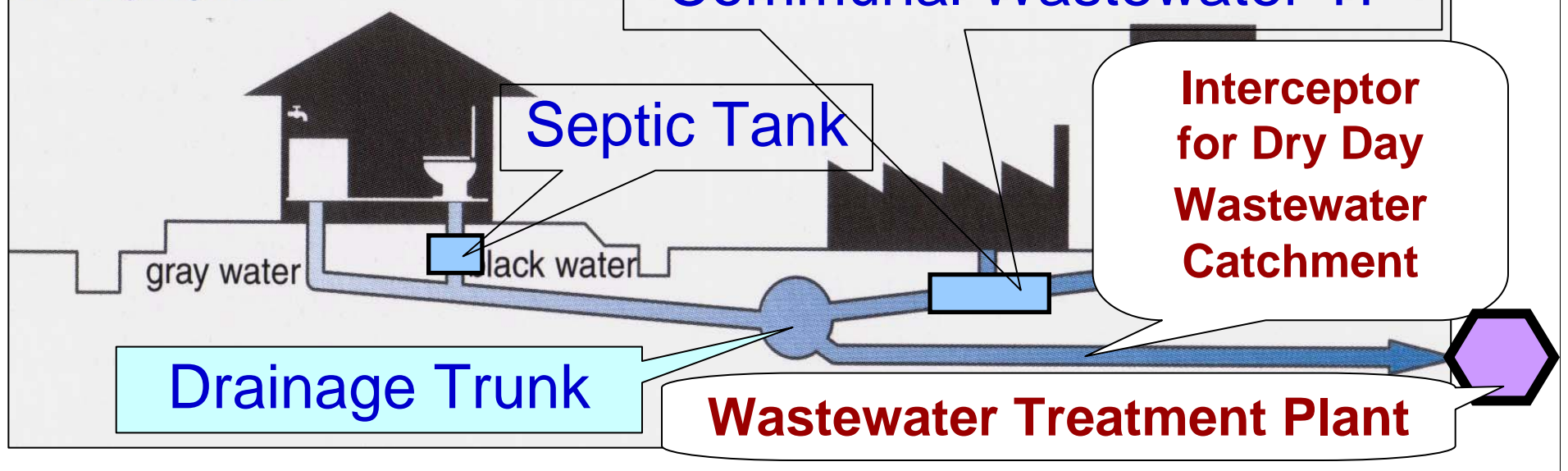
Interceptor  
for Dry Day  
Wastewater  
Catchment

gray water

black water

Drainage Trunk

Wastewater Treatment Plant



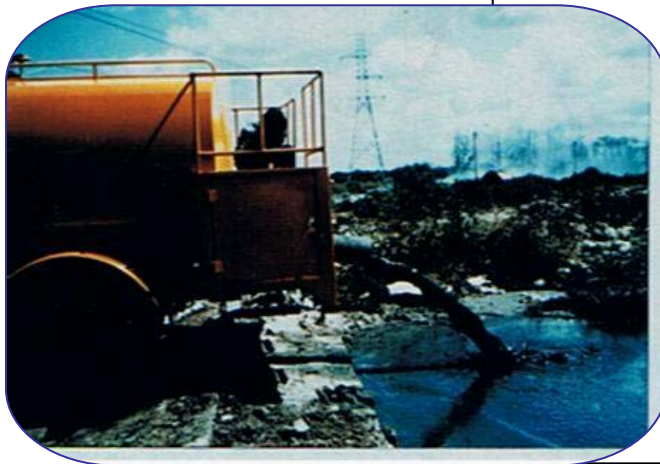


# Solid Waste Disposal Systems in Bangkok

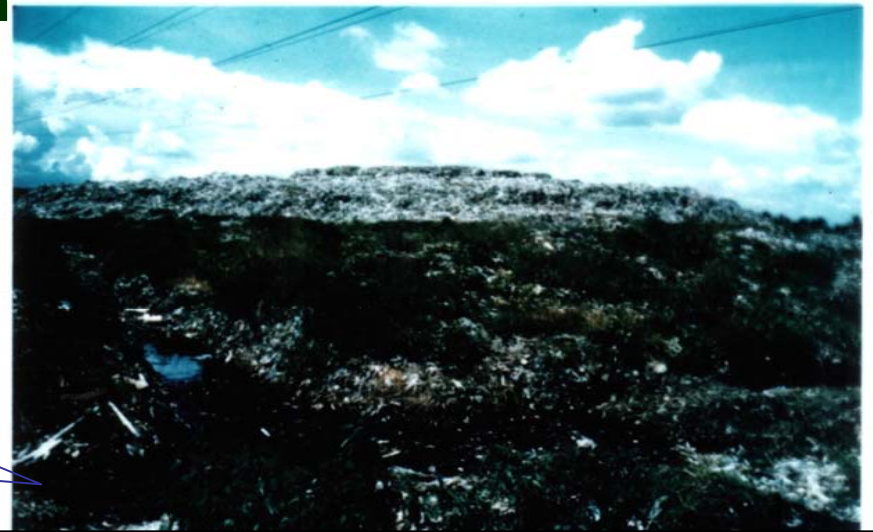
廃棄物の処理・処分システム



Transfer Station



Sludge Disposal



Onnouch Land Fill Site



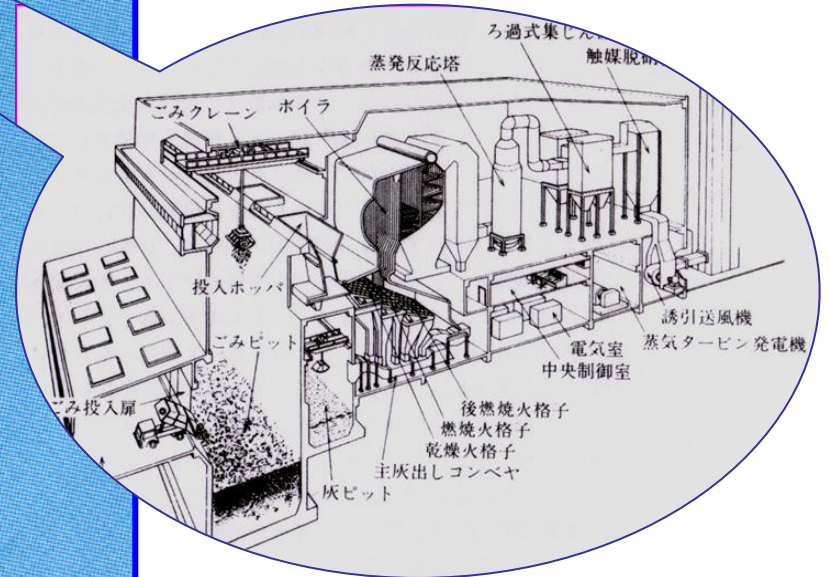
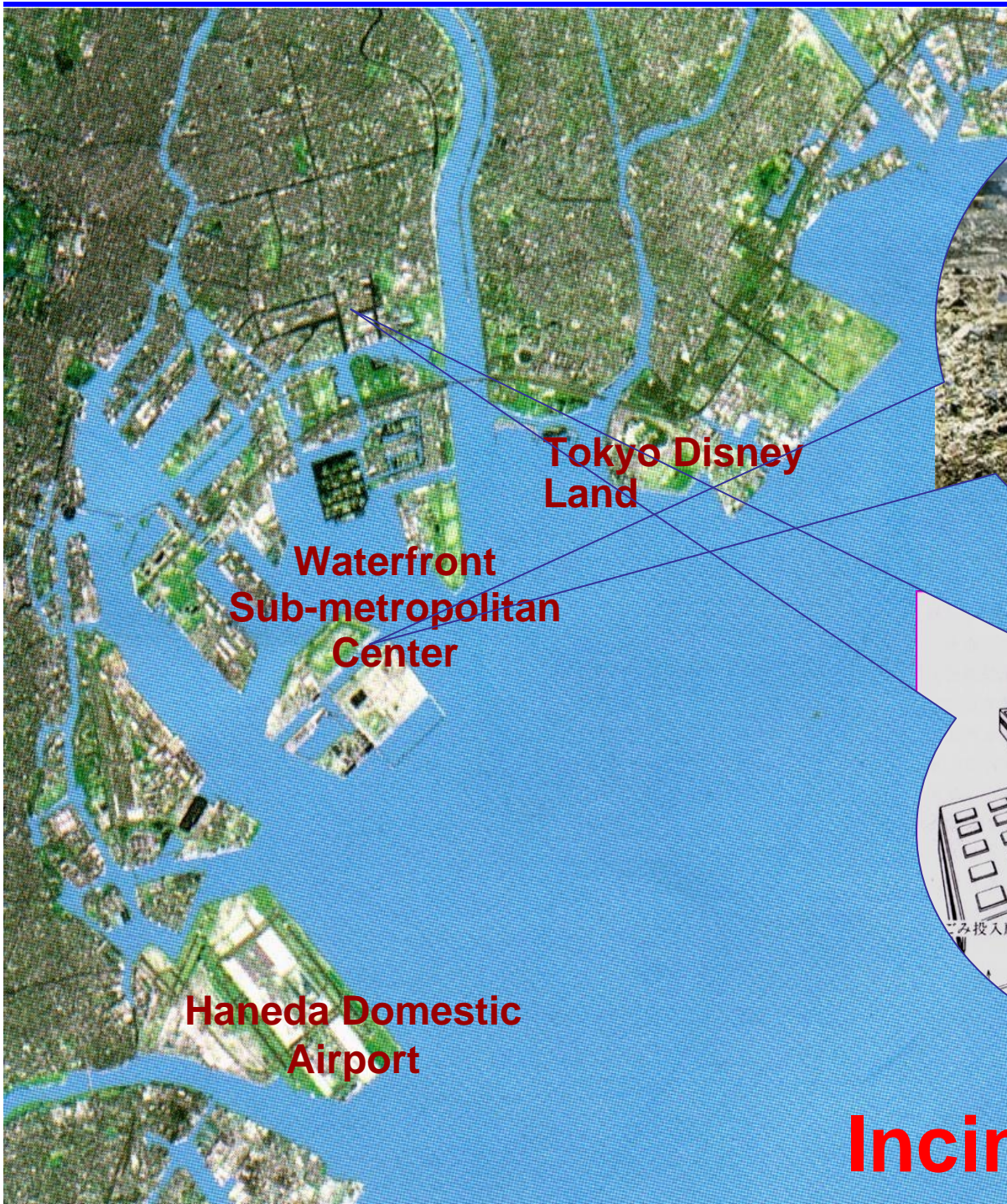
# CDM Project for LFG Utilization (Bangkok)



## Rachatewa Landfill Site

Area: 30 ha, Landfill Period: 1999-2006 (7 years),  
4 000t/d



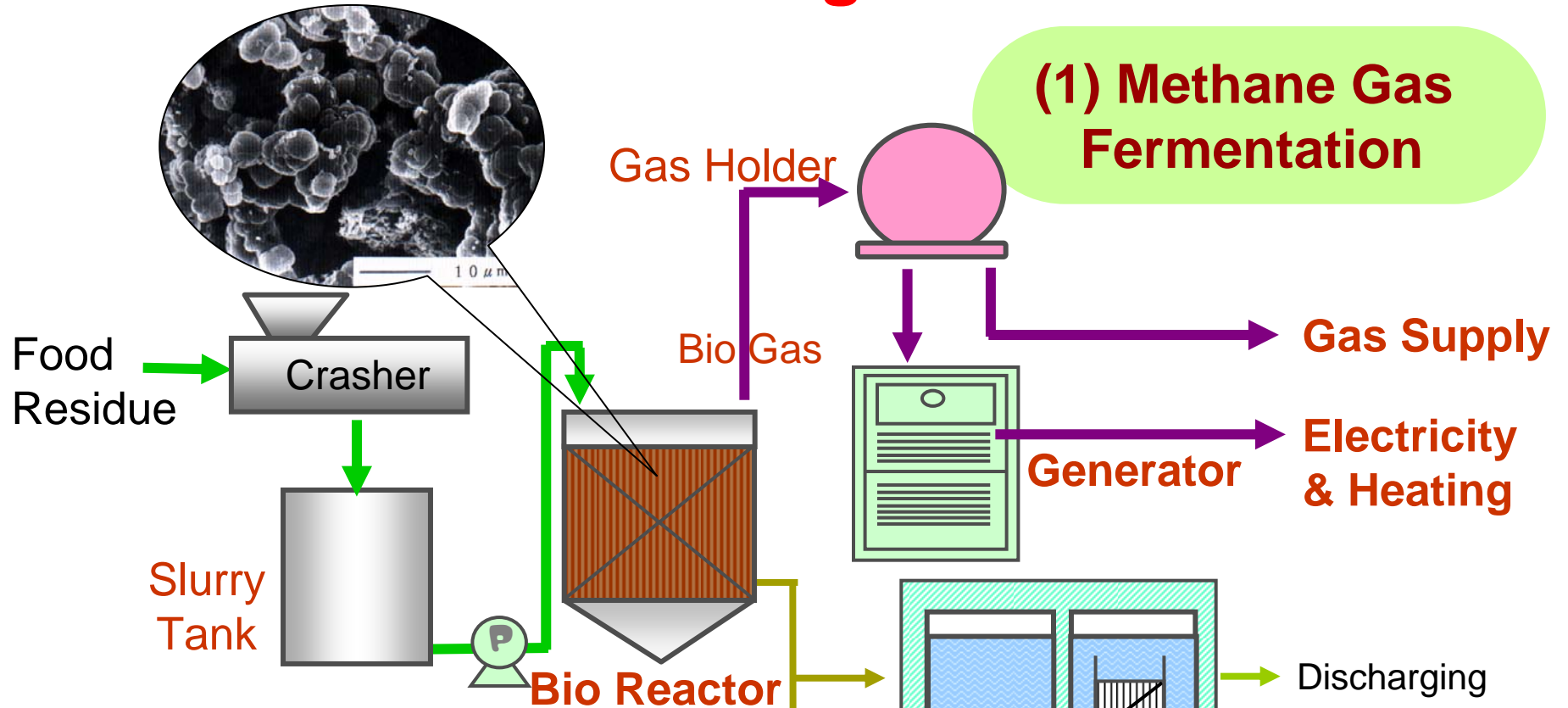


# Incineration Method

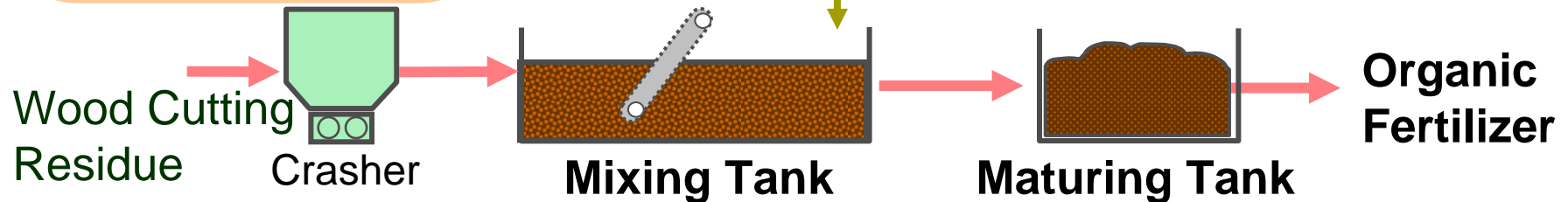


# Bio-Processing Method

## (1) Methane Gas Fermentation



## (2) Composting



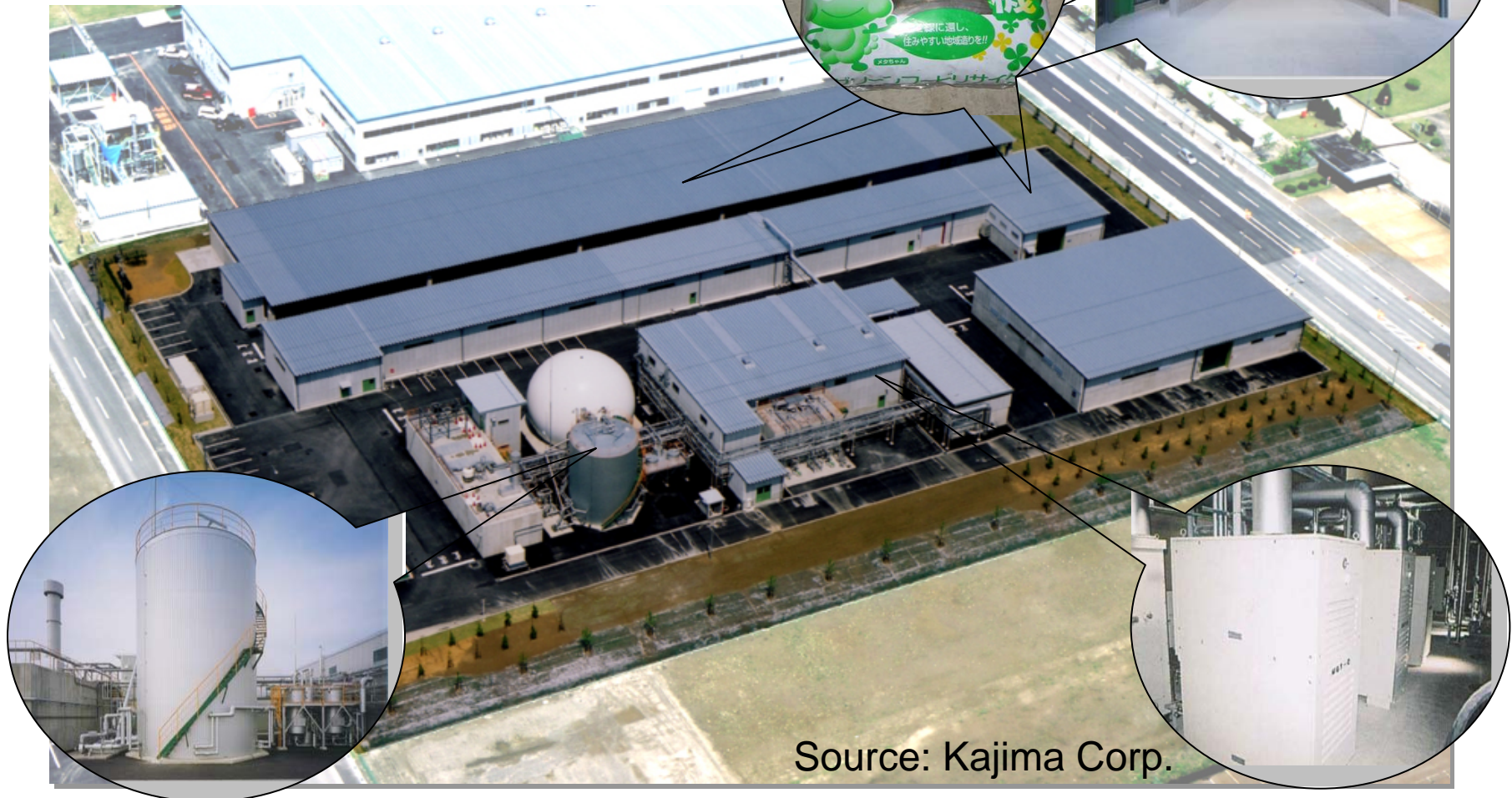


# Bio-Processing Plant (Toyama Eco-Town Project)

## Capacity

Food Residues: 20 ton/day

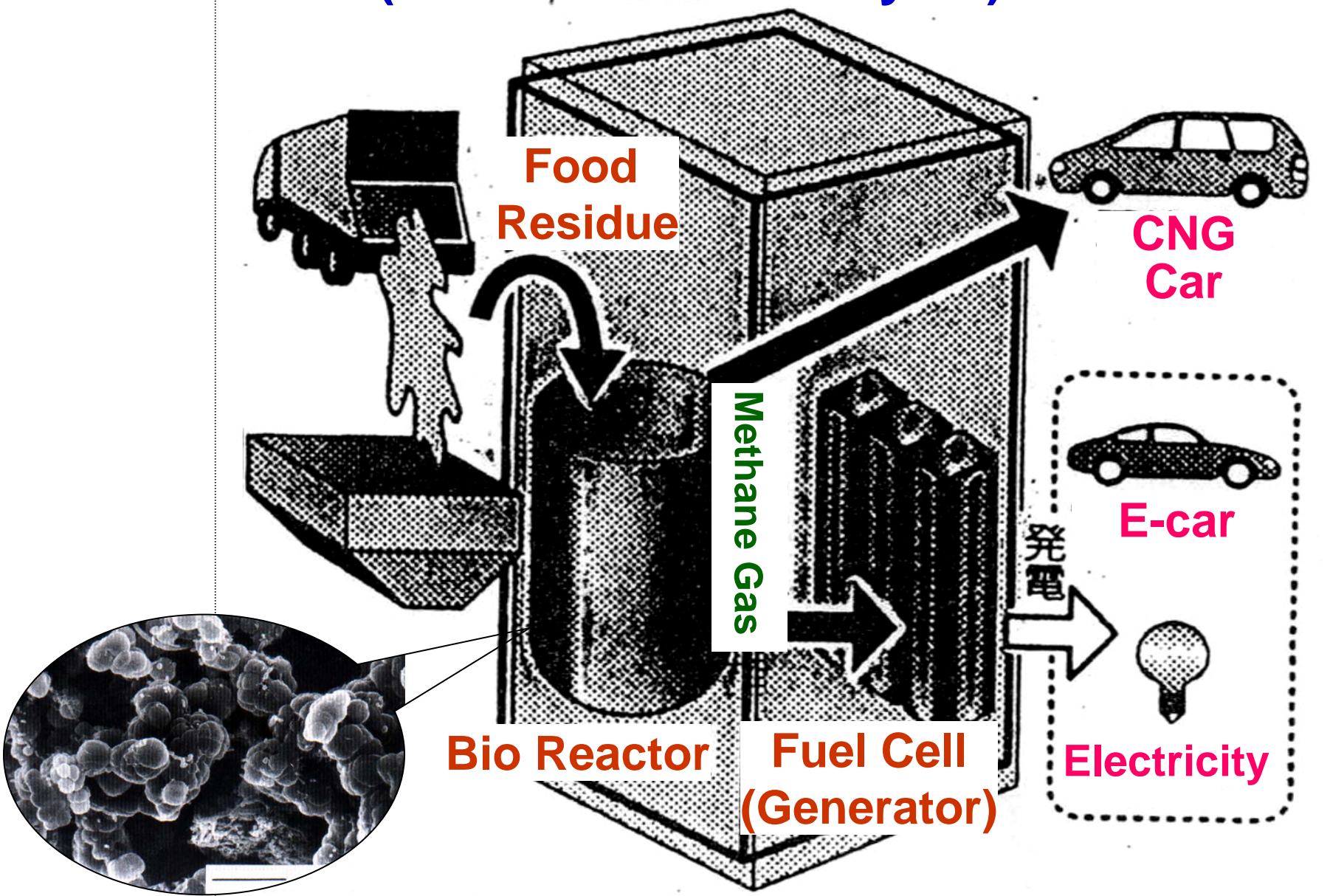
Generator : 30kW@3Units



Source: Kajima Corp.



# Bio-Processing Plant (Kobe Thermal Recycle)





## Comparison of Solid Waste Management between Two Cities

Total Collection: 9,000 Ton/day

(1.5kg/csapits/dasy)

Composition of the Wastes (weight base)

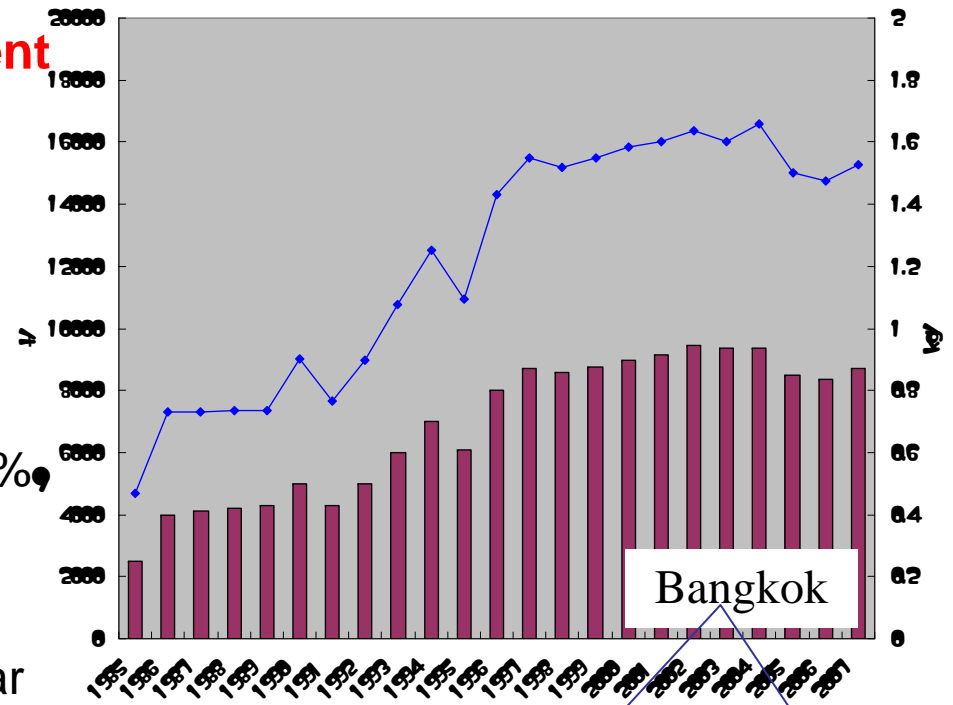
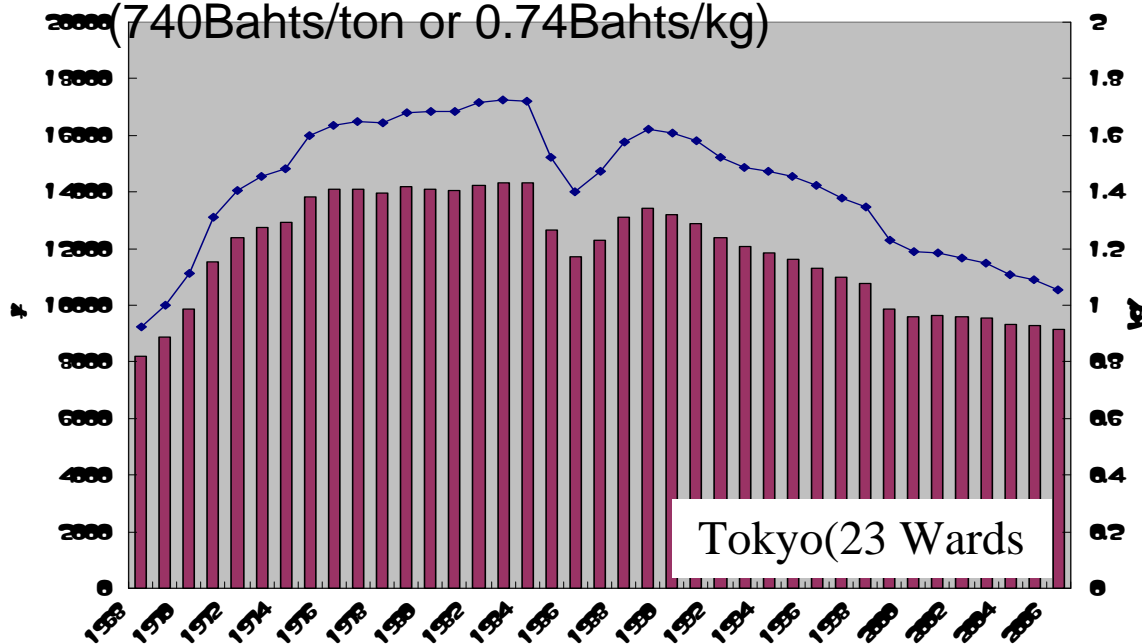
Law Garbage: 33%, Paper, Clothes: 14%

Plastics : 24%

Glass, Metals: 6%, Others: 23%

Overall Annual Cost : 2.5 Billion Baht/year

(740Bahts/ton or 0.74Bahts/kg)



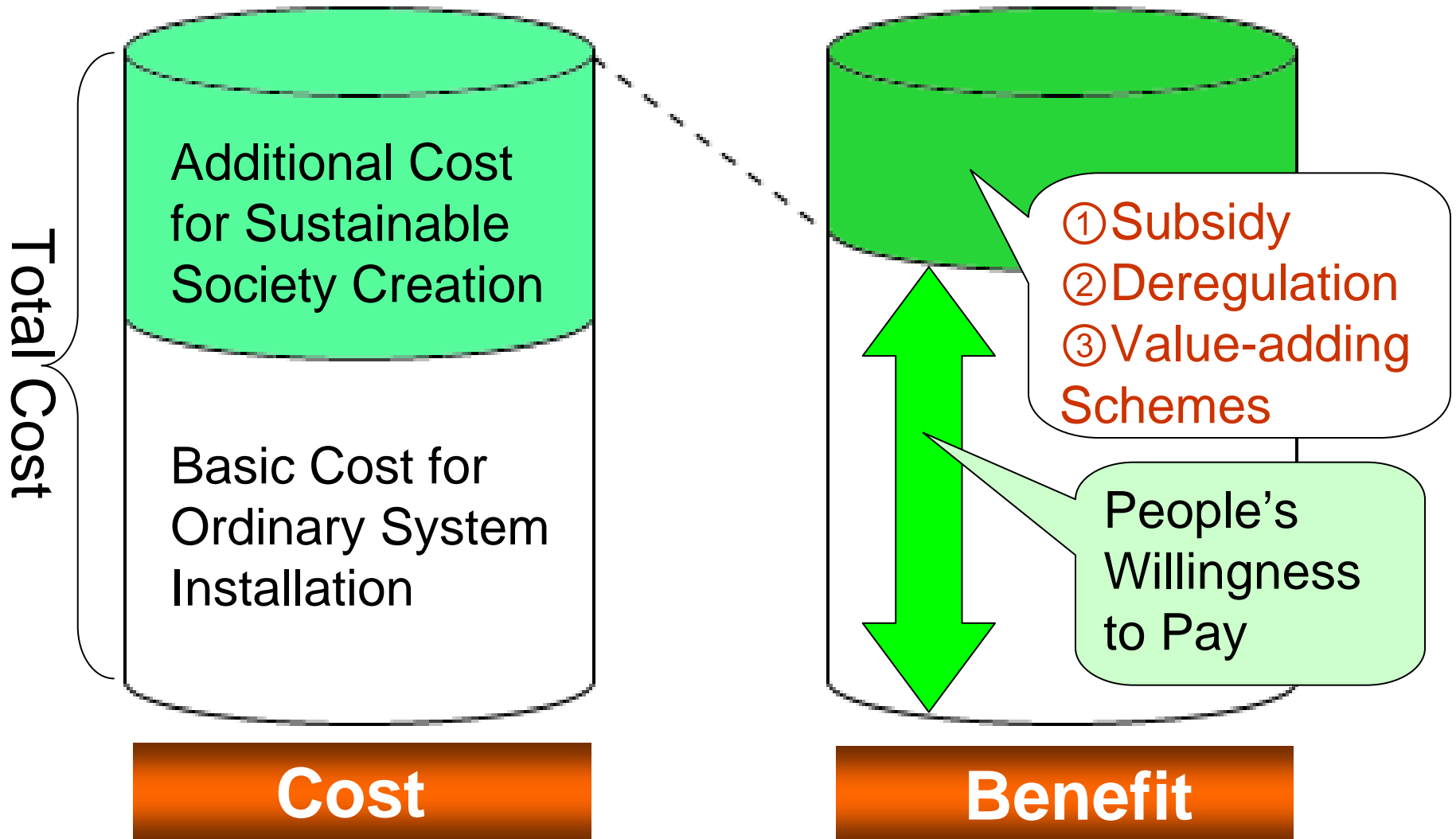
### Transfer Stations

In Bangkok, about 10% of the collected wastes are recycled. Another 90% are sent to 3 final landfill sites.





### 3. Future Task toward Sustainable Society Creation





# Thank you very Much for your Attention.



Lake



四万十川の保全

(略称)

四万  
あらし

「日本最後の清流」といわれる  
の財産として、後世に引き継い  
ました。四万十川の保全を進め  
興をめざします。



West



??????