

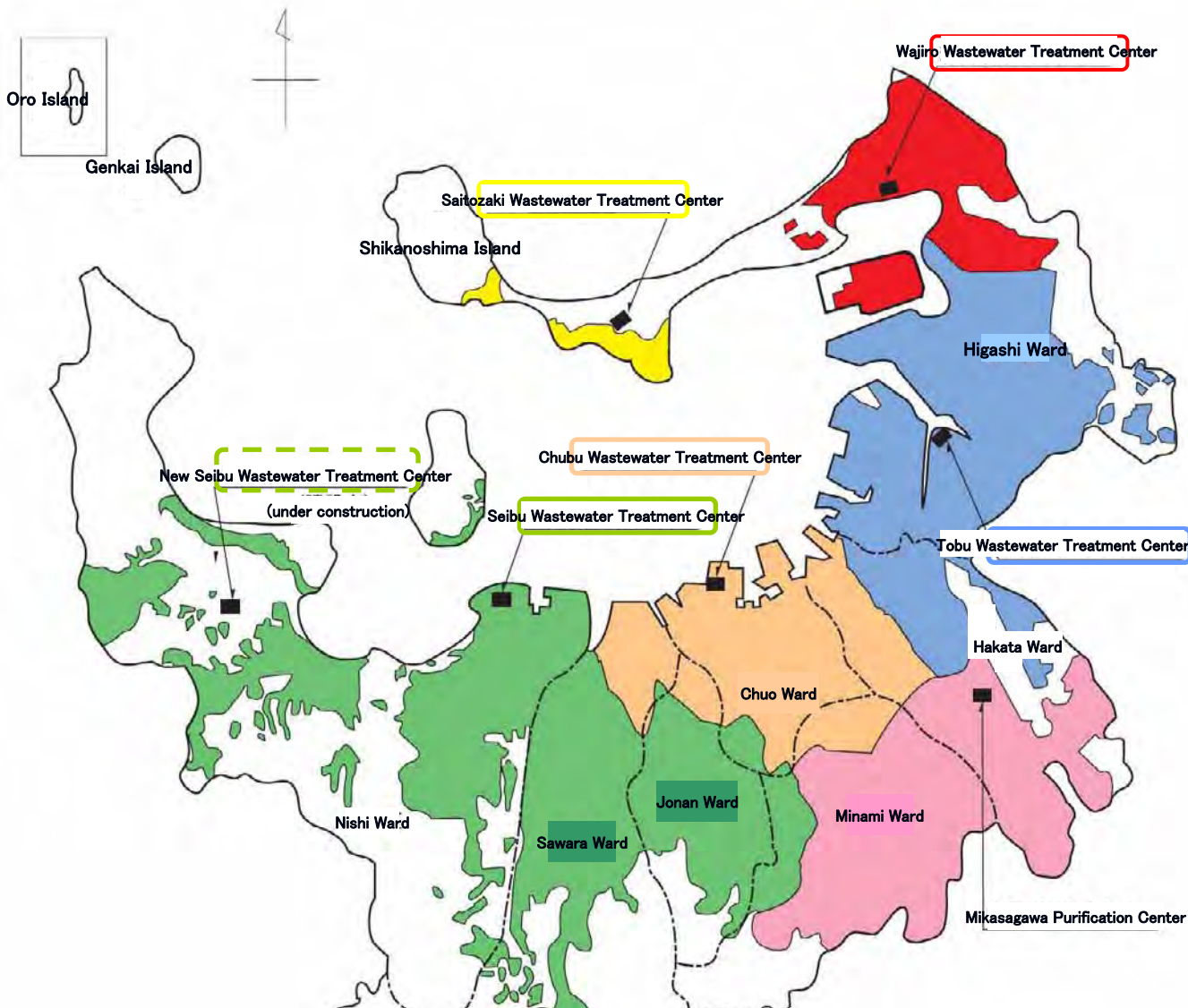
Fukuoka City's Policies for Water Circulation in urban areas and International Cooperation



**KUDO Shuichi , Director, Wastewater Planning
Section, Road & Wastewater Bureau, Fukuoka City**

1 Summary of Wastewater Treatment

Wastewater Services in 2010



【 Profile of Fukuoka City 】

Total Area: 34,132ha

Population: 1,469,000

【 Wastewater Services 】

Planned area: 17,244ha

Developed area: 16,627ha

Population in the serviced area:
1,462,100

Supply rate: 99.5%

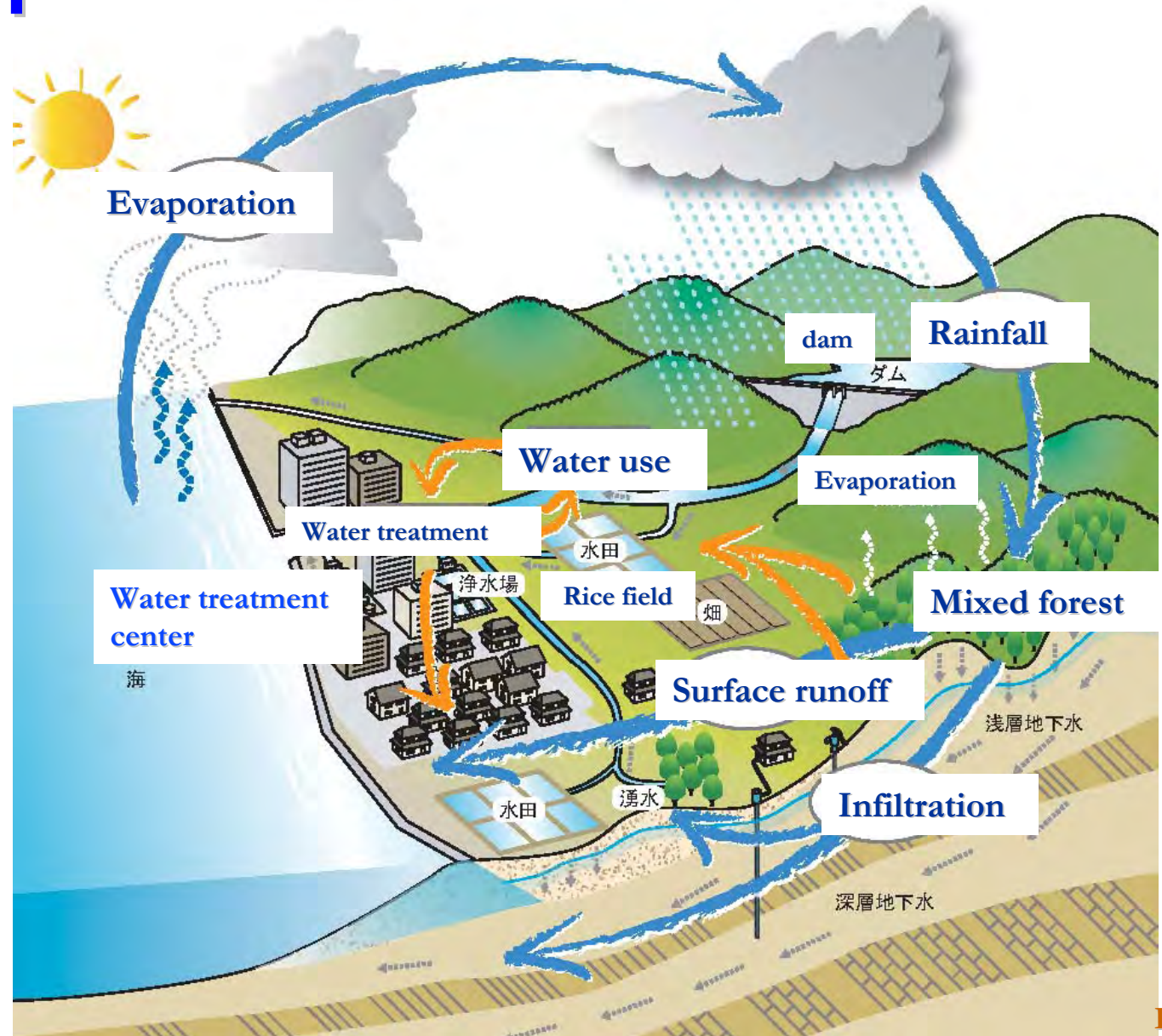
【 Wastewater Treatment Center 】

Number : 5

Amount of treated water: about
500,000m³/d

Amount of generated sludge:
about 250 t/d

2 Creating a healthy water circulation system



Water Circulation in Urban Areas



3 Effective Use of Treated Wastewater

Summary

1. Severe drought in 1978
2. Water Conscious City – “Water Conservation Plan”
3. Reuse of treated wastewater
 - Started in 1980, and service areas have expanded since.
 - Service coverage expanded to include not only government office buildings but large-scale private buildings).
4. In 2003, ordinances for Water Conservation Promotion and Treated Wastewater Reuse Project were enforced.

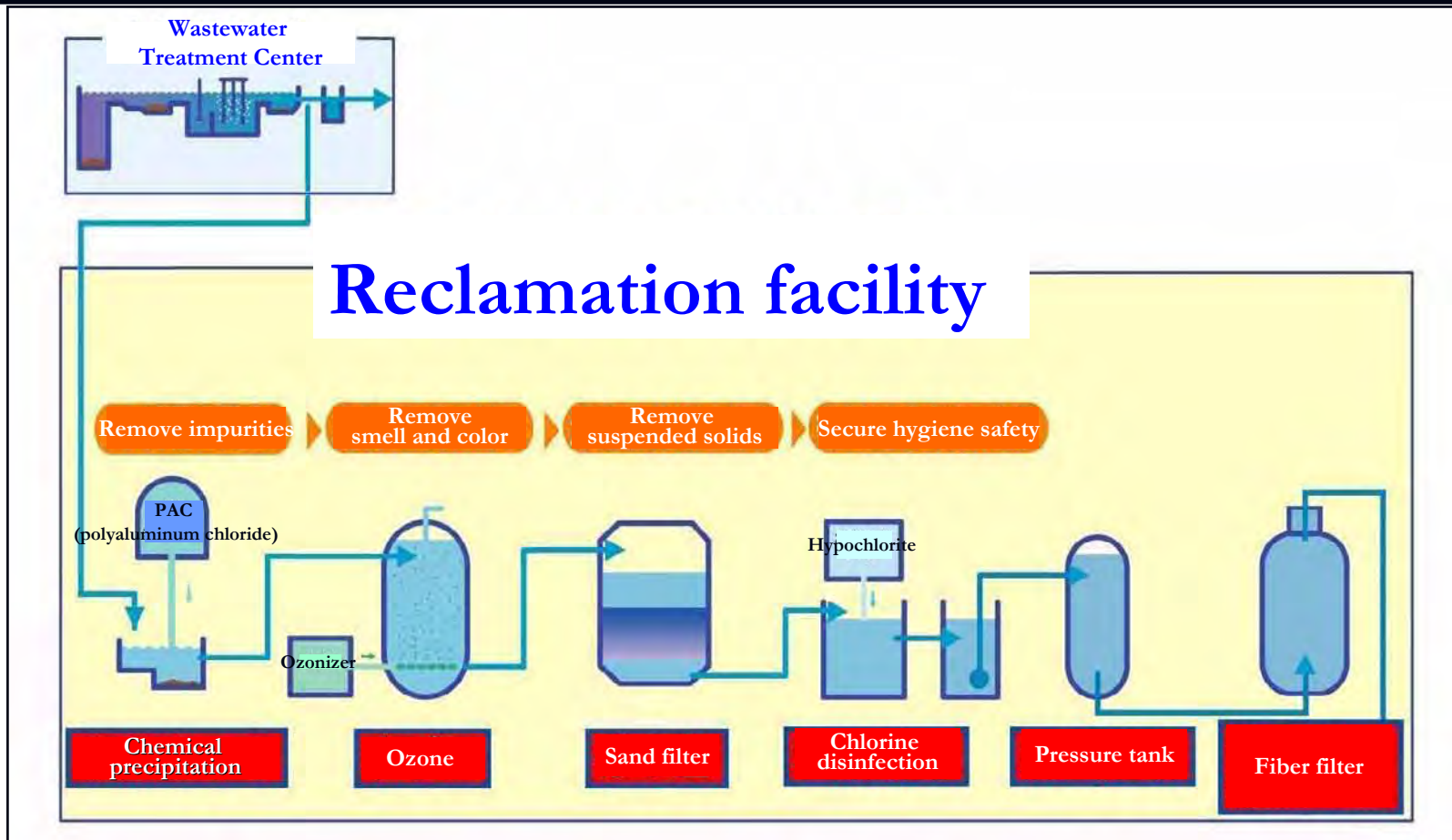
“Wastewater Reuse Project”:

Reclaimed water is reused for toilet flushing and watering trees.



A Flow Diagram of the Treatment

Part of the wastewater which is discharged from the water treatment centers is distributed after removing (1) impurities, (2) smell and color (3) suspended solids and (4) securing hygiene safety, at a reclamation facility

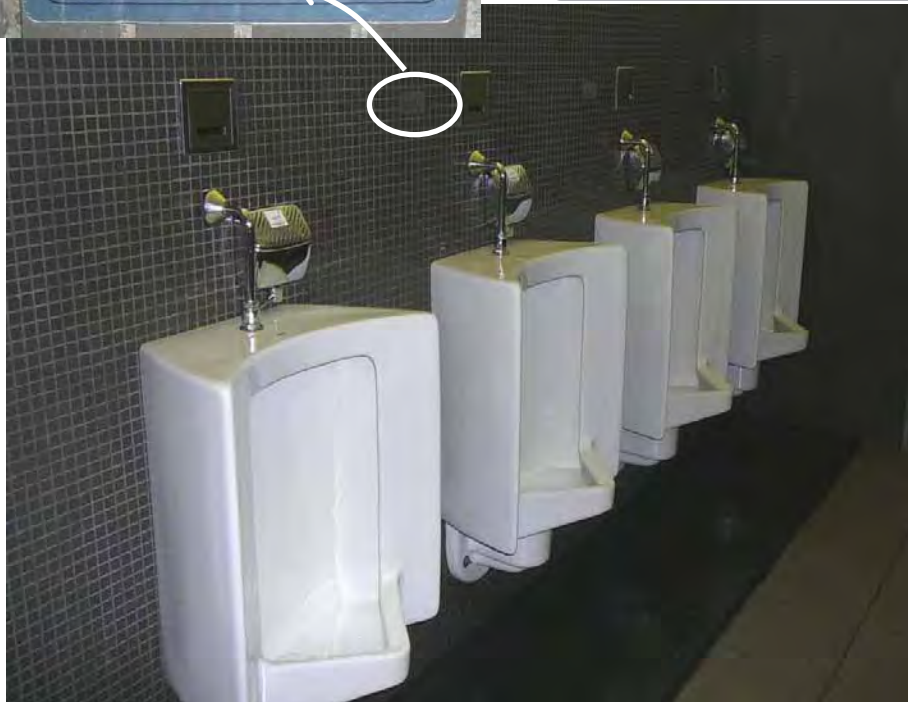
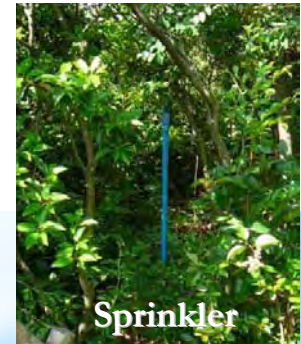


How Reclaimed Water is Used

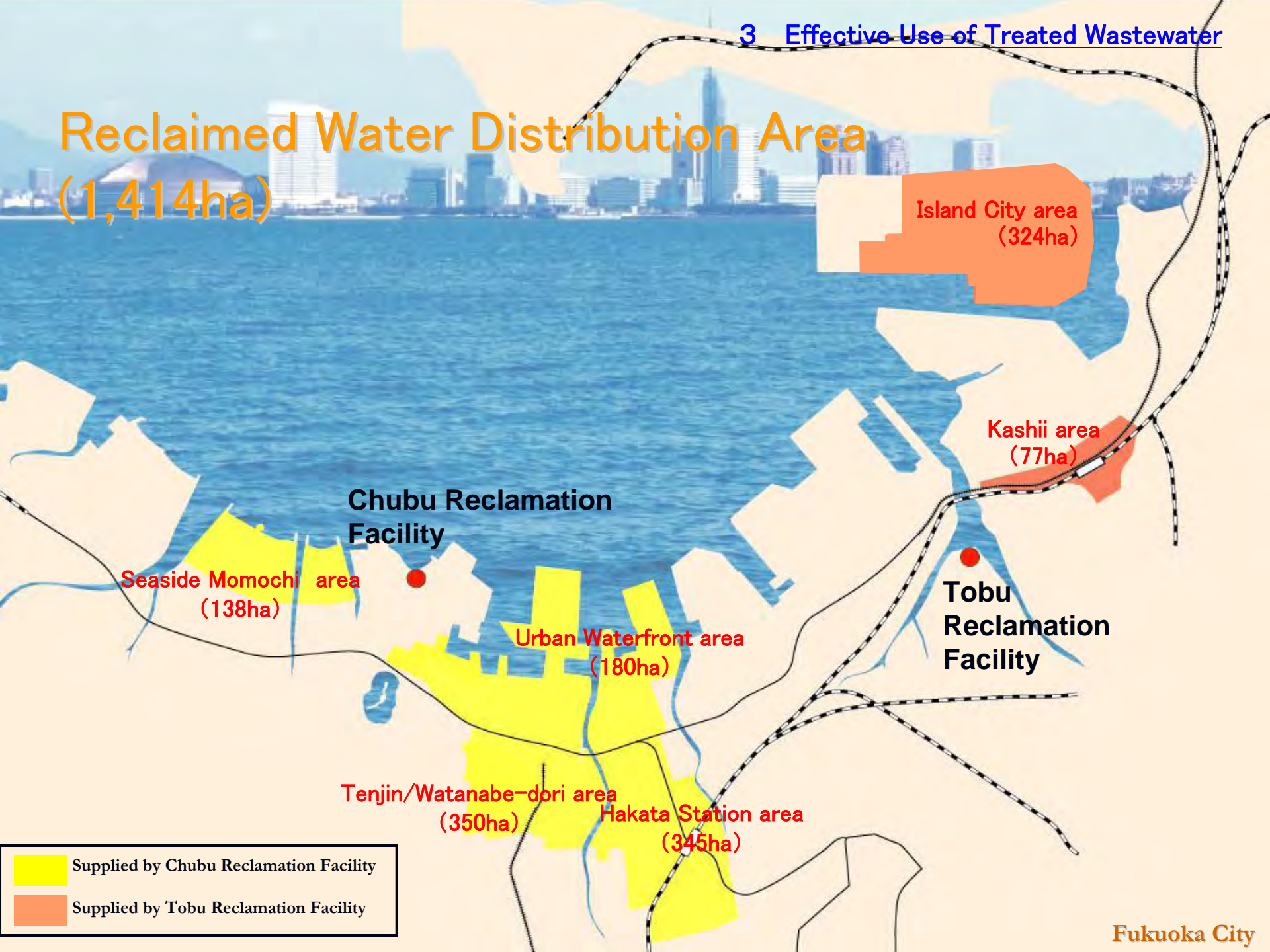
Supplied as toilet flushing water and for watering trees.



Caution!
These toilets use reclaimed water to flush toilets



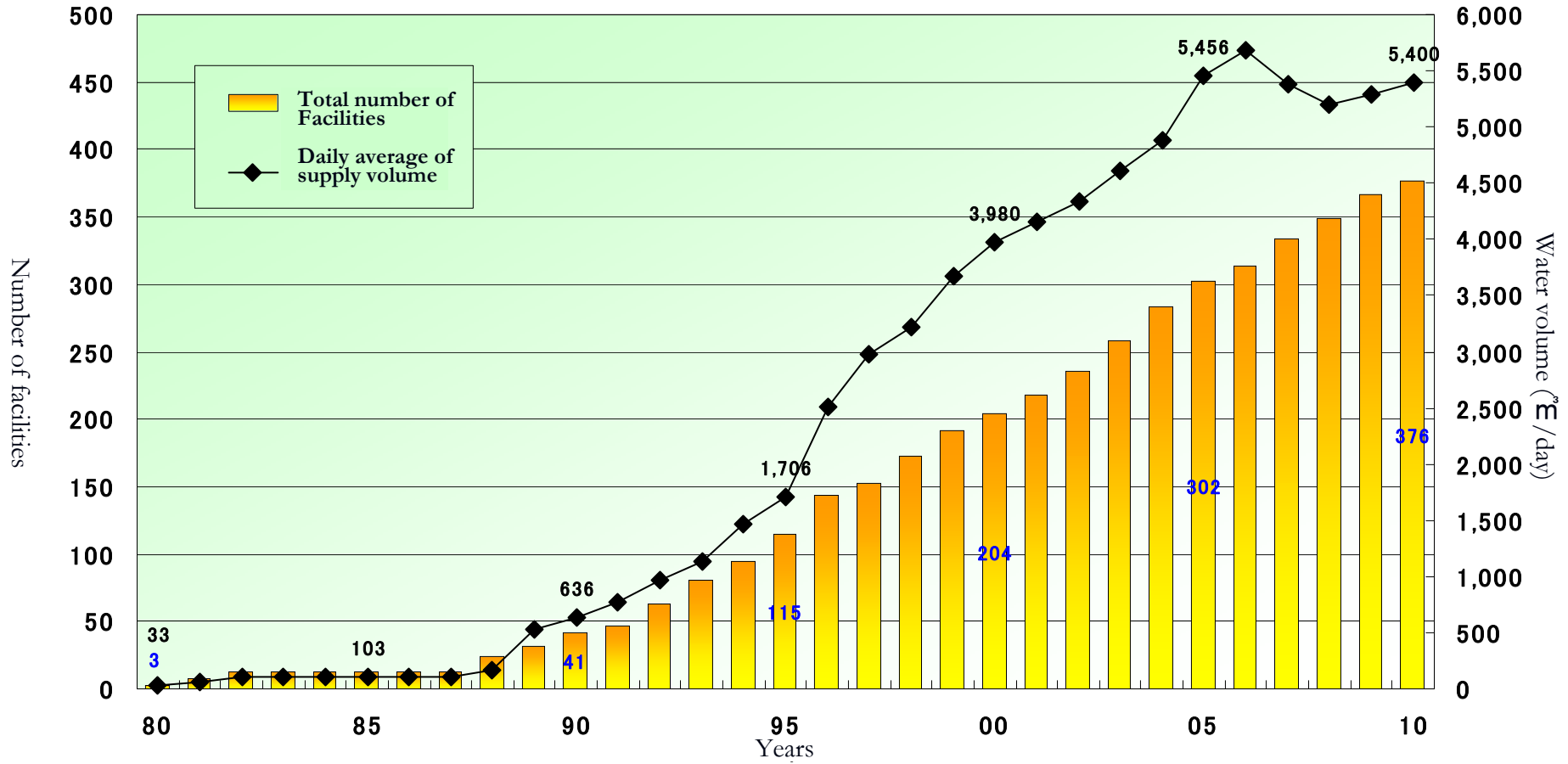
Reclaimed Water Distribution Area (1,414ha)



Supplied by Chubu Reclamation Facility
Supplied by Tobu Reclamation Facility

Supply Volume of Reclaimed Water

Supply Volume of Reclaimed Water



4 Measures for floods

Plans for Flood countermeasure projects

**Storm water Management
Do Plan (FY2000)**

Rainbow Plan Hakata (FY2004)

Rainbow Plan Tenjin (FY2008)



JR Hakata station area (19 July 2003)



Harada, Higashi-ku
(29 June 1999)



Tenjin area (12 July 2007)

Overview of Stormwater Management Do Plan

【Target District】

Priority Districts 59 Other Districts 79

Definitions of 59 priority districts areas which have been flooded several times since 1991 including areas where more than 10 households have been flooded in the 1999 Flood

【Management Standards】

52. 2mm/hr

(5 year Precipitation Probability)

59. 1mm/hr

(10 year Precipitation probability)



Maintenance of rainwater mains



Maintenance of pumping stations

Overview of Rainbow Plan

【Target District】

Hakata Station District 434hectare

Tenjin District 260hectare

【Management Standards】

52. 2mm/hr

(5 year probability)

59. 1mm/hr

(10 year probability)

79. 5mm/hr

(1999 actual rainfall)



Storm water /rain water adjustment pond

【ground reservoir】

Sanno rain water adjustment pond No. 1
(volume approx. 13,000 m³)
* Constructed by excavating 1.8m under baseball stadium



【underground reservoir】

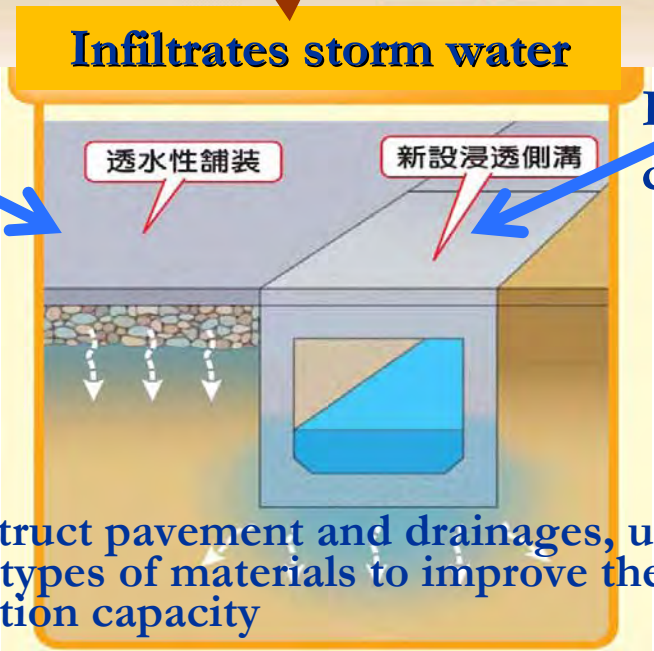
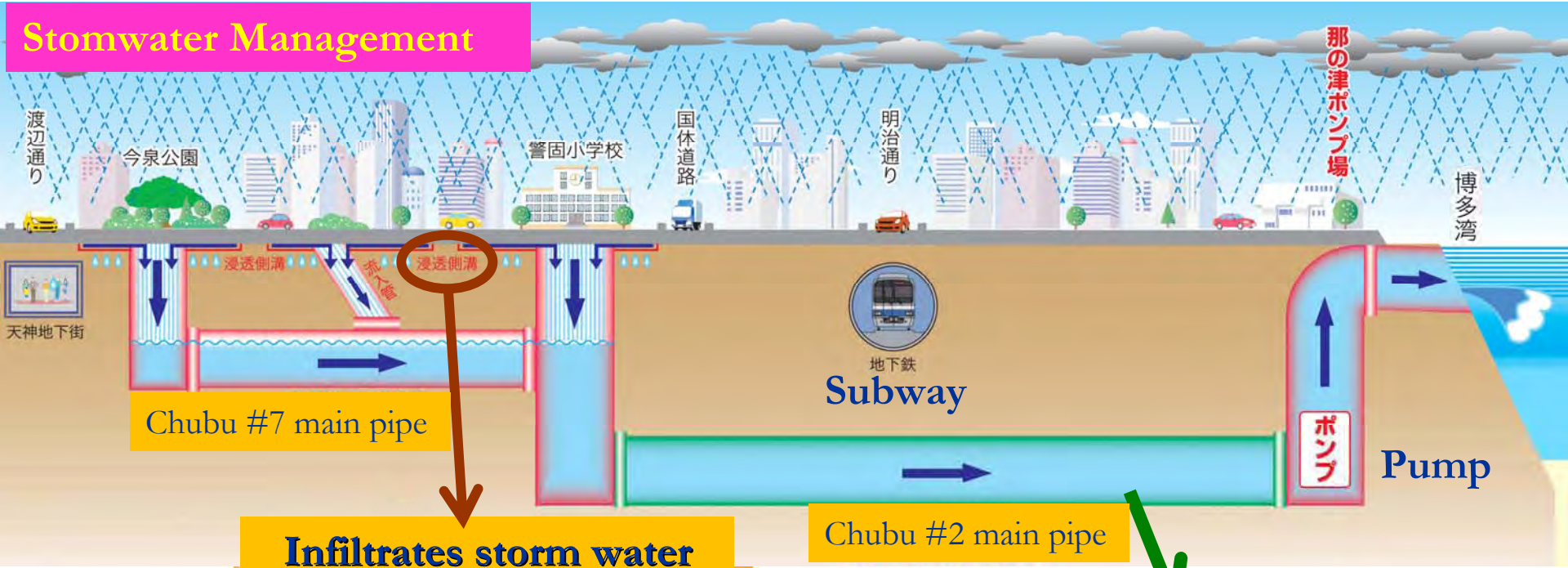
Sanno rain water adjustment pond No. 2 (volume approx. 15,000 m³)

Sanno Pumping Station



Storage and infiltrating facilities for Storm water pipes

Stormwater Management



Porous asphalt pavement

When construct pavement and drainages, use infiltration types of materials to improve the water retention capacity

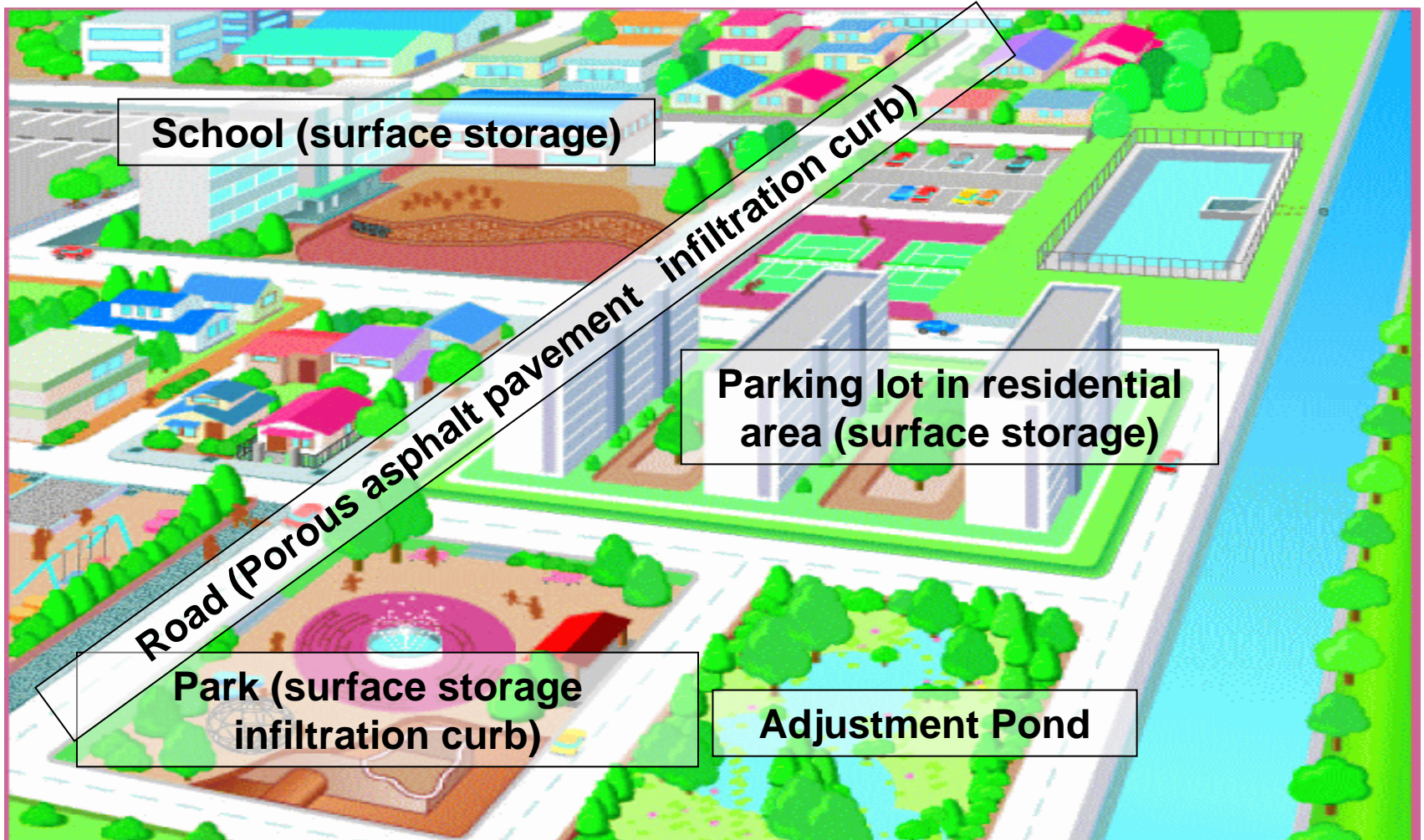
Infiltration curb



When installing new pipes for stormwater, replace it for large size of pipes to increase water retention capacity

Previous size of standard of pipes

Storm water drainage control in urban areas



Reduce the amount of rainwater flowing into rivers and drainages by accelerating the infiltration of rain water into grounds or storage of rainwater in appropriate facilities.

5 Engineering Technology E changes with our riendshi City, Guangzhou

Technology exchanges from 1984 to 1997

Past e changes

When the Guangzhou riendshi Delegation visited ukuoka, the members observed our sewage technology. In res onse to their re uest for technical guidance including engineer training, technological coo eration was im plemented.

- 1984 Hosted 6 Guangzhou City Sewage Technology (ST) engineers
- 1985 Sent 6 ukuoka City ST e erts
- 1987 Received 6 Guangzhou ST engineers
- 1988 Sent 6 ukuoka ST e erts
- 1989 Received 5 Guangzhou ST engineers
- 1990 Sent 5 ukuoka ST e erts
- 1991 Received 6 engineers from Guangzhou for Urban Development Technology (UDT)
- 1992 Sent 6 e erts on UDT from ukuoka
- 1993 Received 5 engineers for UDT from Guangzhou
- 1994 Sent 6 e erts on UDT from ukuoka
- 1995 Received 6 engineers for UDT from Guangzhou
- 1996 Sent 6 e erts on UDT from ukuoka
- 1997 Received 6 engineers for UDT from Guangzhou

This roject successfully achieved the initial targets of im roving each technology and romoting friendshi .



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6 Examples of International Contribution Cooperation by ODA

Summary of projects in our sister city, Ipoh, Malaysia

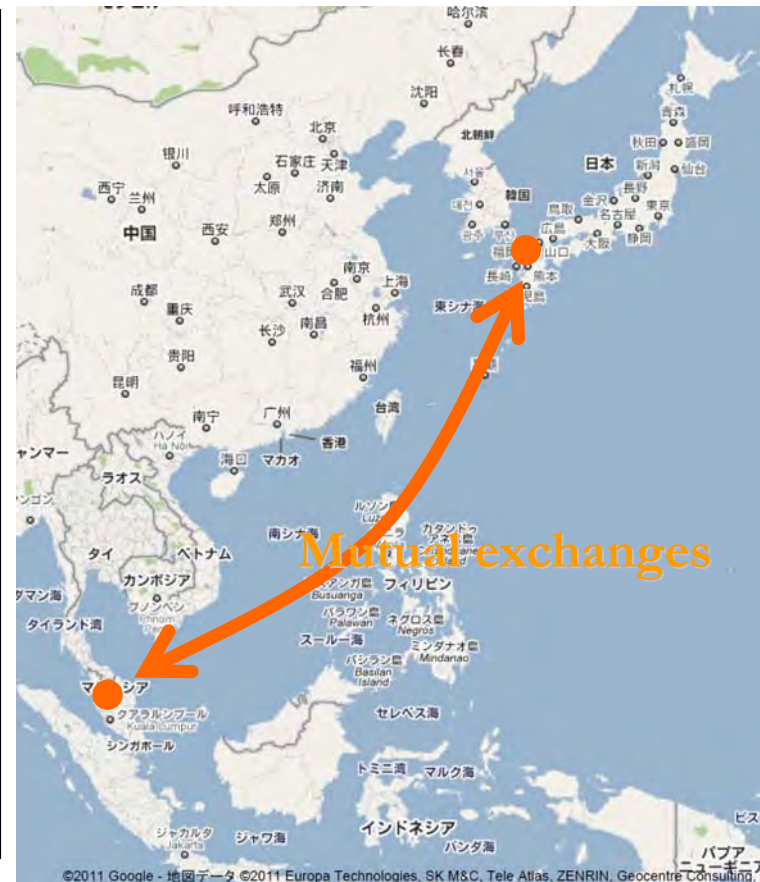
Technological cooperation & exchanges with Ipoh City from 2007 to 2009

Past projects

Technological cooperation on planning, designing, managing, and maintaining a wastewater system.

- 2007 Received Perak State staff in charge of rivers, Ipoh City staff (rainwater), and Inda Public Corporation (wastewater) as trainees
Sent 2 experts on civil engineering electricity from Fukuoka City
- 2008 Received 3 Ipoh City staff in charge of wastewater
Sent 2 experts on civil engineering machinery from Fukuoka City
- 2009 Received 3 Ipoh City staff in charge of wastewater
Sent 2 experts on civil engineering from Fukuoka City

After investigating flooding issues on wastewater in Ipoh from 2007–2008, case studies on flooding were examined with on-site surveys and countermeasures were discussed in 2009.



Activities in Fukuoka (2009)



On-site study of storm/rainwater pipes for anti-flooding



On-site study of river environment development

7 Future Efforts for International Contribution Cooperation

JICA Training Courses

The JICA International Training Course is scheduled to be implemented in Fukuoka City from 2012.

Training courses (tentative)

Basics of the sewage system & wastewater treatment

Planning & designing of sewage pipes and treatment facilities

Maintaining/managing sewage pipes and treatment facilities

Effective use of wastewater resources, reclaimed water, and sludge

Proposals for improving your own wastewater system

Thank you for your attention.

