WES Hub

Water and Environment Solution Hub

About WES Hub

The Water and Environment Solution Hub (WES Hub) was established in 2012 to solve water and environmental issues, including sanitation, in the world.

WES Hub related organizations are :

- **The Ministry of Land, Infrastructure, Transport and Tourism** (MLIT, the organizer)
- **TheJapan Sanitation Consortium** (JSC, the central contact point of WES Hub)
- **11 Alliance Advanced Agencies** (AAAs, public organizations with advanced technologies and policy experience in the field of water and environment) .

Mission

Help local governments in developing countries to improve water and environment quality through knowledge sharing

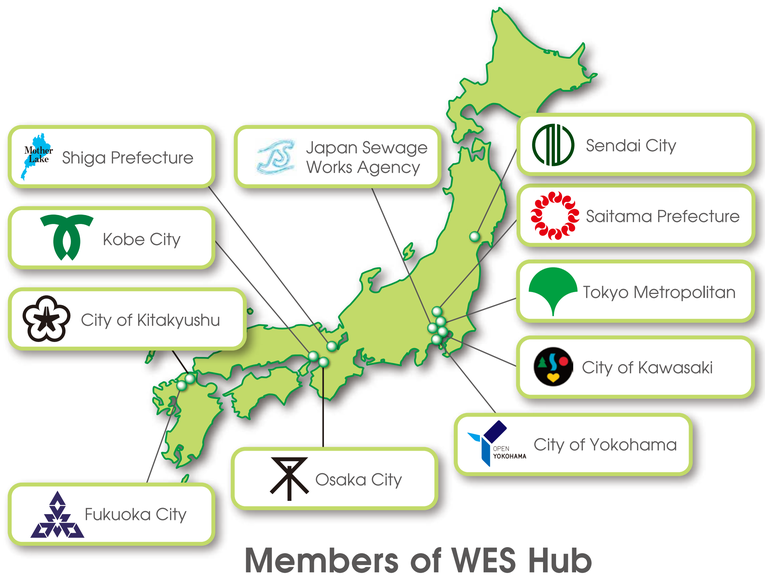
Vision

Establish long term partnership with local governments in developing countries and support them in their challenge to sustain water and environment management systems

Value

I. Accumulation of experience, know-how, human resources and technologies from each advanced agency, which has solid track records in sewerage operations with various socio-economic and geographical backgrounds

II. Reliable and responsible consultation based on long-term and stable management experience of sewerage systems



Members of WES Hub

Experiences and Track records

Japan suffered serious water pollution in the 1960's and started to expand the capacity of sewage works. Sustained efforts resulted in restoring a good water environment in Japan.

WES Hub was established to integrate the experience and knowledge of Japanese local governments in water and environment management.

As illustrated, AAAs are expanding their activities in Asian countries and are conducting cooperation projects. WES hub is prepared to pair AAAs with local governments in developing countries to provide technology and policy know-how, based on each local government`s experience inside and outside Japan.

Relationships between Asian cities and AAAs

■ Sewwage works Exhibition panel W841×H1189mm

Services

To support local governments in developing countries, WES Hub promotes long-term partnership between these local governments and Japan. Through this partnership, WES Hub will identify their issues and needs and provide the following services.

Technology

Arrangement of site visits to waste-water treatment plants

Learning

Training supported by WES Hub, focusing on techniques and policies on water and environment for a sound urban development

Advisory

WES Hub will provide advisory services to solve issues on water management and help local governments in developing countries reach their targets.

Steps For Partnership

1. First Contact

If there are any issues about water and environment in your country or city, please make contact with the Japan Sanitation Consortium(JSC).

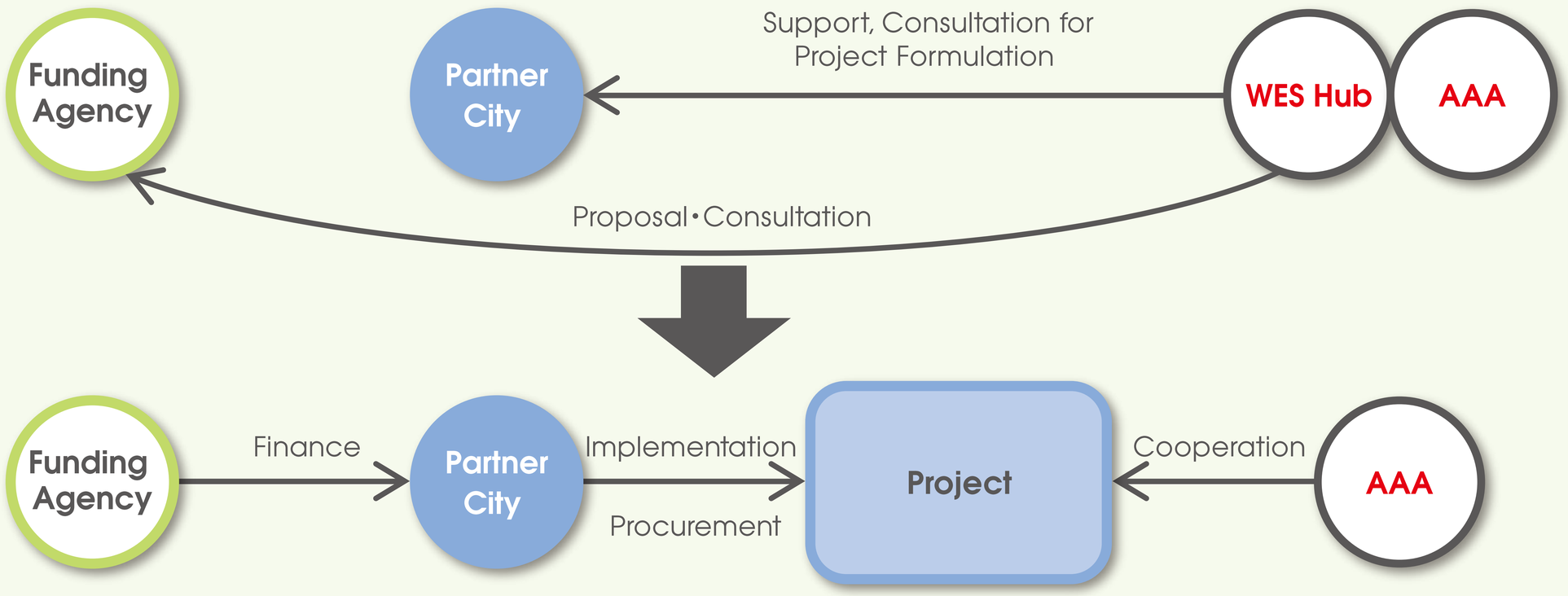
2. Consultation

JSC will search for a solution and consider if an AAA will be able to contribute to solving your issues.

3. Pairing you with an AAA

If an AAA is likely to be able to contribute to solving your issues, JSC will pair you with this AAA and offer available programs and methods through strong partnership with Development Aid Agencies such as ADB, JICA and the World Bank.

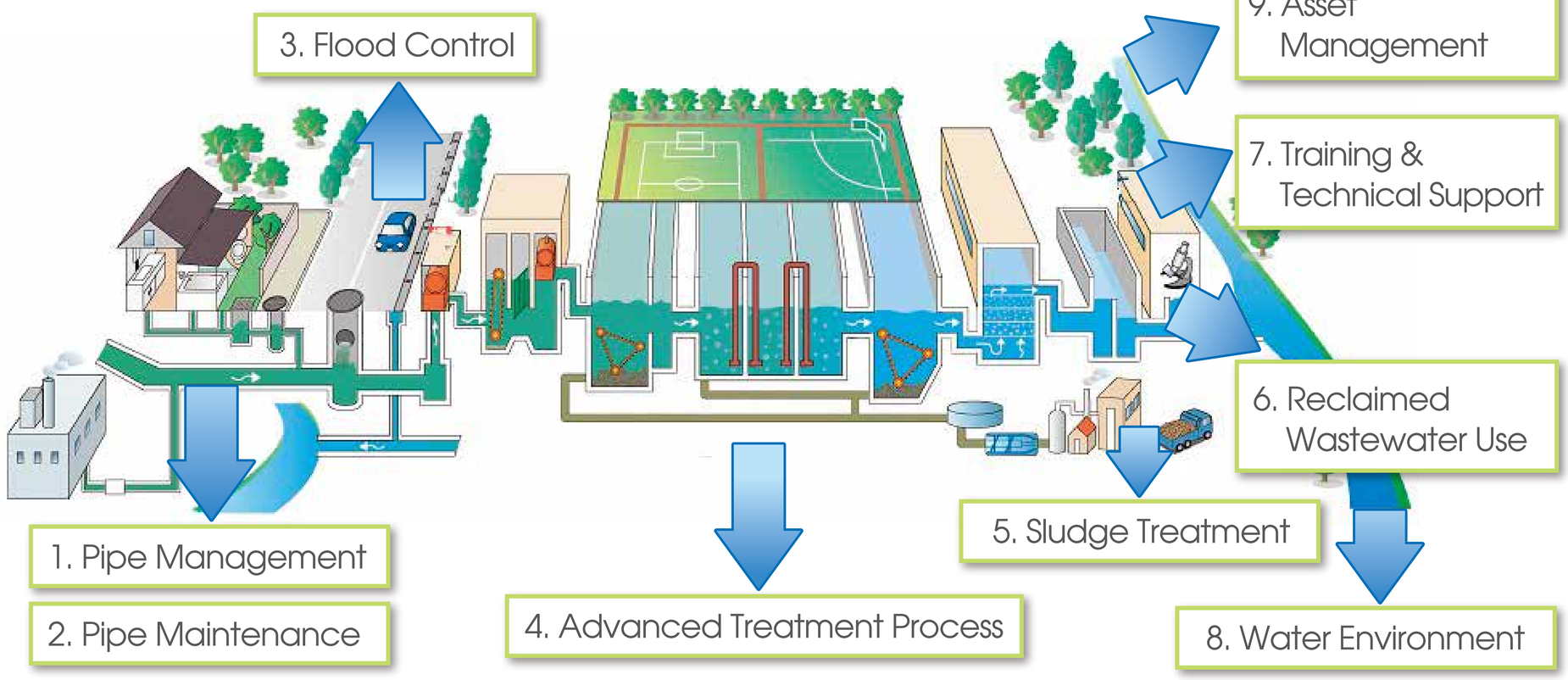
<Examples of Collaboration : Project formulation and Implementation>



Value of the Alliance Advanced Agencies(AAAs)1

AAAs have striven to improve policy and technology to solve their water and environment issues. This section shows the typical areas of knowledge and experience mastered by the AAAs, which may be useful for the current trials in developing countries.

Sewage Treatment Process



Value in each Area

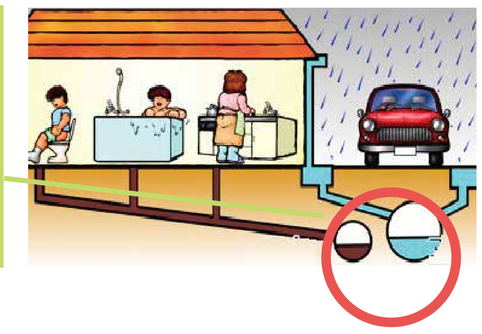
1. Pipe Management

Local governments choose the Combined Sewer System or the Separate Sewer System depending on each local governments' situations.

Basic technology of sewer　Type of Sewer System

Combined Sewer System:
Wastewater and rainwater are collected through a single pipe.

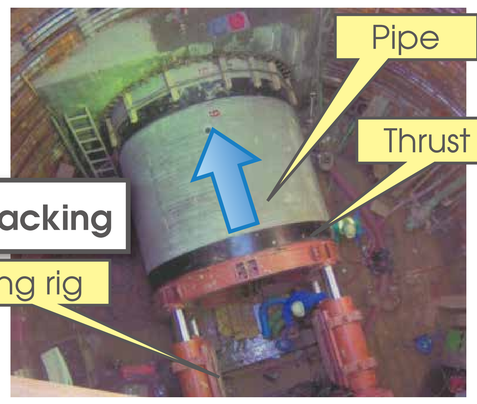
Separate Sewer System:
Wastewater and rainwater are collected through two different pipes.



Advanced sewer installation technology　Microtunneling

Microtunneling is a technology for installing pipes directly underground without open cut trench excavation (Open Cut Method). This technology does not obstruct traffic. Japanese microtunneling technology is applicable for curved and long-distance construction. It is also applicable for installation of both large and small diameter pipes.

Microtunnel boring machine



Microtunnel boring machine

Microtunneling

Open-cut Method　Technology

View of Construction Site

Value of the Alliance Advanced Agencies(AAAs)2

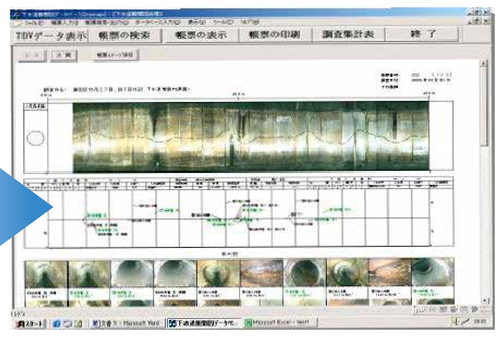
2. Pipe Maintenance

Tokyo Metropolitan

Without sufficient maintenance, accidents such as road subsidence will harm people and cities. Tokyo has created effective methods to maintain the pipes in the whole city area.

TV camera with a mirror system

The TV camera with a mirror system can take digital pictures of the whole inner surface of the sewer pipes (360-degree views)



These pictures are used as information to diagnose damages and decide about the rehabilitation or reconstruction of aging pipes.

SPR-method

The SPR-method is applicable for the rehabilitation of aging pipes.

The benefits of the SPR method are as follows.

1. No need to excavates roads
2. Flexible with irregular pipe shape
3. No need to stop wastewater flow during installation

Under Construction

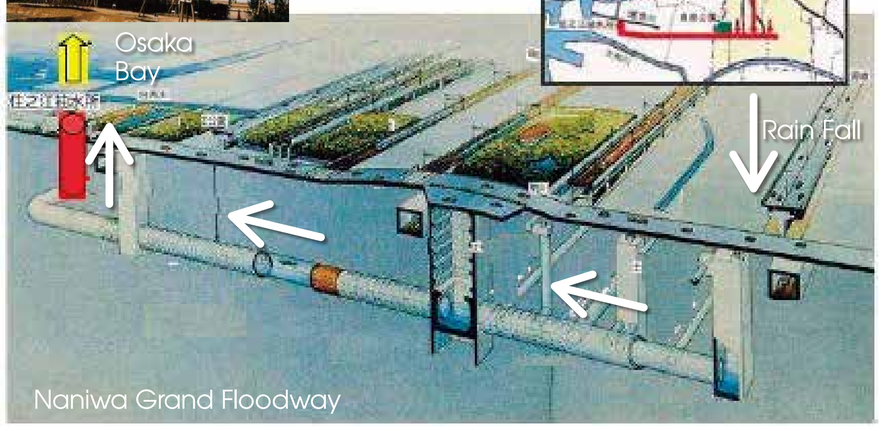
After construction completion

3. Flood Control

Osaka City

Grand Floodway

Suminoe Pumping Station



Osaka, located in a historical reclaimed land, had suffered from floods caused by heavy rains. To prevent floods, the city constructed the Naniwa Grand Floodway and the Suminoe Pumping Station. The floodway collects rainwater 30m below the surface. The pumping station pumps rainwater up to the surface and drains it out to a river or the sea.
This system drastically mitigated the flood damage.

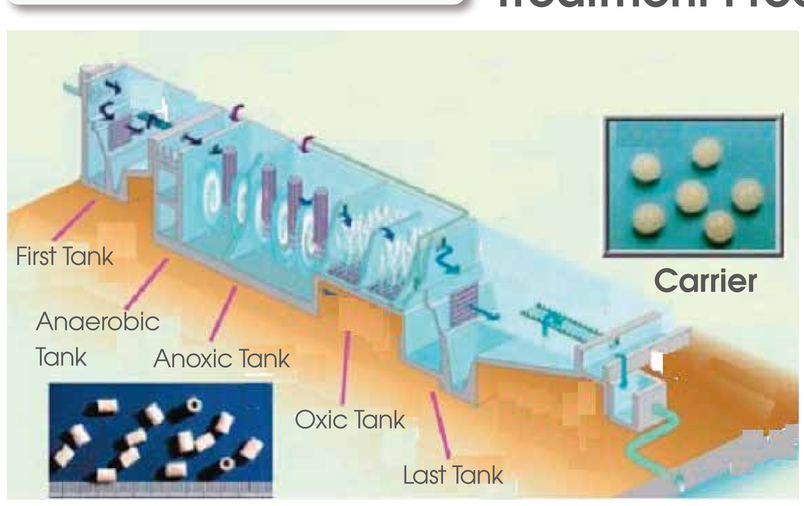
year	precipitation	Flooded houses
1982	40mm/hour	Over 20,000
2002	54mm/hour	0

Comparison of the number of flooded houses before-and-after the Naniwa Huge Flood Control Channel
(Data from Osaka City)

4. Advanced Treatment Process

City of Kawasaki

Mechanism of Advanced Treatment Process



Nitrogen and Phosphorus can be removed from wastewater in a compact treatment plant using 2 methods.

1. A2O (Anaerobic-Anoxic-Oxic) process:
   Removes Nitrogen and Phosphorus
2. Carrier State of microorganism:
   Keep microorganisms at high concentrations

Shiga Prefecture

Super Advanced Treatment Process

The Super Advanced Treatment Process is under experiment at the Lake Biwa South Central Purification Center, to remove COD in addition to Nitrogen and Phosphorus for the prevention of eutrophication in the Lake Biwa. The Super Advanced Treatment Process is a combined system of bio treatment which is common in Advanced treatment Processes, and the physicochemical treatment of ozonation and biological activated carbon.

Value of the Alliance Advanced Agencies(AAAs)3

5. Sludge Treatment

Kobe City

Biogas Generation

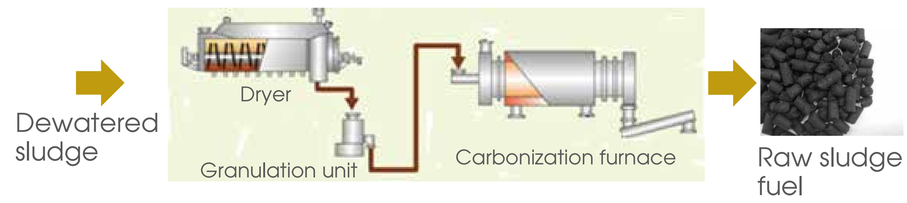
Kobe City has developed in collaboration with the private sector, a technology to produce "Kobe Biogas" at the Higashinada Wastewater Treatment Plant. "Kobe Biogas" is a highly refined gas produced from the digestion gas generated through sludge treatment process. Besides being sold as fuel for buses and other vehicles, the biogas is supplied to the local gas company to make profits.

City of Yokohama

Sludge Carbonizing

The business of carbonizing raw sludge and selling it as an alternative energy sources of coal has been conducted under the Private Finance Initiative Scheme with the vitality of private companies in Yokohama. With the Introduction of funds, technologies and know-how from the private sector for construction and operation and maintenance, around 20% of cost reduction is expected.

Low-temperature carbonization facility



6. Reclaimed Wastewater

Fukuoka City

Water Reuse Policy

Policy making by the public sector and implementation by the private sector ensures effective use of reclaimed wastewater in Fukuoka City.

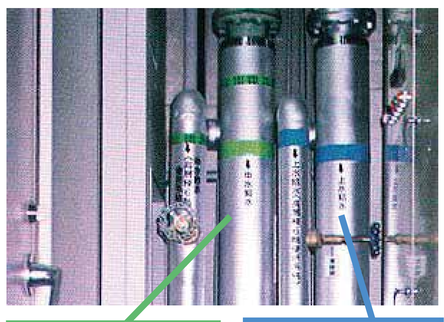
Policy Making : Water-Saving Promotion Act

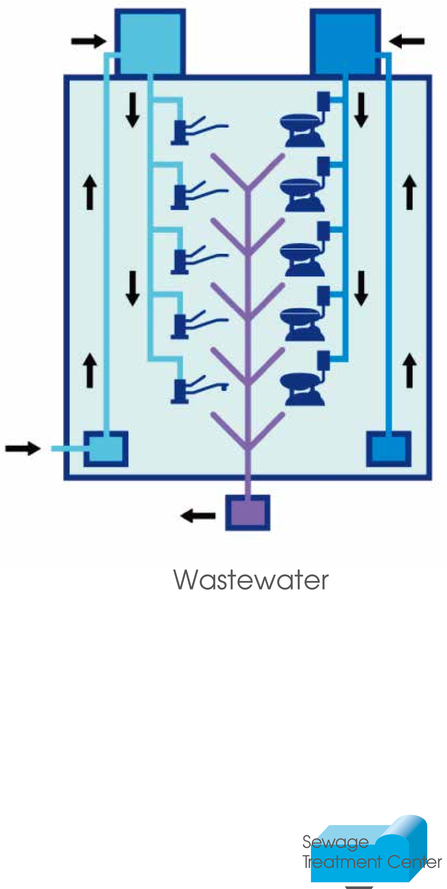
- The owner of a large building shall install a water system to use reclaimed wastewater in the building.
- If the owner breaches the act, the name of the owner shall be published.
- The owner may be able to be subsidized under specific conditions.
- Reclaimed wastewater can only be used for toilet flushing and water sprinkling.

Fukuoka City suffered severe drought in 1978, limiting water supply for 287 days during that year. In the wake of this drought, Fukuoka City set an Action Outline Plan on water saving in 1979, started the supply of reclaimed wastewater in 1980, and enforced the Water-Saving Promotion Act in 2003.

Implementation : Reclaiming System Operation

Large office building owners are required to have a dual piping system for reclaimed wastewater and drinking water. This obligation promotes the use of reclaimed watstewater.



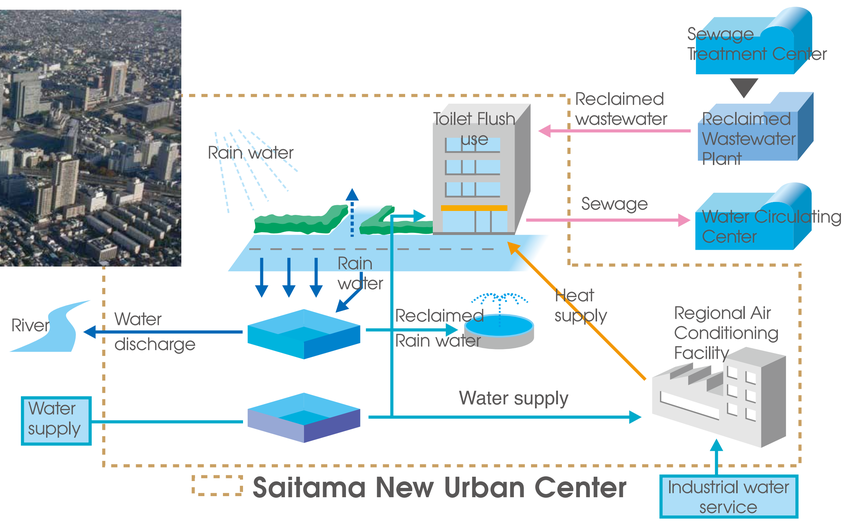


Saitama Prefecture

Supply of Reclaimed Wastewater

The Saitama New Urban Center is one of the largest business centers in which over 57,000 people are working. Saitama Prefecture promotes the use of reclaimed wastewater in this area to meet the growing demand for water supply. Reclaimed wastewater is supplied through a 1,800m-long pipeline.

After 10 years since the start of this business, the number of buildings using the reclaimed wastewater has doubled.



Value of the Alliance Advanced Agencies(AAAs)4

7. Training & Technical Support

Japan Sewage Works Agency

Training and Technical Support

JS Training Programs started in 1972 to train local sewerage experts. As of March 2012, more than 62,500 trainees have completed the programs.
Since sewage works requires a wide range of specialized knowledge - such as administration, civil engineering, architecture, machinery, electricity, chemistry, and biology - it is very important to secure sufficient human resources with appropriate technical knowledge for local communities.

<Training>


design Lab


Water examination Lab

JS provides 6 training courses on the following technical subjects: planning, sewerage management, design, construction supervision, operation and maintenance, and international projects. JS also provides international training courses in cooperation with JICA.

<Technical Support>


Joint Research


New Technology Introduction & Evaluation


Facility Visit

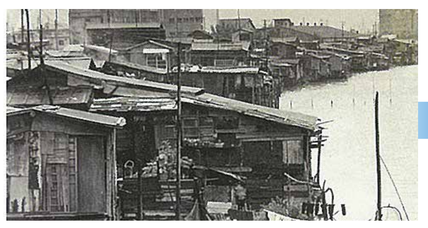

Knowledge Sharing

8. Water Environment

City of Kitakyushu

Murasaki River & Dokai-Bay

The City of Kitakyushu has suffered serious water pollution during its high economic growth period. After decades of efforts, a clean water-front has been successfully recovered.



Murasakigawa River (above) : the city holds swimming event in the restored river.

Dokai-Bay (below) : purified after being polluted by untreated wastewater discharged from factories.

Shiga Prefecture

Lake Biwa

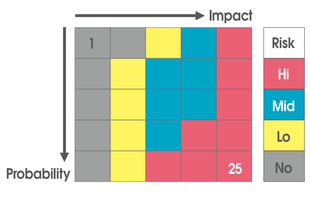
The water quality of the Lake Biwa, the biggest lake in Japan, has been well maintained with the introduction of the sewerage system and other measures such as technology and policy development, including an ordinance made by Shiga Prefecture for further water preservation.

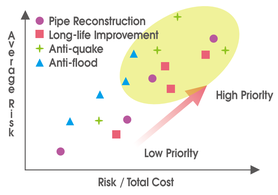
9. Asset Management

Sendai City

Asset Management

To deal with limited resources and growing operational risks, Sendai City became the first municipality in Japan to introduce a comprehensive framework for asset management to its sewerage system.

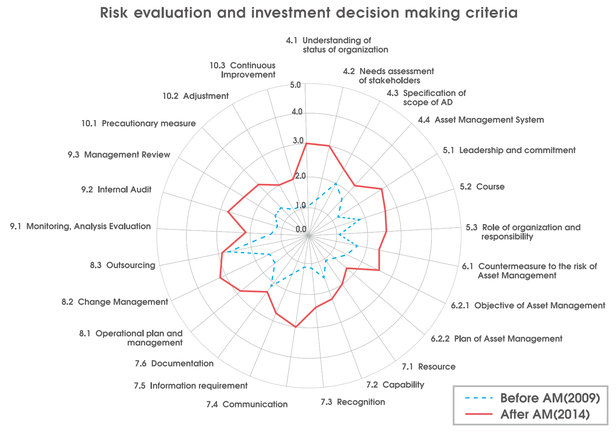




Sendai City's Sewerage Asset Management (AM)

- Setting vision, AM objectives and key performance indicators
- Evaluating risks and making investment decisions based on the criteria
- Forecasting long term rehabilitation cost and developing AM plan
- Developing business processes
- Conducting internal audit
- Introducing new technologies and IT systems

Sendai City acquired ISO55001 certification and integrated its asset management system with BCP and disaster management, making city's sewerage management more efficient. Also, data collected from daily works are used for more accurate asset management and the improvement of its asset management system.
Sendai City aims to become a front runner in sewerage management.



AM system maturity evaluation before/after introducing AM