

## The background of the Tsurumi River Basin Water Master Plan

Following the Tsurumi River New River Basin Improvement Plan (1989) and the report from the Comprehensive Policy Committee of the River Council (1999), the Tsurumi River Basin Water Master Plan was put in place in August 2004 after discussions at the Tsurumi River Basin Water Preparatory Committee, Tsurumi River Basin Water Committee, Tsurumi River Basin Water Master Plan Public Policy Committee and Tsurumi River Basin Meeting.

### Tsurumi River Basin Water Committee (academic experts, citizens and government representatives)

Advice on creating the Tsurumi River Basin Water Master Plan

The 1st Basin Water Committee meeting: February 18, 2002

- Driving the Tsurumi River Basin Water Master Plan, developing its organization and processes
- Overview of the river and its watershed
- Basic philosophy (proposal)

The 2nd Basin Water Committee meeting: May 28, 2002

The 3rd Basin Water Committee meeting: September 3, 2002

The 4th Basin Water Committee meeting: December 25, 2002

The 5th Basin Water Committee meeting: February 26, 2003

- All areas of management (basic plans)
- Evaluating key issues such as how to handle the retarding basin and preserve greenery

The 6th Basin Water Committee meeting: September 16, 2003

The 7th Basin Water Committee meeting: December 16, 2003

Coordination meeting: February 11, 2004

The 8th Basin Water Committee meeting: February 23, 2004

Coordination meeting: March 6, 2004

The 9th Basin Water Committee meeting: March 30, 2004

- Getting citizens' opinions (established the Tsurumi River Basin Meeting)
- Proposals from five wards in Yokohama City
- Proposing the Tsurumi River Basin Water Master Plan (basic plan)
- Drafting the Tsurumi River Basin Water Master Plan

### Tsurumi River Basin Water Master Plan Public Policy Committee

Drafting the Tsurumi River Basin Water Master Plan

The 1st Public Policy Meeting: November 22, 2001

The 2nd Public Policy Meeting: February 14, 2002

The 3rd Public Policy Meeting: August 28, 2002

The 4th Public Policy Meeting: December 19, 2002

The 5th Public Policy Meeting: September 11, 2003

The 6th Public Policy Meeting: December 11, 2003

The 7th Public Policy Meeting: February 16, 2004

The 8th Public Policy Meeting: March 22, 2004

The 9th Public Policy Meeting: July 26, 2004

### Pictures from the Tsurumi River Basin Meeting



(At the meeting)



(Field tour)

### Report

#### Tsurumi River Basin Meeting

- Citizens' Study Group
- Public Service Study Group

The 1st meeting: November 24, 2003

The 2nd meeting: December 23, 2003

The 3rd meeting: February 21, 2004

### Established the Tsurumi River Basin Water Council

(developed and reorganized from the former Tsurumi River Comprehensive Flood Control Policy Council): August 2, 2004

- The council formulates the Tsurumi River Basin Water Master Plan

### Ceremony declaring the promotion of the Tsurumi River Basin Water Master Plan: August 28, 2004



Signing



Declaration promoting the Tsurumi River Basin Water Master Plan

### ● Contact

Tsurumi River Basin Water Council Administrative Office  
Basin Coordination Division, Keihin River Office, Kanto Regional Development Bureau, Ministry of Land, Infrastructure, Transport and Tourism  
Tel: +81-45-503-4009 Fax: +81-45-503-4058

Keihin River Office website <http://www.ktr.mlit.go.jp/keihin/>  
Tsurumi River Basin Water Master Plan website [http://www.ktr.mlit.go.jp/keihin/keihin\\_index049.html](http://www.ktr.mlit.go.jp/keihin/keihin_index049.html)  
Tsurumi River Basin Information Center website <http://www.ktr.mlit.go.jp/keihin/keihin00490.html>

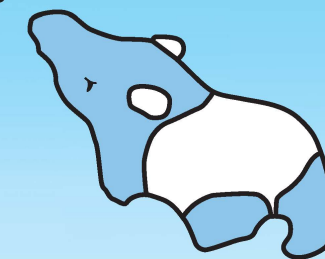
January 2016



Connecting life and living to the Earth

## Tsurumi River Basin Revitalization Vision

The Tsurumi River Basin is shaped like a tapir



## Tsurumi River Basin Water Master Plan

### Tsurumi River Basin Water Council



# Tsurumi River Basin Water Master Plan

## What is the Tsurumi River Basin Water Master Plan?

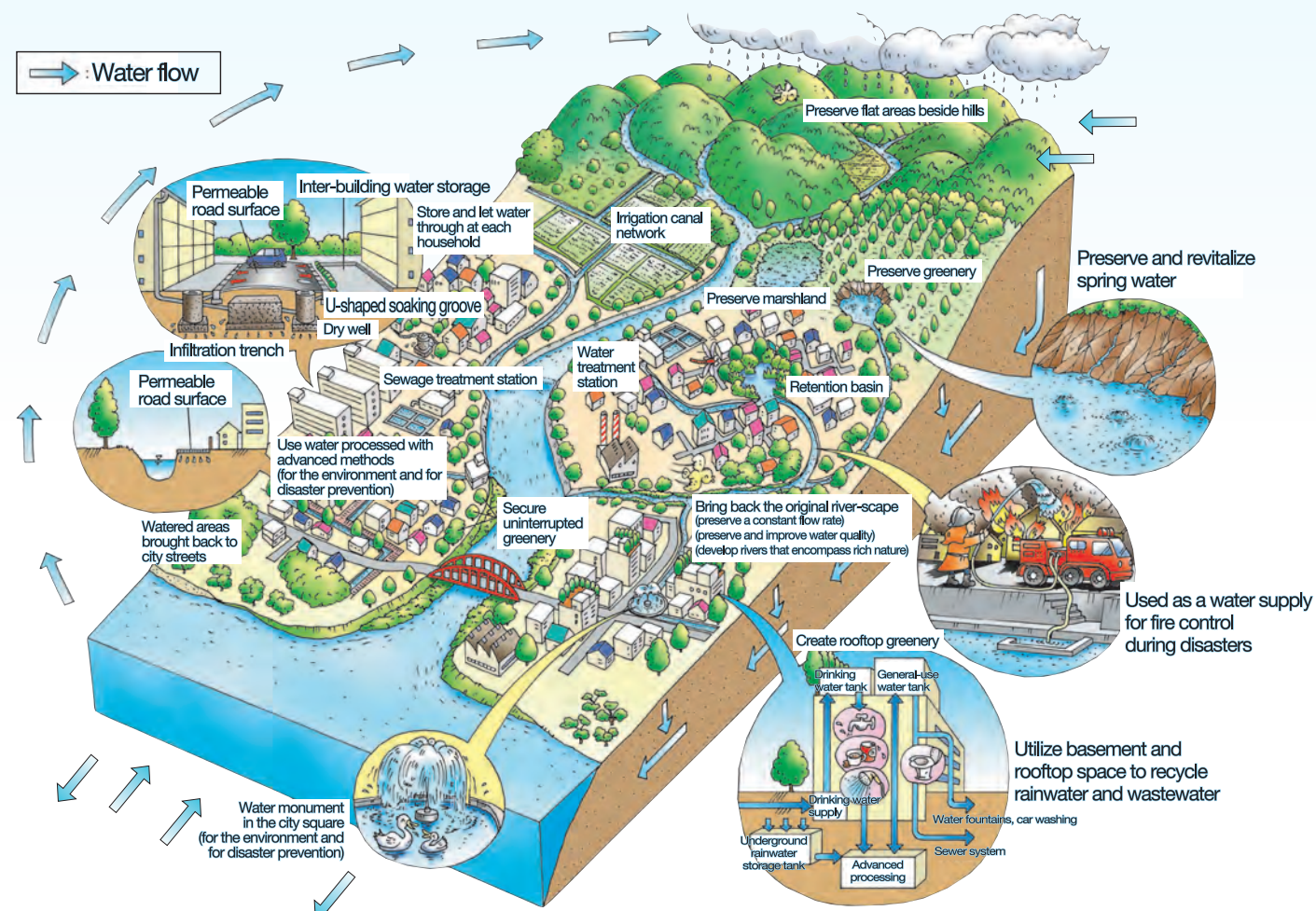
The Tsurumi watershed had often experienced floods due to rapid urbanization developments since the 1960s. Comprehensive flood control measures were adopted from 1980 onward at areas experiencing prominent urbanization as the first initiative of its kind in Japan, seeing that there were limits to work for improving rivers and sewer systems.

Following this, the Tsurumi River Basin Water Master Plan (or "the Master Plan" for short) was formulated in August 2004, in view of social changes and with the aim to bring

back healthy and original water circulation for flood prevention purposes and for the sake of the entire watershed.

Citizens, citizen groups, companies and government bodies from the watershed advanced the Master Plan together. After 10 years had passed since the plan was first formulated, it was reevaluated and reformulated to reflect recent changes in current affairs such as variation in rainfall owing to global warming, as well as the new Basic Water Circulation Plan.

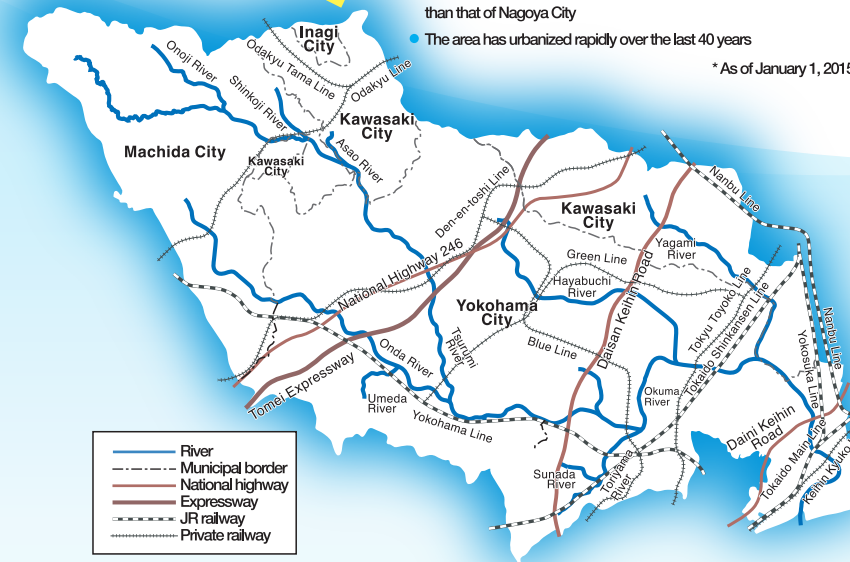
## Conceptual diagram for creating a healthy water circulation system



### Characteristics of Tsurumi River

- The main channel is 42.5 km long, about the same as a full marathon
- The watershed area is 235 km<sup>2</sup>, about the same size as Osaka City and Ishigaki Island (roughly equivalent to one-third of Lake Biwa, or half the size of the 23 wards of Tokyo)
- The nearby population is about 1.96 million\*, equivalent to a large government-ordained city, and bigger than Sapporo City
- The population density is about 8,200 per square kilometer\*, higher than that of Nagoya City
- The area has urbanized rapidly over the last 40 years

\* As of January 1, 2015



### Urbanization

- 1958

Population:  
about 450,000

Urbanization rate

Approximately  
10%

- 1975

Population  
about 1.2 million

Approximately  
60%

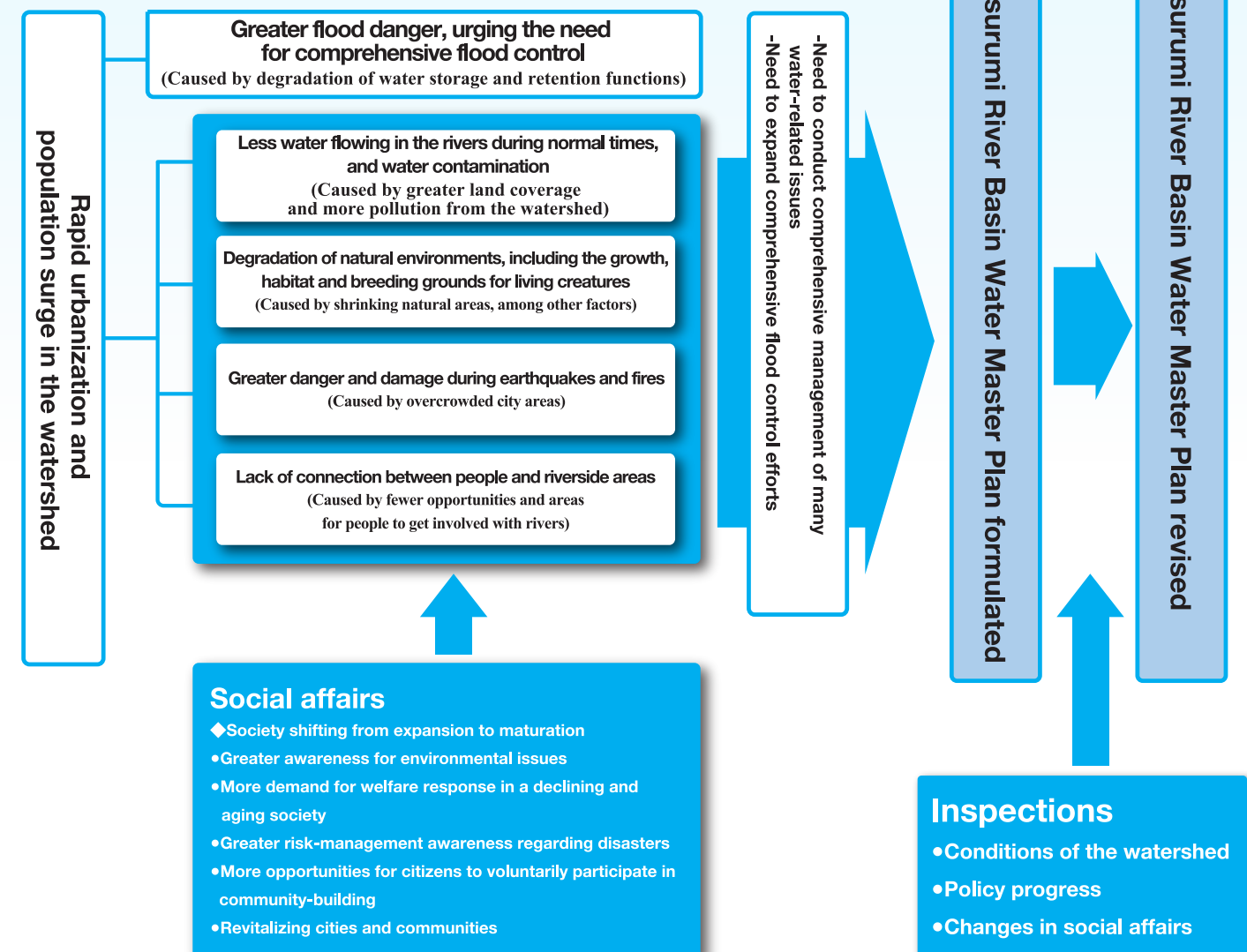
- 2000

Population  
about 1.84 million

Approximately  
85%

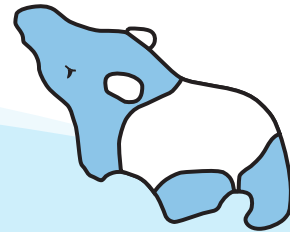
Natural areas  
Urban areas

## Issues at the watershed





# Overview of the Tsurumi River Basin Water Master Plan



## Philosophy

- Creating healthy water circulation over the entire watershed
- Revitalizing the watershed, aiming for a sustainable society that coexists with nature

## Formulating body

- Tsurumi River Basin Water Council (a government body involving the state, the Metropolitan Government of Tokyo, and related prefectures and cities)

## Positioning

- A plan that serves as the basis for comprehensively promoting water-related plans and measures

## Plan details

- Set up basic policies, goals and measures for each of the five areas of watershed water management, and drive them forward together

## Plan period

- Approximately 20–30 years

## [Basic policy and major plan target for each area of management]

### ○Water management during floods

#### «Basic policy» Protect the Tsurumi River watershed from flood danger

- Improve the safety of flood control, involving the entire watershed
- Build communities that are resistant to flood damage
- Adapt to changes brought by global warming, such as heavier and stronger rainfall, and rising sea water levels
- Adapt to fight landslides caused by intense rainfall in smaller watershed areas
- Develop tsunami-resistant river facilities to prepare for major earthquakes

### ○Normal-time water management

#### «Basic policy» Create an enriched and clean water environment

- Secure natural flow rates in side river
- Preserve and develop underground water, and revitalize spring water
- Improve water quality so that children can play in the rivers, and that all aqueous creatures can live, grow, and flourish in them
- Reduce the pollution flowing into the Tokyo Bay
- Create a water-recycling society

### ○Natural environment management

#### «Basic policy» Preserve, create and utilize the watershed landscape and biodiversity, and create a city where people can get in touch with nature

- Preserve the natural environment of the watershed
- Preserve and recover the network of water and greenery
- Bring back cities that live in intimate harmony with nature

### ○Earthquake and fire management

#### «Basic policy» Protect the Tsurumi River watershed from danger during earthquakes and fires

- Develop disaster-proof communities by capitalizing on the presence of the rivers
- Link rivers and communities to create a disaster-prevention network

### ○Riverside connection management

#### «Basic policy» Through connections with the rivers, create an enriching lifestyle for citizens to foster an awareness that the watershed is a shared asset

- Promote learning about the watershed
- Promote watershed tourism, capitalizing on diverse resources
- Achieve lifestyles that do not burden the watershed environment

## [Advancement measures]

Establish a structure for appropriate role assignment, as well as for partnerships and joint efforts

### •Establish a structure to drive the Master Plan

Tsurumi River Basin Water Meeting  
-Citizens' Study Group  
(citizens, citizen groups, companies)  
-Public Service Study Group

Tsurumi River Basin Water Committee  
Academic experts

Report

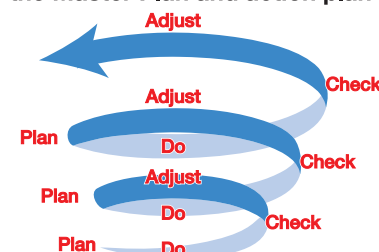
Active efforts and partnerships

Advice

Tsurumi River Basin Water Council  
Public services

Drive the plan with a management cycle (plan, do, check, adjust)

### •Manage and announce the progress of the Master Plan and action plan



## Monitoring and announcement using easy-to-understand indices

### For instance

Watershed safety (scope of flooded areas shown on a map), the level of water flow (in side rivers), water quality (the level of peoples' connections based on citizens' feelings, aqueous creature index), reducing the pollution flowing into the Tokyo Bay (the rate of advanced sewage treatment), the amount of water collected by soaking facilities, the level of nature in the watershed (the area of greenery at the river's origin, and all greenery in general, checking the status of creatures used for reference (types)), the biodiversity level of the rivers and water channels (the number of identified types of species), the areas where river water can be used to fight fires, the situation of river usage (number of users per location and category of usage), status of published river information (number of users accessing the website), and more



Studying aqueous creatures



Published on the Internet

## The formulation of the action plan

### Past examples

- Tsurumi Rivers Improvement Plan (March 2007)
- Tsurumi River Basin Flood Control Plan (March 2007)
- Action plan to bring back water quality where children can play in the water [Advanced sewer treatment] (April 2008)
- Action plan to preserve important species and remove foreign species (March 2009)
- TR Net Tsurumi River Basin Cleanup Operation (March 2009)
- Action plan to promote rainwater permeation (November 2015)



A riverside event



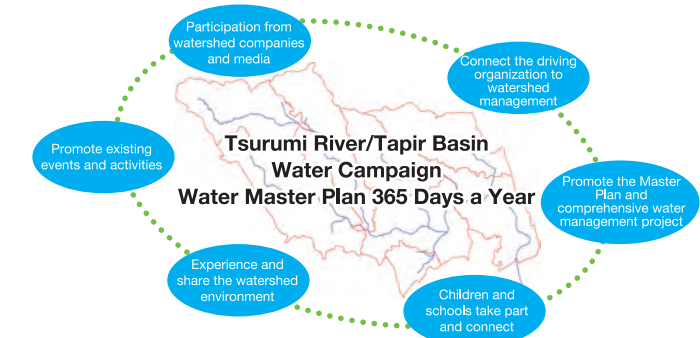
Removing foreign species

Examples of measures that require action plans to be set up and executed (focusing and selecting based on core importance)

- Action plan to drive measures for adapting to global warming
- Action plan to create rivers including flows and riverside areas that are enriched with nature
- Action plan for effective use of rivers and riverside space
- Action plan to secure the water-retaining properties of existing disaster-prevention retention basins

## Hold a watershed water campaign with the catchphrase "Water Master Plan 365 Days a Year"

Connecting life and living to the Earth  
**Tsurumi River Basin Revitalization Vision**





## "Protect the Tsurumi River watershed from flood danger"

The basic policy of water management during floods is to protect the Tsurumi River watershed from flood danger. It aims to prevent flood damage from rivers and landslide water in the Tsurumi River watershed, as well as drive safe and secure community-building that will not result in any victims despite ever stronger heavy rains following global warming. This policy also aims to prevent tsunami damage at the rivers in the event of major earthquakes.

More concretely, the policy aims for even safer flood control by promoting a comprehensive flood control measures that drives measures for riverine, sewer and the watershed together. Also, to minimize damage from heavy rain that is beyond the projected scope of the plan, or from the changes in rainfall caused by global warming, this policy will enforce both tangible and intangible measures. It will also aim to make river facilities and sewage facilities earthquake-resistant in order to protect them against tsunamis in the event of major earthquakes.

### Goal Improve the safety of flood control, involving the entire watershed.

#### Preservation of natural capabilities to retain and retard water

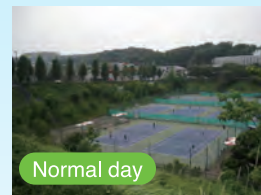


Preservation of green spaces



Restraint on embankment in riverside agricultural land

#### Outflow control facilities established at development sites in the watershed



Normal day



Rainy day

Reservoir for disaster prevention

#### Watershed measures

### Flood control measures of the entire watershed (comprehensive flood control measures)



Multipurpose retarding basin

#### Riverine measures



Before improvement



After improvement

River improvements (embankment and dredging)

#### Sewer measures



Inland water drainage facility (pump station)



Rain water storage pipe



Dry wells and trenches

### Goal Ensure the safe evacuation of citizens even in the event of torrential rain that is beyond the scope of the disaster prevention plan, and build flood-resistant communities so as to minimize damage.

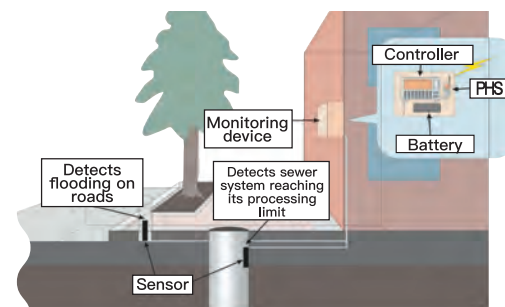
#### Flood damage in cities



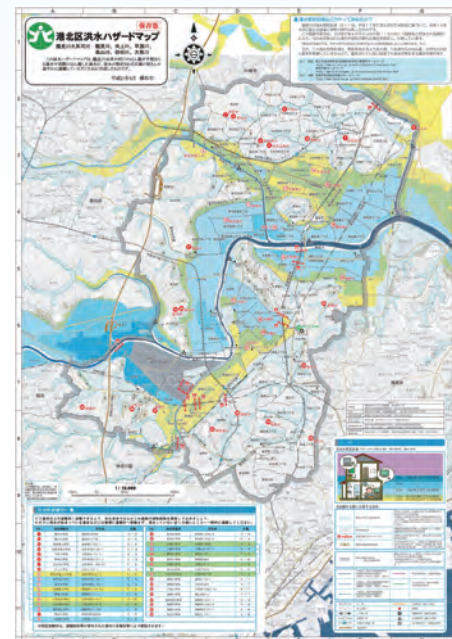
Flood waters in the subway (heavy rain, Fukuoka, 1999)



Overflowing landslide water (Kohoku Ward, Yokohama City, August 1994)



Conceptual diagram for installing a flood water detection system (optical fiber sensors)

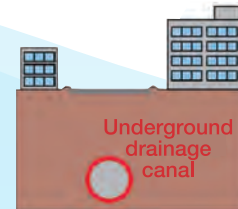


Raise awareness with a flood hazard map  
Source: Kohoku Ward hazard map

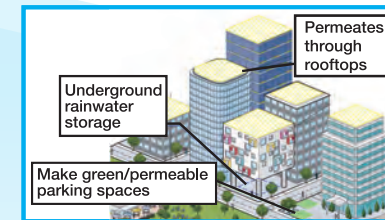
### Goal Adapt to changes brought by global warming, such as heavier and stronger rainfall, and rising sea water levels.

#### Develop flood control facilities that can adapt to changes in rainfall

##### ■ Conceptual diagram of underground drainage canal

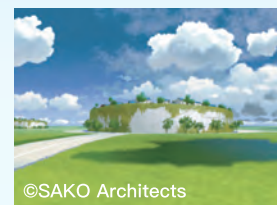


Develop drainage canals and sewer systems



Develop water storage and permeable facilities in existing city areas

#### Engage in community and region building efforts together to reduce flood damage



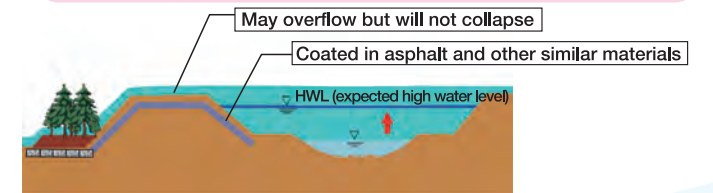
Develop large-scale safety areas

Source: SAKO Architects  
("Tohoku Sky Village concept," a recovery project following the Great East Japan Earthquake)



©SAKO Architects

#### Effectively use existing flood control facilities, enhance their functions, and maintain the watershed's water storage and detention functions



Strengthen the embankment (conceptual diagram)



Preserve land that can retain water

#### Provide disaster information that will ensure appropriate evacuation measures, and raise awareness for disaster-prevention



Provide information (Whole City Hazard Map)



Drive educational activities (lectures with information on disaster prevention)

### Goal Adapt to fight landslides caused by intense rainfall in smaller watershed areas.

#### Prevent landslides occurring due to heavy rain



Drive measures against landslides  
Source: Geospatial Information Authority of Japan

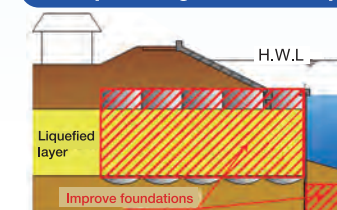


Preparatory measures against disasters (Midori Ward Landslide Hazard Map (eastern district))  
Source: Yokohama City website

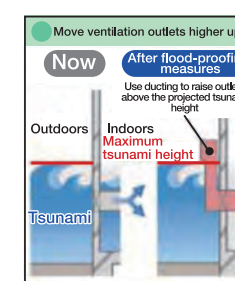
### Goal Develop tsunami-resistant river facilities to prepare for major earthquakes.

#### Enhance the earthquake-proofing and water-proofing at river facilities in projected tsunami areas

##### Conceptual diagram for development



Make river structures more earthquake-resistant



Make sewage facilities more earthquake-resistant and waterproof (flood-proofing measures at pumping stations and similar facilities)  
Source: Bureau of Sewerage, Tokyo Metropolitan Government



## "Create an abundant and clear water environment"

The basic policy of normal-time water management is to preserve, restore and create an abundant and clear water environment, and to use the water in the watershed without wasting it.

More concretely, the policy's goal is to restore the river flow rates in side rivers to a level equivalent to those from before the area was rapidly developed. With this goal, the basic policy aims to preserve the soaking areas and storage basins and promote rainwater permeation in the ground to preserve and nurture underground water, to revitalize spring water, and to preserve and restore natural water circulation.

Also, the policy aims to improve the water quality so that children can play in the rivers, and that all aqueous creatures can live, grow and flourish in them. It also seeks to reduce the pollution flowing into the Tokyo Bay. This policy will save water in the watershed and create a society that recycles water.

**Goal** Secure natural flow rates in side rivers so that they return to how they were before rapid development in the area.



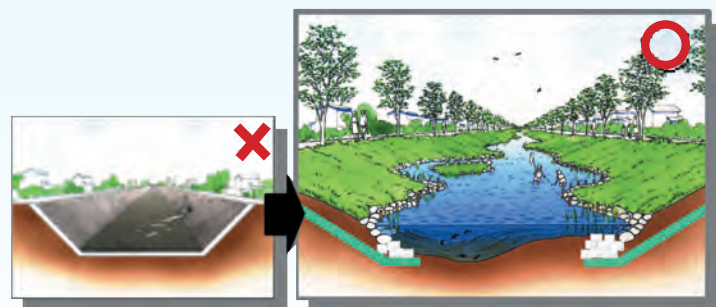
Elementary school children swimming in the Tsurumi River in the Taisho Period  
Source: Mitsuro Iketani

**Goal** Improve water quality so that children can play in the rivers, and that all aqueous creatures can live, grow and flourish in them.

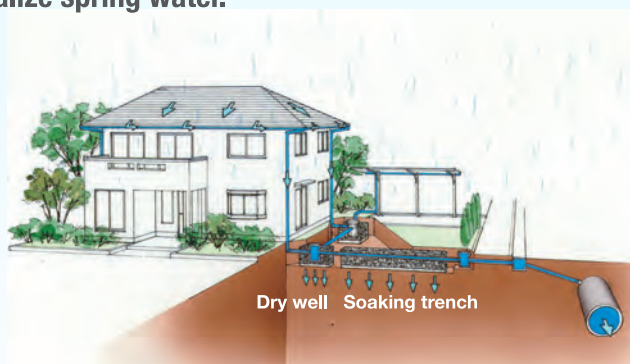


A space that can be used for activities and events, featuring an embankment with stairs leading to the water

**Goal** Preserve and nurture underground water, and revitalize spring water.

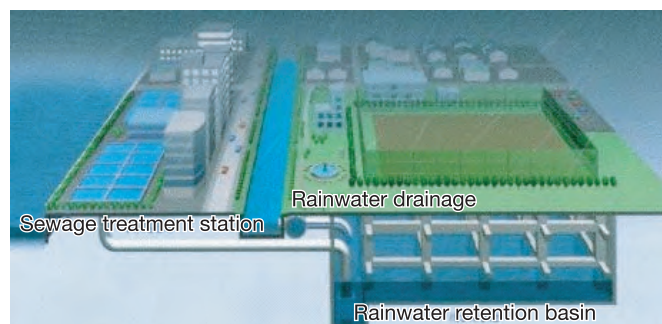


Improve the permeability in the riverbanks of side rivers and canals



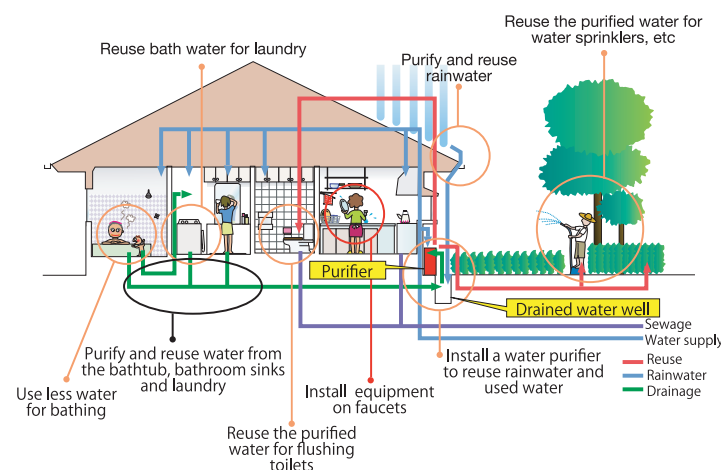
Install dry wells and soaking trenches for rainwater

**Goal** Reduce the pollution flowing into the Tokyo Bay.



Retain polluted initial rainwater in the retention basin

**Goal** Save water and create a water-recycling society.



## "Preserve, create and utilize the watershed landscape and biodiversity, and create a city where people can get in touch with nature"

The basic policy of natural environment management is to preserve, create and utilize natural environments and biodiversity in mountain ridges and watersheds that underpin the nature of the Tsurumi River watershed, and create cities that are in touch with nature.

More concretely, in order to preserve and restore the water circulation system in the watershed, this policy aims to protect the natural environments at the riverside and green areas within the watershed, to restore connections with the waters and greenery, and to create cities where citizens can get in touch with these nearby preserved and recovered natural environments as well as the many different creatures living there.

**Goal** Preserve the natural environment of the watershed.



1972



2015  
Kohoku New Town, Tsuzuki Ward, Yokohama City  
Source: Keihin River Office Kanto Regional Development Bureau, Yokohama City, Ministry of Land, Infrastructure, Transport and Tourism

**Goal** Bring back cities that live in intimate harmony with nature.

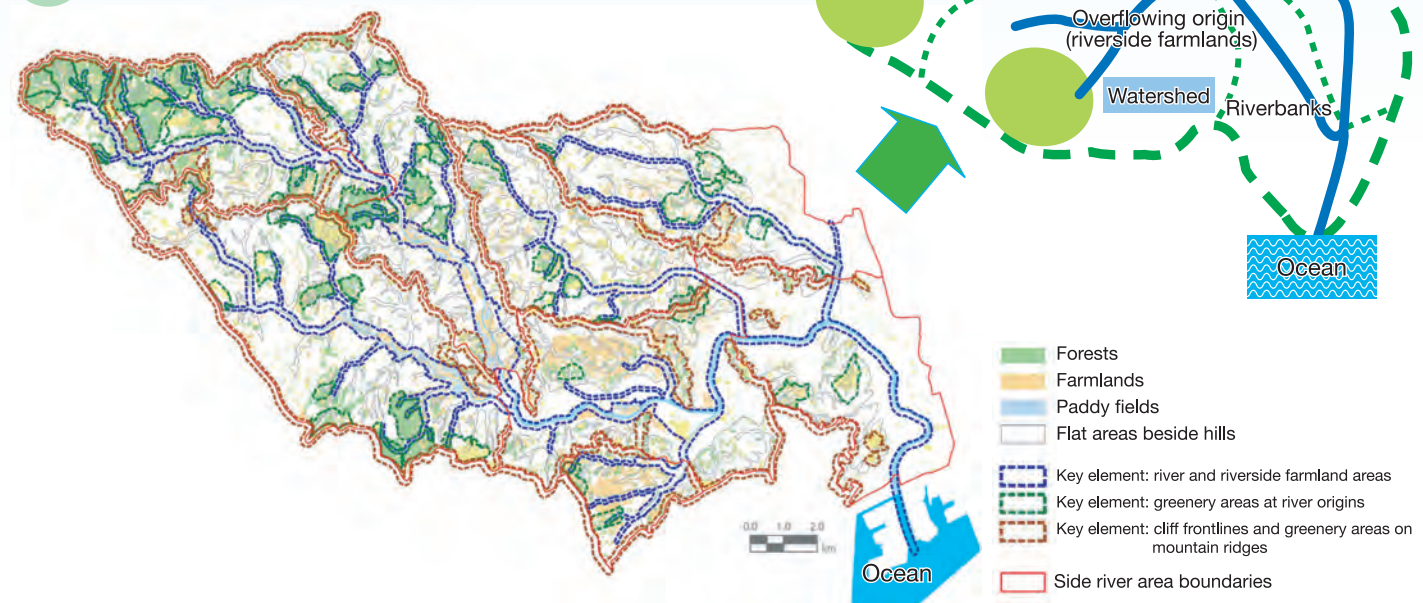


Detention basin biotope



Environmental protection activities

**Goal** Preserve and recover the network of water and greenery.



The structure of the environment in the watershed



## "Protect the Tsurumi River watershed from danger during earthquakes and fires"

The basic policy of earthquake and fire management is to protect the Tsurumi River watershed from danger during earthquakes and fires, and to create disaster-resistant cities that capitalize on the presence of the rivers.

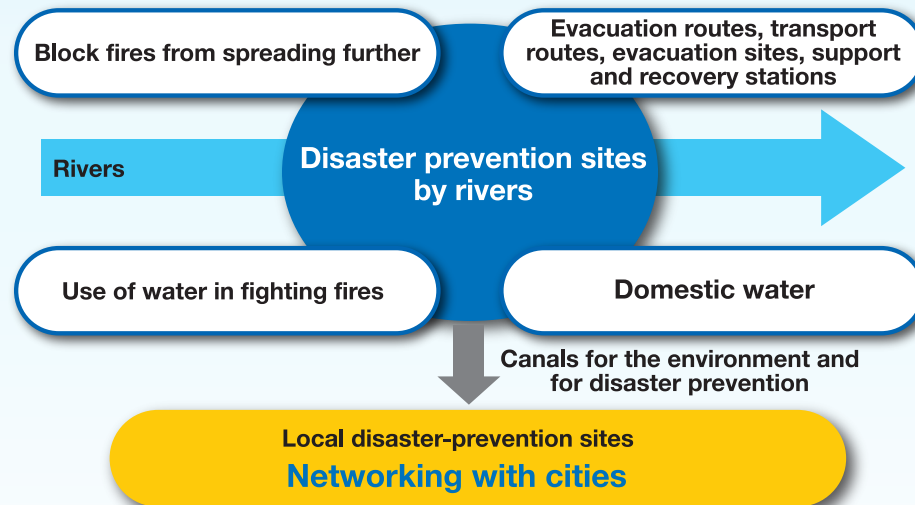
More concretely, the policy aims to link the rivers and cities, to develop and reinforce disaster prevention sites, to create a disaster-prevention network, and to build disaster-resistant cities that make use of the water and space around the rivers.

### Goal Develop disaster-proof communities by capitalizing on the presence of the rivers.



Install stairs and water-intake pits and use the rivers to fight fires

### Goal Link rivers and communities to create a disaster-prevention network.



Conceptual diagram of reassessing and utilizing the disaster-prevention features of the rivers



Tsukuno disaster prevention site



Close-up image

## "Through connections with the rivers, create an enriching lifestyle for citizens to foster an awareness that the watershed is a shared asset"

The basic policy of riverside connection management is to bring an enriching lifestyle to citizens by nurturing connections with the rivers, so as to develop an awareness that the watershed is a shared asset.

More concretely, the basic policy will promote watershed tourism where people can visit, enjoy, get in touch with and learn about the diverse resources in the Tsurumi River watershed. The policy also seeks to build a platform for developing these diverse connections and interactions at the riversides and in the watershed, as well as to achieve lifestyles that do not burden the watershed environment.

### Goal Promote learning about the watershed so as to enhance people's understanding of nature and of how water circulates in the watershed.



Riverside Schooling Project, Umeda River

Tsurumi River Basin Information Center

### Goal Promote watershed tourism, capitalizing on diverse resources.



Walking event

Riverside promenade

Tsurumi River watershed signboards, organized by five wards in Yokohama City (showing distances to landmarks and information on the region)

### Goal Achieve lifestyles that do not burden the watershed environment.



Clean-up operations

Example of creating a green rooftop area (building at Kohoku Ward Office, Yokohama City)