Conference on Watershed Management for
Controlling Municipal Wastewater in South East Asia

Policies for Watershed Management for Controlling Municipal Wastewater in Japan

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Norihide Tamoto
Sewerage and Wastewater Management Department
Water and Disaster Management Bureau
Ministry of Land, Infrastructure, Transport and Tourism (MLIT)

国土交通省
Ministry of Land, Infrastructure, Transport and Tourism

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Background

- Due to the high economy growth, Japan faced severe environmental problems in the 1960s and 1970s

Pictures of Water Environment in 1970's in Tokyo

Tokyo Bay

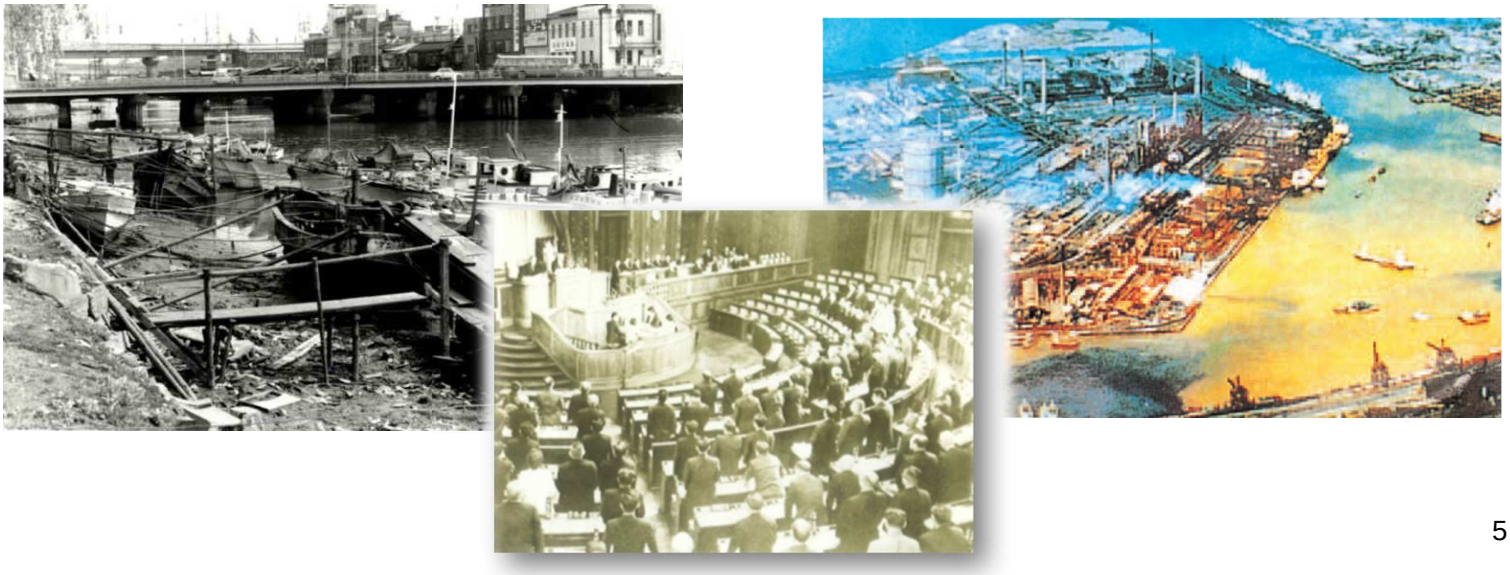
A river in Tokyo

Kanda River in Tokyo

Photo Credit : Environmental Bureau of the Tokyo Metropolitan Government

Background

- After confronting the severe environment pollution, the government revised the “sewerage law” in 1970 and
- the role of sewerage infrastructure to improve the quality of public water bodies was officially stated in the law
- The planning, construction and operation of the large scale sewerage infrastructure was accelerated after 1970



Pollution Diet in 1970

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Objectives of Sewerage Law

The purpose of the Sewerage Law is to contribute to the sound development of cities and improvement of public health and to **preservation of water quality in public water areas**, (Article 1. Sewerage Law).

To establish sewerage system, each local authority set **Sewerage construction plan**

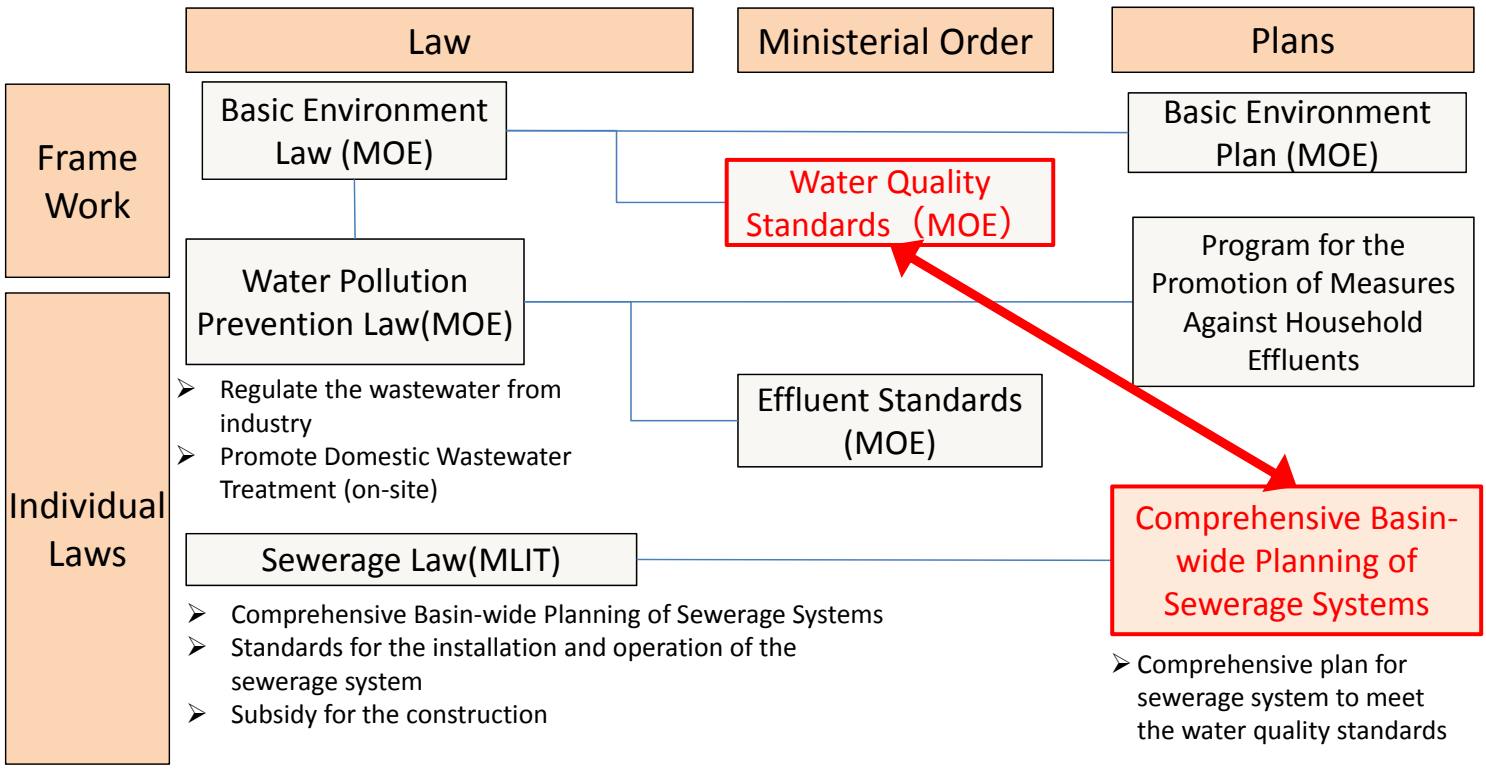
- Planned area for sewerage construction
- Location of wastewater treatment facility
- Treatment methods
- Discharge location

Addition to the construction plan,

Basin Wide Upper Level Plan in is required to improve public waters quality,
since water quality of public waters are related with multi-factors other than domestic wastewater

Overall Policy Structure in Japan

■ In Japan, Prefecture Governments have to prepare Comprehensive Basin-Wide Planning of Sewerage System to meet the Water Quality Standards



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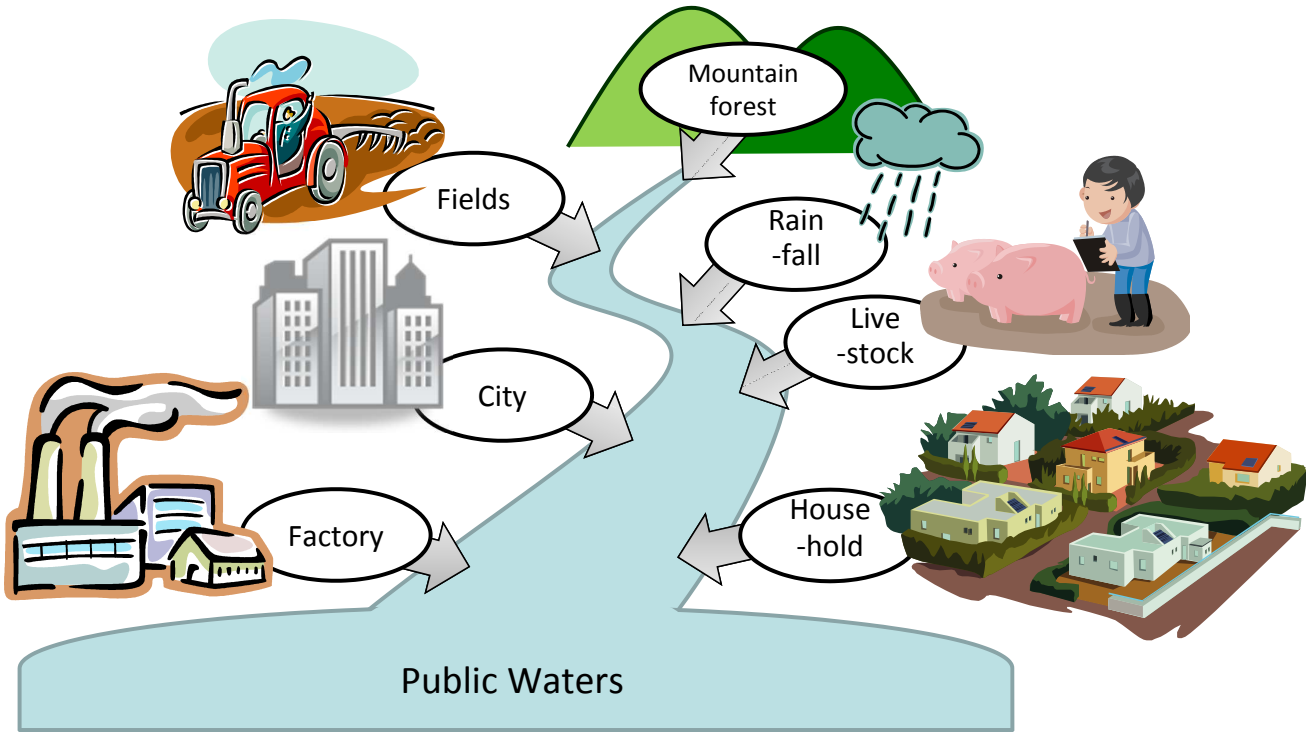
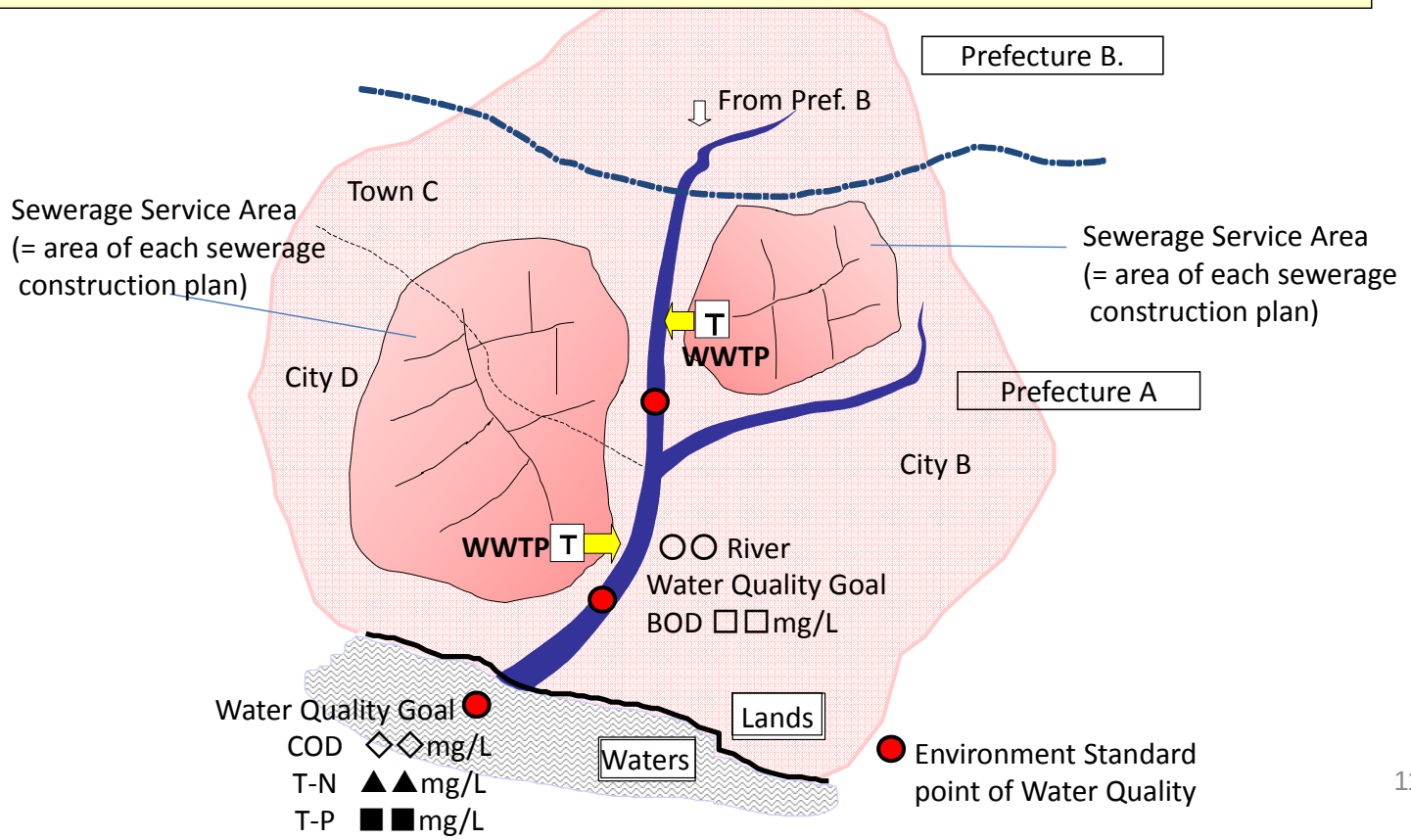
Determinant Factors of Water Quality

Water quality of public waters are **related with multi-factors**



Basin-wide Water Quality Improvement

To improve public waters quality, **a basin-wide approach is required** as well as efforts by each local authority



Comprehensive Basin-wide Planning of Sewerage Systems

To reduce the basin wide pollution load, it is necessary to avoid inefficiency and secure consistency of each measures.

Thus it is necessary to plan most rational and effective solution for the whole water basin.

Comprehensive Basin-wide Planning of Sewerage Systems

A prefecture must set forth a comprehensive basic plan with regard to public water areas for which Environmental Water Quality Standards are prescribed, **to meet and maintain the Environmental Water Quality Standards** in case water pollutions cover more than 2 of municipalities. (Ref. to Article 2. Sewerage Law)

About Environmental Water Quality Standards

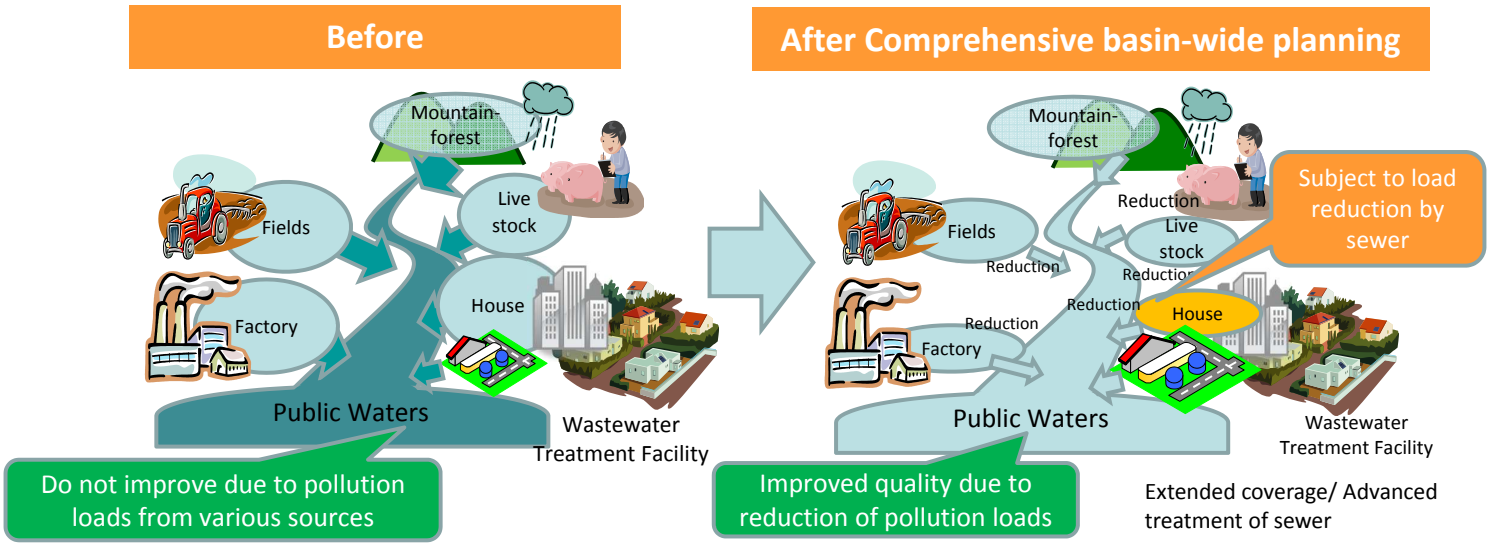
In April. 1970, based on the basic law for environmental pollution control, the standard was set so as to protect human health and maintain a living environment regarding environmental conditions related with water pollutions of public waters

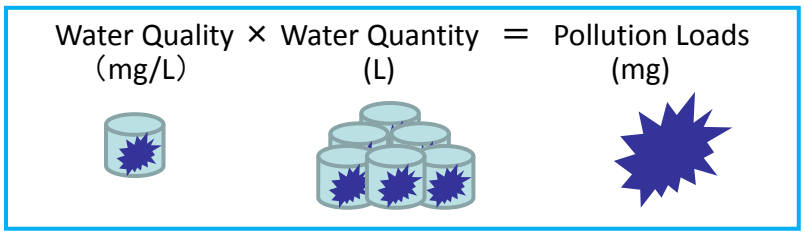
＜FYI＞FY 2013 River (BOD)2,558, Lake(COD)187, Sea (COD)590

Role of Sewerage: Reduction of Loads mainly from Households

Comprehensive basin-wide planning of sewerage systems, plans to reduce pollution loads from various sources and improve water quality of public waters

Sewerage serves to **reduce pollution loads mainly from households**

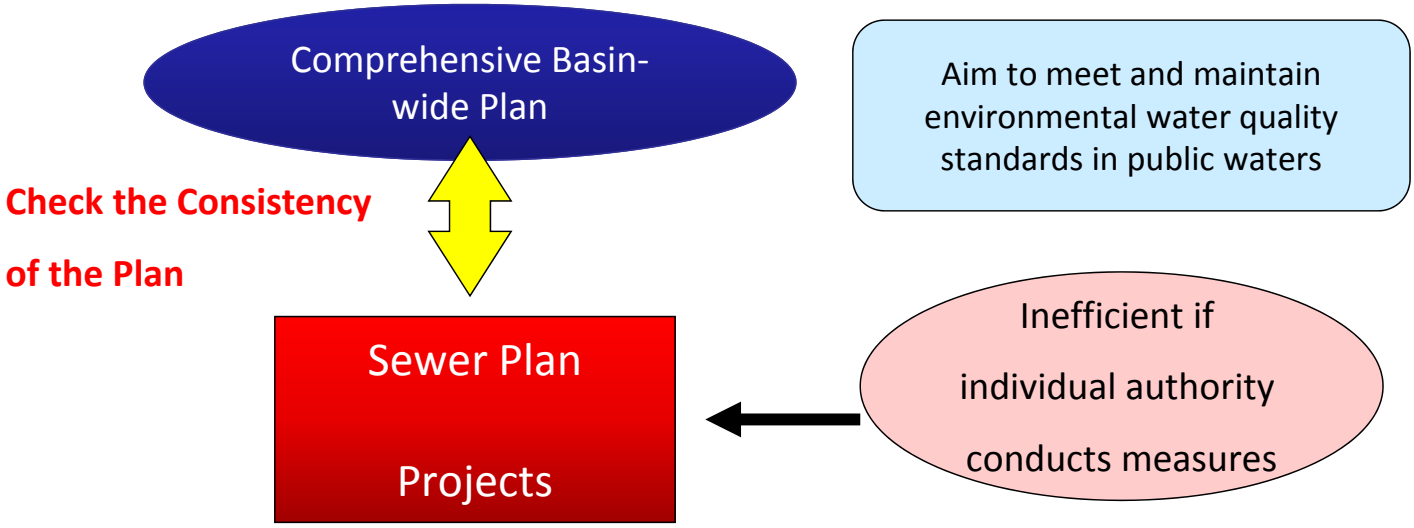




Upper Level Plan for the Sewerage Construction

Comprehensive basin-wide plan worked as **Upper Level Plan for sewerage construction** in the region where environmental water quality standards are set

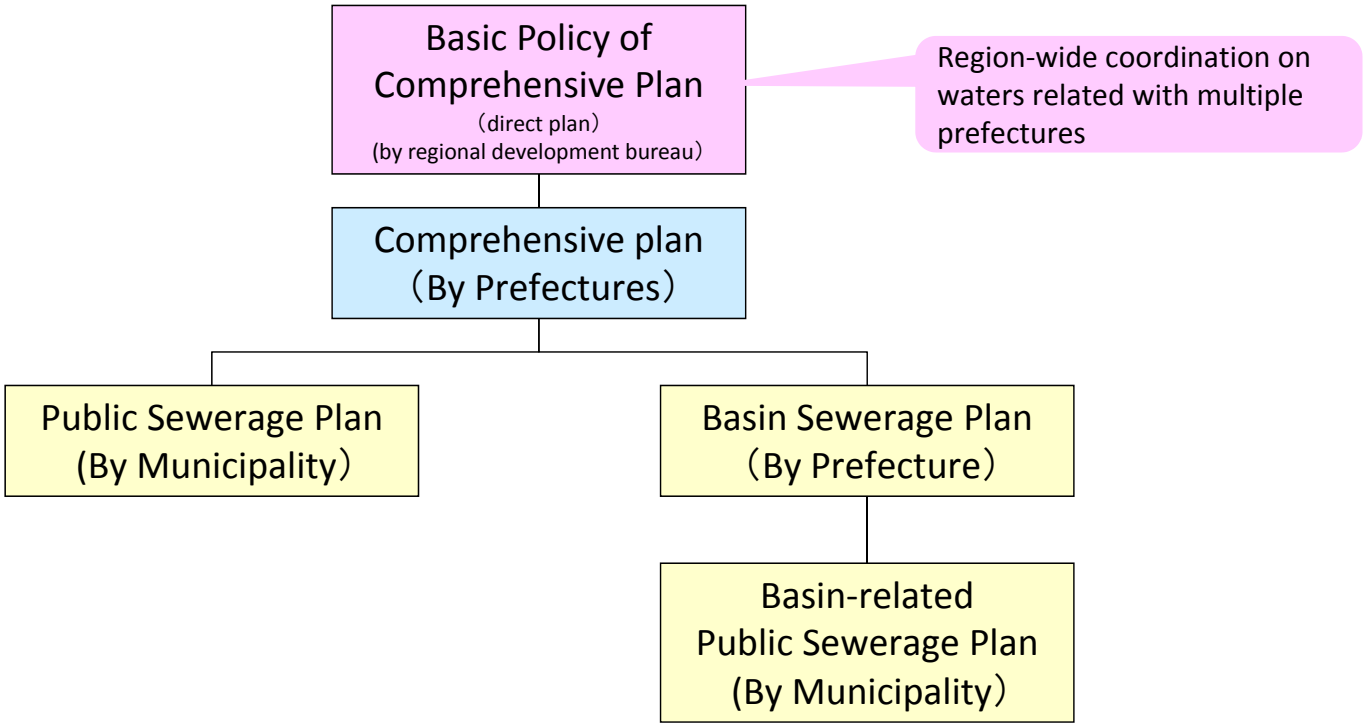
Sewerage works in a region where comprehensive basin-wide plan is set must **corresponds with comprehensive basin-wide plan** (Article 2-2, Article 6 item 5, Article 25-13 item 4, Sewerage Law)



Comprehensive basin-wide plan serves as the **basis of the planning of sewerage system**

Policy Coordination of Comprehensive Basin-wide Plan

In case Comprehensive plan is set on waters which cover more than 2 of Prefectures, National government(regional development bureau) coordinates a Basic Policy for meeting Environmental Water Quality Standards among Prefectures(**Prefectural quota for loads reduction objectives**)



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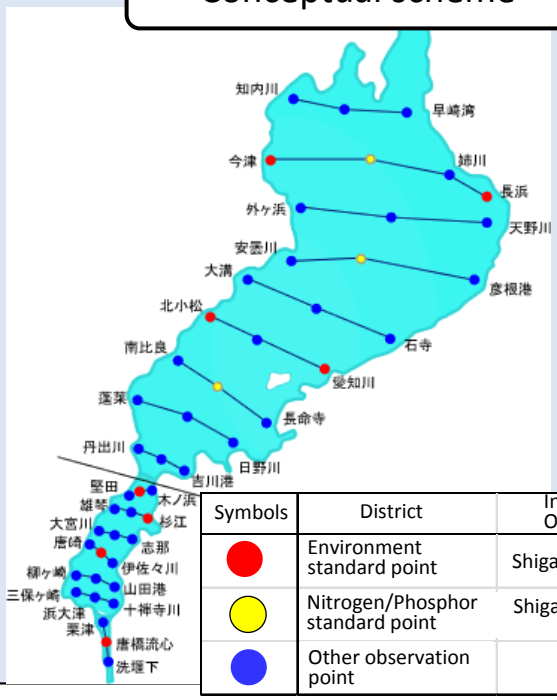
Comprehensive Basin-wide Planning of Sewerage Systems in Pref. Shiga

- Though sewerage works are operated by municipalities, water quality protections of river, lake and sea waters need region-wide cooperation for efficient implementations
- For this, Pref. Gov. set a higher level plan over individual sewer plans to achieve water quality standards of river, lake and sea waters

Overview of Plan

- Scope of year
  Around 20～30 years
- Water Quality objectives
  Achieve/maintain
  water quality standards
- Objectives of Sewerage facility
  Set the necessary plan of facility
  improvement Includes other items

Conceptual scheme



District

Symbols	District	Inspection Organization
●	Environment standard point	Shiga Prefecture
●	Nitrogen/Phosphor standard point	Shiga Prefecture
●	Other observation point	MLIT

Flow of Planning （Ex. Pollution Analysis of Lake Biwa）

- Based on projections of population/industries growth, estimates the projected volumes of discharges and pollutants
- Sets a reduction goal of pollutant load and reduction measures, and reflects on sewerage improvement plan.

Basic survey

- Natural condition
- Current state and prospect of population and industry
- Current state and prospect of volume of discharge and pollutant load.

Pollution analysis and pollutant load reduction plan

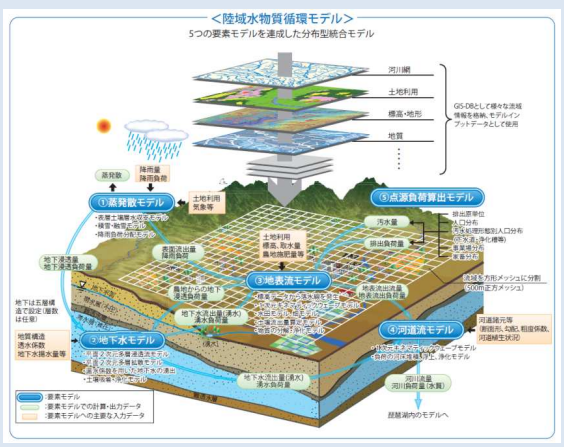
- Pollution analysis using model
- Sets goal of reduction volume and reduction measures.

Sewerage construction plan

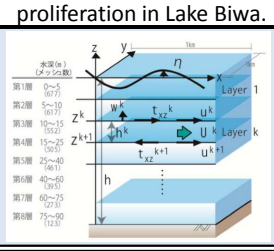
- Sets designed treatment water quality
- Sets measures of sewage treatment.

Continental model
Considering flows of evapotranspiration, river water, and groundwater.

5 element model of evapotranspiration, groundwater, overland flow, river water, point source load calculation.



Lake model
Considering the vertical and horizontal proliferation in Lake Biwa.



Lake ecology model
Considering the decomposition and production by ecology