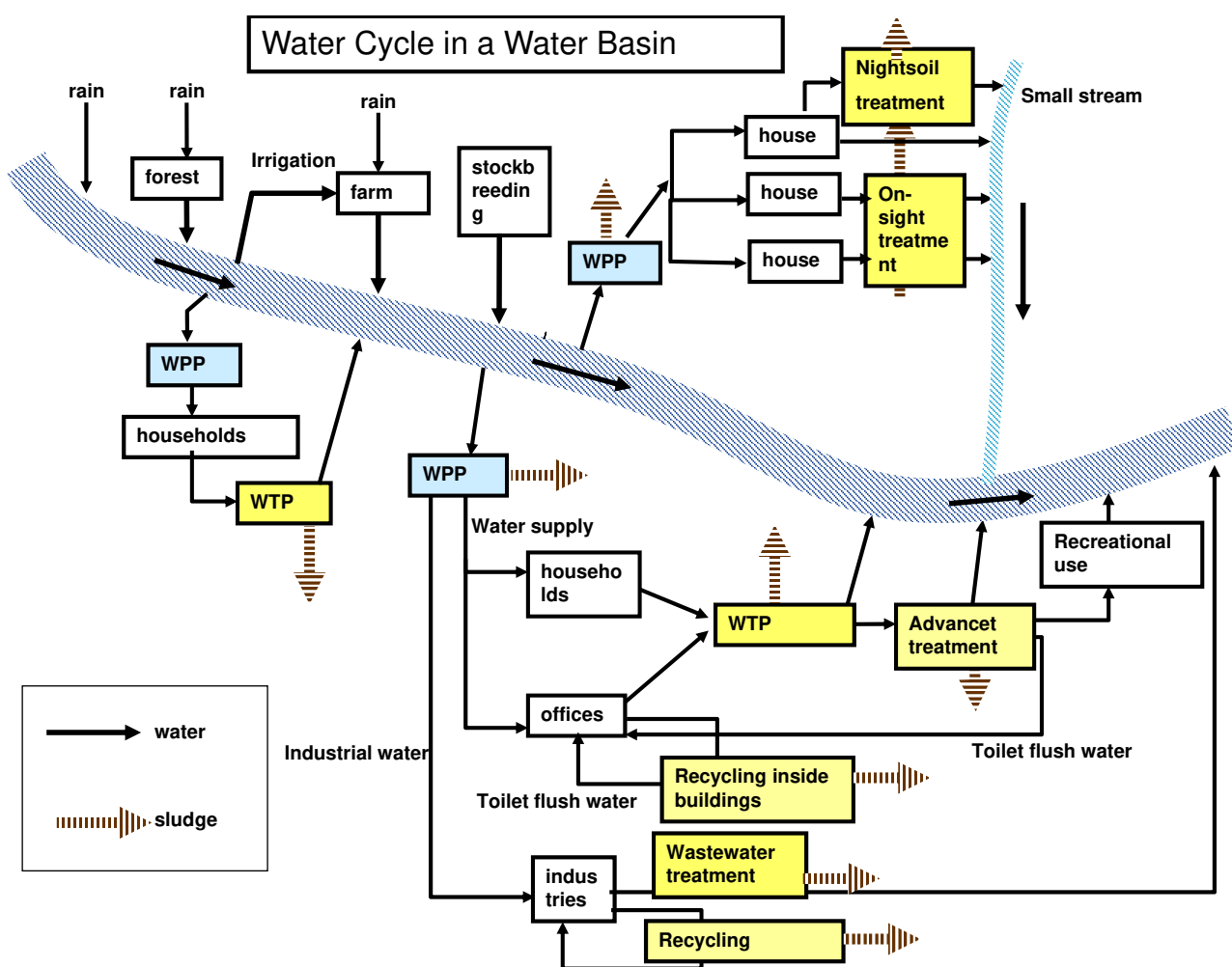
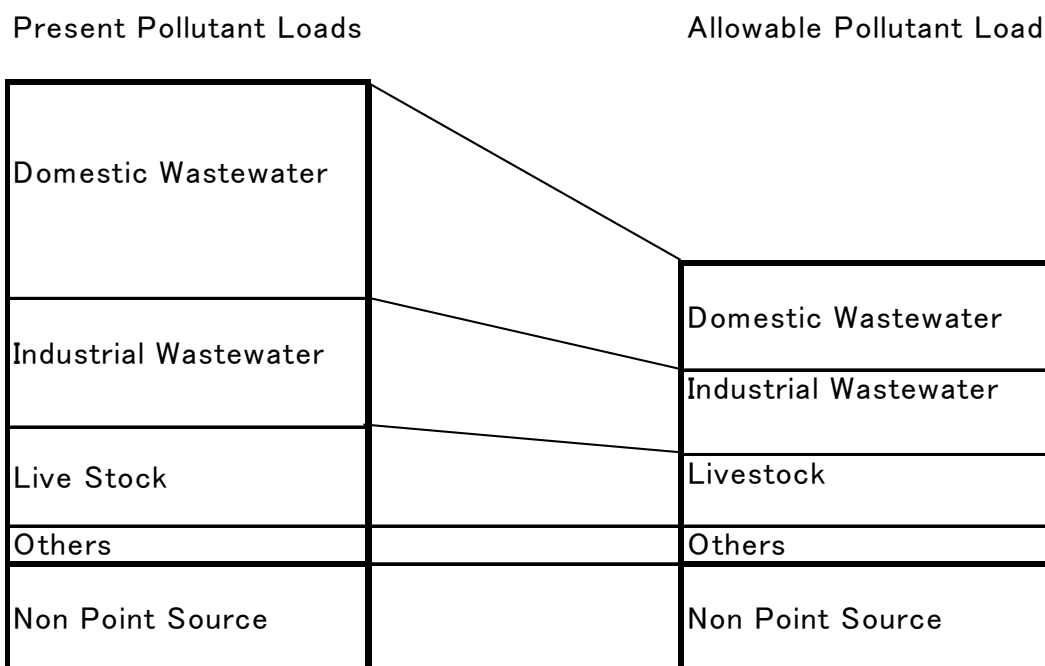


Planning for wastewater management based on results of monitoring, Japanese experience

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Necessary Survey



- 1) Geography
- 2) Water Bodies Condition [(Minimum) Flow Rate, Water Level, etc.]
- 3) Precipitation
- 4) Present Status of Water Quality
- 5) WATER QUALITY STANDARD
- 6) Regulation of Effluent Water Quality
- 7) Present Status of Sewerage System
 - /Target Area, Sewered Area, Sewer pipes, WTPs, Future Plan
- 8) Present Status of On-Site Sewage Treatment System
- 9) Present Land Use and Future Land Utilization Program
 - /Urban Area, Zone Restrictions, Use Zoning



- 1) Present Population,
 Future Population (Estimation of Population Increase)
- 2) Present Condition of Industry and Future
- 3) Agriculture (Livestock, Farm Land, etc.)
- 4) Water Use (Water Supply, Industrial Water, Irrigation)
- 5) Fishery, Fish Culturing



- 1) Domestic Wastewater
- 2) Commercial Wastewater
- 3) Industrial Wastewater
- 4) Live Stock
- 5) Other Man-caused Pollution
- 6) Non Point Source (Natural)



For loads of domestic wastewater, surveys to determine the average specific unit have been conducted regularly in apartment building areas where measuring the quantity and quality of wastewater is comparatively easy.

The standard values for human pollution loads are shown in Table below while water consumption rate is estimated to be 300 - 400 l /capita

Items	Pollution Load (g/capita)
BOD ₅	58
COD	27
SS	45
T-N	11
T-P	1.3

Pollution Analysis of Public Waters



The central government, prefectural governments, and various other organizations have been conducting public water quality surveys regularly at specified stations.

For the major rivers, daily flow measurements have been taken for many years.

From these data, the pollution loads are calculated within each specific basin.

The rivers in Japan have a small drainage area, are short in length, and have very steep gradients that carry the river water quickly to the sea.

As a result, there is a big difference in water flow between wet and dry periods.

Forecast the trend in population and industrial growth



Calculate future generated loads and discharge loads

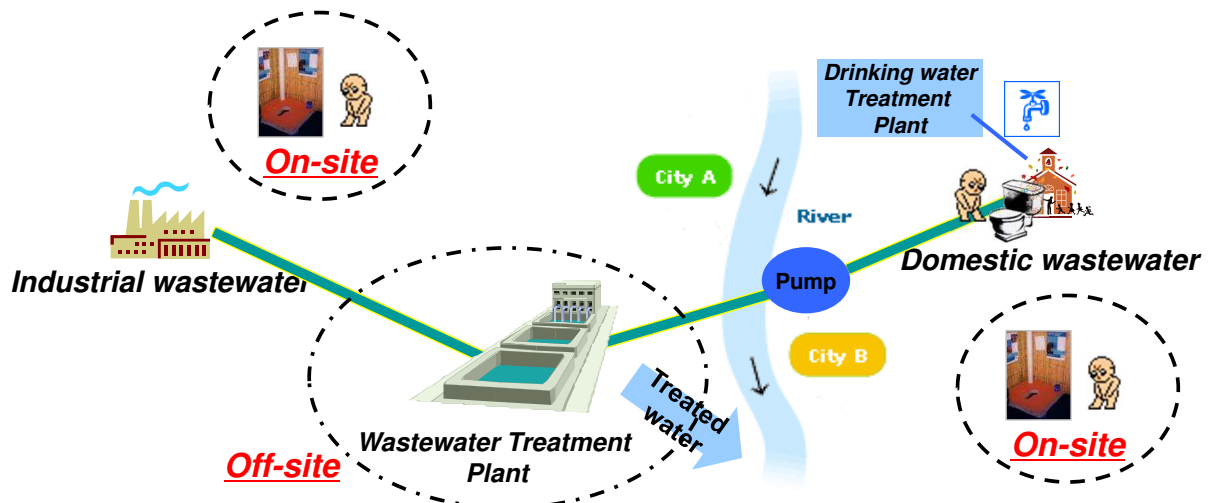


Reduction of loads from domestic wastewater is accomplished by construction of wastewater treatment plants, and reduction of loads from industrial effluents is accomplished by more stringent discharge controls.

Depending on circumstances, planning for future urban development and industrial growth have to be reconsidered.

On-site or Off-site ?

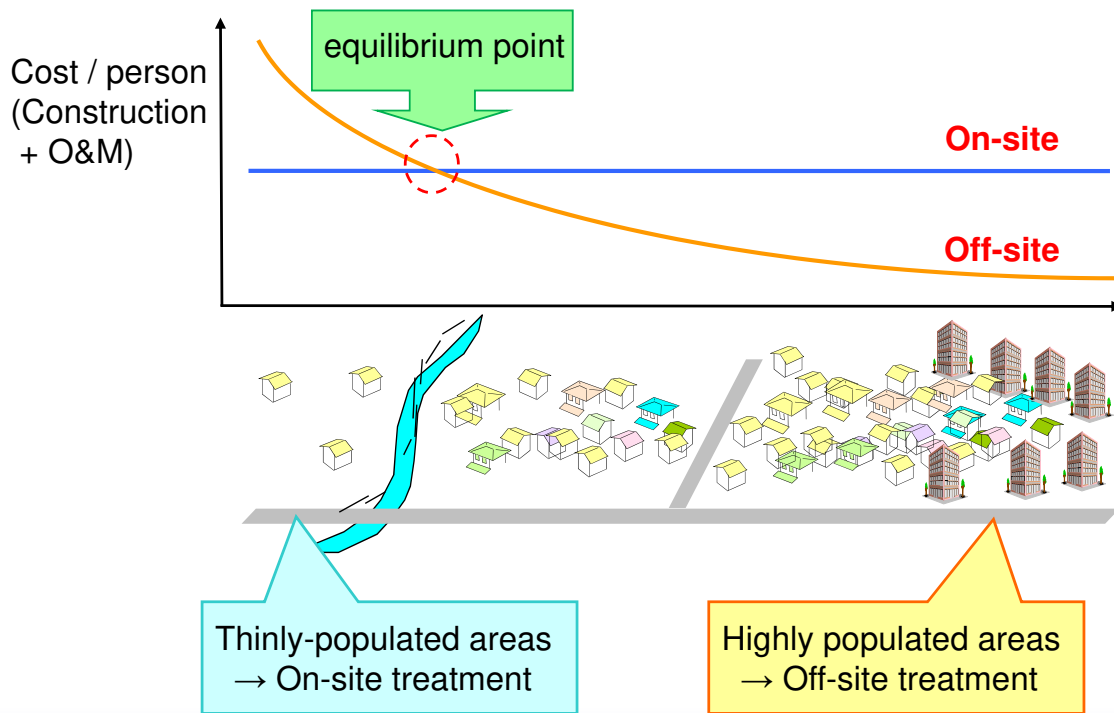
- Location of treatment
 - On-site treatment system
 - Off-site treatment system



On-site or Off-site: Cost comparison



Comparison by construction cost + O&M cost



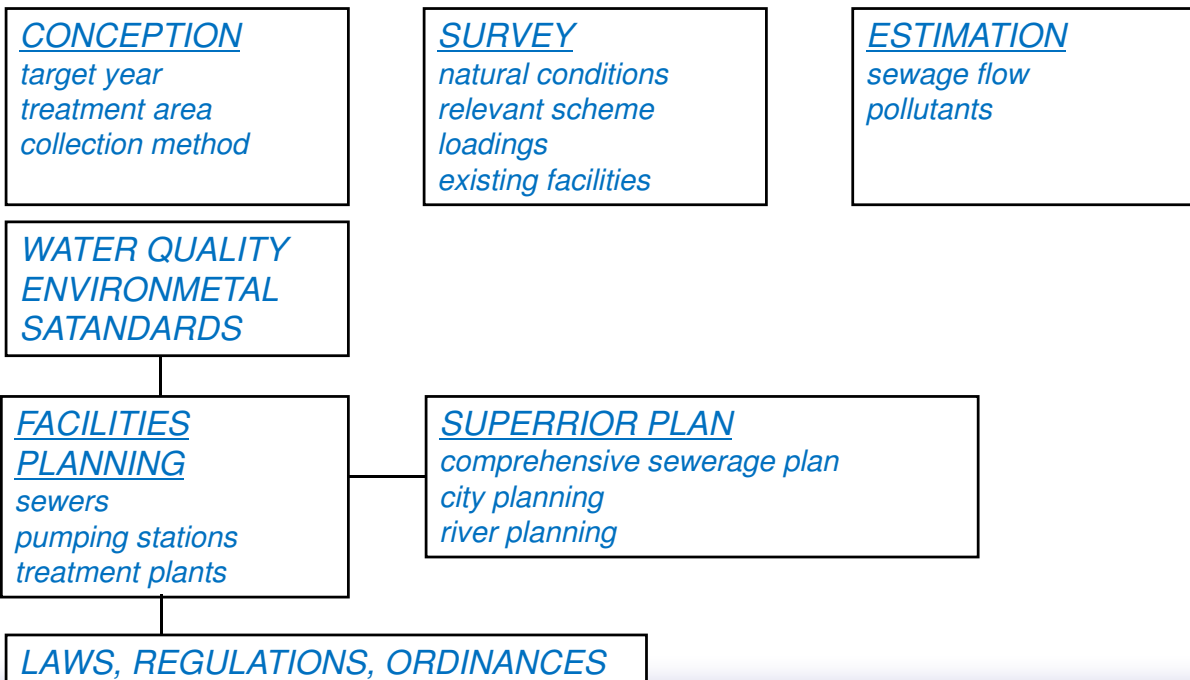
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Fundamentals of sewerage scheme



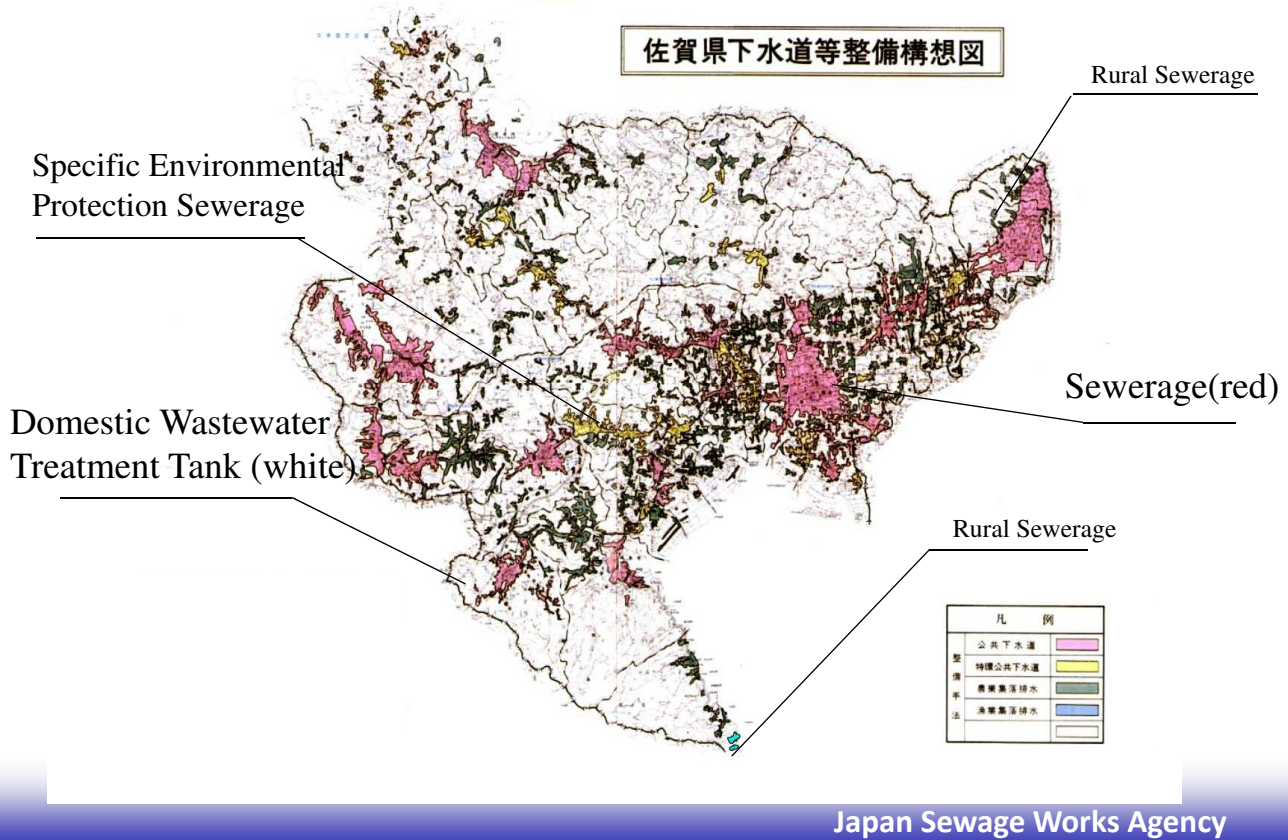
- Sewerage scheme consists of conception, survey, projection, facilities planning, financial examination.



-11-

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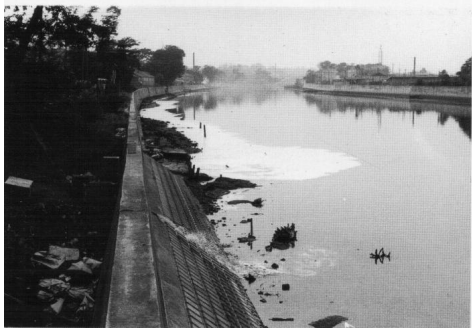
Local Government Plan for Appropriate Wastewater Treatment



Sewerage construction plan



- 1) Study of Alternative Wastewater Treatment Processes
- 2) Costs ; Construction, M&O
- 3) Availability of Site for WTP
- 4) Influences to Rivers; Sewerage System = Bypass of Water
- 5) Reuse of Effluent from WTP
- 6) Wastewater Treatment and Handling & Dispose/Reuse of Sludge
- 7) Opinions and Approval of Municipal Concerned



1960-70's



2000's



Japan Sewage Works Agency (JS)

- Special public institution staked by local governments with national government's support
- Project implementation support for local governments
- Human resource development
- JS has experts of civil, architectural, mechanical, electric and chemical engineering, and business management.
- **Support global wastewater projects**
 - project planning; technology verification;
 - technical support; international standardization