

Water Allocation in Japan

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Introduction

- Japan started to develop toward modern state since 1868 (Meiji Restoration).
- Especially after WWII, Japan had experienced the increase of population, urbanization and industrialization.
- Due to that, water demand for domestic and industrial water had been increased significantly.
- In order to achieve an appropriate water allocation, Japan had developed institutional frameworks of water allocation.

Enactment of the River Law (1896)

- Around 1896, flood control was the biggest concern with regard to river administration.
- In 1896, the River Law was enacted. The main objective of this law was flood control.
- However, provisions regarding river water use were simple. Therefore, uncertainty remained in institutional framework of water use.
- Water right system was provided in the River Law. However, authority of permission for water use belonged to the head of Prefecture.

Change of Situation (before WWII)

- After WWI, demand for hydropower generation increased rapidly. Water utilization had increased.
- Conflict between irrigation sector and other industrial sectors had happened.
- The scheme for construction of dams and weirs was stimulated.
- However, the scheme was discontinued shortly without achieving significant results when the WWII broke out.

Status after WWII

- After WWII, heavy and chemical industry had been developed, and urban area also had been expanded. Water demand had increased significantly.
- Because of the increase of water demand, water allocation became the big issue.
- It is necessary to develop institutional framework of water use.

Ground Water Issue

Ground water...

Good quality and low cost to extract

Therefore

Ground water had been used for municipal use extensively.

As a result

Ground settlement had happened on a nationwide scale around 1960's

In order to prevent ground settlement

Extraction of ground water has been restricted.

Therefore

The expectation for surface water development had been increased.

Reallocation or Construction?

- There are 2 ways for appropriate water allocation in order to deal with the increase of water demand
 - reallocation or construction
- In Japan, water resources development with construction had played a main role in water allocation policy rather than reallocation.
- Because, at that time, most of river water had been already appropriated by irrigation sector.
- Reallocation played a supplementary role.

Necessary tool for water allocation

- Water right system
 - The River Law (revised in 1964)
- Institutional framework of construction of water infrastructure
 - The Electric Power Development Promotion Law (1957)
 - The Specified Multipurpose Dam Law (1957)
- Institutional framework of broad-based plan for water demand-supply.
 - The Water Resources Development Promotion Law (1962)

Water Right System (1/3)

- Water right system with permission is a key tool to allocate water resources appropriately.
- Water right system is provided by the River Law.
- Water right should be granted by river administrators through the permission for river water use.
- In the revised River Law (1964), “One basin, One licenser principle” was provided explicitly.
- On the Other hand, existing water use was approved as customary water right without obtaining permission .

Water Right System (2/3)

Condition of Granting water right

$$\text{[Planned water use]} \leq \text{[Standard drought water discharge (355-day discharge)]} - \text{[Normal discharge (Discharge for vested water rights)]} + \text{[Discharge for maintenance]}$$

Drought water discharge (DWD): the 11th smallest amount of discharge in a certain year

Standard DWD: the least DWD during the recent 10 years

Discharge for maintenance: nearly equal to “Environmental Flow”

Water Right System (3/3)

- In main rivers in Japan, it was usual that there is little room for granting new water right within the standard drought water discharge.
- In order to obtain a new water right, it is necessary to take measures to increase the “standard drought water discharge”.
- In order to do so, it is necessary to construct water infrastructures including multi-purpose dams.



The characteristics of water allocation in Japan
- water allocation with water right system and
construction of water infrastructure

Multipurpose Dams (1/4)

3 Issues related to Multipurpose Dams

- Implementing body of planning, construction and management
 - Water user? Local Government? National Government?
- Coordination among water-related national government because of multipurpose
 - Water-related authorities usually belongs to multiple organizations in National Government
- How to allocate the cost of construction

Authority of water-related organization
(As of 1960)

- Flood Control : Ministry of Construction (MOC)
- Irrigation Water : Ministry of Agriculture, Forestry and Fisheries (MAFF)
- Industrial Water : Ministry of International Trade and Industry (MITI)
- Hydropower Generation: Ministry of International Trade and Industry (MITI)
- Water-supply : Ministry of Health and Welfare (MHW)

Multipurpose Dams (2/4)

The significance of the Electric Power Development Promotion Law (1957)

- River Administrator (MOC) has an authority to construct dams whose purpose is hydropower generation
- It is decided how to allocate the cost of construction consulting the TVA system in the New Deal Policy in USA


Multipurpose Dams (3/4)

The significance of the Specified Multipurpose Dam Law (Enacted in 1957)


- MOC has the responsibility to prepare the basic plan for multipurpose dams, and construct and manage dams in integrated manner.
- In the preparation for basic plan of multipurpose dams, MOC allocate the storage capacity for water users according to user's application.
- In order to finish the preparation of basic plan, MOC must consult with concerned administrative authorities, concerned prefectural government and water users.
- Water users obtain the property right to use the multipurpose dam.

Multipurpose Dams (4/4)

MOC have had both the authority for granting permission for water right and the responsibility related to multi-purpose dams.

That is to say


MOC have allocated developed water resources for water users with granting new water rights.

As a result


Smooth Water Allocation

Basic Plan for Water Resources Development (1/7)

Necessity of prior and broad-based water allocation plan in the large river basins

- In Japan, large basins often include metropolitan areas. In metropolitan areas, the increase of water demand was so significant that water shortages had often happened.
- There was urgent need to develop water resources in such areas. Therefore, it is necessary to develop water resources with predicting the future water demand.
- In large basins, there are a lot of interest oppositions among many stakeholders. Therefore, it is necessary to prepare the plan for water allocation from the broad-based viewpoint.
- There had been urgent need for the plan, so National Government had to play a leading role to prepare it.

Basic Plan for Water Resources Development (2/7)

Defects of the Specified Multipurpose Dam Law

- Basically, this law is not designed for broad-based water resources development
- If water users want to participate in a dam project, they have to make application for MOC.

Therefore



National Government cannot prepare the prior and broad-based plans for water allocation under this law only.

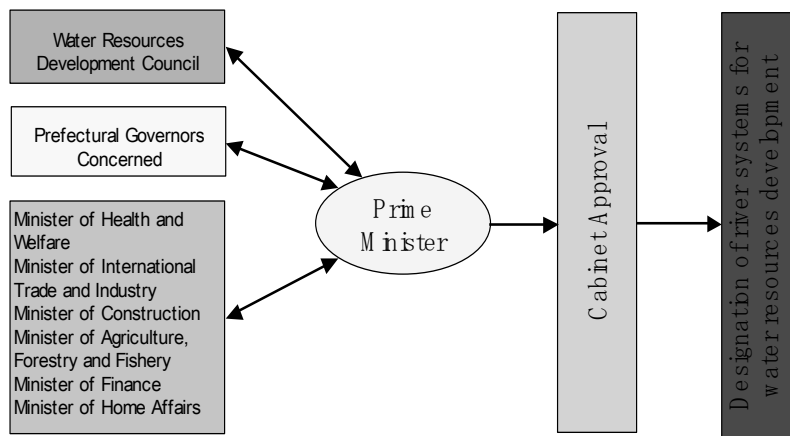
Basic Plan for Water Resources Development (3/7)

The significance of the Water Resources Development Promotion Law (Enacted in 1962)

- Prime Minister shall designate the specific river systems which have a need to take measures for water shortage
- Prime Minister shall decide the Basic Plan for Water Resources Development in the specific river systems based on the explicit plan for water demand and supply.
- In order to finish the preparation of this plan, Prime Minister must consult with the concerned administrative authorities, concerned prefectural governments and Water Resources Development Council.

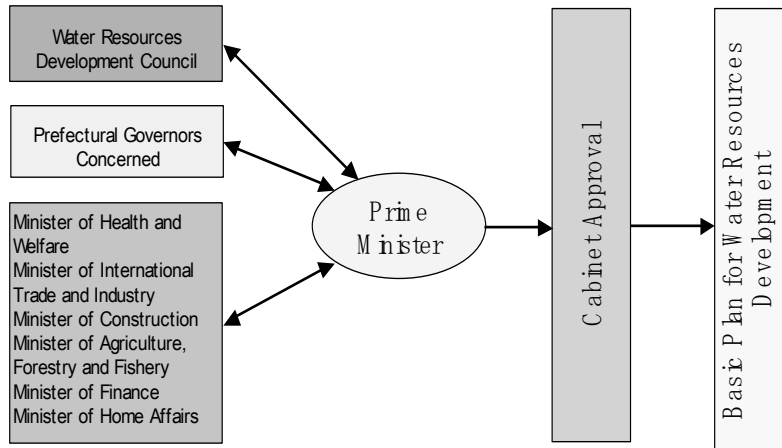
Basic Plan for Water Resources Development (4/7)

Procedural Flow of Designation of River Systems for Water Resources Development

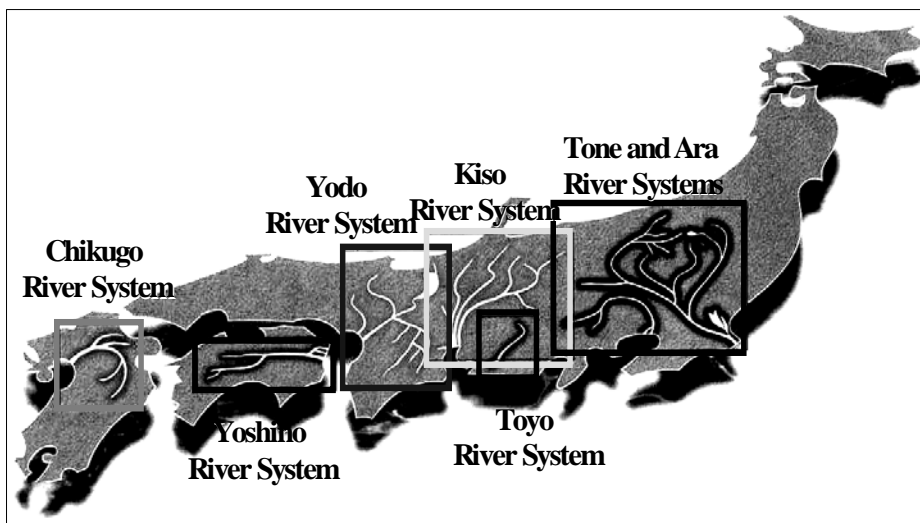


Basic Plan for Water Resources Development (5/7)

Procedural Flow of Preparation for The Basic Plan for Water Resources Development



Designated Seven River Systems



Basic Plan for Water Resources Development (6/7)

In other words...

- In Japan, **National Government played a leading role in preparing plans for water allocation** and construction of water infrastructures in some large basins which include water deficit metropolitan areas.
- This plan is based on the mid-and-long term prediction of water demand and supply within the broad areas across Prefectures.

Basic Plan for Water Resources Development (7/7)

Contribution

- Good plan for mid-and-long term water allocation
- Good plan for positioning of water infrastructures including dams, weirs and canals
- Good coordination among many stakeholders within multiple Prefectures

Current Issues

Issues on unstable water supply because of

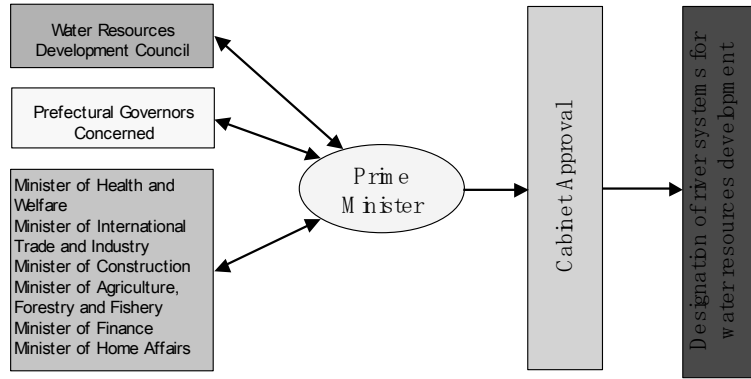
- Long-term trend of temperature change
- Trend of fluctuation between extremely low rainfall and high rainfall year-by-year
- Remarkable trend of smaller precipitation in low rainfall year

Conclusions

- In main rivers in Japan, irrigation use had been so large that there had been little room for granting new water right.
- Construction of water infrastructures including dams had played a main role in water resources development. Furthermore, developed water resources have been allocated with granting permission for river water use by government within the framework of the River Law.
- In addition, in some basins which include water deficit metropolitan area, National Government have played a leading role in preparing plans for mid-and-long term water allocation.

END

Procedural Flow of Designation of River Systems for Water Resources Development



Procedural Flow of Preparation for The Basic Plan for Water Resources Development

