Theme 6
River Management
Managing Land and Water Sustainability

Contents

1. Introduction

Source: Project Research Team

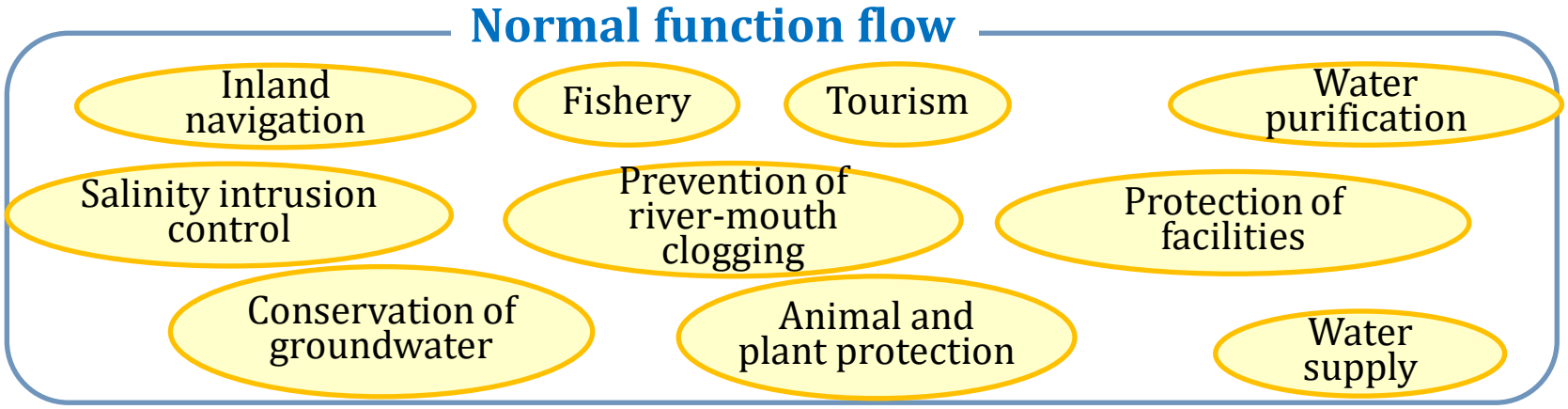
Houses built along river course. These have high risks of flood damage on one hand and hinder the river capacity to carry flood flows on the other hand.

2. Purpose of River Management and Management Entity

(1) Purpose and Administration

In Japan, the purpose of river management is to maintain and improve rivers in an appropriate condition from a wide range of perspectives.

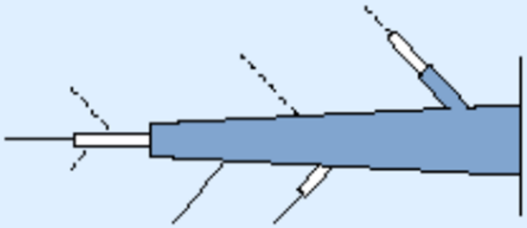
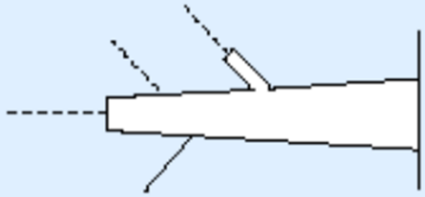
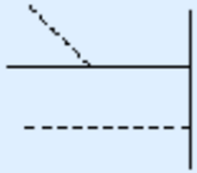
- **Flood Protection**: Prevent disasters caused by floods, tsunamis, storm surges, etc.
- **Use of River**: Use rivers properly and maintain normal function of flowing water.



- **River Environment**: Conserve the river environment.

2. Purpose of River Management and Management Entity

(1) Purpose and Administration

River System	Schematic Diagram	River Classification	Administrator
Class A River System		Class A River System Section Directly Administered by MLIT Designated Sections Provisional Class River Ordinary Rivers	Minister of MLIT Prefectural Governor Head of Municipality Local Public Organizations
Class B River System		Class B River Provisional Class River Ordinary Rivers	Prefectural Governor Head of Municipality Local Public Organizations
Independent River System		Provisional Class River Ordinary Rivers	Head of Municipality Local Public Organizations

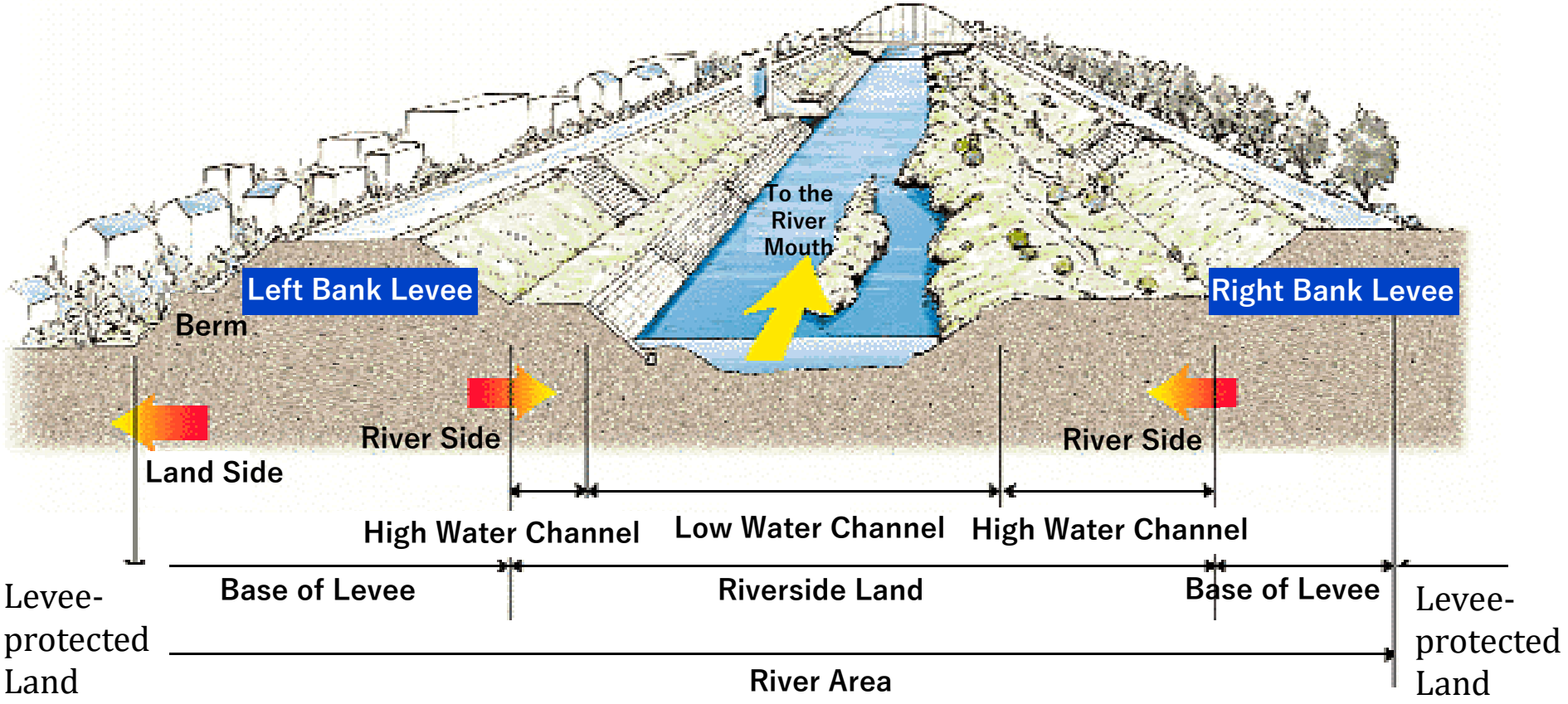
Source: Website of Yamato River Office, Kinki Regional Development Bureau, MLIT

River Management Classification

2. Purpose of River Management and Management Entity

(2) Regulations on River Use

1) River Areas



Source: MLIT

River Area

2. Purpose of River Management and Management Entity

(2) Regulations on River Use

1) River Areas

The River Area is defined as where:

1) river water flows continuously;
2) river management facilities are situated;
3) the land for managing integrally with these areas.

- Permission from the River Administrator is required for certain actions within the River Area.
- The River Administrator in Japan is Minister of MLIT for Class A rivers and Prefecture Governors for Class B rivers.
- The RMOs undertake the river management.

2. Purpose of River Management and Management Entity

(2) Regulations on River Use

2) Actions Requiring Permission

a. New acquisition, change and renewal of water use (occupation of flowing water);
b. Exclusive and continuous use of the river area (occupation of land);
c. Collection of river products such as gravel and wood;
d. Construction and reconstruction of structures such as bridge and weir;
e. Excavation of land;
f. River flow transportation of timbers and passage through navigation lock.

2. Purpose of River Management and Management Entity

(2) Regulations on River Use

3) Occupation of Land in the River Area

Authorized Occupation Activities

- Roads
- Railway
- Infrastructure such as water supply and sewerage pipes, power transmission lines, gas pipelines
- Welfare facilities such as parks and green spaces, golf courses
- Sites for flood protection facilities

Source: Landscape, General Incorporated Association

River Space provided to the public (Kano River)

2. Purpose of River Management and Management Entity

(2) Regulations on River Use

4) Products in River

Source: ISHIGAMIJARI LLC.

Gravel Mining

2. Purpose of River Management and Management Entity

(2) Regulations on River Use

5) Penalty and Enforcement

Source: Keihin River Office, Kanto Regional Development Bureau, MLIT

Removal of Illegally Moored Vessels

2. Purpose of River Management and Management Entity

(3) Management of River Structure

1) River Management Facilities

Source: Fukushima Office of Rivers and National Highways, Tohoku Regional Development Bureau, MLIT

River Management Facilities:

- Dam
- Weir
- Sluice gate
- Levee
- Bank protection
- Groundsill
- Riverine buffer zone

Example of Riverine Buffer Zone as Green Belt

2. Purpose of River Management and Management Entity

(3) Management of River Structure

2) Permitted Structure

- Organizations must obtain permission from the RMO for construction/reconstruction of structures such as bridges and weirs.
- The RMO examines the appropriateness of purpose, technical feasibility, effects/impacts on flood protection, water use and river environment.
- The structures should comply with technical criteria and standards.
- These structures can be used only when it passes the inspection by the RMO.
- The River Law includes "Special Provisions" for Dams to meet strict requirements (Theme 8 Dam Management).

2. Purpose of River Management and Management Entity

(3) Management of River Structure

3) Maintenance

Stipulated in the River Law

River Administrator should maintain and repair the river management facilities to keep these in sound conditions.

Officials of the River Administrators (branch offices of national government and civil engineering offices of prefecture governments) should routinely monitor the River Areas for unusual situation and illegal river use.

2. Purpose of River Management and Management Entity

(4) Disaster Management

Flood Risk

When flood is expected to occur, the **RMO** should:

- set up an alert team and conduct flood-fighting measures;
- announce flood forecast in cooperation with the Meteorological Agency;
- notify the relevant organizations , if the Danger Water Level is exceeded.

Extraordinary Drought

In the event of extraordinary drought:

- Information should be provided to water users to promote mutual coordination among all relevant users.
- If discussions are not converging, necessary mediation should be conducted.

2. Purpose of River Management and Management Entity

(5) Collaboration with Private Sector

Collaboration with the local community is prerequisite for the river management.

Activities of River Collaboration Organizations

Source: MLIT

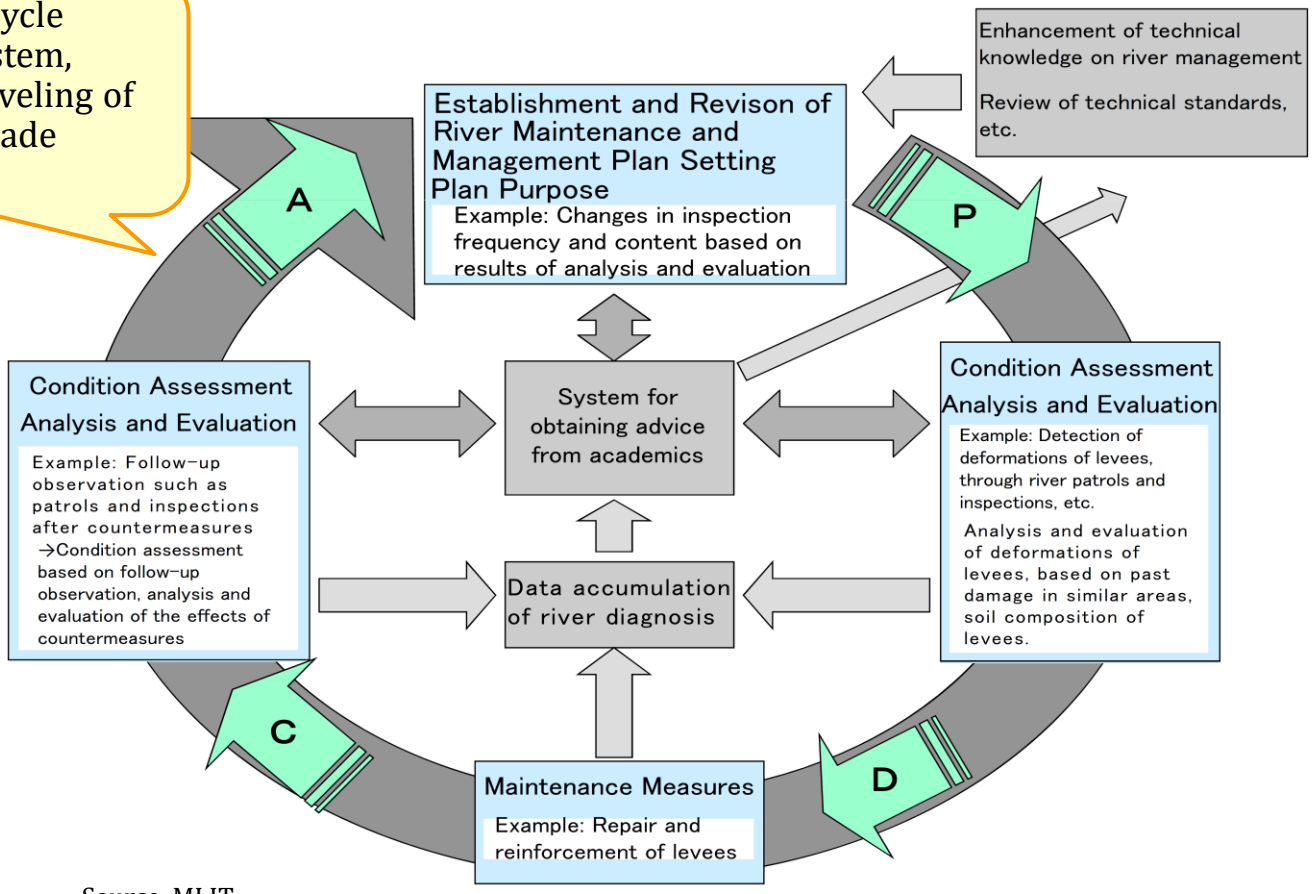
Joint cleaning of channels

Fish investigation

3. New Initiatives

(1) Extending Lifetime of River Management Facilities

With the PDCA cycle maintenance system, reduction and leveling of total costs are made possible



Source: MLIT

Cycle Maintenance and Management System

3. New Initiatives

(2) Collaboration with Relevant Offices

1) Comprehensive Sediment Management Plan

Coast Area
- Development of offshore protection facilities
- Sand recycling, beach nourishment
- Construction of sand jetties (maintenance of navigation channel), maintenance dredging, etc.

Estuary Area
- Maintenance excavation + beach nourishment

The sediment deposited on the estuary sandbar is coarser than that of the marine beach component and is suitable for beach nourishment. On the other hand, maintenance excavation is necessary to prevent inland water damage, and the excavated sediment can be utilized as beach nourishment material.

Erosion Control Area
- Construction of permeable erosion control weirs
- Slitting of existing erosion control weirs
- Maintenance excavation + soil setting

At permeable erosion control weirs, stone removal may be necessary due to sediment deposit, however, from the perspective of effective use of sediment, excavation + soil setting measures should be implemented before stone removal becomes necessary.

River Channel Area
- River channel excavation (river bed disturbance, tree trimming) + soil setting

Excavated soil is placed in the river channel to improve the flow capacity and is discharged downstream by flooding.
As a countermeasure for reforestation in the river channel to secure the cross section area, a part of the reforested sandbar is excavated to induce erosion of the side bank of the sandbar. And by utilizing the excavated soil for soil setting, the beach material is supplied (the figure below is the result of a 6.2k field experiment).

Field experiment of 6.2k Hino River

Dam Area
- Utilization of excavated and dredged dam sediment for soil setting

By excavating and dredging the sediment deposited in the dam reservoir and utilize it for soil setting in the downstream river channel, the sediment can flow away during floods to improve the coarse-grained riverbed.

Run off of setting soil during floods

Source: Chubu Regional Development Bureau, MLIT

Comprehensive Sediment Management Plan for Hino River Erosion Control and Afforestation

8. Lessons Learned (1)

(1) The mechanisms of managing rivers need to be established.

In Japan, the RMO designates river areas that regulate various activities; organizations must obtain permission from the RMO to construct structures and conduct activities. As river water is a public good, water users require RMO permissions; the RMO formulated technical guidelines and standards detailing the permissions process. In Japan, when the prefectural government carried out river management, it was difficult to solve conflicts between upstream and downstream or left and right riverbanks. In response, the management responsibility was altered such that the national government manages major rivers, which is particularly useful for rivers flowing through multiple prefectures.

8. Lessons Learned (2)

(2) River management should adapt to changing social conditions.

As river management becomes more complex with societal development, management goals should be established flexibly. The unique natural conditions in Japan have meant flood protection has consistently been the main focus of river management. The country needs to adapt to effects caused by climate change. Also, sediment management, quality of structure, and leisure activities became more important issues. Restoration of nature requires a long time, and in the worst case, it may be irreversible.

(3) Systematic maintenance is required to ensure long-term quality of river structures.

Systematic maintenance is essentially required to ensure the quality of structures. Therefore, inspections, maintenance, and repairs must be continued at the operation and maintenance stages. These activities extend the longevity of river structures. The use of ICT may also prove to be effective for economic and efficient maintenance.

8. Lessons Learned (3)

(4) Climate change and environmental problems should be addressed through cooperation with communities and inter-governmental coordination.

The frequency and severity of large-scale floods and droughts are increasing worldwide due to climate change. These issues cannot be dealt with solely through using facilities, and river conservation cannot be conducted by the RMO alone. Cooperation with local communities and inter-governmental coordination are essential to cope with these issues; as such, a relevant mechanism should be established.