

THEME 3 FINANCE :
SHARING RESPONSIBILITIES AND
COSTS AMONG STAKEHOLDERS

ABSTRACT

Water resources projects require significant amounts of funding over a long period. Therefore, it is important to legislate medium- to long-term development plans for national water resources and to commit securing a multi-year budget. Additionally, many organizations are involved in water resources management, including not only national and local governments, but also the private sector. National governments could promote the equitable development of national land and water resources by providing financial support to local governments and other organizations.

Moreover, it is necessary to combine various approaches for increasing financial resources. In Japan, a combination of construction bonds, fiscal investment and loan programs, water resources bonds, general funds, and project revenues enabled the construction of facilities to meet the rapid increase in water demand driven by high economic growth. Furthermore, legal mechanisms have been established for water users to share the construction and maintenance costs of facilities.

In Japan, farmers' associations historically manage many small-scale irrigation facilities. These associations collect levies from members to cover the construction, maintenance, and operation costs. Public-private partnerships could finance the management of water supply and sewage facilities. Such public-private partnerships are being expanded in Japan to manage declining financial viability because of the decreasing population.

CHAPTER 1 INTRODUCTION

A combination of various sources of funding is required to finance water resources management projects. In Japan, diverse methods of financing have been established and legislated, including cost allocation among water users (i.e., a subsidy system managed by the national government), special accounts, public bonds, and public-private partnerships (PPPs). In addition, master and long-term plans can demonstrate long-term commitment for financing.

As water resources projects are costly and time-consuming, it is necessary to secure stable and long-term financing sources. Additionally, cost allocation is required to coordinate the many organizations concerned. Further, farmers' associations in Japan manage irrigation facilities and provide sufficient financial resources for operation and maintenance. This theme explains the nature of the legal system used in Japan to secure project financing.

Water resources management is closely related to the Sustainable Development Goals (SDGs), and the relationships between finance and the SDGs are shown in the following box.

Relationships between Finance and the SDGs:

Frameworks facilitating sustainable financing over the long-term such as cost sharing by responsibility and roles as well as the diverse supports and procurement system.

SDG Target 17 "Partnerships for the goals"



CHAPTER 2 FINANCIAL FRAMEWORK OF WATER RESOURCES

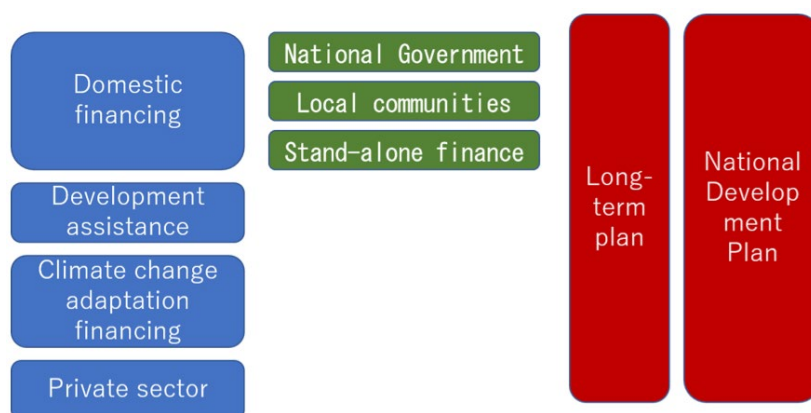
2.1 Legal System

It is necessary to draw up a significant and multiyear budget for financing water resources management. Therefore, the national commitment to financing sources should be secured through legislation of long-term plans and accounts.

(1) Financial Arrangement

The funds used for infrastructure development can be broadly divided into public and private funds. Public funds include, as presented in Figure 2.1: i) budgets of national and local governments; ii) government financing agencies, such as government-affiliated companies, government-affiliated funds, and export credit agencies (ECA); and iii) multilateral development banks (MDBs) such as the World Bank (WB) and Asia Development Bank (ADB). Private funds include iv) bank loans and v) institutional investors for infrastructure funds and project bonds. In recent years, funds such as the Green Climate Fund (GCF) have been established to support developing countries in addressing climate change issues, by providing grants, loans, and equity investments.

In Japan, water resources have been developed under the concept of cost allocation to water users and stakeholders. The government committed to securing long-term financing by associating its national development plan with special accounts dedicated to water resources and flood protection projects. Water supply, sewerage, and industrial water supply projects are mainly implemented by local governments, whereas hydropower generation is primarily implemented by private power companies. Private funds provide project financing for hydropower, water supply and sewerage, and industrial water supply. Specifically, PPPs are expected to stimulate private demand and improve efficiency using private know-how and technology. Nevertheless, such process faces many challenges, such as the low liquidity of assets, the long time required for project implementation, and political and socioeconomic risks. In the case of irrigation water, beneficiaries are required to bear these costs. Since flood protection is a public benefit, it is financed mainly by public funds.



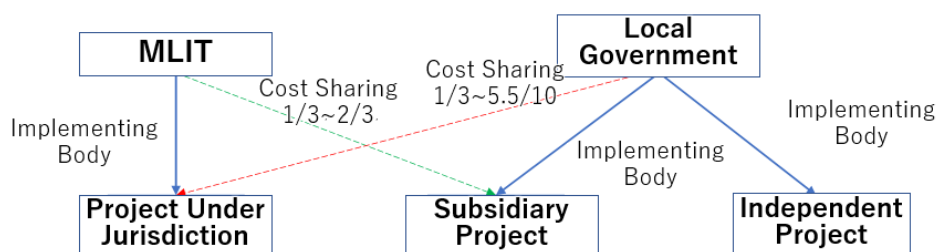
Source: Ishiwatari, M. and Akhilesh S. "Good enough today is not enough tomorrow: Challenges of increasing investments in disaster risk reduction and climate change adaptation." *Progress in Disaster Science 1*

Figure 2.1 Finance for Water Resource Development and Management

(2) Legal System of Cost Allocation for Water Resources Projects in Japan

Public finance plays a significant role in promoting water resources management in Japan. The government budget for public works has been declining from its peak of Japanese Yen (JPY)14.9 trillion in FY1998 to JPY 6.9 trillion¹ in FY2019. This represents approximately 3% of the gross domestic product (GDP). The project costs for flood protection (rivers, sediment disaster management, dams, seacoasts, and sewerage projects) of MLIT were JPY 1,007.4 and 278.1 billion based on the initial and supplementary budgets, respectively, with a total of JPY 1.29 trillion². Of the total costs, the national projects of the MLIT were JPY 1.06 trillion while the subsidy to public works implemented by local governments was JPY 0.23 trillion.

In the case of national projects under the MLIT, prefectural governments bear 1/3 to 5.5/10 of the construction costs (Figure 2.2). Local governments along the river should share some costs because they receive benefits from these works. Local governments claimed that the system forced them to accept an automatic and compulsory burden on national projects in the 2010s. The sharing of maintenance costs was removed in 2011 onward, and the national government has borne such costs thereafter.



Source: Project Research Team

Figure 2.2 Cost Sharing in Projects under the Jurisdiction and Subsidiary Projects

Government-subsidy projects are designed to strengthen infrastructure and improve the national land in a balanced way by financing projects implemented by local governments. The cost sharing among the national and local governments, project owners, and beneficiaries is shown in Table 2.1. In the case of independent projects, the local government bears the cost of the entire project. Subsidies for river works were stipulated under the Old River Law of 1896, by which 1/3 to 2/3 of project costs are covered by the national government's subsidies.

¹ Ministry of Finance

² The Water and Disaster Management Bureau, MLIT (This amount excludes costs for disaster recovery and reconstruction following the Great East Japan Earthquake.)

Table 2.1 Sharing of Project Costs

Purpose	River Type	Cost sharing	Basis
River Management Office (Flood Protection)	Class-A Rivers under the jurisdiction of the National Government	MLIT: 2/3, Prefecture: 1/3	The River Law
	Class-B Rivers under the Control by Prefectural Governments	MLIT: 1/2, Prefecture: 1/2	The River Law
Irrigation		Beneficiaries: 1/10; of the rest, the National Government (Ministry of Agriculture, Forestry, and Fisheries, MAFF): 3/4, Prefectural governments: 1/4	The Specific Multi-Purpose Dams Act
Water Supply		1/2 – 1/3 covered by government subsidies (Ministry of Health, Labor and Welfare, MHLW)	The 877 th Administrative Notice of the Under Secretary of MHLW
Sewerage		Public Sewerage : Main Culverts: 1/2, Final treatment plant: 1/2 or 5.5/10 Basin Sewerage : Main Culverts: 1/2, Final treatment plant: 1/2 or 2/3)	The Sewerage Act Enforcement Order
Industrial Water Supply		Government subsidies cover up to 40% (Ministry of Economy, Trade, and Industry, METI)	Guidelines for Granting Subsidies for Industrial Waterworks Projects
Power Generation		Costs are borne by the power company (the company collects charges from consumers).	

Source: The River Law, Specific Multi-Purpose Dams Act, excerpts from "Japanese River, MLIT"

(3) History of Financial Systems

Local governments and communities historically executed flood-protection projects. During modernization in the 19th century, in 1896, with the enactment of the old River Law, the national government initiated national projects for flood protection in major rivers. After the great flood of 1910, the first flood protection plan was formulated for 20 rivers throughout Japan, which included improvement costs over 18 years. To ensure reliable implementation of the plan, a special account was set up according to the Flood Protection Special Accounting Act in 1911. This special account³ was separated from the national general budget and financed by the general national account, local governments, and postal banking loans. The second flood protection plan was formulated in 1921, and the third in 1933 (Theme 2-1: Development Plan, Chapter 2).

The Agricultural Land Improvement Act of 1899 promoted agricultural investment, including the establishment of agricultural financing institutions. In 1906, under the Land Improvement and Encouragement Finance Regulations, the national government began subsidizing prefectural expenses

³ In general, special accounts clarify the status of specific projects and fund management by handling specific revenue and spending, separately from the general national account.

for survey, design, and construction supervision. In 1908, the national government initiated individual land improvement projects in each prefecture.

Following the legislation of the Electricity Business Act in 1911, water resources were developed for hydropower generation, in addition to conventional irrigation use. The national government proposed a river water control project for storing flood water in reservoirs and utilizing them for power generation. Subsidies for this project type began in 1940. Afterwards, the comprehensive river development project began with the Specific Multi-Purpose Dams Act in 1957. Projects for flood protection and irrigation are financed by public budgets shared at a ratio of 2:1 between the national government and prefectural governments, while for power generation are financed by electric companies.

After the devastating floods caused by the Isewan Typhoon (also known as Typhoon Vera) in 1959, Japan established mechanisms to implement projects based on long-term commitments. The Act on Sabo and Flood Protection Emergency Measures was legislated in 1962 to formulate a long-term investment plan for flood protection. Consequently, a special account for flood protection was established for long-term finance.

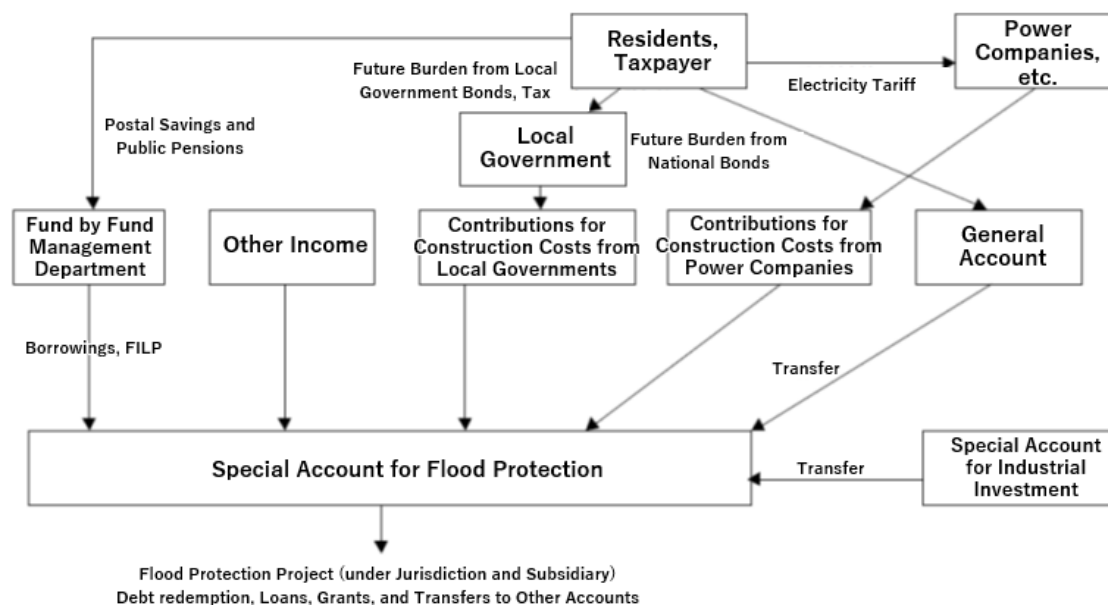
Furthermore, the national government formulated plans for the comprehensive development and management of water resources in river basins that are important for national management (Theme 2-1: Management Planning, Chapter 3). In the 1960s, to meet the rapidly increasing demand for water driven by the high economic growth, the old River Law, which focused on flood protection, was revised in 1964 to the new River Law that includes provisions for water development (Theme 1-1: Legislation and Organization, Chapter 2). In 1961, the Water Resources Development Promotion Act and Water Resources Development Corporation Act were legislated. This institutionalized long-term investment in developing water resources.

2.2 Framework of Diverse Funding

Water resources management requires considerable amounts of funds financed by diverse schemes, such as subsidies, special accounts, government bonds, and fiscal investment and loan programs.
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(1) Special Accounts

The special account for flood protection is independent of the general account revenue and expenditure. It was introduced to ensure a stable source of revenue for flood protection projects that require long-term investment regardless of the yearly availability of national finance. It greatly contributed to the implementation of flood protection and multi-purpose dam projects driven by high economic growth. As shown in Figure 2.3, the special account for flood protection was funded by transfers from the general account, local governments, and power companies, as well as borrowing from loans.



Source: "Problems of Flood Protection Projects and Flood Protection Policy" (Toshiyuki Kamimura, Toyo University)

Figure 2.3 Revenue Sources of the Special Account for Flood Protection

Owing to the tight situation of public finance in the 2000s in Japan, national spending was under scrutiny. The mass media and public claimed that special accounts with independent revenue sources promote projects inefficiently. In particular, the following issues have been raised: i) limited accountability, ii) inefficient project implementation, iii) unused or carried-over funds, and vi) incomplete monitoring. Under the Administrative Reform Promotion Act, which aimed to improve the efficiency of public administration, a special account for flood protection was integrated in 2008 with other special accounts into the special account for social infrastructure promotion projects. Further, the special account for social infrastructure promotion projects was abolished and included in the general national account.⁴

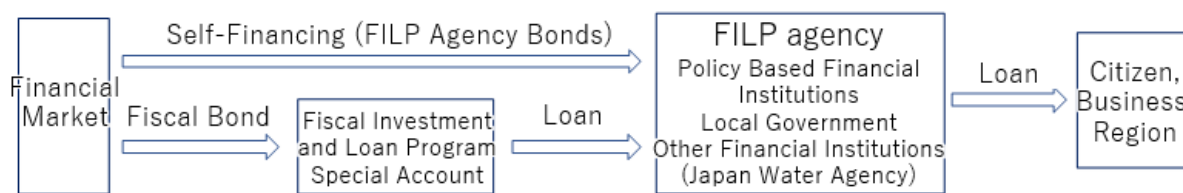
(2) Government Bonds for Construction

Public works are financed by issuing government bonds or by borrowing. As future generations will also benefit from public facilities, they should bear the costs as well. Government bonds for construction are issued within the amounts decided by the National Diet.

(3) Fiscal Investment and Loan Program (FILP)

The FILP is financed by funds raised through government credit or by issuing FILP bonds (government bonds). It is managed independently without relying on taxation. Additionally, it facilitates long-term, fixed, and low-interest financing as well as the implementation of large-scale and long-term projects, which cannot be carried out by the private sector alone. Originally, this program was financed by postal banking and pension funds. It was called "the second budget" because of its role in complementing the general account budget funded by taxes and government bonds. Figure 2.4 presents the FILP system.

⁴ References: "Review of Special Accounts" (2003, Council on Fiscal System, etc.), "Key Policies for Administrative Reform" (2005, Cabinet Decision), "Review of the Special Account System long used" (2013, Budget Committee Research Office, Masakatsu Mikado), and "Special Account Guidebook" (2018, Main Account Bureau, Ministry of Finance)



Source: Prepared by simplifying " Structure of Fiscal Investment and Loan Program" by the Ministry of Finance.

Figure 2.4 The FILP Framework

(4) Charges for Use of River Water (Water Rights Fees)

Prefectural governments collect charges for river water use. These charges are exempted for use in domestic water supply, public power generation, and irrigation. Most of these charges are collected from private companies operating in the areas of power generation and industrial water supply (Theme 1-2: Water Rights, Section 3.3).

(5) Subsidies for Urgent Disaster Rehabilitation Works

Japan repeatedly suffered from typhoons and earthquakes in the 1940s and 1950s. Thousands of lives were lost almost every year, and assets and properties were seriously damaged. Disasters are unpredictable and often impose a significant financial burden on local governments.

The Act on Subsidies for Disaster Rehabilitation of Public Infrastructure was enacted in 1951 to support local governments. That is, the national government provides local governments with more than two-thirds of the total rehabilitation costs. The share of rehabilitation costs by local governments is determined based on their financial capacities. Furthermore, the national government covers debts of local bonds that are issued for local expenses. Consequently, local governments eventually bear only 1.7% of the project costs. In case of extremely severe disasters, the national government increases the support to the local governments by 10-20% of the project costs.

This scheme has the following characteristics:

- 1) It covers various public facilities of rivers, coasts, landslide protection, roads, ports, fishery ports, sewerage, and parks.
- 2) It assesses project costs immediately after disasters and promptly secures supplementary budgets.
- 3) It helps starting work promptly, often on the day of the disaster, before cost estimation by providing subsidies retroactively.
- 4) It aims at functional rehabilitation, and not necessarily reviving the original forms.
- 5) It provides a package budget to each prefecture covering all rehabilitation works so that prefectural governments have flexibility in project implementation.

(6) Farmers' Responsibilities for Irrigation Facilities

Farmer associations historically manage irrigation facilities in Japan. These associations are responsible for the construction of irrigation and drainage facilities, development of agricultural land, and their maintenance. An agreement by two-thirds of the relevant farmers is required to launch projects. Farmers

benefiting from the projects join the farmers' association, pay the cost (levy), and provide compulsory labor services (Theme 1-2: Water Rights, Chapter 6). The levy is set independently by each farmer's association (Table 2.2).

Cost sharing for projects differs according to project classification, which is determined by project features, scale, and scope (Table 2.3, 2.4). The national government's management of projects aims at developing a nationwide food supply or fundamental facilities covering a wide region, while prefectural or municipal management projects promote local agriculture. Disaster prevention projects for agricultural land do not involve local burdens. Moreover, the national and prefectural governments contribute subsidies for large-scale repairs and improvements (Table 2.5).

Table 2.2 Levy examples (The Government-Managed Farmers' Association of Lake Inba)

Type	Unit Levy (per 10a)	Purpose of Use
Ordinary levy	Irrigation and drainage area: paddy: JPY 3,950; field: JPY 1,316. Area only for drainage: paddy: JPY 1,316; field: JPY 438	Management costs of the agricultural irrigation area (district) and association (farmers' association), savings, maintenance and operation costs of common facilities, etc.
Maintenance and management levy	Depending on the sub-district, JPY 3,100 to JPY 7,000 (paddy) (1/3 of the above for fields)	Repair, electricity, and management costs for facilities in the sub-district. Contributions for facilities managed by the prefecture, etc.

Source: Midori Net Lake Inba Website

Table 2.3 Example of Cost Sharing Ratio for Land Improvement Projects

Projects Classification	National Government	Prefectural Government	Municipal Government	Local
National Projects for Irrigation and Drainage	75	25	5	0
Prefectural Projects for Irrigation and Drainage	50	25	10	15
Prefectural Projects for Farmland-Disaster Prevention (maintenance of ponds, etc.)	55	37	8	0

Source: Guidelines for the share of Local Governments in National and Prefectural Projects for Land Improvement

Table 2.4 Management of the Farmers' Association by Scale

Project Type	Beneficiary Area (ha)	Management Entity
National Project	More than 3,000 (paddy) 1,000 (field)	The national government can transfer the rights for management to the farmers' association and municipalities Direct control by the national government helps in management when the facility is large and requires specialized management, or when beneficiary areas extend to two or more prefectures and requires water use coordination.
Prefectural Project	More than 200 (paddy) 100 (field)	The management is transferred to the farmers' association, unions of the farmers' association, agricultural cooperatives, prefectures, or municipalities.
Group Project	More than 5 (paddy)	The project owner directly manages the system.

Source: Ministry of Agriculture, Forestry and Fisheries, Japan Water Agency, Experience in Water Resources Development and Management in Japan

Table 2.5 Improvement Projects: Example of Responsibility Ratio for Repair Works

Project	Implementing Agency	Nation	Prefecture	Municipality	Local
Improvement Project of Water-Utilization Facility	Prefecture	50	25	10	15
	Farmers' Association, etc.	50	15	35	

Note: For prefectural projects, the total project cost per district is JPY 50 million or more, and the project cost per facility is generally JPY 100 million or more; for group projects, the total project cost per district is JPY 30 million or more, and the project cost per facility is JPY 2 million or more.

Source: Miyagi Prefecture data

(7) Public-Private Partnership for Water Supply and Sewerage Services

The risks of water leakage accidents are increasing in Japan due to the aging of water supply facilities and delays in adapting to seismic standards. Additionally, the business circumstances for water utilities are worsening due to declining and aging populations. To facilitate efficient management by utilizing the knowhow of the private sector, local governments has adopted the PPP. Hiroshima Prefecture established “Water Future Hiroshima Co.” as a public-private joint venture (investment ratio: 35% by the prefecture and 65% by Water Co.), which achieved i) efficient management of facilities , ii) securing the assistance of a group of professionals, and iii) strengthening the facility-management system and research and development of high value-added technologies by introducing Information and communications technologies (ICTs). Specifically, the private sector is involved in the management of more than 90% of sewage treatment facilities. There are four types of PPP, as shown in Table 2.6.

Table 2.6 Types and Number of PPP for Water Supply and Sewerage Services

Type	Details of Privatization	Water Supply	Sewerage
Business Outsourcing	Part of and full outsourcing of the entire operation and management of the water treatment plant. Water utilities can benefit from the technical capabilities of the private sector in operations that require specialized knowledge. Further, efficient business operations are facilitated by private companies. Usually, the contracts are for three to five years.	1,845 locations (655 water utilities)	Package outsourcing: Sewage treatment plants: 531 locations Pumping stations: 893 locations Piping facilities: 38 contracts Total: 272 organizations Designated administrator system⁵: Sewage treatment plants: 62 locations Pumping stations: 81 locations Piping facilities: 33 contracts Total: 20 organizations
DB or DBO method	Performance-based contracts, which allow the private sector to utilize its knowhow. This results in more efficient operations compared to normal outsourcing. contracts for 5 to 20 years.	7 locations (8 water utilities)	Sewage treatment plants: 25 contracts Pumping stations: 1 contract Piping facilities: no contract Total: 23 organizations
PFI (conventional method)	Outsourcing to the private sector including financing with contracts for 5 to 20 years. The method of payment is specified in the contract, which was introduced by the revised Water Supply Act in 2011.	12 locations (8 water utilities)	Sewage treatment plants: 10 contracts Pumping stations: 0 contract Piping facilities: 1 contract Total: 8 organizations
PFI (concession method)	Private contractors can participate in business management including setting charge rates flexibly within a certain range.	No cases (2 companies are in preparation.)	Sewage treatment plants: 2 contracts Pumping stations: 1 contract Piping facilities: 1 contract Total: 2 organizations

Source: The Fourth Public-Private Partnership Promotion Council Meeting in 2019, "Public-Private Partnership in the Waterworks Business," Ministry of Health, Labor, and Welfare; "Study Group on the Implementation Status of Relevant Projects in the Sewerage Sector in Each Prefecture (Visualization Map of Public-Private Partnership) [April 2018 Edition]," MLIT, June 8, 2021

(8) Cost Bearing by the Private Sector

Urban development reduces the ground surface area for rainfall infiltration, accelerates the outflow to the river, increases flood flow, and lowers the groundwater level. In addition to river and sewerage improvement works, it is important to restrain rainwater from immediately outflowing to the river by constructing rainwater storing and infiltration facilities (Theme 5: Urban Water Management, Chapter 4). To promote water storage and infiltration facilities, the local governments can require the private sector to construct the facilities, provide subsidies for facility construction, and exempt taxes to reduce the maintenance and management costs. In recent years, water-related disasters have caused severe damage nationwide in Japan. Water disasters may become more frequent and severe as extreme rainfall increases owing to climate change. Thus, it is required to shift to "River Basin Disaster Resilience and

⁵ Outsourcing of the management of public facilities to a private operator includes operation, maintenance, repair, and cleaning, but excludes the cases of exercising public authority such as compulsory collection of charges.

Sustainability by all” in which all parties involved in the basin, that is, the national government, local governments, private sector, and residents jointly implement countermeasures (Theme 2-1: Management Planning, Chapter 4).

CHAPTER 3 COST ALLOCATION IN WATER RESOURCES DEVELOPMENT

It is possible to promote water resources development by defining the cost allocation among users.

(1) Cost Allocation by the Specific Multi-Purpose Dams Act

An act⁶ stipulates methods for cost allocation, which is calculated by the “Separable Costs Alternative Appropriate Expending Method” established in 1966. This procedure is based on i) the increase in construction costs if a new user adds one certain purpose, and ii) the facility cost if constructed solely for that single purpose. The river management offices bear the costs for flood protection as well as for maintaining river flow, securing a stable water supply to users with existing water rights (Theme 2-2: River Basin Planning, Chapter 2).

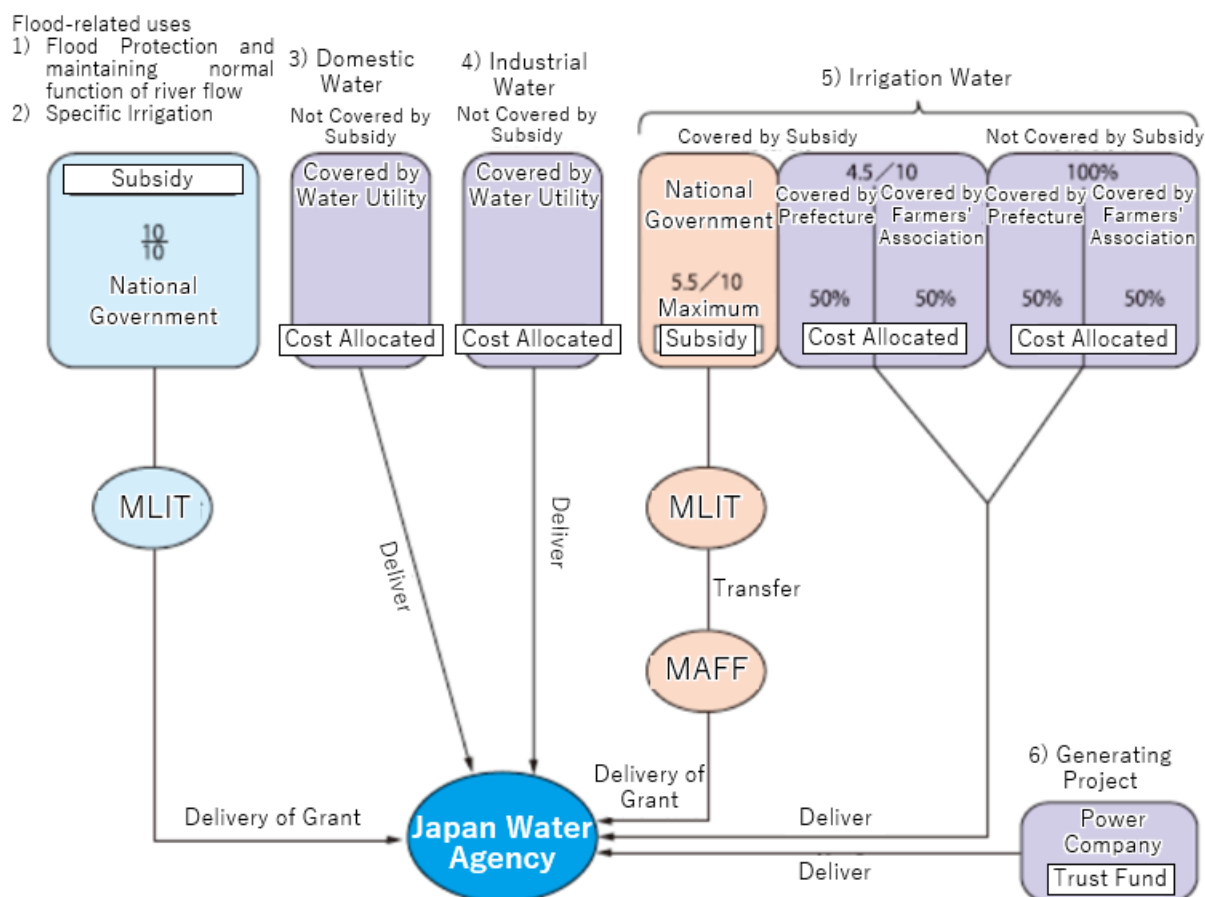
(2) Public Finance and Advanced Investment

The Water Resources Development Public Corporation (WRDPC) (currently, the Japan Water Agency (JWA)) uses the FILP system for investment in multipurpose dams. This helps water users with a weak financial base join the projects. The WRDPC receives long-term loans from the FILP or issues water resources development bonds to manage construction costs. Upon completion of construction work, WRDPC can recover funds from local governments and beneficiaries. In addition, WRDPC can construct dams prior to the decision regarding water allocation among water users. To meet the rapidly growing water demand driven by high economic growth, urgent dam construction is needed for flood protection and providing sufficient water supply. For example, the right for domestic water supply in Muroo Dam was initially not identified, but the local government of Nara Prefecture decided to use the volume after the completion of the construction. The dam has a storage capacity of 14.3 million m³, of which a volume of 6.45 million m³ of the capacity is allocated for domestic water use.

(3) Allocation of Maintenance Costs

Each water user bears maintenance costs based on the allocation ratio adopted for the construction cost. Cost allocation is determined by including the amount based on grants and subsidies by the national and local governments. Figure 3.1 shows an example of a dam managed by the JWA. The national government bears 100% of the cost for flood protection and maintenance of the normal function of river flow, with no cost borne by the local government. The beneficiaries bear the cost of water use through the water utility. Further, the national government provides subsidies of 55% for irrigation water use (subsidized projects).

⁶ Specific Multi-Purpose Dams Act of 1957

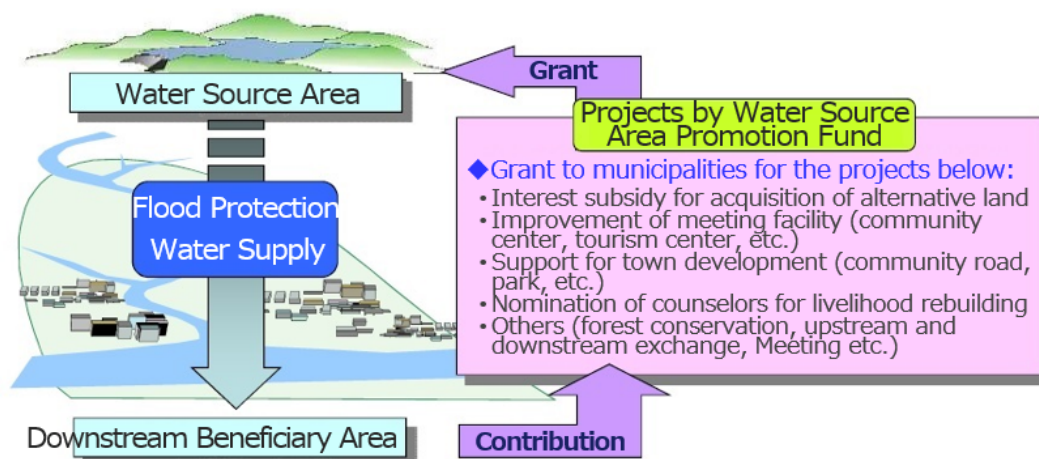


Source: JWA, Task Overview 2020

Figure 3.1 Cost Allocation for Management of Multipurpose Dams Managed by the JWA

(4) Support to Communities affected by Large-scale Projects

Social and economic inequity between upstream and downstream areas is a significant challenge in water resources development. While downstream beneficiary areas are more developed owing to the construction of dams, water source areas may experience depopulation and financial deterioration due to the disappearance of communities, loss of socioeconomic infrastructure, and aggravated public finance. To support the reconstruction of local communities submerged by the construction of dams, various financial sources are provided, including projects for developing water source areas, such as funds raised by beneficiaries, water resources taxes, and the introduction of taxes for water source areas (Figure 3.2) (Theme 9: Environmental and Social Consideration in Large-Scale Projects, Chapter 2).



Source: Japan Water Resources 2014 Ver.

Figure 3.2 Overview of Water-Source-Area Promotion Fund

CHAPTER 4 LESSONS LEARNED

- (1) **To secure sustainable budgeting over a long construction period, a legal framework should be established.** Water resources management often involves large-scale construction projects that require considerable budgets and long construction periods. Thus, it is necessary to secure stable budgeting regardless of the nation's short-term economic and financial situation. In Japan, the development plan was established through legislation, and the budget was secured via measures such as the special account for flood protection.
- (2) **Diverse mechanisms should be established to increase financial resources.** Water resources development involves various stakeholders, including the national and local governments as well as the private sector. Fiscal frameworks such as special accounts, construction bonds, subsidies, and loan programs contributed to the development of water resources to meet the rapidly growing water demand driven by high economic growth in Japan. To provide loans to local governments and organizations that have difficulty managing construction costs in a lump sum, Japan introduced a system of loans program (i.e., FILP) and water resources development bonds. These local governments repay the loans after the completion of projects.
- (3) **To implement water resources development involving multiple water users, a cost-allocation system should be established.** It is difficult to determine the cost allocation for each project through negotiating among stakeholders, including water users. In Japan, an act clarifies the method of cost allocation and the division of roles among water users.
- (4) **PPPs can improve water management.** Since Japan is facing difficulties in managing water facilities because of its aging and decreasing population, the government introduced PPPs to improve financial and technical situations using the technical know-how of the private sector.
- (5) **Beneficiary farmers should pay levies and provide compulsory worker services to develop and manage irrigation facilities.** Farmers' associations historically play a significant role in developing and maintaining water sources and water utilization facilities in Japan. These associations require their member farmers to pay a levy or engage in compulsory labor services.