

THE IMPACT OF DAM DEVELOPMENT

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1 Need for reservoir area development in Japan

The number of dams in Japan increased year by year. The dams in the management phase placed under the direct jurisdiction of the Ministry of Construction (MOC) numbered 471 in 2003, an increase by 119 in the decade since 1993.

The total reservoir area is approximately 90,000 km², occupying about 20% of Japan. The reservoir area is certainly expected to increase further with the future progress of dam projects.

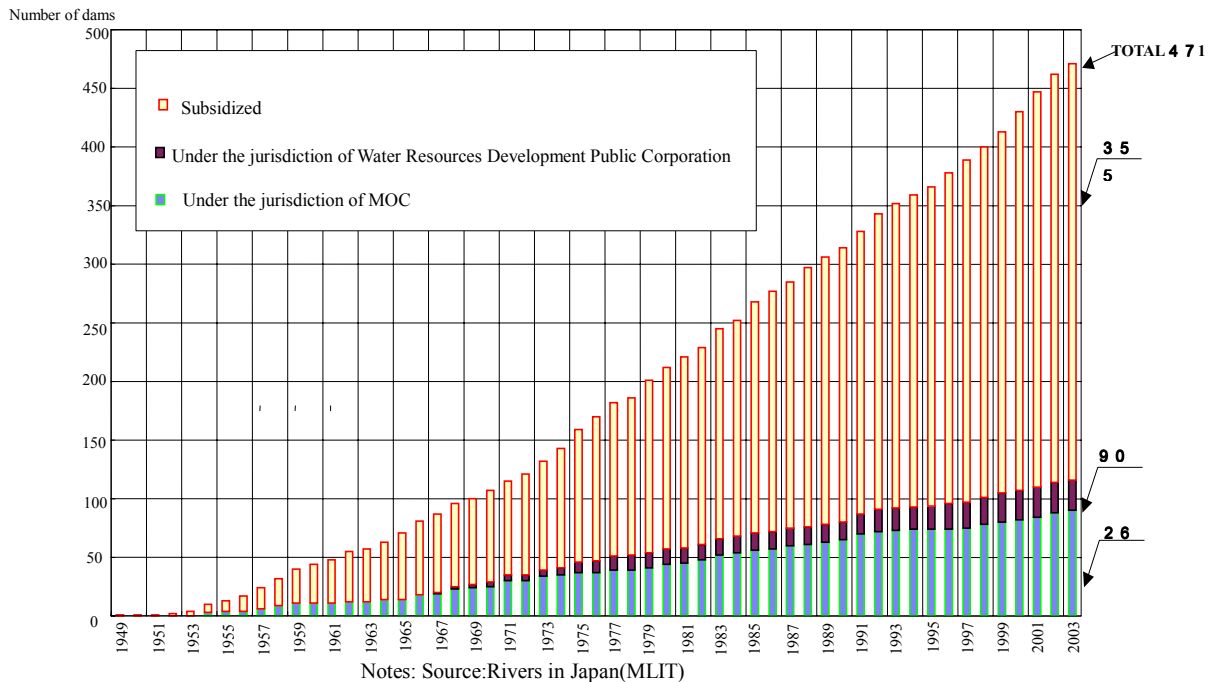


Figure. 1 Trend of numbers of dam in Japan

Dam construction requires a wide project area in a limited mountainous region, so it has a great impact on the area around the dam site and may involve the following problems.

- Community as a basis of life in the area surrounding the submerged area is often lost.
- There may be public concern about the reconstruction of lives because of difficulty in finding land for resettlement and in securing employment opportunities in the limited mountainous area.
- The benefits of the dam for controlling floods and using water are enjoyed only by the downstream residents, so reservoir area residents firmly complain about the unfair advantage taken by the people in downstream areas.

The problems have been becoming outstanding with the recent decrease of appropriate dam sites and social and economic changes, and making a big roadblock to the promotion of dam construction.

Then, there emerge the needs during dam construction for reconstructing the lives of residents in the area to be submerged, developing the basis for life in the reservoir area and encouraging closer mutual relationships between the people in the downstream and upstream areas. Measures to meet such needs are collectively referred to as reservoir area development.

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2 History of reservoir area development

In Japan, compensation played a central role in the reconstruction of lives of reservoir area residents to be relocated, in the early stages of dam construction. The Act on Special Measures for the Reservoir Area Development was established in 1973 based on the recognition of the importance of the reservoir area development to dam construction.

The reservoir area development measures that are difficult for dam project owners to attend are presently taken by the fund for reservoir area development staffed with the members of the local municipalities that control the reservoir area and the areas that enjoy the benefits of dam construction.

<History of reservoir area development measures>

1960s

- Requests were voiced from various quarters for reservoir area development during dam construction. The 1961 Water Resources Development Promotion Act gave considerations to reservoir areas and fair compensation.

1970s

- The public made strong protests against the construction of large dams everywhere. Hot discussions were made about the need of reservoir area development. The Act on Special Measures for the Reservoir Area Development was established, which stipulated that the national government should share more cost of special projects, that part of the project cost should be paid by the beneficiaries and that measures should be taken to help those to be relocated reconstruct their lives.
- Funds for reservoir area development were established for major rivers to support regional development including loans for acquiring real estates to reconstruct life for residents in reservoir areas. Such support was not stipulated in the Act on Special Measures for the Reservoir Area Development.

Table. 1 Legal measures related to reservoir area development

Year	Legal measures related to reservoir area development
1957	[Specified Multipurpose Dam Act]
1961	[Water Resources Development Promotion Act] [Water Resources Development Public Corporation Act]
1964	[New River Law]
1967	[Standard Regulations on Public Compensation for Losses by Public Works Projects]
1973	[Act on Special Measures for the Reservoir Area Development]
1974	[Law on the Development of Areas Adjacent to Electric Generating Facilities] [Law on Special Accounts for Electric Power Development Promotion] [Electric Power Development Promotion Tax Law]
1976	[Establishment of funds for reservoir area development in the Tone and Area River Systems]
1997	Revision of [River Law][

3 Outline of reservoir area development

This section describes the main pillars of reservoir area development in Japan: compensation, Act on Special Measures for the Reservoir Area Development, three laws concerning the electric power development and funds for reservoir area development.

1) Enhancement of land compensation

-General compensation

At the core of the measures for reconstructing the lives of residents to be relocated due to dam construction lies the compensation given by the project owner. In Japan, compensation has been offered based on the Manual for Standard Regulations on Compensation for Losses by the Acquisition of Land for Public Purposes that was approved at a cabinet meeting on June 29, 1962 and the Manual for Standard Regulations on Public Compensation for Losses by Public Works Projects approved at a cabinet meeting on February 21, 1967. The range of compensation, types of compensation and methods for calculating compensation have been uniformly defined.

Major types of compensation based on the manuals are listed below.

- (1) Compensation for land
- (2) Compensation for buildings and other structures
- (3) Compensation for trees
- (4) Compensation for ordinary cost (e.g. cost of temporary homes and compensation for business losses)
- (5) Other ordinary compensation (e.g. compensation for natural resources and local specialities)

-Preparation of resettlement sites

Resettlement sites for the residents to be relocated to reconstruct their lives are prepared by the project owner or local municipality in various patterns described below. Land is acquired and developed according to the conditions surrounding the dam.

1. The project owner develops land and sells it in lots or offers a land-for-land package
2. The local municipality acquires land, the project owner develops it, and the municipality sells it in lots.
3. The local municipality acquires and develops land, and sells it in lots.
4. The project owner or local municipality helps the residents seek resettlement sites.

-Public compensation

Public compensation is granted to reimburse the local municipality's cost of constructing a substitute for a public facility that needs to be closed or terminate its operation due to the implementation of a public works project. Public compensation is applicable to public facilities and other facilities that are installed or managed by a rural community or other regional organization and are considered equivalent to public facilities.

Where considered rational by legal regulations or from technical or economic viewpoint, the project owner can offer in-kind compensation such as the construction of a substitute facility.

2) Legal system development for reconstruction of lives

-Outline of Act on Special Measures for the Reservoir Area Development

The Act on Special Measures for the Reservoir Area Development (Law No. 118. Effective date: October 17, 1973) was established to promote dam projects by improving the living environment and industrial infrastructure and ensuring stable lives for residents in the area suffering drastic changes in fundamental conditions due to the construction of a dam or a facility for regulating lake water level. The Act aims at mitigating the effects of dam construction on the reservoir area. The major benefits provided by the Act are described below.

- (i) Preferential adoption of a nationally subsidized project
- (ii) Sharing of the reservoir area development project cost by downstream beneficiaries
- (iii) Exceptional measures to increase the national government's share of the reservoir area development project cost
- (iv) Compensation for lost revenues due to heterogeneous imposition of real estate tax
- (v) Exemption of special land holding tax

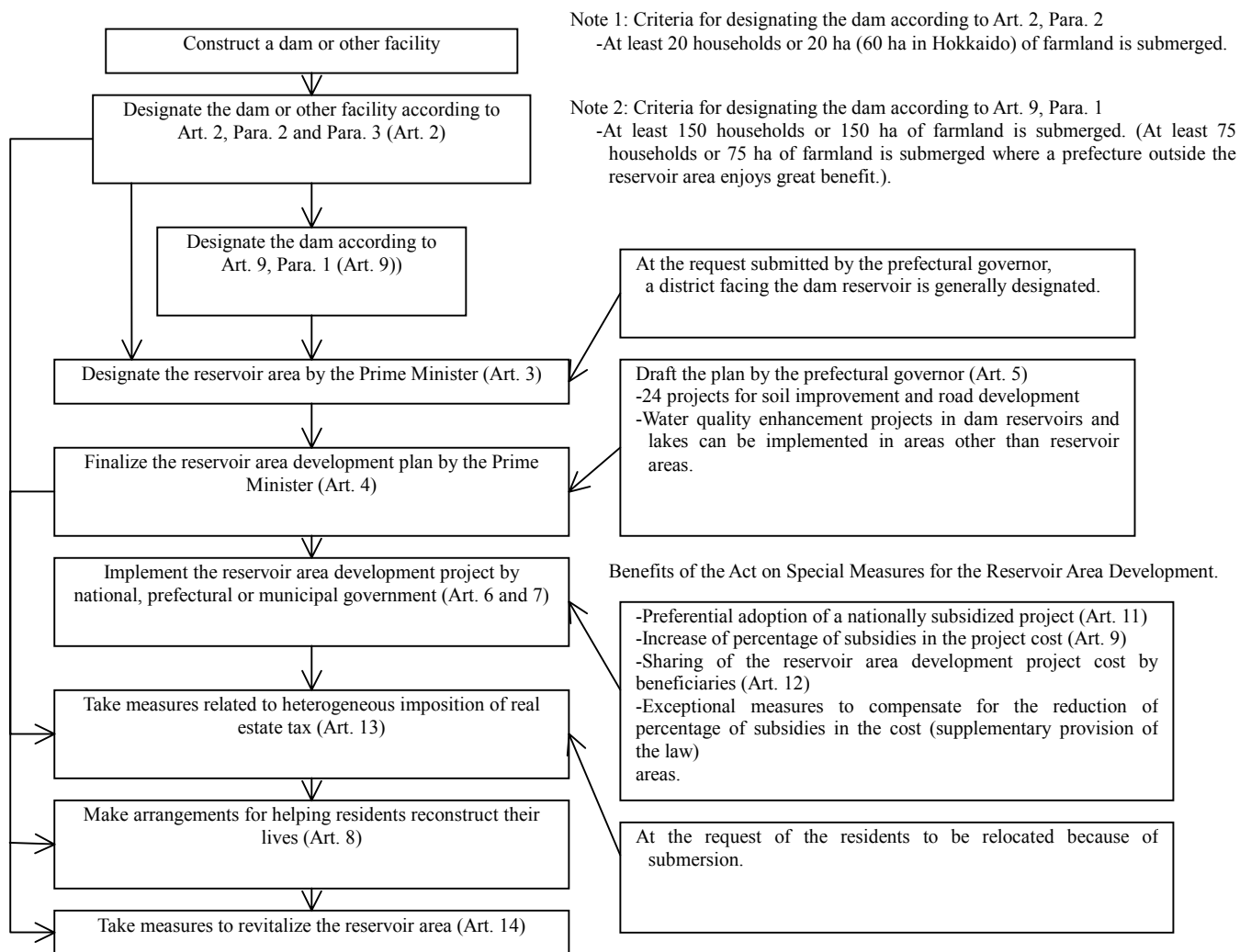


Fig. 2 Measures taken based on the Act on Special Measures for the Reservoir Area Development

-Outlines of three laws concerning the electric power development

The three laws concerning the electric power development are the Law on the Development of Areas Adjacent to Electric Power Generating Facilities, the Electric Power Development Promotion Tax Law and the Law on Special Accounts for Electric Power Development Promotion. For hydroelectric dams, the laws are expected to supplement the Act on Special Measures for the Reservoir Area Development.

The Electric Power Development Promotion Tax Law aims at imposing electric power development promotion tax on the sale of electric power by power utilities. The Law on Special Accounts for Electric Power Development Promotion is applied to the special accounting of the tax revenue and the provision of power plants siting development grant to the municipalities with power generation facilities and the surrounding municipalities to reimburse the cost of construction of facilities for the public and for industrial development as the basis for community planning around the power generation facilities.

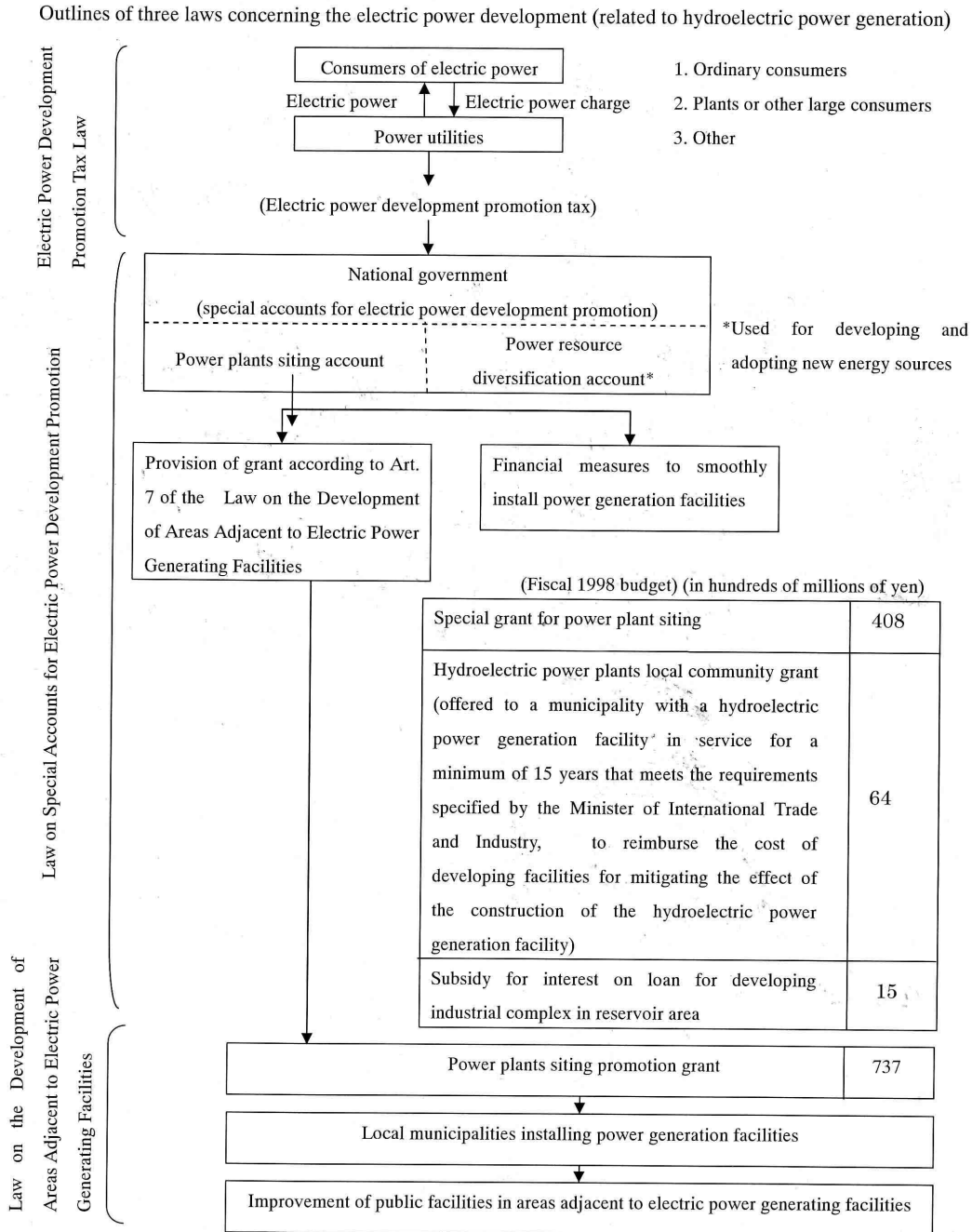


Fig. 3 Three laws concerning the electric power development and power generation promotion measures

3) Outline of funds for reservoir area development

The system for compensation and the Act on Special Measures for the Reservoir Area Development described in the previous sections are related to the actions of project owners and the administrative authorities. The funds for reservoir area development are used jointly by the local municipalities that enjoy the benefits of dam construction and those affected by reservoir area development measures to take more detailed reservoir area development measures than those under the compensation or legal system.

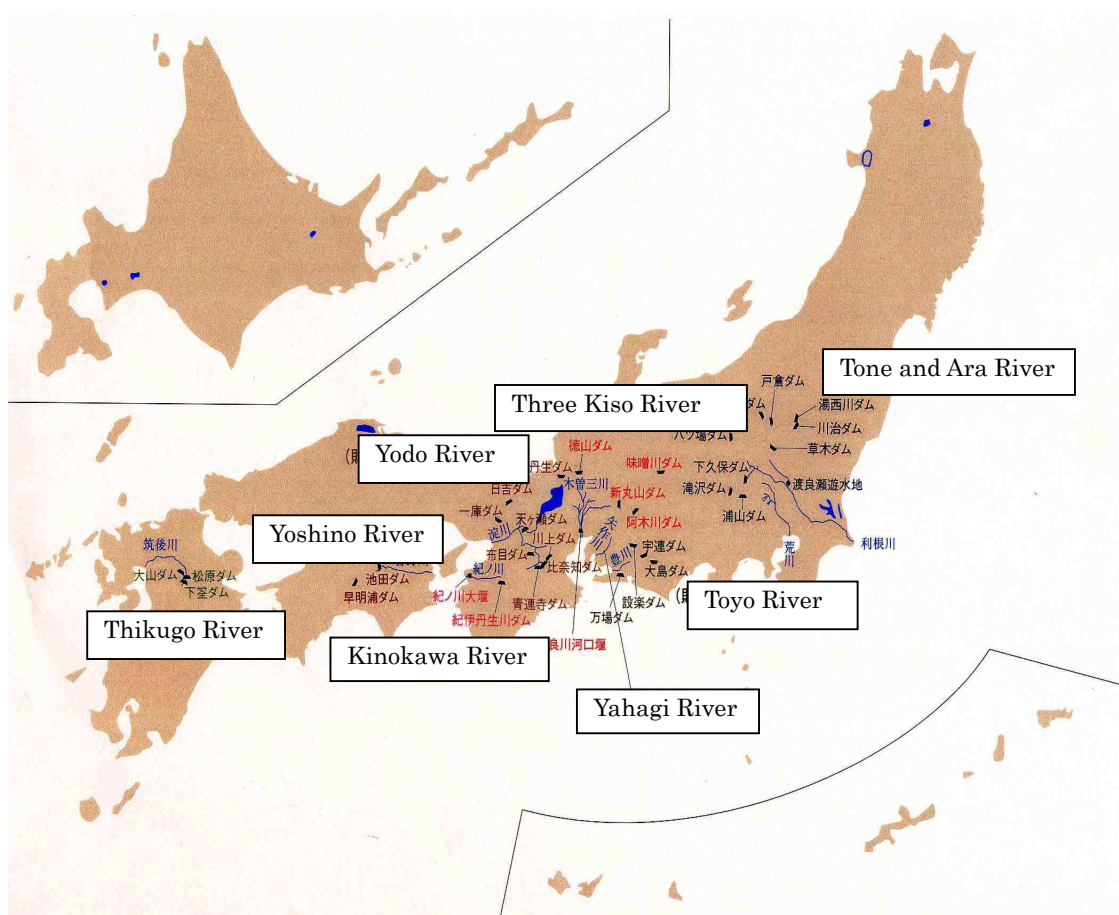


Fig. 4 Funds for reservoir area development in Japan

Table. 2 Major project items of funds for reservoir area development

Item	Specific measures
Granting subsidies for reconstructing lives of residents	-Compensating for the loss of real estate revenue -Granting subsidies for hiring livelihood consultants -Granting subsidies for changing jobs
Granting subsidies for developing the region	-Granting subsidies for renovating roads -Granting subsidies for improving the soil -Granting subsidies for preparing meeting places -Granting subsidies for constructing sports and recreation facilities -Granting subsidies for constructing small waterworks -Granting subsidies for constructing common sewers
Project for cooperation between upstream and downstream areas	-Granting subsidies for organizing public events
Granting subsidies for investigations	-Investigations for promoting basin activities

4 New reservoir area development measures

1) Problems with existing systems

Reservoir area development measures in Japan have focused on the improvement of facilities based mainly on the Act on Special Measures for the Reservoir Area Development for promoting dam projects. In the future, comprehensive reservoir area development focused on basin management will be required to build or revitalize the community in the reservoir area and to ensure sustainable development throughout the basin based on the understanding and cooperation of the people in the basin.

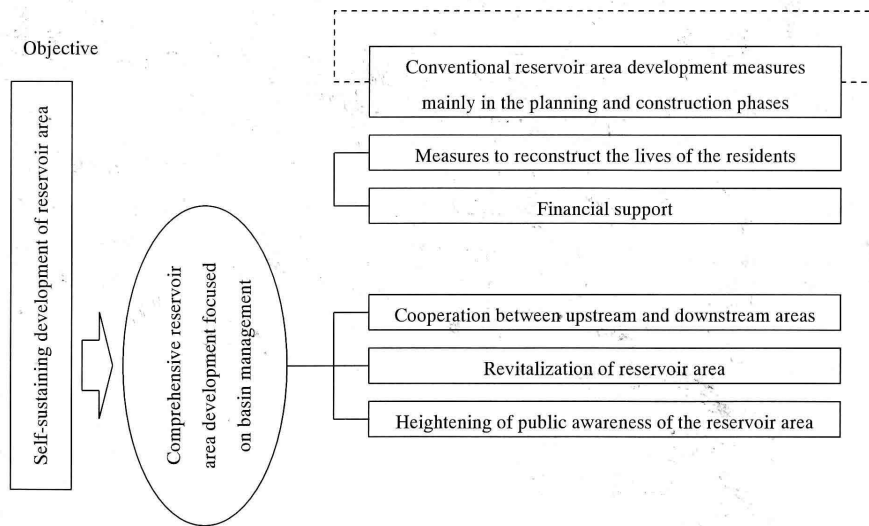


Fig. 5 Comprehensive reservoir area development

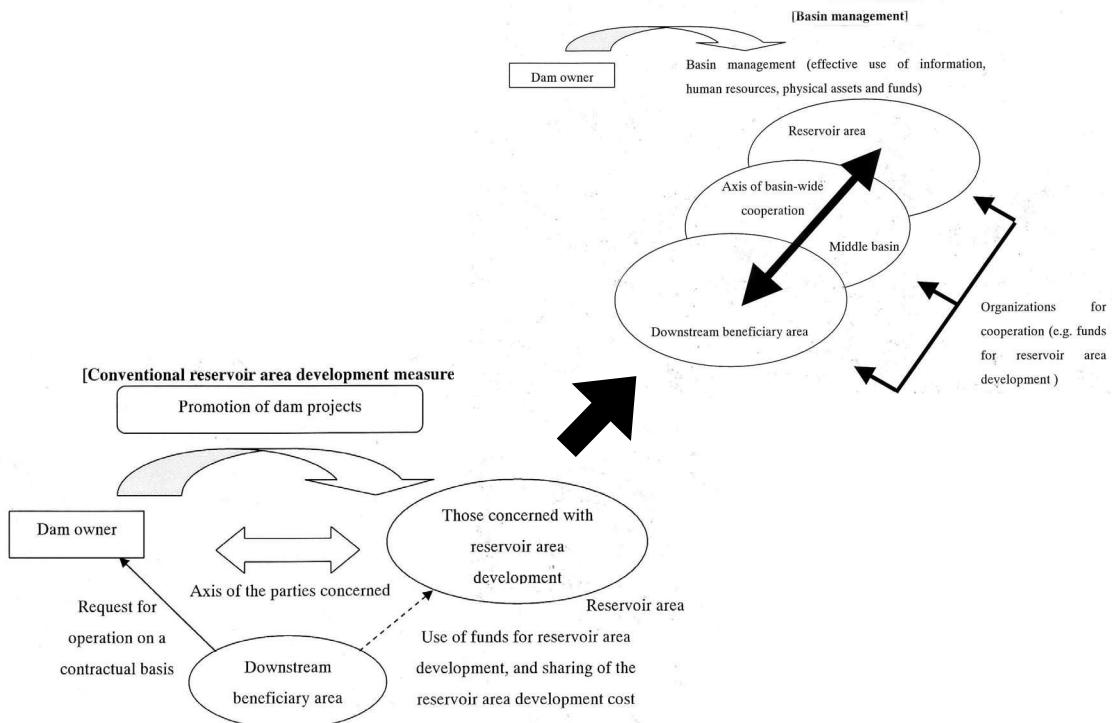
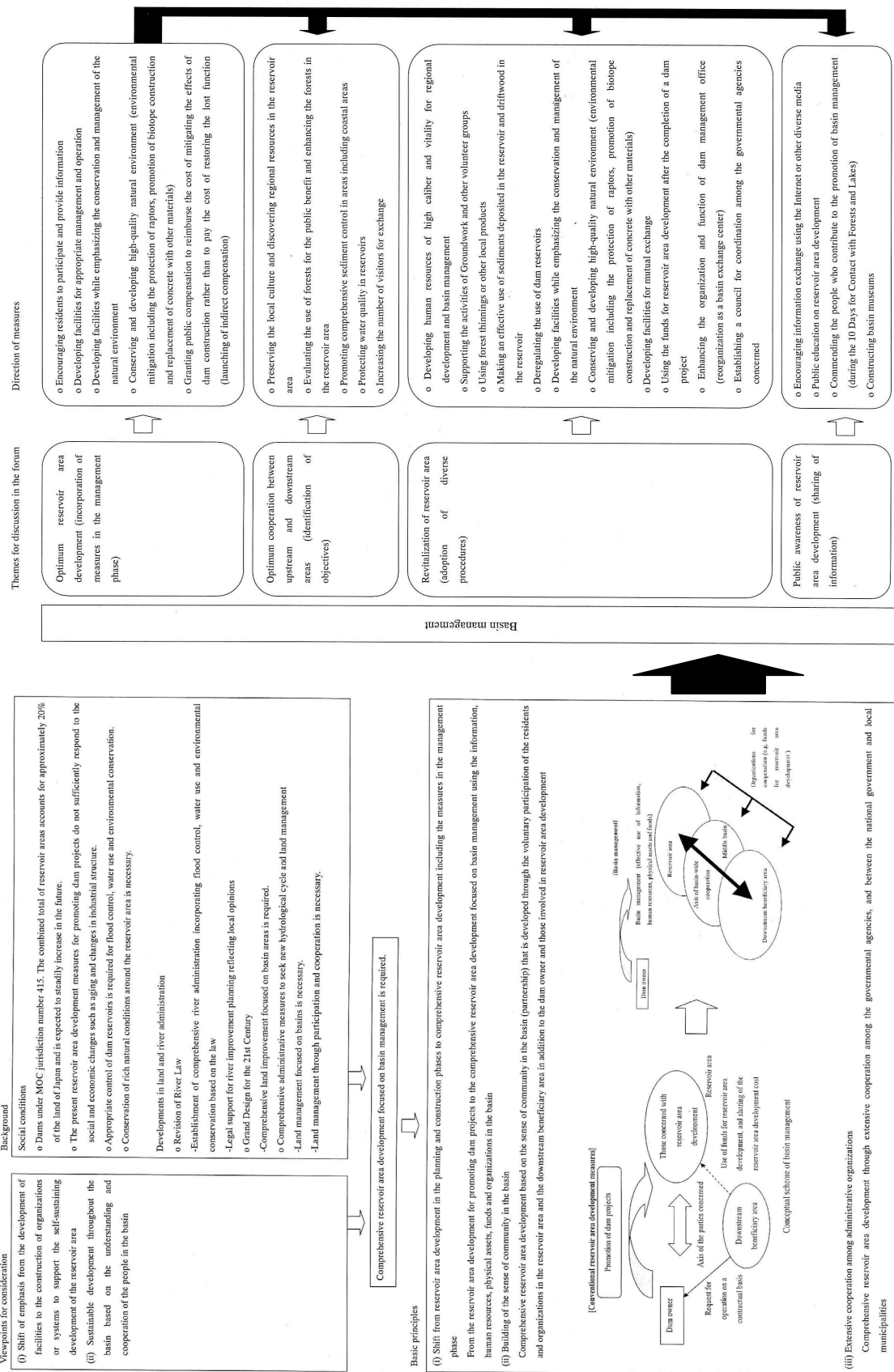


Fig. 6 Conceptual scheme of basin management

Fig. 7 Outlines of recommendations for comprehensive reservoir area development



5 Case studies of reservoir area development

Gosho Dam

Gosho Dam is one of the dams initially designated according to the Act on Special Measures for the Reservoir Area Development. For preparing the development plan, a council was organized for relocating the residents with their land being submerged due to dam construction. The council was staffed with members of the Ministry of Construction, and prefectural, municipal and town governments. The council assessed methods for coordinating the reservoir development and the conservation of the natural environment, and completed a project plan for improving the environment around the site of Gosho Dam. The government of Iwate prefecture where the headwaters are located developed infrastructure systems based on the project plan.

Gosho Dam is now at the center of the newly developed area. The local craft center and sports facilities together with the Koiwai farm and Tsunagi spa have been attracting an increasing number of visitors.

Table. 3 Annual use of the lake

Notes : sources :MI,IT



Fig. 8 Development around Gosho Dam

Year	Use	
	Purpose	Annual estimate (in thousands)
2002	Sports	4 (4%)
	Fishing	4 (4%)
	Boating	1 (1%)
	Walking	37 (4.1%)
	Other	847 (94.8%)
	Outdoor activities	8 (.9%)
	Facilities	722 (80.9%)
	Other	117 (13.1%)
	Total	893
Part of the area used		
	Purpose	Annual estimate (in thousands)
	On the lake	28 (8.9%)
	By the lake	285 (91.0%)
	Dam	0.1 (.0%)
	Total	313.1



Fig. 9 Use of facilities

Miyagase Dam

Miyagase Dam is located near a large city, so day trippers visit it in large numbers on holidays.

The area around the dam site is developed mainly to manage facilities through the coordination with the Fund for Developing the Area Surrounding Miyagase Dam in the planning phase. The Fund is composed of members of the municipalities concerned around the dam, Kanagawa prefecture and local businesses.

Development measures are taken at three key locations. In other locations, conservation of rich nature is planned. Efforts are made to restore the nature by creating biotope in a ravine that was once used as a dumping yard during road relocation.

Various public events started by the dam owner in the initial stages of dam construction are now being organized jointly by local organizations and the dam owner and are rooted in the community.



Fig. 10 Map of the Area Surrounding Miyagase Dam

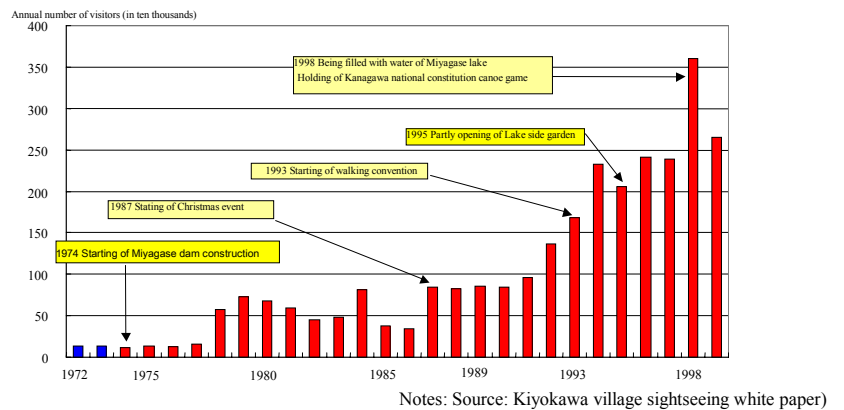


Fig.11 Changes in number of visitors to Miyagase



Fig.12 Canal lift (at damsite)



Fig.14 Canoe lodge (on the Miyagase lake side)



Fig.13 Construction of Mizunosato Park