

## **Chapter 4**

# **Governance for Water Environment Conservation: Implications from Japanese Experiences**

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### **1. Introduction**

In this day and age, water environment conservation, along with water resource development, has become widely recognized as an issue of governance requiring the involvement a variety of stakeholders in many countries. In general, developing countries are seeking successful models and tools to solve water environment issues by examining the experiences of developed countries; however, the contexts and conditions behind the successful or ongoing projects have not been considered carefully heretofore. In this paper, we aim to explore the Japanese experience with water environment conservation from the aspect of governance, focusing especially on stakeholders' participation, in order to provide basic information that will further the study of the building of water environment conservation governance, which we anticipate will be of use to developing countries.

In the first section, we offer a historical overview of water environment conservation policy in Japan during five major periods, focusing not only on functionally specialized organizations (Wolf, 2005) engaging in water and environmental policy, but also on broader organizations working for water environment conservation. In the second section, we briefly identify the issues in governance for water environment conservation. In the third section, we concentrate on several cases of building governance for water environment conservation in Japan. In the last section, we conclude this paper by summarizing our work and providing basic references for further studies on same issues in China and other developing countries.

### **2. A Historical Overview of Water Environment Conservation Policy in Japan**

In this section, we describe the modern history of water environment conservation policy in Japan, dividing it into the five periods of (1) before 1944, (2) 1945 to the early 1960s, (3) late 1960s to the early 1970s, (4) late 1970s to the early 1990s, and (5) early

1990s to the present<sup>1</sup>.

## **2-1 Before 1944**

In Japan, environmental pollution issues (“*kogai*” in Japanese) (Ui, 1992) had already arisen in the late nineteenth century as a by-product of the industrialization and militarization promoted by Japan’s Meiji government in an effort to catch up with the advanced western capitalist nations. One representative case involving water environment issues was the mineral pollution incident caused by Ashio Copper Mine starting in the 1880s; it is known as “the beginning of environmental destruction” in Japan (Shoji and Sugai, 1992). In this case, the operation of a copper mine without any effective pollution control measures resulted in wide diffusion of toxic air and water in the Watarase River basin which was exacerbated by repeated floods. Although the affected farmers and residents appealed to the local government and the National Diet and formed a mob in Tokyo (and Shozo Tanaka, member of the Lower House, also attempted a direct appeal to the Meiji Emperor), the protests were repressed by the government. The government constructed a dam, submerging one village for flood control, but many problems have lingered up to the present day, including soil pollution problems. The Ashio Incident set a precedent and created social pressure that led to negotiations between victims and mine operators in other mining pollution incidents.

In other areas of Japan, development of the heavy and chemical industries aggravated the water quality in many rivers and coastal waters, causing serious damage to agricultural and fishery production; however, the victims were unable to receive sufficient compensation given the national policy of industrialization combined with militarization, while pollution continued to spread over the country.

In urban areas, due to lack of a clean water supply and wastewater treatment, many people became sick and died of epidemic diseases. The first Sewerage Law was passed in 1900; however, it was not until the late twentieth century that urban water environment infrastructure was developed nationwide by public finance.

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<sup>1</sup> See also Kataoka(2005) and Yamada(2005) for a history of river basin management in Japan.

## 2-2 1945 to the early 1960s

After the Second World War, Japan pursued economic development without adequate environmental conservation measures, which resulted in the creation of a “pollution island.”

It was local government which took the initiative to control industrial pollution in the absence of national regulation. The Tokyo metropolitan government established its factory pollution control ordinance in 1949, while the Osaka prefectural government stipulated its ordinance in 1950. It was not until 1958 that the national government passed the first national pollution control laws, called the “Two Laws on Water Quality,” or the Law on Public Water Quality Conservation and the Law on Industrial Wastewater Regulation. However, the laws were stipulated not because of a national initiative in support of environmental conservation but because of serious pollution disputes and the pressure of public opinion calling for environmental regulation. It was in 1958 that over 700 fishermen around Edo River, near the center of Tokyo, broke into a factory operated by Honshu Pulp Company to stop its wastewater emission which had caused serious damage to their fishery production. The laws had defects such as aiming at coordination between industrial development and environmental conservation, instead of giving precedence to environmental conservation, selection of regulated water (not all water was regulated), and other insufficient provisions. In 1964, the Law on Smoke and Soot Regulation was passed: however, it contained the same defects as the Two Laws on Water Quality (Awaji, 1995; Okada and Peterson, 2000; Mizuochi, forthcoming). The city of Yokohama took the lead in exchanging pollution control agreements with corporations, thereby reducing air pollutants more effectively than the weak national regulations.

Aside from a few cities with advanced policies, there was an absence of effective control and conservation measures, and so environmental pollution ballooned, causing such human health damage as Itai-itai disease around the Jintsu River, Minamata disease around both Minamata Bay and Agano River, and asthma around the Yokkaichi industrial complex (these are known as the “four major pollution incidents” in Japan).

Itai-itai disease and Minamata disease were caused by wastewater from mining and chemical factories, respectively. Itai-itai disease began to appear around the Jintsu River about 1955; the patients suffered from severe pain and bone fractures caused by even a little body movement, such that they cried “*itai-itai*” (ouch, ouch) due to the intolerable pain. This disease was caused by the cadmium contained in the wastewater from the

mineral mine located upstream, the Mitsui Mining and Smelting Kamioka Works. The next disease, Minamata disease, was first reported to the Minamata Public Health Center in Kumamoto Prefecture in 1956. Before that, it was observed that dead fish were floating on the surface of Minamata Bay and that local cats around the bay were becoming delirious and dying. Minamata disease is caused by the ingestion of fish and shellfish from water containing organic mercury, which then accumulates in humans and animals, thereby damaging their nervous systems. Sufferers of Minamata disease were not only physical victims but also social victims due to discrimination in their local communities. Although the victims staged protests against the factories, they did not gain social recognition and only received a token amount of money. It was not until 1968 that the central government officially recognized the causes of these diseases. The dearth of effective countermeasures for pollution diseases allowed a second wave of Minamata disease, which was discovered in 1965, to spread around Agano River, Niigata Prefecture (Okada and Peterson, 2000; Iijima, 1993).

### **2-3 Late 1960s to the early 1970s**

To combat the environmental deterioration across the country, public opinion began calling for comprehensive and systematic measures for pollution control at the national level. In 1967, the Basic Law for Pollution Control was passed and put into effect. The basic law was epoch-making in its identification of concepts, measurement standards, and roles of stakeholders for comprehensive and systematic pollution control; however, it contained an article that required coordination of pollution control with economic development and did not mandate strong enforcement of the regulations. Only three years later, the article was deleted from the basic law due to the public demand for strong enforcement. In 1970, in order to fundamentally reform of the pollution control system, the National Diet held a special meeting to enact and amend fourteen laws for pollution control, including the basic law. In 1971, the fragmented administrative bodies involved in pollution control were integrated into a single entity, the Environment Agency. The agency also took charge of nature conservation across the country (Awaji, 1995; Okada and Peterson, 2000; Mizuochi, forthcoming).

In a special meeting of the National Diet held in 1970, the Sewerage Law was amended to stipulate water quality conservation of public waters as one of its aims, while the Water Pollution Control Law was newly legislated as a replacement for the above-mentioned Two Laws on Water Quality. In the Water Pollution Control Law, the

article requiring coordination of environmental preservation with economic development was omitted, and the selective regulation system for water areas was also omitted. Environmental Quality Standards, which were introduced by the Cabinet in 1970, set a national minimum goal for public waters, while direct penalties were provided for violations of effluent standards by this new law. Furthermore, the law allowed prefectural governments to set stricter effluent standards than the national ones (Awaji, 1995; Mizuochi, forthcoming).

It should be noted that there was a groundswell in the grassroots environmental movement which acted as the background to this series of policy reforms. In 1964, a citizens' movement succeeded in stopping the national plan to construct a petrochemical complex in the Mishima-Numazu area, and this was an epochal event that demonstrated the people's power to prevent environmental destruction (Ui, 1992, pp.9-10).

In 1969, at the peak of water pollution in the Yahagi River, a unique association known as the Yahagi Riverfront Water Quality Conservation Measures Council was set up. It consisted of not only irrigation organizations, farmers' cooperatives, and fisheries cooperatives, but also cities, towns, and villages as drinking water consumers. In the absence of effective national regulation, the council staged protests against water pollution caused by upstream polluters, and after enactment of the Water Pollution Control Law, the council filed its first court case against a pit gravel quarry which would not stop illegal discharge of untreated polluted wastewater despite protests by the council in 1972. Since the 1980s, the council has been noted for its formulation of the "Yahagi River Rule" which has promoted partnerships between upstream and downstream municipalities and has played an important role in environmental impact assessments which evaluate the effect of construction projects on the water environment in the river basin (Takahashi, 2001; Yahagi Riverfront Water Quality Conservation Council, 1999).

Also in the late 1960s, groups of victims of the above-mentioned four major pollution incidents united to struggle for human rights in quick succession. The Niigata Minamata disease group was the first plaintiff to file a lawsuit in 1967. The Yokkaichi pollution victims followed in the same year, the Itai-itai disease victims went to court in 1968, and the Kumamoto Minamata disease victims did likewise in 1969. All of these lawsuits resulted in victories for the victims, with the first victory won by the Itai-itai disease victims in 1971, followed by the Niigata Minamata disease victims in 1971, the Yokkaichi pollution victims in 1972, and the Kumamoto Minamata disease victims in 1973. These lawsuits established basic precedents for pollution law enforcement,

including “no-fault liability” which requires polluters to strictly fulfill their legal responsibilities (Awaji, 1995; Iijima, 1993, Toyoda, 1997).

#### **2-4 Early 1970s to the 1990s<sup>2</sup>**

Even after the enforcement of the Water Pollution Control Law, water quality all over the country continued to deteriorate, especially in enclosed bodies of water such as inner bays and lakes. In 1972, a large-scale red tide occurred in the Seto Inland Sea, where industries and population are concentrated, resulting in damage to aquaculture and other fishery production amounting to 7.1 billion yen. The next year, the Law on Provisional Measures for Conservation of the Environment of the Seto Inland Sea was enacted to regulate construction of facilities whose effluent wastewater exceeded the level stipulated by the law as well as to reduce allocations of COD (chemical oxygen demand) load for each prefecture by up to half of the amount of the 1972 load. In 1978, the law was amended and renamed as the Law on Special Measures for Conservation of the Environment of the Seto Inland Sea, and it newly incorporated TMDL (total maximum daily load) controls of COD and countermeasures for reduction of phosphorus loads to prevent eutrophication damage. TMDL control of COD was also incorporated into the amendment of the Water Pollution Control Law in the same year. Since then, in addition to the Seto Inland Sea, TMDL control of COD has been introduced for Tokyo Bay and Osaka Bay. It was not until 1993 that Environment Quality Standards for nitrogen and phosphorous in the ocean were set.

Lakes are enclosed bodies of water which are easily affected by water pollution due to the fact that the same water remains in them for a longer period of time than in the case of rivers and oceans. In Lake Biwa, the largest lake in Japan, located in Shiga Prefecture, as well as the main water source for the large population in the downstream prefectures, large-scale outbreaks of freshwater algae occurred in 1977. In 1979, Shiga Prefecture enacted the Ordinance on Prevention of Eutrophication in Lake Biwa, and this was the first attempt in the country to introduce emission controls for nitrogen and phosphorus, by banning organic phosphorus wash powder. Ibaraki Prefecture followed suit and enacted the Ordinance on Prevention of Eutrophication in Lake Kasumigaura in 1981. Action at the national level was delayed until 1982, when the Environmental Quality Standards were established for nitrogen and phosphorus in lakes and 1984 when

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<sup>2</sup> See Okada and Peterson (2000) and Mizuochi (forthcoming).

the Law on Special Measures for Lake Water Quality Conservation (The Lake Law) was enacted. This law requires each prefectural governor to compose a comprehensive and systematic plan for the water quality preservation of special lakes, which are designated by the Prime Minister, involving sewerage construction and other works, including control of emissions from small-scale facilities like septic tanks and monitoring of small-scale feedlots by requiring licenses for their installation.

Other measures for water quality preservation were developed during the late 1980s and the 1990s. In 1989, the Water Quality Control Law was amended to stipulate proactive measures against groundwater pollution, including prohibition of infiltration of water contaminated with toxic substances from facilities using these substances and installation by the prefectural governors of monitoring systems for groundwater quality. In 1996, the Water Pollution Control Law was amended again to create the “groundwater purification control system” which allows governors to take measures against polluters in order to prevent pollution, and in 1997, Environmental Quality Standards for groundwater were issued. To ensure a clean drinking water supply free from carcinogens and other water pollutants, the Law to Take Special Measures for the Protection of Water Quality in Headwater Areas for the Purpose of Preventing Specific Trouble in the Drinking Water Supply and the Law Concerning Promotion of the Implementation of Quality Protection of the Headwaters for the Drinking Water Supply were enacted in 1994. Pollution loads from households became increasingly important sources of pollution in small- and medium-size rivers beginning in the late 1970s, and the Water Pollution Control Law was amended in 1990 to specify the responsibilities of the central government and the prefectural and local governments in the efforts to control domestic wastewater. The amendment permitted local governments to prepare plans to promote the control of domestic sewage.

## **2-5 1990s to the present**

In 1992, the Earth Summit was held in Rio de Janeiro to disseminate the idea of “sustainable development” for future generations all over the world. In Japan, the increasing complexity, diversification, and internationalization of environmental issues led to a need for further environmental policy reform. In 1993, the Basic Environment Law was enacted and other environment-related laws were amended. This new basic law preserves the countermeasures stipulated in the previous Basic Law for Environmental Pollution, while it also features new ideals for environmental

conservation, including environmental rights, a sustainable society, and global environment conservation with international cooperation, although there remains room for argument concerning the degree to which these new ideals could be realized in actual practice (Awaji, 1995, pp. 25-26). Based on this new basic law, the Basic Environment Plan was formulated in 1994 and amended in 2000 and 2006. The Basic Environment Plan has raised “circulation,” “symbiosis,” “participation,” and “international cooperation” as long-term goals for a sustainable society, and it emphasizes the promotion of integration of a variety of measurements including a command and control system, market-based instruments, voluntary approaches, information-based approaches, participation, partnerships, and so on. In 2000, the Environment Agency was reorganized as the Ministry of Environment to enhance and integrate its comprehensive functions. Following the enactment of the basic law and environmental policy reform, the Environmental Impact Assessment Law was enacted in 1997, the Law Concerning Special Measures against Dioxin and the Law for Pollutant Release and Transfer Register (PRTR) were enacted in 1999, and the Soil Contamination Countermeasures Law was enacted in 2002. Environment Quality Standards for water pollution were also added as new items (Okada and Peterson, 2000; Mizuochi, forthcoming). The concept of tradable load reduction assignment for nitrogen and phosphorus in the basins of enclosed bodies of water was introduced as a new economic instrument by the amendment of the Sewerage Law in 2005 in order to promote advanced sewage treatment in inner bay basins (Fujiki et al., 2008).

It was also during this era that decentralization and participation were highlighted in other related policy developments. In 1997, the River Law was amended to incorporate environmental conservation into its aims, in addition to flood control and water utilization, which are the overriding goals of river management. The revision of this law also opened the way for public participation in river management, such that many river basins have set up river basin committees that include members of the public to discuss river management plans. Looking at the case of the Tama River, a long history of public involvement led to the Tama River Basin Conference held by stakeholders in 1998, and the Tama River Basin Committee reached agreement with the conference participants on the Tama River Improvement Plan in 2001 (see Section 3-1). In the case of the Lake Biwa and Yodo River water system, the Yodo River Water System Basin Committee was set up with members selected from among applicants, and open-door discussions are held, in principle. Committee members prepare written opinions and consolidate discussions voluntarily. In this case, there has been a significant effect on the process of



social consensus over basin governance, including dam construction and water level control, as “the environment [has become] a component and an objective of basin governance” (Nakamura, 2008).

In 2002, the Law for the Promotion of Nature Restoration was enacted to promote nature restoration projects with the involvement of governments, communities, NPOs, and experts. The Law on Special Measures for Lake Water Quality Preservation was also amended in 2005 to stipulate that prefectural governors have a duty to take measures that reflect residents’ opinions in the plans prepared by the prefecture for conservation of lake water quality and that prefectural governors also have a duty to introduce regulation of small factories’ wastewater effluents and non-point source control planning.

Both the package of laws related to decentralization and shortages of tax revenue are driving local governments throughout Japan toward implementation of their own taxation, and toward introduction of taxation for preservation of forestry and water resources in particular (Fujita, 2005, 2007, 2008; Fujita and Otsuka, 2008). In the cases of Kochi and Kanagawa prefectures, it should be noted that there is participation by prefectural residents in the process of design and implementation of this new tax (see Section 3-3).

It should also be noted that there are emerging NPOs which are working on nature restoration projects in partnership with governments, communities, schools, private companies, and other stakeholders to an extent that goes beyond mere deliberations. The Asaza Fund is such an NPO, and it has conducted “citizen-initiated public works” with local and national stakeholders to restore the natural environment of Lake Kasumigaura.<sup>3</sup>

### **3. Issues in Governance for Water Environment Conservation**

#### **3-1 Integrated water resource management**

To realize sustainable use of water resources, it is essential, in addition to developing water resources, to conserve them as well in order to prevent water shortages, deterioration in water quality (contamination), and destruction of the natural

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<sup>3</sup> See details of the Asaza Fund on its website (<http://www.kasumigaura.net/asaza/>).

environment in basin areas which might be caused by the development of water resources. It is also crucial to maintain various tangible and intangible public-interest features generated from the relationship between water and people, such as scenery, history, culture, and amenities.

Integrated water resources management (IWRM) is a concept widely recognized in the international community as a way to realize sustainable use of water resources. According to the Global Water Partnership (GWP), IWRM is defined as “a process which promotes the coordinated development and management of water, land, and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems” (GWP-TAC 2000). The GWP notes that lack of integrated water resources management is the underlying reason for unsuccessful water resources management and advocates integrated management of natural and socioeconomic systems, combined with integrated management of each element of these systems. IWRM is a comprehensive

**Table 1. Water Policies in Japan**

<b>Affair</b>	<b>Organization</b>	<b>Sub-section</b>	<b>Main laws</b>
Water supply	Ministry of Health, Labor and Welfare	Water Supply Division, Health Service Bureau	Waterworks Law Law on Execution of Preservation Project of Water for Water Supply
Water use for agriculture	Ministry of Agriculture, Forestry and Fisheries	Rural Development Bureau	Land Improvement Act
Water conservation Forest		Forestry Agency	Forest Law
Industrial water supply	Ministry of Economy, Trade and Industry	Industrial Facilities Division, Economic and Industrial Policy Bureau	Industrial Water Law Industrial Water Supply Business Law
Hydropower		Agency of Natural Resources and Energy	Electric Power Development Promotion Law
Sewerage	Ministry of Land, Infrastructure and Transport	Sewerage and Wastewater Management Development, City and Regional Development Bureau	Sewerage Law
Rivers, water resource facilities Comprehensive and basic policies for water supply and demand, reservoir area		River Bureau  Water Resources Department, Land and Water Bureau	River Law Specified Multipurpose Dams Law Water Resources Development Promotion Law Water Resources Development Public Corporation Law Law Concerning Special Measures for Reservoir Areas
Water quality, environmental conservation	Ministry of the Environment	Water Environment Department, Environmental Management Bureau	The Basic Environment Law Water Pollution Control Law

*Source: UN/WWAP (2003, p.490).*

philosophy that takes the full scope of aspects related to water resources into consideration.

In Japan, it has been pointed out that integrated coordination of water policy has been needed for a long time (Takahashi, 1993, pp.216-225); however, such integrated coordination has not been realized yet. Table 1 shows Japan's water policies in terms of affairs, authorities (organization and sub-section), and main laws. As this table shows, the water quality and water environment is supervised by the Ministry of Environment, while the domestic water supply is supervised by the Ministry of Health, Labor, and Welfare, irrigation by the Ministry of Agriculture, Forestry and Fisheries, industrial water supply by the Ministry of Economy, Trade and Industry, and sewerage and river management by the Ministry of Land, Infrastructure, Transport and Tourism. In general, water policies in Japan are still fragmented, except for the coordination among central bureaus and local governments for emergent water shortages.

### **3-2 Building basin governance**

The practice of IWRM highly depends on the context presented by the social, economic, cultural, and natural conditions. Currently, a large number of countries and regions are perplexed as to how to implement IWRM in light of their own diverse conditions.

An effective concept for approaching the practical issues of IWRM is "basin governance." "Basin" is a collective term that includes not only river basins in the narrow sense but also catchment, river, and lake basins as hydrological cycle systems in motion over land. Basins include diverse types of land, such as water-source forests that extend from upstream to downstream, farmland, land for industrial use, cities, and coasts as well as various natural and artificial parts of water systems such as rivers, wetlands, lakes, dams, irrigation water, and groundwater. Basin governance is a concept which takes as its starting point real cases of failure or difficulties in water resources management in the past, and in order to overcome these failures and difficulties, seeks a new basin-based management mechanism for water resources and other diverse basin resources.

The basin governance approach consists of the three facets of resources, location, and stakeholders (Otsuka, 2008, pp. 11-13).

The first facet of basin governance deals with the various resources in basins, in addition to water resources. Many basin resources have the nature of a common-pool resource (CPR). CPR means "a natural or man-made resource system that is sufficiently

large so as to make it costly (but not impossible) to exclude potential beneficiaries from obtaining benefits from its use” (Ostrom, 1990, pp. 30). CPRs are quasi-public goods comprised of resource systems that are non-excludable by nature, which is the nature of public goods, and resource units with a competitive and deductible nature, which is the nature of private goods. CPRs include, for example, natural and semi-natural resources such as rivers, lakes, groundwater, irrigation water, oceans, fishing grounds, pastures, and forests as part of their resource systems, and artificial structures such as bridges and streets. Meanwhile, resource units include water resources collected from water systems, fishery products caught in fishing grounds, livestock bred in pastures, and timber cut from forests. In order to achieve sustainable use of CPRs with such a nature, it is necessary to avoid any free ride in resource systems and to establish rules to avoid depletion of resource units. Establishing rules for utilizing basin resources as local CPRs is one of the issues in basin governance.

The second facet of basin governance is its emphasis on the multilevel and cross-border nature of basin resources. The discussion on the multilevel nature of commons by Akimichi (2004, pp. 12-29) suggests the necessity of considering basin resources management from local, public, and global perspectives. For example, the utilization and the proprietary relationship of water vary throughout the path of flow from forests to rivers and further to the sea. Water flowing in national forests is a public common which everyone can use, while river water is a local common if it is used exclusively or shared by certain villages as irrigation water. Water becomes a global common when it flows into the sea and is owned by nobody. The problem lies in the fact that the respective basin resources are not governed in a basin-based, a priori manner. Basin resources are governed by diverse community associations at the local level and by the state or local government at the public level within their respective jurisdictions of authority. In addition, basin resources management often encounters difficulties, not only in its vertically-multilevel nature as seen in the local-public-global structure, but also in its horizontal, cross-border nature as seen among local as well as public structures.

The third facet of basin governance is its emphasis on participation, cooperation, and partnership among diverse stakeholders. Considering the diversity and multilevel, cross-border nature of basin resources, diverse and multilevel stakeholders may be assumed to be involved in sustainable use and conservation of basin resources. It was previously believed that efficient basin governance would be possible if administrative authorities assigned internal and external expert/engineer groups and utilized their

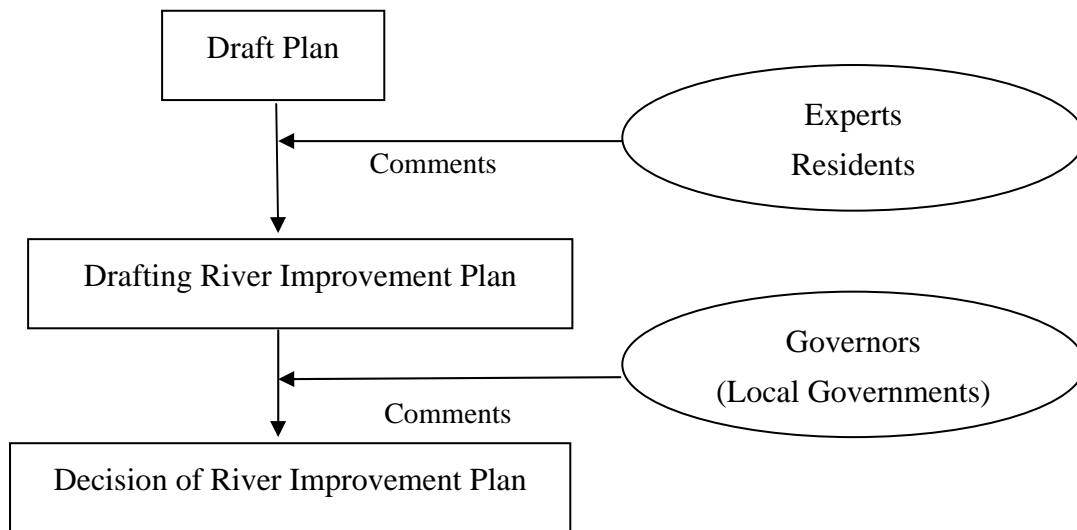
networks. However, issues of basin governance shifted from water control and water utilization to environmental conservation, and the fields of practical basin governance shifted from developed countries with mature administrative governance systems to developing countries which struggle with daily administrative management and need to improve their basin governance capabilities. This trend revealed the limit of traditional, authoritative governance. To cope with this trend, participation of diverse stakeholders and a new governance method based on partnership are sought at present.

Basin governance can be philosophically defined as “governance, utilization, and conservation of diverse basin resources achieved through cooperation/partnership among governmental departments and stakeholders from all walks of life and with multilevel partnership in order to realize social and economic development while making efforts to conserve and rehabilitate the ecology in a basin.” Among the important issues are what type of organizations and systems we should establish for basin governance and how we should finance and share costs for water resources management and basin governance under such organizations and systems (Turner and Otsuka, 2005).

The modern significance of basin governance is, first, that it appeared as a new mechanism featured in the age of “decentralization and participation” when vertical governance by authoritative bodies and supporting expert/engineer groups shifted instead to horizontal governance based on participation of diverse stakeholders and multilevel partnership.

The second significance is that basin governance is a process which is “adaptive” to the indigenous natural ecosystem and socioeconomic system in various forms. Collier (2005) points out that it is important to take an “adaptive approach” to the natural ecosystem in river basin governance based on an experience of the Delaware River Basin Commission. According to the International Lake Environment Committee (ILEC) (2005), it is important to ensure adaptation to community issues and to establish organizations and systems based on existing local and resident systems in order for lake basin-governing organizations and systems to function effectively.

Third, basin governance is a process for stakeholders participating in basin resources management to jointly learn how to promote sustainable use of resources and how to establish organizations, systems, and cost sharing rules for sustainable use. Basin governance is a dynamic process rather than a static and completed system, to be developed by stakeholders’ efforts by trial and error.



**Fig. 1. A Process of River Improvement Plan**

*Source: Kinki Regional Development Bureau*

#### **4. New Initiatives for Building Basin Governance: Case Studies**

##### **4-1 River basin committees and public involvement**

In 1997, the River Law was amended to incorporate environmental conservation into the overriding goal of river management that integrates flood control and water utilization. This revised law also opened the way for the public to participate in river management, and so many river basins have set up river basin committees that include members of the public to discuss river management plans (Figure 1).

The most spotlighted one is the Yodo River Basin Committee (Nakamura, 2008; Isono, 2009). Yodo River flows from Lake Biwa in Shiga Prefecture, through Kyoto and Osaka prefectures, and into Osaka Bay. The river system serves many public functions for a large population. The Yodo River Basin Committee, which was set up in 2001, has utilized the participation of many stakeholders in unique ways. One remarkable feature is its secretariat, which is run by a private consultant company, not by the government, and manages the committee from a neutral position. The second feature is its membership, which includes not only experts but also persons selected among applicants from public widely. The third feature is its openness and transparency which is fostered by voluntary observers nationwide and the uploading of detailed meeting minutes on the website. The fourth feature is that reports are drafted by members who are independent from any government bureau. The committee has had a significant

effect on the process of social consensus over basin governance, including dam construction and water level control, as “the environment [has become] a component and objective of basin governance” (Nakamura, 2008). However, confrontation between the committee and the relevant government bureau surfaced when the bureau proposed a river improvement plan without reflection of the many proposals made by the committee, resulting in severe criticism of the bureau’s attitude by citizens’ groups and the mass media. The committee has just started to discuss with the bureau concerning the handling of the monitoring issues in the improvement plan.

Other types of arrangements are observed in the cases of the Yoshino River and the Tone River (Isono, 2009).

In the case of the Yoshino River, which is one of major rivers on Shikoku Island, the relevant government bureau has not set up any committee but has arranged opportunities to collect comments from experts three times, from governors of municipalities six times, and from residents 23 times by the end of February 2009 in total. At the meetings with each type of stakeholder, the bureau requests a neutral facilitator to preside over the discussion.

In the case of the Tone River, which flows through five prefectures and is an important water source for Tokyo, the relevant government bureau sets up experts’ meetings for each of five areas along the river because it is a long and diversified river, and the bureau also involves residents via public hearings in each area. The experts’ meetings are open to the public, but members of the public are only allowed to observe; the public hearings are the venues where the public can voice its opinions.

Because the River Law’s statement regarding public involvement is vague, the precise form of public involvement varies depending on local initiatives. It is important to review each initiative to find the optimal form for public participation in river environment conservation in Japan.

Another case of a river basin committee that is based on partnership with citizens’ groups is found in the Tama River basin. The Tama River flows from Kasatori Mountain (altitude 1,914 meters) in Yamanashi Prefecture and runs through Tokyo and Kanagawa prefectures into Tokyo Bay. The main river is 138 km long, and the square area of the basin is 1,240 km<sup>2</sup>. The Tama River basin is divided into two administrative districts 22 cities, 4 towns, and 3 villages in Yamanashi Prefecture, Tokyo, and Kanagawa Prefecture, encompassing a total population of 4.25 million persons.<sup>4</sup>

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<sup>4</sup> Tamagawa no chiri (geography of the Tama River) at Tamagawa Ecomuseum website.

Management of the Tama River has a long history of public involvement in water environment conservation, including control of effluents from factories and other sources, environmental restoration focusing on native species of fish, sound riverfront conservation for natural areas and local communities, and so on. Stakeholders including local governments, and the Tama River government authorities have invested enormous efforts in building partnerships for river management by repeatedly holding round table discussions on the river management. These groups also participate in the environmental restoration round table discussions concerning the headwater area organized by the village (community).

The history of public involvement in the management of the Tama River spans 40 years, since the enactment of the River Law in 1964. In the 1960s and 1970s, water pollution and destruction of nature became critical issues in the river's management, and the Tama River was dishonored as the fifth worst first-class river<sup>5</sup> nationwide in terms of water quality in 1975. In 1970, the first civil group in the Tama River basin, the "Association for Nature Conservation in Tama River," was established, and this was followed by the establishment of other associations.

In 1974, the "Association of Nature Conservation Groups in the Tama River System" was established as an umbrella organization for the many groups working toward the same aim of water environment conservation in the river basin. Around this year, central governmental agencies also established a special sub-agency and a liaison organization to cooperate with civil groups regarding the river. Since the late 1970s, some civil groups have released the fry of native fish species into the river for the purpose of natural environment restoration. In 1986, the Tama River Summit was held. It was the first round table conference of stakeholders in the field of the river management, and it was attended by the river authority and the governors and mayors concerned with the Tama River. The NGOs concerned with the Tama River also supported this summit. In 1992, the Workshop on Springs and Cliff Lines was held with the participation of local governments and local people concerned. At the workshop, a resolution entitled "The Three Principles and Seven Rules" was adopted. In 1994, the Tama Center, which became the platform of the NGOs concerned with the Tama River, was established. At that time, the number of NGOs exceeded 200.

"The Three Principles and Seven Rules" which was adapted at the workshop in 1992

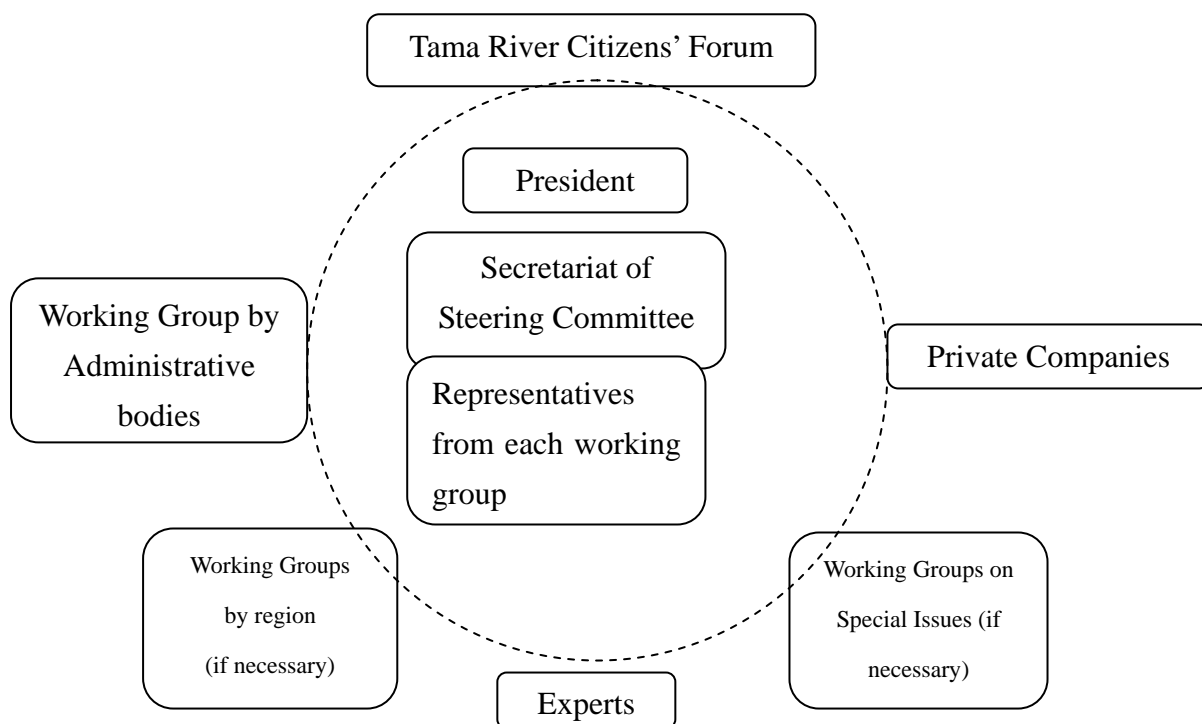
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<sup>5</sup> The first-class rivers are designated by the Ministry of Land, Infrastructure, Transportation and Tourism (MLITT) according to the River Law as important rivers for land conservation and the national economy.



laid out a method for building partnerships among different stakeholders in a manner that avoids waste of time over conflicts on unimportant issues. The Three Principles are (1) free discussion, (2) full/thorough discussion, and (3) prior consent of stakeholders before taking action. The seven rules are: (1) Speakers may express opinions which are not necessarily those of the organizations to which they belong, (2) No one shall ever be assailed with hostile questions, (3) Fair play and fairness shall be strictly observed, (4) Discussions should be based on scientific data, (5) Discussions should be aimed at reaching agreement among the members after clarifying the points in dispute, (6) The issues in dispute should be discussed only with reference to a particular case and should never be generalized, and (7) Projects should be divided into long-term projects and short-term projects. Moreover, opinions that are offered should be practicable.

With the amendment of the River Law in 1997, partnerships among stakeholders became the focus of river management in Japan. It was in 1998 that the Tama River (Figure 2). Its objective was to have all stakeholders interested in cooperating to improve the river reach a “soft agreement.” “Soft agreement” refers to a type of authority and the Tama Center cooperated to organize the Tama River Basin Conference consensus building using non-regulatory and voluntary means based on partnerships



**Fig.2. Tama River Basin Conference**

*Source: Water Environment Intercommunication Association*

and mutual trust among the participants which have been cultivated for long years. In the same year, the Tama River Basin Committee was set up with the involvement of the Council for the Tama River Improvement Plan (TRIP). A draft of TRIP was prepared by the committee and officially put into effect by MLITT in 2001.

In the case of Tama River management, participants in the round table discussions commonly possessed information on the river's condition gained from surveys in which they were involved and from riverfront activities; thus, they recognized that the agreement was a very important element in good river management. The negotiations required patience on the part of all the participants, but the negotiations functioned well because the participants recognized that the best practicable means must be adopted.

#### **4-2 Lake Saroma environment conservation through development of community-based fishery management<sup>6</sup>**

Lake Saroma is a semi-enclosed coastal sea, or brackish lake, located in eastern Hokkaido Prefecture. The lake was originally connected with the Okhotsk Sea via a single small lake mouth, and it is rich in oysters which provide the livelihood of the local fishermen. In 1929, Lake Saroma's water quality changed to that of an ocean inlet after a new lake mouth was cut open, endangering oyster fishery. In response to this, research was initiated to restore oyster fishery. After World War II, research and development were continued chiefly by the youth who belonged to the fisheries cooperatives, leading to the realization of scallop aquaculture on a commercial basis. Later, the Lake Saroma Aquaculture Fisheries Cooperative was established by three fisheries cooperatives, and community-based fishery management was implemented voluntarily for the first time in Japan. Immediately after the establishment of the cooperative, the fishermen were faced with the death of a large quantity of scallops. The Aquaculture Fisheries Cooperative, the three fisheries cooperative associations, and research institutes have engaged in aquatic conservation and fishery resources management in close cooperation. In addition to these efforts, fishermen have actively worked on forestation of the upstream areas since around 1960.

Recently, however, declining water quality due to the inflow of contaminants and organic substances from headwater streams and contaminants accumulated in bottom sediments have become matters of concern. Water quality standards for the COD load

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<sup>6</sup> See Fujita and Otsuka (2006, 2008).

have been designated for Lake Saroma since 1998 as a special measure for control of the COD load. Currently, assessment and monitoring is being implemented, using a material cycle model that brings the hydrological cycle of the basin into view. Fisheries cooperatives and administrative authorities are studying technical measures to improve the environment and are trying to establish a system to implement the measures.

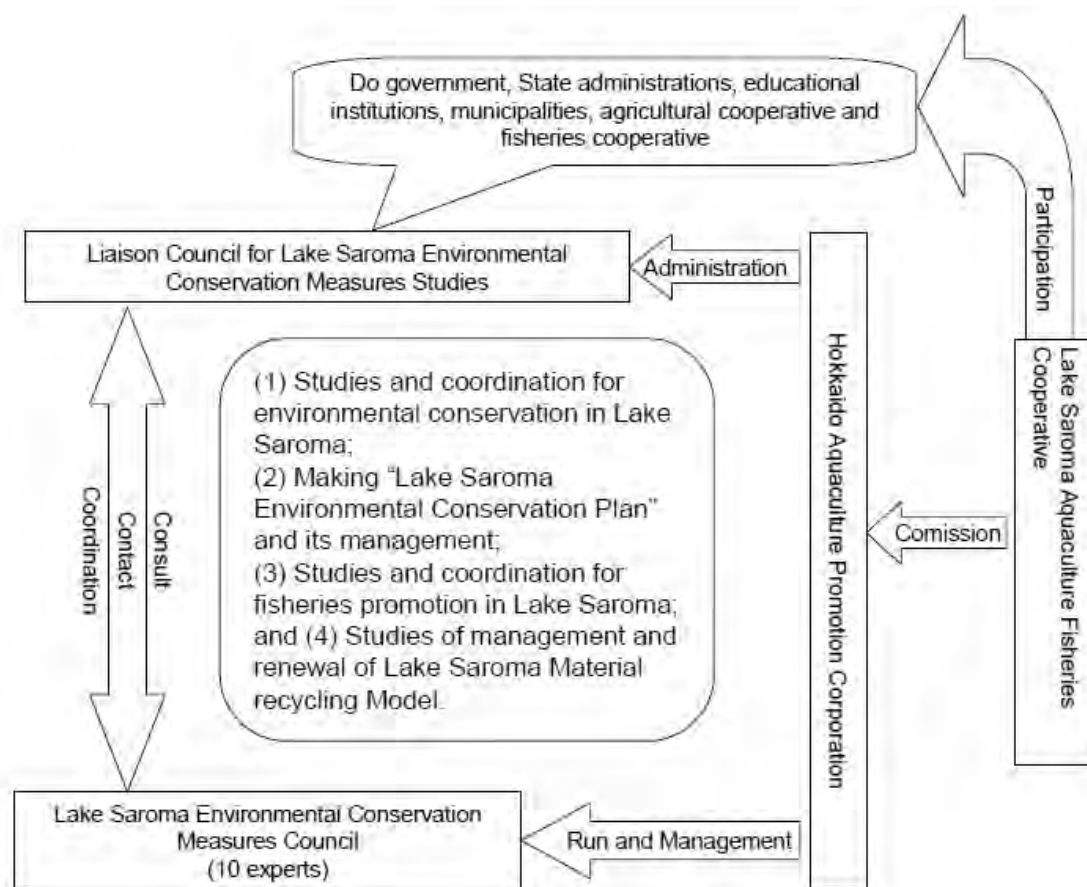
In a report entitled “FY2001 Lake Saroma Environmental Conservation Measures,” the Aquaculture Fisheries Cooperative took the initiative in consolidating the basic concept to promote Lake Saroma’s environmental conservation measures in response to deterioration of water quality and bottom sediments of the lake. According to the report, fishermen who benefit from the lake are responsible for exerting maximum efforts to promote measures to conserve the lake’s natural environment which was created over an extended period of time. The report continues, however, that fishermen are too powerless to conserve the environment by themselves because the issue is too large for them to handle alone. The report articulated a basic concept, stating that active participation and strong support from organizations and groups related to Lake Saroma are indispensable for promoting measures and that it is necessary to establish an independent system to promote measures posited on that participation and support.

Based on this concept, the Lake Saroma Environmental Conservation Measures Council (hereinafter referred to as the Measures Council) and the Committee for the Support of Lake Saroma Environmental Conservation (hereinafter referred to as the Support Committee) were established in 2001. The Measures Council is composed of local agencies (three towns and four fisheries cooperatives), administrative agencies (two agencies from Hokkaido Prefecture and the national government, respectively), and laboratories and technical guidance institutions (two institutions). Its major roles are discussing environmental conservation of Lake Saroma, securing the involvement of concerned agencies, conducting surveys, and implementing projects. Meanwhile, the Support Committee, comprised of a chairperson and six experts, is expected to review issues and reports submitted by the Measures Council, based on scientific assessment, judgment, and verification of Lake Saroma’s environmental conservation, and provide advice, guidance, and instructions to the Measures Council. The Lake Saroma Aquaculture Fisheries Cooperative bears all costs, excluding travel expenses of members of the Measures Council, for the management of the Council and Committee. Thus, a new organization system, with fishermen playing central roles and in cooperation with concerned agencies and experts, began to function to improve the environment of Lake Saroma, which suffers from deterioration of its water quality and

bottom sediments.

The first task tackled by the Measures Council and the Support Committee was development and utilization of a material cycle model to forecast Lake Saroma's water quality and bottom sediments. This model connects the floating ecosystem with the bottom sediment ecosystem in the lake and incorporates the material cycle of water systems outside the lake, such as inflow of nutrient salts and contaminants from rivers, as well as the material cycle within the lake, and exchanges of organic substances with the open sea. The model revealed several issues to be consolidated as part of the 5-Year Plan for Lake Saroma's Environmental Conservation Measures.

Based on this 5-Year Plan, the Lake Saroma Environmental Conservation Measures Management Committee (hereinafter referred to as the new Committee) and the Lake Saroma Environmental Conservation Measures Consideration and Liaison Council (hereinafter referred to as the new Council) were established in 2006 as new organizations to promote specific measures. The new Committee was designed to (1) consider, select, and evaluate projects related to measures to control and improve Lake Saroma's environmental conservation, (2) develop the Lake Saroma Environmental Conservation Plan as a specific plan based on the 5-Year Plan for Lake Saroma's Environmental Conservation Improvement Measures and manage implementation of the specific plan, and (3) utilize and manage the Lake Saroma Material Cycle Model and consider, select, and evaluate projects to add new functions that will be needed in the future. Ten experienced experts who have close ties with Lake Saroma's natural environment and the environment of the fishing grounds were appointed as new Committee members, with emphasis on continuity from the Support Committee. The operational term of the new Committee was set at five years, from 2006 to 2010, and the first meeting was held on July 12, 2006. A total of three meetings were held in FY2006, and in FY2007, one meeting had been held as of September. Hokkaido Aquaculture Promotion Corporation serves as the secretariat of the new Committee, on commission from the Lake Saroma Aquaculture and Fishery Cooperative Association (Figure 3).



**Fig.3. Promotion System for Lake Saroma Environmental Conservation Measures**

*Source: Lake Saroma Aquaculture Fisheries Cooperative*

Meanwhile, the new Council was designed for (1) consideration, liaison, and coordination related to implementation of measures to conserve and improve Lake Saroma’s environment, (2) consideration, liaison, and coordination of projects related to Lake Saroma’s fishery promotion, (3) partnership, cooperation, and support for the Lake Saroma Environmental Conservation Measures Management Committee, and (4) assumption of a role in the Lake Saroma’s Community Council in relation with the Measures to Improve Water Quality of Lakes developed by the Department of Environment and Lifestyle of the Hokkaido government. The new council was joined by the following as members: local agricultural cooperatives (Tokoro Agriculture and Fishery Cooperative, Saroma Agricultural Cooperative, and Yubetsu Agricultural Cooperative), Hokkaido government agencies (Forestry Section of the Hokkaido Government Abashiri Subprefectural Office and Eastern Hokkaido Inland Water Office of the Hokkaido Fish Hatchery), national government agencies (Kitami Branch Office

of the Hokkaido Forest Office, the Central Abashiri Forest Office, and the Western Abashiri Forest Office), and an educational institution (Tokyo University of Agriculture). Just like the new Committee, the Council is also to operate for five years from 2006 to 2010. The first Council meeting was held only recently, one month after a meeting of the new Committee. Hokkaido Aquaculture Promotion Corporation serves as the secretariat for the new Council, as is the case also with the new Committee. The vice president of the Corporation assumes the position of the chairperson.

Traditionally, utilization and conservation of Lake Saroma was led chiefly by local fishermen. They have made efforts for sustainable use of Lake Saroma through community-based fishery management, based on the natural and social characteristics in the Lake Saroma area, and various environmental conservation activities, including antipollution measures in the basin and forestation. In particular, local fisheries cooperatives, as fishermen's communities, and the Lake Saroma Aquaculture Fisheries Cooperative, which was established by local fisheries cooperatives, are both chiefly comprised of fishermen and fulfill important functions.

Community-based fishery management with a focus on scallop aquaculture is conducted at Lake Saroma, where important roles are played by local fisheries cooperatives and the Lake Saroma Aquaculture Fisheries Cooperative, which was established as an umbrella organization of the local fisheries cooperatives. The Cooperative is in charge of management of fishery resources at Lake Saroma and research for aquatic conservation. It also promotes consensus building among fishermen, defining the needs of fishermen in cooperation with local fisheries cooperatives, and providing information and technical guidance to fishermen. Meanwhile, Lake Saroma's resource conservation and environmental conservation requires establishment of a multilevel partnership involving fishermen, operators in other industries such as livestock farmers in headwater stream basins, residents, and administrative authorities as well as appropriate cost sharing based on the partnership. Efforts are being made to establish new rules for this.

#### **4-3 Forestry and water source environment conservation taxation by prefectures**

Decentralization and revenue shortages are driving local governments toward implementation of their own taxation in Japan in the early 2000s (see Section 1-5). The Forest Environment Tax was first introduced in Kochi in 2003 and next in Okayama in 2004, with other prefectures following their lead. Twenty-nine prefectures (among 47

total) had introduced the new tax by FY2008 (Fujita, 2005, 2007, 2008). Most focus on forests, while Kanagawa focuses on water sources in river basins and Ibaraki focuses on both forests and lake environments. The Forestry and Water Source Environment Conservation Tax is a measure that promotes cost sharing equally by all prefectural residents in light of the public-interest functions of forests and water source environments, and it could play the same role as an earmarked tax by stipulating a local ordinance and setting up a special fund, although this is not stipulated in the Local Tax Law. The tax adds 300 to 1,000 yen per person to the existing extra prefectural residents' tax and also adds a percentage to the annual corporate tax in most cases.

In 2003, Kochi Prefecture introduced the first forest environment tax in Japan to finance part of its forest environment conservation costs by adding an extra tax item to the prefectural inhabitants tax. The institutional design of this tax expresses the viewpoint that prefectural residents should bear a certain small amount of tax equally and widely, in view of the importance of the public-interest aspects of forests. The tax revenue accrues in the Fund for Forestry Preservation, and the opinions of the residents are reflected through the Fund Steering Committee. The tax system has been reviewed through questionnaire surveys sent to the residents and enterprises, block meetings, resident symposiums, and other means since FY2006.<sup>7</sup>

Meanwhile, the water source environment tax (Water Source Environment Conservation and Restoration Prefectural Inhabitants' Tax) in Kanagawa Prefecture funds a set of comprehensive initiatives designed for conservation and restoration of the water source environment, such as forestry conservation, measures for sewage, and groundwater protection. The prefecture proposes policy recommendations for the new tax voluntarily, offers opportunities to provide information to stakeholders and promote dialogue with them through various routes such as town meetings, and proposes a new model of local autonomy based on a participatory taxation system. Kanagawa Prefecture set up a prefectural resident council upon introduction of the tax in FY2007, and the activities of the council are attracting people's attention.

Kanagawa Prefecture has a square area of 2,415.84 km<sup>2</sup> and a population of about 9 million persons. It has an advanced water supply system that is fed by rivers which flow from the western and central areas to the eastern area, and 90% of the water is supplied from surface water. Water environments in the catchment area are under threat, and degeneration of forests and urbanization in catchment areas affect the volume and

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<sup>7</sup> For the cases of Kochi and Kanagawa prefectures, see also Fujita and Otsuka (2008).

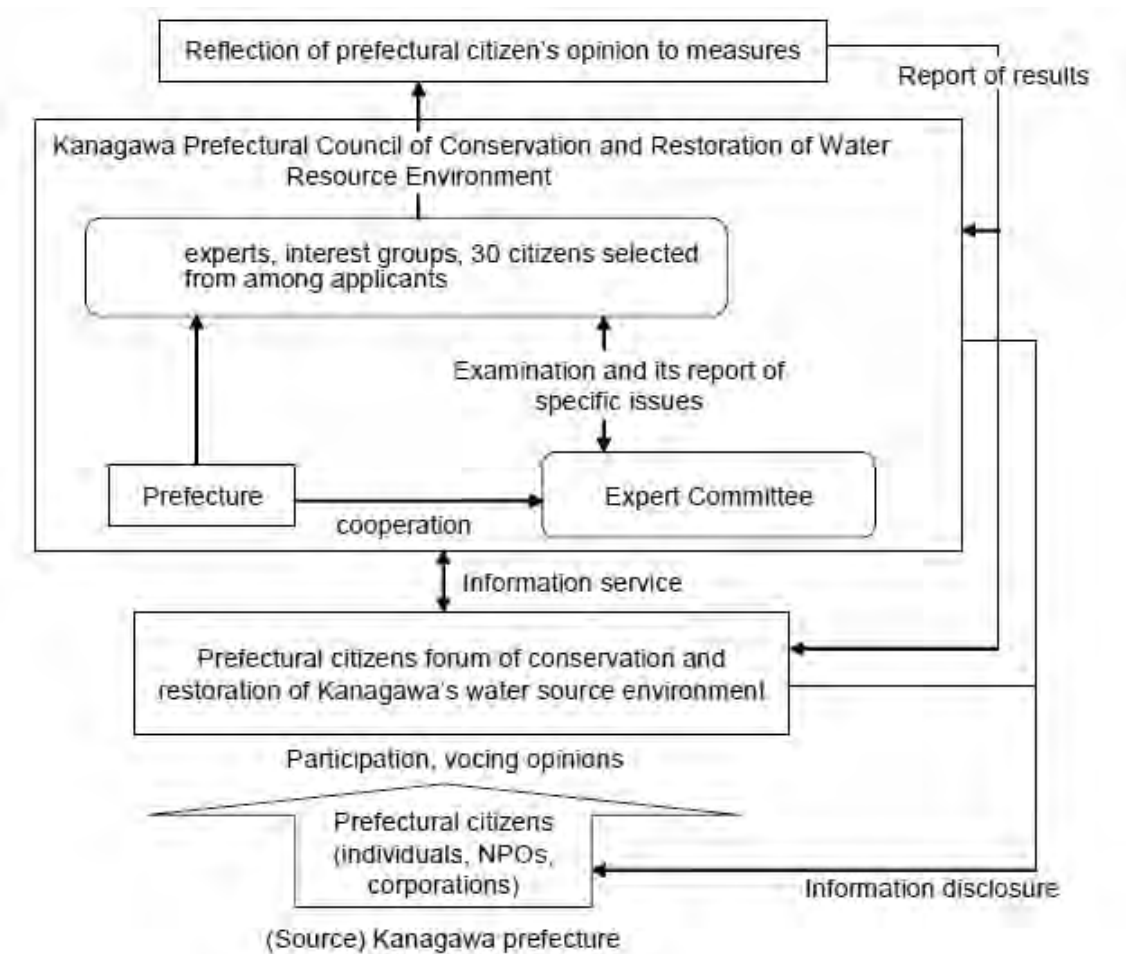
quality of water.

The Kanagawa Water Source Environment Conservation and Restoration 5-Year Plan clarifies special measures to be improved and strengthened during the 5-year period from FY2007 to FY2011 in the 20-year first phase, with the goal of effectively and steadily promoting efforts to conserve and restore the water source environment. The projects to be implemented have the potential for direct effects on conservation and restoration of the water source environment, and they include projects with a focus on the water source conservation areas in the prefecture and projects to establish a new mechanism which is needed to promote conservation and restoration of the water source environment .

A total of approximately 19 billion yen, which is an average of approximately 3.8 billion yen per fiscal year, is additionally needed for 12 ongoing projects and new projects to be implemented during the five years. The original per capita prefectural inhabitants tax paid by individuals in Kanagawa Prefecture is 1,000 yen per year, and the additional amount for the water source environment is only 300 yen per year. The ratio of the original tax based on income levels is 4%, and the ratio of the additional new tax is 0.025%. The tax rate increase is effective for five years starting from April 1, 2007.

Three features that are assumed in promoting the measures are planning, a tax system, and resident participation. Of these, participation of prefectural residents is intended to protect the water source environment through diverse involvement of residents by such means as establishment of the “Prefectural Resident Council.” The first function of the Council is to secure participation of the residents and to reflect their needs and wishes in planning and review of the measures. The second function is to promote resident-participation projects. Kanagawa Prefecture is considering the establishment of a system to support community projects related to conservation and reclamation of the water source environment through the Council in order to promote water environment monitoring with resident participation, dissemination of information to and education of the residents, efforts led by the residents, and initiatives conducted through collaboration among the residents, NPOs, and administrative authorities. The third function of the Council is to evaluate and review the measures to conserve and restore the water source environment. The Council sets up an expert committee composed of scholars, persons from NPOs, and personnel from administrative authorities who are directly involved in environmental conservation in order to verify effects, discuss results





**Fig. 4. A Scheme of Public Participation for Conservation and Restoration of Kanagawa’s Water Source Environment**

*Source: Kanagawa Prefecture*

at the Council, consolidate evaluation of the measures, and reflect evaluation results when they review future projects (Figure 4).

The “Forest Environment Tax” introduced by Kochi Prefecture was the first trial in Japan of a tax designed to finance part of the forest environment conservation costs. Kanagawa Prefecture’s efforts for the “Water Source Environment Tax” were creative in that the prefecture made a policy recommendation on its own initiative and proposed a new participation mechanism based on a new “participatory taxation” system as well as information provision to, and dialogues with, stakeholders.

Another case of water environment conservation through taxation is the Forest and Lake Environment Tax in Ibaraki Prefecture. Ibaraki Prefecture introduced the Forest and Lake Environment Tax in April 2008. One of its targets is to provide financing for

conservation of water quality in Lake Kasumigaura, the second largest lake in Japan, and other bodies of water, as well as in forests. The water in Lake Kasumigaura has not satisfied the national environment quality standards despite over 20 years of efforts.

Lake Kasumigaura has a basin area of 2,156.7 km<sup>2</sup>, its lake surface is 220 km<sup>2</sup>, its lakefront is 249.8 km, its average depth is 4 meters (maximum 7 meters), its water storage capacity is about 800 million tons, and its basin population is about 960,000 persons. The lake basin is home to people and industries in the southern, middle, and western part of Ibaraki Prefecture.

According to the Lake Law (see Section 1-4), Special Measures for the Conservation of Lake Water Quality are composed of the plan for the conservation of lake water quality, projects for the conservation of lake water quality, regulations to reduce pollutant load, and other measures. In the 5<sup>th</sup> Plan for Lake Water Quality Conservation in Kasumigaura, the long-term vision states the goals of “swimming in Kasumigaura” and “playing in the rivers.” To realize this vision, water quality targets are set as shown in Table 2.

The major policies in the 5<sup>th</sup> Plan for Lake Water Quality Conservation in Kasumigaura are that (1) 100% of household sewage should be treated, (2) effluent standards should apply to all factories, including small ones with less than 20m<sup>3</sup>/d of discharge, (3) domestic animal wastes should be treated, (4) non-point source load reduction from farmlands and cities is to be promoted, (5) consumption of fishery products from the lake is to be promoted, (6) forest and natural environment

**Table 2. Target of Water Quality Conservation in Lake Kasumigaura**

Water Quality Target (mg/l)			
Year	2005	2010	2020
COD	7.6	7	5
TN	1.1	0.88	0.8
TP	0.10	0.092	0.08
Load Reduction Target (t/d)			
Year	2005	2020	Reduction
COD	21.8	18.1	3.7 (17%)
TN	11.4	7.8	3.6 (32%)
TP	0.58	0.41	0.17 (29%)

*Source: The 5<sup>th</sup> Plan of of Lake Water Quality Conservation in Kasumigaura*

conservation is to be promoted, (7) sewage disposal facilities on the lakefront are to be introduced, (8) research and monitoring are to be promoted, and (9) partnerships are to be promoted among residents, organizations, corporations, scholars, and governments, using the Kasumigaura Environmental Science Center as the base of operations.

Despite these ongoing measures, the water quality of Lake Kasumigaura has never improved sufficiently to satisfy the Environment Quality Standards, and the water quality in many rivers that flow into the lake has not reached the standards either. This is because the steady increase in population and industries around the lake since the 1960s has perpetuated the deterioration of the water quality over the long term.

Ibaraki Prefecture began to study taxation for water environment conservation in Lake Kasumigaura in 2002 and to study taxation for forestry conservation in the northern part of the prefecture in 2004. From 2005 to 2007, the prefecture conducted public opinion surveys, hearings with social organizations related to the lake environment and forestry conservation in the prefecture, discussions with both advisory councils on forestry and the environment, hearings with the heads of municipalities, and so on. In 2007, a study group issued a report on new taxation for nature conservation in Ibaraki Prefecture and proposed the Forest and Lake Environment Tax. The new tax was launched on April 2008.

In the Forest and Lake Environment Tax in Ibaraki, the original per capita rate of the prefectural inhabitants tax on individuals is 1,000 yen per year, and the additional amount is also 1,000 yen per year. In the new tax, the original per capita rate of the prefectural inhabitants tax on corporations is 20,000 to 800,000 yen per year, and 10% is added to original inhabitants tax per year. The tax rate increase was implemented for five years, the same as other prefectures, starting from April 1, 2008. Through this new tax, Ibaraki Prefecture will collect about 8 billion yen in tax revenue over 5 years.

The allocation of funds from the Forest and Lake Environment Tax in Ibaraki amount to 800 million yen for forest projects and 800 million yen for lake environment projects annually. As for lake environment conservation measures, the cost for household sewage, factory effluent, animal wastes control is 400 million per year, the cost for non-point source load reduction from farmland and cities is 350 million per year, the cost for support of citizens' groups and education programs for school students is 50 million per year.

The new tax in Ibaraki Prefecture is expected to raise constant revenue that will resolve the budget shortage and the attendant lack of effective countermeasures and will enable the launch of new projects for forest and lake environment conservation.

## 5. Conclusion

Japan has a long history of struggling with water environment conservation. From the late 1960s to the early 1970s, a regulatory system with strong provisions for industries developed as a result of social pressure from people nationwide. From the early 1970s to the 1990s, basin-wide measurements incorporating TMDL have been introduced in inner bays and lakes to combat eutrophication, while other countermeasures for water quality preservation have been developed. A new era for environment conservation was launched in the 1990s by emphasizing “circulation, symbiosis, participation, and international cooperation,” and water environment conservation has developed with not only through new regulations, but also through new economic measures, information-based measures, and public participation. However, Japan is still struggling to achieve water environment conservation in rivers, lakes, and inner bay basins.

In the governance of water environment conservation, it is very important to give consideration to consensus and partnership building among different stakeholders in basins. What types of organizations and systems we should establish and how we should finance and share costs are key issues for building basin governance. As we step into the age of “decentralization and participation” in Japan, new initiatives for building basin governance are emerging. As seen in case studies in Japan, it should be noted that basin governance efforts by local initiatives are an adaptive process tied to the local natural ecosystem and socioeconomic system, which take a variety of forms. The most important matter to bear in mind is that social consensus and broader partnerships are needed to disseminate new initiatives to other areas, and eventually nationwide. These efforts are still works in process; therefore, it would be premature to assume that basin governance has been realized, or to predict that it will be realized easily in the near future.

Further study, through examining different cases, should be devoted to exploring issues to be overcome in building basin governance for achieving better water environments. This kind of effort can be expected to provide useful information for promoting international cooperation on water environment conservation in China and other developing countries.

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