CONSERVATION AND RESTORATION OF RIVER ENVIRONMENT

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1 INTRODUCTION

Japan's rivers are one of its most precious resources. They are the habitat for a wide variety of life and are a key element in the natural environments and cultures of each region of the country. The people's close relationship and interaction with rivers and riverside environments is an integral part of the national culture. River areas are of inestimable value as spaces for rest and recreation.

On the other hand, ongoing construction work such as straightening river channels and building concrete revetments is necessary to prevent flood damage and landslides. Unfortunately, these kinds of effective flood control measures often come at the expense of altering the natural environments of rivers and the surrounding landscape.

Fig. 1 The River in Hokkaido is an example of a desirable river environment.

The rise in the standard of living that has taken place in Japan in the past few decades has created new needs and new expectations of a higher quality of life and an opportunity to enjoy the benefits of pleasant environment. This has led to people taking a new look at problems related to environmental protection and building regional communities. As a result, new concepts are being advanced for creating diverse river environments and spaces along rivers to meet functional needs.

Fig. 2 A Tokyo river encased in concrete

It was against this background that Japan's River Law was amended in 1997 to include the goal of protecting and improving river environments. Since then, energetic efforts have been made and public works projects are being carried out to meet this new goal. The figures below illustrate the environmental policies followed and measures that have been taken in Japan.

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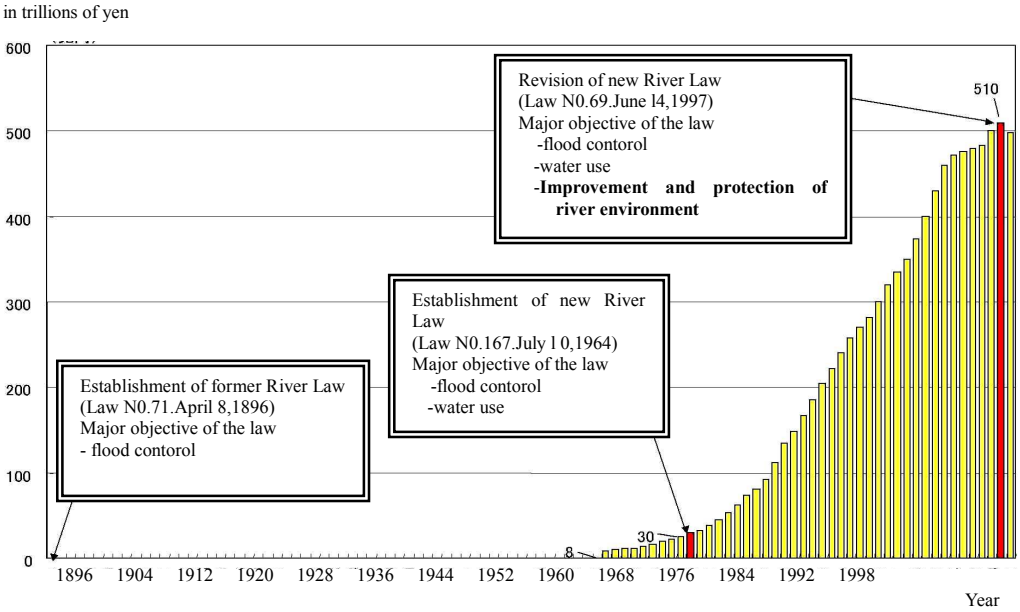


Fig. 3 Changes in GDP and revision of River Law

Sources:

: Long-term retrospective, major-series national economic accounting report relative to the level in 1990 (Economic Planning Agency, or present Cabinet Office) (1955 through 1994)

: 2000 national economic accounting annual report (Economic Planning Agency, or present Cabinet Office) (1995 through 1998)

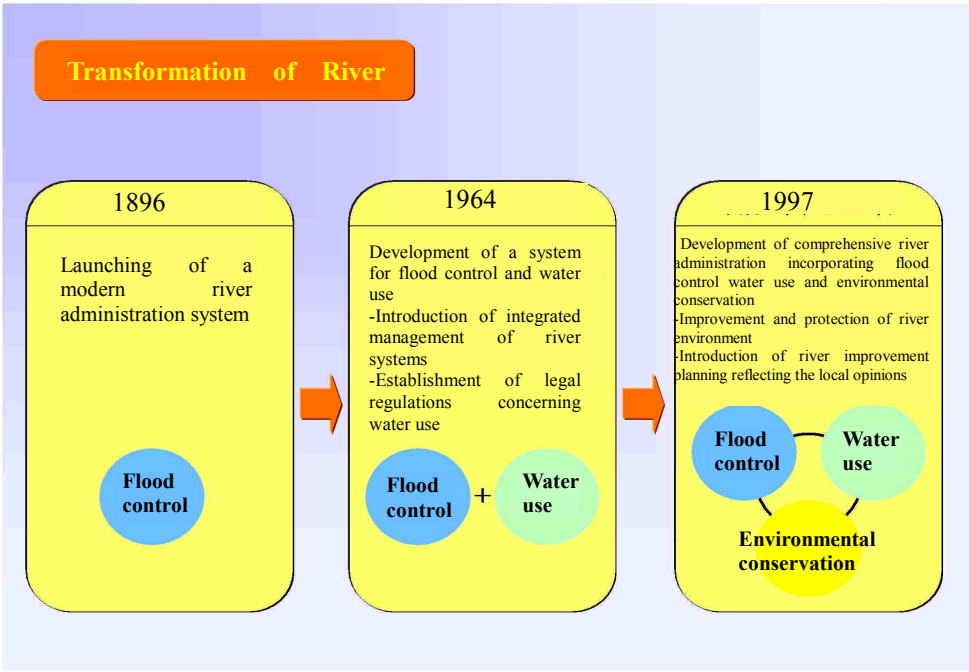


Fig. 4 Transformation of River law

2 EFFORTS TO PROTECT AND RESTORE NATURAL RIVER ENVIRONMENTS —CREATING RIVER ENVIRONMENTS WITH AN ABUNDANCE OF NATURAL FEATURES

In 1997, the purpose of the River Law was stated as the improvement and protection of river environments. In line with this, the underlying concept for river improvement was creating river environments with an abundance of natural features, while ensuring necessary safety from floods. The idea is to try as far as possible not to change natural environments that provide conditions favorable for living creatures to live and multiply, In cases where change is unavoidable, this is to be held to a minimum, and a real effort is made to make it possible to restore a favorable river environment.

In the case of the Izumi River in Kanagawa Prefecture, where triple lining with steel plating had been in place, the river was improved to restore the environment to one with an abundance of nature.

Children can now be seen playing there.

Before (1993) After (1995)

Fig. 5 Increasing the natural environment of Izumi River (Kanagawa Pref.)

3 TOWARD REALIZATION OF THE GOAL OF SOCIETY COEXISTING WITH NATURE—PROMOTING PROJECTS TO RESTORE NATURAL ENVIRONMENTS

Even while the creation of river environments with an abundance of natural characteristics is being promoted, meeting social needs continues to result in increased burdens on the environment. In recent years, countermeasures are being adopted to create environments in which society can coexist with nature. In particular, in response to the problem of rapidly decreasing wetlands such as marshes, swamps and tidelands, the need for provision of favorable living and breeding spaces for creatures that depend on environments along the edges of bodies of water has been recognized. Addressing this issue has been made a priority.

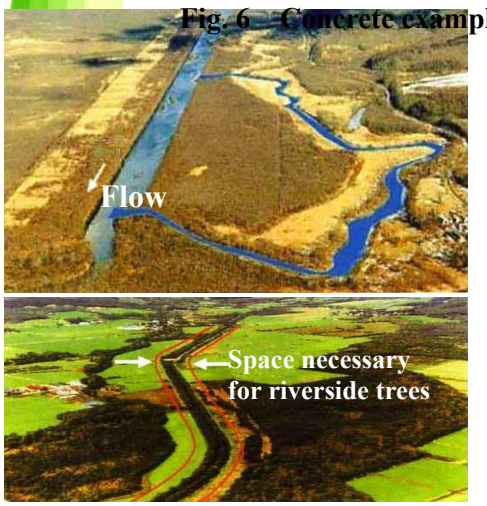


Fig. 6 Concrete example of river improvement

Restoration of straight rivers to original meandering state

As well as reverting once straightened rivers to their original meandering state to restore natural marsh environments, sediment deposits downstream are minimized.

Countermeasures to prevent sediment deposits

By developing riverbank greenbelts, settlement basins, and sediment detention areas, the burden of nutrient salts and sediment that flows into marshes can be lightened.

In response to these conditions, the goal is not only to preserve remaining natural environments, but also to implement positive nature reclamation work to restore nature that has been lost. We have begun new projects this year.

Concrete examples of nature reclamation projects include the restoration of meandering rivers, restoring natural wetlands, and the restoration of tidelands at the mouths of rivers. The following points are borne in mind when embarking on nature reclamation projects: (1) integrated plans are developed with the entire river basin in mind; (2) adaptive and phased realization of project goals (adaptive management); and (3) cooperation with NPOs.

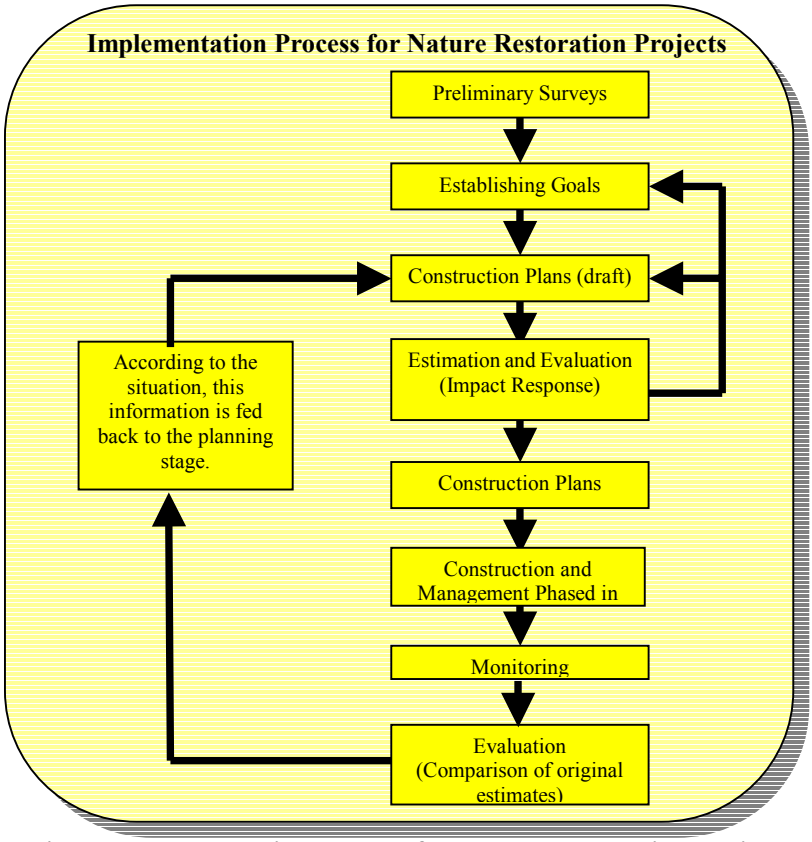


Fig. 7 Implementation Process for Nature Restoration Projects

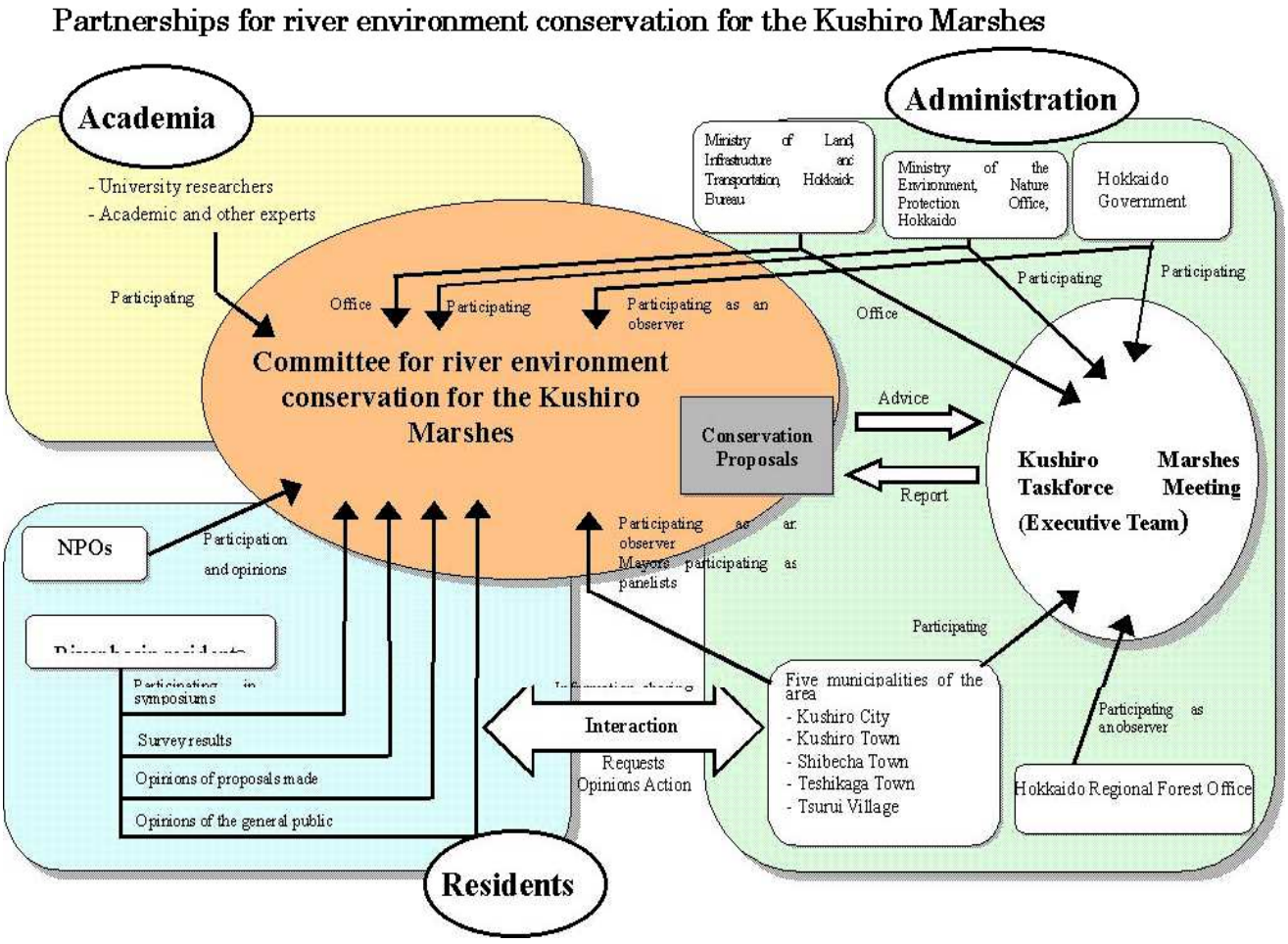


Fig. 8 Partnerships for river environment conservation for the Kushiro Marshes

4 IMPROVING WATER QUALITY IN RIVERS AND LAKES -CLEAN RIVER RENAISSANCE Ⅱ-

Aiming toward the year 2000, river improvement and sewerage service projects have been implemented together with regional efforts focusing on improving water quality in significantly polluted rivers and lakes based on 1993's "Water Environment Improvement Emergency Action Plan (Clean River Renaissance 21)". The effects of these improvements, etc. are now being seen in water quality and river scenery etc.

Due to inpouring of industrial and various domestic waste, the water quality of the Ayase River in Saitama Prefecture has deteriorated significantly, and it has been recorded for 15 consecutive years as having the worst water quality of all rivers under the jurisdiction of the Ministry of Construction. The use of an underground tunnel to send cleaner water from the Ara River into the Ayase River has been planned as of this year, and a marked increase in water quality is expected.

With importance placed on establishing a healthy water cycle environment appropriate to 21st century Japan, rivers, urban sewers, lakes and dam reservoirs etc have been selected as the new focus in efforts succeeding Clean River Renaissance 21 from 2002 aiming to improve water quality and

water levels. Water environment improvement measures are being promoted together with regional efforts based on the adopted Second-phase Water Environment Improvement Emergency Action Plan (Clean River Renaissance Ⅱ).

Regional conferences consisting of local authorities, river administrators, and sewer administrators etc have been established concerning focal rivers etc. After adopting a course of action, water environment improvement measures such as river and sewerage operations etc will be implemented comprehensively, urgently and focused together with regional efforts within a 10 year scope.

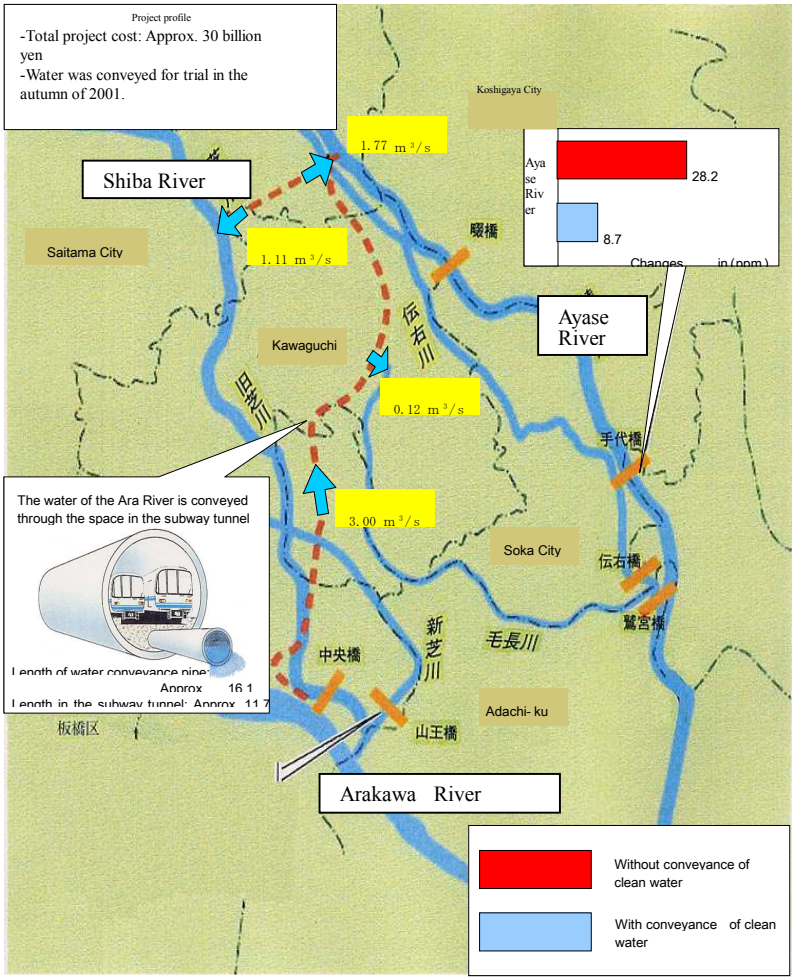


Fig. 9 Ayase and Shiba Rivers water conveyance project

5 RECOVERING DEPLETED WATER LEVELS -THE REVIVAL OF CLEAN RIVERS DOWNSTREAM FROM DAMS-

Instances of insufficient, or in fact no water discharged downstream from hydroelectric power stations and water intake facilities etc can be sited in the deterioration of natural river environments. In recent years, the social demand for the improvement of natural river environments such as the recovery of water levels has risen.

With the cooperation of water facility users, the idea is being pursued of carrying out a review at the time of renewal of the period of power-generating water facility usage rights downstream from

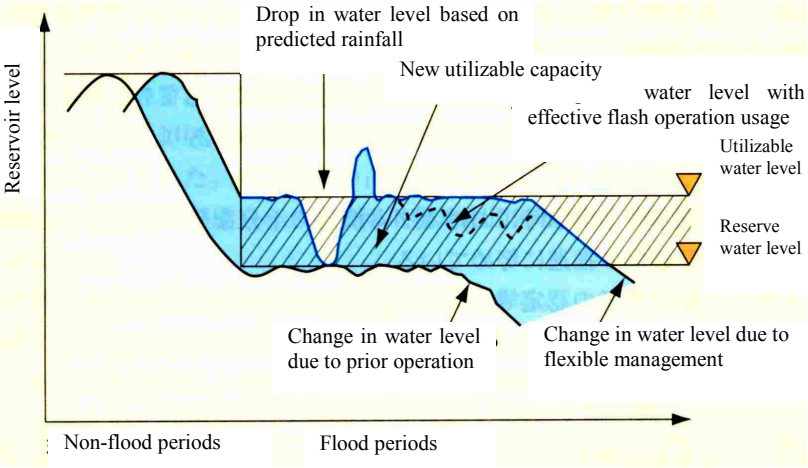
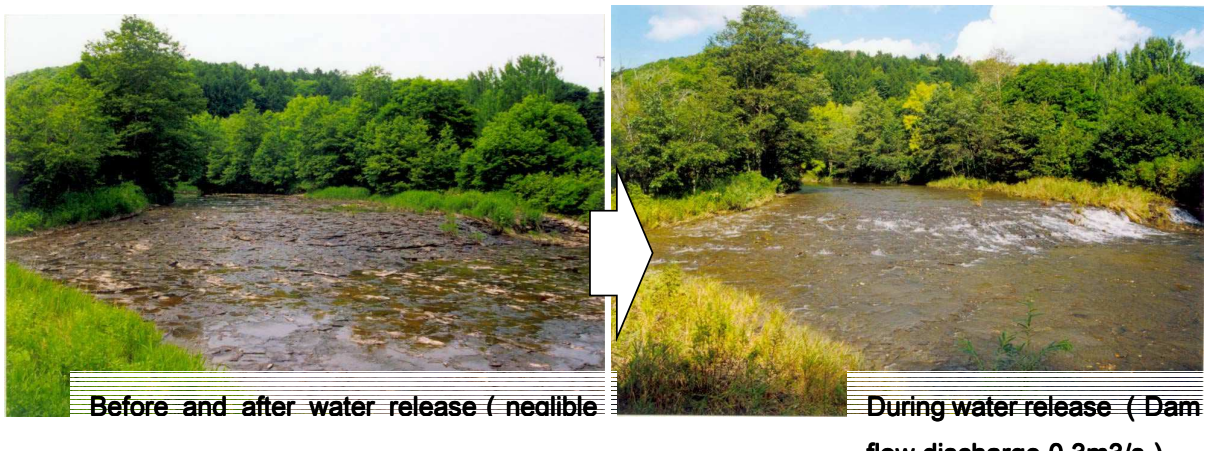


Fig.10 Controlling floods

hydroelectric power stations dams as to the maintainable flow volume in order to release a greater water flow downstream into the river from the water facility point.

Since July 1985, the recovery of water levels has been carried out on the 267 National Class A rivers which total a distance of 3100km. In order to improve the river environments of areas of depleted water intake in hydroelectric power areas in the middle catchment basin of the Shinano River, test outflows exceeding currently maintained water volumes are being trialed in summer and winter. Carrying out these tests before the renewal of water facility usage rights is a first in Japan.

Additionally, by securing spare flood control capacity as free space during flood periods, dams, which also function as flood control, can implement this free space as flood control when needed. Due to flexible dam management begun in 1997, a portion of this flood control capacity can also be used effectively in the improvement of the downstream river environments to an extent in which flood control is not obstructed. This is being implemented in 20 dams throughout the country, and is working toward the improvement of environments downstream from dams.



A stagnant river, with no water flow

The recovery to a clean river

Fig. 11 An example of water level recovery: An increase in maintainable released water flow at Ryo-kawa Dam (Hokkaido)

6 USING RIVERS TO PROMOTE ENVIRONMENTAL EDUCATION

From the vantage point of promoting a society that gains learning from its rivers, projects are forging ahead to improve riverbanks so that rivers and streams near elementary schools can be used as places where children can play and learn. The currently 213 active projects registered nationwide have gained the cooperation of local volunteer groups and NPOs which aim to turn riverbanks into safe and nature-filled play areas for children.

In fact, as of the end of last year there were 23 registered areas where various ministries (Ministry of Land, Infrastructure and Transport, Ministry of Education, Culture, Sports, Science and Technology and Ministry of the Environment), education committees, river administrators and environmental departments were involved in projects that promoted the use of rivers as areas where children could play and experience the natural environment.

Fig. 12 Trying for the first time floating down the river in a life jacket

Fig. 13 Children playing in the river

Fig.14 The introduction of learning materials and methods on the homepage

7 CONCLUSION

We need to continue our efforts to protect the ecosystems of rivers and improve river environments. As we develop a new awareness of the value of the diverse functions rivers perform, we will promote residents' participation in riverbank improvement and the preservation of water quantity and quality. The goal of creating the best possible river environments will be reached by grasping the essential role rivers play.