11. The announcement of the basic plan on flood control of the Hiikawa and the Kandogawa Rivers

A prompt implementation of a comprehensive flood control plan was strongly desired after the flood in 1972.

In October, 1975, Shimane prefecture announced the "Basic Plan for Flood Control of the Hiikawa and the Kandogawa Rivers."

Generally, a basic plan on flood control is announced by the Ministry of Construction, which is in charge of the management concerning the Hiikawa River. But this time, the prefecture took an extraordinary step to announce the plan itself, since there was opposition from locals in the past. Thus, they wanted to obtain understanding from the people of Shimane by presenting the plan along with plans to restore people's lives and to develop the region under their consideration.

The basic plan comprises three pillars: the basic flood control plan, the life-restoring plan and the regional development plan. In addition, the flood control plan has three categories :

1) Upstream area: Construction of dams in the upstream reaches of the Hiikawa and the Kandogawa Rivers
2) Midstream area: Construction of a floodway to discharge a part of the water of the Hiikawa River into the Kandogawa River
3) Downstream area: River improvement including widening of the Ohashigawa River and the embankment of Lake Shinji and Lake Nakaumi

12. The revision of the basic plan of work execution

After the announcement of the basic plan by the prefecture, the basic plans of work execution for the Hiikawa River system was revised and that for the Kandogawa River was drafted in 1976.

In the plan, the yearly possibility of exceedance of design rainfall is set at 1/150. Based on this, the unregulated peak discharge of the Hiikawa River was revised from the previous 3,600m^3/s at Ohtsu key station to 5,100m^3/s at Kamishima key station, and that of the Kandogawa River at Maki key station was set at 3,100m^3/s.

The following is the outline of this plan.

The Obara Dam is to be constructed in the upstream area of the Hiikawa River. In the upstream reaches of the Kandogawa River, the construction of the Shitsumi Dam is planned. The dams will reduce the discharge by 600m^3/s at the Kamishima key station of the Hiikawa and by 700m^3/s at the Maki key station of the Kandogawa River.

At midstream, a floodway is to be constructed from Ohtsu-cho Izumo City on the left bank of the Hiikawa River to Kamienya-cho Izumo City on the right bank of the Kandogawa River, and the discharge of 2,000m^3/s out of 4,500m^3/s will be diverted by the floodway, after the adjustment by the dam. The discharge of the Kandogawa River in the upstream from the confluent point is 2,400m^3/s. In the downstream of the confluent point, the discharge is 4,200m^3/s after joining the 2,000m^3/s from the floodway. (The peak time of the floods differs in the Hiikawa and the Kandogawa.)

Downstream, the Ohashigawa River will be dredged and widened, making its diverted capacity be 1,600m^3/s, in order to improve the drainage of Lake Shinji. Also, the embankments of the main stream of the Hiikawa River, and Lake Shinji and Lake Nakaumi will be improved.

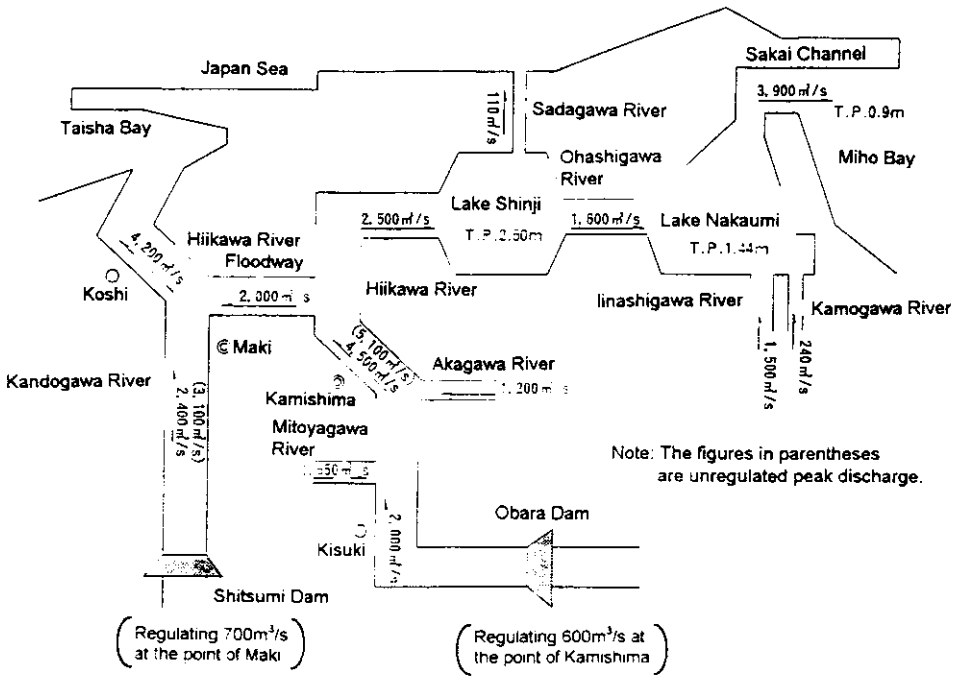

Figure 13 Design discharge distribution in the Hiikawa and the Kandogawa River Systems

13. The floodway project for the Hiikawa River

Out of 4,500m^3/s, the design high water discharge of the Hiikawa River, 2,000m^3/s will be discharged by the floodway, 4.1km long and 96m in width, to be excavated from the left bank at midstream of the Hiikawa River to the Kandogawa River. From the confluent point, the design flood discharge is 4,200m^3/s, which is the adjusted total of the discharge from the upper Kandogawa, 2,400m^3/s, and the diverted discharge from the Hiikawa River, 2,000m^3/s. (Adjustment is required due to the difference of the peak times of flooding in each river.) The project involves the necessary works of excavation and embankment and others in order to convey the flood water safely.

In the 9km long section from the confluent point to the river mouth, the width of the Kandogawa River is required about 300m at the confluent point and about 370m at the river mouth. With this work, the width of the Kandogawa will be about 1.7 times wider. (At the point 4km upstream from the river mouth .)

The improvement work is also to be done for the main stream of the Kandogawa (upstream from the confluent point) and for the tributaries such as the Hiebaragawa River and the Shingugawa Rivers which will also be affected by the project.

The total land area involved in the project is about 322ha. 437 houses will be moved out. The total volume of earth to be excavated is estimated at about 16,000,000m^3 and that for embankment is about 4,000,000m^3. 25 bridges are to be newly built or renovated. Also the weir for diverting flood discharge of the Hiikawa River to the floodway will be constructed and the Kandogawa Weir will be rebuilt. A sluice gate, in the Shin-Naitogawa River will be constructed. Concerning the disposal of the excavated soil, a total of 7,300,000m^3 of soil is to be disposed of in three valleys located near the excavated area.

In the widened area of the Kandogawa River, the width of the river will be completely changed and the state of nature along the river will be altered. So the aim is not only to secure the flood control function but also to improve nature-friendly river, considering the impact on the ecosystems and scenery.

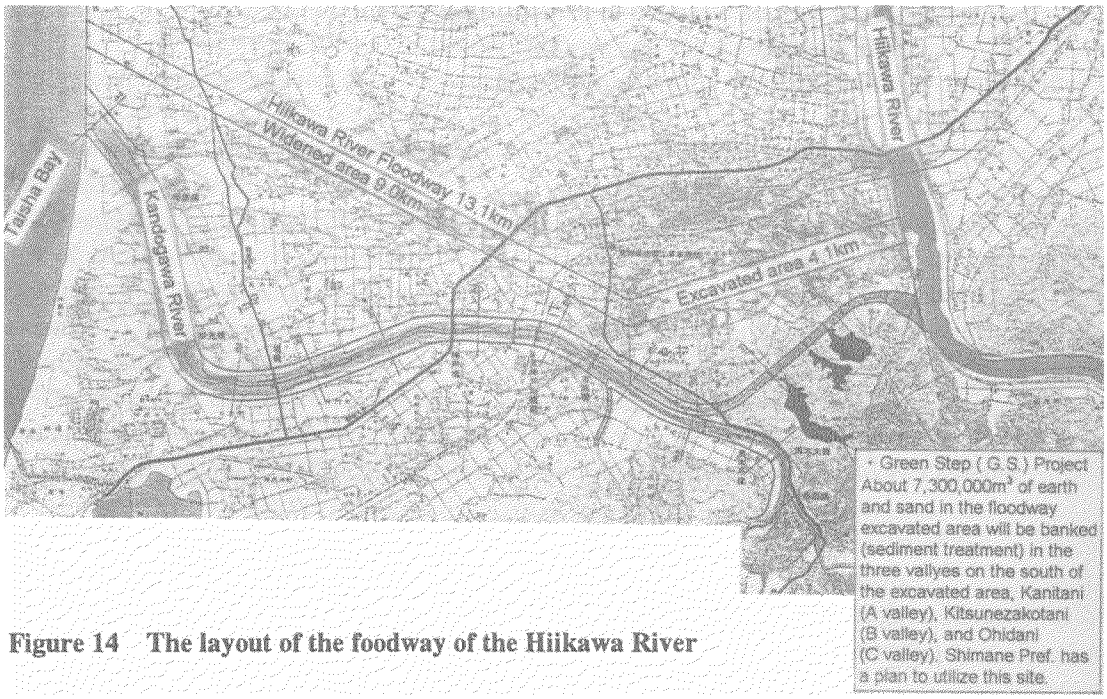

Figure 14 The layout of the foodway of the Hiikawa River

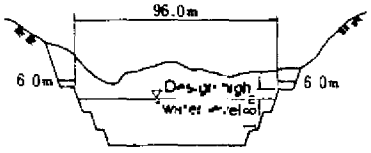

Figure 15 The typical cross section of the excavated area

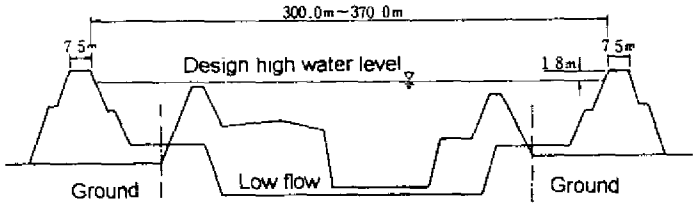

Figure 16 The typical cross section of the widened area

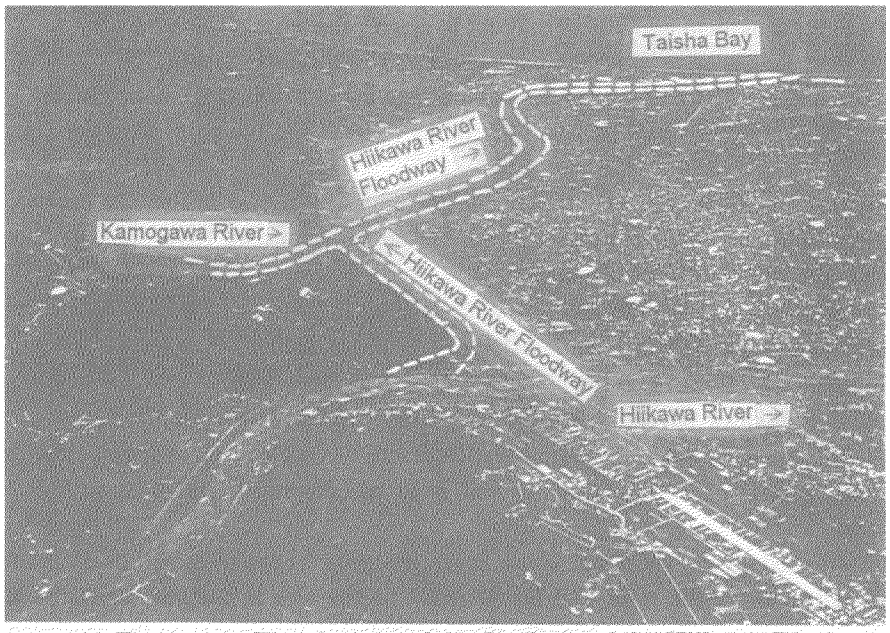

Figure 17 The airscape of the floodway of the Hiikawa River

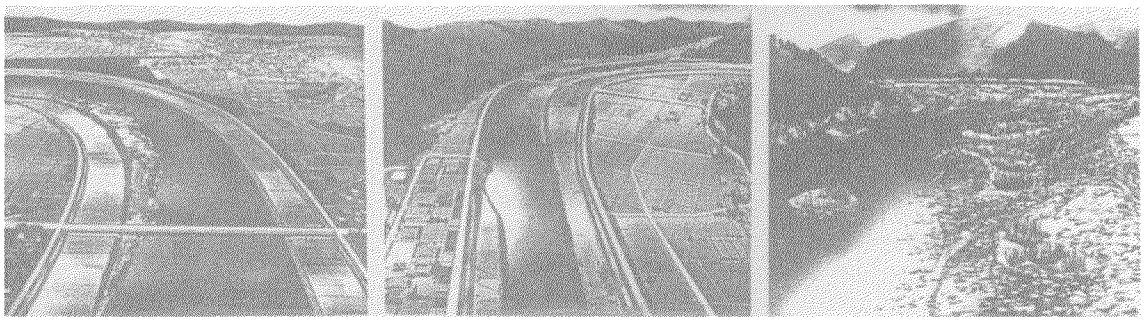

Image drawing for bend area

Image drawing for Kando weir upper reach

Image drawing for an egg-laying site of Ayu fish

Figure 18 Examples of the nature-friendly river improvement in the widened area of the floodway of the Hiikawa River

14. Conclusion

This report has outlined the history of the flood control steps and the floodway project for the Hiikawa River.

The comprehensive flood control project for the Hiikawa and the Kandogawa Rivers is at last about to be launched on the basis of the strenuous efforts made by our ancestors, which has been discussed over and over again since the Edo period and has been unable to be realized because of financial difficulty and opposition from the local residents.

There remains many problems which need to be solved. We will do our best to solve these problems and facilitate the project toward the goal of the earliest completion

Reference :

1) Izumo Work Office, Ministry of Construction, Chronicle of the Hiikawa River.
2) Izumo Work Office, Ministry of Construction, 40 years history of the improvement work of the Hiikawa River.
3) Izumo Work Office, Hii-Kawa Kando-Gawa Comprehensive Development Work Office, The Hiikawa River