

# Status and Perspective on “Water for the Sea” in Japan

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The growing coastal area problems are sending a wake-up call to the state of water resources in land areas. In coastal areas, problems started to appear as water pollution, reclamation and others during the high economic growth period, where the state of deterioration changed dramatically in the short run and the problems were easily located. But recently, the problems have been associated with medium- to long- term phenomena such as ecological changes, beach erosion and reduction of fishery resources.

For the preservation of habitat for commercially useful fish species and for the conservation of river ecology, the formation and implementation of the concept “Environmental Water” which adopts ecological approaches have been internationally initiated. When an agreement is difficult to be reached in terms of industrial use by the fishery industry, the viewpoint of conservation as the habitat of water creatures becomes important.

In the amendment of River Act in 1964, preservation of flow of water was deliberately stipulated. The “unspecified volume” secured in dam development can be effectively used for the public purpose of environmental preservation. This can be taken as the Japanese-style environmental water, forged out in the situation where the legal system for environment has been only poorly developed.

Construction of dams for the purpose of securing environmental water, however, is a reversal of priorities for the environment, as it can cause various problems, such as disruption of movements of organisms and substances, as well as separation of space. Its next amendment in 1997, environment and citizen participation came to be the priority aim of river management. This promoted the environmental flow policy.

For Japanese water resources issues, “Water for the Sea” is a challenge to the system formed by combination of factors of both scientific technologies and the society. What is required for science is not only observation method, data accumulation and technology development, but



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also improvement of the judgment and consensus formation by the whole society about how the results can be utilized for nature and for the society.

However, some social trials have begun. In 2006, at the coastal water of Okayama prefecture in western Japan, discharges from dams on the Takahashi River and the Yoshii River were realized for supporting sea weed culture in winter season. The national administrator of the dams and rivers took this action as an emergency measure. The prefectural fishery division negotiated with water stakeholders, such as agriculture, industries and city water sector, for the sake of local coastal sea weed culture cooperatives suffering from lack of nutrient from rivers.

Agricultural people of upper and middle reaches of the rivers tuned in to the crisis of the sea farming people at the river mouth. Chemical and steel industries accepted this irregular case.

This case indicates a possibility of sharing water resources for supporting the coastal fishery through negotiations with bigger stakeholders. Okayama prefecture is one of the representative highly developed areas in the economic growth after World War II. At present, the big industrial Mizushima complex contributes 5% of GNP of Japan. Owing to the warm and dry climate of this area, grape and peach orcharding is very productive, which ranks 3rd in Japan. Reclamation for agricultural and industrial uses was hard, then, about 8,000 hectares of tidal flat was lost after WWII and many fishery people were forced to become industry workers.

Nonetheless, this coast has overcome various environmental problems. Fishery sector people have not given up continuing fisheries.

In 1970s, many red tides occurred in central and eastern parts of the inland sea. Amberjack culture suffered severely. The sea sector rose against the land sector to save the sea. Governors of coastal prefecture proposed to arrange legal scheme to conserve the water quality. Special Act for Setouchi Inland Environmental Conservation was instituted in 1973.

In 1973, heavy oil spill disaster from Mizushima complex occurred. \*\*tons of oil was spread and oil spills were carried by currents away to the central Setouchi Inland Sea. At that time, this disaster was the first experience in Japan, which led to speculation that coastal fishery might be diminished.

Prefectural fishery agency has developed sea-farming, sea grass bed and tidal flat restoration techniques, with the help of national agency and fishery people. These efforts have continued to encourage fishery villages not to collapse.

On the other hand, the big three rivers were developed by construction of large dams and pipelines to supply water resources for industry and agriculture uses. Tomada Dam was built in 200\*, and a new weir at the river mouth of Takahashi River added the water supply to Mizushima industrial complex. During this development, the fishery sector had no chance and right to take in water to support the coastal fishery.

From the later 1990s, coastal fishery catches came to decline. Water quality such as COD was improved through a few decades of efforts, but nutrients to nourish coastal fishery resources were depleted at the same time. Prefectures of Setouchi Inland Sea, including Okayama prefecture, decided to appeal to the society that they needed "Water Resources for Fishery." However, by introducing the new water resource from rivers, the fishery industry will become a new stakeholder. Then it will be demanded to pay more than other industries. It is impossible for the depressed coastal fishery circle.