Community Activities Contributing to Water Environment Conservation

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Overview:

Located in the Asian monsoon region, Japan receives an annual average rainfall of 1,718 mm, roughly double the world annual average of about 970 mm. Every year, the island nation goes through 84 billion cubic meters of water resources, of which 74 billion cubic meters come from rivers, and 10 billion from groundwater.[1] In other words, Japan depends on its rivers for close to 90% of its water requirements.

A steadily increasing number of rivers in Japan have cleared the BOD environmental water quality standard over the years, with almost 90% of them having done so as of fiscal year 2004. The water quality of lakes and reservoirs, on the other hand, is still relatively low, with only about 50% of them as of fiscal year 2004 having reached the levels stipulated by COD as the standard to be attained.

In Japan, five ministries – the Ministry of Land, Infrastructure and Transport, the Ministry of Agriculture, Forestry and Fisheries, the Ministry of Health, Labour and Welfare, the Ministry of Economy, Trade and Industry, and the Ministry of the Environment – have organized an inter-ministry council to establish sound water cycle systems, and to cooperate in implementing various environmental measures and policies. The Ministry of Land, Infrastructure and Transport oversees water resources development, the maintenance and management of large rivers (including lakes and reservoirs that are part of the rivers), and the sewerage system. The Ministry of Agriculture, Forestry and Fisheries manages water supplies for agricultural use, and forests that contribute to groundwater recharge. The Ministry of Health, Labour and Welfare administers drinking water supply. The Ministry of Economy, Trade and Industry is in charge of water supplies for industrial use, and hydraulic power generation.

Through environmental laws such as the Water Pollution Control Law, the Ministry of the Environment oversees the establishment of environmental water quality standards, monitoring

of water quality in public water areas, and regulation of effluents discharged from factories and businesses. However, the Ministry of the Environment does not consider it sufficient merely to legally bind businesses to comply with effluent standards. The Ministry also recognizes the importance of promoting environmental awareness among the general public to work towards a better society. This is why the Ministry of the Environment engages in various awareness-raising initiatives. This report introduces two such initiatives: water quality conservation activities with the participation of local residents, which is a joint effort with the Ministry of Land, Infrastructure and Transport; and another water quality conservation effort mainly working with children, which is implemented with the cooperation of two other ministries, namely, the Ministry of Agriculture, Forestry and Fisheries, and the Ministry of Education, Culture, Sports, Science and Technology.

1. National survey on aquatic life (a water quality conservation effort with the participation of local residents)

As part of this initiative, elementary and middle school students as well as a variety of community groups investigate the creatures that live in rivers throughout Japan in order to learn about the environment and water quality of the rivers. The Ministry of the Environment has conducted these surveys, with the cooperation of the Ministry of Land, Infrastructure and Transport, since 1984. By the mid-1980s, little progress had been made in addressing the water pollution caused by effluents from households, and the government was trying to strengthen the initiatives on improving water quality. The Law Concerning Special Measures for Preservation of Lake Water Quality was enacted in 1984 to expedite slow-going efforts to clean up the polluted water in lakes and reservoirs.

1) Survey method

Below are the criteria used by the two sponsoring ministries to select benchmark creatures as indicators for the survey:

- They must be widely found throughout Japan.
- They must be easily collectable and identifiable by non-specialists.
- Habitats must depend on water quality.

Locations are to be determined by considering the conditions of rivers, (e.g., the current speed, depth, accessibility, and so on). A detailed map of the survey area is to be provided for easier collection of water creatures. On the day of the survey, the water quality level is determined by sorting out the captured creatures based on the procedure described below. This method takes into consideration the strong correlation between the kinds of creatures that live in a river and the level of dissolved oxygen in the water. For instance, stoneflies and river crabs are two creatures that are commonly present in clean water, while mothflies, crayfish, and

tubificid worms are found in areas with low water quality.

Procedure for determining water quality:

- Table 1 has about 30 creatures classified into four groups based on their preferred water quality levels. Sort the collected samples into these four groups.
- Each group gets a point every time a creature is classified into that group.
- Categorize all the creatures collected, and calculate the total score for each group. The group with the highest score indicates the water quality level of the survey site.

Table 1 Water quality and benchmark creatures

Water quality

High → Low

Water Quality I Clean water	Water Quality II Slightly dirty water	Water Quality III Dirty water	Water Quality IV Very dirty water
Stonefly Mayfly (Heptageniidae) Caddisfly (green sedges) Caddisfly (saddle casemaker) Dobsonfly Black-fly River crab Turbellarian (flatworm)	Caddisfly (little sister sedges) Caddisfly (Macrostemum radiatum) Water penny (Psephenidae) Genji Firefly Sieboldius albardae Freshwater shrimp Corbicula clam Estuarine gastropod Melanian snail	Water stick insect Water scorpion Waterboatman Estuarine isopod Amphipod (Grandidierella japonica) Freshwater snail Leech	Mothfly Crayfish Common pond snail Tubificid worm

2) Survey results for fiscal year 2005

In fiscal year 2005, a total of 85,910 people and 2,292 groups participated, including elementary and middle school students as well as various community groups. Elementary and middle school students accounted for 68% of the participants, and children's and community groups 25%. The total number of survey sites across the nation was 4,059. The water quality at a majority, or 59%, of the survey sites turned out to be very good, and was categorized as Water Quality I (clean water), 25% as Water Quality II (slightly dirty water), 12% as Water Quality III (dirty water), and 2%

as Water Quality IV (very dirty water).

Photo 1: Field survey

Photo 2: Field survey

2. *Kodomo Hotaranger* Awards (promoting and rewarding water quality conservation activities among children)

Since fiscal year 2004, the Ministry of the Environment has encouraged the submission of reports of *kodomo hotarangers'* activities so that children's efforts in conserving water environments for fireflies can be rewarded and made known to the public. The word "*kodomo*" means "child" and "*hotaranger*" – a combination of "*hotaru*" (firefly) and "ranger" – was coined as a moniker for "a person who protects fireflies." While approximately 50 kinds of fireflies live in Japan, the most commonly seen are *Genji* fireflies and *Heike* fireflies. These fireflies lay eggs on aquatic moss, and the larvae live at the bottom of the river. These insects spend their entire lives in and around water. The water in the fireflies' habitats identified in Tokyo has DO levels of 6.8 – 11.8 mg/L, and BOD levels of 0.5 – 1.8 mg/L, which fall into the second highest category out of six levels based on the environmental water quality standard in Japan. Therefore, the Ministry of the Environment has adopted fireflies as a symbol of water environment conservation activities and created this award. The Ministry hopes that children, the next generation of our society, will have a chance to find enjoyment in their lives through hands-on experiences learning about creatures in rivers and lakes, and through various activities to conserve water quality and the environment.

1) Application criteria

The Ministry of the Environment welcomes applications for this award from children's groups that engage in water environment conservation activities. The applicants must meet the following criteria:

- Children's participation: The groups must comprise elementary or middle school students and the children must be the main participants in the activities.

- Fireflies: the activities must focus on fireflies, (e.g., surveys and conservation efforts on fireflies and their habitats).
- Water environment: The activities must concern water environment, (e.g., investigation, research, clean-up, or conservation of water quality and environment including aquatic flora and fauna).

2) Awards for fiscal year 2005

In fiscal year 2005, applications from 40 groups were screened by the selection committee, and four groups were awarded prizes. One group received the Minister of the Environment prize, and three received the outstanding performance prize. Below are details of the group that received the Minister of the Environment prize and its activities.

<u>The Minister of the Environment Prize:</u>

- Group name: Seimei Elementary School, Ueda City, Nagano Prefecture (26 sixth-grade students)
- Activity synopsis: The students of the recipient group began to engage in water environment conservation activities in the common hope of protecting the natural environment along the Yadesawa River so they could see many fireflies along the waterside. The students engaged in the following activities through their own initiative, investigating the riverside environment to see how it affected fireflies, and considering what issues had to be addressed:
  - Investigated water quality by conducting surveys on aquatic creatures.
  - Cleaned up the river.
  - Interviewed local residents living near the river.

Reference:

1) *Japan's Water Resources, FY 2006* (Water Resources Department, Land and Water Bureau of the Ministry of Land, Infrastructure and Transport, August 2006)