

Key Projects of the

Water Environment Policy Bureau

Total Water Pollution Load Management System(TPLMS)

The Total Water Pollution Load Management System(TPLMS) determines water quality goals for each river basin based on scientific evidence, calculates total pollutant emissions to reach the water quality goals, and allocates emissions to each local government in the river basin to keep the total volume of emissions from each section under the permissible level.

The system was first introduced in 1998 to manage Paldangho and other Hangang water supply sources and was legislated through the Act on Water Management and Resident Support in the Four Major River Basins. The three major river basins of Nakdonggang, Geumgang, and Yeongsangang-Seomjingang are required to implement load management in the event that they do not reach the water quality goals. Accordingly, load management was implemented in Busan and Daegu Metropolitan City for the Nakdonggang River basin in August 2004. In the early stages of implementation for the Hangang River basin, the local government was able to arbitrarily determine whether or not to implement load management, and consequently, seven local governments at the headwaters of Paldangho Lake carried out load management until 2012. An amendment in 2010 mandated load management in the Hangang River basin, and accordingly, the mandate was first implemented in Seoul, Incheon, and Gyeonggi from June 2013 and will be gradually extended to other regions. The load management system is also being extended to areas that are not part of the four major river basins but are affected by severe water pollution. As of March 2014, TPLMS has been implemented by a total of 114 local governments, including the four major river basins. Only BOD was targeted by load management until 2010, but from stage 2 (2011-2015), T-P was also added, except in some regions.

Local governments implementing the load management system must formulate a “pollution load management master plan” that includes the allocated pollution load and reduction plans to satisfy the



Photo: Before and after ecological stream restoration of Musimcheon Stream, Cheongju-si

allocation. To ensure the effectiveness of the plan, a yearly fulfillment evaluation regarding plan progress is carried out. According to the implementation evaluation results for stage 1 (2004-2010) of TPLMS implemented by a total of 66 local governments, water quality goals and annual load allocations specified in the load plan were observed even though implementation was in its early stages. This indicates that the TPLMS is being stably established.

Ecological Stream Restoration Project

Ecological stream restoration refers to activities to remove artificial ecological disturbance factors from in and around rivers to ensure close-to-nature restoration and maintain healthy ecosystems. It involves restoring the low water channels and other physical foundation of rivers to their natural form to ensure that rivers maintain their self-purifying ability for water quality improvement and their ecological function as habitats while also acting as water-friendly features for the public to enjoy.

The government has injected 1.6153 trillion won (in 1,510 projects) since when the ecological stream restoration project first began in 1987 until 2013 to restore 1,034km of polluted or damaged rivers. It is currently aiming to first restore 1,667km of rivers in urgent need of restoration between 2011 and 2017 according to a comprehensive mid- to long-term plan on the ecological stream restoration project formulated in 2010.

The key projects for ecological stream restoration consist of improving water quality, restoring urban rivers, and restoring aquatic life. Water quality will be addressed through water quality improvement projects such as dredging contaminated sediments, constructing wetlands, and installing riverbed filtration facilities; the project to restore aquatic ecosystem includes creation of riffles and polls, construction of biotopes, and restoration of meanders; the ecology observation post and the facility for experiential learning will be built, too. Urban rivers will be restored by removing cover structures and restoring disappeared waterways, building ecological waterfront and providing dry and damaged rivers with the water necessary for ecological maintenance. Aquatic life will be restored by selecting and restoring flagships species in each river.

Ecological stream restoration has not only resulted in



The ecological stream restoration project has restored 1,034km of polluted or damaged rivers.

improved water quality and aquatic ecosystem restoration, but also in a variety of benefits for the public, including provision of ecological spaces, job creation and other economic effects, and adaptation to climate change by decreasing city temperatures. A survey of 53 ecological streams restored between 2007 and 2010 indicated that BOD was reduced by 64.8% (7.1mg/L→ 2.5mg/L) on average, and increased biodiversity was also confirmed. Cheonggyecheon in Seoul showed a temperature reduction of 0.3 to 3.3°C. There have been confirmed cases of significant increases in the number of fish species after river restoration, suggesting the improved health of the aquatic ecosystem.

River Basin Management for Co-prosperity of Upstream and Downstream Reaches

Water management policies were previously based on administrative districts and focused on restricting behaviors in upstream regions focused on emission regulation and end-of-pipe treatment and through the designation of water source protection areas. This meant that upstream residents were subject to regulations for water source protection and were therefore disadvantaged while downstream regions enjoyed the resulting benefits, creating conflicts between upstream and downstream reaches. After recognizing the limitations of this approach, water management policies since the 2000s have gone beyond administrative districts and instead focus on river basins to address conflicts between upstream and downstream reaches and between urban and agricultural regions. The key measures for

river basin management include the water pollutant load management system, riparian zone designation, land purchase, establishment of a river management fund from water use charges, and operation of the River Management Committee.

Water use charges and river management funds are used as effective financial measures for river basin management, mediating interests between upstream and downstream reaches to prevent conflicts and preparing financial resources to improve water quality in water source areas. Water use charges are collected from downstream users who are supplied with tap water produced from upstream water. These charges are placed into river management funds to carry out water quality improvement projects for water source areas in the upstream reaches, as well as to support the upstream residents who are negatively affected by regulations to protect water sources.

Water use charges are imposed on water users according to the “user pays principle.” In other words, the charges are imposed on end users who are supplied with source water or purified water collected from the public waters of the four major rivers. The charges are proportionate to the amount of water used and included in the water bill. Water use charges take on the properties of a user charge because they are non-tax charges imposed for the purpose of carrying out the specific administrative task of water quality improvement in water sources only for the beneficiary groups that use the water.

These water use charges are collected to form the river management funds. First, the Hangang River Management Fund was established in August 1999, followed by the Three Major Rivers Management Fund in July 2002. Water quality improvement projects and resident support projects were carried out using the river funds starting in 2003. The funds are used for such purposes as: (1) Environmental infrastructure installation, operation, and other water quality improvements and water source protection projects carried out by local governments in the upstream areas of water sources; (2) Resident support projects in water source management areas that are subject to regulations; and (3) Purchase of land in riparian zones that have a significant influence on the water quality of water sources. Resident support projects include income generation, welfare enhancement, education, scholarship assistance, and housing improvement.

The River Management Committee is a major decision-

making body for managing the four major river basins. It deliberates on and coordinates matters such as operation of the river management fund for the rivers concerned, water use charges, pollutant reduction plans and land purchases to improve water quality, resident support project plans, and assistance for private water quality monitoring. The committee is chaired by the Vice Minister of Environment, and its members consist of the deputy mayors or deputy governors of the wide-area local governments (si or do) concerned, the CEO of K-water and heads of other associated institutions, and high-level public officials of associated government ministries. In other words, the wide-area local governments participate in the River Management Committee to represent local residents, who are stakeholders in the river basins, and ensure resident opinions are reflected in decision making.

