

Study on improving urban water environment using sewer systems

Year of Research

2008

(Objectives)

Efforts are currently being made to improve urban waterfront, often small-scale closed water bodies without predetermined environmental standards, by utilizing sewer systems such as stormwater sewers, and water resources originating from sewer systems such as stormwater or reclaimed wastewater. However, stormwater and reclaimed wastewater have been used for improving such water bodies without clearly understanding the impacts of their water quality or temperature. Moreover, such water bodies often have stormwater outlets but the combined sewer overflow (CSO) discharged from such outlets and their impacts to the water bodies are not been assessed.

This study aimed to determine possible measures to be implemented in sewerage projects for creating an environmentally sound urban water cycle and to examine their effectiveness, existing issues and possible solutions.

The study includes the following parts.

1. Analyzing current measures being implemented for troubled small-scale closed water bodies (moat, pond, etc)
2. Examining a simple time-series analysis method for combined sewer overflow
3. Examining the impacts of stormwater/ reclaimed wastewater to small-scale closed water bodies.

(Outcome)

The outcomes of the study are as follows.

- (1) Surveyed small-scale closed water bodies and investigated current measures against CSO, water quality surveys and community activities by residents based on a questionnaire result.
- (2) Selected a model area for the study based on the questionnaire results, accounting for the existing measures against CSO, water quality surveys, community activities by residents, historic backgrounds and significance.
- (3) Selected and examined simple time-series analysis methods, namely "hydrograph method with rational formula" and "PWRI load model", based on the land-use, existing combined sewer systems and rainfall in the model area.
- (4) Demonstrated that it is possible to determine characteristics of CSO using a simple time-series analysis method.
- (5) Identified correlation between rainfall (rainfall intensity/total rainfall), CSO load and overflow water quality for the model area.
- (6) Investigated the effectiveness and issues regarding utilization of stormwater and reclaimed wastewater

(Future issues)

- Investigate the applicability of the analysis method used in this study for small-scale water bodies in other regions.
- Determine tangible impact to water environment of the model area (water quality, algal bloom, etc)
- Assess the impacts to water environment of the model area when implementing CSO improvement measures.

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Key words

closed water body, combined sewer system, reclaimed wastewater