

Water utilization effects of rainwater and recycled water

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1. Introduction

Rainwater and recycled water can be positioned as water sources which are part of the water cycle along with rivers. A quantitative evaluation of the effect of water use was performed to estimate future water usage in order to ensure the balance of regional water supply and demand, taking into account the fall of drainage caused by the decline of rainfall and water saving measures taken during a drought

2. Estimates for recycled water and rainwater

The study was conducted in Fukuoka City, where the use of rainwater and recycled water is promoted. Rainwater reservoirs are installed in private homes and there are systems installed in buildings and public facilities. Recycled water is used in three ways. They are, individual circulation, district circulation, and regional circulation. Individual circulation is a method of reusing gray water by installing a recycling system independently in buildings or other individual facilities, for this study, we shall assume that it is used in conjunction with rainwater. District circulation and regional circulation are methods to use reclaimed water which was treated by sewage treatment facilities. The Difference between them is the difference between the uses of scale. In Fukuoka City, housing rainwater is used along with individual circulation according to regional circulation. This study, and the quantity of water used is calculated considering the water saving rate during droughts with reference to statistical data.

3. Results of the estimation

It is hypothesized that circulation is the individual method and the source is wastewater reused in the building, but when a drought lowers the water supplied to the building, also reducing wastewater, the amount of recycled water used will also fall. In this study, processing of recycled water is assumed to be stably maintained as long as the water supply is not depleted even during a drought, and its relationship with the amount of water usage was calculated. The quantity of recycled water used for individual circulation was estimated to be about 1.1% of all water supplied in Fukuoka City. Figure 1 shows one example of the calculation result. As a result of

utilizing individual circulation, the amount of the water supply is usually less under normal circumstances. Even during a drought, for part of the recycled water to supplement the decline in water supply, high resistance to drought is a decrease in water use within the facility will be gradual as compared to normal use. In the future, it will be necessary to also increase the cost of facility improvement, maintenance etc., so it will also be necessary to consider the cost balance of drought damage and facility cost etc., but it is assumed that increasing the quantity of recycled water used could increase resistance to droughts.

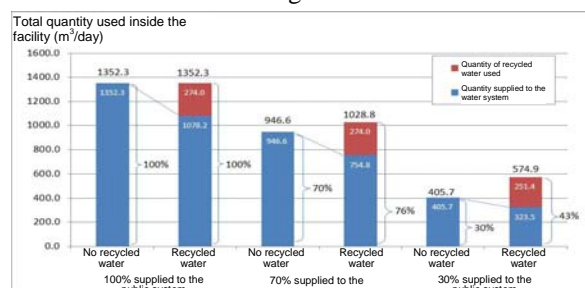


Figure 1. Example of Estimation of Quantity of Recycled Water Used by Individual Circulating

In addition, the future quantity used was also estimated based on rainwater use per detached house and on regional circulation and future numbers of facilities¹⁾²⁾.

4. Conclusion

It was estimated that the effectiveness of water use as a total quantity for all of the methods of use is only a few percent. This evaluation is an evaluation from the perspective of water use, and multi-faceted evaluations also considering flood control, the environment, etc., are expected to be even more effective. And in light of the fact that new water resource development is difficult, it is important to try and expand from the existing form of water supply to discover new utilization possibilities.

[Reference]

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