建築物雨水貯留系統評估工具建置

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摘要

屋頂雨水收集再利用，不僅幫助用水戶節省自來水使用量，也能減輕地區的下水道系統負荷，更是國家節水推廣措施之一。目前國內所設置的雨水貯留設施，多集中於機關、學校與工廠大樓，且雨水貯留設施相關設計原則，為水利專業之建築師或顧問公司使用，一般民眾不易評估與瞭解相關資訊，造成雨水貯留設施不夠普及。本文分析國內外建築物雨水回收評估方法，以一般民眾熟悉的操作介面，建置出可模擬不同雨水收集系統、不同用水需求情境的評估工具，並加入成本分析。本工具由三個基本演算模組組合而成，包含雨水集水量、雨水使用量以及貯水桶水量。為讓使用者更加瞭解雨水貯留系統的設計，另外提供評估因子，讓使用者瞭解特定情境下的雨水貯留系統效益，使用者可比較不同輸入條件，決定雨水貯留系統的設計。評估因子包括：年總回收雨量(噸)、年總使用水量(噸)、雨水使用替代率(%)、溢流率(%)、年節省水費(元)、投資回收期(年)。藉由本工具建置，讓一般民眾更加了解建築物雨水貯留系統的效益，有助於此系統在國內的推廣工作。

關鍵字詞：建築物雨水貯留系統、雨水回收、評估工具

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Establishing a rainwater harvesting assessment tool

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Abstract

Rainwater harvesting and reuse can help to save tap water usage and to reduce rainwater sewer system loadings. Rainwater harvesting is a measure promoted not only in developing countries but also in developed countries. The rainwater harvesting system in Taiwan is usually concentrated in government buildings, schools, and factories. However, the design rules and associated methods are not well understood by public. So far, the design standard are used by professional experts and hardly used by private owners. This study analyzed local and international assessment methods and built up an assessment tool for public use, which is established in an acceptable interface and includes different demand scenario and cost analysis. Three major modules are consisted, i.e., rainwater collections, rainwater usage, and rainwater in storage tank. In order to assist users to make better decisions, six assessment factors are provided. They are annual rainwater harvested volume, annual rainwater demand volume, rainwater replaced rate, overflow rate, annual saving dollars, and investment feedback period. According to the results of these factors, the users can easily estimate the benefit from rainwater harvesting scenario and can decide the size of rainwater storage tank and the possible rainwater reuse amount. This tool is aimed to improve the understandings of rainwater harvesting system of public and to encourage the setting of the system.

Keywords: rainwater harvesting system, rainwater reuse, assessment tool