Assessment on the performance of a rainwater harvesting system

ABSTRACT

The rainwater harvesting system is an alternative way to meet domestic water demand. At the same time, it can also help in reducing run-off, especially in urban areas. In this study, a rainwater harvesting system, which located at the Faculty of Engineering, was taken as a case study. Indicators that measure the performance of the rainwater harvesting system have been developed. One such indicators are reliability, which is dependent on the rainfall and water consumption patterns, tank size and effective roof area. Flow meter and rain gauge used to measure the volume of harvested rainwater and collect the rainfall depth data respectively. In this study also, a model is developed to predict the volume of rainwater harvesting with respect to the rainfall depth with a particular roof catchment. It demonstrates good fits with $R^2 = 0.952$. The reliability of rainwater harvesting using existing tank 4.08 m3 is 60.8%, 66.5%, 67.7% and 98.2% for Consumption 1 (flushing toilets, gardening and washing vehicle), Consumption 2 (flushing toilets and gardening), Consumption 3 (gardening and washing vehicle) and Consumption 4 (flushing toilets and washing vehicle) respectively. The run-off coefficient for the selected roof is found to be 0.92.

Keyword: Rainwater harvesting system; Reliability; Rainfall depth; Run-off coefficient