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Monzur A. Imteaz

Swinburne University of Technology, Australia

Analysis of stormwater harvesting potential: A shift in paradigm is necessary

With increasing population and changing climate regime, water supply systems in many cities of the world are under stress. Two billion people worldwide are currently without access to an adequate water supply. Water demand is increasing day by day but resources of fresh water are limited. To tackle the situation many water authorities around the world have been promoting the use of water conservation and recycling options through various campaigns and offering incentives/grants for such water saving ideas and innovations. Even with several educational and awareness campaigns and financial incentives, there is a general reluctance to adopt any potential stormwater harvesting measure. The main reasons behind this are that people are not aware of the payback period for their initial investment and the optimum size of the storage required satisfying their performance requirements. Among all the alternative water sources, stormwater harvesting perhaps has received the most attention. One of several water conserving techniques is on-site stormwater harvesting for non-drinking purposes. However there is a lack of knowledge on the actual cost-effectiveness and performance optimisation of any stormwater harvesting system, in particular the proposed design storage volume could be overestimated or underestimated. At present stormwater harvesting systems are proposed and installed without any in-depth analysis of its effectiveness in various climate conditions. The biggest limitation of stormwater harvesting schemes and designs is the rainfall variability, which will control the size of the storage needed. Furthermore, with the impacts of global warming and potential climate change, climate variability is expected to increase more. The traditional practice of rainwater harvesting volume/size design is based on historic annual average rainfall data. However, design of rainwater harvesting volume based on annual average rainfall data is not realistic. As a stormwater harvesting system designed considering average rainfall will not provide much benefit for a critical dry period. An in-depth analysis considering different climate regimes (dry, average and wet years) is necessary; however this sort of analysis should be easy to be understood by general end-users. Development of a user-friendly tool has been proposed, which will make end-users decision making process easy, effective and knowledgeable. Developments and issues regarding this sort of tool will be elaborated.

Biography

Monzur Imteaz is working as a Senior Lecturer within Civil Engineering group of Swinburne University of Technology at Melbourne, Australia. He has received his B.Sc. in Civil Engineering from Bangladesh University of Engineering & Technology and M.Eng. in Water Resources Engineering from Asian Institute of Technology (Thailand). He has completed his Ph.D. in 1997 on Lake Water Quality Modelling from Saitama University (Japan). After his Ph.D., he was working with Institute of Water Modelling (Bangladesh) in collaboration with Danish Hydraulic Institute (DHI). Later he has completed his post-doctoral research at University of Queensland, Brisbane. Before joining at Swinburne he has been involved with several Australian local and state government departments. At Swinburne, He is teaching subjects 'Sustainable Design', 'Urban Water Resources' and 'Integrated Water Design'. Also, he has been actively involved with various researches on sustainability, water recycling and modelling, developing decision support tools, rainfall forecasting using Artificial Neural Networks.

mimteaz@swin.edu.au