

Flooded areas reduction analysis using Low Impact Development, Rain Barrel

Maryam Movahedinia (1) and Fakhreddin Barakhasi (2)

(1) Tarbiat Modares University, Faculty of Agriculture, Department of Hydraulic Structure, Iran, Islamic Republic Of (maryammovahed@yahoo.com), (2) Mahab Ghodss Consulting Engineering Co., Iran, Islamic Republic Of (fa.barakhasi@gmail.com)

Urban floods management and its problems reduction, applying modern methods such as low impact development (LID), can be considered as one of the leading measures in this context. In this study, urban stormwater existing network is analyzed to find flooded areas in some parts of Tehran district number 13 using EPA-SWMM mathematical model. After creating stormwater existing network model, storm event with return periods (RPs) 2, 5 and ten years have been selected. Results show that in comparison with total runoff, flood volume of flooded areas in each RPs is 19.3, 24 and 27 percent, respectively. Thus, stormwater existing network can only pass some parts of runoff, and the rest causes urban inundation. After that, applying Rain Barrel (RB) as a low impact development technique, with two different sizes for all RPs mentioned above, were studied. Based on the results, flood volume exit out of the flooded areas for RB smaller size was reduced 47, 21.6 & 9.7 percent and for RB larger size 47.3, 39.6 & 38.7 percent for all RPs mentioned above respectively. Comparison between LID technique and Non-LID technique shows that novel approaches such as rain barrel as a LID technique can reduce adverse effects of small storm events 40 percent approximately.