IMPROVING RAINFALL MANAGEMENT IN DEVELOPED AREA BY USING BIORETENTION SYSTEM

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Abstract

Land development and urbanization have increased significantly in many cities in Indonesia over the last three decades because of the increasing population and economic development. The change of land-use type has had a considerable impact on the nature of runoff and related hydrological characteristics. The runoff is increased, time of concentration is shortened and the peak discharge is raised several times, while ground water recharge is reduced (Weng, 2001). When the runoff flows over dirty surfaces, such as highway, parking area, etc., part of waste is washed out, and the water is becoming polluted. Implementation of bioretention cell in the small area of parking plot of Civil Department, Diponegoro University indicates that the cell can achieve substantial hydrologic benefits through delaying and reducing peak flows and decreasing runoff volume runoff. The runoff and the peak discharge is delayed about 20 minutes and 15 minutes respectively. The peak flow and runoff volume are reduced 43.43% and 72.18% concecutively. The impacts of cell to the water quality have not bee detcted yet, as the monitored events are limited.

Key words: change of land use; hydrological characteristics; bioretention cell; Diponegoro University, Semarang; runoff