Analysis of Land Use Changes Effect on Surface Runoff Using Dynamic System

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Abstract

The population in Surabaya growth rapidly in recent years and reach out up to 3,1 as effect of urbanization. Increasing population will changes the open land become residential area and decrease the pervious area. According to the hydrology cycles, this condition will increase the surface runoff within the watershed. An appropriate drainage channel capacity needs to be evaluated in order to adapt for the current and upcoming land use scenarios to mitigate the inundation problems.

This research will identify the effect of land uses changes on surface runoff based on dynamic system simulation. Dynamic system is an continues simulation which focus on the interaction between variable and feedback loop within the structure (Suryani,2006). Dynamic system modeling is an accurate method to describe a system by feedback analysis within the simulation as a policy control (Simonović, 2013). The simulation will considering several variables that have great impact on inundation problem. Furthermore, the simulation will identify the relationship of each variable that influence the runoff volume to obtain the inundation problem within the watershed. The main question of the inundation problem is the land use planning regarding the percentages between the green open space and the impervious area. The dynamic system simulation will determine the appropriate percentages of pervious and impervious area to mitigate the inundation problems.