

ABSTRACT

MODEL OF A DIFFUSION SYSTEM AT AL-WASI'I MOSQUE OF LAMPUNG UNIVERSITY

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As already known, one alternative to solve run-off problem is by recharging the water into soil by mean of a diffusion system. This way can be expected to be able to conserve ground water. This research was aimed to model a diffusion system conserving rainfall runoff and wastewater from the mosque of Al-Wasi'i of Lampung University. This research was conducted from July to September 2011. Experiment data used in the modeling consisted of a week daily wastewater discharged from the mosque, percolation rate, surface evaporation. The wastewater data was collected both on and off semesters. Percolation rates of three location sites around the mosque were measured by using *double ring infiltrometer*. Surface evaporations were measured by constructing a 30x30x45 cm glass container simulating a runoff collector. The actual evaporation was then used to calibrate the constant (K) by comparing with the Penmann reference evapotranspiration (ET_o). The constant was then validated by another group of actual evaporation data. In addition to the experimental data, a 10 year daily climatological data was also used and collected from the nearest weather station. The model consisted of input components: praying wastewater, runoff from the mosque's roof, direct rainfall, and output components: overflow, evaporation, and percolation. The model simulated daily up and down water surface of the diffusion system.

The result showed that there were three different percolation rates from three different locations, but the stable rate of 1666,12 mm/day was more likely representative and used in this model. Based on the simulation, diffusion system of 3 m depth and 8 m² area could conserve the water by 70%.

Keyword : diffusion system, percolation rate, rainfall run-off, praying wastewater, *double ring infiltrometer* and simulation