THE RELIABILITY TEST OF DAILY AND HOURLY RAINFALL ON DATA INPUT USING HEC-HMS MODEL AT SAMPEAN WATERSHED

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ABSTRACT

The flood particularly happened in the watershed is mostly caused by the decreasing the absorbing area due to uncontrolled and non environmentally land use changing. It caused the increasing of flood volume on that catchment area. Therefore the rainfall-runoff model is very important to assess the hydrological process on the field.

Rainfall-runoff model could be used as a tool to monitoring and evaluating the river discharge in the potentially of surface water resources estimation. For getting the accurate and detail of information and output model, the watershed divided into subs of watershed. In this study, Sampean Baru catchment area that has 718,896 km² wide, divided into 10 subs catchment with the outlet point at AWLR Kloposawit. This study utilize HEC-HMS model due to the calibration facility, the ability of simulation model with distributed data, the continued stream model capability, and GIS prosperity.

The method of SCS CN, SCS Unit hydrograph and Muskingum with the influential parameter on CN, Initial Loss, Imperviousness, Time Lag and the value of K and X were used on HEC-HMS modeling process. For running the HEC-HMS model, it was used the year of 2003 until 2007 rainfall data.

Based on the year of 2003 to 2007 modeling, it was obtained that the peak flow is 101.4 m³/s which caused by the rainfall on February, 23, 2003, while at the field measurement, the peak flow is 242.78 m³/s which caused by the rainfall on February, 27, 2003. For calibration and evaluating the result of model, it was used RMSE and Nash method with the hourly and daily rainfall. It was found that on the December 2005 had the smallest value of RMSE, 3.1 for hourly rainfall, 4.2 for daily rainfall, whereas from the Nash method, it was found 0.2 for hourly rainfall and -0.4 for daily rainfall.

Keywords: Modeling, Rainfall, Discharge, HEC-HMS