

# APLIKASI MODEL SMAR PADA DUA DAS IDENTIK

## *Application of SMAR Model at Two Identical Watershed*

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### **ABSTRACT**

*This paper shows the evaluation process (calibration and validation) of SMAR (The Soil Moisture Accounting Rainfall-Runoff) model at two identical catchment areas (Rawatamtu and Kloposawit) in East Java – Indonesia. Daily discharge, rainfall data and meteorological data were collected from measurement stations located at the catchments areas. Potential evapotranspiration (PET) was calculated from meteorological data extracted from existing stations located inside of the catchments. Calibration was conducted for periods of: 1991 to 1994, while validation was tested for periods of: 1995 to 2000. Model performance was evaluated by means of: (1) Nash-Sutcliffe coefficient, (2) correlation coefficient and (3) graphical comparison of calculated and measured flow. The result shows the Nash-Sutcliffe coefficient = 0,73 and correlation coefficient = 0,86 for calibration period at Rawatamtu, while the same coefficients for Kloposawit are 0,54 and 0,74. Validation periods produce Nash-Sutcliffe and correlation coefficients = 0,35 and 0,64 for Rawatamtu. While for Kloposawit the values are 0,48 and 0,81.*

**Key words:** Calibration, Validation, SMAR Model, identical catchments, East Java

### **ABSTRAK**

*Tulisan ini memaparkan proses dan hasil kalibrasi dan validasi model SMAR (The Soil Moisture Accounting Rainfall Model) pada dua sub-DAS yang relatif identik karakteristik fisiknya (SubDas Rawatamtu dan SubDas Kloposawit, Jawa Timur). Data hujan harian, evaporasi harian dan debit harian diperoleh dari alat ukur yang terletak pada kedua SubDAS tersebut. Metodologi mencakup: visualisasi data, kalibrasi dan validasi model. Kalibrasi dilakukan menggunakan kombinasi metode Automatic dan Manual yang tersedia pada model. Kalibrasi dilakukan pada periode: 1991 sd 1994. Validasi dilakukan pada periode: 1995 sd 2000. Selanjutnya, Coefficient Nash-Sutcliffe, koefisien korelasi dan perbandingan grafik debit terukur dan terhitung digunakan untuk menilai hasil kalibrasi dan validasi. Proses kalibrasi pada Sub-DAS rawatamtu menghasilkan koefisien Nash = 0,73 dan koefisien korelasi = 0,86. Kalibrasi pada Sub-DAS Kloposawit menghasilkan koefisien Nash = 0,54 dan korelasi = 0,74. Validasi pada periode selanjutnya menghasilkan koefisien Nash = 0,35 dan korelasi = 0,64 untuk sub DAS Rawatamtu. Validasi pada sub-DAS Kloposawit menghasilkan koefisien Nash = 0,48 dan korelasi = 0,81.*

**Kata Kunci :** Kalibrasi, validasi, model SMAR, DAS identik, Jawa Timur