

Model input variables selection using gamma test for daily suspended sediment concentration simulation of Pranhita river, India

Anurag Malik¹, Anil Kumar¹, M. A. Alam² and C. John Wesley²

Received March 10, 2016 and Accepted June 10, 2016

ABSTRACT: Simulation of suspended sediment concentration in a river is very important for planning and management of water resources. In this study, co-active neuro-fuzzy inference system (CANFIS), multilayer perceptron (MLP), multiple linear and nonlinear regressions (MLR and MNLR) and sediment rating curve (SRC) were used for simulating the daily suspended sediment concentration (SSC) at Tekra site of Pranhita River, a major tributary of Godavari River basin, Andhra Pradesh, India. The daily data of streamflow and SSC from June, 2000 to November, 2003 were used for SSC simulation. The combination of appropriate input variables for CANFIS, MLP, MLR and MNLR models were decided using the Gamma Test (GT). The results obtained by CANFIS, MLP, MLR, MNLR and SRC models are compared to observed values of SSC on the basis of statistical indices, such as, root mean squared error (RMSE), correlation coefficient (r) and coefficient of efficiency (CE). The CANFIS models performed superior than the MLP, MLR, MNLR and SRC models in simulating the current day's SSC for Pranhita River.

Key Words : CANFIS, MLP, MLR, MNLR, SRC, Gamma test, Pranhita River