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HEC-HMS model for runoff simulation from Tittawella tank catchment

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The paper describes a case study of event based and continuous hydrologic modeling of inflows to the Tittawella tank in Kurunegala using the Hydrologic Engineering Center – Hydrologic Modeling System (HEC–HMS). A high rainfall event in Oct-Nov 1995 was used for calibration of model parameters and high rainfall events in Oct 1996 and May 1995 were used for validation of the event based model. The calibrated model parameters were used in the continuous hydrologic model. Time series data of Sep-Nov 1995 were used for calibration of the continuous model, while three months, one year and two year time series data were used for validation of continuous simulations. The initial and constant infiltration loss method was used to account infiltration loss in event based modeling and 5–layer soil moisture accounting loss method was utilized in continuous modeling. Clark unit hydrograph method and recession base flow method were used to simulate direct runoff and base flow, respectively. The validation results reveal the capability of HEC–HMS to reproduce stream flows in the catchment to a high accuracy with averaged computed Nash Sutcliffe efficiencies of 0.89 for event based simulations and 0.76 for continuous simulations. The calibrated model can be used to water management studies in Deduru Oya development project.

Key words: Continuous, event based, HEC – HMS, modeling, Deduru Oya

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