Rainfall Runoff Modelling of Ramganga at Chaukhutia Using Rainflow Model

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ABSTRACT

In present study, suitability of RAINFLO model for rainfall runoff simulation of Ramganga at Chaukhutia has been studied. Runoff event simulation and model parameter sensitivity was carried out. The study shows that, the parameters such as SCS curve number, antecedent moisture conditions, velocity, and Manning's "n" has its role in the discharge estimation. The RAINFLO model is less sensitive to the velocity of the flow. However, the model is very sensitive to runoff curve number and antecedent moisture conditions. Also it is observed that lower value of Manning's "n" results in higher peak discharge and lower time to peak. Higher values of Manning's "n" results in more diffusion of flow hydrograph resulting in lower peak discharge and increase in time to peak in all the events. Therefore, selection of curve number, initial moisture conditions, and Manning's "n" should choosen carefully and thoughtfully otherwise, it may give unreliable results.

From the simulation results it is concluded that the model can simulate the runoff hydrographs reasonably well for Ramganga at Chaukhutia. The errors in peak discharge, time to peak and overall runoff volume are within ± 12%.