

Charuwan Sakornmaneerat 2007: The Study of Rainfall-Runoff for Major Flood Events of Phetchaburi River Basin. Master of Engineering (Water Resources Engineering), Major Field: Water Resources Engineering, Department of Water Resources Engineering. Thesis Advisor: Associate Professor Chukiat Sapphaisal, M.Eng. 181 pages.

Phetchaburi River Basin has catchment area of 5,603 sq.km. The basin shape is rectangular. The catchment area is about 65 km.wide and 85 km.long. Phetchaburi River Basin has slope from west to east. The west area is mountain and east area is plain. In this study, the subcatchment area was classified into 3 types of bed slope. Type A slope is steeper than 1:100. Type B slope is between 1:100 to 1:500. Type C slope is less steep than 1:500. Type A slope area is on the west side of Phetchaburi River Basin. Type B slope area is on north and south of River Basin and type C slope area is on the middle to east side of River Basin.

The SCS and NAM models are standard rainfall-runoff models. In this study, they were used to demonstrate flood events. The historic daily rainfall of flood events would be distributed into hourly rainfall which would used as an input into the models. Thereafter, the computed flood hydrograph will be compared with the observed flood hydrograph. The model parameters will be adjusted until both of flood hydrographs were considerably conformed. The SCS model showed that the value of parameter CN varied between 48.3 to 99.6. The percentage different of calculated and observed flood peak varied between 0.003% to 3.87%, the flood volume varied between 0.21% to 33.90%, the standard deviation varied between 0.08% to 21.00% and the correlation coefficient varied between 0.90 to 0.99. It also showed that, parameters Tp and CN would significantly affect to the value of peak flood discharge and shape of flood hydrograph. On the other hand, the NAM model showed that four active parameters which significantly affect to the value of peak flood discharge and shape of flood hydrograph were Umax, Lmax, CQOF, CK1 CK2. the value of Umax varied between 10 to 20 mm., Lmax varied between 50 to 200 mm., CQOF varied between 0.6 to 1.0 and CK1 CK2 varied between 9 to 42 hours. The different of the calculated and observed flood peak varied between 0.00% to 25.09%, the flood volume varied between 1.52% to 39.83%, the standard deviation varied between 0.13% to 49.14% and the correlation coefficient varied between 0.65 to 0.95.

For SCS model, the study also showed that the value of parameter CN was correlated with Qp/R by the equation $CN = 18.081 (Qp/R) + 62.788$ for type B slope and by the equation $CN = 14.952 (Qp/R) + 76.431$ for type C slope. Considering the limitation of the observed data at present, the simulation of flood discharge hydrograph from the rainfall data by SCS model would be more easily applicable and the results would be more accurate than by NAM model.

Student's signature

Thesis Advisor's signature

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