

Thesis Title	Regional Flood Frequency Studies of Ping, Wang, Yom, and Nan River Basins
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### Abstract

In this study, the regional flood frequency curves for the Ping, Wang, Yom, and Nan River Basins were constructed, using the U.S. Geological Survey's Index Flood method. The 10 to 75 year momentary peak discharge records (up to year 1995) of 56 selected gauging stations in these river basins (catchment areas ranging from 41 to 41,704 square kilometers) were used in the analysis. Initially, a comparison test of goodness of fit (by the Kolmogorov-Smirnov, Chi-Square, and Mean of Standard Error Summation methods) was made between the Gumbel and the Log-Pearson Type III probability distribution functions to identify the suitable type of distribution to be used for subsequent analysis.

The Gumbel theory with the Maximum Likelihood parameter estimation was found to give best fit with the observed data. For accurate flood frequency estimation, the river basins were divided into 10 subregions of similar meteo-hydrological conditions. A regional flood frequency curves and dimensionless equation ( $Q_T/Q_{2.33}$  vs.  $T_R$ ) were constructed for each subregion, in which an equation to predict  $Q_{2.33}$  from the physical parameters of the catchment ( $A, L, L_c, S$  and  $A/L$ ) was proposed for each subregion. The curves and equations obtained from this study could be used to estimate the design flood of any specified return period at any location, gauged or ungauged, within the river basins under study.

**Keywords :** Regional Flood Frequency Curve / Return Period / Index Flood Method /  
Mean Annual Flood