

THESIS

PROBABLE MAXIMUM PRECIPITATION AND PEAK FLOOD
ANALYSIS FOR PUNCH RIVER AT KOTLI GAUGING STATION



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ABSTRACT

The problems of floods and their computation is one of the main concerns of hydrologists and engineers for optimal development of water resources projects and construction of hydraulic structures such as dams and barrages. For economical design of structures that passes flood water, the estimation is very essential. This study was carried out to estimate peak flood by using flood frequency and Probable Maximum Precipitation (PMP) Techniques.

Data of Kotli gauging station of instantaneous floods (1960-2002) were utilized for flood frequency analysis using Gumbel Extreme Value Type I; Log Pearson Type III; Pearson Type III; and Log-normal probability distributions. These distributions were based on two standard approaches i.e. method of moments and method of maximum likelihood. For these computations a computer program 'Design Flood for Windows' (DFW 1.30) was used. Based on the Chi square test, the Gumbel and log normal distributions were selected. The flood peak discharges at 95 percent confidence limits for different return periods were estimated. In addition to this metrological method was also used for estimation of probable maximum precipitation. Based on estimated PMP the flood value was computed by DFW software.

Results of both the techniques were compared with each other. The design flood value by statistical and metrological methods were found 22,811 and 24,421 m³/sec respectively for 10,000 years return period. The peak flood values for 10, 50 and 100 year return periods by statistical method were found 8,225, 11,686 and 13,149 m³/s respectively.