

**THESIS**

**ESTIMATION OF FLOOD DAMAGES CAUSED BY RIVER JHELM IN  
MUZAFFARABAD-KOHALA REACH USING HEC-2**

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## ABSTRACT

### ESTIMATION OF FLOOD DAMAGES CAUSED BY RIVER JHELUM IN MUZAFFARABAD-KOHALA REACH USING HEC-2

This study has been carried out to assess the flood damages caused by River Jhelum in Muzaffarabad-Kohala reach using HEC-2 model. Flood frequency analysis has been used out to predict the peak flows of unknown events for different return periods. The two methods has been used in the frequency analysis: Log-Pearson Type III distribution and Gumbel Distribution Method. In the Gumbel distribution, moment method has been used for parameter estimation and weibul formula has been used for plotting positions. The analysis showed that results of Log Pearson Type-III distribution for above 100 years return period are closer than others to the observed discharge.

The flood damages are directly related to water surface elevation. HEC-2 model has been used to compute the water surface profiles. In other words we can assess indirectly the flood damages by the use of HEC-2 model. The computational procedure is based upon the solution of one dimensional energy equation with energy loss due to friction evaluated using mannings' formula.

Model has been calibrated at roughness coefficient (manning's n) value 0.04 for the flood event of 1992. Model simulation has been carried out for different return periods i.e. 30, 50, 100 and 200 years. The major damages in the study area are damages of roads, suspension bridges, houses and erosion of lands and others properties.

In assessment of flood damages for various return periods, the actual damages of flood 1992 has been considered as the criteria. The total damages occurred in 1992 flood were estimated about 133.5 million in the study reach having flood hit area about 1381 acres. A unit damage factor was calculated and then multiplied to the area of computed water levels for different return periods to estimate the damages.

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