

Floodplain Modeling of River Jhelum Using HEC-RAS: A Case Study

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Abstract : Floods have become more frequent and severe due to effects of global climate change and human alterations of the natural environment. Flood prediction/ forecasting and control is one of the greatest challenges facing the world today. The forecast of floods is achieved by the use of hydraulic models such as HEC-RAS, which are designed to simulate flow processes of the surface water. Extreme flood events in river Jhelum , lasting from a day to few are a major disaster in the State of Jammu and Kashmir, India. In the present study HEC-RAS model was applied to two different reaches of river Jhelum in order to estimate the flood levels corresponding to 25, 50 and 100 year return period flood events at important locations and to deduce flood vulnerability of important areas and structures. The flow rates for the two reaches were derived from flood-frequency analysis of 50 years of historic peak flow data. Manning's roughness coefficient n was selected using detailed analysis. Rating Curves were also generated to serve as base for determining the boundary conditions. Calibration and Validation procedures were applied in order to ensure the reliability of the model. Sensitivity analysis was also performed in order to ensure the accuracy of Manning's n in generating water surface profiles.

Keywords : flood plain, HEC-RAS, Jhelum, return period

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