



# Ways of how to put into practice a decision support system in Pakistan for improved risk management of dams

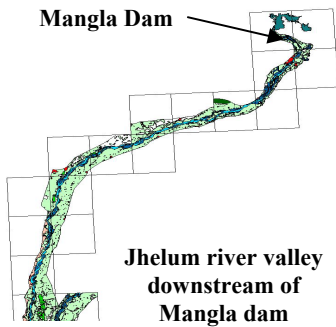
Numerical Modeling - Policy Interface (NMPI) Workshop 2007, 12-13 March 2007, Universität Stuttgart, Germany



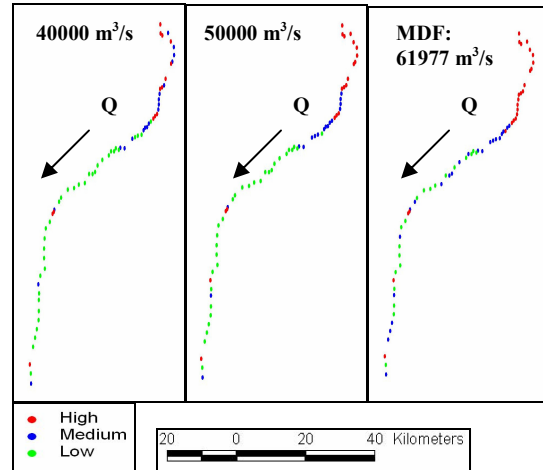
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## The Numerical Modeling

A risk assessment study is being carried out on the Jhelum river valley downstream of the Mangla dam in Pakistan. Mangla dam is one of the largest earth and rock-fill dams in the world located on Jhelum river in Pakistan. The downstream project reach is about 329km long with different hydraulic structures. Various catastrophic flooding scenarios due to dam failure have been analyzed. Risk assessment of dams helps in the risk management process for deciding the structural and non structural risk reduction measures for existing and planned dams.



## Flood Severity indication results d/s of Mangla Dam



## The Policy Interface

In order to generate benefits for the population in Pakistan from the ongoing risk management research work, the interest of authorities concerned with dam and water management in Pakistan has to be attracted before, during and after the research period. In the following, a decision support model has been suggested.

## Data Collection

For carrying out numerical modeling, necessary data was collected from the following authorities in Pakistan.

**Water and Power development Authority (WAPDA)**

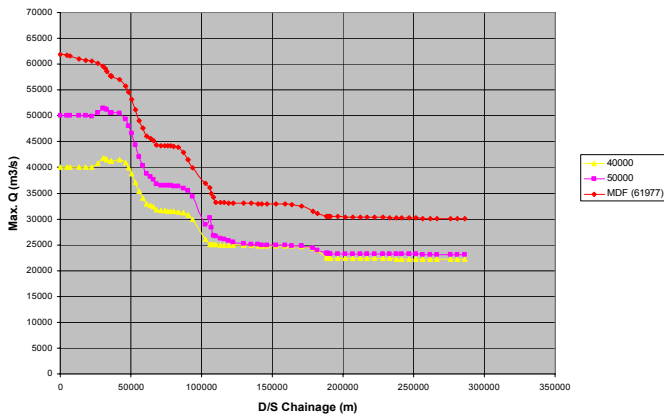


**National Engineering services Pakistan (Pvt.) Limited**

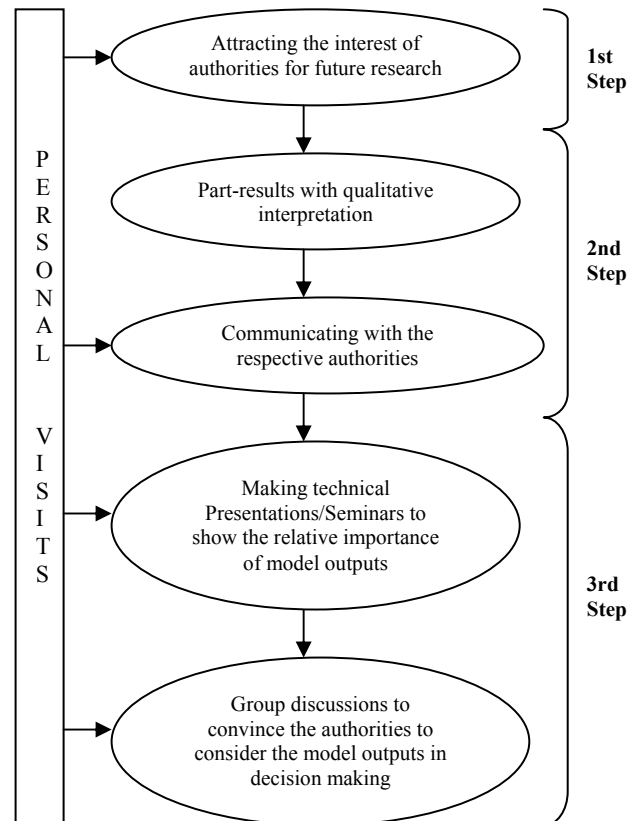


## Modeling and Preliminary Results

The Project reach downstream of the river valley has been modeled for unsteady flow conditions by using MIKE 11 (1-D modeling program by Danish Hydraulic Institute). First results regarding discharge magnitudes to be expected at different locations downstream of the dam and ensuing flood severity indications are displayed in the respective figures.



Maximum Discharge d/s of Mangla dam for considered flooding scenarios with dam failure



Decision Support model for the consideration of model outputs by the Dam Authorities in Pakistan