MATHEMATICAL MODEL FOR DAM-BREAK STUDIES

THESIS BY

SALEEM - UD - DIN

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Centre of Excellence in Water Resources
Engineering, University of Engineering
and Technology, Lahore

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A B S T R A C T

A BASIC Programme (SUD-I) is presented for dam break studies of single dam. This programme is of less than 200 lines and less than 75 variables have been used. The programme uses the hydrological method of flood routing both for reservoir as well as channel routing. The programme can easily be run on a pocket/ Micro computer and does not reflect any instability or non-covergence problem.

SUD-I model has three fundamental parts; (1) description of dam failure mode, i.e. temporal and geometrical description of the breach; (2) computations of the out-flow hydrograph through the breach and spillway as affected by the breach size, reservoir inflow hydrograph, reservoir storage characteristics, and down-stream tailwater elevations and (3) routing the outflow hydrograph through the downstream valley in order to determine the outflow hydrograph at some downstream points and respective water surface elevations and flood wave travel time as affected by the valley storage and channel resistance.

The model assumes the breach starts at a point and enlarges at a linear rate over the failure time interval (T). SUD-I model differs from other models in that it requires small computing facilities, although it assumes partial and time variant breach and can handle both overtopping and piping failure. But the facilities of data input and options are limited.