DEVELOPMENT OF SYNTHETIC UNIT HYDROGRAPHS IN SMALL UNGAUGED CATCHMENTS OF PAKISTAN

Thesis by

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For the Degree of Master of Philosophy
in HYDROLOGY

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PAKISTAN - 1983

A B S T R A C T

The study presents an emperical method of deriving coefficients of Snyder's synthetic unit hydrograph. Basin lag and peak discharges were related to physical characteristics of thirteen (13) catchments, ranging in area from 56 to 1560 square miles. These are located in Baluchistan Plateau and Potwar highlands of Himalayan Foothills in the vicinity of Mangla and Tarbela dams.

Snyder's original parameters for time base and U.S. Corps of Engineers equations for time width of unit hydrograph at 50% and 75% of peak discharge were not found in line with the hydrological conditions of the catchments that have been studied. These empirical equations have, therefore, been modified to derive synthetic unit hydrographs for small catchments in Pakistan.

Validity of derived coefficients was tested by comparing the predicted and observed hydrographs. For the purpose of comparison the predicted and observed hydrographs of the same storm were plotted on the same sheet to see any variation in peak discharge and its time distribution. Comparison of the predicted and the observed results was made in all these catchments, using modified Snyder's method and original Snyder's method. Results achieved are quite satisfactory and indicate that derived coefficients can effectively be used for hydrologically similar catchments, using modified Snyder's method.

This study may help the professional and research engineers to develop unit hydrographs of similar catchments in Pakistan.