

THESIS

**DETERMINATION & IMPLIMENTATION OF FLOOD  
RISK ZONING, EMPLOYING PHYSIOGRAPHIC &  
HYDRAULIC PARAMETERS FOR FLOOD PRONE  
AREAS OF CHINIOT DISTT.**



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## ABSTRACT

The spread of urbanization, of forest clearance and of agricultural under-drainage and the ploughing-up of natural grasslands have increased flood potential. Floods are not *natural disasters*. Although this term is commonly used it should be made clear that floods are *natural phenomena* and form part of the normally occurring range of stream-flow conditions (just as does drought, at the other end of the scale). However, flood *disasters* are *man-made* in that man has put himself at risk by developing floodplains for settlement, agriculture and industry and by building roads, bridges and railway lines in floodable positions.

Flood risk zoning (mapping) is a non-structural measure, as mentioned before, for flood mitigation and essential tool for land use planning for flood prone areas. The introduction of stochastic element enhances the capability of 'Flood Risk Zoning' because it provides the future scenario to the planners responsible for flood mitigation measures.

Project site comprises of flood prone areas of Chiniot, which are located in East & North of two important districts Faisalabad & Hafiz Abad. Chiniot city is located at 6Km in Southwest of the study area. Flood in the study area causes inundation to vast areas on both banks of Chenab River and as a result cultivable lands, and human dwellings of these areas are adversely affected. Overall any study related to safety against the Floods must be considered as the integral problem of the entire society as whole not of individuals. The protection of life and property over many years must be evaluated while comparing it with the expenditures to be involved on Flood control and mitigation projects.

In the study data have been collected for topography and the parameters required for the analysis of high flows and their spread & frequency. For the analysis data has been plotted and tabulated. Primary analysis and application of different statistical tests reveal that highly likely Gumble and Large Pearson III distributions would be suitable for the data available till now. So Gumble distribution is being employed here.

In rest of the work the results of frequency analysis i.e. floods of different magnitudes and different return period, are coupled with hydraulic parameter employing the topography of the project area for the preparation of 'flood risk

mapping'. To cover the physiographical & hydraulic parameters, the use of HEC-RAS was quite result oriented.

Complete results are presented in this thesis. Flood Risk Zoning was done by following the U.S. standards. A base flood was simulated with & without encroachments on both sides of channel. A Flood Risk Zoning is only useful if it is employed & followed by Regulating/Planning Authorities & public awareness is essential to get maximum benefits.