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Title: Natural Disasters and Their Management in Kashmir Valley; with special reference to Floods

Abstract

In Kashmir Valley floods of river Jhelum are as old as the river itself. Historical accounts of Valley suggest that the river had witnessed the devastating floods since ages many among them have created havoc in terms of their resultant destruction. Over the period of time efforts like structural measures have been made to mitigate the havoc caused by floods. These structural measures improved the drainage conditions in the valley, but were not consistent and comprehensive strategies. Under the present circumstances the structural measures are not adequate to ensure the Valley safety of Valley. Increase in population, urbanization, change in land use pattern etc on the flood plains have increased the frequency and magnitude of risk and the associated damages. Among non structural measures, key input for flood management and mitigating practices are provided by geographers like mapping and zonation of flood hazard areas and flood frequency analysis etc. Delineation of flood prone areas have been done using various techniques like, Normalizes Difference Water Index (NDWI) and past flood affected areas. A general methodology of weighting and ranking were used for flood hazard zonation. Five thematic layers (Causative factors) were selected as input data for assessing flood hazard in Kashmir Valley using ArcGIS 9.1 included precipitation, elevation, slope, flow accumulation and landuse landcover. The resulting coverage created by the weighted overlay of these maps generated the flood hazard area with different probability and prepare the flood hazard map. Analysis revealed that the total area falling in very low flood hazard area is 8805.13 Km^2, while, low (2671.07 Km^2), moderate (293.30), high (825.12 Km^2) and very high flood hazard area is 183.71Km^2. The flood management policy makers should mostly concern on very high and high flood hazard areas for proper management. All mitigation and managing policies should also be according to different flood hazard zones. The Flood Frequency Analysis (FFA) of River Jhelum has been carried out for five stations. The FFA was undertaken using the Log-Pearson Type III (LPT-III) probability distribution. The Log-Pearson type III probability distribution has been used to model the annual peak discharge for the period 1970 to 2010 based on stream flow measurements carried out by Flood Control and Irrigation Department, Srinagar (J&K). The probability distribution function was applied to return periods ***(T)*** of ***T*** = 2 yrs, 5yrs, 10yrs, 25yrs, 50yrs and 100yrs commonly used in for engineering designs of hydraulic structures. High flow events are a key component in river engineering, for the design and risk assessment of various projects. Engineering designs like, Bridges, Curvets, and Roads etc. should be in accordance with the exceedence probability (T = 100 year). The information is crucial input for structural design and mitigating measures at respective stations.