THESIS

COMPARATIVE STUDY OF PROBABLE MAXIMUM PRECIPITATION (PMP) TECHNIQUES IN POTHWAR REGION

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ABSTRACT

Comparative study was done using statistical as well as meteorological approaches for the estimation of probable maximum precipitation (PMP) in Pothwar region of Pakistan. Daily precipitation, dew point, wind speed and temperature data were of seven stations was used to estimate one day PMP. One day probable maximum precipitation (PMP) values were observed to be 175 mm, 218.94 mm, 270.64 mm, 222.18 mm, 227.09 mm, 199.86 mm and 302.10 mm for the stations of Gujjar Khan, Mianwali, Jhelum, Chaklala, Chirah Bridge, Kallar Syedan and Murree using statistically approach. Similarly, meteorological approaches were also used to estimate the 1-day PMP and one day PMP value for Mianwali and Chaklala were observed to be 209 mm and 220 mm. The maximum precipitation for different return periods was estimated by using the statistical approaches such as Gumble and Log-Pearson type-III distribution. Chi-square goodness of fit test was applied to Gumble and Log-Pearson type-III distribution. The result revealed that Gumble distribution gives better result as compared to Log-Pearson type-III distribution. The Isohyet map of the study area was produced by using the GIS tool and one day PMP in mountainous region varies from 150mm to 320mm. Moisture maximization and wind moisture maximization techniques were applied in meteorological approach, and it was concluded that wind moisture maximization approach give higher results of 1-day PMP as compared to moisture maximization approach. The results of statistically approach are higher as compared to meteorological approach. Based on this study it is suggested that meteorological approach is most favored into the study area for the estimation of PMP which leads acceptable results as compared to statistically approach.