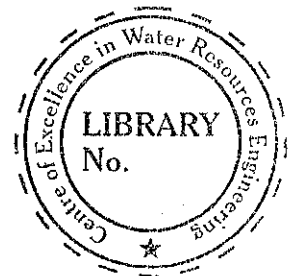
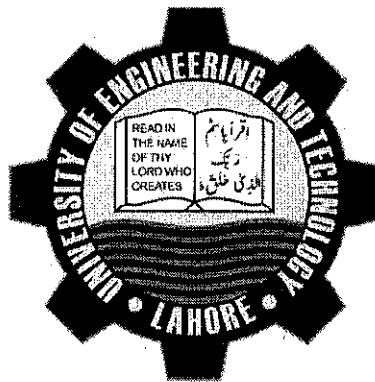


SPATIAL AND TEMPORAL PATTERNS
OF EXTREME PRECIPITATION EVENTS
ACROSS MANGLA WATERSHED



By

FAISAL ALI
2017(F)-MS-WRE-10

Research Supervisor:
Dr. Ijaz Ahmad

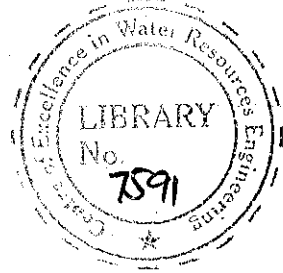
2021

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

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EVENTS ACROSS MANGLA WATERSHED**

Submitted By

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(2017(F)-MS-WRE-10)



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in

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ABSTRACT

Climate change has a wide range impacts on Pakistan's water resources system and resulting in extreme climatic events with increased magnitude, intensity and frequency. Spatial and temporal variation of extreme precipitation events is considered essential in providing the requisite assistance in the planning and management of agriculture and water conservation projects. Therefore, present study investigates the spatial and temporal patterns of extreme precipitation events across the Mangla watershed by using extreme precipitation indices (EPI) which include 11 precipitation indices as suggested by Expert Team for Climate Change Detection Monitoring and Indices, event based extreme precipitation (EEP) and time distribution pattern (TDP). Moreover, variations in extreme precipitation indices were investigated by using Mann-Kendall and innovative trend analysis method.

Results revealed that for the fixed threshold indices, decreasing trend at majority of climatic stations and consecutive dry days (CDD) exhibiting increasing trend; however, at Naran station majority of fixed threshold indices showed significant increasing trend except consecutive wet days (CWD) which exhibits decreasing trend. Station Related Threshold Indices also showed a decreasing trend at most parts of the Mangla watershed, for instance, at Naran station increasing trend was observed. The precipitation events with an amount of 40–290 mm and with a duration of 4–7 consecutive days and a concentration ratio of 0.7–0.95 were found dominant. Therefore, it is concluded that consecutive dry days are found to be increasing while consecutive wet days are decreasing. This may constitute that constant pressure on water resources availability in the Mangla reservoir. It is believed that the results of this study could help to understand the precipitation variability over Mangla watershed.