

**THESIS**

**RAINFALL RUNOFF RELATIONSHIP USING CALIBRATED STRANGE'S  
RUNOFF FACTOR IN SELECTED WATERSHED OF NWFP**



**Submitted By**

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## ABSTRACT

This research study was conducted for ungauged catchment of Gandao Khawar. The annual rainfalls over the Indus Basin vary from 5 to 14 inches in plains and above 20 inches in the northern areas. Overall about 9 MAF net rainfall's volume is estimated to reach the irrigation system annually. The rainfall zones, where runoff data is not available, estimation of runoff from rainfall is a difficult job. Mathematical models for estimating runoff from rainfall data are now being used by hydrologists. Small catchments where hydrological data is not available and also for ungauged catchments it is difficult to apply such models. For ungauged catchments, estimation of runoff using Strange table which was developed by British Engineer W.L STRANGE. In many areas of Pakistan either only long term rainfall data is available or runoff and rainfall data both are available in nearby adjacent watershed. Rainfall runoff relationship in these watersheds can be developed and may be used to predict runoff of the watershed where it is not available. Several relationships have been developed in the world but limited work was carried out in Pakistan in this regard.

It was observed that the River flows are higher in the months of June and July due to snowmelt and monsoon rainfall and are lesser in the months from November to March. It has been observed that runoff determined from Strange factor largely varied from observed runoff and was found overestimated for the catchment. So it has been concluded that Calibrated Runoff factors are preferred on Strange runoff factor for Gandao Khawar (ungauged) catchment because calibrated runoff factors give better results than Strange Runoff factors.