ANALYSIS OF HYDRO-METEOROLOGICAL PARAMETERS BY TREND DETECTIONS AND CORRELATIONS USING A RANGE OF STATISTICAL TECHNIQUES

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ABSTRACT

Climate change is considered as one of the greatest threat to the entire globe. This study is an attempt to focus on the down-scaled assessment of climate change in the northern parts of Pakistan. The study examines the changing trends in climate elements and highlights the statistically significant correlations between them. Temperature and precipitation data from 1960 to 2010 and discharge rate data from 1990 to 2010 was analyzed on monthly, seasonal and annual time scale using Least Square Method, Linear Regression Modeling and Non-Parametric Correlations to determine the statistical significance and correlations between these hydro-meteorological parameters. The months of January, February, March, April, May, November and December show increasing temperature trends and same is the case for winter and spring seasons. On other hand, the months of February, June, August, September, October, November and December show increasing precipitation trends. There is an overall increasing pattern observed for temperature and precipitation on annual scale. The discharge rate analysis also depicts an increasing trend on all time scales. The correlation analysis of these parameters indicate that there is a strong correlation between the discharge rates on temperature amounting to about 60 percent.

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