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Precipitation and Temperature Changes in Eastern India by Multiple Trend Detection Methods

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**PRECIPITATION AND TEMPERATURE CHANGES IN EASTERN INDIA BY
MULTIPLE TREND DETECTION METHODS****Chandra Shekhar Sharma^{1*}, Sudhindra N. Panda¹, Rudra P. Pradhan², Amanpreet Singh³,
Akira Kawamura⁴**¹Agricultural and Food Engineering Department, Indian Institute of Technology Kharagpur 721 302, India (*Corresponding author: shekhar11m@gmail.com)²Vinod Gupta School of Management, Indian Institute of Technology Kharagpur 721 302, India³National Remote Sensing Centre, ISRO, Hyderabad, India⁴Department of Civil and Environmental Engineering, Tokyo Metropolitan University, Japan**Abstract**

Present study deals with spatial and temporal trend analysis of precipitation and temperature (1970 - 2004) in eastern India. Long-term trend direction and magnitude of change over time (annual and seasonal) were detected and analyzed by Mann–Kendall test, Sen’s slope estimator, Least square linear regression, Spearman rank correlation and Sequential Mann–Kendall test. In addition to it, correlation analysis was also performed. Trend analysis of annual rainfall by different methods indicated similar annual trends in eastern India. North-eastern, south-eastern and western parts of eastern India indicated increasing trend, whereas north-western, central and southern parts showed decreasing trend. Similar trend was observed by different methods in case of seasonal rainfall. During winter season, decreasing trend was observed in central part, whereas similar results were obtained for pre-and post-monsoon in western part. The trend during monsoon season was found similar to annual rainfall trend. Abrupt change in trend of rainfall with time was lacking in eastern India. Maximum temperature analysis indicated increasing trend in western part for all the seasons (except in monsoon) and decreasing trend in eastern part. On the contrary, increasing trend was observed in eastern and decreasing trend in western half of the study area for all the seasons in case of minimum temperature. Significant changes were

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