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Press Release

A study on rainfall changes in the country by a joint team including researchers from JMI

A joint team comprising of researchers from Jamia Millia Islamia(JMI), IIT Indore and University of Gour Banga has conducted a study on 'Analyzing trend and forecasting of rainfall changes in India using non-parametrical and machine learning approaches'. The research paper has been published online in the prestigious *Scientific Reports, a journal of Nature Group.*

This study analyzes and forecasts the long-term spatio-temporal changes in rainfall for whole of the country using 115 years data (1901 to 2015). It also predicts rainfall change up to 2035 and has investigated the causes of the changes in rainfall pattern across India.

The team used Sen's innovative method to calculate the trend for seasonal rainfall (winter, summer, monsoon and post monsoon) in thirty-four meteorological sub-divisions of the country. The Artificial Neural Network-Multilayer Perceptron (ANN-MLP) was employed to forecast the rainfall across India.

Co-author & corresponding author of the research paper Prof. Atiqur Rahman of the Department of Geography, JMI said that the present study showed increasing rainfall trend during 1901-1950, but significant decline of rainfall was observed after 1951. A significant decline in the rainfall during monsoon season is observed at most of the meteorological divisions of India. The overall annual and seasonal variability of rainfall was highest in the sub-divisions of Western India, while the lowest variability was found in Eastern and North India.

Almost all of the sub-divisions have detected the negative trend and high variability after 1970. The overall annual and seasonal rainfall at the sub-divisions of North-East, South and Eastern India has observed significant negative trend, while the sub-divisions like Sub-Himalayan Bengal, Gangetic Bengal, Jammu & Kashmir, Konkan & Goa, Madhya Pradesh, Maharastra and Marathwada have recorded positive trend. In addition, the rainfall forecasting for 2030 showed an expected decline to a tune of about 15% in the overall rainfall of India.

The present study is quite significant in the age of climate change, where the whole world including India is experiencing change in rainfall pattern. India's economy is substantially dependent on agriculture, which in turn depends on rainfall. Therefore, this study is very important because of limited availability of water and increase in the future water demand.

The full length paper can freely be downloaded at www.nature.com/articles/s41598-020-67228-

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