Extreme rainfall not because of global factors: study

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Hyderabad: The blame for extreme rainfall in India, a recurrent phenomenon in some cities, cannot be laid squarely on global warming and the El-Nino effect, perhaps. A study by the Indian Institute of Science (IISc) reveals that such rainfall is influenced more by changes in conditions like local temperature and urbanization.

The study was done by analyzing historically observed rainfall data, and land and sea surface temperatures for the period between 1969 and 2005 across 2,000 locations in the country. The researchers found that the intensity and the frequency of rainfall is highly influenced by changes in the local temperature.

“Other global factors like the El-Nino Southern Oscillation and the global climate change do not influence as much as the local temperature," said the study. The warming up of pacific waters is known as El-Nino Southern Oscillation. In fact studies also show that a strong El-Nino goes hand in hand with weak Indian monsoon, an indication of which was seen in 2015, when the rainfall was less than normal.

“If El-Nino can affect one year’s rainfall, global climate change can influence the very seasonality of the rainfall. Interestingly, when it comes to intensity and frequency of extreme rainfall, local conditions have a stronger influence than the other two global factors," said Arpita Mondal, who conducted the study as a research scholar at IISc’s Divecha Centre for Climate Change under the guidance of Pradeep Mujumdar, professor, Department of Civil Engineering.

Extreme rainfall can be assessed by three parameters—intensity, frequency, and duration. The calculations from the data in the study showed that if the intensity and frequency factors were influenced by changes in local temperatures, the duration of extreme rainfall remained uninfluenced.

The strong influence of changes in local temperature on extreme rainfall indicates that localized factors play a more significant role. “One example of such localized processes is urbanization. Further research needs to be carried out to categorically link changes in urbanization and other local processes to those in the extreme rainfall characteristics," said Mondal, who is an assistant professor at IIT Mumbai.

A rainfall is considered extreme if it crosses a high threshold and the frequency is about the number of extreme rainfall spells in the summer monsoon months of June, July, August and September. The duration of extreme rainfall is the number of consecutive days on which rainfall is recorded above the threshold.

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