

Climate experts help communities cope with impact of the Indian Monsoon

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Work by University of Exeter experts to predict the weather in India could help millions of people prepare for the devastating effects of the country's summer monsoons.

Climatologists from the University of Exeter have identified a location in central India where they can predict excess monsoon rainfall or drought, which have an enormous impact on the national and [global economy](#).

The new study, which concentrates on a region at Central North East India, could allow government and policymakers to make more informed decisions which will give better protection to communities, farmers and businesses. It will enable them to make policy which will mitigate the impact of extreme and unusual weather.

By comparing the results of mathematical models with human observations, they have proved it is possible to provide an improved forecast of the Indian Summer Monsoon in Central North East India.

The Indian Summer Monsoon has a major impact on agriculture, and therefore the economy, in India, and is responsible for 80 percent of the country's annual rainfall. Farmers rely on this seasonal rain to grow essential crops. Flooding also threatens life. A strong monsoon in 2005 killed more than 1,000 people.

Having more accurate forecasts means farmers can choose the crops and

plans which are likely to be most successful. It can also help farmers and policymakers plan how to store the excess water.

The Indian Summer Monsoon is influenced by the El Niño Southern Oscillation, which causes extreme weather in different parts of the world.

The ENSO is mainly caused by fluctuations in sea surface temperature around central to east tropical Pacific Ocean. There are two opposite phases, El Niño and La Niña. During La Niña, that [sea surface temperature](#) in the Pacific Ocean is colder, for El Niño, the temperature is warmer. During El Niño there is usually less monsoon rainfall and for La Niña there is more rainfall.

Dr Indrani Roy, Dr Renata Tedeschi and Professor Matthew Collins from the College of Engineering, Mathematics and Physical Sciences studied 23 different mathematical models designed to predict information about the climate. They compared them with human observations about the climate and found that models are able to make accurate predictions about the monsoon rain in Central North East India.

The team found that data from tropical Pacific Ocean could help them predict the behaviour of the Summer Monsoon in Central North East India. The models did not allow the team to make the same predictions for other regions in India.

Dr Roy, the lead author of the study, said: "India is one of the most populated countries in the world, and the [monsoon rains](#) have not only a significant impact on the national but also the global economy.

"Our findings will improve prediction skills which will contribute to better business performance, economic prosperity and wealth creation. It can directly affect the ability of the sub-continent to anticipate and adapt

to changes."

ENSO Teleconnections to the Indian Summer Monsoon in Observations and Models by Indrani Roy, Renata Tedeschi and Matthew Collins is published in the *International Journal of Climatology*.

Provided by University of Exeter

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