

# Fall in monsoon rains driven by rise in air pollution, study shows

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Hervey clouds formed during storm from north-west to south-east, at monsoon, over Salt Lake, Calcutta. Credit: Biswarup Ganguly/Wikipedia

Emissions produced by human activity have caused annual monsoon rainfall to decline over the past 50 years, a study suggests.

In the second half of the 20th century, the levels of rain recorded during the Northern Hemisphere's summer monsoon fell by as much as 10 per

cent, researchers say. Changes to global rainfall patterns can have serious consequences for human health and agriculture.

Scientists found that emissions of tiny air particles from man-made sources – known as anthropogenic aerosols – were the cause. High levels of aerosols in the atmosphere cause heat from the sun to be reflected back into space, lowering temperatures on the earth's surface and reducing rainfall.

Levels of [aerosol emissions](#) have soared since the 1950s, with the most common sources being power stations and cars.

Researchers at the University of Edinburgh say their work provides clear evidence of human-induced rainfall change. Alterations to summer [monsoon rainfall](#) affect the lives of billions of people, mostly those living in India, South East Asia and parts of Africa.

The team calculated the average summer monsoon rainfall in the Northern Hemisphere between 1951 and 2005. They used computer-based climate models to quantify the impact of increasing aerosol emissions and greenhouse gases over the same period. They also took account of natural factors such as volcanic eruptions and climate variability to gauge the impact of [human activity](#) on the amount of monsoon rainfall.

Researchers say levels of man-made aerosols are expected to decline during the 21st century as countries begin adopting cleaner methods of power generation.

The study is published in the journal *Geophysical Research Letters*. The work was funded by the Natural Environmental Research Council, European Research Council and National Centre for Atmospheric Science.

Lead author Dr Debbie Polson, of the University of Edinburgh's School of GeoSciences, said: "This study shows for the first time that the drying of the monsoon over the past 50 years cannot be explained by natural climate variability and that human activity has played a significant role in altering the seasonal monsoon rainfall on which billions of people depend."

Provided by University of Edinburgh

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