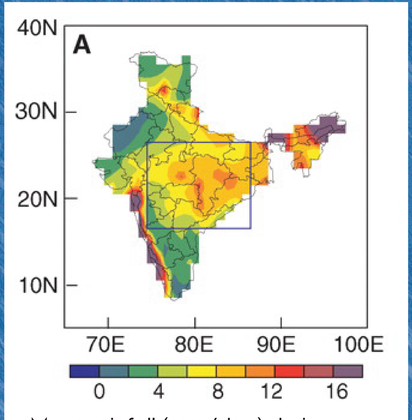
CLIMATE CHANGE IN INDIA: WHAT DO WE KNOW AND HOW?

CHANGES IN EXTREME RAINFALL DURING THE SUMMER MONSOON SEASON

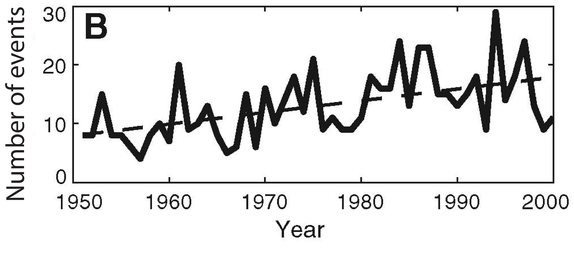


The India Meteorological Department (IMD) has records of weather and climate going back nearly 150 years. IMD measures daily rainfall from thousands of rain gauges across the country. The long-term average Indian summer monsoon (June–September) rain is 880 millimeters or 7.3 millimeters per day, though the actual daily rainfall varies greatly. Short-lived, intense spells of monsoon rain leads to flooding, landslides, crop damage and many fatalities. IMD data shows that the average monsoon rainfall over central India has not increased since 1870, but the number of high-impact rain events has increased significantly since 1950.

Rain gauge and satellite observations show that the most intense rain events last for 1–3 days, with rainfall exceeding 125–150 mm/day over at least 10,000 square km. These events often occur within rapidly moving monsoon storms (clusters of towering cumulonimbus clouds). Analysis of the IMD data shows that the frequency of extreme rainfall over central India has doubled since 1950 and the intensity of the rainiest events has risen by 5–10% per decade. The physical cause of such rapid rise is not fully understood, but is likely to involve enhanced evaporation and moisture supply from a warming ocean.



Mean rainfall (mm/day) during the summer monsoon (June–September) (1871–2003)



Increasing number of extreme rainfall events over central India

CONTRIBUTORS

Debasis Sengupta & V Venugopal
Indian Institute of Science, Bengaluru

B N Goswami
Cotton University, Guwahati

REFERENCES

Increasing Trend of Extreme Rain Events Over India in a Warming Environment, 2006. B. N. Goswami and others. Science.

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