

Briefing Paper

# State of Extreme Events

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## Climate Risks

*Keywords:*

Climate Change, extreme events, swapping trends, district hotspots, global warming, temperature rise

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## Abstract

The intensification of climate extremes is reshaping risk landscapes across the world, with profound socio-economic consequences. India, ranked as the seventh most vulnerable country to climate risks (Germanwatch, 2020), faces escalating climate-induced disasters, incurring an estimated annual loss of USD 87 billion due to extreme weather events (WMO, 2020). Using Climate Risk Observatory tool, developed by IPE Global and Esri India, the study presents a pioneering effort analysing district-level spatial and temporal assessment of climate extremes—including floods, droughts, cyclones, and heatwaves—over the past 50 years (1973–2023), using geospatial analytics and pentad-decadal climatological and meteorological modeling.

The findings reveal a four-fold increase in extreme flood events, particularly affecting the state of Assam, Bihar, and Andhra Pradesh and Telangana, among others. Similarly, drought frequency has doubled, with southern, western, and central Indian districts becoming increasingly exposed to agricultural and meteorological droughts. The study identifies a 1.5-fold rise in cyclone events, with a notable expansion of cyclone-affected regions beyond the historically vulnerable eastern coastline to parts of western India. Heatwaves have emerged as an equally severe threat. The stark findings from the study states that over 85 percent of Indian districts are now classified as extreme climate hotspots. One of the most striking trends observed is the phenomenon of "swapping hazards", where 45 percent Indian districts are shifting between flood and drought conditions and vice-versa. This transition highlights the complexity of climate risks, as regions once prone to floods are now facing prolonged droughts and vice versa. Given the scale and severity of these impacts, the study emphasises the need for urgent, science-driven policy interventions. It advocates for the establishment of a Climate Risk Observatory (CRO) to provide real-time risk assessments at national, subnational levels and cities, the creation of an Infrastructure Climate Fund (ICF) to support climate-resilient development, and the prioritisation of nature-based solutions such as wetland restoration and afforestation to mitigate cascading climate hazards.