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RECORD RAINFALL, FLOODS, AND CLIMATE EXTREMES IN SOUTH ASIA

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The unprecedented monsoon of 2025 has unfolded as one of the most striking reminders of how climate change is reshaping weather systems across South Asia. Unlike the traditional rhythm of the Indian monsoon that alternates between periods of heavy rainfall and dry interludes, this year's rains have been marked by erratic patterns, unseasonal downpours, and extreme flooding in several regions, while others have experienced unexpected dry spells. The scale and intensity of these variations have not only disrupted agriculture, infrastructure, and livelihoods but also underscored the mounting vulnerability of communities to a climate system in flux.

From the onset in June, meteorological records began registering anomalies. Rather than arriving gradually, the southwest monsoon advanced in surges, bringing torrential rainfall to coastal states such as Kerala, Karnataka, and Maharashtra within days. Several districts in Kerala recorded over 250 mm of rainfall in 24 hours, breaking previous records and causing widespread flooding in low-lying areas. Reservoirs filled up far earlier than anticipated, prompting emergency water releases that compounded the crisis downstream. By July, the normally arid parts of Rajasthan and Gujarat were witnessing cloudbursts and flash floods, while large stretches of eastern Uttar Pradesh and Bihar were inundated by swollen rivers flowing from Nepal.

One of the most dramatic developments of the 2025 monsoon has been the persistent flooding across northeastern India and Bangladesh. Sikkim, Assam, and Meghalaya saw rainfall exceeding 40 percent above normal, leading to devastating landslides, road collapses, and isolation of entire districts. The Teesta and Brahmaputra rivers swelled beyond capacity, displacing lakhs of people and destroying agricultural land. In Bangladesh, the inundation was so severe that Dhaka itself experienced waterlogging for weeks, affecting millions and straining the country's urban drainage infrastructure. In stark contrast, peninsular regions like Tamil Nadu and parts of Telangana saw prolonged dry spells despite the abundance

of rain elsewhere. Farmers who had sown paddy in anticipation of consistent rainfall were forced to watch crops wither. This uneven distribution has highlighted how the monsoon is becoming increasingly unpredictable, a challenge for agriculture which still employs nearly half of India's workforce. The 2025 monsoon has not only broken records for rainfall intensity but also for its sharp disparities, reflecting a larger trend of climate extremes.

Scientists attribute these anomalies to a combination of global and regional factors. A strong El Niño, which typically weakens the Indian monsoon, coincided paradoxically with bursts of intense rain, driven by the rapid warming of the Indian Ocean. Rising sea surface temperatures contributed to the formation of low-pressure systems and cyclonic circulations, channeling excessive moisture toward the subcontinent. Meanwhile, Himalayan glaciers, already melting faster due to climate change, released additional water into rivers, amplifying flood risks in the north and northeast. These interconnected processes show how a warming climate disrupts old patterns, creating new extremes that defy traditional forecasts.

The humanitarian toll has been staggering. By September 2025, government reports indicated that more than 1,800 people had lost their lives due to floods, landslides, and lightning strikes triggered by the monsoon. Over 15 million people were displaced across India, Nepal, and Bangladesh, many forced into relief camps with limited access to clean water and medical care. Outbreaks of waterborne diseases like cholera and dengue fever surged in flood-hit regions, stretching public health systems already under pressure from heatwaves earlier in the year. Urban areas were particularly vulnerable, with cities like Mumbai, Patna, and Guwahati struggling to cope with overflowing drains and submerged transport networks.

Economically, the damage has been immense. Preliminary estimates suggest agricultural losses alone could exceed ₹75,000 crore, as crops ranging from rice and maize to sugarcane were destroyed by flooding or drought. Infrastructure damage has added billions more in costs, with highways, rail lines, and power stations inundated or washed away. Insurance claims have surged, highlighting the growing financial risks of climate disasters. For millions of small farmers and daily-wage workers, however, these figures translate into lost livelihoods and rising indebtedness, deepening cycles of poverty.

The unprecedented 2025 monsoon has also sharpened debates about preparedness and adaptation. Despite advances in weather forecasting, the sheer intensity and rapid shifts of rainfall overwhelmed disaster management systems in many states. Early warning systems worked in some regions, but communication gaps and lack of evacuation infrastructure left many vulnerable populations exposed. Environmentalists argue that unplanned urbanization, encroachments on wetlands, and deforestation in the Himalayas worsened the impacts by reducing the land's natural ability to absorb excess water. Calls are growing louder for India and its neighbors to rethink urban planning, invest in climate-resilient infrastructure, and restore ecosystems that act as buffers against floods.

At the international level, the 2025 monsoon is being seen as a case study of how climate change compounds regional vulnerabilities. South Asia, home to nearly a quarter of the world's population, is among the most exposed to climate extremes. The Intergovernmental Panel on Climate Change (IPCC) has long warned of more erratic monsoons, and this year has provided a stark real-world example. Policymakers now face urgent questions: how to safeguard food security when rainfall patterns become unreliable, how to design cities that can withstand recurrent flooding, and how to mobilize global finance for adaptation at the scale needed.

Yet, amid the devastation, stories of resilience have also emerged. Community groups in Assam mobilized boats to rescue stranded families. Farmers in Maharashtra who had adopted mixed cropping systems fared better than those relying solely on rice. In Bangladesh, flood-resilient housing pilots demonstrated how

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elevated platforms and floating gardens could protect livelihoods even under extreme conditions. These examples point toward the kind of adaptive strategies that need to be scaled up if the region is to survive the monsoons of the future.

The unprecedented monsoon of 2025 is more than just a natural disaster it is a turning point in the climate story of South Asia. It has revealed the fragility of human systems in the face of nature's fury, but also the urgent need for transformative action.

The rains this year have carried not only water but also a warning: that climate change is no longer a distant threat but a lived reality demanding immediate responses. For millions across the subcontinent, the monsoon has always been a source of both life and peril. In 2025, it has become a symbol of a new era where resilience, preparedness, and sustainability will decide whether societies can endure the storms to come.