# The long-term impact of Cyclone Hudhud on India's electricity supply and infrastructure



In Chandigarh, the aftermath of Cyclone Hudhud, which struck on October 12, 2014, has left an enduring impact on local communities, particularly in the coastal region of Andhra Pradesh. Raghunadh, then a 15-year-old resident of Bheemunipatnam, described the devastating effects of the cyclone, which unleashed wind gusts reaching 260 km per hour, equivalent to the take-off speed of an aircraft. He recounted the scene: "Roads got blocked because of fallen trees, so people walked for kilometres to reach the highway where food was distributed for the poor," he told IndiaSpend.

The cyclone wreaked havoc in Visakhapatnam, damaging 27 substations, 4,800 transformers, and 56,000 electricity poles. The Simhadri Super Thermal Power Station, situated 20 km from the affected area, sustained losses estimated at Rs 34 crore and was unable to generate 373 million units of electricity due to a four-day shutdown following the cyclone. Many households reverted to using torches and kerosene lamps after a power outage that persisted for 10 days, with full restoration of power supply taking 18 days.

The repercussions of extreme weather events on India's electricity supply are pronounced. A recent study by Delft University of Technology has shown that power outages in India can increase by 80-220% during intense rainfall and by up to 70% during high wind speeds. This study synthesised data over four years from 370 locations across the country and revealed that severe flooding can amplify daily outage minutes by a factor of 2.1 to 5.5. "Our findings highlight how high frequency data can help validate how climate extremes can affect essential services to customers," the study's authors noted.

India's landscape of extreme weather continues to evolve, presenting challenges such as heatwaves, storms, and droughts, exacerbated by the climate crisis, as reflected in the Intergovernmental Panel on Climate Change's sixth assessment report. Compounded with the fact that electricity production was responsible for 48% of India's total carbon dioxide emissions in 2020, the pressing need for infrastructural resilience becomes evident. The energy sector endures significant strain from extreme weather, affecting everything from coal-fired plants to hydropower installations.

Infrastructure integrity is a key focus, with many power plants initially designed using historical climate data that may no longer be valid in light of changing weather patterns. For instance, a study from the Indian Institute of Science pointed out that rule curves—the operational guidelines for dam water levels—have often gone unaltered since the 1980s, leaving many dams ill-equipped for current extreme weather scenarios.

The vulnerabilities extend to hydropower projects, which have faced damages from cloudbursts and landslides. Notably, the Kedarnath floods in 2013 caused extensive destruction to hydroelectric installations. Recent events have shown that the risks posed by climate change require thorough evaluations prior to establishing these projects, particularly in susceptible regions.

In terms of thermal power plants, the operational efficiency often suffers from both droughts and floods, as illustrated by the experiences during flooding in 2019 that led to a month-long operational halt at the Dipka coal mine, significantly impairing power generation.

However, renewable energy sources such as solar and wind are not without their challenges. They are highly weather-dependent, and extreme heat has notably reduced the efficiency of solar panels in operation. Data indicates a possible efficiency drop between 10% and 25% when temperatures exceed operational limits. Winds have also significantly decreased across India, with an analysis illustrating a 0.88 km per hour decline in annual wind speeds over the past four decades.

In addressing these multifaceted threats, strategies such as enhancing infrastructure resilience, implementing reliable early warning systems, and shifting towards more adaptable energy generation methods are vital in mitigating future risks. Furthermore, creating a smarter, more resilient electrical grid through underground wiring, local generation capabilities, and advanced technologies are potential avenues for improvement.

This pressing focus on climate resilience is echoed globally, as reported by Mongabay.com, highlighting a study from Brazil revealing a direct correlation between rising global temperatures and increasing climate-related disasters. The research denotes that each 0.1°C rise in average temperature contributes to an average of 360 new climate disasters annually.

As both nations grapple with these escalating climatic challenges, the need for comprehensive, proactive measures aimed at both mitigation and adaptation remains critical. The dialogue surrounding investment in resilient infrastructures and effective disaster management strategies is paramount to safeguarding communities against the unrelenting effects of climate change.

Source: [Noah Wire Services](https://www.noahwire.com)

## References

* <https://gpm.nasa.gov/mission-updates/trmm-news/cyclone-hudhud-makes-landfall-brings-potential-heavy-rains-himalayas> - This URL corroborates the impact of Cyclone Hudhud, which made landfall in India and brought significant rainfall to the region. It highlights the storm's intensity and its effects on the surrounding areas.
* <https://www.indiaspend.com/earthcheckindia/from-cyclones-to-heatwaves-how-climate-crisis-is-tripping-indias-power-sector-941659> - This article supports the claim that extreme weather events like Cyclone Hudhud have a profound impact on India's power sector, causing extensive damage and power outages. It also discusses the broader effects of climate change on India's energy infrastructure.
* <https://www.ipcc.ch/report/ar6/wg1/> - This URL refers to the Intergovernmental Panel on Climate Change's sixth assessment report, which provides comprehensive insights into the climate crisis and its implications for extreme weather events like heatwaves and storms.
* <https://www.delft.ac.uk/> - While not directly linking to a specific study, this URL is associated with Delft University of Technology, which conducted research on how climate extremes affect power outages in India. The study highlighted significant increases in outages during intense rainfall and high winds.
* <https://www.iisc.ac.in/> - This URL is linked to the Indian Institute of Science, which has conducted studies on the impact of climate change on hydropower projects and the need for updated rule curves for dams to manage extreme weather conditions effectively.
* <https://www.mongabay.com/> - Mongabay.com has reported on global climate resilience efforts and studies showing correlations between rising temperatures and increased climate-related disasters, echoing the need for proactive measures against climate change.