



EL NIÑO AND ITS EFFECTS IN INDIA

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El Niño is a recurring climate phenomenon, which is characterized by the abnormal warming of sea surface temperature in the central and eastern equatorial Pacific Ocean. It forms part of the El Niño–Southern Oscillation (ENSO) cycle, which have significant influences on global weather patterns. El Niño originates in the Pacific Ocean and however, its impacts are observed worldwide, particularly in monsoon-dependent countries such as India.

The Indian summer monsoon, which contributes nearly 75 per cent of the country's annual rainfall and highly sensitive to ENSO variability. During El Niño years, the warming of Pacific waters alters atmospheric circulation patterns and leads to weakening the monsoon winds that transport moisture from the Indian Ocean to the Indian subcontinent. As a result, India often experiences below-normal rainfall, increased frequency of drought incidence and reduced agricultural productivity.

The India Meteorological Department (IMD) has forecast below-normal southwest monsoon rainfall at 90 per cent of the Long Period Average (LPA). Further, there is also a 60 per cent probability of a deficit monsoon season. The anticipated development of El Niño conditions during the monsoon period could further suppress rainfall across India. According to projections from the U.S. National Oceanic and Atmospheric Administration (NOAA), the 2026 El Niño may intensify into a very strong event and persist until the Northern Hemisphere winter of 2026–27. One major consequence is the depletion of soil moisture and groundwater reserves due to deficient rainfall during the El Niño year.

It creates moisture stress for crops in the following agricultural season, particularly in rainfed regions. Reservoir storage levels may also remain below normal, affecting irrigation availability.

Interestingly, many El Niño events are followed by La Niña conditions, characterized by cooler-than-normal Pacific Ocean temperatures. La Niña often enhances monsoon rainfall over India. However, excessive rainfall can lead to floods, waterlogging and crop damage, demonstrating that both phases of ENSO significantly influence India's agricultural and economic systems. Climate change is expected to increase the variability and intensity of extreme weather events, making the impacts of El Niño more complex and less predictable. Therefore, climate-resilient crop varieties, efficient water management and adaptive agricultural practices are essential for minimizing the adverse effects of El Niño and ensuring long-term food security in India.

In conclusion, El Niño is not merely a short-term climate event but a phenomenon with lasting consequences that can influence India's agriculture, water resources and economy in the ensuing year.