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**DAILY EDITORIAL
ANALYSIS**

TOPIC

**EL NIÑO: WHY INDIA FACES A
DEVELOPMENT CHALLENGE?**

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Context

- The National Oceanic and Atmospheric Administration (NOAA) has forecast a high probability of El Niño in 2026, while IMD projects a below-normal monsoon, raising concerns over agriculture, inflation and livelihoods.

About El Niño and Its 2026 Forecast

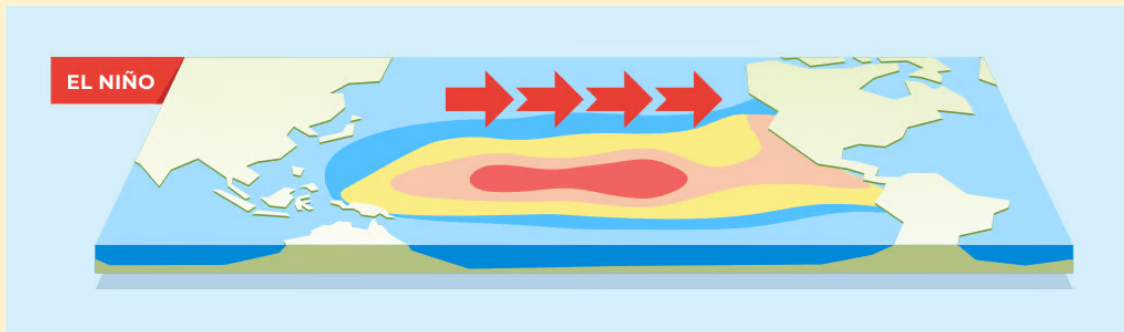
- El Niño is a climate phenomenon characterised by the **abnormal warming of sea surface temperatures** in the central and eastern equatorial Pacific Ocean.
- It is **one phase of the El Niño–Southern Oscillation (ENSO)** cycle and significantly influences global weather patterns, including India's monsoon.

El Niño–Southern Oscillation (ENSO)

- It is a naturally occurring climate phenomenon involving periodic changes in **sea surface temperatures** and **atmospheric pressure** over the tropical Pacific Ocean.
- It is one of the most important drivers of global weather and climate variability.

Components of ENSO

- **El Niño (Warm Phase):** It is characterised by **warmer-than-normal sea surface temperatures** in the central and eastern equatorial Pacific Ocean.
 - ♦ It weakens the trade winds.
 - ♦ It is often associated with below-normal monsoon rainfall in India, droughts in parts of Asia and Australia, and increased global temperatures.



- **La Niña (Cool Phase):** It is characterised by **cooler-than-normal sea surface temperatures** in the same region.
 - ♦ It strengthens the trade winds, and is often associated with above-normal monsoon rainfall in India, increased flooding in some regions, and slightly cooler global temperatures.



- **Southern Oscillation:** It refers to the periodic fluctuation in atmospheric pressure between **Tahiti (Eastern Pacific), and Darwin, Australia (Western Pacific)**.
 - ♦ It is measured through the **Southern Oscillation Index (SOI)**.
 - ♦ Changes in pressure influence trade winds and ocean temperatures.

ENSO Mechanism

- **Under normal conditions**, trade winds blow from east to west across the Pacific, warm water accumulates near Indonesia and Australia, and cooler, nutrient-rich water rises along the South American coast (upwelling).
- **During El Niño**, trade winds weaken, warm water shifts eastward, upwelling decreases, and rainfall patterns change globally.
- **During La Niña**, trade winds strengthen, more warm water accumulates in the western Pacific, upwelling intensifies, and opposite climatic impacts occur.

Impact of El Niño

- **Heat Economy (Productivity Losses and Informal Workers):** India's large informal workforce, comprising construction workers, street vendors, delivery personnel and agricultural labourers remains highly vulnerable to extreme heat.
 - ◆ Higher temperatures lead to reduced working hours due to heat exposure, lower labour productivity, increased health risks and heat-related illnesses, and income insecurity for daily wage earners.
- **Agricultural Stress and Rural Distress:** Agriculture remains the most climate-sensitive sector of the Indian economy.
 - ◆ The **Southwest Monsoon provides nearly 70% of the rainfall required for crops and replenishes reservoirs and aquifers.**
 - ◆ A weaker monsoon can result in delayed or reduced sowing, lower crop yields, increased irrigation costs, greater dependence on groundwater extraction, and higher risks for small and marginal farmers.
- **Food Inflation and Macroeconomic Risks:** Climate shocks often become visible first through rising food prices.
 - ◆ The **Consumer Price Index (CPI) data released by MOSPI in 2026** showed food inflation at **4.2% in April 2026**. A deficient monsoon could intensify price pressures on pulses, vegetables, cereals, and edible oils.
- **Water Security Challenges:** Reduced rainfall directly affects reservoir storage levels, groundwater recharge, drinking water availability, and hydropower generation.
 - ◆ A weak monsoon can worsen these stresses, particularly in drought-prone regions of peninsular and western India.
- **Urban Vulnerability and Rising Inequality:** Indian cities are increasingly becoming **urban heat islands** due to rapid concretisation, shrinking green cover, and loss of water bodies.
- **Public Health Concerns:** El Niño-induced heatwaves and water stress can contribute to heat strokes and dehydration, spread of vector-borne diseases, reduced nutritional security due to food inflation, and greater health expenditure among vulnerable households.
 - ◆ Public health systems may face increased pressure, especially in densely populated urban areas.

Way Forward: Building Climate Resilience

- **Strengthen Heat Action Plans:** Expand city-level heat action plans; establish cooling shelters and early warning systems; and ensure occupational safety standards for outdoor workers.
- **Climate-Resilient Agriculture:** Promote drought-resistant crop varieties; expand micro-irrigation and precision farming; and strengthen crop insurance and weather-based advisories.
- **Water Resource Management:** Improve rainwater harvesting; encourage watershed development; and enhance groundwater governance and recharge initiatives.

- **Urban Climate Resilience:** Increase urban green spaces; protect wetlands and water bodies; and promote heat-resilient urban planning.
- **Social Protection for Vulnerable Groups:** Strengthen MGNREGA and livelihood support programmes, expand social security for informal workers, and improve access to affordable cooling and healthcare.

Daily Mains Practice Question

[Q] Examine the socio-economic implications of El Niño on India's agriculture, labour market, food security, and urban resilience.

Source: TH

