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EDITORIAL ANALYSIS

Spring That Never Came — El Niño 2026 and the Monsoon Threat India Must Prepare For

 **DOWN TO EARTH**

20 March 2026

SUBJECTS COVERED**ENVIRONMENT****GEOGRAPHY****ECONOMY****GS PAPERS****GS1****GS3****CURATED & WRITTEN BY****Bharat Choudhary**

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 Down to Earth

20 March 2026

GS1

GS3

 Down to Earth

MAINS RELEVANCE:

GS Paper 1

GS Paper 3



INTERVIEW ANGLE

"India's winter 2025-26 was 60% below normal rainfall, spring barely arrived, and NOAA puts El Niño probability at over 80% for 2026. Historically, El Niño years weaken the Indian monsoon. What agricultural, water management, and disaster preparedness measures should India take now — before the Kharif sowing season begins?"

WHY IN NEWS

India's **winter 2025-26 was 60% below normal rainfall** — one of the driest on record — driven by weakened Western Disturbances. March brought an abrupt transition directly from winter to summer, **skipping spring almost entirely**. Research scientist Akshay Deoras (University of Reading/National Centre for Atmospheric Science, UK) warns in Down to Earth that **Pacific Ocean heat accumulation points to El Niño development with 80%+ probability in 2026** — raising serious concerns for India's Kharif monsoon season.

WHAT IS HAPPENING — THE SEASONAL ANOMALY

Winter 2025-26 (November 2025 – February 2026):

Rainfall deficit: **~60% below normal** across most of India

Cause: **Weakened Western Disturbances (WDs)** — the extra-tropical weather systems that bring winter rain to northwest India and snowfall to the Himalayan ranges

March 2026:

Despite a brief rain event on the spring equinox (March 20), the overall March pattern shows an abrupt jump from winter conditions to pre-summer heat — spring compressed to near-invisibility

Delhi's March 20 rain was anomalous; the broader trend is unusually early summer temperatures

What this means:

Himalayan snowpack deficit: Less WD activity = less snowfall in the Himalayas = reduced spring snowmelt = lower river flows by May–June in the Indus, Ganga, and Brahmaputra systems

Groundwater recharge gap: Rabi crop irrigation has drawn more heavily on groundwater without adequate winter recharge

Agricultural calendar compression: Rabi harvest being followed by heat-wave conditions earlier than normal — affecting wheat quality (heat stress at grain-filling stage)

EL NIÑO — WHAT IT IS AND WHY IT MATTERS FOR INDIA

El Niño is part of the **ENSO (El Niño-Southern Oscillation)** cycle — a periodic warming of central and eastern Pacific Ocean surface temperatures:

Phase	Pacific SST	India Impact
El Niño (warm phase)	Above-average SSTs in central/east Pacific	Suppresses Indian monsoon; drought risk
La Niña (cool phase)	Below-average SSTs	Strengthens Indian monsoon; flood risk
ENSO Neutral	Near-average SSTs	Variable; other factors dominate

Why El Niño weakens India’s monsoon:

The Walker Circulation (atmospheric east-west convection) is disrupted by warm Pacific SSTs

Upward motion over the Pacific weakens the Arabian Sea low-pressure systems that drive monsoon rainfall toward India

The monsoon onset is typically delayed; active phases are shorter; break phases are longer

Historical Indian monsoon-El Niño correlation:

Not every El Niño year is a drought — **correlation is ~0.6** (strong but not deterministic)

Major El Niño years with significant Indian drought: 1972, 1982, 1987, 1997-98, **2002, 2009, 2014-15**

However: **2015-16** (super El Niño) — India’s monsoon was below normal but not catastrophic; evidence that the relationship has weakened somewhat, possibly due to Indian Ocean warming counteracting Pacific influences

THE 2026 EL NIÑO SIGNAL — HOW SERIOUS?

Down to Earth’s analysis of Akshay Deoras’ research:

NOAA probability: >80% likelihood of El Niño developing in the May–August 2026 window

Strong El Niño probability: ~1 in 3 (33%)

Pacific signal comparison: Current subsurface heat accumulation is “relatively stronger and more coherent” than comparable stages in **2023, 2018, 2015, and 2014** — years that all developed into El Niño events

Onset timing: If El Niño develops by June, it coincides directly with India’s monsoon onset period (June 1 Kerala onset target)

Key monitoring indices:

Niño 3.4 region SST anomaly: Primary El Niño measurement — the central Pacific (5°N–5°S, 170°W–120°W); El Niño declared when 3-month average anomaly $\geq +0.5^\circ\text{C}$

SOI (Southern Oscillation Index): Atmospheric component; sustained negative SOI confirms El Niño

Oceanic Niño Index (ONI): NOAA’s preferred measure; 3-month rolling average of Niño 3.4 SST anomaly

INDIA’S MONSOON DEPENDENCE — THE STAKES

Parameter	Data
Agriculture’s share of India’s GDP	~15%
Agricultural workforce share	~44% of employed population
Rain-fed agriculture	~51% of net sown area (no irrigation)
Kharif crops dependent on monsoon	Rice, maize, jowar, bajra, soybean, cotton, pulses
India’s food grain production (FY25)	~330 million tonnes (record)
Reservoir storage level (March 2026)	Below 10-year average due to dry winter

Why a deficient monsoon cascades:

Food production fall → inflation in food prices (already elevated at ~6.2% in Feb 2026)

Groundwater stress → drinking water crisis in Maharashtra, Rajasthan, Gujarat, Karnataka

Hydropower deficit → power shortages in south India (major hydro-dependent states: Karnataka, Kerala, Andhra Pradesh, Himachal)

Kharif income loss → rural demand contraction → broader slowdown

Fiscal pressure → MGNREGS expansion, drought relief spending

THE EDITORIAL'S CORE ARGUMENT

Down to Earth argues that India is entering its most serious monsoon risk window in several years — and that **preparation must begin now**, not after the monsoon onset:

1. RESERVOIR MANAGEMENT

Pre-position water reserves. The current below-normal reservoir storage (following the dry winter) means India enters the pre-monsoon period with less buffer than usual. **Inter-basin water transfer preparedness** should be activated for drought-prone districts.

2. AGRICULTURAL CONTINGENCY PLANNING

The **National Contingency Crop Planning** mechanism (under ICAR and State Agriculture Departments) must be activated:

- Identify drought-resistant Kharif varieties (for key states) for rapid seed distribution
- Revise sowing calendars and advisory packets
- Advance procurement of food grain buffer stocks for PDS to hedge against price spikes

3. PMFBY REVIEW

PM Fasal Bima Yojana (PMFBY) — India's crop insurance scheme — needs:

- Rapid claim settlement** mechanisms pre-positioned
- Coverage gaps for small/marginal farmers in rain-fed areas addressed before Kharif
- Tech-enabled crop loss assessment (satellite imagery) pre-authorized to avoid delays

4. HEAT ACTION PLANS

Compressed spring = early and more intense heat wave season. **National Disaster Management Authority (NDMA)** heat action plans must be activated for high-risk cities (Ahmedabad, Nagpur, Bhubaneswar, Lucknow) earlier than the normal April-May window.

WESTERN DISTURBANCES — THE MECHANISM

Western Disturbances (WDs) are extra-tropical weather systems originating in the Mediterranean and Caspian Sea regions, travelling eastward and bringing winter precipitation to northwest India:

- Origin:** Mediterranean cyclonic systems, Red Sea troughs, Caspian disturbances
- Track:** Travel east across Central Asia → Pakistan → northwest India → Himalayas → sometimes as far as northeast India
- Seasonal window:** October–April (peak: December–March)

Precipitation: Snowfall in Himachal Pradesh, Uttarakhand, J&K; rain in Punjab, Haryana, Delhi, UP, Rajasthan

Agricultural role: Critical for rabi crops (wheat, mustard, chickpea) sown in October–November and harvested March–April

Why WDs weakened in 2025-26:

Warmer than normal conditions in the Mediterranean and Middle East reduced the temperature gradient that drives WD formation

Climate change is systematically weakening mid-latitude storm tracks — a documented pattern in multiple studies

UPSC RELEVANCE

El Niño (ENSO warm phase), La Niña (ENSO cool phase), NOAA El Niño 2026 probability (>80%), Southern Oscillation Index (SOI), Oceanic Niño Index (ONI), Niño 3.4 region, Western Disturbances (Mediterranean origin), Walker Circulation, India monsoon onset (June 1, Kerala), India rain-fed agriculture share (~51%), PMFBY (PM Fasal Bima Yojana), NDMA heat action plans, India food grain production FY25 (~330 MMT).

Mains GS1: *Climatology — ENSO, El Niño-monsoon relationship, Western Disturbances, Indian monsoon mechanism, climate change and seasonal shifts.* **GS3:** *Agriculture — monsoon dependence, food security, drought management, crop insurance (PMFBY), MGNREGS drought employment, irrigation gap, water reservoir management.*

★ FACTS CORNER — KNOWLEDGEPEDIA

WINTER 2025-26 ANOMALY:

Rainfall deficit: ~60% below normal

Cause: Weakened Western Disturbances

Impact: Himalayan snowpack deficit, lower river flows, groundwater deficit

EL NIÑO 2026 SIGNAL:

NOAA probability: >80% (May–August 2026 development)

Strong El Niño probability: ~33%

Pacific signal strength: Stronger than 2023, 2018, 2015, 2014 analogues at same stage

Measurement: Niño 3.4 SST anomaly $\geq +0.5^\circ\text{C}$ sustained over 5 consecutive months = El Niño

ENSO BASICS:

El Niño: Warm Pacific SSTs → suppresses Indian monsoon

La Niña: Cool Pacific SSTs → strengthens Indian monsoon

Walker Circulation: East-West atmospheric convection loop; disrupted by El Niño

ONI (Oceanic Niño Index): NOAA's primary El Niño measure; 3-month rolling Niño 3.4 average

SOI (Southern Oscillation Index): Atmospheric pressure difference Tahiti–Darwin; negative = El Niño

INDIA-EL NIÑO HISTORICAL CORRELATION:

~0.6 correlation (strong, not deterministic)

Drought years: 1972, 1982, 1987, 2002, 2009, 2014-15

Exception: 2015-16 (super El Niño) — India's monsoon below normal but not catastrophic

INDIA'S AGRICULTURE MONSOON DEPENDENCE:

Rain-fed agriculture: ~51% of net sown area

Agriculture % of GDP: ~15%

Agricultural workforce: ~44% of employed population

Food grain production FY25: ~330 million tonnes (record)

Key Kharif crops: Rice, maize, jowar, bajra, cotton, soybean, pulses

WESTERN DISTURBANCES:

Origin: Mediterranean, Caspian, Red Sea regions

Season: October–April (peak Dec–Mar)

Impact: Snowfall in Himalayas; rain in Punjab, Haryana, UP, Delhi

Critical for: Rabi crops (wheat, mustard, chickpea)

KEY SCHEMES:

PMFBY (PM Fasal Bima Yojana): Crop insurance; government subsidised premiums; rapid satellite-based assessment

MGNREGS: Rural employment guarantee — drought-era lifeline for agricultural workers

NDMA Heat Action Plans: City-level heat wave response; Ahmedabad model (2010, first in Asia)

ICAR: Indian Council of Agricultural Research; national contingency crop planning

RESERVOIR STATUS (MARCH 2026):

Below 10-year average storage level (due to dry winter 2025-26)

Affects irrigation buffer ahead of Kharif season

OTHER RELEVANT FACTS:

India monsoon onset: June 1 (Kerala) — official IMD target date

IMD forecasts El Niño impact assessment using CFSv2 (Climate Forecast System) model

Indian Ocean Dipole (IOD): Another key climate driver; positive IOD can partially offset El Niño effects on Indian monsoon

Galwan El Niño precedent: 2009 El Niño led to ~23% rainfall deficiency — worst in two decades; triggered food inflation and fiscal stimulus

Sources: Down to Earth, NOAA, IMD

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