



# Indian Monsoon 2026: IMD Flags Below-Normal Outlook Amid Climate Concerns

The Indian Monsoon remains the lifeline of the world's largest agrarian economy, irrigating 50% of farmland and influencing 600 million lives. In April 2026, IMD issued its first long-range forecast, predicting the 2026 Southwest Monsoon (June-September) at 92% —classified as "below normal" (90-95% LPA). This comes against evolving El Niño conditions, neutral IOD shifting positive, and reduced Northern Hemisphere snow cover, raising alarms for kharif crops, reservoirs, and food security.

## 1. Background (IMD Data on Indian Monsoon)

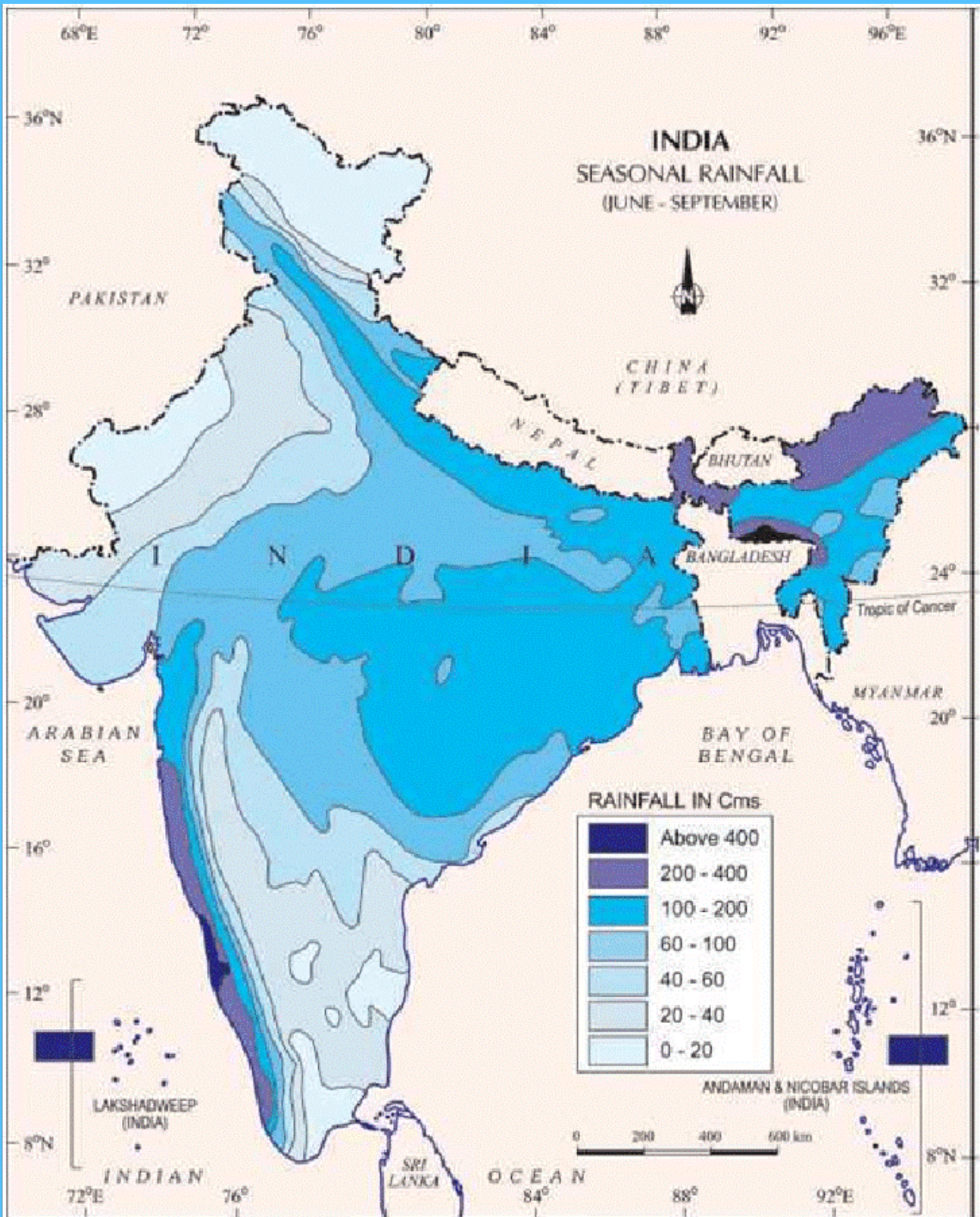
IMD defines monsoon as seasonal wind reversal bringing ~87% of annual rainfall (890 mm). Historical data reveals variability: 2023 (normal, 97%), 2024 (above normal, 108%), 2025 (normal), but deficits like 2019 (74%) caused ₹1 lakh crore losses.

Categorization:

1. Excess (>110%), Normal (96-104%), Deficient (<90%).

Regionally, Central India averages 100-120 cm, Northeast 200+ cm, West (<50 cm rain-shadow). IMD's Monsoon Mission enhances forecasts via 12 models (dynamical/statistical), achieving 75% accuracy since 2010. For 2026, below-normal signals echo 2015 (86%), linked to El Niño; Northeast, Northwest, South Peninsula may see normal/above, but core monsoon zones risk shortfalls. Progress tracking: Onset Kerala ~June 1 ( $\pm 8$  days), covers India by July 15. Withdraws September-October. Recent trends: 10-year average 94% LPA, with extremes rising 20%.

# Current Affairs

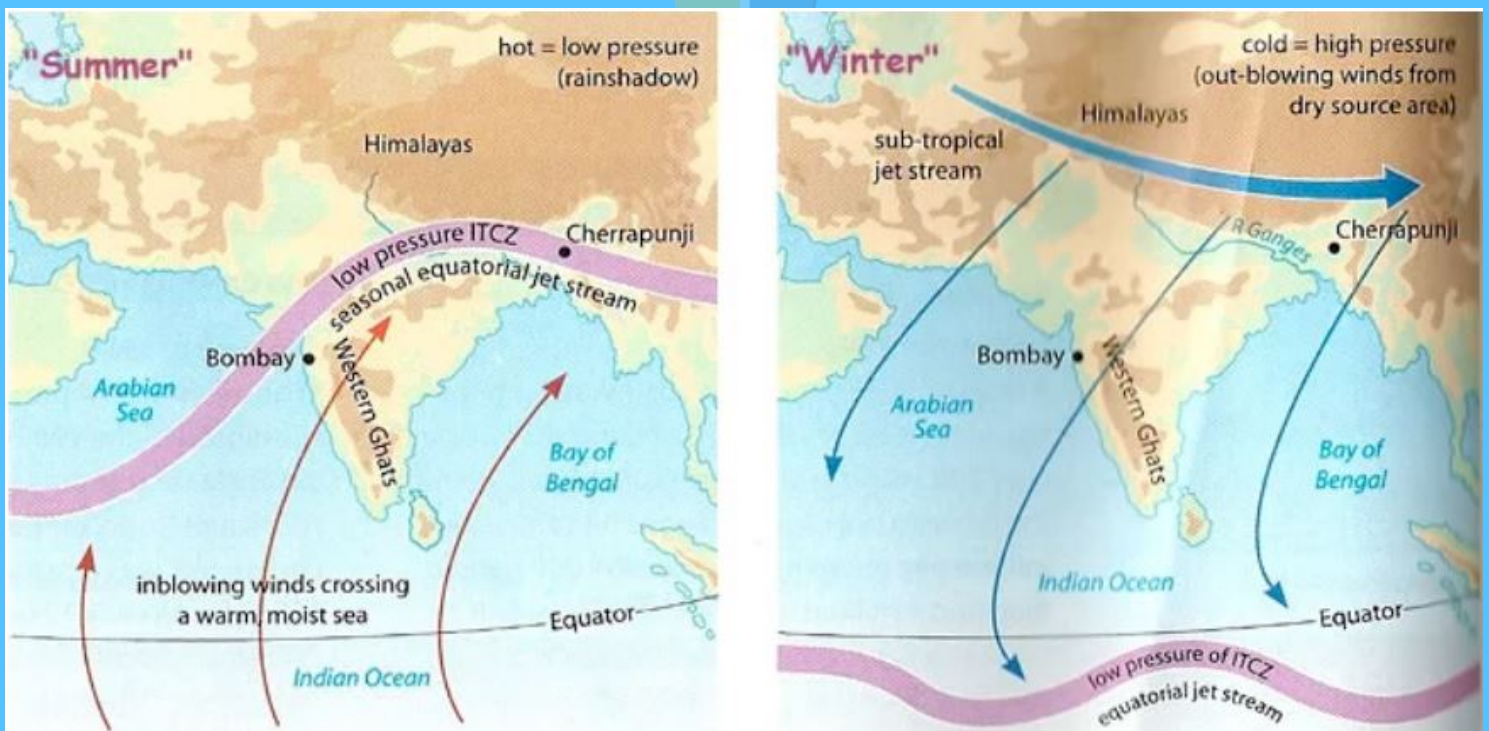




## 2. Mechanism of Indian Monsoon

The monsoon stems from **thermal contrast** between Asia's landmass and oceans, per Halley's theory. Winter: High pressure over cold Siberia draws NE trades (dry). Summer: Intense heating creates low over Thar-North India, shifting ITCZ northward to Ganga plains, pulling SE trades across equator.

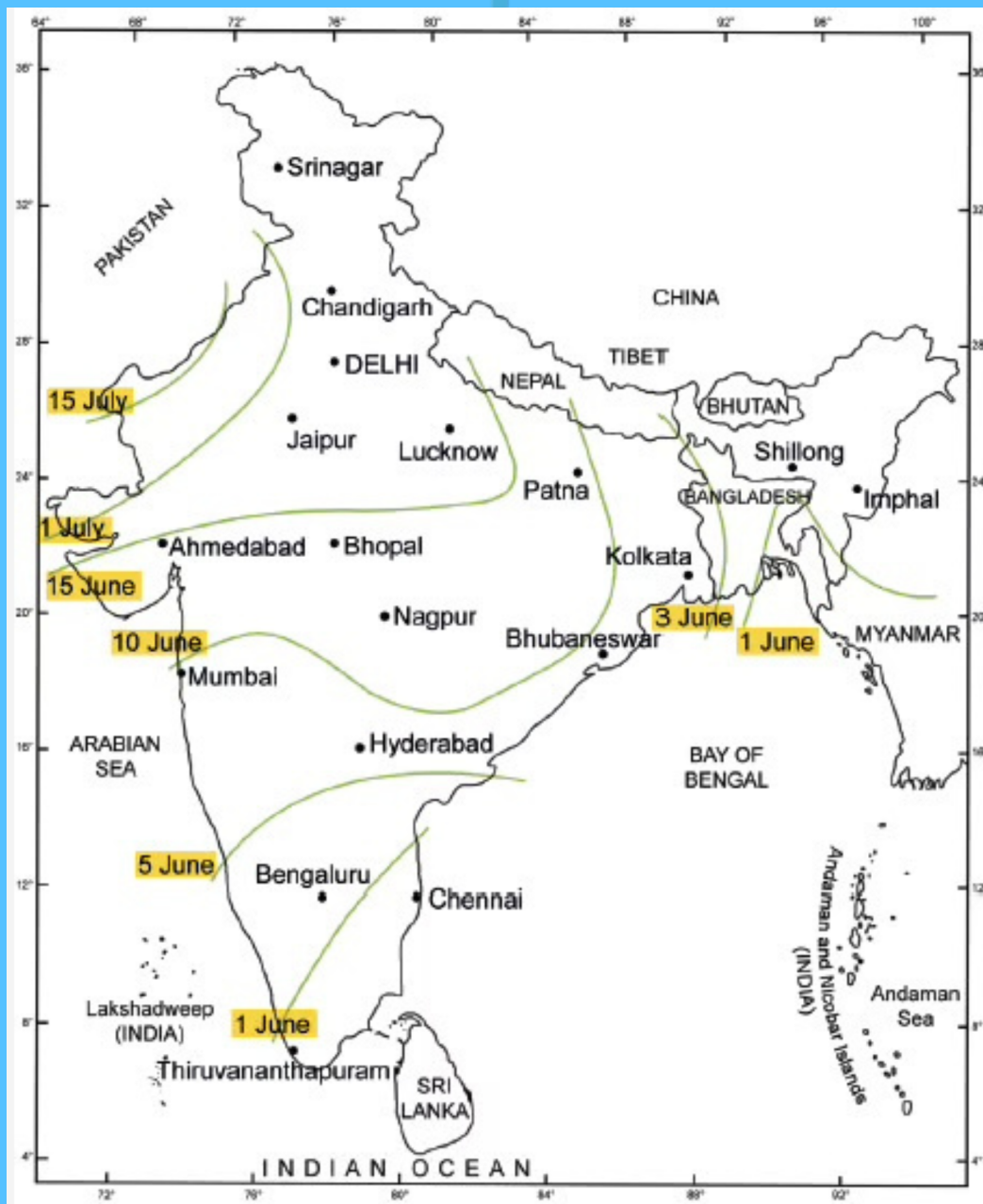
Coriolis deflects them into SW winds, laden with Arabian Sea/Bay of Bengal moisture. Jet streams aid: Easterly jet (above 15°N) triggers onset; Tibetan Plateau's heat low amplifies suction. Moisture convergence at ITCZ forms monsoon trough, spawning depressions (average 16/year, 70% rainfall). Upper divergence via Somali jet (low-level) and Tibetan anticyclone sustains it. Global teleconnections: ENSO (El Niño suppresses), IOD (positive boosts), MJO modulate intensity.





## 3. South-West Monsoon

Dominates June-September, contributing 75-80% rainfall (~700 mm). Splits into **Arabian Sea Branch** (hits Kerala first, ~June 1; parallels Western Ghats for orographic rain >250 cm Kerala/Konkan) and **Bay of Bengal Branch** (crosses Bangladesh, advances NE, then southwest via depressions).





**Advance:** Kerala (1 June), Mumbai (10 June), Delhi (29 June), NE (mid-July). **Bursts/Breaks:** Active (wet spells), breaks (dry, trough shifts south). Branches converge over Indo-Gangetic plains; rain-shadow in Deccan east. 2026 forecast: Weakened by El Niño, favoring erratic distribution. Contributes 55% GDP via kharif (rice, pulses); delays hit sowing on 40 million ha.

#### 4. North-East Monsoon

Retreating monsoon (October-December), vital for southeast coast (20% annual rain). Winds reverse: High over Bay draws NE trades (winter monsoon) from China, picking Bay moisture, hit Tamil Nadu/Andhra Coromandel Coast. Peaks November, 50-100 cm rain (Chennai 80% annual).

Less voluminous than SW (15-20% total), but crucial post-SW withdrawal (NW India Oct). Cyclones (5-6/year Bay) amplify, e.g., 2023 Cyclone Michaung. Differs from SW: affects Tamil Nadu/Puducherry (normal 75 cm). Minimal national impact but regional lifeline for delta crops (paddy, sugarcane).

#### 5. Variability in Indian Monsoon

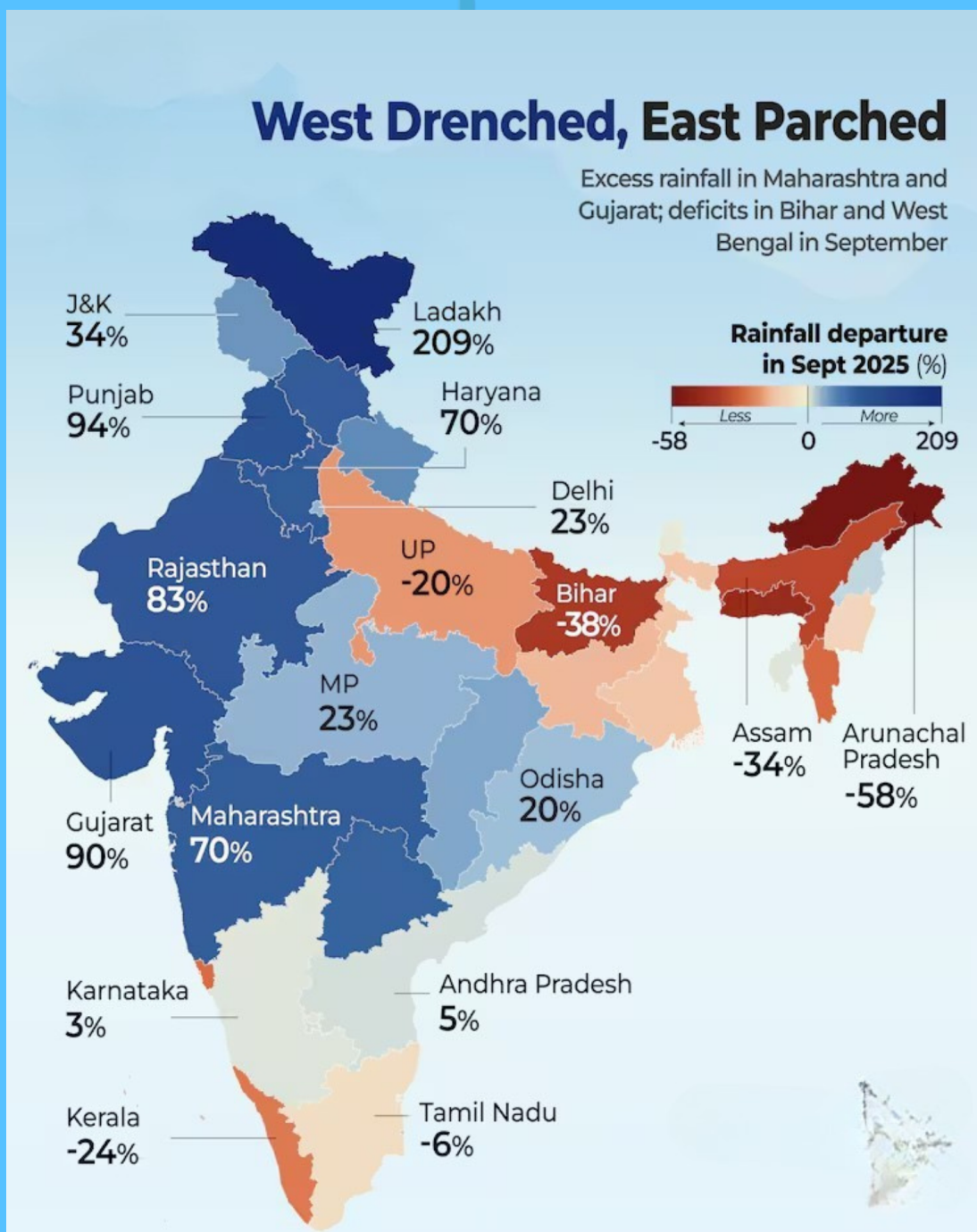
**Inter-Annual:** ENSO dominant—El Niño years (2002, 2009, 2015) deficient (80-85%); La Niña excess (2020, 2022). IOD: Positive (1994) boosts 10-15%; negative weakens. Snow cover: High Himalayas/NH suppresses. MJO phases modulate active/break cycles.

**Intra-Seasonal:** Breaks (July-Aug, 20-30 days) shift trough south, dry central India. Spatial: NE excess, rain-shadow deficits. Trends: Post-1950, 40% years abnormal; frequency up 10%. 2026: El Niño (developing May-July), positive IOD late-season, low snow favor below-normal. Economic toll: 1% GDP loss per 10% deficit.



## 6. Impact of Climate Change on Indian Monsoon

Global warming disrupts via **moisture overload** (Clausius-Clapeyron: +7%/°C) but suppressed totals. Observed: Delayed onset (+2 days/decade), prolonged breaks, southward depressions (less rain Gangetic). Extremes: 30% more heavy spells (>100 mm/day), floods up (Kerala 2018); droughts intensified.





Arctic melt weakens jet streams, erratic ITCZ. Himalayan retreat (1 km/decade) alters river feeds. Regional: West/Peninsula drier (Arctic link), central/north wetter. Projections (CMIP6): 10-20% variability rise by 2050; El Niño-like warming skews deficits. 2026 below-normal exemplifies—ENSO neutral to El Niño transition. Agriculture: Kharif yields down 5-10%; migration/food inflation spikes.

## 7. Schemes for Indian Monsoon

**Forecasting:** IMD Monsoon Mission (₹250 crore) deploys supercomputers, 150 radars for 80% accuracy. DAMINI app for lightning; Meghdoot for farmers.

**Agriculture Resilience: PM Fasal Bima Yojana (PMFBY)** insures 5.5 crore ha (₹2 lakh crore claims paid). **PM Krishi Sinchayee Yojana (PMKSY)** expands irrigation to 100 million ha (Per Drop More Crop). **National Food Security Mission** promotes climate-resilient seeds (millets, pulses).

**Disaster Management: NDMA's National Cyclone Risk Mitigation** (₹1,500 crore) builds shelters/coastal radars. **Flood Management Programme** (₹10,000 crore) embanks Ganga-Brahmaputra. **Jal Shakti Abhiyan** recharges groundwater via check dams.

**Climate Adaptation: National Adaptation Fund for Climate Change (NAFCC)** (₹3,000 crore) funds resilient farming. **Green India Mission** afforests 5 million ha for microclimate stability. 2026 prep: Early alerts via Kisan e-Mitra; drought codes in 500 districts. International: Indo-US MONEX data-sharing.

The 2026 below-normal monsoon tests India's preparedness, but robust schemes and IMD vigilance offer buffers. Sustained investment in resilient agri-infra will safeguard against mounting climate volatility.