



P.L.RAJ IAS & IPS ACADEMY

Building Bureaucrats Since 2006

1. Southwest Monsoon 2026 – Geography

The India Meteorological Department (IMD) confirmed the arrival of the southwest monsoon in Kerala on June 4, 2026, marking the official start of India's rainy season. The monsoon arrived slightly ahead of its normal June 1 onset date, bringing relief amid earlier forecasts of below-normal rainfall (92% of Long Period Average) due to expected El Niño conditions. The southwest monsoon contributes approximately 75% of India's annual rainfall, making it critical for agricultural productivity, water security, and overall economic stability.

1. Southwest Monsoon

Onset and Retreat

1. Monsoon season generally starts early June, lasts until September
2. **Onset:** Marked by arrival of southwest monsoon winds bringing moisture-laden air from Indian Ocean
3. **Normal Kerala onset date:** June 1
4. **2026 actual onset:** June 4
5. **Withdrawal/retreat:** Typically begins October (from northwest India)
6. **Northeast monsoon:** October to December bringing rainfall to parts of southern India (Tamil Nadu, Andhra Pradesh, Puducherry)

Progression of Southwest Monsoon

1. Kerala → Karnataka, Goa → Maharashtra, Andhra Pradesh → Central India → Northern India
2. Reaches entire country by approximately July 8-15
3. **Two branches:**
 1. **Arabian Sea branch:** Strikes Western Ghats first; heavy west coast rainfall; advances toward central-northern India
 2. **Bay of Bengal branch:** Northeast India; deflected westward by Himalayas across Indo-Gangetic Plains

Monsoon Dynamics

1. **El Niño and La Niña** phenomena influencing strength, distribution
2. **Indian Ocean Dipole (IOD):** Positive IOD can compensate for El Niño's weakening effect
3. **Somali Jet:** Low-level jet stream carrying moisture from Indian Ocean to India
4. **Tibetan Plateau heating:** Creating upper-level divergence supporting monsoon circulation
5. **ITCZ (Inter-Tropical Convergence Zone):** Shifts northward during summer drawing monsoon winds

Agricultural Impact

1. Monsoon success directly influencing crop yields, overall economy
2. ~60% of India's net sown area rain-fed (140 million hectares)
3. Critical for Kharif crops: Paddy, pulses, cotton, oilseeds, maize
4. Below-normal monsoon → food inflation, rural distress, GDP impact
5. Above-normal monsoon → flooding, crop damage in certain regions

Importance Beyond Agriculture

1. **Water security:** Replenishes rivers, groundwater (80%+ recharge), reservoirs
2. **Hydropower:** ~50 GW capacity dependent on monsoon flows

3. **Ecological balance:** Forests, biodiversity, soil moisture

2. What is El Niño?

Definition

1. Means "Little Boy" in Spanish
2. Climate phenomenon characterized by periodic warming of sea surface temperatures in central, eastern equatorial Pacific Ocean

Mechanism

1. **Normally:** Trade winds blow westward pushing warm water toward Asia (warm pool near Australia, Indonesia)
2. **During El Niño:** Trade winds weaken
3. Warm water pushed back east toward west coast of Americas
4. Cold water (normally upwelling off South America) suppressed
5. Disrupting normal atmospheric circulation patterns globally

Periodicity

1. Occurs every 2-7 years
2. Typically lasts 9-12 months
3. Followed by La Niña (opposite phenomenon — cooling of Pacific)
4. **ENSO (El Niño-Southern Oscillation):** Broader climate pattern encompassing El Niño and La Niña cycles

3. Impact of El Niño on Weather Patterns

Global Temperature Rise

1. El Niño causes rise in global temperatures
2. Often leading to warmer-than-average conditions worldwide
3. Contributes to record-breaking global temperature years (1998, 2016, 2023-24 linked to El Niño)

Disruption of Indian Monsoon

1. El Niño typically weakens Indian monsoon
2. Leading to reduced rainfall, drought conditions
3. **Mechanism:** Warmer Pacific waters alter atmospheric circulation; weaken Walker Circulation and Hadley Cell affecting moisture transport to India
4. Historical droughts (2002, 2009) linked to strong El Niño events
5. 2026 IMD forecast: 92% LPA partly due to El Niño influence

Increased Risk of Wildfires

1. Increases likelihood of wildfires especially in:
 1. Australia (drier conditions)
 2. Southern Africa
 3. Parts of Americas (California, Amazon)
2. Dry, hot conditions creating fire-prone environments

Extreme Weather Events

1. More intense storms, hurricanes, cyclones particularly in Pacific, Atlantic
2. Flooding in South America (Peru, Ecuador)
3. Drought in Southeast Asia, Australia, India
4. Disrupted agricultural patterns globally

La Niña Effects (Opposite)

1. Strengthens Indian monsoon (above-normal rainfall)

2. Cooling of Pacific, strengthening trade winds
3. Often follows El Niño as correction cycle

4. Way Forward

1. Enhanced district-level monsoon forecasting for precise agricultural planning
2. Drought-resistant crop varieties for El Niño years
3. Strengthening PM Fasal Bima Yojana coverage, claims settlement for monsoon failures
4. Rainwater harvesting, aquifer recharge programs maximizing above-normal monsoon years
5. Real-time weather advisory systems for farmers

5. Conclusion

IMD confirming June 4, 2026 southwest monsoon onset in Kerala marks beginning of India's critical rainy season contributing 75% annual rainfall. Monsoon dynamics — influenced by El Niño (weakening effect through Pacific warming disrupting trade winds, Walker Circulation), La Niña, IOD, and Tibetan Plateau heating — determine agricultural productivity, water security, and economic stability for 1.4 billion people. El Niño's impacts extend beyond India causing global temperature rise, wildfires in Australia-Africa-Americas, and extreme weather events globally. Climate change intensifying ENSO variability demands enhanced forecasting, climate-smart agriculture, and water resource management ensuring India's food security remains resilient against monsoon variability.

Source: <https://www.thehindu.com/news/national/kerala-monsoon-onset-june-4-imd-why-southwest-monsoon-arrival-matters-for-india/article71055995.ece>