UPSC Geography revision · Mechanism, onset, withdrawal, El Niño and the IOD

Monsoon in India

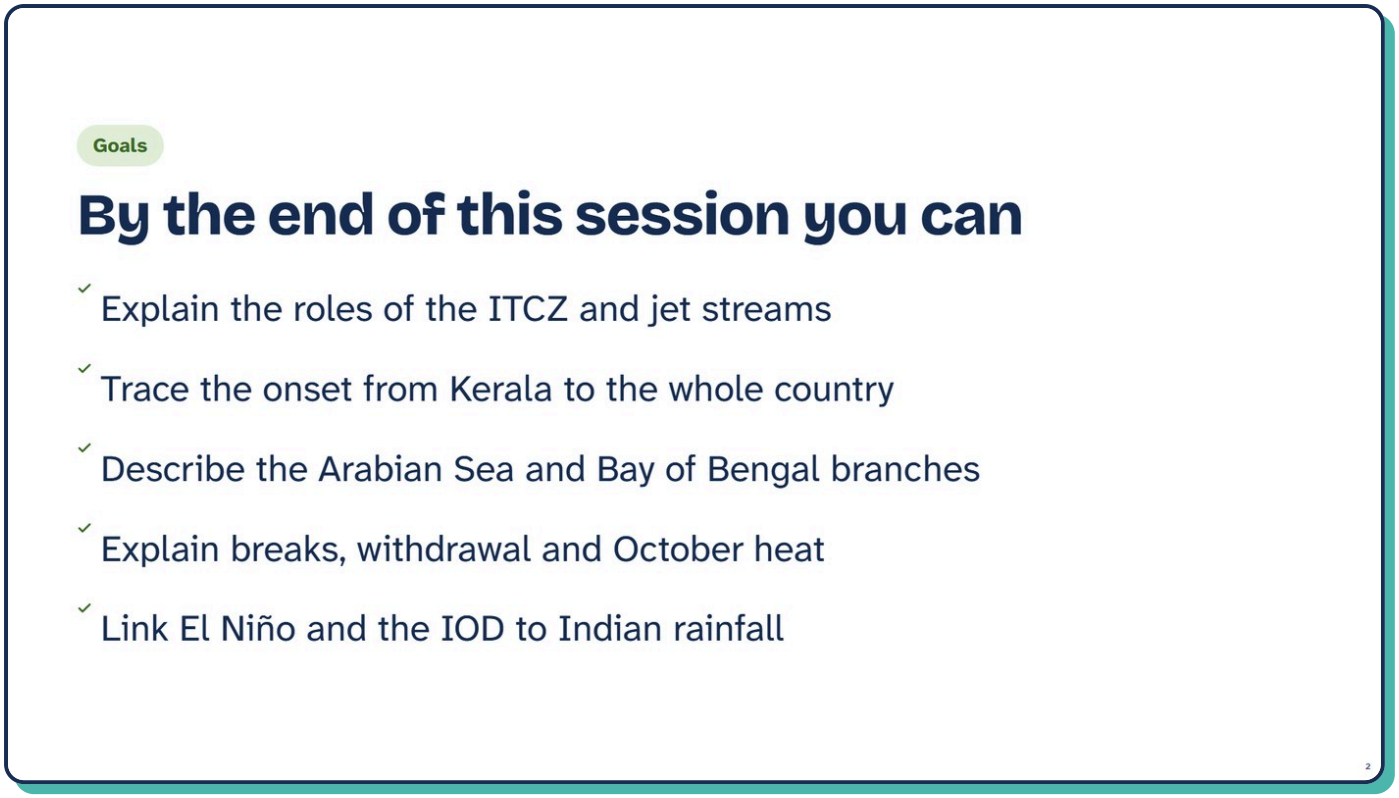


Monsoon in India

Teacher notes

Ask aspirants: on what date does the monsoon normally reach Kerala? Most will say 1 June; tell them we will also learn the dates for Mumbai, Delhi and the whole country. Remind them that UPSC tests both mechanisms and exact facts.

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By the end of this session you can

Teacher notes

Read the objectives aloud. Suggest that aspirants keep a blank outline map of India to mark the branches and onset dates as we go.

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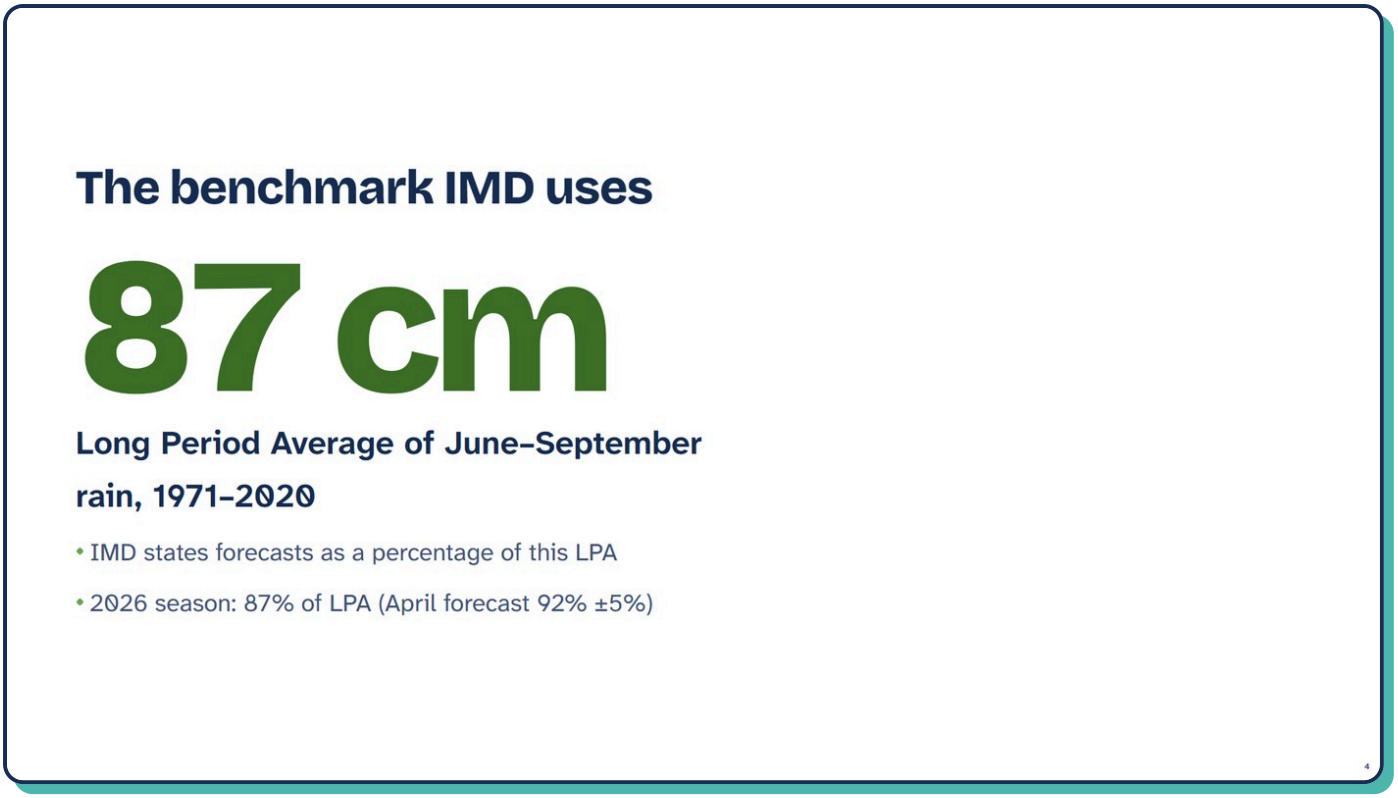


Why the monsoon matters

Teacher notes

The 70–90% figure comes from IMD's 2020 report on normal onset dates. The 116 cm is IMD's 1971–2020 all-India average; the NCERT Class XI book gives an older round figure of about 125 cm, so name your source if you quote one. Ask: which crops depend most on monsoon timing? Kharif crops such as rice. A common misconception is that the monsoon is just heavy rain; it is a seasonal reversal of winds.

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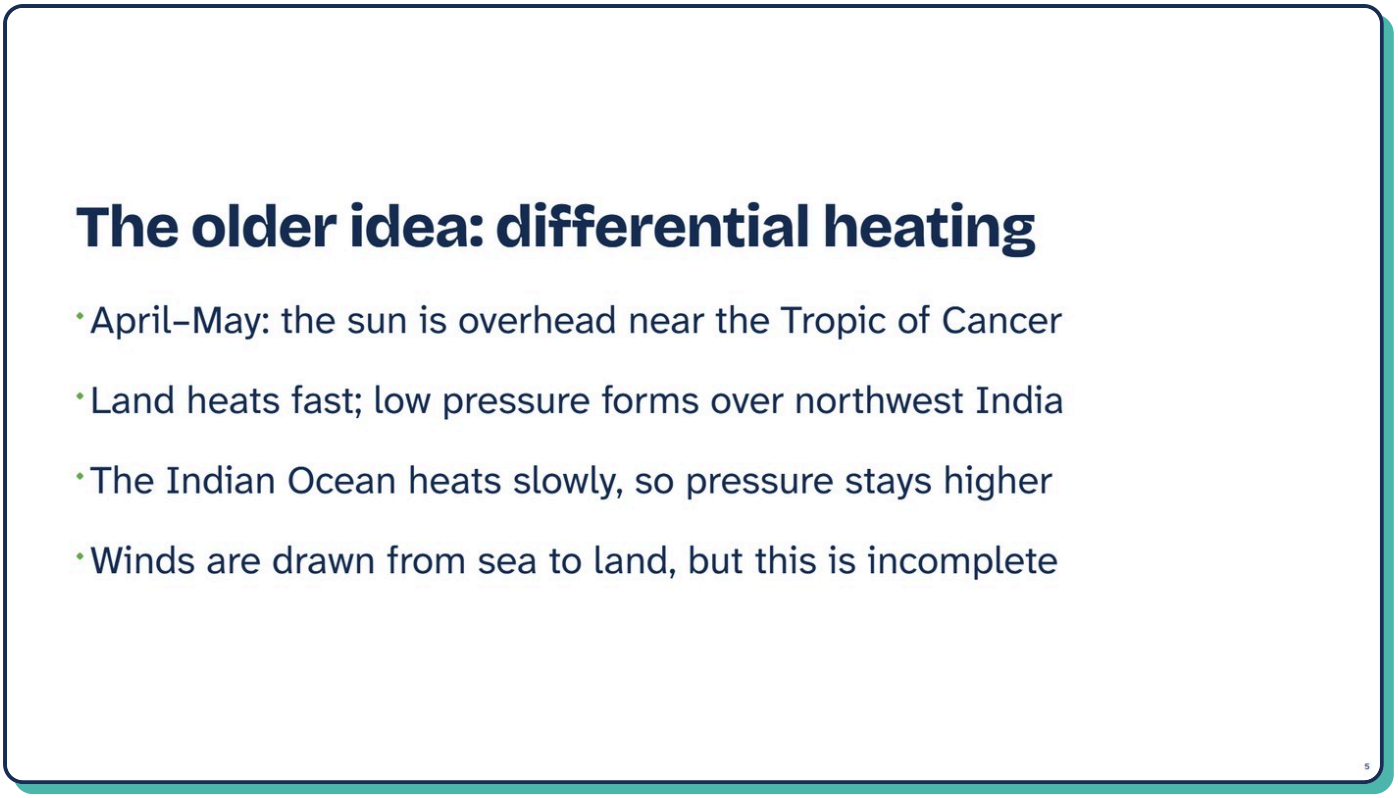


The benchmark IMD uses

Teacher notes

Explain that the LPA is the all-India seasonal average. IMD reported on 30 September 2026 that the 2026 season, an El Niño year, ended at 87% of LPA (759.4 mm), the fourth lowest since 2001. Ask: if a season gets 87% of LPA, roughly how many centimetres is that? About 76 cm. Stress that an all-India figure can hide big regional differences: the South Peninsula got 76% and East and Northeast India 74% of their own averages.

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The older idea: differential heating

Teacher notes

NCERT says this was the accepted view towards the end of the nineteenth century. Ask: what does this simple model leave out? Upper-air winds and the global circulation, which the next slides add.

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The ITCZ and the monsoon trough

Teacher notes

Sketch the equator, the ITCZ in July and the curving trade winds. Ask: why do the winds bend to the right after crossing the equator? The Coriolis force deflects moving air to the right in the northern hemisphere.

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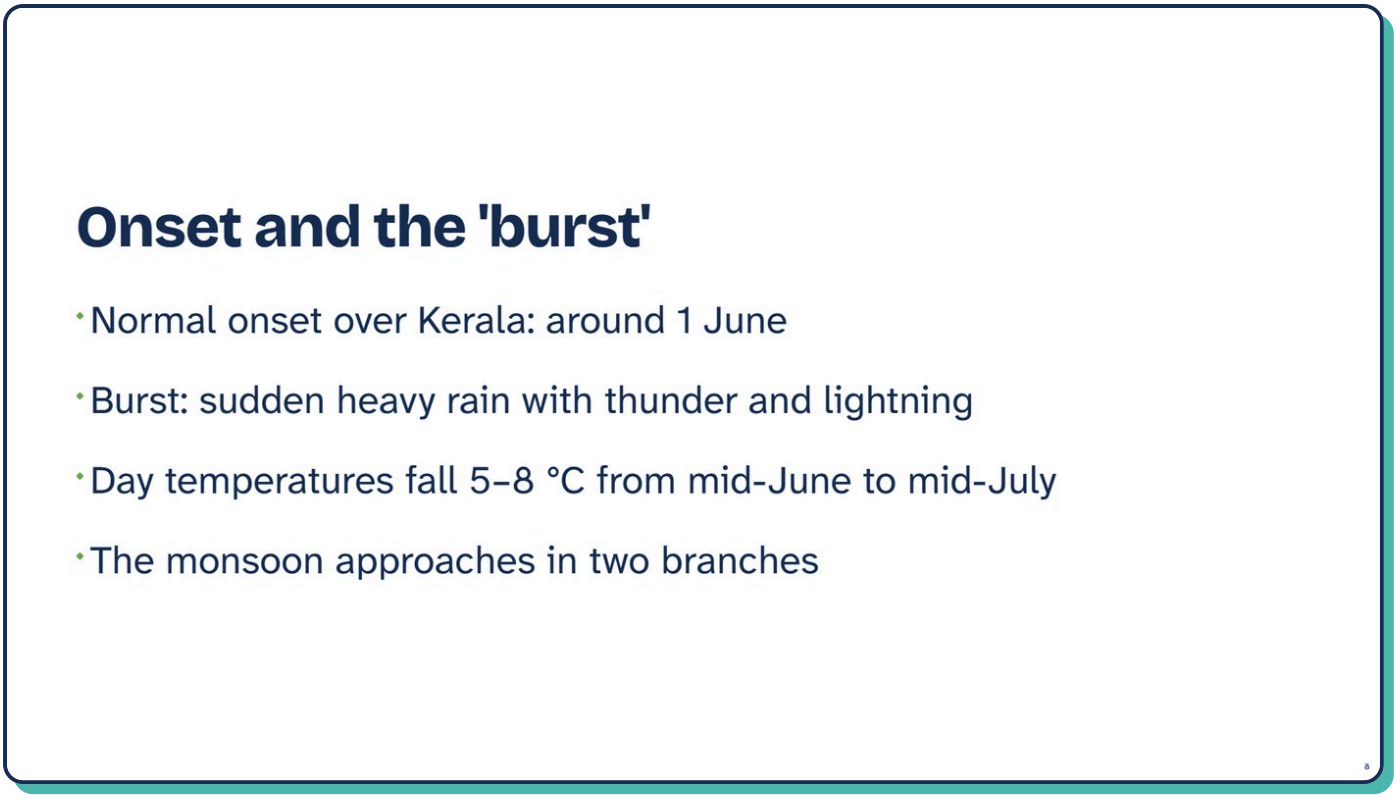


Jet streams and the onset

Teacher notes

This follows the NCERT Class 11 explanation. Ask: what has to happen first, the westerly jet leaving or the easterly jet arriving? The westerly jet must withdraw first. Many aspirants mix up which jet causes the burst.

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Onset and the 'burst'

Teacher notes

Onset over Kerala is the first official milestone every year, and IMD declares it using rainfall, wind and cloud criteria. Ask: why does the first rain bring such a big drop in temperature? Cloud cover and evaporation cool the land.

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Worked example

The monsoon's march north

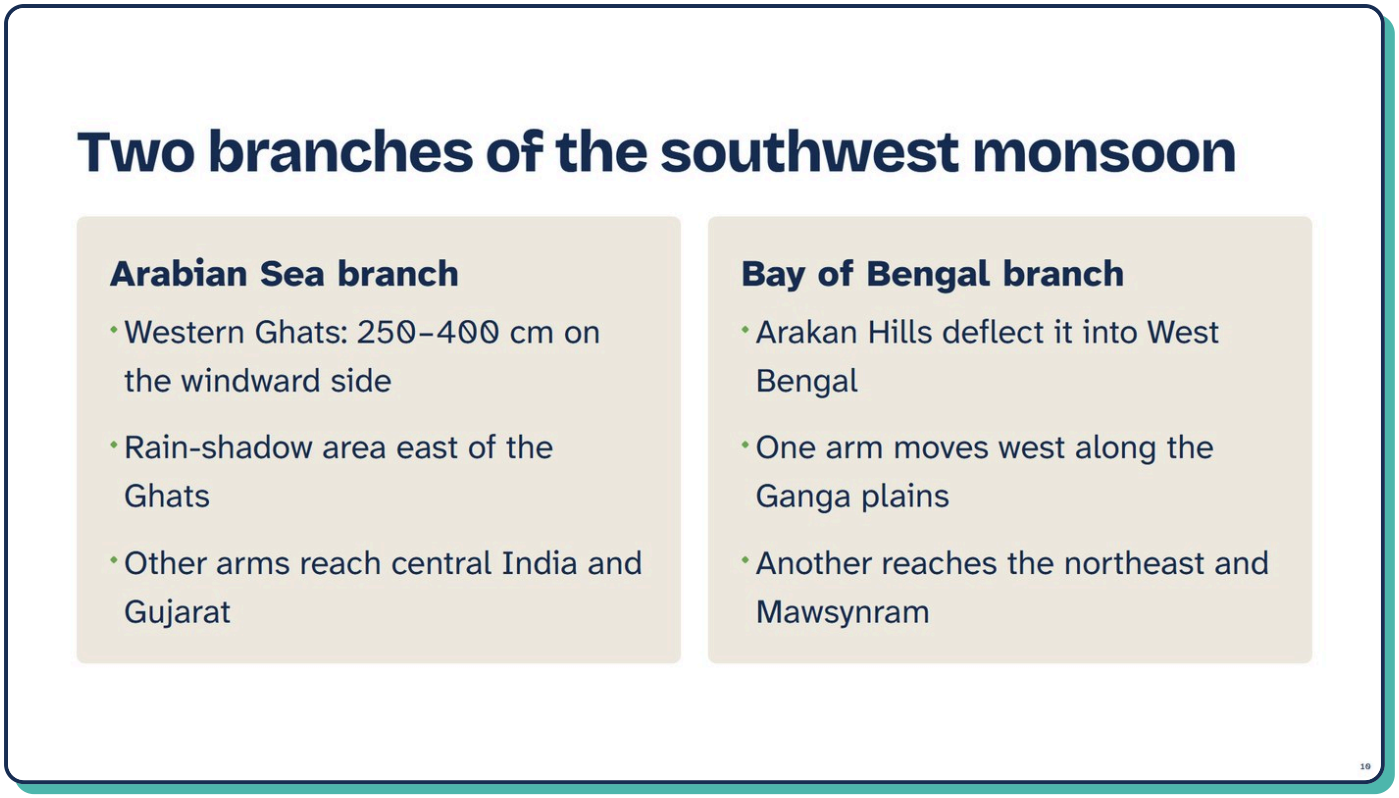
- Thiruvananthapuram and Kochi: around 1 June
- Mumbai: around 11 June
- Delhi: around 27 June
- The whole country: around 8 July

The monsoon's march north

Teacher notes

These are IMD's new normal dates, published in 2020 from 1961–2019 data; in any single year actual dates vary. Ask: how many days does the monsoon take from Kerala to Delhi? About four weeks. The old normal for full coverage was 15 July.

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Two branches of the southwest monsoon

Teacher notes

Ask aspirants to compare Mangaluru with Bengaluru to see the rain-shadow effect. NCERT says Mawsynram, on the crest of the Khasi hills, receives the highest average annual rainfall in the world; use that in the exam, but know the record is disputed: rain gauges on Colombia's Pacific coast, such as Lloró and Puerto López (López de Micay), have reported higher averages.

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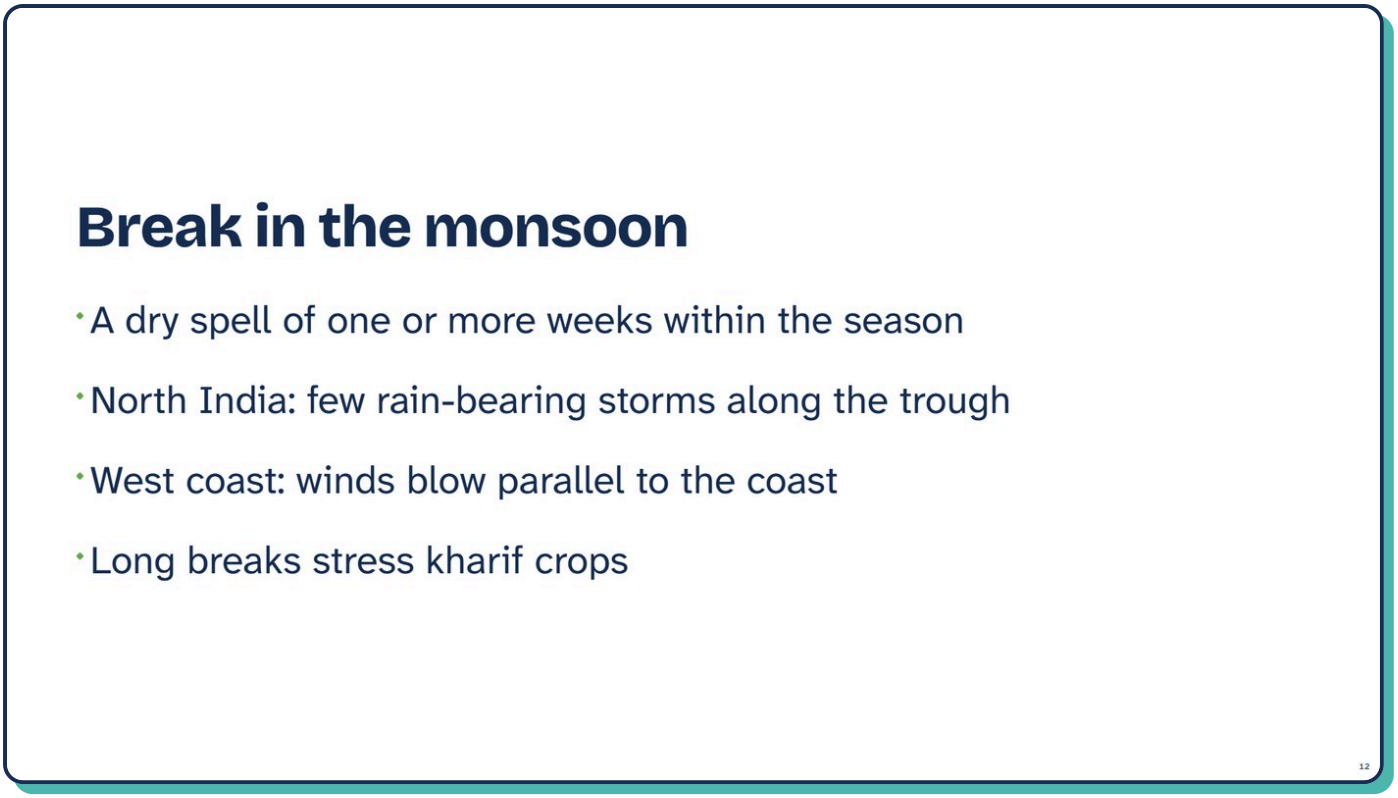


Why Tamil Nadu stays dry in summer

Teacher notes

This is a favourite Prelims statement question. Ask: which two reasons does NCERT give? Parallel coastline and rain shadow. A common error is to blame the Eastern Ghats alone.

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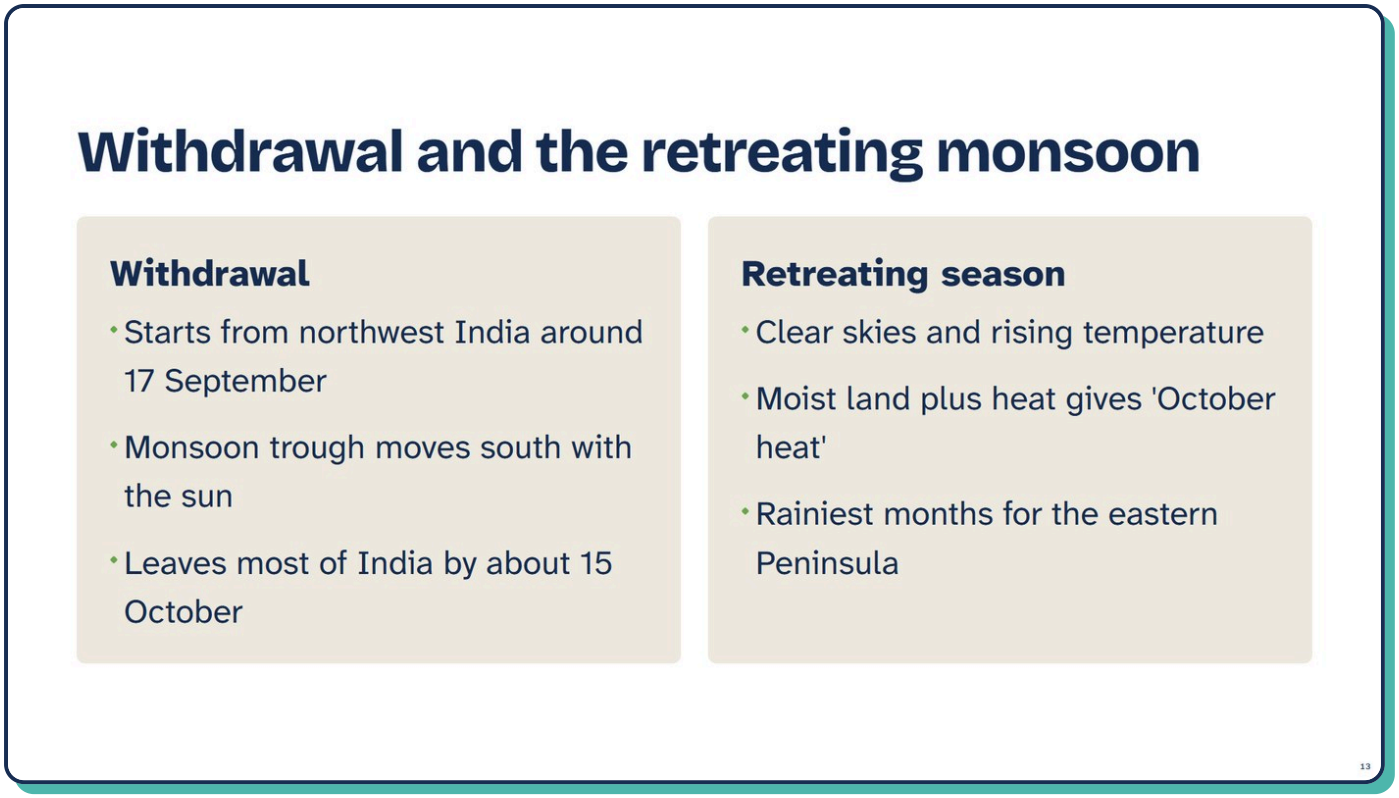


Break in the monsoon

Teacher notes

Stress that breaks are normal, not a failure of the monsoon. Ask: why would a two-week break in July worry a rice farmer? Transplanted seedlings need standing water.

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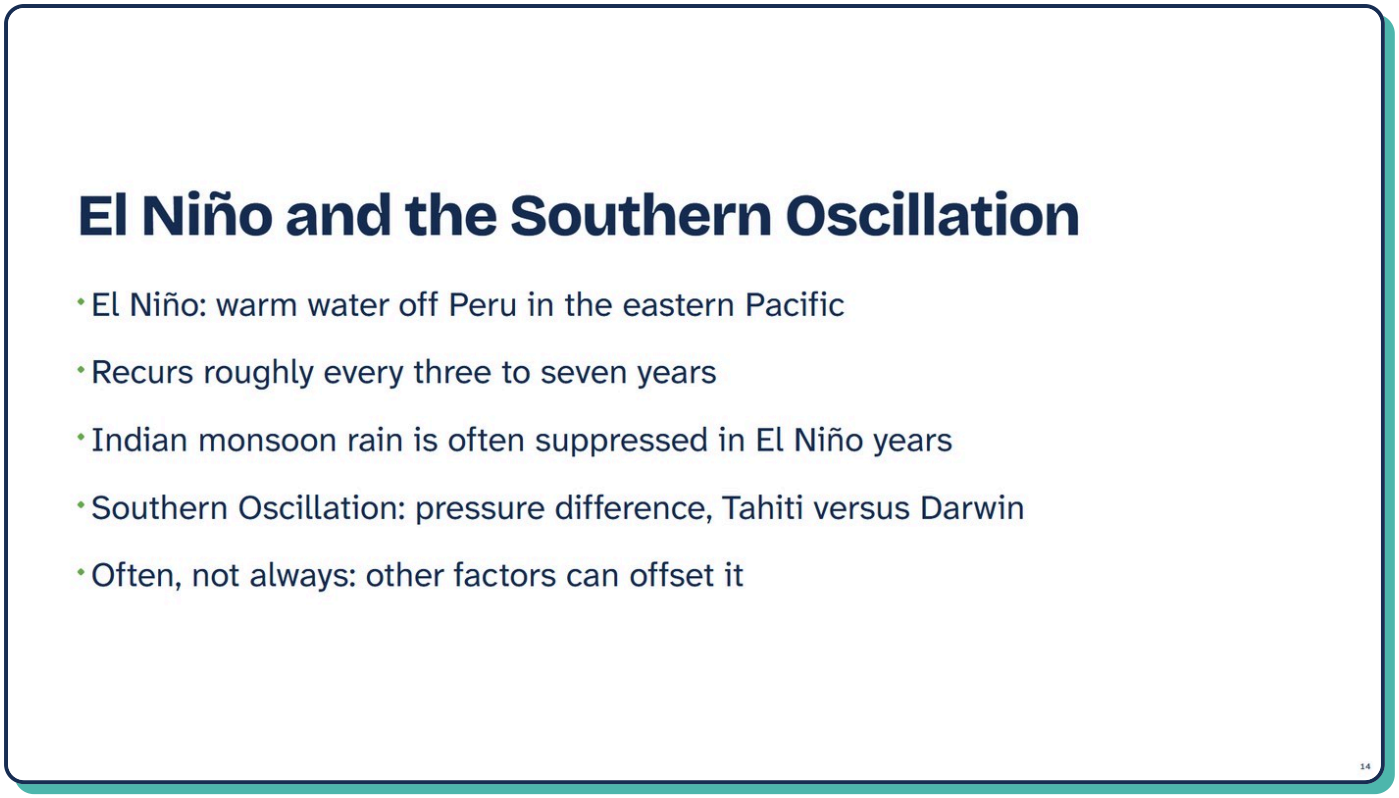


Withdrawal and the retreating monsoon

Teacher notes

IMD moved the normal start of withdrawal from 1 September to about 17 September in 2020. Ask: why is October heat so uncomfortable? High temperature and high humidity together. Withdrawal is gradual, unlike the sudden onset.

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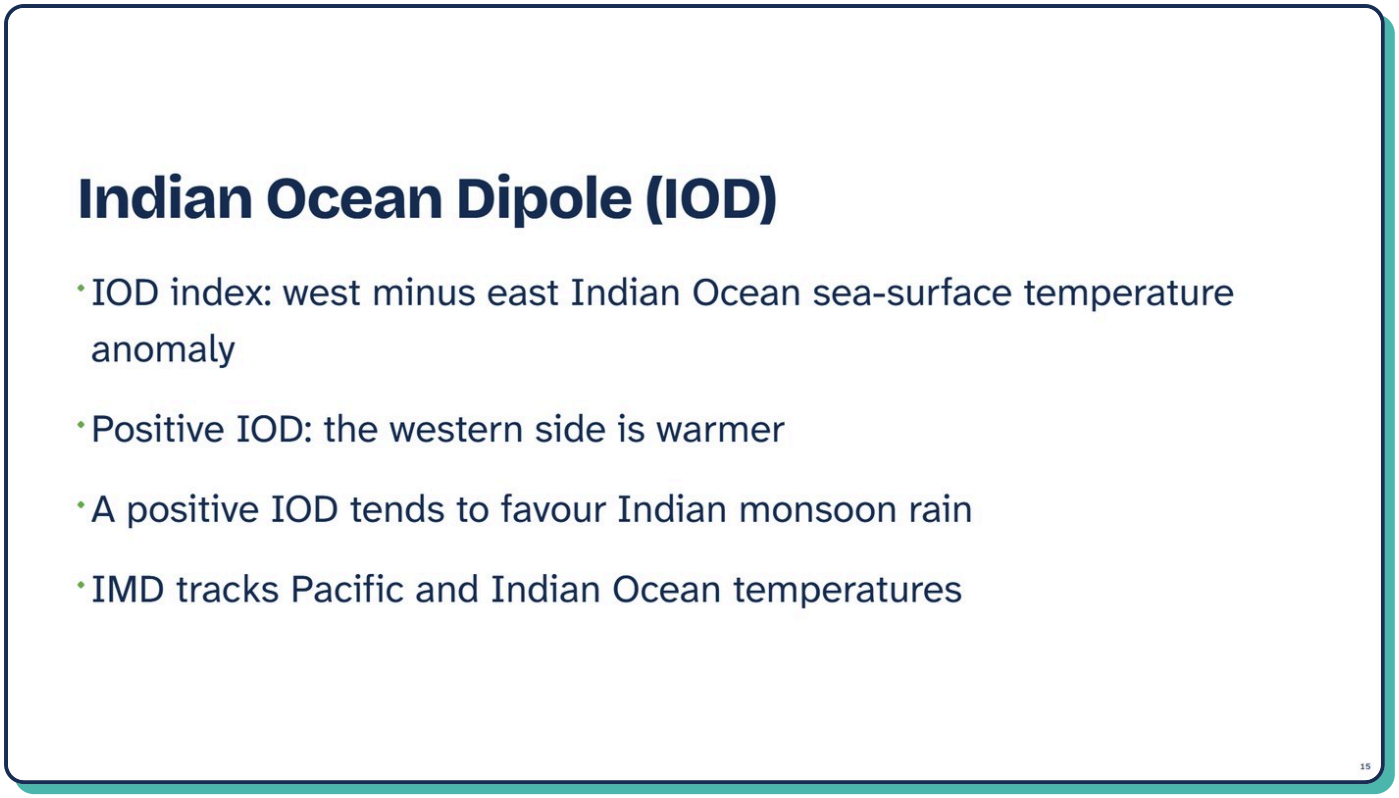


El Niño and the Southern Oscillation

Teacher notes

NCERT notes that El Niño is used in India for long-range monsoon forecasting. Ask: does every El Niño year bring drought in India? No, which is why the Indian Ocean Dipole matters too.

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Indian Ocean Dipole (IOD)

Teacher notes

Researchers define the IOD index as the sea surface temperature difference between a western and an eastern box of the tropical Indian Ocean. Ask: how could a positive IOD help in an El Niño year? It can partly offset the drying effect.

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Prelims practice

Teacher notes

Answer: B, a positive Indian Ocean Dipole. El Niño often suppresses rainfall, the westerly jet must withdraw before the burst, and parallel winds cause breaks on the west coast.

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Revision takeaways

Teacher notes

Ask aspirants to mark the onset dates and both branches on their outline map. Then take the five-question quiz on the page and revise the NCERT Class 11 chapter on climate alongside these slides.

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