

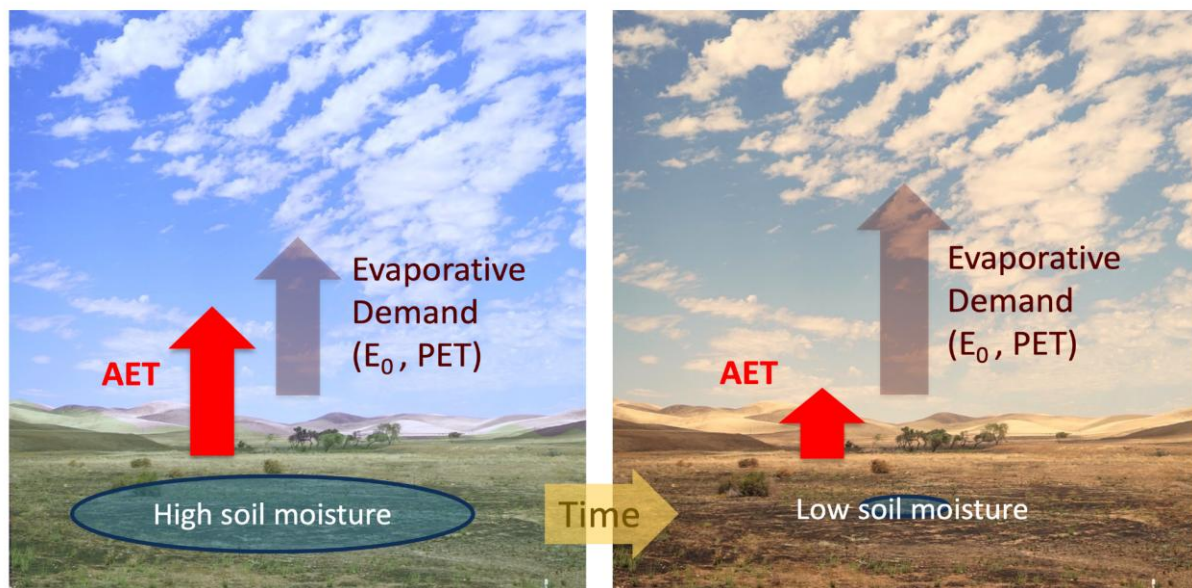
## Today's Prelims Topics

### Evaporative Demand

#### Context

The increasing **evaporative demand** in India is highlighting critical shortcomings in the nation's climate data infrastructure and scientific research capabilities.

#### Evaporative Demand

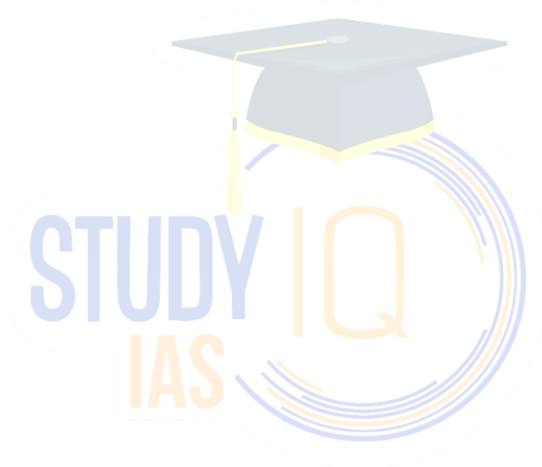


Schematic showing how under high soil moisture and water availability, Actual Evapotranspiration (AET) can have the same magnitude as evaporative demand. With time, if the soils dry out, evaporative demand will often increase (as air temperature rises and humidity decreases in response to the now-dry land surface) but AET decreases, limited by the lower amount of water

- Evaporative demand measures **how much water the atmosphere wants to evaporate** from the land if enough water is available.
- It reflects the **potential evaporation**, not the actual evaporation — which may be low if water is scarce.
- **Main Drivers:** Evaporative demand is influenced by:
  - **Temperature** (higher temps increase demand)
  - **Wind speed**
  - **Humidity** (lower humidity = higher demand)
  - **Cloud cover** (clear skies increase demand)
- **Link to Drought and Fire:**
  - High evaporative demand can **intensify droughts**.
  - It contributes to **drying out soils and vegetation**, increasing the **risk of wildfires**.
- **Early Warning Indicator:** Extended periods of **above-normal evaporative demand** can help detect:
  - Drought onset
  - Drought intensification
  - Elevated fire danger

- **Environmental Impact:**
  - Leads to **reduced soil moisture**
  - **Stresses crops and plants**
  - Makes vegetation **more flammable**
- **Critical Condition for Wildfires:** When **low rainfall** (below-normal precipitation) overlaps with **high evaporative demand**, it creates **critically dry fuel conditions**, enabling **rapid wildfire spread**.

Source: [TheHindu](https://www.thehindu.com)



## SpaDex-2 mission

### Context

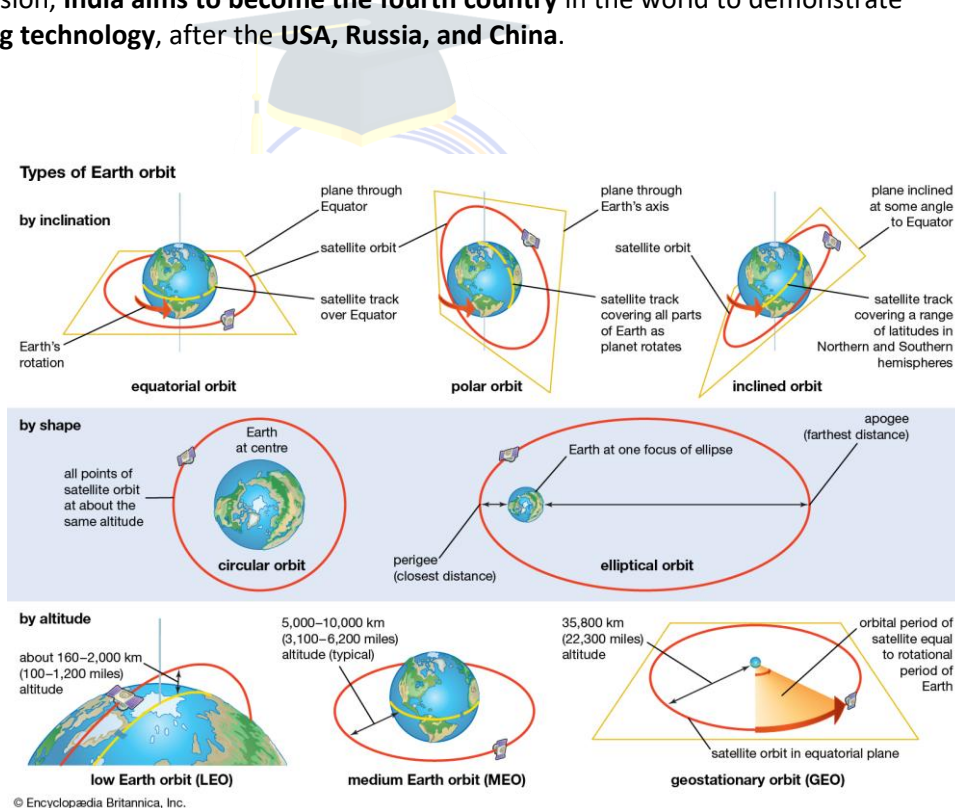
ISRO is set to launch **SPADEX-2**, aiming to **dock two satellites in elliptical orbit**.

### About SPADEX Mission

- **Full Form:** SPADEX stands for **Space Docking Experiment**.
- **Type:** A **cost-effective technology demonstrator mission**.
- **Objective:** To **develop and demonstrate** the technology for **Rendezvous, Docking, and Undocking** of two small spacecraft (**SDX01 – Chaser, SDX02 – Target**) in **low-Earth circular orbit**.
- **Launch by:** PSLV.
- **Importance:** In-space docking is a **critical capability** for:
  - **Human missions to the Moon**
  - **Lunar sample return missions**
  - **Construction and operation of the Bharatiya Antariksh Station (BAS)** (India's planned space station)
  - Enables **coordination of multiple rocket launches** for a single mission goal — essential for long-duration or modular space missions.
  - With this mission, **India aims to become the fourth country** in the world to demonstrate **space docking technology**, after the **USA, Russia, and China**.

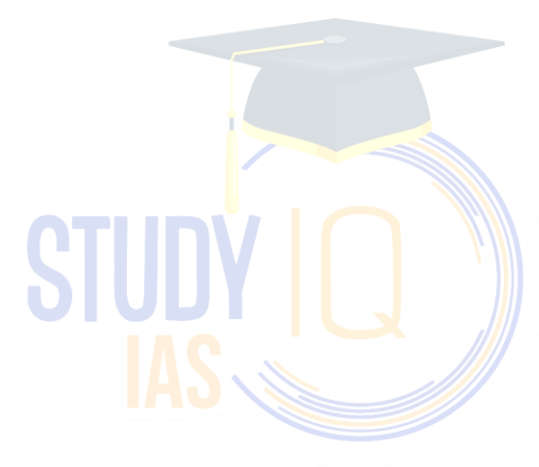
### About Elliptical Orbit

- **Definition:** An **elliptical orbit** is a type of **non-circular orbit** where the path of the satellite around a planet or object forms an **ellipse** (oval shape), not a perfect circle.
- **Shape & Geometry:**
  - Has two focal points (foci); the **central body** (like Earth) is located at **one focus**, not the center.
  - Defined by **eccentricity** (how stretched the orbit is); **eccentricity = 0** is circular, **0 < e < 1** is elliptical.
- **Key Parameters:**
  - **Perigee:** Closest point of the orbit to the Earth.
  - **Apogee:** Farthest point of the orbit from the Earth.
- **Speed Variation:**



- The satellite **moves faster near perigee** and **slower near apogee** due to gravitational pull (Kepler's Second Law).
- **Uses of Elliptical Orbits:**
  - **Earth observation satellites** needing variable altitudes.
  - **Communications satellites** covering polar or high-latitude regions.
  - Missions requiring **longer dwell time** over a specific region.
  - Space experiments like **SPADEX-2**, which simulate conditions for future docking in more complex orbital paths.
- **Examples of Elliptical Orbits:**
  - **Molniya Orbit** – Used by Russia for high-latitude communications.
  - **GTO (Geostationary Transfer Orbit)** – Used as a transfer path before reaching circular geostationary orbit.

Source: [IndianExpress](#)



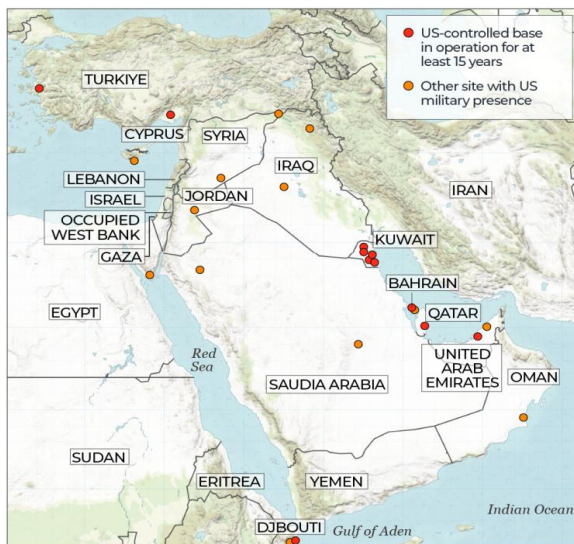
## Places in News

### U.S. Bases in Qatar Iraq

MIDDLE EAST

#### US military presence in the Middle East

The United States has maintained a military presence in the Middle East for decades, currently stationing between 40,000 and 50,000 troops across at least 19 sites.



**News?** Iran launched missile attacks on **U.S. bases in Qatar and Iraq.**

#### U.S. Bases in Qatar Iraq

##### Al-Udeid Air Base (Qatar)

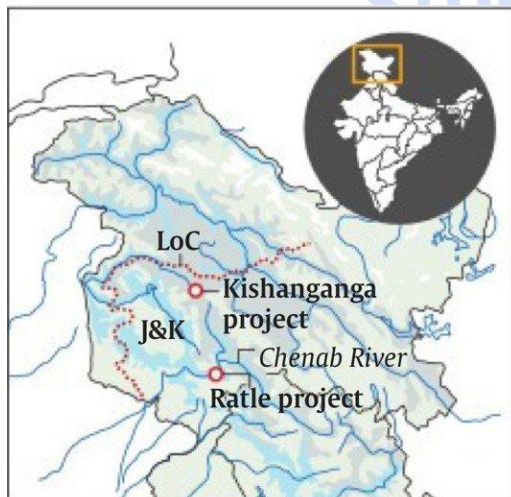
- **Location:** Southwest of Doha, Qatar (190 km north of Iran, across the Persian Gulf).
- **Significance:** **Largest** U.S. military base in West Asia.
  - Serves as the **headquarters of the U.S. Central Command (CENTCOM)** in the region.

##### Ain al-Assad Air Base (Iraq)

- **Location:** Western Iraq.
- **Significance:** A key U.S. military installation housing **U.S. troops** involved in operations against ISIS and other regional threats.

**Source:** [TheHindu](#)

### Kishanganga and Rattle Hydropower Project



**News?** India has asked the World Bank to pause its expert proceedings under the Indus Waters Treaty, following India's suspension of the treaty over Pakistan's objections to the Kishanganga and Ratle projects.

#### About Ratle Hydroelectric Project

- **Location:** Kishtwar District, Jammu & Kashmir.
- **River:** Situated on the **Chenab River**

#### About Kishanganga Hydroelectric Project

- **Location:** Located in **Bandipora district, Jammu & Kashmir.**
- **River:** Diverts water from the **Kishanganga River** (called **Neelum River** in Pakistan) through a **tunnel** to a power station for electricity generation.
- **International Verdict:** In **2013**, the **Permanent Court of Arbitration at The Hague** ruled in **India's favour**, allowing the project with certain environmental safeguards.

**Source:** [IndianExpress](#)



## Editorial Summary

### Agri- Industry & India-U.S. Deal

#### Context

As India and the US work towards a new bilateral trade deal, India's sugar-ethanol and soyabean processing industries are concerned about the impact of potential concessions on their markets.

#### Impacts on Industries

##### ● Sugar-Ethanol Industry

###### ○ Threat to Feedstock

**Balance:** Importing ethanol or genetically modified (GM) maize for biofuel can marginalize sugarcane-based ethanol production, undermining millers already grappling with stagnant sugar demand.

###### ○ Food-Fuel Conflict:

Increased dependence on maize (corn) for ethanol may trigger imbalances, elevating prices and creating shortages for livestock and poultry feed industries.

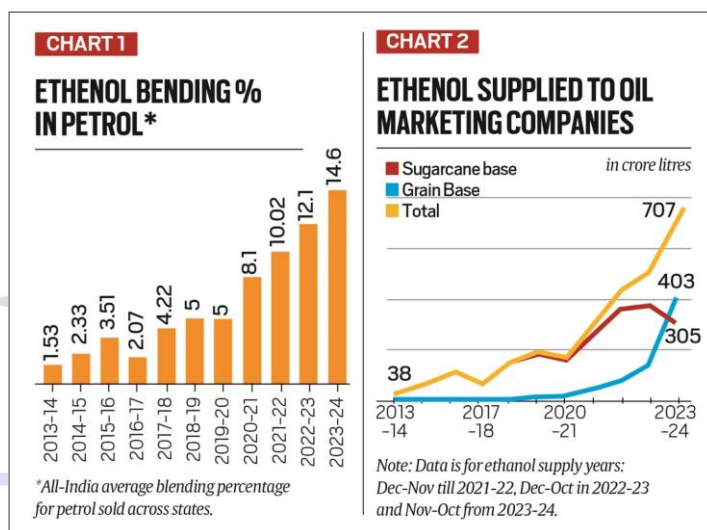
###### ■ E.g., 68% now

comes from grain-based feedstocks (mainly maize), with only 32% from sugarcane (molasses and juice).

##### ● Soyabean Processing Industry

○ **Economic Viability Concerns:** Importing GM soyabean would affect domestic processors, who are located far from ports, increasing logistical costs and potentially displacing locally grown soyabean.

○ **Farmer Livelihood:** Increased imports may depress domestic soyabean prices, harming the incomes of approximately 7 million soyabean farmers and causing a shift in crop cultivation patterns.

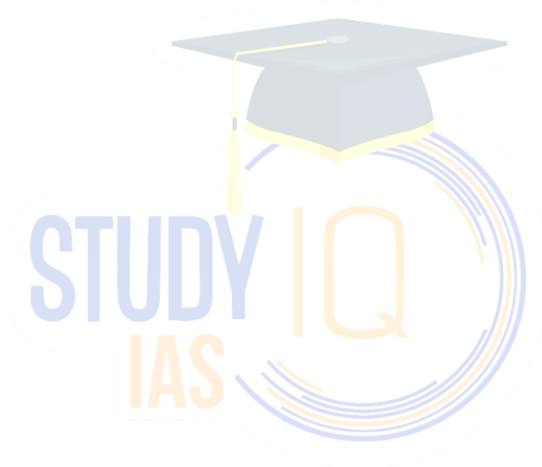


#### Way Forward

- **Balanced Trade Negotiations:** India should strategically negotiate trade terms to ensure limited disruption to domestic agro-industries while securing other mutually beneficial trade opportunities.
- **Selective Imports with Conditions:** Allow controlled imports, focusing on segments less likely to impact local agriculture, coupled with export obligations for by-products.
- **Strengthen Domestic Supply Chains:** Enhance infrastructure and logistic efficiency, making domestic industries more competitive and resilient to global price shocks.
- **Protect Farmer Interests:** Implement targeted price-support mechanisms and crop diversification incentives to safeguard farmers from market fluctuations.
- **Innovative Ethanol Policy:** Encourage sustainable ethanol production methods, exploring alternative feedstocks without significantly impacting the food-feed chain.

- **Public Consultation and Industry Dialogue:** Include stakeholders from these industries in policy deliberations to ensure transparency, minimize conflicts, and develop consensus-based solutions.

Source: [Indian Express](#)



## South Asian economic integration

### Context

- Recent two major incidents— the reciprocal tariffs imposed by the Trump administration and the terror attack in Pahalgam— shook India’s economic and national security landscape.
  - These events highlight the urgent need for India to foster deeper regional integration with South Asian countries.

### About South Asian Countries

- Countries:** The region includes Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka (collectively forming SAARC).
- Population:** Accounts for **about 25% of the global population**.
- Combined GDP:** Approximately **\$5 trillion**, much lower than other major economic blocs.

### Potential of South Asia

- Large Untapped Market:** According to a United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) study, estimated that South Asia’s potential trade could reach **\$172 billion** (2020), while actual intra-regional trade is only about **\$23 billion**.
- Trade Growth:** Despite growth in total trade value (\$1,335 billion between 2015-2022), **intra-regional trade forms just 5–7% of total international trade**—the lowest among global blocs.
- Unexploited Capacity:** Over **86% of trade potential remains untapped**. Bangladesh (93%), Maldives (88%), Pakistan (86%), and others have the highest unexploited trade proportions.

### Issues Hindering South Asia’s Potential

- High Trade Costs:** Intraregional trade costs are **114% of goods’ value**, higher than trade with distant partners like the US (109%).
- Political Tensions:** Border disputes, lack of trust, and terrorism disrupt trade and regional cooperation.
- Inefficient Mechanisms:** Trade agreements like SAFTA exist, but poor implementation and persistent conflicts limit their impact.
- Declining Trade Ratios:** Trade-to-GDP ratio fell from **47.3% (2022)** to **42.94% (2024)**.
- Widening Deficits:** Regional trade deficit increased from **\$204.1 billion (2015)** to **\$339 billion (2022)**.
- Declining Bilateral Trade:** India-Pakistan trade fell from **\$2.41 billion (2018)** to **\$1.2 billion (2024)**.

### Regional Forums in South Asia

- SAARC (South Asian Association for Regional Cooperation):** Principal regional organization, aims to promote economic and regional integration.
  - SAFTA (South Asian Free Trade Area):** Trade agreement under SAARC for reducing tariffs and barriers, though implementation is weak.
- BIMSTEC (Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation):** Connects South Asia with Southeast Asia.

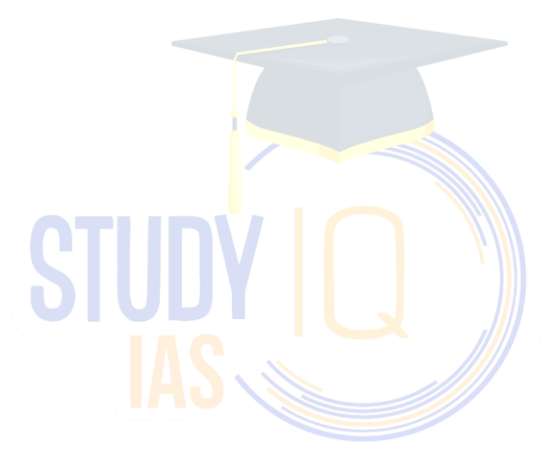
### Way Forward

- Prioritize Regional Cooperation:** Depoliticize trade by keeping economic cooperation above bilateral disputes.
- Lower Trade Barriers:** Simplify customs, harmonize standards, and implement SAFTA provisions effectively.
- Build Trust:** Encourage dialogue, conflict resolution, and people-to-people connections to reduce mistrust.



- **Enhance Connectivity:** Invest in cross-border infrastructure, logistics, and digital links to reduce trade costs.
- **Promote Regional Value Chains:** Foster complementary industries to strengthen regional supply chains.
- **Leverage Services and Investment:** Tap into the potential for trade in services and cross-border investments.
- **Strengthen Regional Institutions:** Reform and empower SAARC and related bodies for more effective governance.

Source: [The Hindu](#)



## Inflation, Unemployment, and Growth in India (2024-25)

### Context

In May 2025, India's inflation rate dropped, however, this decline was accompanied by a rise in unemployment and a slowdown in economic growth, exposing deeper challenges in India's economic landscape.

#### Data

- **Inflation:** In May 2025, India's inflation rate stood at **2.8%**, down from **3.2% in April**—well below the government's target.
- **Unemployment:** The **unemployment rate rose from 5.1% in April to 5.8% in May 2025** (Periodic Labour Force Survey).
  - While falling inflation benefits those already employed (their purchasing power erodes more slowly), it offers no solace to the unemployed.
- **GDP Growth:** GDP growth dropped from **9.2% in 2023-24 to 6.5% in 2024-25**.

### Key Drivers for Reduction in Inflation

- **Sharp Increase in Agricultural Growth:** Agriculture was the only sector to accelerate significantly in 2024-25, boosting food supply.
- **Narrowing Supply-Demand Gap for Food:** Faster growth in agriculture, compared to other sectors, reduced pressure on food prices.
- **Drop in Food-Price Inflation:** Food inflation fell from nearly 11% (Oct 2024) to less than 1% (May 2025).
- **Limited Role of Monetary Policy:** The RBI's unchanged repo rate since June 2022 did not directly influence the recent drop in food inflation.

### Issues in Estimation

- **Overemphasis on Monetary Policy:** There is a common tendency to credit the Reserve Bank of India's monetary policy—especially interest rate adjustments—as the main reason for changes in inflation.
  - This view often **overlooks the crucial role of supply-side factors**, such as agricultural output, which have a more direct impact on food prices and overall inflation in India.
- **Neglect of Unemployment and Growth:** While the decline in inflation is celebrated, **important indicators like unemployment and GDP growth are ignored**.
  - E.g., during the period when inflation fell from 3.2% (April 2025) to 2.8% (May 2025), **unemployment actually rose from 5.1% to 5.8%**, and GDP growth slowed significantly from 9.2% (2023-24) to 6.5% (2024-25).
- **Misinterpretation of Inflation Expectations:** Policymakers often rely on the idea that inflation targeting will anchor public expectations.
  - However, **household inflation expectations have remained persistently high**, well above the RBI's target, showing that inflation targeting has **not effectively influenced public sentiment**.
- **Ignoring Structural Drivers:** Mainstream inflation analysis frequently **underestimates the impact of structural factors** such as the relative growth rates of agricultural and non-agricultural sectors.
  - The recent sharp fall in food inflation was driven more by improved agricultural output than by changes in monetary policy, **highlighting the need to factor in sectoral growth dynamics**.

### What Needs to Be Done

- **Adopt a Broader Policy Perspective:** Focus equally on growth, employment, and inflation, not just price stability.
- **Strengthen Agricultural Productivity:** Invest in agriculture to sustain food supply and control food inflation.
- **Address Unemployment:** Implement targeted job creation and skills development programs alongside macroeconomic management.
- **Enhance Data-Driven Policymaking:** Use comprehensive data analysis (including sectoral growth and supply-side factors) for effective economic decision-making.
- **Communicate Realistic Policy Goals:** Ensure public understanding that inflation management requires balancing both demand- and supply-side interventions.

Source: [The Hindu](#)

