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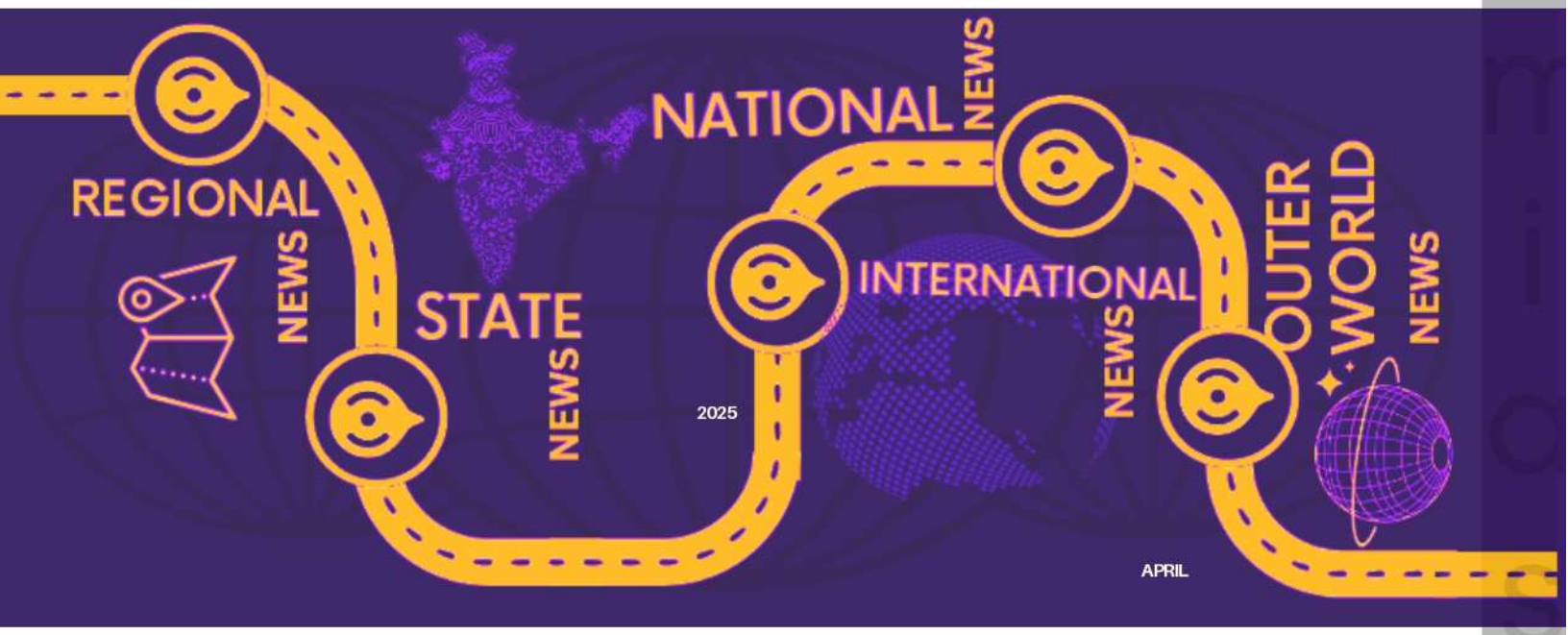
Monthly

# CURRENT AFFAIRS




## MUST READ!

- UGC DISCONTINUES UGC-CARE LIST
- UNESCO GLACIAL REPORT
- KAVACH 4.0
- SOLAR FLARE 'KERNEL'
- MAHASAGAR VISION
- SMOOTH COATED OTTERS
- 2025 HOLBERG PRIZE
- ENSO FORECAST FOR 2025
- SONIC WEAPONS
- SIKKIM'S TOURISM ENTRY FEE
- DIGITAL ASSET STOCKPILE
- AVIAN INFLUENZA (H5N1)
- MASS WHALE STRANDINGS

## SPECIAL COLUMNS

- PLACES IN NEWS
- SPECIES IN NEWS

**April 2025** | **EKAM IAS ACADEMY**

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# PREFACE

Welcome to our monthly current affairs magazine! We are thrilled to provide you with the latest information and updates on the most important events that happened in our country and around the world in the month of April 2025. Our magazine is designed to help you prepare for competitive examinations like UPSC and other State PSC Exams, and we hope that you will find it informative, engaging, and useful.

In this magazine, you will find a wide range of topics covering current affairs, including politics, economics, sports, science and technology, and many more. Our team of writers and editors work hard to bring you the most accurate and up-to-date information, so you can stay informed and prepared for any competitive exam.

We understand that preparing for competitive exams can be a daunting task, but we are here to make it easier for you. Our magazine is designed to be easy to read and understand, with clear and concise articles that will help you stay on top of the latest news and events.

We believe that knowledge is power, and we are committed to helping you achieve your goals. Whether you are preparing for a government job, entrance exam, or any other competitive exam, our magazine will provide you with the information and insights you need to succeed.

Thank you for choosing our magazine, and we hope that you find it helpful and informative.

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# ACKNOWLEDGMENTS

We extend our heartfelt gratitude and appreciation to the exceptional team of content developers who have played a pivotal role in shaping our UPSC Current Affairs Magazine. Your unwavering dedication, extensive research, and commitment to delivering high-quality content have been instrumental in making this publication a trusted resource for our readers.

Your relentless pursuit of current affairs, profound understanding of complex issues, and the ability to distil them into informative, concise, and engaging articles have set a benchmark in the field of competitive examination preparation.

We are proud to have a team that goes above and beyond, ensuring that our readers are well-informed and well-prepared for the UPSC examinations. Your exceptional contributions are the driving force behind our magazine's success.

Thank you for your hard work, expertise, and passion for delivering top-notch content. Your efforts have not only enriched our magazine but have also played a significant role in the educational journey of countless aspiring civil servants.

We look forward to continuing this remarkable journey of knowledge dissemination with your continued support and excellence.

With deep appreciation,

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## GS Paper I — Mains Based Articles



## GS Paper I — Prelims Based Articles



## GS Paper II — Mains Based Articles

## GS Paper II — Prelims Based Articles



## GS Paper III — Mains Based Articles

## GS Paper III — Prelims Based Articles



## Places in News



## Species in News



## Long Articles



## Book Review

# GS PAPER-I: 'MAINS BASED ARTICLES'

## Subject – Indian History, Heritage and Culture

## Poet-Musician Who Shaped India's Syncretic Culture

**Sub Topic:** *Indian Art & Culture, literature*

**Context:** Context: At the 25th edition of **Jahan-e-Khusrau,** held at New Delhi's Sunder Nursery, **Prime Minister Narendra Modi described the annual Sufi music festival as carrying the *"fragrance of the soil of Hindustan."***

**More on News**

- The event commemorates the **legendary poet-musician Amir Khusrau,** whose contributions to **Indian classical music, Persian literature, and Sufi qawwali** have left an indelible mark on the **Ganga-Jamuni tehzeeb**—the rich, syncretic cultural tradition of North India.

**Amir Khusrau: The *'Parrot of India'***

- Bestowed with the title ***Tuti-yi-Hind***—the ***"Parrot of India"***—Khusrau was a **13th-century mystic, poet, and musician** whose works continue to resonate even today.
- He is widely regarded as the **father of Hindavi,** a precursor to modern Hindi and Urdu, and played a crucial role in shaping Indian classical music.

**The 'Indian Turk': A Fusion of Cultures**

- Much of what is known about **Khusrau's life comes from his own autobiographical writings interwoven with poetry.**
- **Born in 1253,** he was the **son of a Turkish father and an Indian mother.**
- **His father had migrated to India from Central Asia** in the early 13th century, **seeking refuge from Genghis Khan's Mongol invasions.**
    - He later **served in the court of Sultan Iltutmish and married an Indian Muslim woman.**
- Khusrau **took pride in his dual heritage,** often referring to himself as an **"Indian Turk."**
- Scholars Paul E. Losensky and Sunil Sharma, in their book ***In the Bazaar of Love (2011),*** highlight how Khusrau's life and works symbolise a synthesis of Persian, Turkic, and Indian cultures.
    - Though his birthplace remains debated, it is widely believed he was born in Patiyali, Uttar Pradesh, or possibly near Delhi.

**A Poet of the Sultan's Court**

- Khusrau's poetic journey began at the age of 20, when he became a **court poet,** a position he held until his death.
- Over five decades, he **served at least five Delhi Sultans—Muiz ud din Qaiqabad, Jalaluddin Khalji, Alauddin Khalji, Qutbuddin Mubarak Shah, and Ghiyasuddin Tughlaq**—as well as several influential nobles.
- In medieval Islamic courts, **poetry played a key role in establishing a ruler's cultural and political legitimacy.**
- As a royal poet, Khusrau **composed eulogies, chronicles, and panegyrics in Persian,** the language of the court, while also writing in Hindavi, making his work accessible to the common people.
- **Sultan Jalaluddin Khalji,** in recognition of his literary genius, **honoured him with the title 'Amir'.**

**A Devoted Disciple of Nizamuddin Auliya**

- Despite his association with the royal court, **Khusrau's heart belonged to Sufism.**
- He was the **most devoted disciple of Shaikh Nizamuddin Auliya, the revered Chishti Sufi saint of Delhi.** Their bond was so profound that Nizamuddin once remarked:
    - *"He (Khusrau) is the keeper of my secrets, and I shall not set foot in Paradise without him."*
- Khusrau seamlessly moved between the royal court and the **Sufi khanqah (spiritual retreat),** earning the trust and respect of both kings and saints.
- When Nizamuddin Auliya passed away in 1325, a grief-stricken Khusrau is believed to have said:
    - *"Beauty sleeps on the bed, her hair across her face. Come Khusrau, let's go home, night has set over this place."*
- He himself passed away just months later and was buried near his beloved spiritual guide in Delhi's Nizamuddin Dargah, where his tomb remains a site of reverence.

**A Lasting Legacy in Music and Poetry**

- Even 700 years after his death, **Khusrau's poetic brilliance continues to captivate audiences.**
    - His works range from royal praise poems to folk riddles and love songs, reflecting a

diverse literary range that appealed to both courtly elites and common people.

- Khusrau's verses have deeply influenced the **Ganga-Jamuni tehzeeb, blending Persian, Turkic, and Indian traditions.** He even admired the philosophical wisdom of Indian Brahmans, writing in **Nuh Siphir:**
    - *"The Brahmans of India have greater wealth of philosophical thought than what Rumi had revealed to the world. As nobody has tried to learn from the Brahmans, their learning has not been revealed to the world."*
- His ghazals and qawwalis, such as ***Chhaap Tilak, Zehal-e-Maskeen, and Sakal Ban Phool Rahi Sarson,*** are performed at Sufi shrines, folk gatherings, and Bollywood musicals alike.

**The Father of Indian Classical Music?**

Khusrau is often credited with major innovations in Indian classical music, though historical evidence remains inconclusive. He is said to have:

- **Created new ragas and refined khayal music.**
- **Pioneered qawwali,** a genre of Sufi devotional music.
- **Invented instruments like the sitar and tabla,** though their exact origins remain debated.

Amir Khusrau was not just a poet or musician—he was a **cultural bridge between traditions,** and a visionary who celebrated unity in diversity. His contributions continue to shape India's music, literature, and spiritual traditions, making him an eternal icon of syncretic heritage and artistic excellence.

# Subject – Geography

## Monsoon and ENSO Forecast for 2025

**Sub Topic:** *Geophysical Phenomena*

Context: India eagerly awaits the summer monsoon forecast each year, with a particular focus on whether it will be a 'normal' monsoon, often linked to the status of El Niño or La Niña events.

**More on News**

- The monsoon's fate is often linked to El Niño and La Niña events, although these phenomena account for only about **60%** of deficit and surplus years.
- **Sea Surface Temperature (SST) patterns** in the tropical Pacific Ocean have evolved unpredictably since early 2024.

**El Niño and Monsoon in 2023**

- El Niño forecasts in early 2023 were accurate, yet the 2023 monsoon was deemed 'normal' in terms of total seasonal rainfall.
- However, 'normal' monsoon did not equate to even distribution:
    - Heavy spells occurred in several states.
    - Deficits were recorded in Karnataka, Kerala, Uttar Pradesh, West Bengal, and the Northeast.
- **Global Warming's Influence on El Niño:** The 2023 El Niño was unusual:
    - Expected cooling in the far western Pacific did not occur.
    - Instead, weak warm SST anomalies appeared, attributed to:
        - Global warming
        - El Niño-induced variations

**Unexpected Shifts in SST Patterns in 2024**

- Early 2024 forecasts predicted a strong La Niña in the latter half of the year.
- Initial cold SST anomalies appeared in the far eastern tropical Pacific, signalling La Niña.
- However, anomalies shifted westward towards the international dateline.
- Warm SST anomalies emerged in the Far East by early summer 2024, contradicting expected La Niña patterns.

**Unusual Wind Patterns**

- Strong easterly anomalies were present in the central-western tropical Pacific.
- Simultaneously, westerly anomalies emerged in the far eastern tropical Pacific.
- The unusual combination persisted, complicating climate predictions.

**The Role of Central Pacific El Niño**

- Historically, the reverse SST pattern was more common, known as the Dateline El Niño or Central Pacific El Niño.
- Unlike La Niña, which has a dominant pattern, El Niño has two 'flavours':
    - Warm SST anomalies in the eastern Pacific.
    - Warm SST anomalies in the central Pacific.

**Uncertainty Around the 2025 ENSO State**

- The current unusual SST patterns could be linked to record-high temperatures from 2023-2025.
- Lack of cooling in the far eastern tropical Pacific prevents ocean heat uptake, leading to atmospheric heat accumulation.

**Possible Cause: ENSO Transition Mode (ETM)**

- A study identified a natural climate variability mode in the Southern Pacific that influences tropical Pacific wind patterns.
- The ENSO transition mode (ETM) was unfavourable for transitioning from El Niño (2023-24 winter) to La Niña (2024 summer).
- ETM-induced wind anomalies likely prevented the anticipated strong La Niña in 2024.

**Uncertainty in Future Climate Predictions**

- The relationship between ENSO and the monsoon has changed over recent decades.
- Global mid-latitude temperature anomalies and jet stream variations influence: Monsoon patterns, Pre-monsoon cyclones, Timing of monsoon onset.

**Implications for India's Agriculture and Policy**

- The unpredictability of monsoon forecasts keeps Indian farmers on edge.
- **Reliable forecasting remains crucial for:**
  - Agricultural planning
  - Disaster management
  - Government policy decisions
- The India Meteorological Department (IMD) and climate scientists continue efforts to improve forecast accuracy.
- However, managing expectations is as challenging as mitigating the risks of monsoon variability and early heat waves in 2025.

**Way Forward**

- **Given ongoing climate uncertainties, India must:**
  - Enhance resilience to monsoon variability.
  - Improve climate adaptation strategies.
  - Invest in better forecasting technology.
- As always, while we hope for the best, we must prepare for the worst.

**What is El Niño–Southern Oscillation (ENSO)?**

- ENSO is a recurring climate pattern where **temperatures in the central and eastern tropical Pacific Ocean** fluctuate **every 3 to 7 years.** Surface waters across a large area **warm or cool by 1°C to 3°C,** affecting rainfall in the tropics and influencing the global weather system.


- Though ENSO is a single climate phenomenon, it has **3 phases:** El Niño , La Niña and ENSO-neutral.

**El Niño:**

- It causes **warming of the ocean surface,** resulting in above-average sea surface temperatures (SST) in the **central and eastern tropical Pacific Ocean.**
- This leads to **reduced rainfall over Indonesia** and increased rainfall across the central and eastern tropical Pacific Ocean.
- The usual **easterly winds** along the equator **weaken** or may reverse, occasionally **becoming westerly.**
- The **warmer the ocean** temperature anomalies, the **stronger the El Niño** (and vice-versa).

**La Niña:**

- This entails cooling of the ocean surface, causing below-average sea surface temperatures (SST) in the **central and eastern tropical Pacific Ocean.**
- Over Indonesia, rainfall tends to increase while decreasing over the central and eastern tropical Pacific Ocean.
- The **normal easterly** winds along the equator **intensify** further.
- The **cooler the ocean** temperature anomalies, the **stronger the La Niña** (and vice-versa).

**Neutral Phase:** This phase occurs when neither El Niño nor La Niña is dominant. Sea surface temperatures (SSTs) in the tropical Pacific are generally near average.

## Importance of Agrobiodiversity and Regenerative Agriculture

**Sub Topic:** *Agricultural Resources & Food Security*

**Context:** Agricultural biodiversity plays a crucial role in ensuring food and nutritional security, particularly in regions like **India and Africa, home to nearly 3 billion people,** or approximately **40 percent of the world's population.**

**More on News**

- **Smallholder farmers,** who **cultivate less than two hectares of land and produce around 35 percent of the world's food, are central to maintaining biodiversity and ensuring sustainable food systems.**

**Role of Agrobiodiversity in Food Security**

- **Lower Yields:** A lack of agricultural biodiversity in farming systems **increases vulnerability to pests, diseases, and environmental stresses, leading to lower yields and reduced access to nutritious foods.**
- **Resource Depletion:** Monoculture farming **depletes soil health, weakens ecosystem resilience, and exacerbates food insecurity.**
  - In India, **approximately 224.3 million people suffer from undernourishment, while across Africa, the number stands at 278 million.**
  - This highlights the **urgent need to prioritise agricultural biodiversity** to enhance food production, resilience, and sustainability.
- **Agrobiodiversity:** Agrobiodiversity encompasses the vast range of plants, animals, and microorganisms utilised in agriculture and food production.
  - **Traditional crops,** such as millets, sorghum, and pulses, **are often more nutritious and resilient to harsh climatic conditions.**

- Promoting these diverse crops can improve dietary diversity, enhance soil fertility, and ensure better health outcomes, particularly in rural communities.

**How Regenerative Agriculture Supports Small Farmers**

Regenerative agriculture is a farming approach that **enhances soil health, increases biodiversity, and sequesters atmospheric carbon dioxide** while improving water and energy management.

- Farms practicing regenerative agriculture **experience higher and more stable yields,** reduced input costs, and increased **environmental sustainability.**

**Several studies** highlight the effectiveness of regenerative farming:

- **Andhra Pradesh:** In Andhra Pradesh, India, **zero-budget natural farming** led to a 10–20 percent increase in yields while reducing input costs.
- **Eastern Rwanda:** In Eastern Rwanda, **diversified cropping systems** maintained yields 20–40 percent higher than monocultures during droughts.
- **Zambia:** In Zambia, **rotating maize with legumes** improved food security and total farm yield.
- **Rajasthan:** In Rajasthan, **rainwater harvesting** combined with regenerative practices boosted crop yields by 15–30 percent in water-scarce regions.
- **Ethiopia**: In Ethiopia, **biodiversity-rich farming systems** have enhanced resilience to drought while reducing malnutrition rates.

**Challenges to Scaling Agro-Food Systems**

- **Policy Barriers:** Agricultural policies often favor monoculture farming, limiting support for regenerative methods.
- **Financial Constraints:** Smallholder farmers struggle with limited access to financial resources and technical knowledge necessary for transitioning to regenerative farming.
- **Market Challenges:** Globalisation has restricted economic incentives for diverse and regenerative produce, making it difficult for small farmers to sustain livelihoods.
- **Initial Productivity Loss:** Farmers often experience a temporary reduction in yields when transitioning from synthetic inputs to natural farming methods.
- **Food Waste:** Inefficiencies in the supply chain lead to 20–25 percent food losses, increasing food costs and limiting access to nutrition.

**Pathways for Change and Policy Recommendations**

- **Supporting Small-Scale Farmers:** Providing access to diverse seeds, agro-ecological farming techniques, and financial resources.
- **Strengthening Supply Chains:** Engaging agricultural corporations to invest in regenerative and carbon-neutral supply chains.
- **Promoting Awareness:** Educating farmers on the long-term benefits of regenerative practices and integrating nutrition education into agricultural programs.
- **Developing Market Incentives:** Encouraging demand for sustainable and regenerative produce to create economic opportunities for farmers.

**Success Stories in Regenerative Agriculture**

- **Tanzania:** In Tanzania, agrobiodiversity-focused interventions improved food security for 22,500 smallholder coffee producers.
- **Madhya Pradesh:** In Madhya Pradesh, India, regenerative farming practices enhanced farm incomes and improved access to affordable, nutritious food.

By fostering collaboration between policymakers, agricultural stakeholders, and local communities, we can enhance agricultural biodiversity, promote sustainable farming practices, and secure nutrition for future generations.

# GS PAPER I — 'PRELIMS BASED ARTICLES'

## Subject – Indian History, Heritage and Culture

### 2025 Holberg Prize

**Sub Topic:** *Miscellaneous*

**Context:** Indian scholar and literary critic **Gayatri Chakravorty Spivak** has been awarded the **2025 Holberg Prize,** one of the most prestigious global honours in the humanities and social sciences.

**Key Highlights of the Award**

- The **Holberg Prize** carries a prize amount of **EUR 515,000 (₹4.6 crore).**
- Spivak, aged **82,** is a **professor in the humanities at Columbia University.**
- She will receive the award from **Crown Prince Haakon of Norway** on **June 5, 2025.**
- The **Holberg Prize committee** recognised her for her **groundbreaking interdisciplinary research** in:
  - Comparative literature
  - Translation studies
  - Postcolonial studies
  - Political philosophy
  - Feminist theory

**About the Holberg Prize**

- **Established:** In 2003 by the Norwegian Parliament.
- **Administration:** The prize is administered by the University of Bergen.
- **Scope:** Recognises outstanding contributions to research in the arts, humanities, social sciences, law, and theology.
- **Named After:** Danish-Norwegian writer and philosopher Ludvig Holberg.
- **Significance:** Considered the closest equivalent to the Nobel Prize for the humanities and social sciences.

**Gayatri Chakravorty Spivak**

**Born:** February 24, 1942, in Kolkata, India.

**Education:**

- Studied at the **University of Calcutta.**
- Earned her **PhD from Cornell University in 1967.**

**Academic Career:**

- A professor at Columbia **University since 2007.**
- Founding member of **Columbia's Institute for Comparative Literature and Society.**
- Has taught at **over 20 institutions worldwide.**

**Major Honours:**

- **Padma Bhushan (2013)** – India's third-highest civilian award.
- **Kyoto Prize in Art and Philosophy (2012).**
- **Modern Language Association Lifetime Scholarly Achievement Award (2018).**
- Has received **over 50 faculty awards** and holds **15 honorary doctorates** globally.

### Global Engagement Scheme

**Sub Topic:** *Cultural Diplomacy*

**Context:** The **Global Engagement Scheme** of India's Ministry of Culture is an initiative designed to promote and showcase India's rich cultural heritage, including the cultural diversity of Maharashtra, on the global stage.

**More on News**

Its primary objective is to strengthen India's cultural ties with other nations, enhance bilateral cultural exchanges, project India's cultural identity internationally, and encourage inbound tourism.

**Key Objectives**

- **Strengthening Cultural Ties:** Establish stronger cultural relationships with foreign nations.
- **Promoting Bilateral Cultural Contacts:** Foster mutual understanding and cooperation in the cultural sector.
- **Projecting India's Cultural Identity:** Enhance India's global cultural image.
- **Encouraging Inbound Tourism: Promote** India as a cultural tourism destination.

**Components of the Scheme**

- **Festival of India:** Indian artists from various cultural fields are given the opportunity to perform abroad under the "Festival of India" banner.

- The participating art forms include **Folk Art, Classical and Traditional Dance, Contemporary Dance, Classical/Semi-Classical Music, Folk Music, Folk Theatre, Theatre,** and **Puppetry.**

- **Grant in Aid to Indo-Foreign Friendship Cultural Societies:** Financial assistance is provided to Indo-Foreign Friendship Cultural Societies functioning in foreign countries through Indian Missions. The aim is to strengthen friendship and cultural contacts between India and the respective countries.
- **Contribution Grant to International Organisations:** Funds are released to international organisations in which India is a member, such as UNESCO and other significant cultural conventions.
    - India's participation includes conventions such as the 1972 World Heritage Convention, the 2003 Convention for Safeguarding Intangible Cultural Heritage, the UNESCO Creative Cities Network, and the Memory of the World Programme.

**Cultural Diplomacy via Festivals of India**

- **Festivals of India** serve as a platform for cultural exchange where Indian artists are invited to perform internationally.
- The **Indian Missions Abroad** administers this component, which is a significant tool in showcasing Indian art, culture, and heritage.
- The Ministry of Culture has **empanelled artists** and cultural groups across the country, including **Maharashtra**, to represent India in these festivals.
- As of now, out of **627 empanelled artists/groups, 37 artists/groups are from Maharashtra.**

**Performances in the Festival of India**

- Over the years, many artists and cultural troupes from Maharashtra have been deputed to perform at Festivals of India held in various countries. Some of the countries and events where Maharashtra's artists performed include:
    - **Oman, Netherlands, Ghana** (2016-17)
    - **Venezuela** and **Vietnam** (Freedom 70 events in 2017-18)
    - **Qatar** (2018-19)
    - **South Africa** (2019-20)

**Key International Memberships and Collaborations**

- India is a member state of **UNESCO** and has active participation in several UNESCO cultural conventions.
- India also collaborates with various international organisations such as **ICCROM** (International Centre for the Study of the Preservation and Restoration of Cultural Property) and **WIPO** (World Intellectual Property Organisation).

# Subject – Geography

## UNESCO Glacial Report

**Sub Topic:** *Water Resources: Need For Conservation*

**Context:** Glaciers worldwide are **vanishing at an unprecedented rate, with the last three years recording the largest mass loss of glacial ice on record,** according to a **UNESCO report** released on 21 March 2025.

**More on News**

- Michael Zemp, director of the Switzerland-based **World Glacier Monitoring Service,** highlighted this dramatic loss during a press conference at the UN headquarters in **Geneva.**
- The release of the **report coincides with a UNESCO summit in Paris,** which marked the first-ever **World Day for Glaciers,** urging nations to take global action to protect these vital ice masses.

**Alarming Ice Loss Across the Globe**

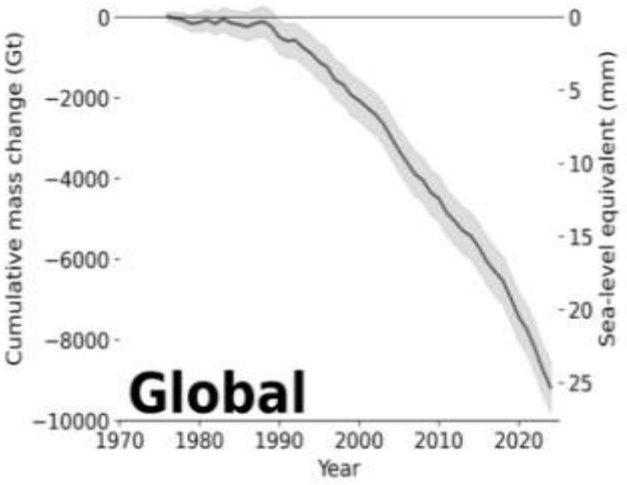
- **The rapid retreat of glaciers**—from the Arctic to the Alps, the Andes to the Tibetan Plateau—is accelerating due to **climate change** driven by the **burning of fossil fuels.** The consequences could be devastating, including:
    - Rising sea levels
    - Increased risk of floods
    - Dwindling freshwater supplies
    - Threats to agriculture and hydroelectric power

**The Growing Threat of Glacier Loss**

- **Stefan Uhlenbrook,** director of the **World Meteorological Organisation's water and cryosphere program,** added that approximately **275,000 glaciers remain globally,** and together with the Antarctic and Greenland ice sheets, they make up about **70% of the world's freshwater.**
- The loss of these glaciers poses an existential threat to both people and ecosystems that rely on them. Uhlenbrook emphasised the need for **scientific advancements:**
    - Better observation systems
    - More accurate forecasts
    - Early warning systems for vulnerable communities

**Key Facts from the Report**

- **Record Glacial Mass Loss:** Since 1975, glaciers have lost 9,000 gigatonnes of ice, equivalent to an ice block the size of Germany, with a thickness of 25 meters.
- **Mass Loss in 2024:** In just one year, glaciers lost 450 gigatonnes of ice.




- **Vulnerable Mountain Communities:** Over 1.1 billion people living in mountain communities are facing the most immediate impacts of glacier loss.
- **Sea Level Rise:** Between 2000 and 2023, melting mountain glaciers contributed 18 millimetres to global sea level rise.
- **Flood Risk:** Every millimetre of sea level rise can expose up to 300,000 people to annual flooding.

**Urgent Call for Climate Action**

- With **five of the last six years recording unprecedented glacial loss, the global community** must act now to:
  - Reduce greenhouse gas emissions
  - Strengthen flood prevention infrastructure
  - Ensure sustainable water management for affected regions

The rapid pace of glacier loss is becoming one of the most pressing climate challenges of our time. The global community must act swiftly to mitigate the impacts of these changes and protect both vulnerable populations and ecosystems worldwide.

## Cities Coalition for Circularity (C-3)

**Sub Topic:** *Circular Economy, Sustainable Cities & Communities*

**Context:** India launched the **Cities Coalition for Circularity (C-3) on March 3, 2025,** as a multi-nation alliance aimed at fostering city-to-city collaboration, knowledge-sharing, and private sector partnerships to promote **sustainable urban development.**

**More on News:**

- **PM Narendra Modi,** in a special written address, emphasised India's commitment to the **Pro-Planet People (P-3) approach** for sustainability.
- Highlighted the significance of the **3R principles (Reduce, Reuse, Recycle)** and circular economy practices for urban sustainability.
- Expressed India's willingness to **share experiences and learnings** in its transition to a circular economy.
- Proposed forming a **working group of member nations** to finalise the coalition's structure and operational framework.

**Background on Regional 3R and Circular Economy Forum**

- The **Regional 3R and Circular Economy Forum in Asia and the Pacific** was launched in **2009** to promote sustainable waste management and resource efficiency.
- The forum addresses environmental challenges caused by **rapid economic growth, resource depletion, and rising waste generation.**
- A major milestone was the **Hanoi 3R Declaration (2013-2023),** which outlined 33 voluntary goals for transitioning towards a **resource-efficient and circular economy.**

**Key Highlights of the C-3 Launch**

- **Objective:** The forum will serve as a **platform for policymakers, industry leaders, researchers, and development partners** to discuss and implement **sustainable solutions** for waste management and resource efficiency in the **Asia-Pacific region.**
- **CITIIS 2.0 MoU Signed:** A key Memorandum of Understanding (MoU) for CITIIS 2.0 was signed at the Jaipur launch event. This marks a significant step in advancing urban sustainability initiatives in India.
- **Agreements for Sustainable Urban Development:** Union Minister of Housing and Urban Affairs, Manohar Lal, announced agreements worth **₹1,800 crore under the CITIIS 2.0 initiative.**
  - The initiative will benefit **18 cities across 14 states.**
  - These projects will serve as **lighthouse models** for other urban areas.

The **launch of C-3** and the signing of the **CITIIS 2.0 MoU** mark critical steps toward achieving a sustainable and circular urban development model in the Asia-Pacific region.

**What is Circular Economy?**

- A **circular economy aims to minimise waste** and make the most of resources by **reusing, repairing, and recycling.**
- Unlike the traditional linear economy, which follows a 'take, make, dispose' model, the circular economy emphasises **maintaining the value of products** and materials for as long as possible.
- This approach is particularly relevant to addressing plastic pollution, which requires rethinking production and consumption systems.

## Ecotourism Measures for Bangus Valley

**Sub Topic:** *Support for Local Communities with Sustainable Ecotourism*

**Context:** The **Jammu and Kashmir government** announced a set of new rules for Bangus, a scenic tourist spot near the **Line of Control (LoC)** in north Kashmir, on **March 6, 2025.**

**More on News**

- The move is part of an effort to develop **Bangus** as a **sustainable ecotourism destination** while preserving the region's **ecological balance.**
- The announcement comes in response to the **unplanned growth** in concrete constructions in established tourist hotspots like **Pahalgam, Gulmarg,** and **Sonamarg.**

**Geography and Accessibility**

- Bangus is located in **Kupwara district** and is about **100 km** from **Srinagar**.
- The area features **two bowl-shaped valleys** at an altitude of **10,000 feet,** offering scenic views.
- The region, historically a militant infiltration route, is now becoming a key addition to the growing list of tourist spots near the LoC, including Gurez, Machil, and Keran.

**Key Highlights**

- **Focus on Ecotourism:** Bangus will be developed as an **ecotourism destination** to maintain the area's natural beauty. The development will avoid the construction of large buildings and hotels, which have contributed to uncontrolled urbanisation in other popular tourist areas of Kashmir.
    - In **Pahalgam, 269 unauthorised constructions** were identified over the past two years. The **Pahalgam Development Authority (PDA)** has been actively involved in **demolition drives** to curb illegal construction activities.
- **Basic Infrastructure Development:** Efforts will be made to establish **basic recreation facilities** such as: **Rain shelters Public conveniences, Signages and lighting,** and **Waste disposal facilities.**
    - This infrastructure will aim to provide comfort for visitors while ensuring minimal ecological disruption.
- **Support for Local Communities:** The government aims to safeguard the livelihoods of local shepherds, nomads, and other inhabitants in the Bangus Valley.
    - The **Tourism Department** has started registering paying guest houses in the area, providing an **immersive travel experience** that will also preserve local culture, traditions, and cuisine. Currently, **19 paying guest houses** in the vicinity of Bangus have been registered with the Department of Tourism.

**Significance of the Initiative**

- **Ecological Preservation:** The emphasis on **ecotourism** and restricting large-scale constructions reflects a commitment to preserving Kashmir's **natural heritage.**
- **Cultural Immersion:** By promoting **local guest houses** and cultural experiences the initiative aims to create a more **authentic** tourism experience while supporting the **local economy.**
- **Balanced Growth:** The measures aim to strike a balance between promoting tourism and maintaining **ecological sustainability,** learning from the challenges faced by other tourist destinations in Kashmir.

## The Alarming Rise of Global Sea Levels

**Sub Topic:** *Impact of Pollution & Global Warming*

**Context:** The study titled ***"Community estimate of global glacier mass changes from 2000 to 2023",*** published in **Nature** on February 19, found that glaciers have lost between **2% and 39% of their ice** regionally, with a global loss of about **5%.**

**Glacial Ice Loss and Sea Level Rise**

- **Glaciers worldwide** have been losing **273 billion tonnes of ice** annually for the last 25 years, which is equivalent to the amount of water the entire global population would consume over **30 years.**
- This melting has caused **global sea levels to rise by nearly 2 cm this century.** Although 2 cm might seem small, the consequences are significant.
- **Andrew Shepherd,** a leading expert from Northumbria University, explained that **each centimetre of sea level rise** exposes **2 million people** to **annual flooding.**

**Why Sea Levels Are Rising?**

- **Glacier Melting:** The loss of ice from glaciers and ice sheets, particularly in regions like Greenland and Antarctica, contributes significantly to rising sea levels.
- **Thermal Expansion:** As global temperatures rise, the oceans warm up, causing seawater to expand. This process contributes to **one-third to half of global sea level rise,** according to NASA.

**Current Sea Level Trends**

- **Global Sea Level Rise:** Since **1880**, global sea levels have risen by approximately **21 cm (NOAA).**

However, the rate of increase has accelerated dramatically.
    - **1993:** Sea level was rising at **0.18 cm per year.**
    - **2024:** The rate has more than doubled to 0.42 cm per year, which has led to more than **10 cm of rise** since 1993.
- This **acceleration** is unprecedented over the past **2,500 years.**

**Regional Variations**

- **Southwestern Indian Ocean:** This region is rising at a rate of **2.5 mm per year,** faster than the global average.
- **Coastal Cities in India:** Cities like M**umbai, Haldia, Visakhapatnam, and Kochi** have witnessed significant sea-level rises. For example:
    - **Mumbai** has seen 4.44 cm of rise from 1987 to 2021.
    - **Haldia:** 2.726 cm
    - **Visakhapatnam:** 2.381 cm
    - **Kochi:** 2.213 cm

**Impact of Rising Sea Levels**

- **Flooding and Coastal Erosion:** Increased sea levels result in **more frequent and severe coastal flooding** and **erosion**, displacing populations living near the coast. For instance, between **1990 and 2016**, West Bengal lost nearly **99 sq km** of land due to sea-level rise.
- **Coastal Ecosystems:** The rise impacts ecosystems like **mangroves, coral reefs, and salt marshes**, as well as **freshwater supplies.**
- **Storm Surges:** Rising sea levels lead to **stronger storm surges,** increasing the inland spread of water during tropical storms.

**Future Projections**

- A **2024 study in Scientific Reports** found that:
    - **29% of the global population** lived within **50 km of the shore** (2018).
    - **15%** lived just **10 km away.**
- **NASA's Nadya Vinogradova Shiffer warns:** At current acceleration rates, another **20 cm rise by 2050** is expected. This would **double the sea level rise in just 30 years** compared to the previous century.
    - **More frequent and intense floods** worldwide.

# GS PAPER II — 'MAINS BASED ARTICLES'

## Subject – Polity, Governance, Constitution

### UGC Discontinues UGC-CARE List

**Sub Topic:** *Institutions and Bodies constituted for the Protection and Betterment*

**Context:** The **University Grants Commission (UGC) has decided to discontinue the UGC Consortium for Academic and Research Ethics (UGC-CARE) list,** which was **introduced in 2018** as a means of recognising quality academic journals.

**More on News**

- The UGC-CARE list will now be replaced by a set of suggestive parameters for choosing journals based on **eight criteria.**
- Stakeholders, including institutions and academics, have been invited to submit their suggestions on the new guidelines by **February 25, 2025.**

**What Do the New Parameters Say?**

- Under the draft notification titled "Suggestive Parameters for Peer-Reviewed Journals," the UGC has outlined 36 parameters across eight broad criteria.
- These parameters aim to guide institutions in the selection of reputable journals for academic publication.
- **Journal Preliminary Criteria:** The UGC emphasises the need for basic details such as the journal's title, international standard serial number (ISSN), periodicity, continuity, and transparency in the review policy.
- **Editorial Board Criteria:** Authors are encouraged to ensure that the journal makes its editorial board details and composition publicly available, ensuring transparency in the publication process.
- **Other Criteria:** Additional parameters focus on aspects such as the journal's editorial policy, academic standards, visibility, and adherence to research ethics.

**Why Did UGC Withdraw UGC-CARE?**

- **Over-centralisation Issues** – Critics argued that the UGC-CARE list **lacked transparency** and was **slow** in updating journals.
- **Exclusion of Regional Language Journals** – Many respected journals, particularly in **Indian languages,** were left out.
- **Decentralisation of Journal Selection** – Institutions will now establish their own mechanisms to evaluate journals.
- **Combating Predatory Journals** – The new approach aims to prevent **fake, low-quality, and predatory journals.**

**Institutional Responsibility in Journal Selection**

- Higher education institutions (HEIs) will be responsible for **evaluating and selecting** academic journals.
- Institutions can develop **custom evaluation models** aligned with UGC's suggestive parameters.
- The **decentralised system** allows for discipline-specific evaluation and evolving academic fields.

**Concerns and Criticism**

- **Risk of Low-Quality Journals** – Academics fear the absence of central oversight may lead to **proliferation of substandard journals.**
- **Student Opposition** – The **Students' Federation of India (SFI)** condemned the move, citing lack of consultation with research communities.
- **Impact on Academic Integrity** – Critics argue this decision is part of broader **deregulation** under the **National Education Policy (NEP) 2020.**
- **Inconsistencies in Journal Evaluation** – Different institutions may have **varying standards,** leading to **arbitrary evaluations.**

**Way Forward**

- With the **UGC-CARE list scrapped,** institutions must **set up robust journal evaluation systems.**
- The effectiveness of the **new parameters** will depend on how well institutions **implement quality control.**
- Academic communities continue to push for **a balanced approach** that ensures **quality research without excessive centralisation.**

### Panchayat Governance in India

**Sub Topic:** *Local Governance*

**Context:** The **popular web series Panchayat,** set in the fictional village of Phulera, humorously portrays the trials of

a city-bred protagonist navigating the complexities of rural governance.

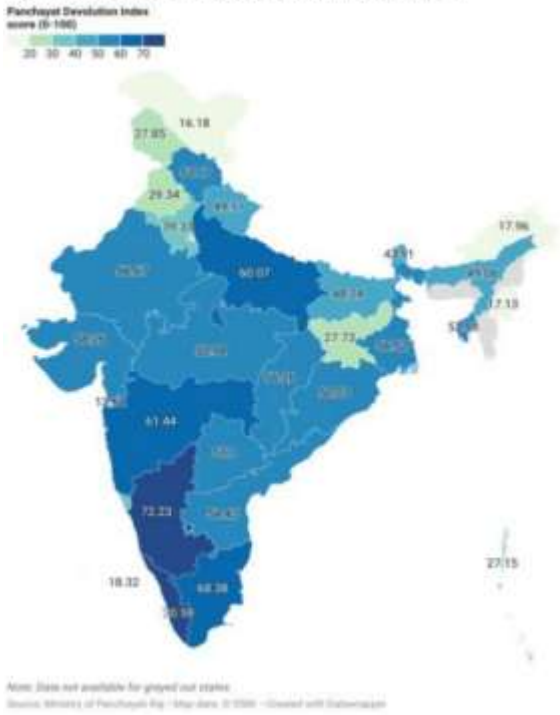
**More on News**

- While the series captures the everyday struggles of running a local government body, real-life panchayats across India face similar challenges, as highlighted in a recent government report.
- A report published this month by the **Union Ministry of Panchayati Raj,** based on a study by the **Indian Institute of Public Administration (IIPA),** sheds light on the devolution of powers and responsibilities to panchayats across states.

**Panchayat Devolution Index (PDI)**

- The **2024 Panchayat Devolution Index (PDI)** evaluates the performance of panchayati raj institutions on six key parameters: **framework, functions, finances, functionaries, capacity building, and accountability.**

**How states fared on the devolution index in 2024**




**Top-Performing and Lagging States:**

- **Karnataka, Kerala, and Tamil Nadu** have emerged as the **top-performing states** in the latest index, while **Uttar Pradesh and Bihar recorded the most significant improvements.**
- The study examined 172 panchayats across 68 districts, assigning scores on a scale of 0 to 100. Since the last index in 2014, the **national average score has increased from 39.92 to 43.89.**
- A decade ago, Maharashtra, Kerala, Karnataka, Tamil Nadu, and Chhattisgarh led the rankings.
- However, in the latest assessment, Manipur, Arunachal Pradesh, and Jharkhand ranked lowest, with Manipur, Arunachal, and Haryana witnessing the steepest declines.
- Despite Maharashtra securing the fourth position overall, it was the only state in the top 10 to experience a drop in performance.

**Representation in Panchayats**

- **Number of Panchayats:** India currently has **2.62 lakh panchayats,** up from **2.48 lakh in 2013-14.**
  - **Uttar Pradesh, Maharashtra, and Madhya Pradesh have the highest number** of panchayats, while **West Bengal, Assam, and Bihar report the most densely populated ones.**
- **Gender Representation:** Regarding gender representation, **21 states and Union Territories meet or exceed their respective women's reservation quotas** in panchayats, while seven states, including Madhya Pradesh, Haryana, Punjab, and Tripura, fall short.

**The six parameters and top performing states**

The index score is on a scale of 0 to 100

| Parameter | Definition | Top state | Score |
|---|---|---|---|
| Framework | Whether the basic provisions mentioned in the Constitution are adhered to by states | Kerala | 84 |
| Functions | How panchayats fulfilled civic responsibilities, from sanitation and waste management to health and education | Tamil Nadu | 60 |
| Finances | Efficiency in the devolution of funds to panchayats and the sources of their funding, whether from their own revenues, borrowing, or from state and Central grants | Karnataka | 71 |
| Functionaries | Strength and performance of panchayat officials and the infrastructure available to them | Gujarat | 91 |
| Capacity Building | How states are expanding the knowledge and skills of panchayat officials to fulfil and take on more responsibilities | Telangana | 89 |
| Accountability | The framework in place to audit and monitor the functioning of panchayats | Karnataka | 81 |

Source: Ministry of Panchayati Raj • Created with Datawrapper

- Odisha leads with the highest proportion of women representatives at 61.51%, followed by Himachal Pradesh (57.5%) and Tamil Nadu (57.32%).
- Uttar Pradesh, where only one-third of seats are reserved for women, has the lowest proportion at 33.33%.
- The **national average** for women representatives in panchayats stands at **46.44%, slightly up from 45.9% in 2013-14.**
- **Communities:** While there are no mandated reservations for Scheduled Castes (SCs), Scheduled Tribes (STs), and Other Backward Classes (OBCs) in panchayats, **Punjab has the highest SC representation (36.34%), Chhattisgarh leads in ST representation (41.04%), and Bihar records the highest OBC representation (39.02%).**
  - The **national average stands at 18.03% for SCs, 16.22% for STs, and 19.15% for OBCs.**
  - These figures have remained **largely consistent over the past decade.**

**Key Challenges Facing Panchayats**

- **Funding:** A major challenge for panchayats is **inadequate and inconsistent funding.**
  - **In 2023-24, state governments allocated Rs 47,018 crore for panchayats,** but **only Rs 10,761 crore was released** as of November 2023.
  - The previous year, Rs 46,513 crore was allocated, with Rs 43,233 crore being disbursed.
- **Infrastructure:** Infrastructure deficiencies also hinder panchayat operations.
  - While **seven states and Union Territories reported that all their panchayat offices were housed in pucca (permanent) buildings,** in **Arunachal Pradesh, only 5% had such structures, followed by Odisha at 12%.**
  - Similarly, **while 12 states and UTs reported 100% computer availability** in panchayats, **Arunachal Pradesh had none, and Odisha only 13%.**
  - **Internet access is another challenge,** with 14 states and UTs reporting full connectivity, while in Haryana, no panchayat had internet access, and **only 1% did in Arunachal Pradesh.**

## Government's Use of Section 79 of the IT Act and X's Legal Challenge

**Sub Topic:** *Law, Constitution, Government Policies & Interventions*

**Context:** The recent legal challenge by **Elon Musk-owned X (formerly Twitter)** against the Indian government's interpretation of **Section 79(3)(b) of the Information Technology (IT) Act, 2000,** has raised critical concerns regarding **free speech, content moderation, and intermediary liability.** X has filed a petition before the **Karnataka High Court** contesting the **government's expanded use of Section 79** to issue content-blocking orders, arguing that it bypasses safeguards provided under **Section 69A of the IT Act.**

**X's Legal Challenge**

- X has challenged the government's **interpretation and application of Section 79** before the **Karnataka High Court,** stating that:
  - Section 79 is **only a safe harbour provision** and **does not grant blocking powers** to the government.
  - The **Sahyog portal** creates an **arbitrary censorship regime.**
  - Government orders lack **sufficient justification** and are not in line with **constitutional safeguards under Article 19(2).**
  - These measures **harm X's business model,** which relies on the **free exchange of lawful information.**
- The Karnataka High Court, while refusing to pass an **interim order,** has allowed X to **approach the court again** if coercive action is taken.

**Grok AI Controversy and Legal Debate**

- X's AI chatbot, **Grok 3,** has drawn government scrutiny for using **Hindi slang and allegedly posting critical responses about the government.**
- **Key legal question:** Does AI-generated content qualify as **third-party content under Section 79's safe harbour provision?**
- Courts may need to determine whether **X can be held liable for AI-generated responses.**

**Section 79 of the IT Act: Safe Harbour Provision**

- Section 79 provides a **"safe harbour"** for intermediaries (such as X), exempting them from liability for content posted by **third-party users.**
- **Section 79(3)(b) states that intermediaries can be held liable** if they do not remove unlawful content upon receiving **actual knowledge** or notification from the appropriate government agency.
- The **Supreme Court's ruling in Shreya Singhal v. Union of India (2015)** restricted the application of this provision, ruling that intermediaries are only required to remove content **if ordered by a court or if the government's order aligns with Article 19(2) restrictions.**

**Section 69A: Government's Blocking Powers**

- Section 69A allows the **Central Government** to block public access to any online content in the interests of **sovereignty, integrity, national security, and public order.**
- It is governed by the **Information Technology (Procedure and Safeguards for Blocking of Access to Information by Public) Rules, 2009,** which mandates **a structured review process before issuing blocking orders.**
- **The Shreya Singhal ruling** upheld Section 69A, noting that it has **safeguards against misuse.**

**Government's Expanded Use of Section 79**

- In **October 2023,** the **Ministry of Electronics and Information Technology (MeitY)** issued directives allowing **all ministries, state governments, and law enforcement agencies** to issue **blocking orders under Section 79(3)(b).**
- In October 2024, MeitY launched the **"Sahyog" portal,** enabling agencies to issue and upload content removal orders.
- X has argued that these measures establish an **"unlawful parallel content-blocking**

**mechanism",** bypassing **Section 69A safeguards and the Supreme Court's ruling in Shreya Singhal.**

**Constitutional and Legal Implications**

- The case raises critical issues related to **constitutional rights, legal safeguards, and digital governance.**
- **Concerns over censorship:** X's challenge underscores fears of **arbitrary content takedowns** without proper legal oversight.
- **Need for due process:** The Supreme Court's ruling in **Shreya Singhal emphasised the importance of judicial review** in content removal decisions.
- **Impact on free speech and digital rights:** The outcome of this case could set a **precedent for content regulation and intermediary liability in India.**

**Way Forward**

- **Judicial Clarity:** The Supreme Court or High Courts should provide a **clear interpretation** of Section 79's scope and ensure it is not **misused for arbitrary censorship.**
- **Legislative Reforms:** The IT Act should be amended to **define due process mechanisms** for content takedown requests.
- **Transparency Mechanisms:** MeitY and digital platforms should collaborate on **transparent and accountable content moderation frameworks.**
- **Balancing Free Speech and National Security:** Any content-blocking framework must **balance national security concerns with fundamental rights** under **Article 19(1)(a).**

## Parliamentary Panel Criticises NITI Aayog

**Sub Topic:** *Government Institution, Policies & Interventions*

**Context:** The **Parliamentary Standing Committee on Finance has strongly criticised NITI Aayog over discrepancies in its budget allocations and spending over the past three financial years.**

**About NITI Aayog:**

- NITI Aayog, or the National Institution for Transforming India, is the premier policy think tank of the Government of India. It was established on 1 January 2015 through a resolution of the Union Cabinet, replacing the Planning Commission, which had been in place since 1950. The need for this transition arose from criticisms that the Planning Commission's centralised approach was outdated and unresponsive to the evolving economic and developmental needs of the country. NITI Aayog was designed to foster a more participatory and cooperative model of governance between the Centre and states, aligning with modern developmental priorities.

**Some of the indices published:**

- **School Education Quality Index (SEQI):** Assesses the quality of school education across states and union territories.
- **State Health Index:** Evaluates health outcomes, governance, and processes in states and union territories.
- **Composite Water Management Index:** Tracks water management practices and efficiency across states.
- **Sustainable Development Goals (SDG) India Index:** Measures progress towards achieving the UN's SDGs at the state and national levels. The latest edition, SDG India Index 2023-24, shows significant improvement in India's overall SDG score, rising to 71 from 66 in 2020-21 and 57 in 2018.
- **India Innovation Index:** Ranks states and union territories based on their innovation environment.
- **Export Preparedness Index:** Evaluates states' readiness and performance in exports.
- **Multidimensional Poverty Index (MPI):** Assesses multidimensional poverty across states and union territories, helping identify areas for targeted interventions.
- **Fiscal Health Index:** Provides insights into the fiscal health of Indian states, launched as an annual publication

**More on News**

- The committee, chaired by Bharatiya Janata Party (BJP) MP Bhartruhari Mahtab, **accused India's premier policy think tank of "amateur planning"** and **lacking foresight in financial projections.**

**Concerns Over Budget Planning and Utilisation**

- In its report, the committee highlighted a **pattern of unrealistic budget estimates** and **inefficient fund utilisation by the NITI Aayog.**
- It pointed out that the **think tank has consistently failed to project its expenditures accurately,** leading to a **mismatch between allocated funds and actual spending.**
- The report noted that **while NITI Aayog has sought ₹1,006.60 crore as Budget Estimates (BE) for FY26,** marking a 16**.77% increase from ₹837.26 crore in FY25, past trends raise concerns.**
    - **In FY23, actual spending stood at ₹849.10 crore,** far exceeding the initial **BE of ₹321.42 crore.**
    - **In FY24,** the actual expenditure was only **₹290.82 crore, significantly lower than the BE of ₹824.39 crore.**

- **For FY25,** the committee found that **only ₹197.49 crore had been utilised in the first three quarters—just 23.58% of the allocated budget.**

- The panel expressed concern over this **erratic spending pattern and called for a more realistic assessment of targets and expenditures.**

**Call for Fiscal Prudence and Efficiency**

- The committee **urged NITI Aayog to avoid fund spillovers and unnecessary parking of resources** under non-essential budget heads.
- It recommended that the **institution adopt greater fiscal discipline** in allocating and utilising resources, ensuring that budget estimates align more accurately with actual spending needs.
- Furthermore, the **report cautioned the think tank against bureaucratic delays and inefficiencies,** stating that **pending approvals were hindering key initiatives such as the Atal Innovation Mission (AIM).**
- The committee stressed that **NITI Aayog must streamline its processes to ensure the effective implementation of crucial policy initiatives.**

Moving forward, the think tank is expected to adopt a more precise and transparent approach in budgeting and expenditure management to enhance its effectiveness in driving India's policy framework.

## Appointment of the Chief Election Commissioner and Election Commissioners

**Sub Topic:** *Appointment to the Constitutional Posts*

**Context:** The **Chief Election Commissioner and Other Election Commissioners (Appointment, Conditions of Service and Term of Office) Bill, 2023,** marks the first legislative framework enacted by Parliament under Article 324(5) of the Constitution.

**More on News**

- This law **governs the appointment of the Chief Election Commissioner (CEC) and Election Commissioners (ECs).**
- It was introduced **in response to a Supreme Court directive issued in March 2023,** which stipulated that these **appointments should be based on recommendations from a high-powered committee comprising the Prime Minister, the Leader of Opposition (LoP) in the Lok Sabha, and the Chief Justice of India (CJI).**
    - This arrangement was intended as **an interim measure** until Parliament formulated a formal law on the subject.
- **Historically,** the CEC and ECs were **appointed by the President of India on the Prime Minister's recommendation,** a process deemed unsatisfactory by the Supreme Court.

**Controversy Over the New Law**

- **Modification:** While the government introduced the new law in compliance with the Supreme Court's direction, it made a crucial modification: **replacing the CJI with a cabinet minister nominated by the Prime Minister** in the selection committee.
    - The three-member committee now consists of the **Prime Minister (as chairperson), the LoP, and a cabinet minister.**
    - This alteration has s**parked legal challenges,** as it **deviates from the Court's directive, which had explicitly included the CJI as a member of the selection panel.**
- **Search Committee:** Under the new law, a search committee **led by the Law Minister, along with two senior bureaucrats from the Union government, compiles a list of five eligible candidates** for consideration.
    - The names of these candidates have **not been made public.**
    - In a recent selection, the **senior-most EC was appointed as the CEC,** with the decision made by the Prime Minister and the Home Minister, **despite dissent from the LoP,** who advocated delaying the process until the Court adjudicated on the law's validity.
    - Nevertheless, the government proceeded with the **appointments in accordance with the procedure outlined in the legislation.**

**Concerns Over the Selection Process**

- **Article 324:** The Constitution entrusts the Election Commission of India with the **responsibility of conducting elections to Parliament and State legislatures,** overseeing **presidential and vice-presidential elections, and preparing electoral rolls** under Article 324.
- **Plenary Powers:** To effectively discharge these duties, the ECI is granted plenary powers.
    - In the landmark case ***Election Commission of India vs. State of Tamil Nadu and Others (1993),*** the Supreme Court emphasised that the **ECI is a high constitutional authority with the mandate to ensure free and fair elections and maintain the purity of the electoral process.**
- **Selection Committee:** A significant issue with the new law is the composition of the selection committee.

- According to **Section 7 of the Act,** the **President must appoint the CEC and ECs based on the committee's recommendations,** effectively making the **selection committee the final authority in these appointments.**

- **Government-Majority:** The most glaring flaw in this arrangement is that the law structurally ensures a government-majority within the selection panel.
  - Since the **third member is a cabinet minister under the Prime Minister,** the government effectively controls two out of the three votes, thereby **eliminating any real deliberation or objective assessment.**
- **PM's Powers:** Furthermore, allowing the **Prime Minister to nominate one of the committee members creates an inherent conflict of interest.**
  - Members of the selection committee should be independent and capable of exercising free judgment. However, a cabinet minister, being directly accountable to the Prime Minister, is **unlikely to oppose the Prime Minister's decision.**

**Implications for Free and Fair Elections**

- These structural deficiencies render the law **constitutionally questionable.**
- The law **compromises the fairness and objectivity of the selection process.**
- This raises **concerns under Article 14 of the Constitution,** which guarantees ***equality before the law.***
- If the selection process ensures a perpetual majority for the government in power, the independence of the ECI is at risk, thereby **jeopardising the credibility of elections in India.**

## Supreme Court Stays Lokpal Order on Corruption Complaint Against HC Judge

**Sub Topic:** *Accountable Judiciary, Interventions & Issues Arising Out of Design*

**Context:** The Supreme Court has stayed a Lokpal order that took cognizance of a corruption complaint against an unnamed High Court judge.

**More on news**

- The order, issued on January 27, 2025, by a Lokpal bench led by former Supreme Court judge **A M Khanwilkar,** asserted that the **Lokpal has the authority to hear corruption complaints against former judges under the Lokpal and Lokayuktas Act, 2013.**
- However, the **Supreme Court took suo motu cognizance of the case,** with a Bench comprising Justices B R Gavai, Surya Kant, and A S Oka describing the matter as ***"something very, very disturbing."***
- The court subsequently **stayed the Lokpal order, with the next hearing scheduled for March 18.**

**Supreme Court's Rationale**

- While acknowledging the need for judicial accountability, the Supreme Court has consistently emphasised **safeguarding judicial independence.**
- The **Lokpal**, an independent statutory body under the executive, **could have introduced a new avenue for complaints against judges,** potentially bypassing established procedures for handling allegations against members of the judiciary.

**Legal Framework for Complaints Against Judges**

- Under **Section 77 of the Indian Penal Code, 1860** (now **Section 15 of the Bharatiya Nyaya Sanhita, 2023), judges cannot be charged with offenses related to the execution of their official duties.**
- Additionally, in **K Veeraswami v. Union of India (1991),** the Supreme Court ruled that **judges could be investigated under the Prevention of Corruption Act,** but **only with the President's sanction,** which must be granted after consultation with the Chief Justice of India (CJI).
  - This safeguard was established to protect judges from frivolous prosecution and undue harassment.
- The **process for investigating a judge is distinct from the impeachment process,** which requires approval from Parliament.

**Lokpal's Jurisdiction**

- The case before the Lokpal involved two complaints against a High Court judge, alleging that he had influenced judicial proceedings involving a company he had previously represented as an advocate.
  - The Lokpal's ruling did not address the merits of the complaint but rather examined whether it had jurisdiction over High Court judges.
- The **Lokpal and Lokayuktas Act states that it applies to public servants both within and outside India.**
  - Section 14 defines **"public servant"** to include individuals **serving in or previously serving** in autonomous bodies established by an Act of Parliament or controlled by the central government.
- While the Lokpal has ruled that Supreme Court judges do not fall under this definition—since the Supreme Court was established under Article 124 of the Constitution—the **Lokpal determined that High Court judges do.**

- It cited the **General Clauses Act, 1897,** which includes Acts passed before the Constitution's commencement, such as the High Courts Act, 1861, and the Government of India Act, 1935, as falling under the definition of an Act of Parliament.

- The **Lokpal concluded that a High Court judge qualifies as a "public servant"** under its jurisdiction.
  - However, recognising the legal precedent set by K Veeraswami, the Lokpal exercised caution, ruling that before proceeding further, it would refer the matter to the Chief Justice of India for guidance on the appropriate course of action.

**Jurisdiction of Lokpal**

***Prime Minister and Ministers:*** The Lokpal has jurisdiction over the Prime Minister, **except for allegations related to international relations, security, public order, atomic energy, and space.**

***Members of Parliament (MPs):*** Current and former MPs are under Lokpal's jurisdiction, excluding matters related to speeches or votes in Parliament.

***Government Officials:*** The Lokpal's jurisdiction extends to **all Groups A, B, C, and D** officers and officials of the Central Government.

***Institutions and Bodies:*** It covers chairpersons, members, officers, and directors of any board, corporation, society, trust, or autonomous body **established by an Act of Parliament or funded by the Centre.** Additionally, **it includes societies or trusts receiving foreign contributions exceeding ₹10 lakh per year.**

***CBI and Other Agencies:*** The Lokpal has **supervisory powers over the Central Bureau of Investigation (CBI) for cases referred to it,** ensuring that investigating officers cannot be transferred without Lokpal's approval.

## Questioning Archaic Colonial Law

**Sub Topic:** *Law, Justice & Judicial Interventions*

**Context:** Recently, Prime Minister Narendra Modi questioned the continuation of a colonial-era law that permitted the arrest of individuals dancing in public spaces, even 75 years after India's independence.

**More on News**

- His remarks were made in the context of his **government's ongoing efforts to repeal obsolete and archaic laws.**
- The law in question was the **Dramatic Performances Act, 1876,** which **empowered the British government to prohibit public dramatic performances deemed scandalous, defamatory, seditious, or obscene.**
- Enacted during the colonial period, it was **one of several laws introduced to suppress nationalist sentiment following the visit of Prince Albert Edward to India from 1875 to 1876.**
- Other draconian laws enacted during that period included the **Vernacular Press Act, 1878, and the Sedition Law of 1870.**

**Provisions of the Dramatic Performances Act, 1876**

- Under the law, **any play, pantomime, or dramatic performance in a public space could be banned if the government deemed it to be scandalous, defamatory, or likely to incite disaffection against the state.**
- **Authorities were granted sweeping powers,** including the right for any magistrate to issue search and seizure warrants for venues suspected of violating the law.
- Individuals found guilty under this Act could face **imprisonment of up to three months, a fine, or both.**

**Status of the Law Post-Independence**

- Though the Dramatic Performances Act was **formally repealed in 2018** as part of the **government's campaign to eliminate redundant laws, i**t had ceased to be a valid law much earlier.
  - In 1956, the Allahabad High Court declared the Act unconstitutional in the landmark ***State vs. Baboo Lal and Others case.***
- Furthermore, the law had also been **enacted at the state level in Madhya Pradesh, Karnataka, Delhi, and Tamil Nadu.**
  - However, **several states, including Delhi, later repealed it.**
  - In 2013, the Madras High Court struck down the Tamil Nadu Dramatic Performances Act, 1954.

**Judicial Intervention and Repeal**

- The unconstitutionality of the law was brought to light when, in June 1953, the Lucknow branch of the **Indian People's Theatre Association (IPTA)** attempted to stage a play based on Munshi Premchand's short story Idgah.
  - Although the group had initially obtained permission, the **local magistrate later revoked it and prohibited the performance.**
  - The prohibitory order was issued in the middle of the play, but the organisers chose to continue with the performance.
- When the case reached the **Allahabad High Court,** the court examined the broader constitutional validity of the law instead of just the specifics of the case.
  - Referring to previous judgments that had struck down colonial statutes conflicting with fundamental rights, the court ruled that the **Dramatic Performances Act**

**imposed restrictions on freedom of speech and expression that were not protected under Article 19(2) of the Constitution.**

- Additionally, the ruling noted suspicions that the case might have been an instance of victimisation based on political ideology, further reinforcing the need to strike down such outdated laws.

**Colonial Laws in Independent India**

- Despite the repeal of several colonial laws, **many still remain in force due to Article 372 of the Constitution,** which **allows laws operational at the time of Independence to continue unless explicitly repealed.**
    - However, **colonial laws do not enjoy a presumption of constitutionality,** meaning that when challenged, the government must justify their continued existence.
- Over the years, **successive governments have defended several colonial laws.**
    - **Congress-led governments have historically supported preventive detention laws and laws banning unlawful associations.**
    - The **NDA government has retained the sedition law,** albeit with modifications under the Bharatiya Nyaya Sanhita, and continues to defend the marital rape exception, a colonial provision currently under challenge before the Supreme Court.

**Efforts to Repeal Obsolete Laws**

- The repeal of obsolete laws has been a key aspect of the present **government's push to enhance the 'Ease of Doing Business' in India.**
- Since 2014, **over 2,000 redundant laws have been scrapped.**
- The **Dramatic Performances Act, 1876,** though invalidated by the courts decades earlier, **was formally repealed by Parliament through the Repealing and Amending (Second) Act, 2017.**

## Supreme Court Ruling on Visually Impaired Candidates in Judicial Services

**Sub Topic:** *Indian Constitution, Constitutional Amendments, Judgements & Cases*

**Context:** The **Supreme Court of India** has ruled that visually impaired candidates cannot be disqualified from applying for judicial services. The ruling reinforces **equal opportunity** and aligns with the principles of **inclusivity and social justice.** It upholds the constitutional rights of **persons with disabilities (PwDs)** and strengthens their participation in the judiciary.

**Key Aspects of the Supreme Court's Judgment**

- The ruling emphasises that **visually impaired candidates must be allowed to apply and compete** for judicial positions.

**Legal and Constitutional Basis**

- The judgment is based on provisions of the **Rights of Persons with Disabilities Act, 2016,** which mandates equal opportunities in employment.
- **Article 14 (Right to Equality) and Article 21 (Right to Life and Dignity)** of the Constitution protect against discrimination.
- **Article 41** directs the state to secure the right to work for persons with disabilities.
- The ruling aligns with India's commitment under the **United Nations Convention on the Rights of Persons with Disabilities (UNCRPD).**

- Any **blanket exclusion** of visually impaired individuals from judicial services is unconstitutional.
- The **judicial role primarily involves intellectual abilities** rather than physical mobility, making visual impairment **not a justifiable ground** for disqualification.

**Implications of the Judgment**

- **Strengthening Judicial Diversity**
- Enhances **representation of PwDs in the judiciary,** ensuring a more inclusive legal system.
- A diverse judiciary can offer **better perspectives** on disability rights and accessibility issues.

**Improving Accessibility in Judicial Institutions**

- Calls for **technological adaptations** like screen readers, braille transcripts, and AI-based tools to assist visually impaired judges.
- Encourages **courtroom infrastructure** modifications to accommodate judges with disabilities.

**Setting a Precedent for Other Professions**

- The ruling may influence **employment policies** across other government and private sectors.
- Encourages broader **inclusion in administrative and legal professions.**

**Reinforcing India's Commitment to Disability Rights**

- Strengthens implementation of **reservation policies** in government services.
- Encourages **awareness and sensitisation** regarding the capabilities of PwDs in professional roles.

**Challenges and the Way Forward**

- **Overcoming Institutional Barriers**
    - Many judicial institutions lack **proper accessibility measures.**
    - Need for **structured training programs** to integrate visually impaired judges effectively.

- **Addressing Societal Perception**
    - Persistent biases question the capability of visually impaired individuals in judicial roles.
    - Awareness campaigns and **success stories of visually impaired** professionals can challenge such misconceptions.
- **Ensuring Implementation of the Judgment**
    - Strict monitoring is needed to **enforce compliance** with the Supreme Court's directive.
    - Government bodies should ensure that **recruitment processes are inclusive.**
- **Enhancing digital and infrastructural accessibility** in courts.
- **Conducting workshops and sensitisation programs** for judiciary members.
- **Ensuring strict adherence to reservation policies** for PwDs in judicial services.
- **Encouraging research and policy discussions** on disability rights in the legal profession.

## Supreme Court Ruling on Domicile-Based Reservations

**Sub Topic:** *Judiciary, Judgements & Cases*

**Context:** The recent Supreme Court judgment in ***Dr. Tanvi Behl vs. Shrey Goyal (2025),*** which **struck down domicile-based reservations in post-graduate medical admissions,** marks a pivotal shift in India's medical education policy.

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- By ruling that **such reservations violate Article 14 of the Constitution,** the Court has **dismantled a mechanism that States have long relied upon to build a stable medical workforce tailored to their public health needs.**
- While the **judgment upholds meritocracy, it overlooks the intricate relationship between medical education policies and State-level health planning.**
- This decision introduces a **centralising bias** in India's medical education framework, potentially discouraging States from investing in government medical colleges and turning competitive federalism into a race to the bottom.

**Role of Domicile Quotas in State Health Planning**

Domicile-based reservations in post-graduate medical courses are a **crucial policy tool for States to align their investment in medical education** with long-term healthcare workforce retention.

- **States invest substantial resources in training medical students,** anticipating that these graduates will contribute to their local healthcare systems.
- Given the **chronic shortage of specialists,** domicile quotas provide a **steady supply of doctors** who are familiar with the State's healthcare landscape.

The Court's reliance on **Pradeep Jain vs. Union of India (1984) to strike down domicile-based reservations fails to recognise the fundamental difference** between undergraduate and post-graduate education.

- While MBBS programs lay the groundwork for medical knowledge, post-graduate training is the primary means through which States develop a specialist workforce.
- The removal of domicile quotas disrupts this pipeline, leaving States dependent on external recruitment—a process that is often uncertain and inefficient.

By eliminating domicile quotas, the **ruling weakens States' incentives to invest in medical education.**

- A healthy system of competitive federalism should encourage States to develop strong institutions that attract and retain talent.
- However, if States cannot ensure that their investment translates into a local specialist workforce, they may deprioritise funding for medical education.
- This could lead to a decline in infrastructure and widen regional healthcare disparities.
- The ruling also contrasts sharply with premier central institutions such as the All India Institute of Medical Sciences (AIIMS) and the Postgraduate Institute of Medical Education and Research (PGIMER), which retain autonomy over their selection processes.
- State medical colleges—arguably even more vital to India's public health system—are now denied similar prerogatives, leaving States at a disadvantage in planning for long-term healthcare needs.

**Article 21** of the Indian Constitution guarantees the **right to life,** which includes **access to adequate healthcare,** while public health remains a State legislative competence.

- **Government medical colleges serve a dual role:** they are **not just institutions of higher learning but also critical components of a State's healthcare infrastructure.**
    - **Over-centralisation,** whether through judicial or policy interventions, **limits States from tailoring policies to meet their unique public health needs.**
    - A **more flexible approach** that respects the role of State government medical colleges in sustaining healthcare systems is essential.

**Limitations of Absolute Meritocracy**

The Supreme Court's insistence on a rigid meritocratic framework **disregards the structural inequities in India's medical entrance system.**

- Analysing National Eligibility cum Entrance Test (Postgraduate), or NEET-PG, results reveals significant flaws in how merit is assessed.
- For instance, in 2023, the National Medical Commission, under the Health Ministry's directive, reduced the qualifying percentile for NEET-PG and Super-Speciality exams to zero to fill vacant seats.
    - This raises questions about the robustness of a purely exam-based merit system.

If undergraduate admissions consider regional and socio-economic disparities, there is **little justification for excluding these factors from post-graduate admissions.**

- Court rulings such as **Jagdish Saran & Ors vs. Union Of India (1982), Pradeep Jain (1984),** and **Neil Aurelio Nunes & Ors vs. Union of India (2022)** have acknowledged that **merit should not be viewed in isolation but rather in the context of promoting societal good and addressing structural inequalities.**
- Domicile-based reservations, by prioritising candidates more likely to remain and serve in their home States, enhance healthcare access and mitigate regional disparities—aligning with a more inclusive definition of merit.

**Need for Policy Reconsideration**

- While the Court's decision follows precedents from Pradeep Jain and the Constitution Bench, **it warrants re-evaluation.**
- The **rigid distinction** drawn between undergraduate and post-graduate admissions **was formulated in a vastly different healthcare landscape.**
    - Today, the **retention of specialists within** State health systems **is more critical than ever,** especially in light of challenges such as the COVID-19 pandemic and the rising burden of non-communicable diseases.
- Rather than eliminating domicile quotas outright, a **balanced approach would integrate these reservations with public service obligations.**
    - **Tamil Nadu's medical education framework,** for instance, **links quotas to mandatory service in public institutions**, ensuring that State investment translates into tangible healthcare benefits.
    - Such models merit judicial and policy consideration rather than outright dismissal.

## The Indian University and the Search for a Vice-Chancellor

**Sub Topic:** *Rule, Regulation & Government Policies*

**Context:** The **Draft University Grants Commission (UGC) Regulations, 2025** propose significant changes in the appointment and eligibility criteria of **Vice-Chancellors (V-Cs).** The key concerns include the **reduced role of State executives in selection and the broadening of eligibility criteria.**

**Broadening of Eligibility Criteria for Vice-Chancellors**

**Traditional vs. Expanded Eligibility Criteria**

- **Traditional Model (2010-2018 UGC Regulations):**
    - Required **10 years of a professorship or equivalent academic experience.**
    - Focused on research-oriented leadership.
- **New Proposed Model (2025 Draft Regulations):**
    - Allows candidates with experience in **public policy, government, and private sector industry.**
    - Aims to bring **diverse expertise** beyond academic circles.

**Concerns Regarding Broadening Eligibility**

- Potential dilution of **academic rigour and expertise.**

**Global Best Practices in University Leadership**

**International models emphasise diverse leadership skills:**

- **Post-tertiary education, indexed publications, public speaking skills,** and **visionary insights are considered.**
- Eminent figures from **public service, industry, diplomacy, arts, and sports** have successfully led universities worldwide.

The **UGC's approach aligns with global trends** but must ensure a balance between **academic merit and leadership acumen.**

- A V-C must possess **deep academic insight,** which **non- academic professionals** may lack.
- Courts like the **Madurai Bench of the Madras High Court** have taken a restrictive view on eligibility, emphasizing **academic credentials.**

**Stakeholders Affected by the Proposed Changes**

**State Governments and State Universities**

- **Reduced State role** limits their ability to shape university leadership.
- **State universities** cater to **regional educational priorities** and **state-led innovation.**

**University Governance Bodies**

- **University executives** lose direct influence over V-C appointments.
- Central universities follow a **similar model** where the **Chancellor, UGC, and university bodies** oversee selection.

**Academic and Non-Academic Professionals**

- **Expanded eligibility criteria** open positions to **non-academic backgrounds.**
- Some argue this may dilute the **focus on academic scholarship.**

**Key Concerns in UGC Regulations**

**Reduced Role of State Executives in V-C Appointments**

**Judicial Precedents Limiting State Influence**

- The **Supreme Court of India** has consistently **ruled against State executive involvement** in V-C selection.
- **Important judgments:**
  - ***Gambhirdan K. Gadhvi vs State of Gujarat (2019):*** Rule that State executive members cannot be part of the selection committee.
  - ***Professor (Dr.) Sreejith P.S vs Dr. Rajasree M.S. (2022):*** Declared the V-C's appointment void due to non-compliance with UGC norms.
  - ***Dr. Premachandran Keezhoth vs The Chancellor, Kannur University (2023):*** Reinforced the need for an **independent selection process.**

**Rationale Behind the Court's Ruling**

- **Ensuring Compliance with UGC Regulations: The** UGC's 2018 regulations mandate a selection committee with only a UGC representative and no State executive influence.
- **Preventing Arbitrary Appointments:** Political interference could lead to biased appointments, undermining merit-based selection.
- **Preserving Autonomy and Neutrality:** The selection process must be free from political and administrative influence to maintain academic integrity and independence.

**Way Forward: Balancing Autonomy and State Interests**

**State Nominee with Specific Criteria**

- Allow the **State executive to nominate one member** to the search committee.
- The nominee must be a **distinguished academic with no active government role.**
- Similar to **Union Public Service Commission (UPSC) guidelines,** ensuring neutrality.

**Increased Consultation Mechanism**

- Introduce a **pre-selection consultation phase.**
- The **State executive can provide inputs** on regional educational needs without **directly influencing selection.**

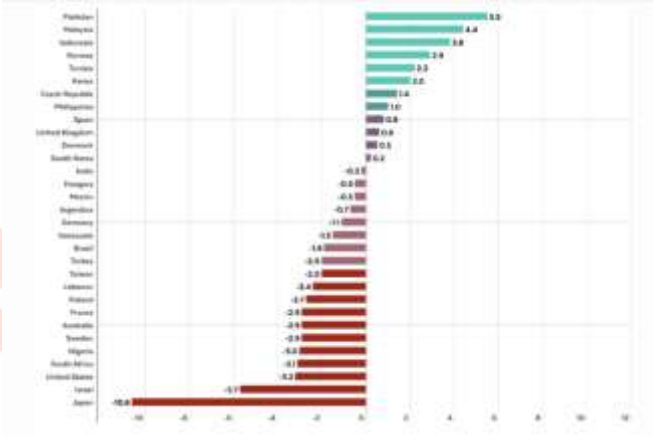
## India's Ranking in the Global Free Speech Survey

**Sub Topic:** *Global Survey & Report*

**Context:** A new global survey by the **Future of Free Speech,** a U.S.-based think tank, ranked India **24th out of 33 countries** on support for free speech. The report titled **'Who in the world supports free speech?'** highlights that while abstract support for free speech remains strong, there is a declining commitment to protecting controversial speech worldwide. The survey was conducted in **October 2024** and observed a general trend of decreasing support for free speech in democratic nations like the **United States, Israel, and Japan.**

**Key Takeaways from the Report**

- **General Support:** Majorities in all 33 countries favour free speech, ranging from 54% to 88%, with significant variations between countries and social groups.
- **Highest & Lowest Support:** Scandinavian countries, Hungary, and Venezuela show the highest support, while Muslim-majority nations and the Global South rank lowest.



- **Mismatch in Reality vs. Demand:** India, Hungary, and Venezuela exhibit high demand for free speech despite relatively low actual freedom.
- **Trends Since 2021:** Support has declined in Japan, Israel, and the U.S., while Indonesia, Malaysia, and Pakistan have improved but still rank low.
- **AI & Free Speech:** Strong scepticism exists against AI-generated offensive content, especially deepfakes of politicians. Support is high for restricting AI tools, in contrast to the regulation of social media.
- **Limits on Free Speech:** Support is lower for offensive speech targeting minorities, religion, or the national flag but has remained stable since 2021. Approval of homosexual relationships has increased in several nations, while willingness to trade free speech for national security has decreased in some.
- **Demographic Differences:** Women show lower tolerance for offensive speech but higher acceptance of pro-LGBTQ+ statements. Older people tolerate government criticism but oppose insults to national symbols.
- **U.S. Trends:** Declining free speech support among men and younger generations, including lower tolerance for pro-LGBTQ+ statements and flag insults.

**Key Findings in the Report vis - a - vis India**

**India's Position in the Index**

- India received a **score of 62.6,** ranking **between South Africa (66.9) and Lebanon (61.8).**

- **Scandinavian countries** dominated the top positions, with **Norway (87.9) and Denmark (87.0) leading the index.**
- **Indonesia (56.8), Malaysia (55.4), and Pakistan (57.0)** showed the biggest improvements despite being at the lower end of the ranking.
- Surprisingly, some **authoritarian-leaning nations** such as **Hungary (85.5) and Venezuela (81.8)** scored high, indicating a disconnect between government restrictions and public attitudes.

**Public Sentiment in India**

- A majority of Indians **value the ability to speak freely** without government censorship.
- However, **support for criticism of government policies is below the global average.**
- **37% of Indian respondents supported government control over criticism of policies, the highest percentage among all surveyed nations.**
- In contrast, **only 5% in the U.K. and 3% in Denmark** supported such restrictions.

**India's Shift in the Global Expression Categories**

- In 2023, the **percentage of people living in countries facing a freedom of expression crisis** rose to **53% globally.**
- India **shifted into the 'Crisis' category between 2022 and 2023,** contributing to the global increase in repression.
- The classification system:
  - Crisis: 0-19
  - Highly Restricted: 20-39
  - Restricted: 40-59
  - Less Restricted: 60-79
  - Open: 80-100
- India moved from **Highly Restricted to Crisis.**

**Key Takeaways from the Report Globally**

Disconnect Between Public Opinion and Government Policies

- Nations that show strong public support for free speech tend to have greater freedom of expression.
- India, Hungary, and Venezuela **deviate from this trend,** where public support is high but actual protection remains low.
- The report links this trend to **democratic backsliding,** where countries with previous high political liberties are witnessing increased restrictions on expression.

**Perceptions vs. Global Rankings**

- When asked about changes in free speech over the past year:
  - **Indians and South Africans felt that the situation had improved.**
  - However, independent rankings suggest that **India's free speech environment has worsened.**
  - Observers and data trends indicate a **decline in freedom of expression in India.**

**Global Trends in Freedom of Expression**

**Over the past year (2023-24):**

- **5 countries improved** their freedom of expression ranking **(Brazil, Fiji, Niger, Sri Lanka, Thailand).**
- **9 countries regressed,** including **India, Burkina Faso, Ethiopia, Senegal, and Mongolia.**

**Over the last decade (2013-2023):**

- **6.2 billion people across 78 countries saw a decline** in free speech.
- The largest declines were in **Hong Kong (-54 points), Afghanistan (-48 points), and El Salvador (-46 points).**
- **The Gambia saw the largest improvement (+63 points).**

**Key Takeaways for India**

- **Rising government control over critical speech** contradicts the traditionally strong support for free expression.
- India's **movement into the Crisis category** raises concerns about **democratic backsliding.**
- The **gap between public opinion and government policies** indicates an increasing restriction on dissent and press freedom.
- **Comparative analysis** with global trends shows that nations improving in free speech tend to adopt policies that promote open criticism and independent media.

## Supreme Court Questions 'Habitual Offender' Laws

**Sub Topic:** *Governance, Constitution, Polity, Social Justice & Human Rights*

**Context:** Months after the Supreme Court of India raised concerns over decade-old laws classifying certain individuals as "habitual offenders," the **Government of India has disclosed in Parliament that such laws remain in force in 14 States and Union Territories.**

**Supreme Court's Observations**

- **SC's Concerns:** In October 2024, while ruling on a **case regarding caste discrimination** in Indian prisons, the **Supreme Court questioned the constitutional validity of the "habitual offender" classification.**
  - The court noted that the classification was ***"constitutionally suspect"*** and had been used to ***"target members of denotified tribes."***

- **MoSJ Reply:** The recent information, presented in the Lok Sabha on March 11 by the **Union Social Justice Ministry,** revealed **differing stances among States.**
    - **Gujarat,** for instance, **defended the continuation of the law, citing its intended purpose,** while **Punjab is in the process of discontinuing its application.**
    - **Haryana has already repealed the legislation.**
    - The **Union Ministry of Home Affairs regularly communicates with States** regarding the status of these laws and their potential repeal.

**Origin of the 'Habitual Offender' Classification**

- **Regulation XXII of 1793:** According to the **National Commission for Denotified, Nomadic, and Semi-Nomadic Tribes (DNT, NT, SNT),** led by **Bhiku Ramji Idate,** the **criminalisation of communities began with Regulation XXII of 1793.**
- **CTA of 1871:** Subsequent laws, such as the **Indian Penal Code (1860) and the Criminal Procedure Code (1861),** established a system for maintaining a register of **"dacoits and thugs,"** culminating in the **Criminal Tribes Act (CTA) of 1871.**
    - This law formally labelled certain tribes as "criminal" and mandated their registration.
    - The **CTA was repealed in 1952 following the recommendations of the Criminal Tribes Act Enquiry Committee (1949-50).**
- **States' Laws:** However, **many States subsequently introduced their own "habitual offender" laws,** shifting the focus **from communities to individuals** based on their past convictions.
    - States such as Rajasthan (1953), Andhra Pradesh, West Bengal, Karnataka, Goa, Himachal Pradesh, and Uttar Pradesh enacted similar legislation over the following decades.
- **Lokur Committee:** Despite this shift, the Lokur Committee in 1965 **continued to view denotified tribes as having an "anti-social heritage," reinforcing negative stereotypes.**

**Crimes Under 'Habitual Offender' Laws**

- **Classification:** The classification of "habitual offenders" included crimes such as **"being a thug," "belonging to a gang of dacoits," "living on the earnings of prostitution,"** and various offences related to **"lurking."**
    - **States maintained registers of habitual offenders, and prison regulations** often reflected this classification, **sometimes explicitly targeting former members of "criminal tribes."**
- **Budhab Sabar:** The **1998 custodial death of Budhan Sabar,** a member of a denotified community in **West Bengal,** sparked national outrage and renewed scrutiny of these laws.
    - This led to the formation of the **Denotified and Nomadic Tribes Rights Action Group (DNT-RAG)** by writers Mahasweta Devi and G.N. Devy.
    - The group **highlighted ongoing discrimination and petitioned the National Human Rights Commission (NHRC) and the United Nations, calling for the repeal of such laws.**

**Calls for Repeal and Global Scrutiny**

- **Advocacy Group:** Following advocacy efforts, the **NHRC established an Advisory Group in 2000,** which **recommended the repeal of habitual offender laws.**
- **Subsequent Reports:** Subsequent reports by national commissions, including those led by **B.S. Renke (2008) and Professor Virginius Xaxa (2014), reiterated the negative impact of these laws on denotified and nomadic tribes.**
- **UN Committee:** In 2007, the **United Nations Committee on the Elimination of Racial Discrimination also called for their repeal.**

**State Responses and Ongoing Debate**

- When the **Supreme Court** revisited the issue in October 2024, it **acknowledged that habitual offender laws were not the primary subject of the case but nonetheless felt compelled to comment.**
- The Court observed that **these laws,** though intended to replace the CTA, **continued to be used to target denotified tribes. It urged State governments to review the necessity of these laws.**

According to the **latest reports** from States and Union Territories to the **Ministry of Home Affairs:**

- **Punjab** has not implemented the law for over five years and has not maintained any registers.
- **Odisha** has reported no cases registered under the law in the past five years.
- **Andhra Pradesh** has stated that no prisoners currently fall under this classification.
- **Goa** has argued that, since it has no denotified tribes, there is no risk of misuse and has suggested retaining the law.
- **Gujarat** has opposed repealing the law, asserting that it is not intended for harassment.
- **Telangana** has described the law as preventative.
- **Uttar Pradesh** has indicated that all habitual offender provisions are covered under its Goondas Act, rendering the law redundant.

**Current Status and the Way Forward**

- As per the **National Crime Records Bureau's 2022 data, 1.9% of India's 1.29 lakh convict population is classified as "habitual offenders," with the highest percentage in Delhi, where 21.5% of convicts fall under this category.**

- With the Supreme Court questioning the relevance of these laws and multiple national and international bodies advocating for their repeal, the **debate over the habitual offender classification continues.**

While some States have moved towards discontinuation, others defend the law's necessity. The coming years may determine whether these laws persist or are phased out in favor of more progressive legal frameworks.

## Standing Committee Recommends AI Adoption and Diversification in Banking

**Sub Topic:** *Indian Economy & Financial Sector Reforms*

**Context:** The **Standing Committee on Finance**, in its report, has recommended that **banks diversify their funding sources, optimise operations, and leverage artificial intelligence (AI)-driven automation to enhance efficiency, reduce costs, and drive digital banking innovations.**

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- These measures are suggested **as a response to the decline in the current account savings account (CASA) deposit ratio.**
- The recommendations **were part of the committee's review of the demands for grants of the Department of Financial Services for the financial year 2025 (FY25).**
- The report further emphasised that **fostering a secure banking ecosystem** while **prioritising technological advancements would enable banks to position themselves as forward-looking institutions that balance security with innovation.**

**CASA Deposit Ratio**

The Current Account and Savings Account (CASA) deposit ratio is a **critical financial metric used to assess a bank's funding structure.** It measures the **proportion of a bank's total deposits that are held in current and savings accounts,** which are typically low-cost sources of funds.

**Calculation of CASA Ratio:** The CASA ratio is calculated using the following formula: ***CASA Ratio (%) = (CASA Deposits / Total Deposits) × 100***

**Where:**

- **CASA Deposits** = Total deposits in current accounts + Total deposits in savings accounts
- **Total Deposits** = All deposits held by the bank, including term deposits and other types.

For example, if a bank has total deposits of ₹50,000 crore, with ₹15,000 crore in savings accounts and ₹8,000 crore in current accounts, the CASA ratio would be:

- CASA Ratio = (15,000 + 8,000 / 50,000) × 100 = 46%.

**Importance of CASA Ratio:**

- **Cost of Funds:** A **higher CASA ratio indicates that a larger portion of a bank's deposits comes from low-cost sources.** Current accounts typically do not earn interest, while savings accounts offer minimal interest (around 3-4%). This results in lower overall costs for the bank compared to higher-interest term deposits.
- **Profitability: Banks with higher CASA ratios tend to have better net interest margins (NIM),** as they can lend out these low-cost funds at higher interest rates. This enhances their profitability and operational efficiency.
- **Financial Stability:** A robust CASA ratio can reflect customer loyalty and trust in the bank. It suggests that customers are willing to keep their funds in the bank for transactional purposes, which can provide stability during economic fluctuations.
- **Competitive Advantage:** Banks with high CASA ratios can offer more competitive loan rates while maintaining healthy profit margins. This can attract more customers and increase market share.

**Strengthening Grievance Redressal Mechanisms**

- In addition to addressing banking liquidity concerns, the Standing Committee on Finance highlighted the **need for a comprehensive review and strengthening of grievance redressal mechanisms within the banking and insurance sectors.**
- The report suggested that **studying global best practices could provide valuable insights** for improving the current system, ensuring better customer service and complaint resolution.

By adopting these recommendations, banks can not only improve their operational resilience but also maintain customer trust and competitiveness in a rapidly evolving financial landscape.

# Subject – Social Justice

## Expanding Backward Classes (BC) Reservation in Telangana

**Sub Topic:** *Reservation, Social Justice & Government Policies Interventions*

**Context:** The Telangana government has passed a resolution to increase **Backward Classes (BC) reservation to 42%,** raising the total reservation in the state to **67%.** This move aims to promote **social justice** and address **historical disadvantages** faced by BC communities. However, it raises significant **constitutional, legal, and political** considerations.

**Legal and Constitutional Dimensions**

**Supreme Court's 50% Cap on Reservation**

- The **Indra Sawhney judgment (1992)** set a **50% ceiling** on reservations.
- Exceptions to this cap have been made only in **extraordinary circumstances.** Recent attempts by **Maharashtra (Maratha quota) and Bihar (caste-based reservation increase)** were struck down by the Supreme Court.

**Comparison with Other States**

- Tamil Nadu provides **69% reservation**, protected under the Ninth Schedule.
- Karnataka, Rajasthan, and Maharashtra have also attempted to **surpass the 50% limit** but faced legal challenges.

**Ninth Schedule Protection**

- If the Telangana government requests **central intervention** to place the law under **Schedule IX of the Constitution,** it may gain **immunity from judicial review.**
- However, even laws under the Ninth Schedule can be reviewed if they violate the **basic structure of the Constitution.**

**Socio-Economic Rationale for Increased Reservation**

**Demographic Justification**

- BCs constitute a **majority** in Telangana's population, demanding **proportional representation.**
- The recent **caste census in Bihar** has reignited debates on **reservation based on contemporary socio-economic data.**

**Social Backwardness and Development Deficit**

- Despite political participation, BCs face **educational and economic backwardness.**
- Increased reservation aims to **improve access to higher education and employment** opportunities.

**Political Implications**

**Electoral Strategy**

- The move is likely to **mobilise BC voters** in Telangana.
- Political parties may use this as a **precedent** to demand similar reservations in other states.

**National-Level Repercussions**

- The demand for a **nationwide caste census** and **reservation realignment** may gain traction.
- The central government may face pressure to **amend the Constitution** for accommodating higher reservations.

**Challenges and Counterarguments**

**Judicial Scrutiny**

- The Supreme Court may **strike down** the law if it violates the 50% limit.
- Previous cases show reluctance in **allowing unrestricted expansion of reservations.**

**Economic Concerns**

- Critics argue that **economic empowerment programs** should complement or replace reservations.
- A focus on **skill development and affirmative action policies** may be more effective.

**Balancing Merit and Social Justice**

- Reservation expansion must **balance equity with efficiency.**
- A merit-based approach, with targeted **welfare schemes,** could address **BC concerns without exceeding constitutional limits.**

# Subject – International Relations

## Charting the Future of IORA under India's Chairship

**Sub Topic:** *Regional and Global Groupings*

**Context: India will assume chairmanship of IORA from November 2025** and aims to enhance its governance, resilience, and funding mechanisms.

**About IORA**

- The Indian Ocean Rim Association (IORA) is a **regional inter-governmental organisation** which was established on **7 March 1997** fostering economic cooperation, maritime security, and sustainable development in the Indian Ocean Region (IOR).
- The vision for IORA originated during a visit by late **President Nelson Mandela** of South Africa to India in 1995.
- IORA's apex body is the **Council of Foreign Ministers (COM)** which meets annually.
- The IORA's strategic relevance stems from its **unique position within the Indo-Pacific framework,** its role in global trade, and the security challenges affecting member states.

**IORA's Geostrategic and Economic Significance**

- The Indian Ocean connects Asia, Africa, and Australia and is vital for global trade:
  - Transports 75% of global trade and 50% of daily oil consumption.
  - Generates **$1 trillion worth of goods and services** annually.
  - **Intra-IORA trade was $800 billion in 2023.**
- The region faces multiple challenges:
  - **Poor development, political instability, climate change-induced disasters, environmental degradation.**
  - **Security threats:** Piracy, terrorism, human and drug trafficking.

- Despite the **U.S., China, and EU** being dialogue partners, **IORA is primarily driven by middle and small powers,** necessitating stronger cooperation and institutional development.

**Challenges Faced by IORA**

**Funding Constraints**

- **IORA's budget is member-dependent** and limited due to most members being developing economies.
- **Comparison with the Indian Ocean Commission** (which has only five members but a budget of **$1.3 billion for 2020-25**) highlights the funding shortfall.
- Need to **increase private sector participation** in funding by involving **shipping companies, oil and gas industries, marine tourism players, and fisheries-related businesses.**

**Institutional Weaknesses**

- The **IORA Secretariat (based in Mauritius) has limited staff and operational capacity.**
- **Data management and policy analysis** are hampered by traditional, non-digitised methods.
- The need for **technological integration** to enhance governance, efficiency, and decision-making.

**India's Strategic Priorities as IORA Chair**

**Enhancing Funding Mechanisms**

- Establishing **sustainable financial sources** beyond member contributions.
- Encouraging **private sector collaboration** for investment in **blue economy projects.**
- Seeking **funding support from external dialogue partners like Japan, Germany, France, and the UK** to counterbalance China's influence.

**Leveraging Technology for Improved Governance**

- **Digitisation of data and records** for efficient decision-making and accountability.
- Adoption of **AI-driven policy analysis** to identify security and economic trends.

**Strengthening Maritime Security and Regional Stability**

- Implementing **India's Security and Growth for All (SAGAR) vision** to complement IORA's objectives.
- Enhancing **cooperation in marine surveillance, anti-piracy operations, and disaster response mechanisms.**
- Deepening engagement with **France, UAE, and Oman for technological and investment support** in maritime security.

**Collaboration and Capacity Building**

**Academic and Research Collaborations**

- Establishing **maritime-ready courses** in collaboration with academic institutions.
- Promoting **marine accounting** as an interdisciplinary course to support the **blue economy.**
- Encouraging knowledge-sharing from **Australia (marine research), France & Singapore (marine technology), and island nations (traditional coastal governance methods).**

**Strengthening IORA's Role in Indo-Pacific Cooperation**

- **Aligning IORA's initiatives with the Indo-Pacific Oceans Initiative (IPOI) and ASEAN Outlook on the Indo-Pacific (AOIP).**
- Establishing **lighthouse projects** under IORA to enhance regional economic cooperation.
- Promoting **mutual trust, transparency, and adherence to international maritime laws.**

**Navigating Geopolitical Challenges**

- **Balancing China's role as a dialogue partner** while preventing strategic dominance.
- **Sri Lanka's upcoming chairship** may increase China's influence, necessitating **stronger coordination with Japan, Germany, France, and the UK.**
- **Bangladesh's push for a larger role for dialogue partners** should be carefully monitored to prevent **unwanted external interference.**

## Kurdish Struggle: A Stateless People in Search of a Homeland

**Sub Topic:** *Important International Issues*

**Context:** Traditionally a nomadic society, Kurds are spread acro**ss modern-day Turkiye, Syria, Iran, Iraq, and Armenia.** For over a century, they have so**ught to establish Kurdistan,** a state imagined since the concept of the nation-state emerged in the Ottoman Empire.

**Historical Struggle for Identity**

- **Never United:** Kurdish communities were di**spersed throughout the Ottoman Empire and never united under a singular national identity like the Armenians or Turks.**
  - This lack of cohesion **prevented them from making a successful claim for an independent state** when European powers reshaped the region after World War I, leaving them stateless in modern geopolitics.
- **Challenge:** In contemporary nationalist discourse, particularly in Turkiye, **Kurdish identity has often been challenged.**
- Former Turkish Deputy Prime Minister Bulent Arinc once remarked, ***"Kurdish is a language without a civilisation,"*** reflecting a broader narrative that attempts to undermine Kurdish history and legitimacy.

**Fragmented Kurdish Identity**

- **Zagros Mountains:** Despite their **fragmented tribal structure,** the **Zagros Mountains—home to Sunni, Shia, and Alevi Kurds—have long served as the heartland of a hypothetical Kurdistan.**
- **Allies against Persia:** During the **height of the Ottoman Empire, Kurds were considered valuable**

**allies against Persia,** transitioning from nomads to soldiers to tribal leaders.
    - At one point, they **even ruled semi-autonomous emirates.**
    - However, **Ottoman efforts to centralise power dismantled these emirates, reducing them to divided tribes once more.**
- **Treaty of Sèvres:** The Treaty of Sèvres, signed on August 2, 1920, **brought the Kurds closer to statehood than ever before.**
    - Drafted **primarily by Britain,** the treaty **proposed local autonomy for predominantly Kurdish areas east of the Euphrates and acknowledged the potential for an inde**pendent Kurdish state.
    - However, due to their **tribal divisions and reluctance to align under British influence** at the cost of detaching from the Ottoman heartland, **Kurdish leaders failed to capitalise on this opportunity.**

**Formation of the Turkish Republic and the Kurdish Setback**

- **Turkish Republic:** Following **World War I,** the **collapse of the Ottoman Empire gave rise to the Turkish Republic under Mustafa Kemal Atatürk in 1923.**
    - The new state was **rooted in nationalism and sought homogeneity, suppressing minority identities,** including the Kurds.
- **Treaty of Lausanne:** The Treaty of Lausanne in 1923 dismissed British requests to recognise Kurds as a national minority, and Kurdish cultural institutions, religious fraternities, and schools were banned.
- **Unsuccessful Efforts:** Efforts to resist Turkish oppression emerged but were largely unsuccessful.
    - The **Azadi organisation,** an early attempt at Kurdish unity, was **swiftly dismantled in 1924.**
    - In 1925, the **Sheikh Said Rebellion,** led by Sunni Zaza-speaking Kurds, attempted to seize Diyarbakir but **failed due to a lack of broader Kurdish support.**
    - Subsequent revolts, including the **Ararat rebellion** (1928-1930), met with **brutal suppression**, resulting in mass executions and the razing of Kurdish villages.
    - By 1966, the region remained a military zone closed to foreigners.

**Revival of the Kurdish Movement**

- **Political Landscape of Turkiye: Turkiye's political landscape** began to shift in 1946 with the **relaxation of the authoritarian one-party system.**
    - **Opposition parties sought Kurdish support,** leading to a resurgence of Kurdish identity.
    - **Urbanisation and the mechanisation of agriculture** created a Kurdish proletariat, among whom nationalist sentiments flourished.
- **Evolution of Identity:** During this period, Kurdish identity evolved amidst several political polarities—left vs. right, Kurdish nationalists vs. Turkish nationalists, Sunnis vs. Shias, and secularists vs. Islamists.
    - **Kurdish frustration with the Turkish left led to the formation of separate left-wing Kurdish parties, including the Kurdistan Workers' Party (PKK)** in 1978 under Abdullah Öcalan, which became a defining force in the Kurdish struggle.

**Rise of the PKK**

- The PKK adopted a **Marxist-Leninist ideology** and **launched a guerrilla campaign** against the Turkish state, **targeting right-wing factions, state agents, and Kurdish landlords aligned with the government.**
    - While initially shocking to Kurdish communities, **increasing state repression**—military sweeps, arbitrary arrests, and torture—**pushed many Kurds toward the PKK's cause.**
- Expanding beyond Turkiye, the **PKK forged alliances with Kurdish factions in Syria (PYD), Iran (PJAK), and Iraq (PCDK),** all under the umbrella of the Kurdistan Communities Union (KCK).
    - The **People's Protection Units (YPG),** formed in 2012 during the Syrian Civil War, became the armed wing of the Kurdish cause.

**<u>International Dynamics and the Uncertain Future of Kurdistan</u>**

**PKK as Terrorist Organisation:** The PKK is designated as a terrorist organisation by Turkiye, the U.S., and the European Union.

- However, **Russia has historically provided support,** with the Soviet Union training PKK fighters.
- Even after the Soviet collapse, the PKK maintained ties with Moscow, holding a congress there in 1996.

**Recognition Elsewhere:** In contrast to Turkiye's suppression, **Kurdish autonomy found recognition elsewhere.**

- **Iraq's 2005 Constitution granted the Kurdish region semi- autonomous status.**
    - The 2017 Kurdish independence referendum saw overwhelming support for statehood but prompted a military response from Baghdad, resulting in the loss of Kirkuk, a key economic and strategic hub.
- In **Syria**, the PYD and YPG established a de facto autonomous Kurdish region, Rojava, during the civil war.

- The **U.S. supported the YPG against ISIS,** forming the Syrian Democratic Forces (SDF). However, with shifting geopolitical alliances, the status of Rojava remains uncertain.

## India and the Arctic: A Strategic Imperative

**Sub Topic:** *Effect of Policies & Politics on India's Interests*

**Introduction**

The **Arctic region** holds vast reserves of **oil, natural gas, minerals, and hydrocarbons,** making it an emerging economic and energy hub. **India's Arctic Policy (2022)** initially focused on **scientific research and climate studies,** but its **geopolitical and strategic dimensions remain underexplored.** Given the evolving global power dynamics, **India must integrate strategic considerations** into its Arctic engagement to safeguard its interests.

**Geopolitical Significance of the Arctic**

- The Arctic is governed by **eight nations: the United States, Canada, Denmark/Greenland, Iceland, Norway, Sweden, Finland, and Russia,** forming the **Arctic Council.**
- The region is **warming four times faster** than the global average, leading to:
  - **Melting ice caps** and opening of **new shipping routes.**
  - Increased **oil and gas exploration.**
- **Key Shipping Routes:**
  - **Northern Sea Route (NSR):** Runs along Russia's Arctic coast, reducing travel distances between **East Asia and Europe by 40%** compared to the Suez Canal.
  - **Northwest Passage (NWP):** Sought by European nations for enhanced trade with Asia.
- **Strategic Resource Reserves:**
  - **90 billion barrels of oil and 1,669 trillion cubic feet of natural gas** (US Geological Survey, 2008).
  - **High transportation costs** and **regulatory challenges** limit immediate commercial viability.

**Security Dynamics and Militarisation**

- The **Ukraine crisis (2014, 2022)** escalated **security tensions** in the Arctic between Russia and the West.
- **Russia's Military Buildup:**
  - **Ballistic missile submarines (SLBMs)** deployed in the region.
  - **Nuclear warhead storage facilities** in the Kola Peninsula.
  - **Expansion of Arctic-specific military forces and bases.**
- **NATO's Response:**
  - **Finland and Sweden joined NATO,** increasing Arctic tensions.
  - Strengthening of **air and naval capabilities in the Arctic.**
  - Russia views NATO's expansion as a **direct security threat.**
- **Challenges for the Arctic Council:**
  - Russia's **invasion of Ukraine (2022)** led to a **temporary suspension of the Council's operations. Western Arctic states continued engagement without Russia,** undermining **pan-Arctic cooperation.**

**China's Expanding Footprint in the Arctic**

- China has declared itself a **"Near-Arctic State",** intensifying its **economic and military interests** in the region.
- Through the **Polar Silk Road,** China is expanding its **shipping and resource exploitation** strategies.
- **India must proactively engage in Arctic geopolitics** to counterbalance China's growing presence.

**India's Arctic Policy: Key Pillars**

- Scientific Research and Technological Development
- Climate and Environmental Protection
- Economic and Resource Utilisation
- Connectivity and International Cooperation
- Governance and Institutional Capacity Building
- Human and Indigenous Community Engagement

**Why India Must Adopt a Strategic Approach?**

**Climate Change and Environmental Impact:**

- The Arctic and **Himalayas are interconnected** through the **cryosphere.**
- Melting Arctic ice influences **monsoons, sea level rise, and biodiversity.**
- Arctic changes impact **Indian agriculture, water security, and coastal populations.**

**India's Historical Engagement in the Arctic**

**1920:** India signed the Svalbard Treaty under British rule.
**1981:** Creation of the Department of Ocean Development (DOD) for Arctic research.
**2006:** Reorganised into the Ministry of Earth Sciences (MoES).
**2007:** India's first scientific expedition to the Arctic.
**2008:** Establishment of Himadri Research Station in Svalbard, Norway.
**2013:** India granted Observer Status in the Arctic Council.
**2014:** Deployment of IndArc, India's multi-sensor moored observatory.
**2016:** Establishment of an atmospheric laboratory at Gruvebadet.

**Scientific Research and Technological Advancements:**

- **Himadri Research Station** enables polar research.
- The **National Centre for Polar and Ocean Research (NCPOR)** leads studies on **glaciology, climate modeling, and biodiversity.**

- Expanding India's **satellite-based Arctic monitoring systems** enhances research capabilities.

**Economic and Trade Opportunities:**

- **The Northern Sea Route (NSR)** can reduce **India's shipping distances to Europe by up to 40%.**
- The Arctic's **energy resources** present a **diversification opportunity** for India's energy security.
- **Bilateral energy agreements** with **Russia and Norway** enhance resource access.

**Geopolitical and Strategic Considerations:**

- The Arctic is a **theatre of competition** among **Russia, the USA, China, and NATO.**
- China's **Polar Silk Road initiative** under **BRI** aims to expand influence, posing a **strategic challenge** to India.
- India's policy focuses on **multilateral engagement, bilateral diplomacy,** and securing **its Arctic interests.**

**Way Forward: Strengthening India's Arctic Role**

**Enhancing Scientific and Technological Capabilities:**

- Expanding Arctic research programs and partnerships with Arctic nations.
- Strengthening **satellite-based Arctic monitoring systems.**

**Strengthening Economic and Trade Engagement:**

- Encouraging Indian **energy firms** to engage in **sustainable Arctic exploration.**
- Expanding **maritime and logistics infrastructure** for **Northern Sea Route (NSR) benefits.**

**Geopolitical Balancing and Multilateral Cooperation:**

- Maintaining an **independent Arctic strategy** while aligning with **like-minded nations.**
- Strengthening **India's role in Arctic governance platforms.**

## US, Ukraine agree to terms of critical minerals deal

**Sub Topic:** *Bilateral, Regional & Global Groupings & Agreements*

**Context:** The recently concluded **US-Ukraine minerals deal** marks a significant shift in geopolitics, economic diplomacy, and security considerations.

**More in news**

- Ukraine possesses vast reserves of critical minerals such as **lithium, titanium, graphite, and rare earth elements,** which are crucial for advanced technology and defence industries.
- However, the **deal lacks explicit security guarantees,** raising concerns over its long-term implications for Ukraine and European stability.

**Key Features of the Agreement**

- Establishment of a Reconstruction Investment Fund: Jointly managed by Kyiv and Washington, funded by mineral revenues.
- Revenue Sharing Model: Ukraine to contribute 50% of revenue from its natural resources until contributions reach $500 billion.
- US Financial Commitment: The US commits to supporting Ukraine's economic stability without direct military assurances.
- Strategic Resource Utilisation: The deal ensures access to high-value minerals for the US, reducing dependency on China for critical raw materials

**Global Geopolitical Context**

**Historical Parallels with Oil Dependence**

- In the **20th century,** nations fought wars and engaged in foreign interventions due to their dependency on oil.
- The **United States (US),** once highly import-dependent, has become the world's largest producer of oil and gas.
- **Russia's ability to sustain protracted wars,** like in Ukraine, is largely due to its self-sufficiency in energy.

**China's Dominance in Critical Minerals**

- **China controls over 75% of the world's rare earth supply,** giving it substantial leverage over global supply chains.
- It has **increasingly restricted** the export of key minerals, posing a challenge to dependent economies.
- **US concerns** mirror the Cold War scenario where control over oil was a key strategic factor.

**The US Response and Strategic Interests**

- **Ukraine's vast reserves** of lithium, graphite, and rare earths make it an important strategic asset.
- The US seeks **to reduce reliance on China and secure alternative sources,** including Ukraine, Canada, and Greenland.
- The race for critical minerals is shaping global alliances and influencing foreign policies.

**Geopolitical and Strategic Implications**

**For Ukraine**

- **Economic Reconstruction:** Revenue from minerals could fund post-war rebuilding.
- **US Stake in Ukraine's Stability:** While not providing military guarantees, the US has economic interests in Ukraine's long-term stability.
- **Strategic Leverage Against Russia:** Strengthening Ukraine's resource control limits Russia's economic coercion.
- **Concerns Over Sovereignty:** Potential loss of control over strategic national resources.

**For the United States**

- **Securing Critical Mineral Supply Chains:** Reduces reliance on China and Russia.

- **Economic Gains:** The deal ensures the return of US taxpayer money used in aid to Ukraine.
- **Shift in Foreign Policy:** Marks a departure from traditional US aid policies, emphasising economic reciprocity.
- **Strategic Ambiguity on Security:** By avoiding clear security guarantees, the US reduces its long-term commitment risk.

**For Europe**

- **Concerns Over Exclusion:** European allies fear being sidelined in peace negotiations.
- **Security Dependence on the US:** The deal does not ensure continued military support for Ukraine.
- **Potential Competition:** Europe may face challenges accessing Ukraine's mineral resources under US-dominated terms.

**Russia's Response and Countermoves**

- **Control Over Occupied Territories:** Russia holds $350 billion worth of Ukrainian resources in annexed regions.
- **Offering Rare Minerals to the US:** Putin signalled willingness to provide rare minerals, countering Ukraine's deal.
- **Influencing Trump's Policy:** Russia seeks to delay negotiations and gain territorial advantages before formal talks begin.

**Required Policy Interventions for India**

**Liberalisation of Exploration and Mining**

- Allowing **private investment and global players** to explore and extract critical minerals.
- Providing **incentives for technology-driven exploration** to identify new reserves.

**Strengthening Domestic Processing and Refining**

- India lacks **refining capabilities** for critical minerals, increasing reliance on Chinese processing units.
- Setting up **domestic refining and value-addition industries** is essential for supply chain security.

**India's Dependence on Critical Minerals**

**Import Dependence and Strategic Vulnerabilities**

- India **imports over 80% of its critical minerals,** making it more dependent than for oil.
- The government has been signing **supply agreements with friendly nations** and investing in overseas assets.
- However, reliance on imports is risky due to **geopolitical uncertainties and supply chain disruptions.**

**Expanding Strategic Partnerships**

- Diversifying import sources by securing **long-term agreements with friendly nations.**
- Investing in **critical mineral mines overseas,** similar to India's approach to securing energy resources.

**Developing a Circular Economy**

- Promoting **recycling and recovery of critical minerals** from electronic waste.
- Reducing dependency on fresh extraction by **incentivizing the reuse of key materials.**

**Conclusion**

- The **US-Ukraine minerals deal represents a significant geopolitical shift,** prioritising economic interests over security guarantees.
- While **Ukraine benefits from economic investment,** long-term security concerns remain unresolved.
- The deal sets a **new precedent for US foreign policy,** reinforcing the 'America First' doctrine.
- The **implications extend beyond Ukraine, affecting global security,** economic dependencies, and international power dynamics.

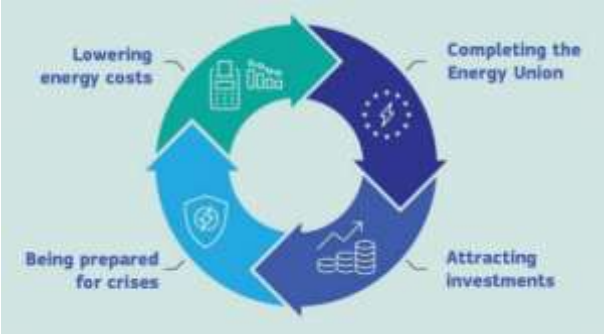
## EU's Strategy to Support Industries Amid High Energy Costs and Investment Barriers

**Sub Topic:** *Effect of policies and politics of developed and developing countries on India's interests*

**Context: The European Union** (EU) **Clean Industrial Deal** aims to balance climate goals with **industrial competitiveness** by addressing **high energy costs, regulatory burdens, and global competition** from the US and China. The strategy includes **financial support, energy cost reduction measures, and regulatory reforms** to accelerate **industrial decarbonisation** while ensuring economic growth.

**Key Objectives of the Clean Industrial Deal**

- **Reducing Greenhouse Gas Emissions:** Setting an **intermediate target of 90% reduction by 2040.**
- **Improving Industrial Competitiveness:** Providing regulatory relief and financial assistance to energy-intensive industries.
- **Lowering Energy Costs:** Implementing measures to cut power bills and reduce reliance on fossil fuels.
- **Promoting Clean Energy and Infrastructure:** Expediting the deployment of renewables, grid modernisation, and clean technology.
- **Addressing Geopolitical Challenges:** Responding to **US policy shifts** and China's aggressive subsidies in clean tech sectors.



**Key Measures Announced**

**Financial Support for Industries**

- **European Investment Bank (EIB) Commitments:** Funding industrial modernization and clean technology deployment.
- **Leveraging Private Investment:** Reforming regulations to attract more private sector capital into clean industrial projects.
- **State Aid Flexibility:** A new framework allowing greater state intervention to support industries struggling with high energy costs.

**Challenges Faced by European Industries**

- **Persistently High Energy Costs:** The EU's reliance on imported fossil fuels has made energy prices structurally high.
- **Regulatory Burdens:** Complex and time-consuming approval processes hinder industrial efficiency and clean energy adoption.
- **Global Competition:** The US and China have implemented aggressive subsidy and trade policies, putting European manufacturers at a disadvantage.
- **Slow Implementation of Reforms:** Industry leaders argue that delays in regulatory changes and financial support have hampered European manufacturing.

**Energy Cost Reduction Strategies**

- **Power-Purchase Agreements (PPAs) and Contracts for Difference (CfDs):** Encouraging industries to enter long-term contracts for affordable renewable energy.
- **Grid Modernisation Package:** Scheduled for early 2026 to improve electricity transmission efficiency and lower costs.
- **Affordable Energy Action Plan:** Expected to save up to €260 billion annually by 2040 through targeted reforms.

**Regulatory Reforms to Accelerate Clean Energy Adoption**

- **Fast-Track Renewables Permitting Law:** Expected in Q4 2025 to reduce approval timelines for renewable energy projects.
- **Updated Low-Carbon Hydrogen Regulations:** Enhancing regulatory certainty for green hydrogen producers.
- **Energy Market Reforms:** Breaking the link between electricity prices and volatile gas markets.

**Security of Energy Supply and Crisis Preparedness**

- **Reducing Dependence on Imports:** Engaging with reliable LNG suppliers and strengthening internal energy production.
- **Energy Security Framework Updates:** Addressing threats such as cyber-attacks and critical infrastructure vulnerabilities.
- **EU Gas Market Scrutiny:** Enhancing transparency and competition in the gas sector to prevent unfair pricing.

**Criticism and Industry Concerns**

- **Slow Implementation:** Industry leaders argue that the EU's efforts have not yet yielded tangible relief for manufacturers.
- **Uncertainty in Energy Transition Policies:** Calls for reassessment of the role of nuclear energy and domestic hydrocarbon production.
- **Global Trade Pressures:** Rising concerns about the impact of Chinese subsidies and US policy reversals on EU competitiveness.
- **Chemical Industry Crisis:** European chemical giants warn of de-industrialisation due to high operational costs and regulatory constraints.

**Way Forward**

- **Enhance Implementation Speed:** Fast-track state aid approvals and financial disbursements to struggling industries.
- **Strengthen Energy Self-Sufficiency:** Expand domestic renewable energy production and explore nuclear energy as a viable option.
- **Promote Global Fair Trade Practices:** Engage in diplomatic negotiations to counter unfair subsidies from competing economies.
- **Ensure Flexibility in Policy Frameworks:** Regular reassessments of the Clean Industrial Deal to incorporate emerging technological and geopolitical realities.

## Strengthening India-US Strategic Ties

**Sub Topic:** *Bilateral Relations*

**Context:** Prime Minister Narendra Modi's recent visit to the United States marked a significant moment in the evolving geopolitical landscape, particularly as President Donald Trump embarked on his second term in office.

**Focus of the Discussions**

The **relationship between the two leaders has been instrumental** in advancing India-US ties, with a **shared commitment to strengthening strategic cooperation in the Indo-Pacific region.**

- During Trump's first tenure, **India and the US made notable progress in enhancing collaboration in this vital region,** driven in part by the growing challenges posed by China's expanding influence.

For the US, the **Indo-Pacific has long been a focal point** of its geopolitical and security framework.

- Meanwhile, **India has increasingly prioritised the region as crucial to safeguarding its strategic interests.**
- The **PM's visit reaffirmed Washington's continued commitment** to Indo-Pacific security in multiple ways.

- Firstly, despite pressing domestic and international concerns—including ongoing conflicts and immigration issues—the **Trump administration prioritised bilateral meetings with key Indo-Pacific players, India and Japan.**
- Secondly, the **Quad Foreign Ministers' meeting,** held shortly after Trump's inauguration, **underscored a robust commitment to regional security.**
- Thirdly, the **escalating US-China rivalry remains a defining factor in shaping America's foreign policy in the Indo-Pacific.**

**Evolving US-India Cooperation in the Indian Ocean**

- **Strong Partnership:** While the joint statement reaffirmed a strong Indo-Pacific partnership, the US approach under Trump's second administration may differ in its execution.
  - A key theme likely to shape US policy will be its **expanded expectations from allies and partners.**
- **Different Approaches:** Within the Indo-Pacific, **this approach may unfold differently across various regions.**
  - The Pacific theatre is expected to **remain a zone of intense great-power competition,** while the Indian Ocean may emerge as a secondary layer of regional security, focusing on connectivity, **Humanitarian Assistance and Disaster Relief (HADR), Search and Rescue (SAR), and Intelligence, Surveillance, and Reconnaissance (ISR) operations.**
- **ASIA:** A crucial initiative emerging from the joint statement is the **Autonomous Systems Industry Alliance (ASIA),** designed to enhance industrial collaboration and co-production.
  - This initiative aims to foster the **development of advanced maritime security systems, including Artificial Intelligence-enabled counter-Unmanned Aerial Systems (UAS)** and towed array sonars—low-frequency systems used in Anti-Submarine Warfare (ASW) and intelligence gathering.
- **TRUST:** Additionally, the US-India **Transforming the Relationship Utilising Strategic Technology (TRUST)** initiative seeks to create a resilient and trustworthy supply chain for critical industries such as semiconductors, critical minerals, advanced materials, and pharmaceuticals.

**<u>Divergent Strategic Perspectives on the Indian Ocean</u>**

**Divergences:** Despite significant progress in India-US security cooperation, **strategic divergences persist regarding their respective approaches to the Indian Ocean.**

- **India perceives the Indian Ocean as central to its Indo-Pacific security strategy,** whereas **US attention remains largely focused on key conflict zones** such as the Taiwan Strait and the South China Sea.
- While the **US has increasingly recognised the Indian Ocean's strategic importance, the Western Indian Ocean remains beyond the geographical purview of the US Indo-Pacific Command (INDOPACOM).**

**Explicit Emphasis:** However, a notable development in the recent meeting was the explicit emphasis on the Indian Ocean.

- A new initiative, the In**dian Ocean Strategic Venture,** was introduced as a comprehensive platform to promote coordinated investments in economic connectivity and commercial development.
- Additionally, **digital infrastructure** in the region received a boost with the announcement of a multi-billion-dollar undersea cable project aimed at strengthening connectivity in the Indian Ocean.

**India-US Collaboration: Strengthening Maritime Security and Connectivity**

- **Renewed Commitment:** The PM's visit to the US underscored a **renewed commitment to deepening India-US engagement in the Indian Ocean.**
- **Limited Synergy in History:** Historically, Washington and New Delhi had limited synergy in this region, **but recent initiatives indicate a shift towards more meaningful collaboration.**
  - The emphasis **on infrastructure and digital connectivity** aligns with the broader vision of enhancing economic partnerships, but robust security cooperation remains imperative.
- **China's Expansion:** China's expanding footprint in the Indian Ocean presents a **growing security challenge.**
  - Beijing has been **increasing its presence through research vessel deployments and strengthening political ties with Indian Ocean littoral states.**
  - Additionally, **rising incidents of piracy and maritime terrorism in the Western Indian Ocean continue to pose threats to regional stability and connectivity initiatives.**

**Future of India-US Engagement in the Indo-Pacific**

- **Shared Vision:** The meeting reaffirmed a **shared vision for strengthening regional security and infrastructure investments in the Indo-Pacific.**
- **Strategic Reorientation:** The **Indian Ocean, which bridges the Middle East and the Pacific theatre,** is set to play a crucial role in the US administration's broader strategic reorientation.

- A key element of this strategy involves a **transregional connectivity initiative, leveraging partnerships within the India-Middle East-Europe Economic Corridor and the I2U2** (India, Israel, United Arab Emirates, and US) Group.
- Over the next six months, India's engagement in the Indian Ocean is expected to expand, incorporating both economic and security dimensions.

## Bhutan's Strategic Role in India's Regional Diplomacy

**Sub Topic:** *India & Neighbouring Countries and Geopolitical Significance in South Asia*

**Context:** Bhutan holds a unique position in India's South Asia strategy, acting as a crucial ally in countering China's influence. The Union Budget 2025-26 reflects India's commitment to strengthening this partnership.

**India's Neighbourhood-First Policy (NFP) and Bhutan's Importance**

- India's **Neighbourhood-First Policy (NFP)** prioritises strong regional ties through trust, development, and security cooperation.
- Bhutan remains India's most **committed regional partner**, unlike other South Asian nations balancing between India and China.

**Budget 2025-26: Financial Commitment to Bhutan**

- The **Ministry of External Affairs (MEA)** received ₹20,516 crore in the new budget, with ₹5,483 crore allocated for aid to foreign nations.
- Bhutan is the **largest recipient,** receiving **₹2,150 crore,** reaffirming India's **long-standing strategic partnership.**
- Other South Asian countries, including **Maldives (₹600 crore) and Nepal (₹700 crore),** also saw financial allocations, but Bhutan remains the primary focus.

**Bhutan as a Strategic Buffer Against China**

- Bhutan's **geopolitical significance** lies in its location near India's **Siliguri Corridor,** a vital link between India's northeastern states and the mainland.
- The **2017 Doklam standoff** highlighted Bhutan's critical role in India's security strategy.
- India's continued financial support ensures Bhutan's **political stability and economic growth,** preventing Chinese influence from expanding into this crucial region.

**Strengthening Economic and Trade Partnerships**

- The **India-Bhutan Trade, Commerce, and Transit Agreement** ensures a free **trade regime,** making India Bhutan's **largest economic partner.**
- **Bilateral trade** has tripled in a decade, reaching **$1.6 billion in 2022-23,** with India accounting for **73% of Bhutan's total trade.**
- Budget 2025-26 continues to fund **trade corridors and infrastructure development,** reinforcing Bhutan's economic **dependence on India.**

**Hydropower Cooperation: A Pillar of Economic Ties**

- Bhutan's **hydropower sector** contributes **40% of national revenue** and **25% of its GDP,** with India as its primary investor and buyer.
- India has developed major **hydropower projects,** including **Tala (1020 MW), Chukha (336 MW), and Mangdechhu (720 MW).**
- Future projects, such as **Punatsangchhu I & II (2,200 MW) and Kholongchhu (600 MW),** will further expand **electricity exports to India,** benefiting both economies.

**Infrastructure and Digital Connectivity Investments**

- India's budget allocation supports **border roads, trade facilitation centres, and modern checkpoints,** enhancing **cross-border trade.**
- Digital initiatives, including the **RuPay card system and UPI payment integration,** ensure smoother financial transactions between India and Bhutan.

**Bhutan's Role in Regional Cooperation Frameworks**

- Bhutan actively participates in **SAARC, BIMSTEC, and BBIN,** strengthening India's regional coalition against China's **Belt and Road Initiative (BRI).**
- India's investments in Bhutan's connectivity ensure it remains **economically integrated with India** rather than exploring trade routes through China.

**Future Areas of India-Bhutan Collaboration**

- **Climate resilience and sustainability:** Joint efforts in **green hydrogen projects** and **renewable energy expansion** align with India's sustainability goals.
- **Digital economy:** Expanding fintech infrastructure, enabling Bhutan to modernise its **banking and payment systems.**
- **Strengthening security cooperation:** Continued **defence and intelligence collaboration** to counter China's regional assertiveness.

## Key Takeaways from PM Modi's U.S. Visit

**Sub Topic:** *Bilateral Relations With Major Powers*

**Context:** Prime Minister Narendra Modi's recent official visit to the United States was a **milestone in strengthening bilateral relations,** with significant developments across trade, defence, technology, and energy.

**Boosting Trade Relations**

- **BTA:** A major highlight of the visit was the **initiation of the first phase of a Bilateral Trade Agreement (BTA)** aimed at reducing trade barriers and streamlining regulatory processes.
    - This agreement is **expected to encourage U.S. companies to invest in India** and integrate the country into global supply chains.
    - The ambitious **goal of achieving $500 billion in trade by 2030**— endorsed by the Confederation of Indian Industry (CII)— appears attainable with sectoral sub-targets and simplified cross-border procedures.
- **Resolving Tariff Issues:** Efforts to resolve tariff issues on both sides have already been set in motion.
    - Emphasis was placed on **boosting exports of industrial goods from the U.S. to India and labour-intensive products from India to the U.S.,** including agricultural goods.
- **Investments:** Additionally, **greenfield investments, including those by Indian companies in the U.S., are being encouraged.**
    - A well-structured BTA would further facilitate investment and technology transfers, benefiting both nations.

**Advancing Technology, Defence, and Energy Collaboration**

- **TRUST:** The visit also saw the launch of the U.S.-India **Transforming the Relationship Utilising Strategic Technology (TRUST) initiative**, which **aims to strengthen technological cooperation in critical sectors such as defence, artificial intelligence (AI),** semiconductors, quantum computing, biotechnology, energy, and space.
    - This initiative **opens avenues for private sector collaboration** with governments and academic institutions in both countries.
- **INDUS:** The **INDUS Innovation Initiative will further accelerate research and development** in these advanced fields.
- **Roadmap on AI Infrastructure:** As India emerges as a key player in the AI-driven economy, the U.S.-India Roadmap on AI Infrastructure is **expected to attract investments in data centres, computing power, and AI model development.**
    - This initiative **could support Indian startups in sectors such as fintech, healthtech,** and agritech, benefiting not only India but also other developing nations.
- **Framework for the U.S.-India Major Defence Partnership:** In defence, the establishment of a **10-year Framework for the U.S.-India Major Defence Partnership marks a significant step forward.**
    - Agreements on **technology transfers, joint production, and industrial collaboration** will promote indigenous manufacturing, skill development, and economic growth.
    - Potential offset clauses in defence deals could provide substantial opportunities for Indian industry.
- **Energy:** Energy cooperation was another focal point of discussions.
- Both leaders **emphasised the need to establish long-term strategic partnerships to ensure energy security and diversification.**
- India's 2025-26 Union Budget includes plans to collaborate with the private sector on **small modular reactors (SMRs),** with U.S. companies expected to play a crucial role.
- With **India's net-zero targets in mind,** the U.S., with its abundant natural gas reserves, can serve as a stable energy partner.

**Infrastructure and Digital Connectivity**

- A significant outcome of the visit was the **commitment to advancing the India-Middle East-Europe Economic Corridor (IMEC)** through joint infrastructure projects.
- Such initiatives **could accelerate the development of railways, roadways, smart cities, and industrial zones,** offering Indian industries new avenues for participation.
- The **proposed undersea cable project** between India and the U.S. is expected to boost India's digital economy and services exports, strengthening its position in global digital trade.

**Enhancing Higher Education Collaboration**

- **Leading U.S. universities plan to establish campuses in India,** providing more opportunities for Indian students while improving access to global academic resources.
- Additionally, **efforts to streamline legal mobility between the two nations will further benefit students and professionals.**

Beyond diplomacy, PM Modi's U.S. visit represents a transformative roadmap for India's economic and technological aspirations. By leveraging global partnerships, strengthening trade ties, and fostering innovation, India is positioning itself as a key player in the global economic landscape.

## Weaponisation of Economic Activity: A Reality in Global Trade

**Sub Topic:** *Global Trade & Disputes*

**Context:** External Affairs Minister S. Jaishankar, speaking at the **Raisina Dialogue 2025,** highlighted the **growing link**

**between business decisions and national security,** stating that tariffs, sanctions, and financial restrictions are now common tools of power.

**Evolution of Trade as a Strategic Tool**

- The concept of **weaponisation of economic activity** refers to the strategic use of trade, finance, and technology as tools of geopolitical influence.
- It has become a defining feature of contemporary international relations, shaping economic policies, trade agreements, and national security strategies.
- Historically, trade was considered an economic activity driven by **cost and efficiency.**
- However, in recent years, trade decisions are increasingly influenced by **trust, reliability, and geopolitical alignments.**
- Countries now factor in **national security considerations** while making trade and investment decisions.

**Recent Examples of the Weaponisation of Trade**

- **US-China Trade War:** The imposition of tariffs on Chinese goods by the US and **countermeasures by China.**
- **China-Australia Trade Dispute:** Following Australia's call for a COVID-19 investigation, China imposed **trade restrictions on Australian exports.**
- **Russia-Ukraine Conflict:** Sanctions on Russian energy exports, restricting access to global financial systems.
- **US Sanctions on Iran:** Economic sanctions aimed at limiting Iran's nuclear ambitions.
- **China-NBA Controversy:** Economic pressure exerted on the NBA following support for Hong Kong protests.
- **Norway-China Trade Freeze (2010-2018):** After the Nobel Peace Prize was awarded to Liu Xiaobo, China reduced trade with Norway.

**<u>Tools Used in the Weaponisation of Trade</u>**

**Tariffs and Trade Barriers**

- Imposed to restrict imports, often under the pretext of national security.
- Example: **US tariffs on steel and aluminium imports** under Section 232 of the Trade Expansion Act.

**Economic Sanctions**

- Targeted measures against countries, individuals, or entities.
- Example: **Western sanctions on Russia,** limiting its access to international financial markets.

**Export Controls and Technology Restrictions**

- Restrictions on the sale of critical technologies.
- Example: **US restrictions on semiconductor exports to China.**

**Financial and Banking Restrictions**

- Blocking access to international financial systems.
- Example: Russia's exclusion from the SWIFT payment system.

**Energy Supply Manipulation**

- Controlling energy exports to exert pressure.
- Example: **Russia's reduction of gas supplies to Europe** post-Ukraine war.

**Boycotts and Consumer Pressure**

- Informal state-backed consumer boycotts.
- Example: **China's boycott of South Korean products over the THAAD missile defence system deployment.**

**<u>Impact on Global Trade and Economy</u>**

**Erosion of Free Trade Principles**

- The rise of economic coercion undermines the **rules-based international trade system.**
- **Example:** The WTO dispute settlement mechanism losing effectiveness due to unilateral actions.

**Disruptions in Global Supply Chains**

- Trade weaponisation leads to **uncertainty in supply chains,** forcing countries to adopt self-reliance strategies.
- **Example:** India's push for Atmanirbhar Bharat (self-reliance) in critical sectors.

**Financial Market Volatility**

- Sanctions and economic restrictions cause instability in global financial markets.
- **Example:** Fluctuations in global oil prices following sanctions on Russian crude oil.

**Rise of Alternative Trade Alliances**

- Countries seek **regional trade agreements** to bypass economic restrictions.
- **Example:** India's engagement with UAE, Russia, and Southeast Asian countries for trade diversification.

**<u>India's Position on Trade Weaponisation</u>**

**Balancing Economic and Strategic Interests**

- India is negotiating trade agreements with **the US, UK, and EU,** focusing on trust-based partnerships.
- **Example:** India-US negotiations to reduce trade surplus concerns.

**Strengthening Economic Resilience**

- India aims to **diversify its trade partners** and reduce dependence on specific markets.
- **Example:** Expansion of India's exports to Africa and Latin America.

**Strategic Use of Tariffs and Trade Policies**

- India employs tariffs selectively to **protect critical sectors.**
- **Example:** Tariffs on Chinese imports to support domestic manufacturing.

**Building Trusted Trade Partnerships**

- Emphasis on economic diplomacy to create resilient trade relations.
- **Example:** QUAD countries enhancing technology and supply chain cooperation.

# GS PAPER II — 'PRELIMS BASED ARTICLES'

## Subject – Polity, Governance, Constitution

### PM-YUVA 3.0

**Sub Topic:** *Governance, Policies & Interventions*

**Context:** On **March 11, 2025, the Ministry of Education,** under the **Department of Higher Education,** launched the **PM-YUVA 3.0 scheme** — the **Prime Minister's Scheme for Mentoring Young Authors.**

**More on News**

- This author mentorship program is designed to nurture young and aspiring writers (under the age of 30) in order to foster a culture of reading, writing, and book creation in India while showcasing Indian literature on the global stage.
- The launch of PM-YUVA 3.0 follows the success of its first two editions, which saw broad participation from budding authors across **22 different Indian languages and English.**

**Key Objectives**

- The scheme aligns with the **Prime Minister's vision** to encourage the youth to appreciate India's rich culture, heritage, and the contributions of visionary figures to the country's development.
- The program aims to bring the perspectives of young writers to the forefront, with a **focus on three key themes:**
    - Contribution of Indian Diaspora in Nation Building
    - Indian Knowledge System
    - Makers of Modern India (1950-2025)
- Through these themes, PM-YUVA 3.0 seeks to help develop a new generation of writers who can creatively and innovatively explore subjects that promote India's **heritage, culture, and knowledge system.**

**The Vision Behind PM-YUVA 3.0**

- The **National Education Policy (NEP) 2020** emphasises empowering young minds and creating a learning ecosystem that prepares young learners for leadership roles in a rapidly evolving world.
- India, with **66% of its population being youth,** stands poised to harness this potential for **capacity building and nation-building.**
- PM-YUVA 3.0 aims to foster the next generation of **creative writers,** thus contributing to the cultural and literary landscape of India.

**Features of PM-YUVA 3.0**

- Mentorship Program: The scheme will focus on training and mentoring young authors through a **phased approach,** where the selected authors will engage with eminent writers and participate in literary festivals.
- Book Publication: The works produced under PM-YUVA 3.0 will be publ**ished by the National Book Trust, India,** and translated into various **Indian languages.** This initiative aims to strengthen **cultural and literary exchanges** and promote the idea of **'Ek Bharat Shreshtha Bharat'** (One India, Great India).
- **Engagement with Visionaries:** The program will encourage authors to explore the contributions of visionaries in areas like **education, science, economy, and social empowerment,** offering a comprehensive view of India's growth from 1950 to 2025.

**Categories and Selection Process**

- As part of the All India Contest, 50 authors will be selected, with a breakdown based on the following themes:
    - Contribution of Indian Diaspora in Nation Building – 10 authors
    - Indian Knowledge System – 20 authors
    - Makers of Modern India (1950-2025) – 20 authors
- The contest will run from **March 11, 2025, to April 10, 2025,** and the proposals will be evaluated in **April 2025.** The selected authors will be announced in **May-June 2025.**

**Mentorship and Training**

- The young authors will undergo mentorship from eminent authors and literary mentors from **June 30, 2025, to December 30, 2025.**
- Additionally, a **National Camp** will be held for the PM-YUVA 3.0 authors during the **New Delhi World Book Fair in 2026,** providing an opportunity for networking, learning, and exposure to the wider literary community.

## Sashakt Panchayat-Netri Abhiyan

**Sub Topic:** *Local Government & Women Empowerment*

**Context:** The **Ministry of Panchayati Raj** is set to launch the "Sashakt Panchayat-Netri Abhiyan" (सशक्त पंचायत-नेत्री अभियान) during a **National Workshop on March 4, 2025, at Vigyan Bhawan, New Delhi**.

**More on News**

This significant event will be graced by **Union Minister of Panchayati Raj** Shri Rajiv Ranjan Singh alias Lalan Singh, **Union Minister of Women and Child Development** Smt. Annpurna Devi, **Union Minister of State for Panchayati Raj** Prof. S. P. Singh Baghel, and **Union Minister of State for Youth Affairs and Sports** Smt. Raksha Nikhil Khadse.

**About Sashakt Panchayat-Netri Abhiyan**

- It is a strategic initiative aimed at strengthening the **capacity-building interventions for Women Elected Representatives (WERs)** of Panchayati Raj Institutions (PRIs) across the nation.
- **The initiative focuses on:**
  - **Leadership development** for WERs
  - Strengthening their decision-making capabilities
  - Reinforcing their active role in **grassroots governance**
- This program will provide a strategic roadmap for empowering women in local governance, ensuring their participation in shaping rural local governance structures.

**Key Highlights of the Workshop**

- Over **1,200 women Panchayat leaders** from all three tiers of PRIs will convene at a **national platform** ahead of **International Women's Day.**
- The event will feature the **felicitation of outstanding women leaders** who have made significant contributions to rural self-governance.
- **Training modules** will be launched to enhance the capacity of women representatives, along with a **Primer on Law Addressing Gender-Based Violence and Harmful Practices.**
- **Panel discussions** will focus on:
- **Women's participation and leadership** in PRIs, examining the evolving dynamics in local governance.
- **Women-led local governance**, covering topics such as health and nutrition, safety, education, economic opportunities, and digital transformation.
- **Cultural performances** organised by UNFPA will celebrate women's achievements, showcasing the resilience and cultural contributions of women.

**Alignment with National Vision**

- The **National Workshop** is in line with **Prime Minister Narendra Modi's vision** articulated during the **119th episode of 'Mann Ki Baat',** emphasising the role of **'Nari Shakti'** (women's power) in nation-building.
- The initiative aims to contribute to building **safer, inclusive, gender-sensitive, and socially just Gram Panchayats**—creating an environment conducive for the prosperity of **women and girls** across the country.

## Overweight and Obesity in India

**Sub Topic:** *Issues Related to Health*

**Context:** In the past two decades, India has undergone a significant epidemiological shift, with overweight and obesity emerging as major public health concerns.

**More on News**

- According to the **National Family Health Survey (NFHS-5, 2019-21),** nearly one in four adults in India is obese.
- The problem spans across diverse regions, urban and rural areas, and both genders, with the proportion of overweight and obese individuals ranging from 8% to 50%.
- The **World Obesity Federation** has pointed out that India is experiencing one of the steepest increases in childhood obesity globally.

**What Is Obesity?**

- **Obesity** is defined by the **World Health Organisation (WHO)** as an abnormal or excessive fat accumulation that presents a risk to health**. Body Mass Index (BMI)** is used as a common metric to classify obesity:
  - **Overweight:** BMI of 25 or above
  - **Obese:** BMI of 30 or above

***Body Mass Index (BMI)*** *is a simple method used to assess if an adult has a healthy weight, calculated by dividing a person's weight in kilograms by the square of their height in meters (kg/m2). A normal BMI is considered to be between 18.5 and 24.9 according to WHO guidelines.*

**Rising Obesity Rates in India**

- A nationwide study by the **Indian Council of Medical Research (ICMR)** published in **The Lancet Diabetes and Endocrinology (2023)** revealed alarming statistics:
  - **35 crore adults** have abdominal obesity.
  - **25 crore adults** are suffering from generalised obesity.
  - **21 crore adults** have high blood cholesterol.
- Overweight and obesity in India have doubled in the last 15 years and tripled in the past 30 years. This

rise is associated with lifestyle changes, dietary patterns, and urbanisation.

**Why the Issue Needs Urgent Attention?**

- Overweight and obesity are often seen as personal issues in India, and societal attitudes often normalise these conditions. However, this widespread belief ignores the broader public health implications:
- **Dietary Shifts:** India, once food deficient, has transitioned into a nation where calories are more than sufficient, though with significant inequities in distribution.
- **Poor Nutritional Quality:** The State of Food Security and Nutrition in the World report (2024) estimates that nearly **55% of India's population (78 crore people)** cannot afford a healthy diet, and **40%** of the population falls short of adequate nutrient intake.
    - The rise of **high-fat, salt, and sugar (HFSS) foods and ultra-processed foods (UPFs)** has exacerbated the obesity crisis.
- **Sedentary Lifestyles:** Urbanisation has led to more sedentary lifestyles, with **50% of Indians failing to meet the recommended physical activity levels** according to the **World Health Organisation (WHO).**

**The 'Thin Fat Indian' and Obesity's Health Risks**

- The concept of the **'thin fat Indian'** has been scientifically validated.
    - Even individuals with normal **body mass index (BMI)** can have higher body fat levels. Furthermore, obesity is strongly linked to **diabetes** and **hypertension.**
    - The **'common soil hypothesis'** highlights obesity as a risk factor for diabetes, with **one in four Indian adults** being diabetic or prediabetic.
- Globally, overweight and obesity are responsible for approximately **3.4 million deaths annually.**
    - In India, the **economic cost of obesity** was estimated to be **$28.95 billion** (₹1,800 per capita) in 2019, approximately **1.02% of GDP.** This includes healthcare costs and lost productivity, and without adequate interventions, the cost is projected to increase to ₹4,700 per capita by 2030.

**The Policy and Programmatic Response**

- Tackling obesity requires **multifaceted policy interventions** and a change in societal attitudes toward health.
- Government campaigns like **Khelo India, Fit India Movement,** and **Eat Right India** focus on personal responsibility but lack broader, systemic action.
    - **Fit India Movement** and Khelo India have been pivotal in encouraging physical activity across the population, especially among youth.
    - **POSHAN Abhiyaan** focuses on improving nutritional outcomes for children, pregnant women, and lactating mothers, helping to tackle childhood obesity.
    - **Eat Right India,** launched by the Food Safety and Standards Authority of India (FSSAI), promotes healthier food choices and awareness, with campaigns like Aaj Se Thoda Kam urging people to reduce intake of harmful fats, salts, and sugars.

**Proposed Solutions**

- **Raising Awareness:** Begin a nationwide **dialogue** to highlight that obesity is a **disease**, not just a lifestyle choice. Address its link to chronic diseases such as diabetes, hypertension, and liver disorders.
- **Promote Physical Activity:** Invest in urban infrastructure to encourage **physical activity,** such as creating **bicycle lanes,** accessible **parks,** and **open gymnasiums.**
- **Taxation on Unhealthy Foods:** Introduce **higher taxes** on **HFSS foods** and **ultra-processed foods,** while providing **subsidies for healthier food options,** such as fruits and vegetables. The food industry should adopt ethical practices in food marketing, especially targeting children.
- **Health Check-ups: Weight, height, and waist circumference** measurements should become standard at every **health visit.** People need to be educated on **optimal weight** and the risks of **high waist circumference.** For example, **women** should aim for a waist circumference under **80 cm** and **men** under **90 cm.**
- **Anti-Obesity Medications: Anti-obesity drugs** are being licensed in several countries. India needs **clinical guidelines** to identify individuals who can benefit from such medications, which should be prescribed only when medically indicated.
- **Workplace Initiatives: Offices and workplaces** should focus on obesity prevention by raising awareness about **unhealthy weight** and providing access to **weighing scales. Body fat analysis** should also become part of routine health practices in workplaces.
- **School and College Engagement:** Schools should teach **healthy eating habits,** and can**teens should serve healthier food.** The adoption of **health-promoting schools,** modelled after countries like Japan, where dietitians are involved in school nutrition, should be explored.
- **Coordinated Interventions: Multiple ministries** (health, finance, education, agriculture, urban development) need to collaborate to tackle obesity. The **nutrition intervention program** should evolve into a **'Suposhan Abhiyan',** addressing not only undernutrition but also mindful under feeding and micronutrient deficiencies.

- **Research and Evidence Generation: The medical and research communities** must focus on generating **epidemiological data** on obesity. **Doctors and health professionals** should be trained to handle obesity as a chronic disease.
- **Making Healthy Eating Affordable: Healthy food** should be made more accessible and affordable. The **food industry,** particularly **online food delivery platforms**, should promote **healthy eating habits.** Corporate social responsibility (CSR) funds should be dedicated to promoting healthier lifestyles.

## Pashu Aushadhi Initiative

**Sub Topic:** *Issues Related to Livestock Health and Disease Control*

**Context:** The government has announced the launch of **Pashu Aushadhi stores across India to provide affordable generic veterinary medicines** for those engaged in **animal husbandry** and **dairying**. This initiative aims to improve livestock health and reduce the financial burden on farmers.

**Modelled on Janaushadhi Kendras**

- The initiative is inspired by the Pradhan Mantri Bharatiya Janaushadhi Kendras (PMBJK), which provides affordable generic medicines for human healthcare.
- More than **10,300 PMBJKs** are currently operational across the country.
- Generic medicines are non-branded drugs marketed under a non-proprietary or approved name rather than a brand name.
- While PMBJKs cater to human healthcare, Pashu Aushadhi Kendras will provide generic medicines specifically for animals.

**Objective: Improving Livestock Health**

- Part of the **revised Livestock Health and Disease Control Programme (LHDCP)** approved by the Union Cabinet on March 5, 2024.
- LHDCP has a total outlay of **Rs 3,880 crore for 2024-25 and 2025-26.**
- **Rs 75 crore** was allocated specifically for Pashu Aushadhi to provide affordable veterinary medicines and incentivise their sale.

**Why Pashu Aushadhi is Important?**

- India's livestock population stood at **535.78 million** as per the **20th Livestock Census (2019).**
- The total bovine population (cattle, buffalo, mithun, yak) is **302.79 million.**
- **Livestock productivity is affected by diseases such as** Foot and Mouth Disease (FMD), Brucellosis, Peste des Petits Ruminants (PPR), Cerebrospinal Fluid (CSF), and Lumpy Skin Disease.
- Vaccination drives have been conducted, but additional efforts are needed.
- A significant portion of farmers' out-of-pocket expenses is spent on medicines for their livestock.
- The implementation of **LHDCP** aims to prevent diseases through immunisation and reduce financial losses for farmers.

**Operation of Pashu Aushadhi Kendras**

- The stores will be **run by cooperative societies and Pradhan Mantri Kisan Samriddhi Kendras (PMKSK).**
- The Depar**tment of Animal Husbandry & Dairying** will soon release operational guidelines for these stores.

**Incorporation of Traditional Veterinary Medicines**

- The Pashu Aushadhi Kendras will also sell **ethnoveterinary medicines,** based on traditional and indigenous knowledge for treating animal diseases.
- The **National Dairy Development Board (NDDB)** has compiled ethnoveterinary formulations for various ailments in bovines, including:
  - *Mastitis*
  - *FMD mouth and foot lesions/wounds*
  - *Fever, diarrhoea, bloating, indigestion, and worm infections*
- Traditional formulations for treating fever include natural ingredients like: **Coriander, garlic, bay leaves, pepper, cumin, turmeric, chirata, betel, tulsi, neem, basil, jaggery, onions/shallots.**

## Rashtriya Karmayogi Jan Seva Programme

**Sub Topic:** *Capacity Building & Skill Development*

**Context:** The **Department of Social Justice and Empowerment (DoSJE),** under the **Union Ministry of Social Justice and Empowerment,** has successfully launched the first batch of the **Rashtriya Karmayogi Jan Seva Programme.**

**More on News**

This initiative, spearheaded by the **Capacity Building Commission,** is aimed at cultivating a sense of **Seva Bhav** (spirit of service) among government officials, making them more **solution-oriented, compassionate, and citizen-focused.**

**Key Highlights**

- **Training Format:** The programme consists of four short training sessions, each lasting about **1.5 hours,** encouraging **open discussions, teamwork,** and **practical problem-solving** with a service-oriented approach.

- **Location and Duration:** The programme is being held from **5th to 11th March 2025** at the **Dr. Ambedkar International Centre, New Delhi.**
- **Philosophy of the Program:** The term **'Karmayogi',** which signifies one's duty towards the **nation, department, citizens, and oneself.**
    - The program is designed to help public servants develop essential **leadership skills,** adopt a **solution-oriented approach,** and maintain the **Seva Bhav** in their roles.
- **Covered key aspects of:**
    - Policy formulation and governance
    - Grievance redressal mechanisms
    - Legal frameworks and accessibility of social justice schemes
    - Nationwide welfare initiatives and real-world case studies

**Impact and Future Outlook**

- Participants **gained a deeper understanding** of their roles and responsibilities.
- **Citizen interaction** and **solution-oriented administration** emphasised as **pillars of governance.**
- The programme aligns with the government's broader vision of **capacity building and efficient public service delivery.**

## India's Obesity Crisis and Regulating Ultra-Processed Foods

**Sub Topic:** *Ultra-Processed Foods & Nutrition*

**Context:** Prime Minister Narendra Modi's call to tackle obesity and the **2025 Economic Survey's** recommendation for imposing a **'health tax'** on ultra-processed foods (UPFs), it points out that India's **food marketing regulations** are often **ambiguous, industry-friendly, and ineffective.**

**Obesity Crisis in India**

- **One in four adult Indians is obese,** and a similar proportion suffers from diabetes or pre-diabetes.
- This highlights the urgency of addressing obesity and related health issues through effective regulation of food marketing and labelling.

**Regulatory Gaps and Challenges**

**Weak Labelling Framework:** The **Food Safety and Standards Authority of India (FSSAI)** has failed to implement stringent labelling regulations since 2017. In **2022**, FSSAI introduced the **Indian Nutrition Rating** (Health Star System) modelled on Australia's less effective framework.

- **Flaws in the Star System:**
    - **Misleading Labels:** Unhealthy UPFs like biscuits or soft drinks can still receive two stars, misleading consumers.
    - **Dominance of Industry Influence:** Industry representatives influenced decisions, sidelining scientific experts.
    - **Ignored Proposals:** FSSAI overlooked its 2021 draft for mandatory 'traffic light' warning labels.

**Global Best Practices Ignored:** Chile's 'High In' Labels: Reduced UPF consumption by 24% using bold, front-of-pack warnings. India still lacks these straightforward, impactful labels.

**Ambiguous Advertising Regulations:** Existing regulations under the **Consumer Protection Act, 2019,** and other laws are subjective and ineffective.

- **Key Gaps:**
    - No clear definition of **HFSS (High Fat, Sugar, Salt)** or UPFs.
    - Advertisements can avoid disclosing sugar or salt content.
    - Unregulated advertising continues to target vulnerable groups like children.

**Why Urgent Action is Essential?**

- **Health and Financial Impact:** Without strong regulations, the goal of reducing obesity by 2025 is at risk.
- **Environmental Consideration:** Reducing food waste and unhealthy consumption patterns can also mitigate environmental damage.
- **Protecting Children and Youth:** Restricting misleading advertisements is crucial to safeguarding the health of younger generations.

**Way Forward**

- **Scrap the Health Star System:** Replace with **mandatory 'high in' warning labels** for HFSS and UPF products. Align with **WHO SEARO** and **Indian Council of Medical Research (ICMR)** guidelines.
- **Define Clear Nutrient Thresholds:** Set specific limits for sugar, salt, and fat to classify foods as HFSS.
- **Tighten Advertising Regulations:** Amend existing laws or draft new, unified legislation to regulate or ban UPF/HFSS advertisements. Ensure the definition of misleading advertisements includes non-disclosure of harmful nutritional information.
- National Awareness Campaign: Launch mass media campaigns in regional languages to highlight the health risks of UPFs.

# Subject – International Relations

## Sonic Weapons

**Sub Topic:** *"Emerging Technologies: Use and Ethical Concerns of Sonic Weapons"*

**Context:** Serbia's President, **Aleksandar Vucic,** has firmly denied claims that his government used a **sonic weapon** to disperse protesters in Belgrade on March 15, 2025.

**What is a Sonic Weapon?**

- **Sonic weapons** are devices that emit extremely loud sounds over long distances.
- These devices can produce both audible and inaudible sound waves, which can be used for a variety of purposes, including crowd control and communication.
- While sound amplifiers have existed for centuries, their use as **crowd-control tools emerged in the 1990s.**
- In 2004, the **United States military** deployed **long-range acoustic devices (LRADs)** in Iraq, marking one of the first instances of such technology being used in military operations.

**How Do Sonic Weapons Work?**

- Sonic weapons typically operate using **modern transducers,** which convert energy from one form to another.
- The sound produced by these devices is highly **concentrated** and **amplified**, creating a **narrow beam** that can be aimed at specific targets. Police officers can adjust the **frequency, intensity, quality,** and **duration** of the sound to control its impact, potentially causing pain or discomfort to those in its path.

**Types of Sonic Weapons**

- **Long-Range Acoustic Device (LRAD):** Manufactured by **Genasys Inc** (formerly known as LRAD Corporation). It can reach up to **8,900 meters** for intelligible speech and can emit sounds as loud as **160 decibels (dB).**
    - For comparison, jet engines emit between **130-140 dB** during takeoff, and a gunshot produces around **150 dB.** Sounds exceeding **140 dB** can cause pain, while sounds over **120 dB** can lead to **permanent hearing damage** even with brief ex posure.
- **Mosquito:** This device emits high-pitched sounds that are painful only to **younger people**—typically teenagers and individuals in their twenties. The sound is **inaudible** to older adults (over 30), as their hearing diminishes with age.
- **Infrasonic Weapon:** A newer technology that produces **low-frequency sound** waves that are **inaudible** but can still cause discomfort or disorientation. Experts suggest that **infrasonic devices** are challenging to weaponise effectively.

**Health Effects of Sonic Weapons**

- The use of sonic weapons can lead to significant harm, primarily to the **ears** and **hearing**. These effects depend on the **distance from the sound source,** the **duration of exposure,** and the individual's **preexisting health conditions.**
- **Ear damage:** Loud sounds, such as those produced by LRAD devices, can result in **ringing in the ears** (tinnitus), which can persist for minutes, hours, or even days.
- **Other symptoms:** Exposure can cause **headaches, nausea, sweating, vertigo, loss of balance,** and in severe cases, **vomiting or blood/mucus from the ears.**
- **Indiscriminate harm:** Human rights organisations, including **Physicians for Human Rights (PHR),** note that these weapons are **indiscriminate**, meaning they can cause harm to **protesters, bystanders**, and even **law enforcement officers,** despite the narrow targeting capability of the beam.

While sonic weapons are touted as a means of controlling crowds with a precise, directed beam of sound, the health risks they pose—especially in terms of hearing damage and broader health consequences—raise significant ethical and legal concerns.

# GS PAPER III — 'MAINS BASED ARTICLES'

## Subject – Indian Economy & Agriculture and Banking

## E-Commerce Price Index: A New Metric for Inflation Measurement

**Sub Topic:** *"Digital Economy and Inflation Measurement""*

**Context:** The Ministry of Statistics and Programme Implementation (MoSPI) is planning to introduce an **E-Commerce Price Index** to track prices of goods and services available on digital platforms. This new index aims to complement the existing **Consumer Price Index (CPI) and Wholesale Price Index (WPI)** by capturing inflationary trends in the rapidly growing **e-commerce sector.** The initiative is significant given India's projected **e-commerce market growth from ₹12.2 trillion in 2024 to ₹24.1 trillion by 2028.**

**Rationale Behind the E-Commerce Price Index**

- The rapid digital transformation and increased internet penetration necessitate a dedicated measure to track **online retail price trends.**
- **E-commerce contributes a growing share to retail transactions,** influencing price dynamics across sectors.
- Traditional indices like **CPI and WPI do not fully capture the digital marketplace,** necessitating a separate price index.

**Features of the E-Commerce Price Index**

- Similar to the **CPI**, it will include categories such as:
  - Food products
  - Clothing and footwear
  - Housing
  - Fuel and light
  - Health
  - Education
  - Recreation and amusement
- Prices will be tracked from **e-commerce platforms like Flipkart, Amazon, and Meesho.**
- The index will be released **alongside CPI data** but will remain a separate indicator.
- Unlike CPI, which tracks physical market prices, this index will capture **online listing prices** rather than final consumer prices affected by discounts.

**Challenges in Implementing the Index**

- **Lack of Data Sharing:** E-commerce firms are reluctant to share pricing details due to business confidentiality concerns.
- **Weightage Determination:** The government needs to determine what percentage of a household's monthly expenditure is through e-commerce.
- **Coverage and Representation:** Identifying a representative basket of goods and services sold online.
- **Integration with Existing Indices:** Ensuring that the new index complements rather than distorts overall inflation measurements.

**Government's Approach and Implementation Strategy**

- **Engagement with E-Commerce Platforms:** The National Statistical Office (NSO) is in talks with over 15 e-commerce firms to obtain data.
- **Inter-Ministerial Coordination:** MoSPI is working with DPIIT and MeitY to facilitate data sharing.
- **Market Surveys:** A recent market survey covered 2,860 representative physical markets, a significant increase from under 2,000 in the last exercise (2011- 12).
- **New CPI Series (2026):** The upcoming CPI revision in 2026 (base year 2024) may integrate e-commerce data for better price tracking.

**Significance of the New Index**

- **Better Price Tracking:** Will improve understanding of how online prices impact overall inflation.
- **Enhanced GDP Estimates:** More accurate private **consumption data** will refine GDP calculations.
- **Urban and Semi-Urban Insights:** Helps track changing consumption patterns in urban and semi-urban India.
- **Macroeconomic Policy Tool:** Enables policymakers to better assess inflation trends in the digital economy.

**Way Forward**

- The government must **ensure cooperation from e-commerce firms** while safeguarding business strategies and consumer privacy.
- A pilot study can help determine **e-commerce's share in household consumption.**
- If online spending remains below **5% of total consumption,** integrating e-commerce prices into CPI may be a better approach than a separate index.

- **Regular updates and methodological refinements** will be needed to keep pace with the evolving digital economy.

## Sikkim's Tourism Entry Fee

**Sub Topic:** *Ecotourism & Sustainable Infrastructure*

**Context:** The Sikkim government has introduced a **₹50 entry fee** for every tourist visiting the state from **March 2025.** The move aims to **generate revenue** for tourism infrastructure and promote **sustainable tourism.** However, it has sparked debates, with critics arguing that it **burdens domestic tourists** and may negatively impact the tourism sector.

**Legislative and Policy Framework**

- The decision stems from the **Sikkim Registration of Tourist Trade Act, 2024.**
- Under this act, a **₹150 charge** is levied on accommodations (hotels, homestays) for every tourist staying overnight, valid for **30 days.**
- The revenue is deposited into the **Tourism Sustainability Development Fund (TSDF)** to enhance infrastructure and services.

**Objectives Behind the Entry Fee**

**Sikkim's Track Record in Environmental Conservation**

- **First Indian state to ban single-use plastics** (1998), much before the **national ban** (2022).
- **Banned packaged drinking water** in government offices and events (2016).
- **India's first fully organic state** (2016), recognised by **PM Narendra Modi.**

- **Sustainable Tourism:** Encourages responsible tourism practices and contributes to environmental conservation.
- **Infrastructure Development:** Funds will be used for road connectivity, cleanliness, and facilities improvement.
- **Boosting Hospitality Sector:** Enhancing services to attract more high-value tourists.
- **Revenue Generation:** Aims to reduce dependence on government funding for tourism projects.

**Criticism and Opposition**

**Citizen Action Party (CAP) Sikkim** has strongly opposed the fee.

**Concerns Raised:**

- Charging Indian citizens for entering a state within India is unjust.
- Multiple existing charges, including **permits, parking fees, and wildlife fees,** already burden tourists.
- Tourism industry stakeholders fear a **decline in visitor numbers.**
- **Infrastructure issues,** such as **poor road connectivity and lack of 24-hour facilities,** remain unresolved.

**Comparison with Bhutan's Sustainable Development Fund (SDF)**

- **Bhutan levies a Sustainable Development Fund (SDF) on foreign tourists** but exempts its own citizens.
- Sikkim's policy applies to **Indian tourists,** unlike Bhutan, which charges only **foreign nationals.**
- Critics argue that Sikkim should **focus on better infrastructure and services** before introducing such fees.

**Rational Behind the Decision**

**Considerations of Economic Impact on Tourism**

- **Tourism is a key economic driver** for Sikkim, attracting 93,000 foreign tourists in 2023 (up from 68,000 in 2022).
- **Major tourism investments:**
  - **Luxury hotels:** New projects by ITC Welcomhotel and Leela Palaces.
  - **Pakyong Airport:** A key infrastructure development.
- **Post-COVID tourism struggles:** The sector has faced **slow recovery,** impacting local businesses.

**Environmental and Climate Change Considerations**

- **Sikkim faces climate change-related risks,** including **flash floods.**
- **October 2023 Flood Disaster:**
  - A **glacial lake outburst flood** impacted the **Teesta River and Teesta III hydropower dam.**
  - Over **100 lives lost, 20 Army personnel and military equipment destroyed.**
  - Highlighted the vulnerability of Sikkim's ecosystem.

**Government's Justification**

- Chief Minister **Prem Singh Tamang Golay** defends the policy as a step toward responsible tourism.
- The government believes **₹50 is a minimal charge** and will not significantly impact tourists.
- **Upcoming Major Events:**
  - Golden Jubilee Celebrations of Sikkim's accession to India.
  - Concert by British musician Ed Sheeran, expected to boost tourism.

## Kavach 4.0

**Sub Topic:** "*Indigenisation of Technology & Development of New Technology*"

**Context:** Indian Railways has achieved a significant milestone with the introduction of **Kavach Version 4.0,** an

indigenously developed Automatic Train Protection (ATP) system.

**Kavach System Overview**

- **Kavach,** an indigenously developed Automatic Train Protection (ATP) system, is a cutting-edge technological advancement that aims to enhance the safety and efficiency of train operations across India.
- This system has been designed with the highest safety standards, requiring certification of **Safety Integrity Level (SIL-4),** the highest order of safety certification.

***Automatic Train Protection (ATP)*** *ensures that the train's speed is within the permissible limits by continuously monitoring and automatically applying the brakes if necessary. This safety feature is critical in preventing accidents.*

**Key Features**

- The primary function of **Kavach** is to assist the Loco Pilot (train driver) by ensuring that trains operate within specified speed limits.
- In case the Loco Pilot fails to apply the brakes, the Kavach system automatically engages the brakes to prevent any potential accidents.
- Additionally, the system plays a critical role in ensuring safe operations during inclement weather, where visibility and environmental conditions may otherwise compromise safety.

**Development and Evolution**

- **Field Trials (2016): I**nitial trials began in February 2016, leading to valuable insights and improvements.
- **Kavach Version 3.2 (2018-2019):** After field trials and independent safety assessments, three firms were approved for the supply of Version 3.2.
- **National Adoption (2020):** In July 2020, Kavach was officially adopted by Indian Railways as the national ATP system.
- **Kavach Version 4.0 (2024):** The latest iteration, **Kavach Version 4.0,** was approved by the **Research Designs and Standards Organisation (RDSO) on 16th July 2024.** This version includes significant upgrades, making it more adaptable to the diverse railway network.
- **Notable improvements in Version 4.0 include:**
    - **Increased location accuracy** for safer train movements.
    - **Improved signal aspect information** for larger yards.
    - **Station-to-Station Kavach Interface on Optical Fibre Cable (OFC)** for seamless communication.
    - **Direct Interface with Electronic Interlocking Systems** for more efficient control.

**Progress of Kavach Implementation (As of February 2025)**

- **Optical Fiber Cable Laying:** 5743 km of optical fiber cable has been laid, ensuring robust communication infrastructure.
- **Telecom Towers Installation:** 540 telecom towers have been set up to facilitate continuous communication across the network.
- **Provision of Kavach at Stations:** 664 stations have been equipped with the Kavach system.
- **Loco Kavach Deployment:** 795 locomotives have been fitted with Kavach technology.
- **Track Side Equipment Installation:** Kavach system has been installed across 3727 RKm of track.

**Training and Capacity Building**

- To ensure that all relevant stakeholders are equipped to handle the new technology, Indian Railways has initiated a specialised training program for Kavach.
- These training sessions are being conducted at centralised training institutes of Indian Railways.
- More than **20,000 technicians, operators, and engineers** have already been trained on Kavach technology, with courses designed in collaboration with the **Indian Railways Institute of Signal Engineering and Telecommunications (IRISET).**

**Financial Overview**

- The cost of implementing the Kavach system is significant but necessary for the safety of the railway network.
- The **cost for provision of Track Side equipment** (including Station equipment) is approximately **Rs. 50 Lakhs per kilometer,** while the cost for equipping each locomotive with Kavach is around Rs. 80 Lakhs per loco.
- So far, **Rs. 1950 Crores** has been utilised for the implementation of the Kavach system. For the year **2024-25,** an allocation of **Rs. 1112.57 Crores** has been made to continue the works.

**Future Plans and Expansion**

- The next phase of Kavach implementation is focused on **scaling up** the system across Indian Railways. The plans include:
- **Equipping 10,000 Locomotives:** A major project to equip 10,000 locomotives with Kavach has been finalised.
- **Loco Sheds Preparation:** 69 loco sheds are being prepared for the installation of Kavach.
- **Track Side Works:** Bids for track side works covering approximately 15,000 RKm have been invited. Out of these, works for **1865 RKm** have already been awarded.

# Managing India's Government Debt

**Sub Topic:** *Fiscal Responsibility & Debt Management*

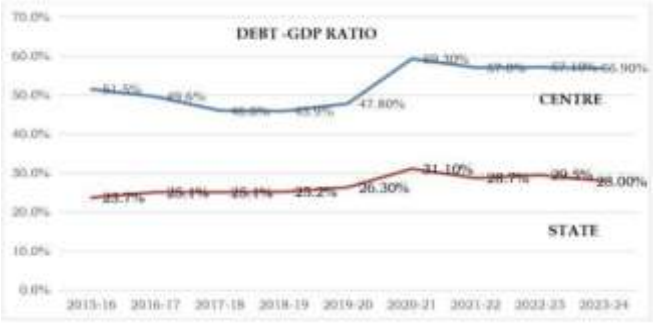
**Context:** The **Standing Committee on Finance** has recommended a **comprehensive and coordinated approach** to monitor and manage **general government debt** in India. The committee's report, tabled in **Parliament on March 19, 2025,** underscores the need for **prudent fiscal policies** at both the **central and state** levels.

**More in News**

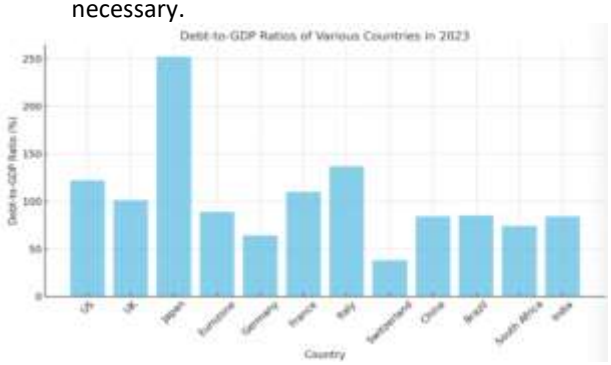
- Ajay Seth, **Secretary, Department of Economic Affairs (DEA),** emphasized that achieving a **debt-to-GDP ratio of 50% by 2031** would not be possible unless states also reduce their debt-to-GSDP ratios.
- The need for **efficient budgetary planning, fiscal discipline, and responsible borrowing** has been strongly emphasised.

**Current Debt Scenario and Targets**

- **India's general government debt-to-GDP ratio** currently stands at **80%+,** significantly higher than the **ideal level of 60%.**
- The government aims to **gradually reduce** this ratio, with an **interim target of 75%** before moving towards **60% in the long term.**




- The **Fiscal Responsibility and Budget Management (FRBM) Act** recommends a **debt-to-GDP ratio of 40% for the Centre and 20% for the states,** making a combined target of **60%.**
- Globally, countries with **reserve currency status** can sustain higher debt levels, but for **emerging economies like India, a prudent debt policy** is necessary.




**Challenges in Reducing Government Debt**

**Balancing Borrowing and Expenditure**

- India has **significant expenditure commitments,** including **PM-KISAN, food, fertiliser, and fuel subsidies.**
- Reducing borrowing without **cutting essential programs** could **adversely impact socio-economic welfare.**
- Scaling back such initiatives may affect **poverty alleviation and economic stability.**

**Revenue Growth Constraints**

- To sustain welfare spending, **faster revenue growth** is required.
- **GST collections** are near optimal, leaving limited scope for revenue expansion.
- Expanding the **tax base** or increasing **tax rates** could face **resistance.**
- Maintaining programs like **MGNREGA and health schemes** without additional revenue is a challenge.

**Difficulty in Reducing Debt without Impacting Growth**

- **Cutting infrastructure investments under the National Infrastructure Pipeline (NIP)** may **slow economic growth.**
- Reducing **social safety nets** such as **PDS (Public Distribution System)** and **PMAY (Pradhan Mantri Awas Yojana)** could **hinder poverty reduction.**
- Efforts to lower the **fiscal deficit** must balance **development priorities with fiscal consolidation.**

**Recommendations to Manage Current Debt Scenarios**

**Need for Revisiting Budget Allocations**

- The **Department of Economic Affairs (DEA)** must reassess fund allocations that are n**ot directly related** to its mandate.
- Example: In **Budget Estimates (BE) 2024-25,** the **'new scheme' category** was allocated **₹2,62,592.88 crore,** but later **revised down to ₹29,068.29 crore** in **Revised Estimates (RE) 2024-25.**
- More **accurate forecasting and better budgetary planning** are essential to ensure **efficient fund utilisation.**

**Improving Budgetary Forecasting and Execution**

- **Enhanced forecasting techniques** and **strategic foresight** are required for **better budget projections.**
- The **DEA must focus on financial discipline and fiscal prudence.**
- Setting a **benchmark of excellence in budgetary planning** will help other **ministries and departments** improve their execution.

**Efficiency in Subsidy Allocation**

- Ensuring **targeted subsidies** to the **most deserving beneficiaries** is crucial.
- Prioritising **critical sectors** for **maximum socio-economic impact.**
- Aligning **subsidy allocations with fiscal sustainability** to avoid excessive government borrowing.

## Strategic Bitcoin Reserve and Digital Asset Stockpile

**Sub Topic:** *"Cryptocurrency Regulation and Strategic Reserves: Global Trends and India's Approach"*

**Context:** President Donald Trump has signed an executive order establishing a Strategic Bitcoin Reserve, fulfilling a **campaign promise made during his presidential bid last year.**

**More on News**

- The order also mandates the **creation of a U.S. Digital Asset Stockpile,** encompassing other cryptocurrencies obtained through forfeiture proceedings.

**Strategic Advantage in Bitcoin**

- The executive order highlights **Bitcoin's status as the original cryptocurrency** and underscores the **strategic benefits of accumulating BTC due to its fixed supply.**
- The reserve **will be funded using Bitcoin currently held by the Department of Treasury,** acquired through criminal and civil asset forfeiture cases.
    - Other government agencies will assess their legal authority to transfer Bitcoin in their possession to this reserve.
- Despite this significant policy move, **Bitcoin's price dropped over 4% following the announcement.**

**Management and Operation of the Bitcoin Reserve**

- According to a fact sheet released by the White House, **no clear framework previously existed** for managing the government's digital asset holdings, leading to inefficiencies and missed opportunities.
- The order calls for a **full audit of all federal cryptocurrency holdings,** with estimates suggesting that the U.S. government possesses approximately 200,000 Bitcoin.
- The reserve **will be maintained as a long-term store of value,** and the U.S. government will not sell Bitcoin deposited into it.
- Additionally, the Secretaries of Treasury and Commerce have been authorised to explore **budget-neutral strategies to acquire more Bitcoin** without imposing additional costs on taxpayers.
- The White House fact sheet further noted that previous premature sales of Bitcoin by the government have cost taxpayers over $17 billion.

**U.S. Digital Asset Stockpile**

- In addition to the Bitcoin Reserve, the **executive order establishes the U.S. Digital Asset Stockpile,** which will consist of forfeited digital assets beyond Bitcoin.
    - Last week, Trump identified **Ethereum, XRP, Solana, and Cardano** as some of the cryptocurrencies that will be included.
- Unlike the Bitcoin Reserve, the **government will not actively acquire additional assets** for this stockpile beyond those obtained through forfeiture.
- The **Secretary of the Treasury will oversee the management of these holdings,** with the possibility of selling assets as part of responsible stewardship.

**Shifting Crypto Landscape**

- Since Trump's election victory, the **cryptocurrency market has shown increased optimism,** responding positively to signals that his administration may take a more favorable stance on digital assets.
- In a sign of shifting regulatory priorities, the **Securities and Exchange Commission (SEC) has recently dropped multiple investigations and lawsuits** against cryptocurrency firms, including Robinhood and Coinbase, that had been accused of securities violations.

**India's Status**

- In 2023, **India brought virtual digital assets (VDA),** including cryptocurrencies, **under the Prevention of Money Laundering Act (PMLA).**
- Both offshore and onshore VDA service providers are now **required to register with the Financial Intelligence Unit (FIU)** as reporting entities.
    - Additionally, **strict taxation policies discourage the holding and trading of cryptocurrencies.**
- India already has a r**obust digital financial ecosystem,** including the Unified Payments Interface **(UPI), Aadhaar-enabled payments, and the digital rupee.**
- The unchecked growth of cryptocurrencies **could undermine monetary policy, create fiscal risks, and bypass capital flow regulations.**
- Lessons can also be drawn from **El Salvador,** which declared Bitcoin legal tender.
    - Due to its volatility, the **country suffered losses of $22 million in national reserves by January 2022.**
- However, **despite India's cautious approach**, U.S.-based cryptocurrency exchange Coinbase recently **received approval from the FIU to re-enter the Indian crypto trading market.**
    - Whether India will maintain its cautious stance on cryptocurrencies or gradually open up remains to be seen.

## Quality Control Orders and Trade

**Sub Topic:** *Trade Barriers, Supply Chain Disruptions, and Transparency Issues*

**Context:** The experts are raising concerns that quality control orders are being misused to restrict imports, causing supply chain disruptions.

**Understanding Quality Control Orders (QCOs)**

- Quality Control Orders (QCOs) are **mandatory quality standards set by various central government departments** to ensure that **products sold in the Indian market meet specific benchmarks.**
- **These standards apply to both domestic and foreign manufacturers,** with compliance being assessed through testing, inspection, and certification by the **Bureau of Indian Standards (BIS).**
- QCOs have been issued for a **wide range of products,** including toys, footwear, electronics, electrical appliances, steel, and textiles.

**Why is India Issuing More QCOs?**

- **Developed countries regulate product quality through QCOs that apply to all manufacturers,** regardless of origin.
- As **India lowers import duties, QCOs have become a key tool for maintaining quality control and managing imports.**
- Before 2014, only 14 QCOs covered 106 products in India. However, since the enactment of the BIS Act in 2017, **over 140 QCOs have been introduced, covering approximately 550 consumer and industrial products, with many more in progress.**
- While QCOs aim to improve product standards, they have also **sparked debate over their impact on trade and industry.**
- Businesses argue that these **regulations create unnecessary trade barriers, lack transparency, and disrupt supply chains.**
    - For instance, strict QCOs on steel imports have led to shortages, affecting various industries reliant on the material.

**Challenges in Steel Imports**

- The **Ministry of Steel** mandates that **foreign manufacturers obtain BIS certification for 1,376 steel grades under the QCO framework.**
    - However, **import restrictions extend beyond these grades,** requiring a **No Objection Certificate (NOC)** for all steel imports, even for grades not covered under QCOs.
    - This regulation is particularly problematic, as there are over 10,000 globally recognized steel grades.
- The **complex approval process**—requiring clearance from multiple regulatory bodies including the **Ministry of Steel, BIS, and Customs—lacks coordination and functions like an outdated licensing system.**
    - As a result, **importers face delays, increased costs from demurrage fees, and business disruptions due to supply chain bottlenecks.**

**Concerns Over Selective Approvals**

- There have been concerns about the transparency of BIS approvals for foreign suppliers.
- In some cases, QCOs appear to have been selectively issued to benefit certain foreign firms that have joint ventures with large Indian companies, while applications from other foreign suppliers remain pending.
- Such practices raise concerns about fair competition and the possibility of market distortions.

**Improving QCO Implementation**

To ensure that QCOs enhance product quality without becoming barriers to trade, India must adopt a more structured and transparent approach. Several key measures can help improve their implementation:

- **Establish Clear Timelines:** BIS should define predictable timelines for inspections and QCO approvals to prevent unnecessary delays.
- **Limit NOCs to Regulated Products:** NOCs should not be required for products that do not fall under QCO regulations.
    - For example, **India mandates NOCs for all steel grades, even though only 1,376 out of 10,000 global grades are regulated.**
- **Exclude Non-Domestically Manufactured Products:** QCOs should not apply to products that India does not manufacture, such as Cold Rolled Grain Oriented (CRGO) steel, which is essential for transformers and primarily sourced from international suppliers.
- **Ensure Fair and Non-Selective Approvals:** BIS should ensure that approvals are granted fairly and are not selectively delayed based on the applicant's country or business affiliations.
- **Provide Sufficient Transition Periods:** Businesses, particularly **small and medium enterprises (SMEs),** need adequate time to adapt to new regulations.
    - While Europe allows a four-year transition period for new safety standards, India's rapid implementation has created compliance challenges.
- **Align QCOs with International Standards:** Standardising quality requirements with global benchmarks can enhance India's export competitiveness and attract foreign investment.
    - Strengthening testing facilities, accreditation systems, and market surveillance will also improve overall efficiency.
- **Conduct Regulatory Impact Assessments:** Before implementing new QCOs, the government should assess their potential impact on trade, supply

chains, and industry competitiveness. This will help mitigate disruptions and support better decision-making.

**Preventing the Misuse of QCOs**

- With global tariffs declining, **many countries are using QCOs as a means to regulate trade.**
  - For example, **China employs pre-registration and factory inspections** to delay import approvals.
- **In India, BIS factory inspections currently lack clear timelines,** raising concerns that QCOs could be misused as a trade restriction tool rather than a genuine quality control measure.

While QCOs play a crucial role in ensuring product quality, their implementation must be transparent, efficient, and aligned with global best practices. By streamlining approval processes, conducting thorough impact assessments, and ensuring fair competition, India can strengthen its manufacturing ecosystem while maintaining its reputation as an open and business-friendly economy.

## Delhi Metro's Freight Initiative: A Paradigm Shift in Urban Logistics

**Sub Topic:** *Integration of Public Transport with Sustainable Urban Freight Logistics*

**Context:** The Delhi Metro Rail Corporation (DMRC) has announced the introduction of urban freight services on its metro network. This initiative, in collaboration with Blue Dart, is the first of its kind in the South Asia Pacific region.

**Rationale for Metro-Based Freight Services**

**Traffic Congestion in Delhi**

- Delhi's roads are **highly congested,** with commercial freight vehicles adding to the problem.
- Shifting freight movement to the metro will help in **decongesting urban roads.**

**Environmental Concerns**

- Heavy reliance on **trucks and delivery vehicles** contributes to **air pollution and carbon emissions.**
- **Metro-based freight services, powered by electricity, will significantly reduce vehicular pollution.**

**Efficient Utilization of Metro Infrastructure**

- Metro networks are currently **underutilised during non-peak hours.**
- Freight integration will enhance the **economic sustainability** of the metro system.

**Growing Demand for Last-Mile Delivery Solutions**

- **E-commerce and retail sectors require fast and efficient logistics services.**
- Metro freight transport can **provide a reliable, time-bound, and cost-effective alternative.**

**Working Model: Hybrid Freight-Passenger System**

**Hybrid System Overview**

- Unlike Madrid Metro's **dedicated freight train model,** DMRC will adopt a hybrid approach.
- Freight will be transported **only during non-peak hours** to prevent disruption to passenger movement.

**Operational Mechanism**

- **Last coaches** of selected trains will be designated for cargo transportation.
- **Dedicated compartments** will be used to ensure safe and efficient transport.

**Types of Goods Transported**

- **E-commerce packages** (online retail orders, small parcels)
- **Small business supplies**
- **Perishable goods** (food, medicines, and essential commodities)

**Smart Scheduling System**

- **AI and IoT-based logistics solutions** will ensure smooth transition between passenger and freight operations.

**Expected Benefits of the Initiative**

**Reduction in Road Traffic Congestion**

- Shifting freight transport to the metro will **reduce the number of trucks on roads.**
- **Public transport efficiency and urban mobility** will improve.

**Environmental Sustainability**

- **Electric metro operations will reduce fossil fuel dependency.**
- Lower **carbon emissions** will contribute to **improving Delhi's air quality.**

**Cost-Effective Logistics Solution**

- Businesses will **save on transportation costs** due to metro-based freight.
- Logistics firms will benefit from **reduced fuel and maintenance expenses.**
- **24/7 Supply Chain Support:** The initiative will ensure uninterrupted logistics support for retailers, manufacturers, and essential services.

**Revenue Diversification for DMRC**

- Additional revenue from freight services will **support metro expansion and maintenance.**
- The financial sustainability of DMRC will improve. Operational Challenges and Solutions

**Logistical Integration**

- **Seamless coordination** between metro operations and logistics providers is crucial.
- **Solution: Efficient loading/unloading mechanisms and real time scheduling.**

**Global Precedents and Best Practices**

Madrid Metro Model

- In October 2024, Madrid Metro launched freight transport services using a dedicated train.

- Cargo was moved between 7-8 PM, ensuring no passenger disruption.

DMRC's Engagement with Madrid Metro

- DMRC is actively studying Madrid's model to adapt best practices for Indian conditions.
- The initiative is part of global urban freight trends aimed at enhancing sustainability and revenue generation.

**Infrastructure Adaptation**

- **Metro stations and trains require modifications** for cargo handling.
- **Solution:** Implement automated parcel handling systems and dedicated freight zones.

**Public Safety and Service Efficiency**

- Balancing **passenger convenience with freight movement.**
- **Solution:** Implement **strict time-slot management** and conduct **public awareness campaigns.**

**Future Expansion and Policy Implications**

**Scaling Up the Freight Network**

- DMRC aims to expand services to **Noida, Gurgaon, Faridabad, and Ghaziabad.**
- Future expansion could include **inter-city metro freight corridors.**

**Policy Support for Sustainable Urban Logistics**

- Government support through **incentives and regulatory approvals** will be critical.
- Policy frameworks must be aligned with **multi-modal urban logistics strategies.**

**Integration with Smart City Initiatives**

- The initiative aligns with In**dia's Smart Cities Mission,** aiming to reduce congestion and pollution.
- **Technological solutions** such as **IoT-based tracking and AI-powered logistics planning** will be essential.

**Challenges and Considerations**

- **Infrastructure Readiness:** Need for designated freight zones within metro stations.
- **Regulatory Approvals:** Requires clearance from urban transport authorities.
- **Safety and Security:** Ensuring that cargo does not interfere with passenger safety.
- **Pricing Mechanism:** Must be affordable for businesses while ensuring DMRC's profitability.
- **Public Acceptance:** Awareness campaigns needed to gain public support.

## India's Economic Growth

**Sub Topic:** *Economic Development, Growth & Investment*

**Context:** The latest national accounts data released by the National Statistical Office (NSO) on February 28, 2025, provide **crucial insights into India's economic performance.**

**More on News**

- These include revised annual **Gross Domestic Product (GDP)** and **Gross Value Added (GVA) estimates** for 2022-23, 2023-24, and 2024-25, as well as third-quarter GDP and GVA figures alongside the second advance estimates for 2024-25.

**Third Quarter Growth and Sectoral Performance**

- **Improvement: India's GDP grew by 6.2% in the third quarter of 2024-25, an improvement from the second quarter's 5.6%.**
- **Sectors:** Agriculture led the way with a robust growth rate of 5.6%, while manufacturing saw a modest recovery at 3.5%, up from 2.1% in the previous quarter.
    - The **services sector,** particularly trade and hospitality, also showed better performance, growing by 6.7% compared to 6.1% in the second quarter.
- **Concerns:** A key concern is the **sharp drop in GDP growth in the second quarter, which fell from 6.5% in Q1 to 5.6% in Q2.**
    - The primary driver behind this decline was **reduced private final consumption expenditure (PFCE),** which contributed only 3.3 percentage points to GDP growth, down from 4.3 in Q1.
- **Investments:** Investment also played a significant role in the third-quarter slowdown. **Its contribution to GDP growth dropped to 1.8 percentage points from 2.0 in Q2.**
    - The **Controller General of Accounts (CGA) reported that the government had spent ₹7.57 lakh crore in capital expenditure by January 2025, leaving ₹2.61 lakh crore to be spent in the final two months.**
    - Given that past February-March expenditure has averaged ₹1.81 lakh crore, a shortfall could jeopardise the 7.6% GDP growth estimate, potentially leading to a downward revision of the full-year 6.5% growth projection.

**Annual Data Revisions**

**Upward Adjustments:** The revised annual GDP estimates indicate **upward adjustments in real and nominal growth** rates.

- Real GDP growth for 2022-23, 2023-24, and 2024-25 has been revised to 7.6%, 9.2%, and 6.5%, respectively.
- The most significant revision occurred in 2023-24, where GDP growth was increased from 8.2% to 9.2%, and GVA growth was raised from 7.2% to 8.6%.

**Sectoral Adjustments:** Sectoral adjustments show the **largest upward revisions in manufacturing (2.4 percentage points) and financial and real estate services (1.9 percentage points).**

- However, the transition from 2023-24 to 2024-25 has seen a notable decline in growth, primarily due to lower gross capital formation, which dropped from 10.5% to 5.8%.

**ICOR:** The revisions also affect the Incremental Capital-Output Ratio (ICOR), a key measure of investment efficiency.

- ICOR values for 2022-23, 2023-24, and 2024-25 stand at 4.8, 4.0, and 5.5, respectively, with an average of 5.1. Large revisions in ICOR complicate economic policy planning and decision-making.

The **Incremental Capital-Output Ratio (ICOR)** is a key **economic metric used to assess the efficiency of capital investments in generating output.** It **measures the additional capital required to produce an additional unit of output,** typically expressed as the ratio of investment to growth. A **lower ICOR indicates that an economy is more efficient** in using capital to generate output. Conversely, a **higher ICOR suggests inefficiency,** as more capital is required to achieve the same level of output growth.

**Outlook for 2025-26 and Medium-Term Growth**

- **Higher than Expected:** Upward revisions in nominal growth rates suggest a **higher-than-expected nominal GDP growth of 14%, 12%, and 9.9% for 2022-23, 2023-24, and 2024-25, respectively.**
- **Balance:** A key consideration in India's growth strategy is the balance between consumption and investment.
    - While increasing the PFCE-to-GDP ratio could boost growth, it would also reduce investment demand, which is critical for long-term expansion.
- **Savings and Investments:** India's medium-term strategy should focus on increasing savings and investment rates.
    - The real investment rate, measured by the **gross fixed capital formation (GFCF)** to GDP ratio, is projected at 33.4% for 2024-25. Given an ICOR of 5.1, this translates into a potential growth rate of 6.5%, reinforcing the viability of an investment-led growth strategy over the long term.

**Gross Fixed Capital Formation (GFCF) is the total value of a producer's acquisitions, minus disposals**, of fixed assets during a given period. It also includes certain additions to the value of non-produced assets realised by producers or institutional units.

India's economic trajectory continues to be shaped by a complex interplay of consumption, investment, and global economic conditions. While recent data revisions indicate stronger-than-expected growth in prior years, sustaining momentum will require focused efforts on boosting investment and savings. As the country navigates global uncertainties, an investment-driven approach remains the most viable path for long-term sustainable growth.

## Indian Digital Economy Ranked 28th in User Spending

**Sub Topic:** *Infrastructure (Digital Sector) & Inclusive Growth*

**Context:** India has emerged as the third-largest digital economy globally, following the United States and China however despite its rapid digital growth, India's per capita digitalisation ranks 28th out of 32 countries.

**India's Digital Economy: A Global Perspective**

- According to the **ICRIER-Prosus Centre for Internet and Digital Economy (IPCIDE) report, I**ndia is the **third-largest digital economy but ranks 28th in per capita adoption.**
- The CHIPS framework evaluates India's digital standing based on **Connectivity, Harnessing technology, Innovation, Protection, and Sustainability.**
- The **digital economy is expected to contribute one-fifth of national income by 2029-30,** reflecting its transformative impact on economic growth and employment
- India ranks **8th globally** in overall digital performance, surpassing Japan, Australia, Mexico, and Brazil.
- The US and China dominate the **AI ecosystem,** accounting for **70% of AI unicorn valuations and 80% of venture capital (VC) investments in AI.**

**Paradox of Digital Adoption in India**

- While India has high telecom penetration, **40% of the population lacks internet access, and 50% does not use smartphones.**
- **Mobile internet access is higher than fixed-line access,** a pattern observed only in India and Nigeria.
- Limited **fixed broadband infrastructure** restricts long-term digital resilience.
- The **Southern and Western states** are ahead in digitalisation compared to the **Eastern and Northern states.**

**Sectoral Digitalisation Trends**

**Banking, Financial Services, and Insurance (BFSI)**

- Over **95% of banking transactions** are digital.
- However, **core revenue-generating activities (loans and investments) remain largely offline.**

**Retail and E-commerce**

- **Omni-channel retailing** is growing, with e-tailers integrating physical stores.
- AI chatbots and **digital inventory management** enhance operational efficiency.

**Economic Contribution of the Digital Sector**

- The **digital economy accounted for 11.74% of GDP** (INR 31.64 lakh crore or USD 402 billion) in 2022-23.

- It employs **14.67 million workers, contributing 2.55% of India's workforce**.
- The digital economy is nearly **five times more productive** than the rest of the economy.
- **Digital platforms and intermediaries contributed 2% of GVA,** while **digitally enabling industries (ICT, electronic components, and communication equipment) added 7.83% of GVA.**
- **India hosts 55% of the world's Global Capability Centers (GCCs),** reinforcing its role in global digital services.

**Education**

- A hybrid model combining **online and offline learning** is emerging as the preferred approach.
- AI-based learning platforms are gaining popularity, though accessibility remains a concern.

**Hospitality and Logistics**

- Large firms have fully digitalised operations, whereas **smaller players lag behind.**
- **AI, metaverse applications, and automation** are being adopted in supply chain management.

**Challenges in Digital Growth**

**Infrastructure Bottlenecks**

- **Limited fixed broadband** access restricts high-speed connectivity and long-term growth.
- Digital infrastructure gaps persist in rural and underdeveloped areas.

**AI Readiness and Digital Research**

- India ranks **11th in AI research and 16th in AI infrastructure.**
- The US and China lead AI advancements, raising concerns about India's competitiveness in this field.

**Consumer IoT and Metaverse Adoption**

- India lags significantly in the adoption of **Consumer Internet of Things (IoT) and metaverse applications.**
- Scores in these categories are **below the median of 32 countries.**

**Future Prospects and the Way Forward**

- By **2030, India's digital economy is projected to contribute nearly 20% of GDP,** surpassing agriculture and manufacturing.
- **Digital platforms** are expected to grow at **30% annually,** driven by advancements in AI, cloud computing, and fintech.
- The **digital workforce is set to expand,** providing new opportunities, particularly for women.
- An inclusive and sustainable digital transition will require a **collaborative effort between the government, businesses, and individuals.**
- **Government and Policy Interventions:** India's **G20 Sherpa Amitabh Kant** emphasised the need to democratise technology through **open-source models and cost-competitive AI solutions.** Government initiatives must focus on:
  - Strengthening digital infrastructure.
  - Encouraging startups and innovation.
  - Enhancing digital skills among citizens.

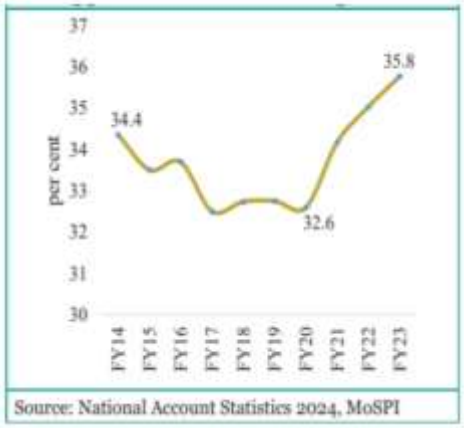
## India as a Global Leader in Textiles

**Sub Topic:** *Indian Economy, Manufacturing Sector, and Infrastructure*

**Introduction:** The textiles and apparel industry is **India's second-largest employer** after agriculture, providing direct employment to **45 million people.** With a projected annual growth rate of 10%, the sector is expected to become **a USD 250 billion market by 2030.**

**About India's Textile Industry:**

- Valued at **$153 billion in 2021, with $110 billion from domestic business.**
- **Contributes 2.3% to GDP and 10.6% to total manufacturing GVA (FY23).**
- **Third-largest textile exporter globally (FY22), with a 5.4% share.**
- If **exports** grow from **USD 45 billion to USD 100 billion,** textiles can add **one million jobs annually.**
- Around **80% of the sector consists of MSMEs,** making it sensitive to global market fluctuations.




Share of Non-corporates

- India has the potential to establish itself as a global leader as major competitors like **China, Bangladesh, and Vietnam** face disruptions due to **geopolitical and economic shifts.**

**Factors Favoring India's Textile Industry**

**Economic and Demographic Strengths**

- **Stable economy and governance** with strong **bilateral relations** with major economies.
- **The young population** ensures a steady labour force.
- **Centuries-old textile tradition,** with deep-rooted expertise in craftsmanship.

**Government Initiatives Supporting the Sector**

- **Pradhan Mantri Mega Integrated Textile Region and Apparel (PM MITRA)** Parks to develop textile hubs.

- **Production Linked Incentive (PLI)** Scheme to boost domestic manufacturing.
- **Rebate of State and Central Taxes and Levies (RoSCTL)** Scheme to promote exports.
- **Focus on digitalisation and e-commerce,** providing new opportunities for market expansion.
- **100% FDI under automatic route** to attract investments.
- **National Handloom Development Programme** to support traditional textile sectors.

**Challenges Hindering India's Textile Growth**

**Export Slowdown**

- **Growth in FY22:** Exports reached $43.4 billion.
- **Decline in FY23:** Demand fell, leading to shutdowns of nearly 500 spinning mills in Tamil Nadu.
- **Tiruppur,** a major textile hub, witnessed a 40% drop in business.

**Cost Disadvantages and Labour Issues**

- India faces a **15-20% cost disadvantage** compared to competitors like Bangladesh and Vietnam.
- **Labour Shortages:** Major hubs like **Tiruppur** suffer from workforce shortages, while regions **like UP, Bihar, Odisha, and MP** have excess labour.
- **High Attrition Rate:** About 10% attrition, largely due to high transport and accommodation costs for workers.

**Raw Material and Policy Issues**

- **High Cotton Prices:** 10% import duty on cotton increases production costs.
- **Quality Control Orders on MMF:** Regulatory hurdles affect raw material availability and price stability.

**Structural Challenges of MSMEs**

- **Fragmented industry** with limited economies of scale.
- **High transportation costs and reliance on imported machinery.**

**Lack of skilled manpower.**

- Sustainability and Changing Consumer Preferences
- Growing demand for **sustainable textiles** due to **stricter ESG norms.**
- **Rise of e-commerce and direct-to-consumer retailing** altering business models.

**Way Forward**

**Industrial Housing Policy**

- **Building worker quarters near factories** to reduce absenteeism and improve retention.
- **Incentives such as FSI regulation relaxation, GST exemptions, and government grants** to support manufacturers in housing investments.
- Model based on Ch**ina's worker accommodation strategy** to enhance efficiency.

**Enhancing Labour Efficiency**

- **Skill development programs** to improve worker productivity.
- Adoption of **automation and modern technologies** alongside human talent to increase efficiency without reducing employment.
- Providing stable jobs for women, who constitute **90% of the blue-collar workforce,** ensuring their empowerment.

**Boosting Domestic and Export Markets**

- Strengthening domestic demand through **e-commerce and quick commerce platforms.**
- Expanding export markets by leveraging India's **strong international trade relations.**
- Promoting **sustainable and value-added textiles** to cater to global trends in ethical consumption.

## India's Path to High-Income Status by 2047

**Sub Topic:** *Indian Economy, Growth & Development, Economic Reforms and Growth Strategies*

**Context: India must implement bold economic reforms to achieve high-income status by 2047,** requiring an **average annual growth rate of 7.8%,** according to the **World Bank's India Country Economic Memorandum released recently.**

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- The report stresses the **need for a shift from "business as usual" to "accelerated reforms",** focusing on productivity growth, sustained investment, quality job creation, and economic development in low-income states.

**Challenge of Transitioning to a High-Income Economy**

- **Few countries have successfully transitioned** from middle-income to high-income status within two decades.
- While nations like **Chile, Romania, Poland, Czech Republic, and Slovakia have made this leap,** others such as **Brazil, Mexico, and Turkey remain trapped in the upper-middle-income group.**
- For India to achieve its ambitious goal, its **gross national income (GNI) per capita must increase eightfold, from $2,540 in 2023 to surpass the high-income threshold of $14,005** as per the World Bank's classification.
- This would require **not just maintaining current growth trends but intensifying reforms to navigate a challenging global economic environment.**

**Reform Scenarios: Business as Usual vs. Accelerated Growth**

The World Bank report outlines **two potential growth trajectories for India:**

**Business as Usual:**

- **Investment will peak at 37% of GDP by 2035.**

- The **economy will grow at an average annual rate of 6.6%.**

**Accelerated Reforms:**

- **Investment will reach 40% of GDP by 2035.**
- **Economic growth will accelerate to 7.8% per year,** facilitating high-income status.

Currently, **India's gross capital formation-to-GDP ratio stands at 31.4%** (2023-24).

- The **Ministry of Statistics and Programme Implementation (MoSPI) has revised real GDP growth for 2023-24 to 9.2%, while growth for 2024-25 is projected at 6.5%.**

**Key Reform Areas for Sustained Economic Growth**

To achieve high-income status, India must **prioritise structural and financial sector reforms, investment in critical industries, and trade liberalisation.**

**Financial Sector Reforms:** Efficient credit allocation and financial stability are essential. The report calls for:

- **Deepening the corporate bond market** to reduce reliance on traditional banking.
- **Expanding credit access for micro, small, and medium enterprises (MSMEs).**
- **Strengthening financial institutions** to minimise risks.

**Boosting Public and Private Investments:** The report emphasises targeted public investments in sectors that stimulate private investment, including:

- **Agriculture and allied industries** to enhance rural employment.
- **Urban development** to support infrastructure and sustainable growth.
- **Transport networks** to improve logistics efficiency.

**Trade and Foreign Investment Liberalisation:**

- **Reducing tariffs and trade barriers** will drive economic expansion.
- **Enhancing foreign direct investment (FDI)** will integrate India into global value chains (GVCs), increasing productivity and exports.
- **Addressing market concentration in key industries**—such as petroleum, computer and communications equipment, and cement—to encourage competition and new market entrants.

**Creating Quality Jobs and Strengthening Labor-Intensive Sectors:** For job creation, the report recommends:

- **Strengthening labour-intensive industries** such as traditional market services and intermediate manufacturing.
- **Improving logistics infrastructure,** labour laws, and land availability to facilitate industrial expansion.
- **Encouraging sectors with strong backward linkages,** such as hospitality, commercial trade, and communications.

**Bridging State-Level Economic Disparities**

- India's development is uneven, with income disparities between states. The report highlights the **need for state-specific policies rather than a one-size-fits-all approach:**
  - **Less-developed states should strengthen fundamental growth drivers,** such as infrastructure, education, and governance.
  - **More developed states should focus on next-generation reforms,** including advanced manufacturing, technology-driven sectors, and high-value services.
  - **Large-scale interstate migration is limited,** making it critical to foster regional economic convergence through tailored policy interventions.

India's aspiration to become a high-income economy by 2047 is ambitious but achievable— provided that comprehensive reforms are implemented with urgency.

## Gender Budget and Care Economy

**Sub Topic:** *Policies for Women's Economic Empowerment*

**Context:** The Union Budget for 2025 has **allocated a record ₹4,49,028.68 crore to the Gender Budget (GB), reflecting a 37.3% increase from FY24 and accounting for 8.86% of the total Budget.**

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- This substantial rise is largely **attributed to the inclusion of the PM Garib Kalyan Anna Yojana,** which constitutes **24% of the GB,** rather than significant investments in care infrastructure or new gender-responsive initiatives.
- Despite the increase, the **lack of targeted investment in care infrastructure underscores the continued neglect of care work in India's economic planning.**
- While the **Economic Surveys of 2023-24 and 2024-25** highlight the **importance of care infrastructure for women's empowerment, the Budget fails to translate this recognition into concrete financial commitments to strengthen India's care economy.**

**Burden of Unpaid Care Work**

**UCDW: Globally, women spend an average of 17.8% of their time on unpaid care and domestic work (UCDW),** with those in the **Global South carrying a disproportionately higher burden.**

- **Indian women, in particular, shoulder 40% more of this workload than their counterparts in South Africa and China.**
- According to the **International Labour Organisation, 53% of Indian women remain outside the labour force due to caregiving responsibilities, compared to just 1.1% of men,** highlighting deep-seated gender inequalities.

**Greater Burden:** For women from low-income and marginalised communities, this burden is even greater, **often**

**requiring them to juggle 17–19 hours of daily work between paid and unpaid responsibilities.**

- This exacerbates **'time poverty,' severely affecting their well-being and economic opportunities.**
- Feminist economists from the Global South emphasise that **unpaid work in these regions extends beyond household caregiving to include agricultural labour, water and fuel collection, and sanitation-related tasks.**
- **Limited access to essential infrastructure** forces women to spend up to 73% of their time on unpaid work, with water collection alone consuming nearly five hours daily, compared to 1.5 hours for men.
- **Climate change is expected to further aggravate these challenges,** with water-related unpaid labour in India projected to reach $1.4 billion by 2050 under high-emission scenarios.

**Policy Recommendations: Recognising and Addressing Care Work**

The Economic Survey 2023-24 suggests that public investment equivalent to 2% of GDP could create 11 million jobs while reducing the care burden. Applying an expanded **'Three R'** framework—Re**cognise, Reduce, Redistribute, and Represent**—can make policies more effective and transformative.

**Recognising Unpaid Care Work:** India's 2019 **Time Use Survey** was a critical step in acknowledging the extent of unpaid care work, revealing that women spend an average of seven hours daily on UCDW.

- However, the **high cost of conducting these surveys limits their implementation.**
- Integrating time-use modules into existing household surveys could provide a more feasible solution.

**Reducing the Burden of UCDW:** Expanding access to time-saving infrastructure and affordable caregiving services is essential.

- The government has extended the **Jal Jeevan Mission (JJM) until 2028 to ensure 100% potable water coverage.**
- However, **delays in funding and underutilisation hinder its progress.**
- While the **scheme's Budget declined by 4.51% from last year's estimates, it saw a 195% increase in revised estimates,** reflecting allocation-spending mismatches.
- Strengthening implementation and sustainability measures for JJM is crucial to reducing the time women spend on water collection.
- Enhancing childcare centers, eldercare facilities, and assistive technologies would significantly alleviate women's care burdens and boost their workforce participation.

**Redistributing Care Work: Shifting caregiving responsibilities from the home to the State and within households is vital.**

- The newly announced **₹1 lakh crore Urban Challenge Fund,** with ₹10,000 crore allocated for FY 2025-26, presents an opportunity to address these issues.
- By **financing up to 25% of bankable projects, the fund encourages private and public sector participation in urban redevelopment, water, and sanitation projects.**
- This initiative could be leveraged to scale up care infrastructure models piloted under the **Smart Cities Mission.**

**Ensuring Women's Representation in Policy-Making:** Women's participation in decision-making processes is essential for crafting gender-transformative policies.

- Excluding them results in policies that fail to reflect their lived realities.
- Research suggests that women's involvement in governance enhances policy effectiveness significantly, sometimes by six to seven times.

## Guidelines for Transporting Petroleum Products by Road

**Sub Topic:** *Sub Toic- Infrastructure, Transport & Disaster Management*

**Context:** In response to recent accidents involving trucks carrying liquefied petroleum gas (LPG), the **Petroleum and Natural Gas Regulatory Board (PNGRB) has introduced stricter guidelines for the transportation of petroleum products by road.**

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- The new regulations **prohibit the transportation of these products between 11 PM and 6 AM and mandate quarterly inspections of vehicles** to ensure all safety fittings are properly installed, maintained, and tested.

**Preference for Pipelines and Railways**

- The PNGRB has **recommended reducing road transportation of bulk petroleum products** over long distances and **instead utilising pipelines or railway rakes.**
- The board also **suggested that spare pipeline capacity of oil marketing companies be used for product sharing or as common carriers** to facilitate the transportation of petroleum products more safely and efficiently.
- On December 10, the regulator proposed the **development of nine LPG pipelines** with a total length of 3,470 kilometres.
    - These pipelines would connect 50 bottling plants with ports and refineries, significantly reducing reliance on road transport.

**Petroleum and Natural Gas Regulatory Board (PNGRB)**

The Petroleum and Natural Gas Regulatory Board (PNGRB) is a **statutory body established under the Petroleum and Natural Gas Regulatory Board Act, 2006** in India. It is **responsible for regulating downstream activities** in the petroleum and natural gas sector, which include refining, processing, storage, transportation, distribution, marketing, and the sale of petroleum products and natural gas. The PNGRB is **led by a chairman and includes members from various fields,** such as commerce and marketing, legal, information technology, and marketing.

**Key Responsibilities of PNGRB:**

- **Regulation of Downstream Activities:** PNGRB oversees the refining, processing, storage, transportation, distribution, marketing, and sale of petroleum and natural gas products. However, it does not regulate the production of crude oil and natural gas.
- **Promotion of Competitive Markets:** The board aims to ensure competitive markets in the oil and natural gas sectors, promoting consumer interests and investment.
- **Consumer Protection:** PNGRB works to protect consumer interests by ensuring an uninterrupted and adequate supply of petroleum products and natural gas across the country.

**Emphasis on Public Safety**

- PNGRB emphasised that **commercial viability should not be the sole consideration** when deciding on a mode of transport; **public safety must also be a priority,** particularly when transporting petroleum products over long distances or through congested areas.
- To enhance safety, **oil marketing companies have been instructed to develop comprehensive journey management plans.**
- These plans **should include designated stops along specific routes,** awareness programs for drivers and crews about accident-prone areas, emergency response measures, and weather forecasts for the travel route.

**Stricter Work Hour Regulations**

- The new guidelines also specify that transport workers **should not be required to work more than eight hours a day or 48 hours a week,** ensuring better working conditions and reducing the risk of accidents caused by fatigue.

## Cotton Crisis in Punjab

**Sub Topic:** *Indian Economy, Agriculture & GM Crops*

**Context:** The cotton industry in Punjab is facing a severe crisis due to pest attacks and decreasing yields. Farmers are demanding the introduction of advanced pest-resistant genetically modified (GM) cotton varieties like **Bollgard-3,** but regulatory delays are hindering progress.

**Declining Cotton Acreage and Industry Setback**

- **Shrinking Cotton Cultivation:** The area under cotton cultivation in Punjab has drastically reduced from **8 lakh hectares three decades ago to only 1 lakh hectares in 2024.**
- **Impact on Ginning Industry:** The decline in cotton production has led to the closure of most ginning units, with only **22 operational units remaining** out of **422 in 2004.**

**The Demand for Bollgard-3 in India**

- **Superior Pest Resistance: Bollgard-3** is a genetically modified cotton variety that contains three Bt proteins—**Cry1Ac, Cry2Ab, and Vip3A**—which disrupt insect gut function, leading to pest death.
- **Effective Against Pink Bollworm:** Unlike earlier Bt cotton varieties, **Bollgard-3 is highly effective against lepidopteran pests like the pink bollworm,** which has devastated crops in Punjab since 2015-16.
- **Unavailability in India:** Despite its global use, **Bollgard-3 has not been approved in India yet,** leaving farmers to struggle with pest attacks.

**Bollgard-2 Roundup Ready Flex (BG-2RRF) as a Likely Alternative**

- **Pending Approval Since 2012-13:** BG-2RRF, another advanced GM cotton variety with **herbicide tolerance**, has undergone both government and private trials but still **awaits final regulatory approval.**
- **Weed Control Benefits:** BG-2RRF allows farmers to control weeds without harming cotton plants, reducing competition for resources and increasing yield.
- **Potential for Future Technologies:** Experts believe BG-2RRF can serve as a gateway for more advanced seed technologies, which can further improve yields and pest resistance.

**Regulatory Delays and Their Impact**

- **Hindrance to Innovation:** The lack of timely approvals for **Bollgard-3 and BG-2RRF** has significantly **delayed the introduction of next-generation seed technologies in India.**
- **Economic Impact on Farmers:** Farmers face **low yields, higher pest management costs, and low profitability,** making cotton farming increasingly unsustainable in Punjab.

**Short-Term Solutions for Farmers**

- **Agronomic Practices:** Experts recommend **proper seeding, mulching, high-density planting, and drip fertigation** to improve cotton yield despite pest challenges.
- **Pest Management Remains an Issue:** Without access to **advanced pest-resistant varieties like**

**Bollgard-3,** farmers must rely on traditional pest control measures, which are less effective.

**Global Advances in Cotton Farming**

- **Brazil's Bollgard-5 Technology:** Brazil has moved ahead with Bollgard-5, a cotton variety that offers protection against multiple pests, weeds, and insects.
- **Yield and Profit Comparison:** Brazilian farmers achieve astronomical yields of 2400 kg per hectare, whereas Indian farmers produce only 450 kg per hectare. Profit margins in India remain as low as 15%, compared to 85% in Brazil.

**Future of Punjab's Cotton Industry**

- **Uncertain Future Without Innovation:** Industry leaders warn that without **high-yielding, pest-resistant cotton varieties,** Punjab's cotton industry b
- **Need for Policy Reform:** Experts and farmers urge **faster regulatory approvals** to introduce next-generation cotton seed technologies, which are crucial for reviving the industry.

## Strategic Petroleum Reserves and Energy Security Needs

**Sub Topic:** *Energy Security and Infrastructure Development*

**Context:** Indian **Strategic Petroleum Reserve Limited (ISPRL)** is currently assessing bids from domestic firms for the construction of the second phase of India's Strategic Petroleum Reserve (SPR) at Padur, Karnataka.

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- Simultaneously, ISPRL is in **discussions with the Abu Dhabi National Oil Company (Adnoc) to renew a lease for a cavern at the existing Mangalore SPR facility,** which is set to expire in May.
- The **bidding process,** which concluded in late February, **was aimed at selecting a partner for the 2.5 million-ton capacity SPR at Padur.**
- To attract investment, the **Indian government eased restrictions on the sale and export of crude from SPRs** and introduced incentives like tax benefits and viability gap funding.

**Expanding Storage to Meet IEA Requirements**

- ISPRL **plans to more than triple its current SPR capacity from 5 million to 15 million tons over the next decade.**
- This expansion **aligns with India's ambition to join the International Energy Agency (IEA),** which ***mandates that member countries maintain at least 90 days of crude storage.***
- The increased SPR capacity is **expected to cover approximately 25 days of India's oil consumption,** and when combined with commercial storage at refineries, it would allow India to meet IEA requirements.
- In February, Finance Minister Nirmala Sitharaman **allocated ₹5,597 crore in the 2025-26 Budget to refill the country's strategic crude reserves.**
    - This decision followed a **parliamentary committee's recommendation to enhance storage levels.**

**Current Storage Status and Oil Holdings**

- India's SPR capacity currently stands at **5.33 million tons (39 million barrels), with nearly 70% of this volume filled.**
- **ISPRL-controlled storage is almost at full capacity,** with only **200,000 tons available at Visakhapatnam.**
- At present, ISPRL manages **23 million barrels of SPR capacity at Padur and Visakhapatnam,** with additional storage held by oil companies.
    - The 18-million-barrel Padur facility, operated by ISPRL, is stocked with Saudi Arabian crude, while the 5-million-barrel capacity in one of the two Visakhapatnam caverns contains Iraqi Basrah oil.
    - Hindustan Petroleum holds a 2.2-million-barrel cavern at Visakhapatnam and has leased an equivalent volume from ISPRL for storing Iraqi crude.
- In **Mangalore**, Adnoc operates one of the two 11-million-barrel caverns, storing Murban crude, while MRPL has leased the second cavern.

**International Energy Agency (IEA)**

It is a Paris-based intergovernmental organisation established in 1974 under the Organisation for Economic Co-operation and Development (OECD). Initially created to ensure the security of oil supplies following the 1973-1974 oil crisis, the IEA's mandate has expanded over time to address broader energy issues, including climate change, energy efficiency, and sustainable energy transitions. The IEA has 31 member countries, primarily industrialised nations, and 13 associate countries, which together represent over 75% of global energy demand. Countries like India, China, and Brazil participate in IEA activities through associate membership, enhancing cooperation on energy security and sustainability. The IEA requires its member countries to maintain strategic petroleum reserves equivalent to at least 90 days of their net oil imports. This collective reserve system ensures that member countries can respond effectively to supply disruptions.

**Geopolitical Concerns and Future Projects**

- In late 2023, the **Indian government scrapped a ₹5,000 crore allocation intended for SPR refilling to manage the fiscal deficit.**
    - However, a **geopolitical crisis affecting Gulf oil supplies—India's primary import**

**source—highlighted vulnerabilities in India's strategic reserves.**

- Looking ahead, **India is determined to enhance its crude oil storage capacity to meet IEA membership criteria.**
    - Officials estimate that **India currently has nine days of strategic storage, supplemented by 80 days of commercial storage at refineries.**
- The planned SPR at **Chandikhol, Odisha,** is facing delays due to land acquisition issues. Officials are currently demarcating land, and once the acquisition process is completed, ISPRL will proceed with issuing a tender for its construction.

## Second Phase of Asset Monetisation Project

**Sub Topic:** *Asset Monetisation and Infrastructure Development*

**Context:** The NITI AAYOG has commenced a significant exercise to identify infrastructure projects for the second phase of its ambitious asset monetisation initiative, as announced in the FY26 Budget.

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- According to official sources, the **government will soon appoint a consultant** to develop a sector-wise roadmap for the **National Infrastructure Pipeline (NIP) 2.0.**
- This phase, termed the **National Monetisation Pipeline (NMP) 2.0,** aims to mobilise **₹10 lakh crore from brownfield operational assets** across various sectors between FY26 and FY30.
- The sectors include **highways, railways, power, petroleum and natural gas, civil aviation,** ports, warehousing and storage, urban infrastructure (including housing and transport), coal and mines, and telecom. The respective ministries will play a crucial role in setting sectoral targets and implementing the plan.
- The **last date for submitting bids for the consultancy is April 5,** and the selected technical consultant will be hired for five months.
- Under NMP 2.0, the monetisation of highway assets is expected to accelerate significantly, with a target of generating ₹3.5 lakh crore over the next five years— more than double the estimated revenue from the first phase of NMP.

**National Infrastructure Pipeline (NIP)**

The NIP is a **comprehensive initiative to develop social and economic infrastructure** projects across India over a five-year period. It aims to improve the quality of life, attract investments, and support India's goal of becoming a $5 trillion economy by 2025. Initially, **NIP targeted investments of ₹102 lakh crore,** which has since increased to **₹111 lakh crore and further to around ₹160 trillion,** covering sectors like roads, railways, renewable energy, and affordable housing. The **Centre, States, and private sector** share the capital expenditure in a ***39:39:22 ratio.*** The NIP includes both **greenfield and brownfield projects.**

**National Monetisation Pipeline (NMP)**

The NMP is designed to **unlock the economic potential of underutilized brownfield government assets** by engaging the private sector. It **aims to raise ₹6 lakh crore from FY22 to FY25** and has been expanded to **target ₹10 lakh crore for FY26 to FY30.** Includes sectors such as highways, railways, power, petroleum and natural gas, civil aviation, ports, warehousing, urban infrastructure, coal and mines, and telecom. Focuses on **leasing revenue rights rather than selling ownership,** ensuring assets return to the government after the transaction period.

**Key Aspects of the Initiative**

**Role of DIPAM:** The **Department of Investment and Public Asset Management (DIPAM)** plays a pivotal role in the asset monetisation process.

- DIPAM is **responsible for identifying and managing public assets,** ensuring their efficient monetisation, and facilitating private sector participation.
- It acts as the **nodal agency for implementing the government's disinvestment and monetisation strategies,** ensuring transparency and maximising value realisation.

**Asset Monetisation Plan:** The Asset Monetisation Plan aims to **unlock the value of underutilised or idle public assets by leasing or selling them to private entities.**

- This strategy helps generate funds for new infrastructure projects without increasing the fiscal burden.
- The NMP 2.0focuses on brownfield assets, which are already operational, to attract private investment and accelerate infrastructure development.

**Example in India:** A notable example of asset monetisation in India is the **Toll-Operate-Transfer (TOT) model implemented by the National Highways Authority of India (NHAI).**

- Under this model, operational **highways are leased to private players for a fixed period in exchange for an upfront payment.**
- The first bundle of TOT projects, involving nine highways, fetched ₹9,681 crore in 2018.

**Practices from Different Countries:** Asset monetisation is a globally recognized strategy.

- For instance, **Australia's "Asset Recycling Initiative"** encouraged state governments to privatise assets and reinvest the proceeds into new infrastructure projects.
- Similarly, **Canada** has leveraged **public-private partnerships (PPPs)** to monetise assets like airports

and highways, ensuring efficient management and revenue generation.

**Capital Receipts vs. Revenue Receipts: Proceeds from asset monetization are classified as capital receipts** since they involve the sale or lease of government-owned assets.

- These receipts are **non-recurring and are used to finance capital expenditures,** unlike revenue receipts, which are recurring in nature and include taxes and other regular income.

**NITI Aayog's Previous Involvement:** NITI Aayog has been actively involved in identifying and recommending assets for monetisation in the past.

- The **Economic Survey 2020-21** highlighted **NITI Aayog's role in preparing a comprehensive list of non-core assets for disinvestment and monetisation.**
- The organisation has also provided strategic inputs for the first phase of NMP, ensuring alignment with national infrastructure goals.

## Role of AI in Inflation Forecasting

**Sub Topic:** *Indian Economy & Economic Development*

**Context:** The year 2022 marked a turning point in global economic trends as inflation surged unexpectedly, reversing previous patterns of low inflation.

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- This shift underscored the **complexities of monetary policymaking** in the post-pandemic era, particularly in India, where the **Reserve Bank of India (RBI) now faces similar challenges.**
- The **interconnected nature of global markets has significantly influenced inflationary cycles,** further complicated by the integration of low-wage workers into the global workforce.

**Response of Central Banks**

- **Modernised Methods:** In response to these challenges, central banks, including the RBI, **must modernise their economic forecasting methods.**
    - The new RBI governor has already emphasised the **need for technological advancements in this domain.**
- **LLMs:** A key innovation in economic forecasting is the integration of Large Language Models (LLMs).
    - These AI-driven models **offer a transformative approach to understanding and predicting inflation.**
    - Given that central banks invest substantial resources in surveying consumer inflation expectations, **LLMs could serve as a viable alternative by replicating human survey patterns and processing economic information in real-time.**

**Leveraging LLMs for Inflation Estimation**

LLMs can improve inflation forecasting in two primary ways:

**Analysing Large Textual Data Sources:** LLMs can process vast amounts of information from news articles, economic reports, and social media to detect inflation trends and sentiments.

- This approach provides a **more nuanced and timely assessment** compared to traditional methods, which rely solely on numerical data.
- By enhancing **"nowcasting"** techniques—short-term inflation forecasting— AI and machine learning models are becoming integral to economic analysis.

**Deploying AI Agents for Inflation Surveys:** AI-driven survey agents can simulate consumer responses to structured inflation expectation surveys, reducing the reliance on costly and time-consuming household surveys.

- These agents incorporate external knowledge, helping policymakers understand how economic information shapes public expectations.
- Given that household inflation expectations influence consumer behaviour and central bank policies, this approach could significantly enhance economic decision-making.

**Effectiveness:** Recent studies underscore the effectiveness of AI in inflation forecasting.

- Research by **Miguel Faria-e-Castro and Fernando Leibovici (2024) at the Federal Reserve Bank of St. Louis** highlights how **LLMs like Google's PaLM generate inflation forecasts with lower errors compared to traditional survey-based models.**
- Similarly, Bybee (2023) demonstrated the potential of GPT-3.5 in simulating economic expectations, reinforcing the credibility of AI-driven forecasting techniques.

**Challenges and Future Prospects**

- Despite its promise, the use of LLMs for inflation forecasting comes with **limitations.**
- These models are **trained on specific datasets selected by developers, restricting user control over the training process.**
- Additionally, the **absence of time-stamped data prevents true out-of-sample forecasts.**
- Furthermore, publicly available LLMs undergo regular retraining, making replicability a challenge for researchers.

**AI's Growing Influence on Economic Forecasting**

- Studies indicate that **nearly 40% of U.S. adults had used GAI by August 2024, with 28% incorporating it into their work.**
    - As AI-driven decision-making becomes more prevalent, understanding its implications for economic forecasting is essential.

- A compelling example of AI's predictive capabilities emerged during **India's 2024 general elections.**
    - While **traditional exit polls failed to accurately predict results, Kcore Analytics, an AI-driven research firm, successfully forecasted voter preferences.**
    - By analysing social media interactions—what people read, wrote, and engaged with—alongside key economic indicators like inflation, the firm delivered an accurate prediction. This demonstrates AI's potential to process real-world economic and political data effectively.

In the words of **Milton Friedman,** albeit with a modern twist: ***"Inflation is everywhere a monetary (and a political) phenomenon."*** As AI continues to reshape economic research, central banks must embrace these technologies to enhance forecasting accuracy and support informed policymaking.

## The Parliamentary Standing Committee Report on Indian Railways (FY26)

**Sub Topic:** *Infrastructure: Railways; Investment Models including PPP*

**Context:** The Parliamentary Standing Committee on Railways has recommended that the **Ministry of Railways** focus more on **public-private partnership (PPP)** projects to reduce its dependence on **gross budgetary support (GBS)** from the central government.

**More on News**

The committee highlighted that while the Indian Railways has been receiving record GBS for expanding and modernising its network, it must be more ambitious in attracting private sector investment to reduce dependence on government funds.

**Current Scenario**

- For **FY26**, Indian Railways' annual plan is set at **₹2.65 lakh crore,** similar to FY25.
- Over **95% of capital expenditure (Capex)** is funded through **GBS**.
- Less than **5%** comes from **other sources** like **Public-Private Partnerships (PPP)** or financing via Indian **Railway Finance Corporation (IRFC).**

**Committee Recommendations**

- Railways should be **more ambitious** in promoting **private sector participation.** Set **higher PPP targets** to reduce reliance on GBS.
- Explore ways to enhance **PPP investments** in railway infrastructure.
- Acknowledge that borrowing via IRFC increases **financial liabilities** due to debt servicing, but encourages finding **sustainable investment avenues.**
- **Accelerate approvals** and construction of new freight corridors, and ensure **timely completion** of existing infrastructure projects.

**Accelerating Dedicated Freight Corridors (DFCs)**

- **Current Status: DFCCIL** has submitted **Detailed Project Reports (DPRs)** for three new corridors: **East-Coast Corridor, East-West Corridor,** and **North-South Sub-Corridor.**
    - The **Ministry of Railways** has indicated that these projects' sanctioning depends on factors like **traffic volume, techno-economic feasibility,** and **financial viability.**
- **Committee's Concern & Suggestions:** Urged the ministry to **fast-track studies** to assess feasibility and initiate work on new corridors **without delay.** Emphasised completing the **remaining portion of the Western Dedicated Freight Corridor (WDFC)** within the **decided time frame** to avoid further extensions.

**Speeding Up Kavach Deployment**

- The **Kavach** system, an **indigenous automatic train protection (ATP)** system, has been deployed on **1,465 route km** of the **South Central Railway** and **80 route km** of the **North Central Railway.**
- The committee expressed concerns about the **slow deployment** of Kavach and called for the **speeding up of Kavach-related works** to ensure its faster implementation across the railway network.
- It also noted that tenders have been invited for important corridors like **Delhi-Chennai** and **Mumbai-Chennai** to expand Kavach's coverage.

**Privatisation of Indian Railways**

- **Privatisation Goal:** The Indian Railways has initiated the process of inviting Request for Qualifications (RFQ) for private firms to operate passenger trains. This will allow private investment for the first time in running passenger trains over the network.
- **Trains and Routes:** A total of **151 modern, high-speed trains** will be introduced, designed for speeds up to 160 km/h. These trains are expected to significantly reduce journey times, aligning with the speed and efficiency of the Rajdhani, Vande Bharat, and Tejas trains operated by Indian Railways.
- **Private Sector Role:** The private entity will be responsible for **financing, procurement, operation,** and **maintenance** of the trains. The trains will be manufactured **under the Make in India initiative,** ensuring that most components are locally sourced and assembled.

- **Long-Term Funding:** The government has estimated that **₹50 lakh crore** will be needed for Indian Railways' operations over the next 12 years, and the privatisation of passenger train services is seen as a potential way to meet this funding gap.

## Global Government and Corporate Debt

**Sub Topic:** *Indian Economy, Government Borrowing, Fiscal Policy, and Debt Sustainability*

**Context:** The **total outstanding government and corporate bonds worldwide exceeded $100 trillion in 2023,** according to a report released by the **Organisation for Economic Co-operation and Development (OECD).**

**Rising Interest Costs and Economic Impact**

**Interest Costs:** Between 2021 and 2024, interest costs as a share of global economic output **increased from historic lows to the highest levels seen in two decades.**

- According to the OECD, **governments within its member states spent 3.3% of their GDP on interest payments in 2023**—exceeding their defence expenditures.
- Although central banks have begun reducing interest rates, **borrowing costs remain significantly higher than pre-2022 levels.**
- Consequently, as low-interest debt continues to be replaced, the **burden of interest payments is expected to rise further.**

**Fiscal Challenges:** This trend is unfolding at a time when **governments are facing significant fiscal challenges.**

- For instance, **Germany recently approved a massive infrastructure investment plan** and **increased defence spending at the European level.**
- Additionally, **major economies must contend with persistent expenses related to climate change initiatives and ageing populations.**

**OECD**

The Organisation for Economic Co-operation and Development (OECD) is an **international organisation founded in 1961 to stimulate economic progress and world trade.** It serves as a platform for member countries to collaborate, compare policy experiences, and develop solutions to common challenges. The OECD is headquartered at the **Château de la Muette in Paris, France.** It comprises **38 member countries, primarily high-income democracies** with market economies including nations from Europe, North America, Asia-Pacific, and Latin America. It publishes economic reports, statistical databases, and policy recommendations. The OECD **evolved from the Organisation for European Economic Co-operation (OEEC),** which was established in 1948 to administer **Marshall Plan** aid for post-war reconstruction in Europe.

**Constraints on Future Borrowing**

- The OECD warned that the combination of rising debt levels and higher borrowing costs **could restrict future borrowing capacity,** especially at a time **when global investment needs are at an all-time high.**
- Despite the increase in interest rates, **more than half of OECD countries and nearly a third of emerging markets are still servicing debt at lower rates than current market levels.**
- However, **refinancing pressures remain high,** with nearly half of government and corporate debt in these economies set to mature by 2027.

**Refinancing Risks for Low-Income Nations**

- **Low-income countries and high-risk economies face the most severe refinancing challenges.**
- **More than 50% of their debt will mature within the next three years,** and over 20% is due this year, the report noted.
- As borrowing becomes more expensive, **governments and corporations must ensure that their debt is directed toward long-term economic growth and productivity,** OECD's Head of Capital Markets and Financial Institutions, Serdar Celik, emphasised.

**Shifting Corporate Borrowing Trends**

- Since 2008, **companies have increasingly used debt for financial engineering,** such as refinancing existing obligations and shareholder payouts, rather than for capital investments.
    - This shift has contributed to **declining corporate investment levels,** the OECD noted.
- **In emerging markets,** where foreign currency borrowing is prevalent, **the OECD emphasised the need to develop local capital markets** to reduce dependency on external debt.
- The **cost of issuing dollar-denominated bonds has surged from around 4% in 2020 to over 6% in 2024,** with junk-rated economies facing rates exceeding 8%.
- Many emerging markets **struggle to tap into domestic financial resources due to low savings rates and underdeveloped capital markets.**

**Geopolitical Tensions and Climate Financing Challenges**

- The OECD report also highlighted the **significant financial challenge of transitioning to a net-zero emissions economy.**
- Emerging markets outside China are **expected to face a $10 trillion funding gap to meet the Paris Climate Agreement goals by 2050.**
- If these necessary climate investments are financed primarily through public borrowing, **debt-to-GDP ratios could rise by 25 percentage points** in

advanced economies and by 41 percentage points in China by mid-century.

As global economies navigate these financial hurdles, strategic investments and responsible borrowing practices will be crucial in ensuring economic stability and sustainable growth.

## Global Arms Imports

**Sub Topic:** *International Relations – Security and Defence*

**Context: Ukraine emerged as the world's largest importer of major arms between 2020 and 2024,** marking an almost **hundredfold increase compared to the 2015-2019 period,** according to the latest report by the **Stockholm International Peace Research Institute (SIPRI).**

The **Stockholm International Peace Research Institute (SIPRI)** is an **independent international institute** based in **Stockholm, Sweden.** Established in 1966, SIPRI **conducts research on issues related to conflict, armaments, arms control, and disarmament.** The institute aims to contribute to the understanding of conditions necessary for peaceful solutions to international conflicts and sustainable peace.

**More on News**

- The surge in arms imports is **attributed to the ongoing war with Russia,** which has now entered its fourth year.
- **India ranked as the second-largest arms importer** during the same period, despite a **9.3% decline** in its total arms imports compared to 2015-2019.
    - The country remained the **top recipient of arms from both Russia and France,** though its imports from Moscow have seen a significant decline.
- In contrast, **China, for the first time since 1990-1994, dropped out of the list of the world's top 10 arms importers, reflecting the nation's growing domestic defence manufacturing capabilities.**

**India's Shifting Arms Import Trends**

- **Russia:** India's **reliance on Russian arms has decreased over the years,** with **Moscow accounting for 36% of India's arms imports in 2020-24,** a notable **drop from 55% in 2015-19 and 72% in 2010-14.**
- **France:** However, India **continues to engage in major defence deals,** particularly with France.
    - It remains the **largest buyer of French arms, receiving 28% of France's total exports**—nearly double the share that went to all European buyers combined (15%).
    - **Qatar was the second-largest importer of French arms,** accounting for 9.7% of exports.
    - India has already procured **36 Rafale fighter jets and six Scorpene-class submarines from France,** with deals for **26 Rafale-M jets and three more submarines expected to be finalised soon.**

**Pakistan's Arms Imports Rise**

- Pakistan saw a **61% increase in arms imports between 2015-2019 and 2020-2024.**
- **China remained its dominant supplier, providing 81%** of Pakistan's arms imports in the latest period, up from 74% in 2015-2019.
- This reflects Beijing's expanding influence in South Asia's defence landscape.

**Global Export Trends**

- **Europe:** The SIPRI report highlights a **significant surge in European arms imports,** which rose by **155%** in response to increasing security concerns following Russia's full-scale invasion of Ukraine in 2022.
- **USA:** Meanwhile, the **United States strengthened its position as the world's leading arms exporter,** increasing its share of global arms exports to 43%.
- **Russia: Russia's arms exports, however, declined by 64%, falling to 7.8% of global exports,** putting it behind France, which accounted for 9.6% of global arms sales in 2020-24.
- **France:** France **exported arms to 65 countries,** with its arms sales to other European nations nearly tripling (+187%) between 2015-2019 and 2020-2024.
    - This surge was primarily driven by the **supply of combat aircraft to Greece and Croatia, as well as arms shipments to Ukraine.**

**Ukraine's Arms Imports and Global Transfers**

- Ukraine **accounted for 8.8% of global arms imports in 2020-24,** with weapons supplied by at least 35 countries since the onset of the war in 2022.
- The **United States was the largest supplier to Ukraine,** providing 45% of its total arms imports, **followed by Germany (12%) and Poland (11%).**
- **Ukraine was the only European nation among the top 10 global arms importers,** though several other European nations significantly increased their arms procurement during the same period.

## India's Boost to Defence Manufacturing

**Sub Topic:** *Indigenous Defence Manufacturing and Self-Reliance in India*

**Context:** The **Cabinet Committee on Security (CCS),** led by Prime Minister Narendra Modi, has approved a monumental **deal worth ₹7,000 crores** for the **procurement of 307 domestically produced artillery guns** and their towing vehicles.

**More on News**

- This deal marks a significant step towards **strengthening India's defence manufacturing capabilities,** particularly in the artillery sector.
- The approval for the **Advanced Towed Artillery Gun System (Atags)** was granted on **19th March,** setting the stage for the signing of a formal contract by the end of March 2025.

**Background of the Atags Project**

- The Atags project, spearheaded by the **Defence Research and Development Organisation (DRDO)** since 2013, is designed to **replace India's older artillery systems with modern,** more efficient **155mm/52-calibre guns.**
- These guns, with an impressive **range of 48 km,** are poised to enhance the artillery capabilities of the Indian Army.
- The order for the Atags guns will be divided between the two firms, with **Bharat Forge** securing 60% of the production, while **Tata Advanced Systems Limited (TASL)** will be responsible for the remaining 40%.
- Bharat Forge emerged as the lowest bidder for the tender, highlighting the competitive nature of India's push to boost domestic defence production.

**Context and Strategic Importance**

- **Previous Defence Contracts:** This move comes just three months after the **Ministry of Defence** signed a contract worth ₹7,629 crores with **Larsen & Toubro** for the procurement of 100 self-propelled **K9 Vajra-T** artillery guns.
    - These K9 Vajra-T guns, which are manufactured with technology transfer from the South Korean firm **Hanwha Techwin,** will be deployed with a focus on mobility and precision, especially in mountainous terrain like **Ladakh.**
- **Modernisation Strategy:** The Indian Army's artillery modernisation focuses on improving **firepower, mobility, precision, range, quick strikes, and survivability.**

**Five-Pronged Strategy for Modernisation:**

- **Equipping artillery regiments** with advanced 155mm artillery systems like Atags.
- **Induction of missiles and rockets** with longer ranges and precise targeting capabilities.
- **Development of lethal ammunition** to increase the effectiveness of artillery.
- **Reorganisation of surveillance and target acquisition units** for better intelligence and quicker decision-making.
- **Shortening the sensor-to-shooter loop,** enabling rapid target detection and destruction.

The **Atags** system plays a key role in this strategy, offering India a cutting-edge artillery capability, including the deployment of prototypes for ceremonial events like the **75th Independence Day** at the **Red Fort** in 2022, where it shared the stage with traditional British guns.

**Boosting Self-Reliance in Defence Manufacturing**

India has been increasingly focused on achieving **self-reliance** in its defence manufacturing sector, and this latest deal is a testament to that commitment.

A series of measures have been implemented to reduce dependency on foreign imports and foster the domestic defence industry, including:

- **Phased import bans** on various weapon systems and technologies.
- **Creating a separate budget** for the purchase of locally made military hardware.
- **Increasing foreign direct investment (FDI)** from 49% to 74%, with a focus on improving the ease of doing business in the defence sector.
- Allocation of more than **₹6.81 lakh crore** for defence spending in the **Union Budget** of 2025, with **₹1.8 lakh crore** dedicated to military modernisation.
    - A significant part of the modernisation budget—75%—is dedicated to procuring weapons and equipment from domestic sources, furthering India's goal of **"Atmanirbhar Bharat"** (self-reliant India).
- **Declining Weapon Imports and a Growing Domestic Sector:** India has made notable progress in reducing its dependency on foreign weapons, with a **9.3% decline in imports** between 2015–2019 and 2020–2024, according to a recent report by the **Stockholm International Peace Research Institute (SIPRI).**

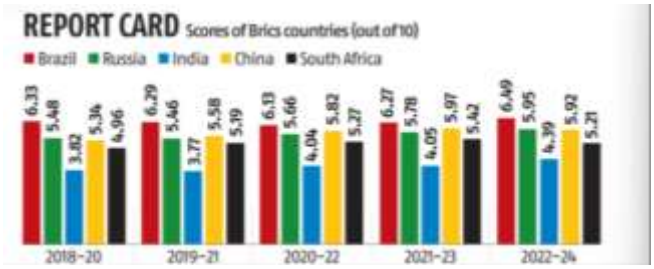
## India's Happiness Ranking

**Sub Topic:** *Governance, Social Justice & International Reports and Indices*

**Context: India has made notable progress in its global happiness ranking,** as per the **World Happiness Report 2025.**

**More about the Findings**

- The country's happiness **score increased from 4.054 out of 10 in the 2021-23 period to 4.389 in 2022-24.**
- This improvement also led to a **rise in India's ranking from 126th among 143 countries to 118th among 147 nations.**




- Meanwhile, **Pakistan**, despite facing economic struggles, **has outperformed India in terms of happiness scores.**
    - Pakistan's score saw an **improvement from 4.657 to 4.768** during the same period. However, its **global ranking dropped slightly from 108th to 109th.**

| Countries | Happiness score (2022-24) | Change in happiness score from 2006-10 to 2022-24 |
|---|---|---|
| Nepal | 5.31 | 0.71 |
| Pakistan | 4.77 | -0.37 |
| **INDIA** | 4.39 | -0.58 |
| Sri Lanka | 3.89 | -0.38 |
| Bangladesh | 3.85 | -0.92 |

- **Finland has been named the happiest country in the world for the eighth consecutive year.**
- Following Finland in the rankings are **Denmark, Iceland, Sweden, and the Netherlands,** all of which benefit from high living standards and robust social support networks.
- Notably, Costa Rica and Mexico made significant strides by entering the top ten for the first time since the report's inception in 2012.
- In contrast, the United States fell to its lowest-ever ranking at 24th place, down from 23rd in 2024.
- The bottom of the list includes Afghanistan, Sierra Leone, and Lebanon, with Afghanistan ranked as the least happy country due to ongoing challenges faced by its population.

The World Happiness Report is published by the **Wellbeing Research Centre at the University of Oxford**, in partnership with **Gallup and the UN Sustainable Development Solutions Network.** The report also involves **an independent editorial board consisting of experts in the field of happiness and wellbeing.**

**Methodology**

- The happiness scores are **determined based on the national average of responses to life evaluation questions in the Gallup World Poll.**
- Respondents assess their current life **on a scale from 0 (worst possible life) to 10 (best possible life).**
- The rankings in the 2025 report are derived from a three-year average of life evaluations collected between 2022 and 2024.
- To analyse the differences in happiness levels among nations, the **report considers six key factors:** GDP per capita, healthy life expectancy, social support, perceived freedom to make life choices, generosity, and perception of corruption.
    - According to **World Bank data, India's per capita income in 2023 stood at $2,480.8, significantly higher than Pakistan's $1,365.3.**
    - In terms of healthy life expectancy at birth, **India recorded 58.1 years in 2021, slightly surpassing Pakistan's 56.9 years, as per the World Health Organisation.**

While India's rise in the rankings is a positive indicator, Pakistan's higher happiness score, despite economic challenges, suggests that factors beyond financial stability play a crucial role in determining overall happiness levels.

## Subject – Science & Technology

## NASA's SPHEREx and PUNCH Missions

**Sub Topic:** *Science & Technology, Space Missions, and Their Applications*

**Context:** NASA has successfully launched two groundbreaking missions, **SPHEREx** and **PUNCH**, aboard a **SpaceX Falcon 9 rocket** from **Vandenberg Space Force Base** in California on **March 11 at 8:10 p.m. PDT.** These missions aim to enhance our understanding of the universe and the Sun, from studying the origins of galaxies to exploring the solar wind.

**Mission Goals and Timelines**

- Both missions will operate in a **low Earth, Sun-synchronous orbit,** ensuring the Sun remains consistently positioned relative to the spacecraft.
- SPHEREx will begin its **two-year mission** after a **one-month checkout period.** Its scientific data will provide a wide perspective on the cosmos and deepen our understanding of the universe's origins and evolution. PUNCH will undergo a **90-day commissioning period,** during which the spacecraft will align and calibrate its instruments. Afterwards, the mission will begin analysing the Sun's corona and solar wind dynamics.

**SPHEREx: Unveiling the Origins of the Universe**

- The **Spectro-Photometer for the History of the Universe, Epoch of Reionisation and Ices Explorer (SPHEREx)** mission will focus on mapping the universe's history.
- SPHEREx will spend its two-year mission period creating a **3D map of the entire celestial sky** every six months.

  - This comprehensive perspective will complement the work of other space telescopes, such as **NASA's James Webb Space Telescope** and Hubble Space Telescope, which observe smaller sections of the sky in more detail.
- The mission will use **spectroscopy** to measure the distance to over **450 million galaxies** in the nearby universe and examine the **cosmic glow** from these galaxies to understand their formation and evolution.
- SPHEREx will also explore the **Milky Way** for **frozen water ice** and other essential molecules like **carbon dioxide**, which are crucial for life as we know it.
- SPHEREx is expected to provide critical insights into cosmic events such as **inflation**, a period of rapid expansion in the early universe.
- The observatory's data will help answer profound questions about how the universe began and where the building blocks of life are found.

**PUNCH: Studying the Sun's Solar Wind**

- Riding along with SPHEREx is the **Polarimeter to Unify the Corona and Heliosphere (PUNCH),** a mission designed to study the Sun's outer atmosphere and solar wind.
- The PUNCH mission consists of **four small satellites** that will observe the **solar corona** and investigate how **solar wind** is generated and how it affects space weather.
- PUNCH's primary objective is to understand the formation and evolution of **coronal mass ejections** (CMEs), which can generate energetic particle radiation that may pose risks to astronauts and spacecraft.
- By capturing detailed **3D images of the solar wind,** PUNCH aims to answer basic questions about how stars like our Sun produce stellar winds and the impact of space weather events on Earth.

**Collaboration and Mission Details**

- **SPHEREx** is managed by NASA's **Jet Propulsion Laboratory (JPL)** and led by Caltech. The spacecraft was built by **BAE Systems** (formerly Ball Aerospace), and its data will be publicly available through the **NASA-IPAC Infrared Science Archive.**
- **PUNCH** is led by **Southwest Research Institute (SwRI),** with the four satellites and **Wide Field Imager instruments** built at SwRI's headquarters in Texas. The **Narrow Field Imager** was built by the **Naval Research Laboratory** in Washington. PUNCH's mission will be managed by NASA's **Explorers Program Office at Goddard Space Flight Center.**

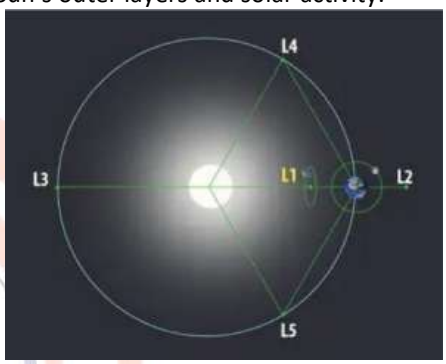
## Aditya-L1 Captures First-Ever Image of Solar Flare 'Kernel'

**Sub Topic:** *Science & Technology, Space Missions, and Their Applications*

**Context:** India's first space-based solar mission, **Aditya-L1,** has achieved a significant breakthrough by capturing the **first-ever image of a solar flare 'kernel'** in the lower solar atmosphere. This discovery provides new insights into solar energy dynamics and its impact on Earth.

**Aditya-L1 Mission Overview**

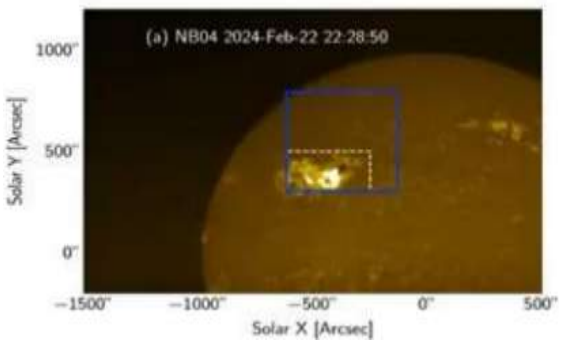
- **India's First Solar Mission:** Launched to study the Sun's outer layers and solar activity.

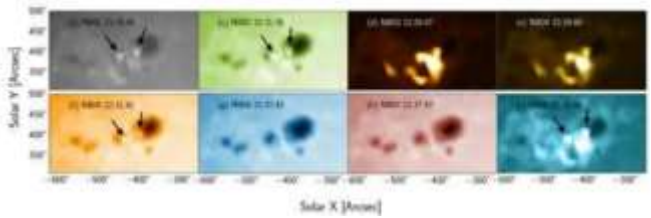



- **Position at L1 Point:** The spacecraft orbits the **first Earth-Sun Lagrange Point (L1),** 1.5 million km from Earth, allowing uninterrupted solar observation.
- **Launch Details:** Launched on **September 2, 2023,** by **PSLV-C57,** and successfully placed in a **halo orbit** around L1 on **January 6, 2024.**

**Discovery of Solar Flare Kernel**

- **First-Ever Image of Solar Flare Kernel:** Aditya-L1's **Solar Ultraviolet Imaging Telescope (SUIT)** recorded a unique brightening in the **Near-Ultraviolet (NUV) band (200-400 nm)** in the lower solar atmosphere.
- **Observed Solar Flare:** On February 22, 2025, SUIT detected an **X6.3-class solar flare,** one of the most intense categories of solar eruptions.
- **New Insights:** This observation confirms that **flare energy spreads through different layers** of the Sun's atmosphere, advancing our understanding of solar physics.





**Solar Ultraviolet Imaging Telescope (SUIT)**

- **What is SUIT?:** A **specialised telescope** onboard Aditya-L1, developed by **Inter- University Centre for Astronomy and Astrophysics (IUCAA), Pune.**
- **Functionality:** Captures **high-resolution images in 11 different Near-UV wavebands,** covering the **photosphere and chromosphere.**
- **Significant Observations:**
    - Recorded **NUV brightening** in a solar flare, a wavelength never observed in such detail.
    - Provided **clear evidence of energy transmission** from the solar surface to the corona.
    - Confirmed **linkage between flare energy deposition and temperature evolution.**

**Understanding Solar Flares**

- **Definition:** A **sudden and intense burst of solar energy** caused by the **Sun's dynamic magnetic field.**
- **Effects:** Emits **X-rays, ultraviolet light, and charged particles,** which can disrupt satellite communications, GPS, and power grids on Earth.
- **Classification:** Solar flares are categorised into **A, B, C, M, and X classes,** based on intensity.

**How Aditya-L1 Studies Solar Flares**

- **SUIT (Solar Ultraviolet Imaging Telescope):** Captures UV images of the lower solar atmosphere.
- **SoLEXS (Solar Low Energy X-ray Spectrometer) & HEL1OS (High Energy L1 Orbiting X-ray Spectrometer):** Monitor solar X-ray emissions to detect flares.
- **Continuous Observation:** Aditya-L1's unique position at L1 enables real-time monitoring of solar activity.

**Link Between Solar Flares and Solar Corona**

- **What is the Solar Corona?:** The Sun's outermost layer, consisting of highly ionized gas with temperatures ranging from 1 to 10 million Kelvin.
- **Energy Transfer Confirmation:** SUIT's observations confirmed that the **localised brightening in the lower solar atmosphere corresponds with plasma temperature increase in the corona.**
- **Scientific Validation:** This validates long-standing theories and provides new data reshaping our understanding of solar flares.

**Significance of the Discovery**

- **Validates Theories:** Confirms long-standing predictions about solar energy transfer mechanisms.
- **Enhances Space Weather Prediction:** Helps scientists **forecast solar storms,** protecting satellites and power grids.
- **Advances Solar Physics:** Strengthens global research on the **Sun's impact on Earth's climate** and space environment.

**Future Implications of Aditya-L1's Observations**

- **Better Understanding of Solar Activity:** Helps decode magnetic field variations and solar eruptions.
- **Protection Against Solar Storms:** Provides crucial data for mitigating solar flare-induced disruptions.
- **Foundation for Future Missions:** Paves the way for advanced solar studies and next-generation space missions.

## The Mystery of Bose Metals

**Sub Topic:** *Science & Technology, Quantum Mechanics, and Material Science*

**Context:** A recent study by researchers from **China and Japan,** published in Physical Review Letters on February 13, 2024, suggests that **Niobium Diselenide (NbSe2)** may exhibit Bose metal behaviour, challenging existing theories of metallic states.

**More on News**

- The study of electrical conductivity in metals has led to fascinating discoveries, including superconductivity and the theoretical concept of **Bose metals.**
- While superconductors exhibit **infinite conductivity** at extremely low temperatures, Bose metals exist in an anomalous state where Cooper pairs form but do not condense into superconductivity.

**Understanding Electrical Conductivity in Metals**

- Metals are materials that conduct electricity efficiently, with **conductivity varying based on temperature.**

  **Example:** Zinc's conductivity at **20°C** is approximately **16.9 million siemens per meter**. When cooled to **-272.3°C,** zinc becomes a **superconductor**, meaning it has **zero electrical resistance** and can conduct electricity infinitely.
- This transformation occurs due to changes in the behaviour of **electrons within the metal**. At room temperature, electrons move freely but experience **repulsive forces** and disturbances from atomic vibrations, impurities, and interactions with atomic nuclei.

**How Metals Become Superconductors?**

- When metals are **cooled to extremely low temperatures,** certain forces acting on electrons weaken:

- Below a **critical temperature,** electrons experience a weak net attractive force, forming **Cooper pairs.**
- Cooper pairs act differently from individual electrons and undergo a **phase transition** to form a **superconducting state.**
- In this state, the material exhibits **infinite conductivity**, meaning no electrical energy is lost during transmission.

**Key Findings of the Study**

- The researchers observed **Cooper pairs in NbSe2 without full superconductivity.**
- **Hall resistance disappeared** as the thickness of NbSe2 increased, indicating charge carriers were Cooper pairs.
- Used **Raman spectroscopy** to confirm fluctuating local pairing without condensation into a superconducting state.
- Findings suggest **phase fluctuations** disrupt superconductivity in NbSe2.

**The Concept of Bose Metals**

- A **Bose metal** is an **anomalous metallic state (AMS)** where: **Cooper pairs exist** but do not form a superconducting state. The material does not achieve **long-range superconducting coherence.**
- This contradicts traditional theories, which predict that metals at absolute zero should either:
- Become an **insulator (zero conductivity).**
- Become a **superconductor (infinite conductivity).**
- Since Bose metals exhibit conductivity between **zero and infinity,** their existence challenges fundamental assumptions in **condensed matter physics.**

**Why Studying Bose Metals Matters?**

- Bose metals may provide insights into **disordered metals**, which contain **irregular atomic structures, impurities, or alloying effects** that alter their properties.
- They may help **explain quantum behaviours** in metals that do not fit within standard superconductivity theories.
- Although **no Bose metals have been directly observed,** scientists have predicted their existence in specific materials.

**Implications**

- Results challenge existing theories on superconductivity and metallic states.
- Provides insights into **phase transitions** and **quantum processes** in materials.
- No immediate practical applications, but research on Bose metals could influence future innovations in **quantum computing and superconducting technologies.**

**NbSe2 (Niobium Diselenide)**

- NbSe2 is a **type-II superconductor**, which allows magnetic fields to penetrate in isolated pockets without disrupting the superconducting state.
- NbSe2 becomes superconducting at low temperatures but has additional behaviour, making it more dynamic under the influence of a magnetic field.

## India's AI Ambitions: Launching an Indigenous AI Model and AISI

**Sub Topic:** *Science & Technology, AI Governance, and Digital Economy*

**Context:** India is set to make a **significant leap in artificial intelligence (AI)** with the announcement of an **indigenous AI model** and the establishment of an **AI Safety Institute (AISI)** under the **Safe and Trusted Pillar** of the IndiaAI Mission.

**More on News**

- Union Minister **Ashwini Vaishnaw** highlighted this initiative, reinforcing India's commitment to **AI governance and risk mitigation.**
- In recent years, governments worldwide have realised the importance of addressing AI risks proactively, leading to the establishment of **AI Safety Institutes (AISIs)** in several nations.

**Global Context and Need for AISIs**

- Countries like the **U.K., U.S., Singapore,** and **Japan** have already set up such institutes to evaluate and mitigate the risks posed by AI, ensuring its safe and ethical use.
    - **U.K.:** Unveiled the **'Inspect'** open-source platform for evaluating AI models across multiple domains such as reasoning and autonomous capabilities.
    - **U.S.:** Established an inter-departmental taskforce focusing on national security and public safety risks related to AI.
    - **Singapore:** Focuses on **content assurance, safe model design, and rigorous testing** of AI technologies.
- These institutes underline the importance of **technical rigour** and **international collaboration** to ensure the safety and fairness of AI systems across borders.

**India's Approach to AI Safety and Indigenous Solutions**

- India, with its unique socioeconomic landscape, linguistic diversity, and technological gaps, must prioritise AI solutions that cater specifically to local concerns such as **AI inaccuracy** and the **risk of discrimination.**
- India's AISI is designed to operate on a **hub-and-spoke model,** collaborating with various **academic institutions, startups, industry players,** and **government departments** to address these challenges effectively.
- **India-Specific AI Solutions:**

- **Data Representation:** Indian startups like **Karya** are tackling the issue of unrepresentative data by empowering rural communities to create **high-quality datasets** in Indian languages.
- **Multilingual AI:** Other startups are advancing AI development in **multiple languages,** ensuring that AI technologies are inclusive and accessible.

- These local initiatives are essential for ensuring **social equity** and overcoming technical challenges unique to India.

**AI Safety Initiatives and Indigenous R&D**

- India's AISI will focus on advancing **indigenous research and development** with a focus on **Indian datasets**. Some of the key initiatives under the **IndiaAI Mission's Safe and Trusted pillar** include:
  - **Responsible AI Projects:** Eight projects have already been selected, focusing on areas such as **watermarking, ethical AI frameworks, risk assessment, and deepfake detection.**
  - **Expression of Interest (EOI):** A second round of EOI has been launched, addressing critical AI areas to ensure safe AI development and deployment.
- The AISI will play a pivotal role in fostering AI innovation while ensuring that these technologies adhere to the principles of safety, transparency, and inclusivity.

**Global Alignment and Collaboration**

India's AISI cannot operate in isolation. To ensure that its AI policies and frameworks align with international standards, India must collaborate with global AISIs and develop systems that facilitate **global interoperability.**

**Key Steps for Global Collaboration:**

- **Global Standardised AI Safety Taxonomy:** A common, **standardized taxonomy** for AI safety is crucial to ensure consistent communication and assessment of AI systems across different countries.
  - A global taxonomy would help stakeholders from multiple disciplines speak the same language when assessing AI systems and attributing responsibilities across the AI supply chain.
- **International Notification Framework:** India's AISI should advocate for the creation of a **global notification framework** that allows AISIs to share information about the purpose and potential impact of AI models. This would enhance transparency and enable coordinated governance, ensuring that nations are prepared for the safe deployment of advanced AI systems.
- **Leadership in the Global South:** As a leader in the **Global South,** India has a unique opportunity to champion inclusive AI governance, especially for emerging economies that lack the resources to develop their own AISIs. India can play a leading role in co-developing AI safety frameworks and **evaluation metrics** for tackling **local challenges** in these regions.

**Supporting Frameworks and Collaborative Efforts**

- India's collaboration with **UNESCO** on AI readiness and the insights from the **MeitY**-UNESCO project will provide a strong foundation for the AISI. This partnership has already identified gaps in the **ethical development** and deployment of AI technologies, which will help shape the future AI safety frameworks.
- The **IndiaAI Mission** is already focused on critical themes such as **machine unlearning, synthetic data generation, AI bias mitigation,** and **privacy-enhancing tools,** all of which can serve as the building blocks for a robust AI safety ecosystem in India.

## Second National GenBank

**Sub Topic:** *Agriculture, Biodiversity, and Environmental Conservation*

**Context:** Prime Minister Shri Narendra Modi, during a post-budget webinar conducted via video conferencing, announced the **establishment of a Gene Bank to conserve India's genetic resources.**

**More on News**

- This initiative is a **crucial step toward ensuring genetic diversity and food security** for future generations.
- The webinar served as a platform for **collaboration among government, industry, academia, and citizens,** encouraging discussions to translate key Budget announcements into actionable outcomes.
- The key themes of the webinar—***Investing in People, the Economy, and Innovation***—highlight the nation's strategic priorities.

**Role of Gene Banks in Biodiversity Conservation**

**Repository:** A gene bank is a **repository designed to store genetic material, including seeds, pollen, and tissue samples,** collected from various plant species.

- These repositories play a **vital role in preventing extinction and preserving essential crop varieties** for future generations.

**First Bank:** India's **first National GenBank was established in 1996** by the Indian Council of Agricultural Research-National Bureau of Plant Genetic Resources **(ICAR-NBPGR) in New Delhi.**

- Operating through 12 regional stations across the country, this bank is **responsible for collecting and storing essential crop germplasms**— genetic

materials critical for research, conservation, and crop breeding.

- As of January 15, 2025, the National GenBank **holds approximately 0.47 million accessions** (plant materials stored for breeding), as per the ICAR-NBPGR database. These accessions include:
    - **Cereals:** 0.17 million accessions
    - **Millets:** Over 60,600 accessions
    - **Legumes:** Over 69,200 accessions
    - **Oilseeds:** More than 63,500 accessions
    - **Vegetables:** Nearly 30,000 accessions

**Establishment of the Second National GenBank**

- In the 2025-26 Budget, the **Ministry of Finance announced the establishment of a second National GenBank,** reinforcing **India's commitment to safeguarding its agricultural biodiversity.**
- This new facility will **accommodate 1 million germplasm lines,** providing critical conservation support for both public and private sectors engaged in genetic resource management.
- **India is recognised as a biodiversity-rich country,** boasting over 811 cultivated crop species and 902 crop wild relatives.
- The nation plays a **pivotal role in preserving Plant Genetic Resources (PGR),** which are vital for agricultural resilience, food security, and addressing the challenges posed by climate change.
- The existing **National GenBank,** managed by ICAR-NBPGR, **conserves more than 4.7 lakh accessions and contributes significantly to global PGR conservation through partnerships with researchers, breeders, and scientists worldwide.**

**Global Leadership in Biodiversity Conservation**

- The establishment of the second National GenBank **will bolster India's position as a global leader in biodiversity conservation.**
- This initiative will **not only safeguard the country's invaluable plant genetic resources but also support international biodiversity efforts,** particularly benefiting countries in the SAARC and BRICS regions that lack well-developed PGR networks.

**Ensuring Long-Term Sustainability and Food Security**

- Given the mounting threats posed by climate change, natural disasters, and geopolitical challenges, the **security of genetic diversity has become increasingly vulnerable.**
- The creation of a **safety duplicate GenBank is essential in securing India's irreplaceable germplasm.**
- This redundancy structure will serve as a protective measure, ensuring the long-term sustainability of agricultural biodiversity and enhancing global food security.

## Government's Initiative for Smart Proteins: A Climate-Resilient Solution

**Sub Topic:** *Agriculture, Biotechnology, Food Security, and Environmental Sustainability*

**Context:** The Indian government, through the **Department of Biotechnology's BioE3 initiative,** is funding research into **smart proteins** to ensure climate-resilient food sources. These proteins aim to replicate the **taste and texture of real protein sources** while reducing environmental impact.

**Why Smart Proteins?**

**Traditional food systems** contribute significantly to **carbon emissions, resource depletion, and food insecurity.** With India's rising food demand, expanding conventional livestock farming could worsen **climate change, zoonotic diseases, and sustainability challenges.**

**Three Key Smart Protein Categories**

**Fermentation-Derived Proteins**

- Sourced from **microbes like algae, bacteria, and fungi.**
- Challenges include **developing cost-effective biomanufacturing** and optimising strains for **higher yield and reduced by-products.**
- Research aims to use **agricultural waste as feedstocks** instead of glucose.

**Plant-Based Proteins**

- Extracted from **crops and agricultural by-products.**
- Focus on **enhancing texture, flavour, and nutritional value** by combining plant-based and fermentation-based proteins.
- Research aims to **eliminate pesticide residues, allergens, and anti-nutrients.**

**Cell-Culture-Based Proteins**

- Derived from **animal cells grown in laboratories** without slaughtering animals.
- Aims to provide **sustainable meat alternatives** while reducing **land and water usage.**

**Rising Meat Consumption & Its Impact**

- **71% of India's 1.3 billion people consume meat,** with demand increasing due to **income growth and dietary shifts.**
- **Poultry demand projected to rise by 850% by 2040,** leading to **rapid industrialisation of livestock farming.**
- This intensification could put **severe pressure on natural resources** and increase greenhouse gas emissions.

**Urgency for Protein Diversification**

- India faces **severe nutritional deficiencies,** with **38% of children stunted and 53% of women anemic.**
- Current **animal agriculture drives deforestation, water scarcity, and greenhouse gas emissions.**

- **Zoonotic diseases and antimicrobial resistance (AMR) risks are rising** due to industrial animal farming.

**Smart Proteins: A Sustainable Alternative**

- **Eliminates reliance on animal farming,** reducing **land, water, and energy usage.**
- Offers a **nutritional alternative** to meet India's growing protein demands.
- Reduces the risk of **pandemics, antimicrobial resistance, and supply chain disruptions.**

**India's Role in the Global Smart Protein Sector**

- With **rich crop biodiversity,** India can supply **protein-rich crops like pulses and millets** for global markets.
- **Existing food processing infrastructure** can be leveraged to scale up smart protein production.
- India's **biopharmaceutical and fermentation capabilities** can support **alternative protein manufacturing.**

**Government's Roadmap for Smart Protein Growth**

- **Public-private partnerships** to drive research, innovation, and commercialisation.
- **Investment in research organisations like ICRISAT** to enhance crop-based protein production.
- **Funding initiatives for cultivated and fermentation-derived proteins** in institutions like **CCMB Hyderabad and ICT Mumbai.**
- **Developing a skilled workforce** to support the industry's growth.

**Positioning India as a Smart Protein Leader**

- India can **become a global hub** for **plant-based, cultivated, and fermentation-derived proteins.**
- Countries like **Canada, Netherlands, and Singapore** are leading in this space, and India must act fast.
- To succeed, smart proteins must **taste as good as or better than traditional meat and be cost-competitive.**

# Subject – Environment, Bio-diversity and Disaster management

## Enhancing Ethanol Production in Cooperative Sugar Mills

**Sub Topic:** *Economy, Energy Security, Sustainable Agriculture, and Environmental Conservation*

**Context:** The Government of India has notified a **modified Ethanol Interest Subvention Scheme** for Cooperative Sugar Mills (CSMs) to enhance ethanol production. The scheme allows the conversion of existing **sugarcane-based ethanol plants** into **multi-feedstock-based plants**, enabling the use of maize and **Damaged Food Grains (DFG).** The initiative aligns with the **Ethanol Blended Petrol (EBP) Programme,** which aims for **20% ethanol blending** with petrol by **2025.**

**Rationale for the Scheme**

- Sugar mills operate for only **4-5 months annually** due to the limited sugarcane crushing period, leading to **reduced operational efficiency.**
- To enhance the financial viability and **year-round operation** of CSMs, conversion to **multi-feedstock-based plants** is encouraged.
- Multi-feedstock plants will ensure **continuous ethanol production,** improving efficiency and productivity.

**Key Features of the Scheme**

- Interest **subvention of 6% per annum or 50% of the rate of interest** charged by banks/financial institutions (whichever is lower).
- The **Central Government bears the interest** on loans for **five years,** including a one-year moratorium.
- The scheme was earlier applicable only to **private sugar companies** but has now been extended to **cooperative sugar mills.**
- The scheme benefits **approximately 63 cooperative** sugar mills with attached distilleries.

**Financial Implications**

- Loans for conversion projects will be **subsidised**, making borrowing **more affordable.**
- Cooperative mills, primarily borrowing from the **National Cooperative Development Corporation (NCDC) at 8.5% interest**, will now have an effective interest rate of **around 4.25%.**
- Estimated investment per sugar mill for conversion is **₹50-60 crore,** ensuring smooth capital infusion.

**Impact of the scheme**

**1) On Ethanol Production and Economy**

- Enhances ethanol supply to meet the **EBP Programme's 20% target.**
- Reduces **dependence on sugarcane** and promotes **diversification of raw materials.**
- Improves the **economic viability of cooperative sugar mills,** allowing them to operate for **2-3 months longer.**
- Strengthens India's **biofuel economy,** reducing **fossil fuel dependency** and enhancing **energy security.**

**2) Broader Environmental and Economic Benefits**

- **Sustainable Use of Resources:** Utilises **damaged food grains** that would otherwise go to waste.
- **Reduces Carbon Emissions:** Ethanol blending decreases **greenhouse gas emissions.**
- **Boosts Rural Economy:** Supports farm**ers and rural industries** by creating demand for alternative crops like **maize.**

- **Energy Security:** Aligns with India's biofuel policy and reduces reliance on **imported crude oil.**

**Challenges and the Way Forward**

**Challenges:**

- **Logistics and Infrastructure:** Adapting distilleries for multi-feedstock production requires technological upgrades.
- **Raw Material Availability:** Ensuring a stable supply of maize and DFG without disrupting food security.
- **Implementation Hurdles:** Timely disbursal of loans and compliance with regulatory frameworks.

**Way Forward:**

- **Strengthening Supply Chains:** Developing a robust procurement network for alternative feedstocks.
- **Capacity Building:** Training sugar mill operators in multi-feedstock processing.
- **Policy Coordination:** Ensuring alignment with food security policies and ethanol blending mandates.
- **Public-Private Collaboration**: Encouraging investments in ethanol infrastructure through public-private partnerships (PPPs).

**Conclusion**

The **modified Ethanol Interest Subvention Scheme** is a strategic move towards **sustainable ethanol production.** It ensures the **financial stability of cooperative sugar mills,** supports **biofuel expansion,** and contributes to **India's energy security goals.** Addressing implementation challenges will be key to **maximising benefits** for the **economy, environment, and rural communities.**

**Ethanol Interest Subvention Scheme (Ethanol Blended Petrol Program - EBP)**

The **Ethanol Interest Subvention Scheme** is a key initiative under India's **Ethanol Blended Petrol (EBP) Program,** aimed at boosting domestic ethanol production to reduce dependence on imported crude oil and enhance farmer incomes.

**Key Features of the Scheme**

**Objective:**

- Promote **ethanol production capacity** to meet the **Ethanol Blending Target** (India aims for 20% ethanol blending (E20) by 2025-26).
- Ensure an **adequate supply of ethanol** for the blending program while reducing carbon emissions.
- Support farmers by **diverting excess sugarcane, broken rice, and maize** into ethanol production.

**Financial Assistance (Interest Subvention):**

- **Interest subvention of up to 6% per annum or 50% of the interest rate** on loans taken for ethanol production projects.
- Subsidy is provided for **5 years**, including a **1-year moratorium.**
- The scheme is implemented through **public sector banks, private banks, and cooperative banks.**

**Eligibility & Scope:**

- Sugar mills, distilleries, cooperative societies, and entrepreneurs setting up new or expanding **ethanol production facilities.**
- Loans are provided for:
  - Setting up **new ethanol plants.**
  - Expansion and modernisation of **existing ethanol distilleries.**
  - Conversion of **molasses-based distilleries into dual-feed plants** (which can also use grains like maize & rice).

**Raw Materials Covered:**

- Sugarcane juice/syrup
- B-heavy & C-heavy molasses
- Damaged food grains (broken rice, maize)
- Surplus rice from Food Corporation of India (FCI)

**Implementation & Monitoring:**

- The **Department of Food & Public Distribution (DFPD)** under the Ministry of Consumer Affairs, Food & Public Distribution is the nodal agency.
- The scheme is part of the **National Bio-Energy Mission** and aligned with the **National Policy on Biofuels (2018).**
- **Oil Marketing Companies (OMCs)** procure ethanol from distilleries at government-fixed rates

## Revolutionising Waste: Turning Urine into Valuable Fertiliser

**Sub Topic:** *Environment, Science & Technology, and Sustainable Agriculture*

**Context:** In the 17th century, **German alchemist Hennig Brandt** sought the **mythical "philosopher's stone"** by distilling urine, believing its golden colour hinted at the presence of gold. Though he failed to find gold, Brandt discovered phosphorus, highlighting urine's potential as a resource.

**Urine: The Original 'Liquid Gold'**

- **Nutrient-Rich Composition:** Urine is rich in **phosphorus, potassium, and nitrogen—the "Big Three" nutrients** crucial for plant growth and the backbone of commercial fertilisers.
- **Annual Output:** An adult produces **450-680 litres of urine annually,** containing about **4 kg of nitrogen and 0.3 kg of phosphorus**—enough to grow wheat for a daily loaf of bread for an entire year.

**The New Scientific Breakthrough**

- **Electrochemical Innovation:** A study published in Nature Catalysis introduces a greener, less energy-consuming technique to extract urea from urine in its solid form.
- **Conversion to Percarbamide:** The method transforms urea into a crystalline peroxide

derivative called **percarbamide,** offering a sustainable way to treat wastewater and recover valuable nutrients.

**How the Process Works?**

- **Key Challenges:** Extracting urea is difficult due to urine's complex composition, especially the presence of salts.
- **Game-Changing Chemistry:** Urea forms hydrogen bonds with hydrogen peroxide, producing percarbamide, a white, crystalline solid. Percarbamide can steadily release active oxygen, making it valuable for other chemical reactions and enhancing the recovery of urea from urine.
- **Electrochemical Technique:** Utilises graphitic carbon-based catalysts for in-situ conversion. Achieves almost 100% purity in extracting percarbamide from both human and animal urine.

**The Eureka Moment**

- **Initial Focus:** Researchers aimed to stabilise hydrogen peroxide in liquid form.
- **Innovative Insight:** They realised using urea from urine could achieve dual benefits—enhancing peroxide stability and promoting sustainable urine treatment.

**The Role of Activated Graphitic Carbon Catalyst**

- **Structure:** Activated graphitic carbon, a porous and reactive form of graphite, was engineered to increase surface area and chemical reactivity.
- **Dual Pathways for Percarbamide Formation:**
- **Pathway I:** Urea directly reacts with hydrogen peroxide in the presence of a catalyst.
- **Pathway II:** Urea interacts with a hydroperoxyl intermediate, gaining hydrogen ions to form percarbamide.
- **Efficiency:** The catalyst effectively facilitates both pathways.

**Optimising the Process**

- **Concentration Levels:** Ideal urea concentration is between 15% and 38% for maximum percarbamide yield.
- **Temperature & pH:** Slightly acidic conditions (pH ~4) and temperatures just above freezing optimise the process.

**Sustainable Applications and Future Potential**

- **Agricultural Benefits:** The solid percarbamide slowly releases nitrogen, promoting root respiration and enhancing crop growth. Facilitates the completion of the nitrogen cycle in human society.
- **Environmental Impact:** Provides a dual solution for wastewater treatment and resource recovery. Encourages a shift in how waste is perceived and utilised.

**Vision for the Future**

- Researchers express optimism about integrating **resource recovery** with wastewater treatment.
- This innovation could significantly transform **sustainability practices** and promote efficient recycling methods in urban settings.

## 2024 World Air Quality Report

**Sub Topic:** *Environment & Ecology, Public Health, and Sustainable Development*

**Context:** The 2024 World Air Quality Report has confirmed that **Delhi** remains the world's most polluted capital city, with an average **PM 2.5** concentration of **91.8 µg/m$^3$.** The report highlights the alarming state of air pollution, not only in Delhi but across several Indian cities.

**Delhi's Improvement Despite High Pollution Levels**

- While Delhi has seen a slight improvement, the **National Capital Region (NCR)** continues to experience **heavy pollution.**
- The report noted that **India's PM2.5 concentrations declined by 7% in 2024,** with an average of 50.6 µg/m3, down from 54.4 µg/m3 in 2023.
- Despite this improvement, **Delhi's** pollution levels remain consistently high, with an annual average of **91.6 µg/m$^3$** in 2024, nearly unchanged from 92.7 µg/m3 in 2023.

**India's Struggle with Pollution**

The report reveals that India remains a global hotspot for air pollution, with **13 of the 20 most polluted cities in the world** located within its borders.

- Among these, **Byrnihat**, situated on the Assam-Meghalaya border, has the highest annual PM2.5 concentration, recorded at 128.2 µg/m$^3$.
- Other major cities like **Faridabad, Loni (Ghaziabad), Gurgaon, Greater Noida, Bhiwadi, Noida, Muzaffarnagar, and Central and South Delhi** continue to rank among the world's most polluted urban areas.

**India's average Air Quality Index (AQI)** stands at **50.6 µg/m3, which is 10 times higher** than the World Health Organisation's (WHO) annual guideline value for PM2.5 of 5 µg/m3.

- In 2023, India was the third most polluted country, but the latest data confirms that it remains in the top five.
- The report further highlights the severe health impact of this pollution, which has led to a **reduction in life expectancy by an estimated 5.2 years** for the Indian population.

**Global Air Quality Trends**

- The report, based on data from over **40,000 air quality monitoring stations** across **138 countries and regions,** underscores the dire state of global air quality.

- **Global Cities' Compliance:** It reveals that only 17% of the world's cities meet the WHO's air pollution guidelines. Furthermore, a staggering 91.3% of the countries and regions monitored have PM2.5 levels that exceed the WHO's recommended limit of 5 µg/m3 annually.
- **Southeast Asia's Declining PM2.5 Levels:** PM2.5 concentrations have decreased across Southeast Asia, despite challenges like transboundary haze and the lingering effects of El Niño.
- **Air Pollution in Africa:** Africa faces severe data scarcity on air pollution, with only one monitoring station for every 3.7 million people.
- **Pollution Levels in the United States:** The most polluted major city in the United States is Los Angeles, California, followed by Ontario, California.

**The Broader Perspective**

- **Persistent Challenge for India:** Despite a slight decline in pollution levels, six of the world's ten most polluted cities are still in India.
- **Urgent Need for Action:** Addressing emissions, enhancing monitoring systems, and enforcing stricter regulations are crucial.
- **Global Perspective:** The report highlights the interconnectedness of air pollution issues and the need for international cooperation.

## Indore's Green Waste Processing Plant

**Sub Topic:** *Environment, Urban Development, and Sustainable Waste Management*

**Context:** Indore is set to launch **India's first green waste processing plant under the Public-Private Partnership (PPP) model** as part of the **Swachh Bharat Mission-Urban.**

**More on News**

- This initiative aims to **revolutionise waste management** by converting **green waste into valuable resources.**
- It highlights Indore's commitment to **innovation and sustainability** in urban waste management.

**Key Features**

- **Location:** Built on a 55,000 sq. ft. area in Bicholi Hapsi.
- **Objective:** Recycling **wood and branches** to produce **wooden pellets,** an eco-friendly alternative to coal.
- **Revenue Generation:** Indore Municipal Corporation (IMC) will earn **Rs 3,000 per tonne** in royalty for supplying wood and branches.

**Green Waste Collection & Processing**

- **Daily Waste Generation:** Indore produces 30 tons of green waste daily, which can rise to 60-70 tons during autumn.
- **Source of Waste:** Includes wood, branches, leaves, and flowers collected from major institutions and municipal premises.
- **Processing Locations:**
  - **Large tree branches** are sent to **the Green Waste Processing Plant at City Forest** for repurposing.
  - **Other green waste** is collected based on a **fixed fee structure** and transported to the facility.

**Role of Private Partnership**

- In partnership with IMC, **Astronomical Industries Pvt. Ltd.** is leading the waste transformation process.
- The waste undergoes a **3-4 month drying process,** reducing **moisture content by 90%,** making it easier to process.
- Advanced machines convert the **dried waste into fine sawdust,** giving it multiple commercial applications.

**Uses of Processed Green Waste**

- **Eco-friendly Fuel:** Sawdust can be used as a cleaner alternative to traditional fuel.
- **Furniture & Packaging:** Strengthens composite materials for chairs, tables, and packing materials, reducing plastic usage.
- **Fertilisers:** Sawdust-based fertilisers improve soil health and crop yield.
- **Food Industry:** Can be moulded into **biodegradable disposable plates,** replacing plastic and Styrofoam.

**Municipal and Private Sector Collaboration**

- **IMC Responsibilities:** Providing land and transportation of green waste to the plant.
- **Private Sector Role:**
  - Setting up infrastructure like **sheds, electricity, and water facilities.**
  - Managing **installation, operation, and maintenance** of the plant.

**Expansion of Green Waste Management in Indore**

- Private firms have set up Me**ghdoot and sub-grade plants** in **Sirpur**, covering **10,000-15,000 sq. ft.**
- These plants process **garden waste (leaves, twigs, etc.)** from municipal sources.
- **Composting pits** in municipal gardens further support waste recycling efforts.

**Environmental and Economic Impact**

- **Wooden pellets** produced from green waste are supplied to **industries like NTPC,** serving as an **eco-friendly energy alternative.**
- **Air Quality Index (AQI) Control:** Reduces pollution by preventing **uncontrolled waste burning.**
- **Revenue Generation:** The initiative creates **additional income streams** for IMC.
- **Cleaner & Healthier Environment:** Enhances hygiene, minimises pollution, and promotes sustainability.

**Contribution to Swachh Bharat Mission-Urban**

- Aligns with the **vision of Garbage-Free Cities** under **Swachh Bharat Mission-Urban.**
- Aims to build a **cleaner, greener, and more sustainable** urban ecosystem.
- Offers an **alternative to coal,** supporting both **clean energy** and **waste management** goals.

## New Delhi's perilous recalibration with the Taliban

**Sub Topic:** *International Relations & Security Challenges and Strategic Interests*

**Context:** India's Foreign Secretary Vikram Misri met with the Taliban's acting 'Foreign Minister' Amir Khan Muttaqi in Dubai in January, marking a significant step in New Delhi's evolving approach toward the regime in Afghanistan. The discussions reportedly focused on strengthening political and economic ties, as well as providing humanitarian aid.

**About the Recent India's Diplomatic Engagement with Afghanistan**

India maintains indirect yet continuous engagement through **regional forums and international organisations.**

**Key issues discussed:**

- **Humanitarian assistance and development projects.**
- **Regional security concerns,** including India's security interests.
- **Utilisation of Chabahar Port** for trade and humanitarian aid.
- **Enhancing sports cooperation,** particularly in cricket.

**Humanitarian and Development Assistance**

- India's approach prioritises humanitarian support to the **Afghan people.**
- **Key initiatives undertaken since August 2021:**
  - 50,000 tonnes of wheat.
  - 27 tonnes of relief material.
  - 40,000 litres of pesticides.
  - 300+ tonnes of medicines and medical equipment.
  - Partnership with UNODC to aid drug-affected Afghan populations, especially women.
  - 11,000 hygiene kits, baby food, and clothing supplied since 2022.

**Security Concerns and Implications for South Asia**

- The Taliban's rule has altered **regional security dynamics,** raising concerns for India and South Asia.
- India is wary of Afghanistan becoming a hub for **terrorist organisations** due to:
  - **Taliban's ties with Al-Qaeda** and other extremist groups.
  - **Potential for cross-border** terrorism in Kashmir.
  - **Pakistan-based terror groups** aligning with the Taliban.
- **UN 1267 sanctions monitoring report** has highlighted the presence of terror outfits in Afghanistan, reinforcing India's security concerns.

**India's Evolving Engagement with the Taliban**

**India's Past Approach to the Taliban**

India historically opposed the Taliban due to:

- **Terrorism concerns,** especially links with **Jaish-e-Mohammed (JeM) and Lashkar-e-Taiba (LeT).**
- **IC-814 hijacking in 1999,** where India was forced to release terrorists in Kandahar.
- **Support for the Northern Alliance** against the Taliban in the 1990s.
- **Investments in democratic governments** post-2001, including infrastructure and development projects.

**Recent Engagements and Diplomatic Initiatives**

India has not officially recognised the Taliban but maintains backchannel diplomacy.

Key Developments:

- **2022:** Sent a technical team to Kabul for humanitarian and developmental assistance.
- **Reopened the Indian Embassy** in Kabul, signalling pragmatic engagement.
- **Participation in regional dialogues** like the **Moscow Format, Tehran talks, and SCO meetings.**

**Key Concerns about India's Engagement with Taliban**

**Strategic and Security Concerns**

- **Terrorism threats:** Taliban's ties with JeM, LeT, and Al-Qaeda.
- **Pakistan's influence:** Taliban's dependence on Pakistan for support.
- **Kashmir issue:** Taliban's ideological stance may embolden terrorism.
- **Haqqani Network:** Strong ties with ISI pose a security risk.

**Economic and Developmental Interests**

India has invested over $3 billion in Afghan projects:

- Zaranj-Delaram Highway (linking Iran and Afghanistan).
- Salma Dam (Afghanistan-India Friendship Dam).
- Parliament Building in Kabul.
- Health and education initiatives.

Taliban has expressed interest in India's continued involvement in development projects.

**Regional Connectivity and Trade Prospects**

- **Access to Central Asia:** Afghanistan is key for India's connectivity.
- **Chabahar Port:** Alternative trade route bypassing Pakistan.
- **Trade via Afghanistan:** Potential connectivity through INSTC and TAPI pipeline.

**Geopolitical Considerations**

- **China's growing influence:** Economic and strategic engagement with the Taliban.
- **Russia and Iran's pragmatism:** Maintaining diplomatic ties.
- **US and Western nations' stand:** Sanctions but continued counterterrorism engagement.
- **Pakistan's role:** Balancing Taliban ties while maintaining strategic influence.

**Challenges in Engaging with the Taliban**

- **Legitimacy issues:** Taliban's government remains globally unrecognised.
- **Human rights concerns:** Regressive policies on women's rights and media freedom.
- **Instability and internal conflicts:** Rival factions and groups like ISIS-K.
- **Lack of policy consistency:** Taliban's statements on engagement with India fluctuate.

**Way Forward for India**

- **Pragmatic engagement:** Continue dialogues without formal recognition.
- **Security cooperation:** Work with Iran, Russia, and Central Asian nations.
- **Economic diplomacy:** Focus on infrastructure, health, and education.
- **Humanitarian assistance:** Ensure aid reaches Afghan people without empowering extremist groups.
- **Regional groupings:** Strengthen role in SCO, INSTC, and Chabahar projects

**India's Multilateral and Regional Approach towards Taliban**

India engages in **regional and international platforms** to address Afghan stability:

- UNSC discussions on Afghanistan.
- UN meetings in Doha and Moscow Format.
- Bilateral and trilateral dialogues with regional players.
- Collaboration with UN agencies on food security, health, and capacity building.

India advocates for a UN-led consensus to resolve Afghanistan's political and security challenges.

**Challenges and Roadblocks**

- Taliban's selective approach to international obligations.
- Pakistan-Afghanistan nexus fostering militancy and regional instability.
- Radicalisation and separatist movements inspired by Taliban's ideology.
- Porous borders aiding the spread of fundamentalist ideology.

**India's Strategic Posture and Future Course**

- Ensuring **regional peace and stability** through diplomacy and humanitarian aid.
- Continued engagement with **all Afghan stakeholders** while balancing pragmatism with security concerns.
- Strengthening **economic and infrastructure partnerships** like the **Chabahar Port** for trade.
- Expanding **intelligence cooperation** with regional players to counter terrorism.
- **Confidence-building measures** while closely monitoring the Taliban's actions.

# Subject – Internal Security

## Addressing Left-Wing Extremism: Beyond a Militaristic Approach

**Sub Topic:** *Internal Security Challenges, Role of State and Non-State Actors, Linkages of Development and Extremism, and Governance Issues in Left-Wing Extremism (LWE)- Affected Areas*

**Context:** While the Left-Wing Extremism (LWE) movement has significantly weakened over the years, recent operations in **Bastar, Chhattisgarh (March 20, 2025), resulting in 30 alleged Maoists being killed,** highlight the ongoing counterinsurgency efforts. A purely **militaristic approach** to eliminating the Maoist threat, however, poses challenges, particularly with regard to **tribal repression and human rights violations.**

**Evolution and Weakening of the Maoist Insurgency**

- The insurgency peaked during the **mid-to-late 2000s,** prompting the government to label it the **"greatest internal security threat".**
- The movement has since been **restricted to forested regions of southern Chhattisgarh and adjacent areas.**
- Factors leading to its decline:
  - **State-led development initiatives** in tribal areas.
  - **Increased security operations and intelligence-driven tactics.**
  - **Erosion of mass support** due to the Maoists prioritising militarism over public welfare.
  - **Disruptions in Maoist recruitment and logistics networks.**

**Challenges in the Militaristic Approach**

While the decline in Maoist influence is evident, a **purely militaristic strategy has limitations.**

**Historical lessons from anti-insurgency operations** highlight the risks of excessive force:

- **Salwa Judum (2005-2011)** – A vigilante movement that led to human rights violations and Supreme Court intervention.

- **Civilian casualties** – Security operations often result in tribals being caught in the crossfire.
- **Potential for alienation** – Excessive use of force may fuel resentment among tribal communities, inadvertently strengthening Maoist narratives.

**Failure of force-alone strategy in global contexts:**

- **Colombian insurgency (FARC)** – Ultimately resolved through negotiated peace.
- **Nepalese Maoists** – Transitioned into mainstream politics via a political settlement.

**Need for a Holistic Approach**

**Civil Society Engagement & Rehabilitation**

- **Encourage Maoist cadres to surrender** by offering rehabilitation incentives.
- **Use civil society organisations (CSOs)** to facilitate communication between the government and affected communities.
- **Strengthen tribal representation** in local governance structures to reduce alienation.

**Development and Governance Initiatives**

- **Improve access to education, healthcare, and employment opportunities** in Maoist-affected regions.
- **Address land rights and displacement issues** to prevent exploitation by insurgents.
- **Ensure transparent implementation of welfare schemes** in tribal areas to build trust.

**Intelligence-Driven and Targeted Security Operations**

- **Minimise collateral damage** by using precise intelligence-based operations.
- **Strengthen police capacities and local intelligence networks** for effective counterinsurgency.
- **Avoid excessive militarisation**, which may reinforce insurgent narratives.

**Political and Peace Dialogues**

- **Facilitate dialogue with Maoist factions** willing to engage in a peace process.
- **Follow the Nepalese and Colombian models,** where armed groups integrated into mainstream politics.
- **Encourage localised conflict resolution mechanisms,** involving tribal leaders and grassroots organisations.

**Government actions and operations against LWE**

- **SAMADHAN Doctrine:** Serves as a comprehensive strategy against LWE, incorporating:
  - Smart Leadership, Aggressive Strategy, Motivation and Training, Actionable Intelligence, Dashboard-Based KPIs and KRAs, Harnessing Technology, Action Plan for Each Theatre, and No Access to Financing
- **ROSHNI**: Launched in 2013 under Pandit Deen Dayal Upadhyaya Grameen Kaushalya Yojana, aimed at training and placing rural youth from 27 LWE-affected districts across 9 states.
- **Left Wing Extremism Division:** Established in 2006, implementing security schemes for capacity building and monitoring LWE situations and state responses.
- For quality education in tribal blocks of LWE affected **districts 130 Eklavya Model Residential School (EMRS)** have been made functional in LWE affected districts.
- Security Related Expenditure (SRE) Scheme
- Special Infrastructure Scheme (SIS)
- Scheme of Fortified Police stations
- Assistance to Central Agencies for LWE management Scheme
- Road Connectivity Project for LWE affected areas (RCPLWE)
- LWE Mobile Tower Project
- Aspirational Districts Programme

**Counter-insurgency efforts**

- **Salwa Judum:** Villagers responded to Naxal interference in tendu leaf trade by recruiting local tribes & former Naxalites as Special Police Officers (SPOs).
- **GreyHounds:** Elite commando force of combined Andhra Pradesh state, known for guerrilla tactics akin to Maoists.
- **Operation Green Hunt:** It was an unofficial term used to describe the "all-out offensive" launched by the government of India's paramilitary forces and the state's forces to defeat the Naxalites.

**Way Forward**

**Bandyopadhyay Committee (2006)** recommended tribal-friendly land acquisition and rehabilitation as a means to counter this issue.

Innovative measures are needed **to prevent IED** (Improvised Explosive Device)-related incidents, which have caused significant casualties.

The **2nd ARC suggested a 14-point policy** to curb LWE, with key points including:

- **Strengthening Local Police Stations:**
- **Capacity building of administrative institutions:** The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 seeks to enhance institutional capacity in tribal areas.
- **Capacity building of local bodies:** The enactment of the provisions of the Panchayats (Extension to the Scheduled Areas) Act, 1996, commonly known as PESA, is a welcome initiative aimed at ensuring grassroots management of community affairs.
- **Cutting the source of finance for Naxalites,** who raise funds through extortion and illegal mining operations facilitated by a nexus of contractors, transporters, and extremists.

# India-Mauritius Strategic Partnership: The MAHASAGAR Vision

**Sub Topic:** *India and its Neighborhood, Bilateral Agreements, and Regional Groupings & Security Challenges and Role of External State and Non-State Actors in India's Maritime Domain*

**Context:** Prime Minister **Narendra Modi** unveiled the **MAHASAGAR** vision (**Mutual and Holistic Advancement for Security and Growth Across Regions**) during his visit to Mauritius.

**About the MAHASAGAR vision**

- **The MAHASAGAR** vision Strengthens India's **strategic ties** with Mauritius and expands cooperation in the **Indian Ocean Region (IOR).**
- Built upon **SAGAR (Security and Growth for All in the Region),** announced in 2015, to create a comprehensive framework for the Global South.

**Strategic Importance of India-Mauritius Relations**

- **Geostrategic Location:** Mauritius lies at a crucial maritime junction in the **Indian Ocean,** making it significant for **regional security, trade, and connectivity.**
- **Maritime Security Cooperation:** India is committed to ensuring the security of Mauritius' **Exclusive Economic Zone (EEZ)** through joint surveillance, hydrographic surveys, and **defence cooperation.**
- **Countering China's Influence:** India's proactive engagement seeks to **balance China's increasing presence** in the Indian Ocean through initiatives like the Belt and Road Initiative (BRI).

**Key Announcements and Agreements**

**Defence and Maritime Security Cooperation**

- **Enhanced Deployment:** Increased joint maritime surveillance, patrols, and hydrographic surveys.
- **Strengthening Mauritius' Coast Guard:** Assistance in procuring defence assets, refitting Coast Guard ships, and setting up a National Maritime Information Sharing Centre.
- **Chagos Archipelago Dispute:** India reaffirmed its support for Mauritius' sovereignty over Chagos, advocating for its position in multilateral forums like the Colombo Security Conclave and Indian Ocean Rim Association (IORA).
- **Cooperation on White Shipping and Hydrography:** Enhancing real-time data sharing for better maritime domain awareness and combating illegal activities.

**Economic and Trade Agreements**

- **Trade in Local Currencies:** Agreement signed to promote settlement of bilateral trade in Indian Rupees and Mauritian Rupees, reducing dependence on foreign currencies.
- **Indian Rupee Clearing Centre:** Plan to extend its benefits to the Common Market for Eastern and Southern Africa (COMESA) countries.
- **Support for MSME Sector:** Strengthening business collaborations in the Micro, Small, and Medium Enterprises (MSME) sector.

**Infrastructure and Development Projects**

- **Water Pipeline Modernisation:** A ₹487 crore Line of Credit (LoC) extended for replacing 100 km of old water pipelines in Mauritius.
- **New Development Projects:** Initiatives worth 500 million Mauritian Rupees under the second phase of high-impact community development projects.
- **Parliament Building Construction:** India to build a new Parliament building for Mauritius as a gift symbolising India's support.

**Cultural and People-to-People Ties**

- **Capacity Building:** Agreement to train 500 Mauritian civil servants in India over the next five years.
- **Religious and Cultural Initiatives:** Support for Mauritian citizens undertaking Char Dham Yatra and the Ramayana Trail in India.
- **Education and Public Service:** Dedication of the Atal Bihari Vajpayee Institute of Public Service and Innovation.

**Technological and Financial Cooperation**

- **DPI (Digital Public Infrastructure) Collaboration:** Strengthening cooperation on Artificial Intelligence (AI) and DPI for human development.
- **Financial Transparency and Anti-Money Laundering:** MoU between India's Enforcement Directorate and Mauritius' Financial Crimes Commission to combat money laundering and financial crimes.

**Implications for India and the Region**

**Strengthening India's Position in the Indian Ocean**

- Enhances India's role as a **security provider** in the Indian Ocean.
- Reinforces India's **'Neighbourhood First'** and **'Act East' policies.**
- Counters **China's Maritime Silk Route** strategy by providing **alternative connectivity and security solutions.**

**Boost to Global South Cooperation**

- Positions India as a **leader in the Global South,** advocating for **holistic growth and security.**
- Extends India's **economic and strategic outreach** beyond **South Asia** to **Africa and Indian Ocean island nations.**

**Economic and Financial Benefits**

- Strengthens **economic integration** between India and Mauritius through **local currency trade mechanisms.**

- Expands India's financial footprint in the region by **facilitating rupee transactions** in COMESA nations.

**Enhanced Soft Power and Diplomatic Ties**

- India's **developmental assistance** strengthens **bilateral trust** and goodwill.
- Strengthens India's cultural and historical ties with Mauritius, home to a **large Indian diaspora.**

# GS PAPER III — 'PRELIMS BASED ARTICLES'

## Subject – Indian Economy & Agriculture and Banking

### SHIELD Initiative

**Sub Topic:** *Government Policies and Interventions for Development & Disaster Management, Climate Change, and Sustainable Development*

**Context:** The World Bank is in discussions with the Indian government to provide nearly $500 million in funding for the **Sustainable Housing Integrated Efficient Living and Disaster-Resilience (SHIELD) initiative** under the **Pradhan Mantri Awas Yojana-Gramin (PMAY-G).**

**More on News**

- The initiative aims to enhance climate adaptability and heat resilience in rural housing.
- The project will be implemented over five years under the PMAY-G framework.

**PMAY-G Expansion (2024-29)**

- Approved by **Prime Minister Narendra Modi in August 2023.**
- **Target:** Construct **20 million additional houses** in rural India.
- **Budget:** ₹23.06 trillion allocated for the program.
- **First introduced in 2016,** PMAY-G aims to:
  - Improve access to **affordable housing.**
  - Enhance **living standards** and support rural **socio-economic development.**

**Objectives & Features**

- Development of **climate-adaptable and heat-resilient** rural housing.
- Ensuring minimum standards in housing design to incorporate **active and passive measures** for mitigating heat.
- Learning from **best practices in other countries** to improve housing quality.
- Homes to be constructed will be **heat- and climate-resilient,** providing better protection for rural communities.

**Rationale for the Initiative**

- Rising **heat stress in rural areas,** especially during peak summers.
- Lack of access to **air conditioning** in many rural homes, making extreme temperatures more dangerous.
- **Heatwave crisis in 2024:** India recorded **536 heatwave days,** the highest since 2010 (when there were 578).
  - States like **Jharkhand, Maharashtra, Karnataka, Telangana, West Bengal, and Odisha** are already experiencing heatwaves with temperatures exceeding **40°C.**

**Government's Future Plans**

- Discussions have been ongoing for over a **year**, with the project now awaiting approval from the **Ministry of Finance.**
- Consideration of linking **PMAY-G with the Pradhan Mantri Suryoday Yojana (Rooftop Solar Scheme)** to enhance energy resilience.

**World Bank's Perspective**

- Shift in focus from **quantity** (building more houses) to **quality and comfort.**
- Emphasis on th**ermal comfort and disaster resilience** (earthquake- and flood-resistant housing).
- Collaboration with the government to improve **housing safety and sustainability.**

### Bharat Ports Global: Enhancing India's Role in Global Maritime Trade

**Sub Topic:** *India's Bilateral, Regional, and Global Groupings & Agreements Affecting India's Interests and Infrastructure – Ports, Supply Chain, and Trade Corridors*

**Context:** The Government of India has launched **Bharat Ports Global,** a consortium of public sector entities aimed at **expanding India's presence in global maritime trade.**

**About the Initiative**

The consortium brings together three key entities:

- **India Ports Global Ltd (IPGL)** – Handling port operations.
- **Sagarmala Development Corporation Ltd (SDCL**) – Facilitating financing.

- **Indian Port Rail and Ropeway Corporation Ltd (IPRCL)** – Leading infrastructure development.

The initiative is expected to **streamline logistics, strengthen supply chains, and boost exports,** supporting **the 'Make in India'** initiative.

**Objectives of Bharat Ports Global**

- **International Expansion:** Bid for global port operations and development projects.
- **Trade Connectivity:** Strengthen maritime trade routes and supply chain resilience.
- **Economic Growth:** Position India as a key player in the global logistics and shipping sector.
- **Infrastructure Development:** Leverage India's expertise in port management and financing to enhance international connectivity.
- **Strategic Diplomacy:** Support India's interests in key corridors like the **International North-South Transport Corridor (INSTC) and the India-Middle East-Europe Economic Corridor (IMEC).**

**Key Components**

- **IPGL:** The Special Purpose Vehicle (SPV) responsible for **port operations,** including the management of Iran's **Chabahar Port.**
- **SDCL:** Expected to become a **maritime-dedicated Non-Banking Financial Company (NBFC),** facilitating financial requirements.
- **IPRCL:** A joint venture of **11 central government-owned ports and Rail Vikas Nigam Ltd (RVNL),** responsible for infrastructure projects.

**Key Responsibilities of Bharat Port Global**

**Focus on the Development of Key Maritime Corridors**

- **International North-South Transport Corridor (INSTC)**
  - A **7,200 km-long corridor** linking **India with Russia, Central Asia, and Europe via Iran.**
  - Aims to **reduce transport costs and travel time** for cargo movement.
- **India-Middle East-Europe Economic Corridor (IMEC)**
  - A **multimodal trade corridor** connecting **India, the Middle East, and Europe.**
  - Expected to **enhance connectivity, trade efficiency, and strategic partnerships.**

**Strategic Global Comparisons**

- **Singapore's PSA International** and **Dubai's DP World Ltd** are leading examples of **state-owned entities managing global ports.**
- India aims to replicate similar models to **expand its maritime footprint.**
- The consortium will explore opportunities to **develop and operate around 20 ports globally.**

- **Eastern Maritime Corridor with Russia**
  - Aims to **diversify India's trade routes** by establishing a maritime trade corridor with Russia.
  - Potential to **enhance energy security and reduce dependence on traditional sea routes.**

**Future Prospects and Challenges**

**Opportunities**

- **Expansion into global port management** will boost India's **maritime diplomacy.**
- **Improved trade infrastructure** will strengthen India's economic resilience.
- **Increased regional cooperation** with BIMSTEC, ASEAN, and the Middle East.

**Challenges**

- **Geopolitical Risks:** Managing ports in regions with strategic tensions (e.g., Chabahar in Iran).
- **Funding and Investment:** Need for **robust financial backing** to sustain large-scale port projects.
- **Operational Efficiency:** Ensuring that Indian ports remain **globally competitive in terms of cost, speed, and technology.**

# Subject – Science & Technology

## New Study on the Origin of Life

**Sub Topic:** *Science and Technology – Developments in Biotechnology, Origin and Evolution of Life, and Scientific Innovations*

**Context:** A new study suggests that life on Earth may have begun through simple processes like **crashing waterfalls** and **breaking waves** that generated **mists of water.** These mists could have triggered **chemical reactions,** offering an alternative explanation to the traditional **Miller-Urey hypothesis.**

**More on News**

- The research, titled ***"Spraying of water microdroplets forms luminescence and causes chemical reactions in surrounding gas",*** was published in **Science Advances.**
- The findings offer a new perspective on how life might have started, **challenging the traditional view that lightning was the key catalyst for the formation of organic molecules** essential for life.

**What is the Miller-Urey Hypothesis?**

- **Background:** In 1952, scientists **Stanley Miller** and **Harold Urey** proposed that life's origins could have been sparked by a **lightning strike** that triggered **chemical reactions** in the early Earth's atmosphere.
- **Experiment:** They conducted an **experiment** where electricity was applied to a mixture of **water** and **inorganic gases** (methane, ammonia, hydrogen), producing **organic compounds** such as **amino acids.**

- **Criticism:** While groundbreaking, this hypothesis faced criticism in later years. Critics pointed out that **real lightning** would have occurred infrequently and in **open oceans,** where any **organic compounds** formed would likely have dispersed quickly, making this mechanism unlikely to kick-start life.

**New Study's Findings**

- **Water Spray and Organic Compounds:** The new study, led by **Richard Zare from Stanford University,** suggests that **water sprays** (e.g., from waterfalls or breaking waves) could generate **organic compounds** on their own, without the need for external **electricity.**
- **Microlightning:** The researchers demonstrated that when **water droplets** break into smaller droplets, they develop **opposite charges** (larger droplets are positively charged, smaller ones are negatively charged). These droplets then create **tiny sparks** when they come close, a process the researchers dubbed **"microlightning."**
- **Chemical Reactions:** When these water droplets were sprayed into a gas mixture (including **nitrogen, methane, carbon dioxide,** and **ammonia**), **organic compounds** like **hydrogen cyanide, glycine,** and **uracil** were formed.

**Implications for the Origin of Life**

- **Alternative to Lightning:** This study challenges the idea that **lightning** was the key trigger for life's origins. Instead, **tiny sparks** from **water sprays**—such as those created by **crashing waves** or **waterfalls**—may have triggered the necessary **chemical reactions.**
- **More Common than Lightning:** Zare suggests that **water sprays** were much more common on early Earth than lightning strikes, making them a more plausible mechanism for kick-starting life.

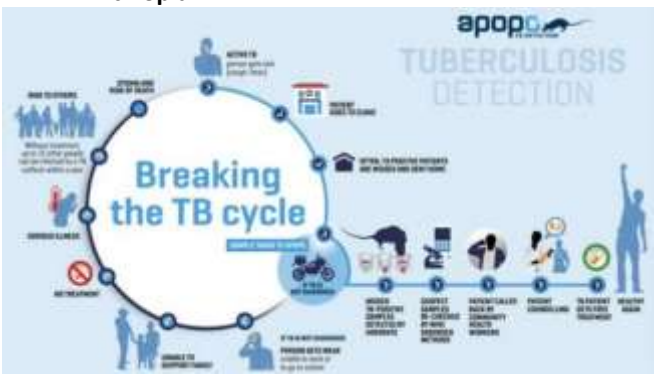
## Using African Giant Pouched Rats for Tuberculosis Detection

**Sub Topic:** *Science and Technology – Developments in Biotechnology, Public Health, and Disease Control Strategies*

**Context: African Giant Pouched Rats (Cricetomys gambianus),** also known as HeroRATS, are being explored as an **innovative solution for TB detection.**

**Role of African Giant Pouched Rats in TB Detection**

- Initiative developed by **APOPO**, a **Belgian-Tanzanian non-profit.**
- Rats possess an **exceptional sense of smell** due to **highly sensitive olfactory receptors.**
- Used as a **secondary diagnostic tool,** detecting TB in **sputum samples.**
- Proven effective in **Tanzania, Mozambique, and Ethiopia.**




**Training Process of HeroRATS**

- **Training duration: Nine months.**
- **Method:** Positive reinforcement using food rewards.
- **Process:**
  - Rats sniff **sputum samples** placed in a rectangular chamber with **10 sniffing holes.**
  - A trained rat **holds its nose for 3+ seconds** at a hole if TB is detected.
  - Samples flagged by rats undergo **microscopy confirmation.**

**Detection Efficiency of HeroRATS**

- **Speed:** A rat can analyse **100 samples in 20 minutes,** while a human takes **3-4 days.**
- **Accuracy:** Rats detect **cases missed by traditional methods,** especially in **children and smear-negative patients.**
- **Studies and Scientific Validation:**
  - **2024 study in BMC Infectious Diseases:** Rats detected **twice as many TB cases in children** compared to conventional methods.
  - **Study on 35,766 patients:** HeroRATS identified an additional 2,029 TB cases.
  - Rats detected **six times more TB cases** in patients with **low bacillary loads.**
  - Ongoing research on **drug-resistant TB detection** by rats.

**Advantages of Using HeroRATS for TB Detection**

- **Speed and Efficiency:** A rat can examine more samples in 10 minutes than a human can in a day.
- **Cost-Effectiveness:**
  - **Training cost:** $6,700–$8,000 per rat, with a **lifespan of 6–8 years.**
  - **GeneXpert machine:** Costs $17,000 per unit, with $10–$17 per test.
- **High Sensitivity:**
  - **Rats detect cases missed by microscopy.**
  - Serve as an **additional verification** tool for diagnostic labs.

**<u>Challenges and Limitations</u>**

Lack of WHO Recognition:

- Rats are not **officially approved** for TB diagnosis.

- Further **clinical trials and validation** required.

Inability to Detect Drug-Resistant TB:

- Rats **cannot differentiate** between **drug-sensitive and drug-resistant strains.**

Scalability and Logistics:

- Requires **regional rat-training centers** for large-scale adoption.
- Cultural barriers as **some communities consume rats as food.**

False Positive Concerns:

- Only **25% of suspect samples** identified by rats are later **confirmed as TB-positive.**
- Further confirmatory **lab tests required.**

**Feasibility of Implementing HeroRATS in India**

- **High TB burden in rural areas** necessitates **alternative diagnostic tools.**
- **Potential as a secondary screening tool** under **NTEP.**
- **Advantages for India:**
  - Cost-effective and faster than existing techniques.
  - Improved detection in children and smear-negative patients.

**Role of Animals in Disease Detection**

- **Dogs detect Parkinson's disease** due to high **olfactory receptor count.**
- **Ants identify cancer cells** within three days.
- **Honeybees detect lung cancer** with 88% accuracy using synthetic biomarkers.
- **Rats in TB detection** are part of a broader effort to **use animals in medical diagnostics.**

- **Experts suggest a phased implementation** starting with **high-TB burden states.**

**Future Prospects and Research Directions**

- **Expanding Coverage:** Deploying rats in **rural areas with limited medical facilities.**
- **Exploring Other Animals:** Research on **dogs, honeybees, and electronic noses** for TB detection.
- **Refining Training Techniques:**
  - Studying if **male and female rats perform differently.**
  - Investigating if rats can **detect latent TB.**
- **Gaining Institutional Support:** Collaboration with **health ministries, WHO, and research institutions.**

## Turing Award

**Sub Topic:** *Science and Technology – Developments in Artificial Intelligence, Computing, and their Applications*

**Context:** The **2025 AM Turing Award,** often referred to as the Nobel Prize for computer science, has been awarded to two pioneers in the field of **reinforcement learning, Andrew Barto** and **Richard Sutton.**

**More on News:**

- In the early 1980s, Barto and Sutton published a paper introducing their approach using a specific task: **balancing a pole on a moving cart** in a simulated world. This task demonstrated how an AI could learn from trial and error.
- They distinguish their work from the current trend in **generative AI** technologies (e.g., LLMs like ChatGPT) that rely on learning from data created by humans. In contrast, their work focuses on AI learning from its own experiences and actions.

**Key Highlights:**

- **Reinforcement Learning:** Barto and Sutton's work focused on teaching machines to adapt and improve their behaviour through **reinforcement learning.** This method involves training AI systems to respond to positive feedback, much like how animal trainers mould the behaviour of animals like dogs or horses.
- **Impact on AI Development:** Their research was crucial in enabling AI programs to perform complex tasks, such as **Google's AlphaGo** beating top human players in the ancient game of Go in 2016 and 2017.
  - It has also been integral in improving AI tools like **ChatGPT, financial trading algorithms,** and even **robotic systems,** such as a robotic hand solving a **Rubik's Cube.**

**About the ACM A. Turing Award:**

- The award is named after **Alan M. Turing**, a British mathematician who laid the mathematical foundations of computing. Turing is also known for his crucial role in the Allied cryptanalysis of the **Enigma cipher** during World War II.
- **Inception:** Established in **1966**, the Turing Award honours computer scientists and engineers who have made significant contributions to the field of computing.
- **Purpose:** The award recognises both the creation of innovative systems and the theoretical foundations that have shaped the **information technology industry.**
- The Award carries a **$1 million prize,** sponsored by **Google**, and was presented to Barto and Sutton by the **Association for Computing Machinery.**

## AIKosha Platform

**Sub Topic:** *Science and Technology – Developments in AI, Data Governance, and Digital Infrastructure in India*

**Context:** The **Union government** launched **AIKosha** on **March 6, 2025,** as a national platform for non-personal data to aid in the development of **Artificial Intelligence (AI) models and tools.**

**Key Features**

- The platform includes an **AI sandbox** with integrated development environments, tutorials, and tools.
- It is designed with **AI readiness scoring** of datasets, permission-based access, and strong **security mechanisms** (e.g., data encryption, secure APIs, real-time traffic filtering).
- The platform currently hosts **316 datasets** at launch, primarily focused on creating and validating **language translation tools** for Indian languages.
- Other datasets available include **health data, 2011 Census data, satellite imagery, meteorological and pollution data,** and submissions from **Telangana's open data initiative.**

**Part of the IndiaAI Mission**

- **AIKosha** is one of the **seven pillars** of the **IndiaAI Mission,** the government's flagship AI initiative.
- The **IndiaAI Mission** has an **outlay of ₹10,370 crore** and aims to enhance AI development in India.
- As part of the **Compute Capacity** pillar, the government has made **14,000 GPUs** available for shared access by **startups and academic institutions** to train and run AI models. Additional GPUs will be **added quarterly** to support AI model training.

**Homegrown AI Foundation Model**

- The government is also supporting efforts to develop an **indigenous foundational AI model.**
- This initiative has gained **urgency** following the success of **China's DeepSeek,** which built a **cost-effective foundational AI model** compared to **US firms like OpenAI and Google.**
- According to Mr. Vaishnaw, there is **high interest from Indian startups** in building such a model.

**Previous Government Data Initiatives**

- AIKosha is not the government's first attempt at **aggregating public data.**
- The **Open Governance Data platform (data.gov.in)** already hosts **12,000+ datasets** from government agencies.
- The government has appointed **Chief Data Officers** across Ministries to encourage dataset contributions for use by **researchers, companies, and policymakers.**

## Study on Particle Acceleration in Space

**Sub Topic:** *Science and Technology – Space Technology, Astrophysics, and Cosmic Ray Formation*

**Context:** The **January 13, 2021 study** by researchers from **Johns Hopkins University** and **Northumbria University** shed light on the role of **collisionless shock waves** in accelerating subatomic particles to extreme speeds, addressing a long-standing puzzle in astrophysics.

**Key Findings of the study**

- **Data Sources:** NASA's **MMS, THEMIS,** and **ARTEMIS** missions provided critical data on plasma interactions.
- **Acceleration Mechanism:** The researchers focused on **diffusive shock acceleration,** where shock waves accelerate electrons. However, a key challenge is the **"electron injection problem"** — electrons must first reach ~50% of light speed to be further accelerated.
- **Significant Observation (Dec 17, 2017):**
  - High-energy electrons (500 keV) were detected in the foreshock region of Earth's bow shock.
  - Typically, electrons here have just around **1 keV** of energy.
  - These electrons were moving at **~86% of the speed of light,** a surprising and significant leap.
  - The acceleration was attributed to a complex interaction of plasma waves and transient structures in the foreshock.

**Implications of the Study**

- The process might **explain the origins of some cosmic rays.**
- High-energy electron acceleration could also occur in systems where **gas-giant planets** orbit very close to their stars.
- This finding hints at a broader mechanism across the universe, potentially **redefining how we understand cosmic ray formation.**

**Future Directions**

- The researchers urged the **astrophysics and particle acceleration** communities to explore and verify this model.
- The study underscores the value of using **near-Earth plasma environments** as a "natural laboratory" to understand universal phenomena.

## Toponymous Diseases

**Sub Topic:** *Health and Governance – Disease Classification and Global Health Ethics*

**Context:** Toponymous diseases, named after places or regions, have long been a source of confusion, misinformation, and prejudice. The names can lead to racial prejudice, politicise scientific findings, and harm international cooperation in combating diseases.

**Understanding Toponymous Diseases**

- **Definition:** Toponymous diseases are named after geographic locations—towns, rivers, islands, mountains, countries, and continents.
- **Examples:** Spanish flu, Delhi boil, Madura foot, West Nile Virus.

**The Harm Caused by Geographical Naming**

**Misinformation and Stigma:** Such names can lead to misinformation, racial prejudice, and the tarnishing of regions and communities.

**Case Study: Spanish Flu**

- Despite its name, the **1918–1920 influenza pandemic** didn't originate in Spain.
- Spain's neutrality in World War I meant its media reported freely on the pandemic, unlike war nations that suppressed news to maintain morale.
- This led to the mistaken naming, linking the deadly flu (which affected 500 million and killed over 20 million people) unfairly to Spain.

**WHO's Initiative to Correct Naming Practices**

**Mandate in 2015:** The World Health Organisation (WHO) mandated that diseases should be named based on scientific characteristics, avoiding geographical references.

**Successful Renaming Efforts:**

- **Zika Virus:** Named after Uganda's Zika forest where it was first discovered in 1947. The related fetal condition was later renamed to **congenital Zika** syndrome to focus on scientific clarity.
- **Mpox:** The term **mpox** replaced monkeypox to curb racist and stigmatizing language associated with the original name.

**WHO's Naming Guidelines**

**Responsibilities:** WHO assigns disease names via the **International Classification of Diseases** through consultative processes involving member states.

**Key Criteria**

- Scientific appropriateness and rationale.
- Avoidance of geographical, zoological, or cultural references.
- Pronounceability and ease of historical information retrieval.
- Sensitivity to stigma and misrepresentation.

**Ethical Renaming: Learning from History**

- **Reiter's Syndrome:** Originally named after Hans Reiter, a German physician who first described it in 1916.
- Post-World War II revelations of Reiter's Nazi associations and unethical experiments led to the disease being renamed **reactive arthritis.**

**The Path Forward**

- **Precision in Language:** Scientists and global health organisations must prioritise accurate, unbiased naming that focuses on scientific facts.
- **Global Sensitivity:** Naming should avoid fuelling stereotypes and stigma, recognising that diseases affect the global community indiscriminately.
- **Unified Approach:** The SARS-CoV-2 pandemic underscored the need for global solidarity, sensitivity, and collective action to combat health crises.

## Green Energy Corridor Phase-III

**Sub Topic:** *Infrastructure – Energy, Renewable Energy & Climate Change Mitigation Policies*

**Context:** The Union government is set to provide financial assistance of approximately **₹22,400 crore to states for the development of intra-state transmission systems under the third phase of the Green Energy Corridor (GEC-III).**

**Budget and Project Scope**

- GEC-III, **proposed in the Union Budget for FY26, is estimated to cost around ₹56,000 crore,** with the **central government covering 40% of the expenses.**
- **Key beneficiary** states include **Gujarat, Rajasthan, Karnataka, Maharashtra, and Andhra Pradesh.**
- **Gujarat is expected to have the highest share,** undertaking transmission projects worth over ₹29,000 crore, **followed by Rajasthan** with projects valued at more than ₹9,000 crore.

**Government's Focus on Energy Transition**

- The **Ministry of New and Renewable Energy (MNRE)** recently held discussions with stakeholders, emphasising the **need to accelerate the expansion of the transmission network.**
- The **initiative aligns with India's target of achieving 500 GW of non-fossil fuel capacity by 2030,** which requires a robust and stable grid to accommodate the intermittent nature of solar and wind energy.
- The **previous phases of the Green Energy Corridor are at various stages of implementation** across ten states, with the Centre providing up to 40% financial assistance for the projects.

**Panchamrit**

The Panchamrit refers to **India's five-point action plan to combat climate change,** presented at the **COP26 conference in Glasgow in November 2021.** This plan aims

to align economic growth with environmental sustainability and includes the following commitments:

- Achieve **500 GW of non-fossil fuel energy capacity by 2030.**
- Meet **50% of energy requirements from renewable sources by 2030.**
- **Reduce total projected carbon emissions by 1 billion tons by 2030.**
- **Lower carbon intensity of GDP by 45% by 2030.**
- Achieve **net-zero emissions by 2070.**

**Strengthening Renewable Energy Integration**

- An MNRE spokesperson highlighted that **Phase III aims to strengthen transmission infrastructure for the seamless integration of renewable energy sources.**
- The scheme **will support states with high renewable energy potential** as well as emerging markets, helping to offset costs, reduce tariffs, and attract private investment.

**Background and Challenges**

- Launched in 2015, the **Green Energy Corridor project includes both inter-state and intra-state transmission systems,** along with **renewable energy management centers and control infrastructure.**
- While the **third phase focuses primarily on intra-state transmission,** previous phases have faced delays due to issues such as right-of-way challenges, land acquisition problems, low bidder turnout leading to re-tendering, court cases, forest clearances, and environmental concerns, including approvals related to the **Great Indian Bustard's habitat.**
- The **Parliamentary Panel on energy** has **urged the MNRE to work closely with state governments and other stakeholders** to resolve these issues and ensure the timely expansion of transmission infrastructure.
    - The ministry has confirmed that Phase III of the Green Energy Corridor is expected to be rolled out in 2025-26.

## Genetically Engineered Non-Browning Bananas

**Sub Topic:** *Developments in Biotechnology; Environmental Conservation and Food Security*

**Context:** A new breed of banana is being developed by **Tropic,** a UK-based biotech company, with a specific goal in mind: reducing food waste.

**More on News**

- These genetically engineered bananas are designed to have a longer shelf life, preventing them from turning brown too quickly, even after being peeled.
- Tropic claims that their bananas will stay fresh and yellow for up to 12 hours after peeling and are less likely to turn brown when subjected to rough handling during harvesting and transportation.

**Why Do Bananas Turn Brown?**

- **Bananas, like many fruits, undergo a natural ripening** process triggered by a **hormone called ethylene.**
- As bananas ripen, they **shift from a deep green to a yellow hue,** and eventually to a brown color. Ethylene continues to be produced even after bananas are harvested, causing them to ripen further and eventually brown.
- A **key factor** in this process is the **enzyme polyphenol oxidase (PPO),** which breaks down the **yellow pigments in bananas and turns them brown** when exposed to oxygen.
- When bananas are bruised or bumped — a common occurrence during harvesting and transportation — they release more ethylene, speeding up the ripening and browning process.

**How Was the Non-Browning Banana Developed?**

- Tropic achieved their non-browning bananas by **genetically altering the fruit** to disable the production of the **PPO enzyme.** This doesn't stop the banana from ripening—rather, it keeps the fruit from turning brown, maintaining its appetizing appearance for longer periods.
- The technique is similar to what was used in the development of **Arctic Apples,** created by **Okanagan Specialty Fruits** in the U.S., which were the first genetically engineered fruits to be approved for commercial sale.
- Interestingly, the same approach has been effective in other fruits and vegetables, including **tomatoes, melons, kiwifruits**, and even **mushrooms.**

**Why Does This Matter?**

- **Bananas** are highly perishable, and estimates suggest that around **50% of the global banana crop** goes to waste each year.
    - In the UK alone, it is reported that about **1.4 million bananas** are thrown away every day, many of which are still perfectly edible. This significant level of waste is both **financially costly** and environmentally harmful.
    - **Food waste** is one of the **major contributors** to **greenhouse gas emissions,** which exacerbate **global warming.**
- By reducing the rate at which bananas turn brown, Tropic's **non-browning bananas** may help **lower food waste** by encouraging people to consume older, but still good, bananas.

- According to Tropic's press release, their new bananas could reduce $CO_2$ emissions to the equivalent of **removing 2 million passenger vehicles** from the roads each year.

This innovation not only presents a potential **financial benefit** for consumers but could also make a **positive environmental impact,** addressing both **food waste** and **climate change.**

## Hantavirus Pulmonary Syndrome

**Sub Topic:** *Health, Disease Prevention, and Epidemiology & Issues Relating to Health and Public Health Policies*

**Context:** The recent tragic deaths of Oscar-winning actor Gene Hackman and his wife, pianist Betsy Arakawa, have been linked to hantavirus pulmonary syndrome (HPS), which is a rare but potentially deadly disease.

**What Is Hantavirus Pulmonary Syndrome (HPS)?**

- Hantavirus is a **family of rodent-borne viruses** that can cause serious diseases, including HPS, which is common in the Western Hemisphere.
- The virus is primarily **spread through infected rodents' urine, faeces, and saliva,** but it does not spread between humans.
- HPS is typically **transmitted when humans inhale dust contaminated with rodent droppings or saliva.**
- The most common hantavirus responsible for **causing HPS is carried by the deer mouse,** according to the **U.S. Centers for Disease Control and Prevention (CDC).** In other regions, such as Europe and Asia, hantaviruses cause a different illness known as **haemorrhagic fever with renal syndrome (HFRS).**

**Symptoms of HPS**

- Generally appear **one to eight weeks after exposure and resemble flu-like symptoms.**
- **Early symptoms** include **fatigue, fever, and muscle aches.**
- As the disease progresses, individuals may experience **respiratory difficulties,** including **shortness of breath and chest tightness** as the lungs fill with fluid.
- **According to the CDC, 38% of people who develop respiratory symptoms** due to HPS may die from the disease.

**Is There a Cure for HPS?**

- Currently, there is **no known cure or specific treatment for HPS.** However, **early detection and medical intervention** can be crucial for managing the disease.
- Some **antiviral medications may help alleviate symptoms,** and respiratory support, such as breathing tubes, may be necessary for patients experiencing severe breathing difficulties.

**Prevention and Safety Measures**

- For those living in areas where hantavirus-infected rodents may be present, microbiologist **Sabra L. Klein** suggests the following precautions:
- **Wear gloves** and an **N95 mask** when cleaning areas with rodent excrement.
- Avoid **vacuuming** or sweeping, as this can stir up harmful aerosols from the droppings.
- Use **bleach solution** or **commercial disinfectants** to clean contaminated surfaces and carefully dispose of cleaning materials.

# Subject – Environment, Bio-diversity and Disaster management

## Mass Whale Strandings

**Sub Topic:** *Environmental Ecology, Conservation, and Climate Change; Biodiversity and Sustainable Development*

**Context:** Australian authorities announced the euthanasia of **90 false killer whales** that survived a **mass stranding** on a remote beach in Tasmania.

**More on News**

- The decision was made as **saving them was deemed impossible** due to complex conditions.
- **Total affected pod:** 157 whales stranded near **Arthur River, north-west Tasmania.**

**What is Whale Stranding?**

- **Definition:** A phenomenon where **whales, dolphins, or porpoises** get stuck on land, usually on a beach.
- **Types:**
  - **Single strandings:** Involving individual animals.
  - **Mass strandings:** Groups of hundreds of marine animals stranded together.
- **Historical Perspective:**
  - Occurred since **Aristotle's time.**
  - Once considered a **gift from the gods** as stranded whales and dolphins provided **food and oil.**

**Why Do Whales Strand?**

- The exact reasons remain **unclear**, but experts identify several contributing factors:

- **Topography of the region:** Certain areas experience frequent strandings due to tidal variations making deep waters **suddenly shallow.**
- **Illness or injury:** Diseased or weak whales may struggle to navigate.
- **Human activities:** Increased ocean noise, pollution, and climate change.

**Hotspots for Mass Strandings**

- Tasmania, Australia
- Golden Bay, New Zealand
- Cape Cod, Massachusetts, USA
- These areas see frequent strandings, possibly due to rapid depth changes in surrounding waters.

**Human Activities and Whale Strandings**

**Increasing frequency:** Human interference may be worsening strandings.

**Key human-induced factors:**

- **Noise pollution:**
  - Large commercial ships, **military sonar, offshore drilling.**
  - Disrupts whales' ability to **communicate, navigate, and detect predators.**
  - Loud noises can **deafen, disorient, or scare** whales, driving them ashore.
- **Climate Change & Ocean Temperature Rise:**
  - Affects **prey and predator distribution,** forcing whales to **move closer to shore.**
  - Whales follow their **food sources,** which may now be in riskier coastal areas.

**Can Mass Strandings Be Prevented?**

**Difficult to prevent entirely** due to multiple causes.

**Possible mitigation measures:**

- **Reduce ocean noise pollution** by regulating **shipping, drilling, and sonar use.**
- **Monitor environmental changes** to understand whale movements.
- **Raise awareness** and take greater care in human activities affecting marine ecosystems.

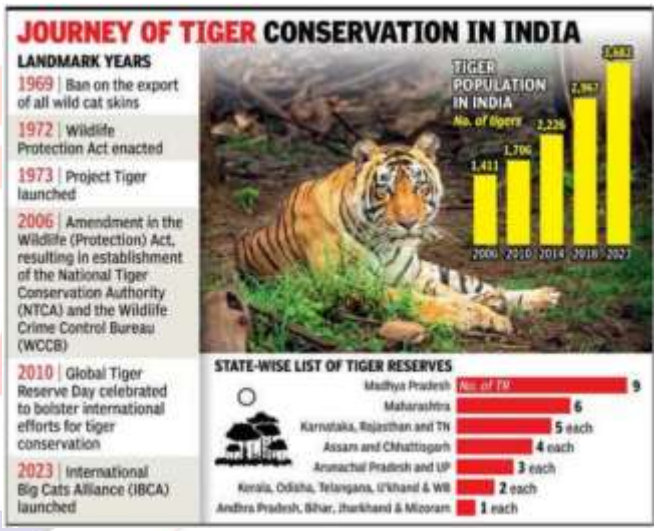
## Madhav National Park

**Sub Topic:** *Environmental Ecology, Biodiversity, and Conservation; Protected Areas and Species Recovery Programs in India Programs*

**Context:** The Madhav National Park in Madhya Pradesh has officially been designated as India's **58th Tiger Reserve,** marking a significant milestone in the country's efforts to conserve its wildlife and ecological heritage.

**Key Highlights**

- This announcement was made by **Union Environment Minister Bhupender Yadav on March 9, 2025,** and it adds to Madhya Pradesh's growing contribution to tiger conservation, with the park becoming the **ninth tiger reserve in the state.**
- The **Madhav Tiger Reserve** is located in the **Shivpuri district**, within the Chambal region of Madhya Pradesh.
- The park currently houses **five tigers,** including two recently born cubs.
- Two more tigers are expected to be introduced to the reserve, as announced by **Madhya Pradesh Chief Minister Mohan Yadav.**
- The **Madhav Tiger Reserve** has been actively involved in **tiger reintroduction** efforts. **In 2023, three tigers** (including two females) were introduced to the park as part of the state's initiative to bolster the tiger population and restore natural habitats.




**About Madhav National Park**

- Madhav National Park is situated on the **northern fringe** of the **Central Highlands of India,** nestled in the **Upper Vindhyan Hills.**
- The park spans an area of **355 square kilometres** and is a fascinating mix of natural beauty, history, and architectural marvels.
- The park was officially notified as a **National Park in 1958.**
- The park is home to two significant lakes in the southern part: **Sakhya Sagar** and **Madhav Sagar.**
- These lakes serve as a **lifeline** for both aquatic and terrestrial species, offering water sources and supporting diverse **wetland habitats.** These lakes also attract **migratory waterfowl,** particularly during the winter months.
  - **Sakhya Sagar** is especially famous for the abundance of **Marsh Crocodiles,** earning it the nickname "Crocodile Safari."
  - **Madikhera Dam** is located in the **northwestern part** of the park, contributing to the region's water resources.

- **Flora:** Dominated by **Kardhai** trees, the forest also includes various species of shrubs and undergrowth typical of dry forests.
- **Fauna:**
    - **Mammals:** Home to species like **Nilgai, Chinkara, Chowsinga, Chital, Sambar, Barking Deer, Leopard, Wolf, Jackal, Fox, Wild Dog, Wild Pig, and Porcupine.**
    - **Reptiles: Marsh Crocodiles, Turtles,** and various species of **Snakes.**
    - **Avian Fauna:** A variety of migratory birds, especially in the winter months, can be seen around the lakes.

## Satkosia Tiger Reserve (STR)

**Sub Topic:** *Environmental Ecology, Biodiversity, and Wildlife Conservation; Protected Areas and Species Recovery*

**Context:** In 2023, 112 families from Tuluka and Asanbahal were relocated to Dhauragotha, marking the second such resettlement colony around **Satkosia.** This **shift is part of Odisha's larger effort to free the forest for tiger conservation.**

**Reserve Without Tigers**

- **Location and Area:** Satkosia Tiger Reserve is located in the border of Angul and Nayagarh districts of Odisha, India.
- **History:** The **Satkosia Gorge Wildlife Sanctuary was established in 1976, and the Baisipalli Wildlife Sanctuary was added in 1981.**
    - Satkosia Tiger Reserve was **established in 2007 by merging the Satkosia Gorge and Baisipali sanctuaries.**
- **Terrain and Biodiversity:** The reserve is **situated where the Mahanadi River passes through a 22 km long gorge in the Eastern Ghats mountains.**
    - It is **part of the Eastern Highlands moist deciduous forests** ecoregion and features diverse flora and fauna, including mixed deciduous forests and riverine forests.
    - Key wildlife includes **leopards, wild dogs, elephants, various deer species, and reptiles like crocodiles and snakes.**
- **Tiger Population:** The **tiger population in STR has dwindled alarmingly—from 12 recorded in 2007 to none by 2022.**
    - In an effort to restore the tiger population, **India's first inter-state tiger relocation program was launched in 2018.**
    - A **male tiger from Kanha Tiger Reserve and a tigress from Bandhavgarh Tiger Reserve in Madhya Pradesh were introduced into STR.**
    - However, the **project met a tragic end**—one tiger was killed in a poacher's trap, and the other, after straying into human settlements, was eventually sent back.
- **Crocodile Conservation:** In March 1974, the Forest Department of Odisha, with technical assistance from the **United Nations Development Programme (UNDP) and the Food and Agriculture Organisation (FAO),** launched a crocodile breeding program.
    - A year later, in March 1975, the **Gharial Research and Conservation Unit (GRACU)** was established, playing a key role in crocodile conservation efforts in India.
    - Its initiatives focus on conservation breeding, rehabilitating crocodiles, and releasing reared individuals into their natural habitat.

# PLACES IN NEWS

## Places in News: Vanuatu

**Sub Topic:** *Location and Physical Features*

**Context:** Vanuatu, a small island nation in the South Pacific, has gained global attention for its citizenship by investment (CBI) program, commonly referred to as a "golden passport" scheme.

**About Vanuatu**

- **Location: A Melanesian archipelago** located in the **South Pacific Ocean.**
- Geographically, Vanuatu is situated in both the **Southern and Eastern hemispheres** of the Earth.
- **Capital:** Port-Vila, located on Efate.
- **Currency:** Vatu (VUV)


- **Neighbouring Countries:** Lies to the east of Australia, northeast of New Caledonia, west of Fiji, and southeast of the Solomon Islands.
- **Geography: A chain of 13 principal and many smaller islands**
    - The islands form an irregular Y shape, extending north-south for approximately 400 miles (650 km).
    - **Seismic Activity**: Frequent earthquakes indicating structural instability.
    - The terrain of Vanuatu is diverse and is famed for its gorgeous islands and active volcanoes.
    - **Active Volcanoes:** Sere'ama (Vanua Lava), Monaro (Aoba), Garet (Santa Maria), Benbow and Marum (Ambrym), Yasur (Tanna)
- **Wildlife:** Approximately 10 types of bats are found here (with three species unique to Vanuatu) and home to the estuarine crocodile.

# SPECIES IN NEWS

## Species in News: Gangetic Dolphins

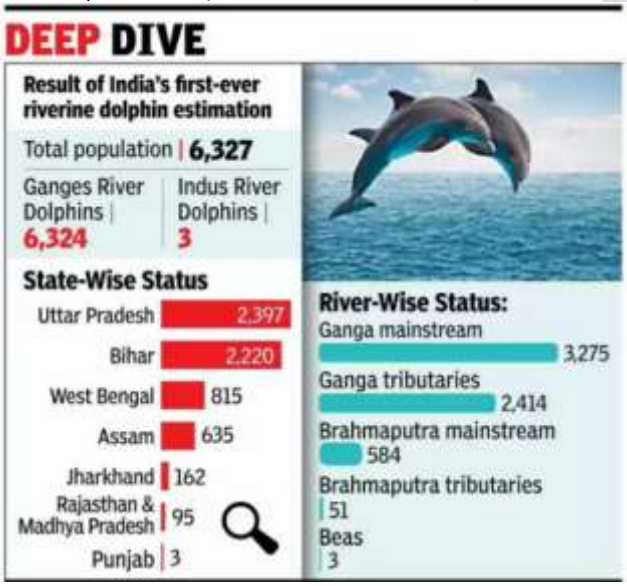
**Context:** The **first comprehensive estimate** of the Gangetic dolphins, the only riverine dolphins found in India, reveals a **population of 6,327 individuals** across the river Ganga and its tributaries.

**More on News**

- Conducted under **Project Dolphin (launched in 2020),** the survey provides crucial insights into the status of these species in India.
- The survey also found **three Indus River dolphins** in the Beas River.
- The survey covered **28 rivers across 8 states,** spanning 8,507 km.

**About Ganges River Dolphin**

- India is home to two species of **freshwater dolphins:**
  - **Ganges River Dolphin** (Platanista gangetica)
  - **Indus River Dolphin** (Platanista minor)
- **IUCN Status:** Endangered (Listed under **Schedule I of the Wild Life (Protection) Act, 1972,** which provides them with the highest level of legal protection.)




- Once found across the **Ganges-Brahmaputra-Meghna and Karnaphuli-Sangu River systems in Nepal, India, and Bangladesh,** the species is now **extinct in many of its former habitats.**
- These dolphins serve as bio-indicators, meaning their presence signals a **healthy river ecosystem.**
- Unique Characteristics:
  - It is a **freshwater species** and **cannot survive in saltwater.**
  - The dolphin is **essentially blind** and relies on ultrasonic sound waves for hunting. These sounds **bounce off prey,** creating a **mental image** to help them navigate and find food.
  - They are often found **alone or in small groups, with mothers and calves typically traveling together.**

**Survey Methodology and Challenges**

- Unlike land animals like **tigers and elephants,** dolphin counting is **more complex** due to their **underwater nature** and **sporadic surfacing.**
- Dolphins **lack distinct physical markers,** making **individual identification difficult.**
- The survey used **acoustic hydrophones (underwater microphones)** to detect dolphin sounds.
- A team of observers **triangulated** dolphin locations to **avoid double counting.**
- The dolphins, being **blind,** rely on **echo-location** to navigate and communicate.

**Government Response and Conservation Efforts**

- The survey results were **officially released by PM Narendra Modi on March 3, 2025 (World Wildlife Day).**
- He emphasised the importance of **local community participation** in conservation.
- Educational initiatives were suggested, encouraging **schoolchildren to visit dolphin habitats.**

## Species in News: Indian Long-Billed Vulture

**Context:** Nehru Zoological Park has launched a dedicated **vulture breeding programme** to conserve endangered vulture species, following the challenge of ageing vultures that are no longer able to reproduce.

**More on News**

- The programme is being implemented in two phases: the first phase focuses on **conservation breeding,** aiming to increase the vulture population under controlled conditions, while the second phase will assess their survival in the wild before releasing them into their natural habitat.
- This initiative began with nine vultures from Sakkarbaug Zoo in Gujarat.

**About Indian Long-Billed Vulture**

- **Scientific Name:** Gyps indicus
- **Appearance:**
  - Medium-sized, light brown vulture.

  - Whitish feathers on a dark head and neck.
  - Pale bill and a pale collar, more prominent behind the neck.
  - Juveniles have a darker bill, more white feathering on head and neck, and overall browner plumage with pale streaks on the breast and belly.
- **IUCN Status:** Critically Endangered (CR)
- **Diet:** As scavengers, the Indian vulture feeds primarily on the carcasses of dead animals, playing a crucial role in ecosystem clean-up by disposing of decaying organic matter.

**Distribution and Habitat**

- **Geography:** Native to **South Asia**, with its primary distribution in **India**, **Pakistan, Nepal,** and parts of **Afghanistan**.
- **Biogeography:** Found in the **Indomalayan** biogeographical realm.
- **Habitats:** The Indian vulture is commonly found in **tropical savanna** and **tropical dry forests,** often near **villages, cities,** and **cultivated areas,** which provide ample scavenging opportunities.

**Habits and Lifestyle**

- **Social Behaviour:** Indian vultures are highly **social** birds and typically congregate in flocks when feeding on carcasses.
- **Foraging:** They are **diurnal** (active during the day) and spend most of their time soaring over open landscapes in search of food. They may fly up to **100 km** in a single day while searching for carcasses.
- **Communication:** Generally **silent**, but when gathered around carcasses, they produce **grunts** and **hisses**.

**Population Threats**

- **Poisoning from Diclofenac:** This **veterinary drug** was widely used to treat livestock for joint pain. Vultures that consumed the carcasses of these treated animals would ingest the toxic drug, leading to kidney failure and death.
- **Impact of Diclofenac:** The use of diclofenac in veterinary medicine caused a massive decrease in the vulture population. Fortunately, its use has been **banned,** and efforts to save the species have been ramped up.
- **Conservation Efforts:** Captive breeding programs have been established to help restore vulture numbers. However, given the vultures' **long lifespan** and **slow reproduction rates,** it may take decades for these efforts to yield significant results.
- **Future Hope:** The hope is that, once the environment is clear of diclofenac, the **captive-bred vultures** can be **reintroduced** into the wild and help restore the species' numbers.

## Species in News: Smooth Coated Otters

**Context:** In an exciting development, the sm**ooth-coated otters** are set to return to the Delhi Zoo, officially known as the **National Zoological Park,** after an absence of nearly two decades.

**More on News**

- The otters, which were last housed in the zoo in **2004**, will be part of an **exchange programme** with the **Surat Zoo.** The otters are expected to arrive by the **end of this month.**
- Along with the otters, the **Delhi Zoo** will also receive **10 star tortoises** from Surat as part of the exchange. In return, the Delhi zoo will send **five sangai deer, two blue-and-yellow macaws,** and **four green-cheeked conures** to the Surat zoo.

**About**

- **Scientific Name:** Lutrogale perspicillata
- **Common Name:** Smooth-coated Otter, Indian Smooth-coated Otter
- **Species: L**. perspicillata (I. Geoffroy Saint-Hilaire, 1826)
- **Conservation Status:**
  - IUCN: Vulnerable
  - IWPA: Schedule I
  - CITES: Appendix I
- **Distribution:** The **Smooth-coated Otter** is found throughout **South Asia** and **Southeast Asia.** In **India,** it is widely distributed across all major rivers south of the **Himalayas.**
- **Habitat:** Smooth-coated otters prefer **rocky stretches** for dens and resting.
- They are commonly found in river stretches with **bank-side vegetation and marshes,** which provide cover for traveling or foraging, especially during summer months.
- **Social Behaviour:** These otters are **social animals,** and they often **hunt in groups.** They are predominantly **diurnal** (active during the day), with a **short lull in activity** during midday.

**Major Threats**

- **Loss of Wetland Habitats:** Large-scale hydroelectric projects, as well as reclamation of wetlands for settlements and agriculture, are significantly reducing their habitat.
- **Decline in Prey:** The **lack of an adequate prey base** threatens the survival of otter populations.
- **Pollution:** Wetlands and waterways are becoming polluted due to **eutrophication** and accumulation of **persistent pesticides** such as **chlorinated hydrocarbons** and organophosphates from agricultural runoff.
- **Poaching:** The smooth-coated otter is often **poached for its pelt,** which contributes to its declining numbers.

## Species in News: Fijian Crested Iguana

**Context:** Fiji and Tonga are home to a unique species of native iguanas that have long puzzled scientists.

**More on News**

- Unlike their counterparts, which are found exclusively in the **Americas** (from the southwestern US to the Caribbean and South America), these iguanas exist thousands of kilometres away in the **South Pacific.**
- A study published in the **Proceedings of the National Academy of Sciences** suggests that the iguanas' ancestors **rafted across the ocean** on mats of floating vegetation.

**About**

- The **Fiji Crested Iguana** (Brachylophus vitiensis) is a striking and colourful reptile first described in **1980.**
- This species is notable for its **vibrant green colouration** with distinctive **white bands, and a spiky crest** along its neck, back, and tail, giving it a unique appearance among other iguana species.
- These iguanas are also known for their **ability to change colour,** shifting from green to black when threatened or excited, often accompanied by opening their mouths and lunging to deter potential threats.
- **IUCN Status:** Critically Endangered
- **Geography**: Native to Fiji, in the South Pacific.
- **Habitats**: Prefers rocky areas and forests.
- **Diet:** Primarily **herbivorous**, feeding on the leaves, fruits, shoots, and flowers of various trees and shrubs. Their favourite food includes the **sweet hibiscus flowers** of the **Vau tree (Hibiscus tiliaceus).**
- **Predation by Introduced Species:** Feral **cats, mongoose,** and **rats** are significant predators, targeting both adult iguanas and their eggs.
- **Threats:**
  - **Habitat Loss:** The main threat to the Fiji Crested Iguana is **habitat loss,** caused by: **Fires, Storms, Agricultural development, and Competition from feral goats.**
  - **Hunting and Illegal Trade:** The iguanas have been hunted for food and the illegal pet trade.
- **Conservation Efforts:** A **Species Action Plan** is underway for all Fijian iguanas, which includes:
  - Habitat protection and restoration
  - Invasive predator control
  - Improved forestry and agricultural practices
  - Community outreach and education

# LONG ARTICLES & BOOK REVIEW

## Kurdish Struggle: A Stateless People in Search of a Homeland (By Manikant Sir)

The Kurds, traditionally a nomadic people, are spread across modern-day **Turkiye, Syria, Iran, Iraq, and Armenia.** For over a century, they have aspired to establish **Kurdistan**, a **state envisioned since the Ottoman Empire** introduced the concept of nation-states. However, Kurdish communities have remained fragmented and stateless due to historical and geopolitical challenges.

Historically, **Kurds** were dispersed across the **Ottoman Empire** and lacked a unified national identity, unlike other groups such as Armenians or Turks. This disunity hindered their ability to **claim an independent state** during the **post-World War I reshaping of the region by European powers.** The **Treaty of Sevres** in 1920 proposed **autonomy for Kurdish areas** and even hinted at possible independence.

However, **tribal divisions** and **reluctance to detach from the Ottoman heartland** prevented **Kurdish leaders from seizing this opportunity.** The formation of the **Turkish Republic** in 1923 further suppressed Kurdish identity, with the **Treaty of Lausanne** excluding Kurds from recognition as a national minority. Efforts to resist Turkish oppression, such as the **Sheikh Said Rebellion (1925)** and the **Ararat rebellion (1928–1930),** were brutally suppressed, leaving Kurds politically marginalised.

Despite these setbacks, Kurdish identity saw a revival **post-1946 with Turkiye's political liberalisation.** Urbanisation and agricultural mechanisation fostered nationalist sentiments among Kurds, leading to the emergence of left-wing Kurdish parties like the **Kurdistan Workers' Party** (PKK) in 1978 under **Abdullah Ocalan.** The PKK adopted **Marxist-Leninist ideology** and launched an armed campaign against the Turkish state. Increasing state repression drove many Kurds to support the PKK, which expanded its influence across borders by forming alliances with Kurdish factions in **Syria (PYD), Iran (PJAK), and Iraq (PCDK).**

Internationally, Kurdish autonomy has found partial recognition. **Iraq's 2005 Constitution** granted **semi-autonomous status to its Kurdish region,** though attempts at full independence through a 2017 referendum were met with military backlash. In **Syria**, during the **civil war,** Kurds established **Rojava** as a **de facto autonomous region with US support against ISIS**. However, shifting geopolitical alliances have left its future uncertain. Meanwhile, Türkiye continues to view groups like the PKK as terrorist organisations, while Russia has historically supported them.

**What is Statelessness and how can it be tackled?**

**Article 15** of the **Universal Declaration of Human Rights (UDHR)** states that everyone is entitled to nationality, and statelessness is addressed in the **Convention on the Status of Stateless Persons, 1954 and 1961**. India is not a party to any of these conventions apart from those related to conventions on refugees. Therefore, the idea of statelessness is a matter of concern. However, legal instruments and judicial precedents are available to address such issues.

In India's case, laws like the **Foreigners Act, 1948, Passport Act, 1967, and Registration of Births and Deaths Act, 1969** render provisions related to stateless persons. The Passport Act, 1967, is the only Indian Act that acknowledges the rights of stateless persons, including those with no nationality or doubtful foreign nationality. Also, the Supreme Court in the **State of Arunachal Pradesh vs Khudiram Chakma (1993)** ruled that Article 21 of the Constitution extends to foreigners, providing them with life, liberty, and a fair trial, but not the right to reside.

Countries like **South Africa** have established an exception to **statelessness** through the **South Africa Citizenship Act, 1995.** The Act, which has evolved from Jus Soli to Jus Sanguinis citizenship, recognises the citizenship of people born in South Africa but without any citizenship or nationality of any country, provided the birth is registered. This helps curb the gap created by the Act, preventing children from suffering from statelessness. The right to education is provided to every child within South Africa's boundaries, regardless of their nationality or citizenship. The Act only recognises the citizenship status of a child born in South Africa and does not consider the status of migrant children. **Article 5 of the African Charter on Human and Peoples' Rights** confirms that **statelessness is a violation of human dignity and legal status.**

**Kurdish and Jewish - Two Sides of the Same Coin:**

The **Kurdish people** and the **Jewish people** share a **history of persecution, displacement,** and **aspirations for self-determination,** but their trajectories have diverged significantly. While the Jewish people succeeded in establishing a **nation-state, Israel,** in 1948, the **Kurds remain the largest ethnic group without a state.** This disparity can

be understood through historical, political, and geopolitical contexts.

The lack of **international support** has compounded the plight of Kurds. Unlike the **Jewish case, no global consensus or powerful allies have championed Kurdish independence.** Instead, regional powers view Kurdish aspirations as a threat to territorial integrity. For instance, Turkey has consistently opposed Kurdish autonomy due to fears of separatism among its own Kurdish population.

In contrast, the **Jewish people** successfully established **Israel** after centuries of persecution culminating in the Holocaust. The **Zionist movement** gained significant momentum in the late 19th and early 20th centuries with strong international backing. The **Balfour Declaration (1917)** and subsequent **British Mandate over Palestine** laid the groundwork for Jewish immigration to the region. Following **World War II** and the Holocaust's atrocities, global sympathy for Jews reached unprecedented levels. In 1948, with support from Western powers and international organisations like the United Nations, Israel declared independence.

A key factor in Israel's establishment was the **Law of Return (1950),** which granted Jews worldwide the right to immigrate to Israel. This law facilitated **mass migrations of Jewish communities from Europe, the Middle East, and North Africa.** In contrast to the Kurds' fragmented diaspora, Jews were able to consolidate their population within a defined territory.

Both Kurds and Jews have faced systemic discrimination and violence. However, while Jews were able to unite around a shared religious identity and historical claim to Palestine as their ancestral homeland, Kurds remain divided by geography and political boundaries. Additionally, while Jewish diasporas maintained strong cultural ties and political advocacy for Israel's creation, Kurdish diasporas have struggled with fragmentation and limited influence.

Despite statelessness, both groups have preserved their identities. Kurds continue to celebrate their language and traditions despite pressures to assimilate within host states. Similarly, Jewish communities maintained their cultural practices during centuries of exile but were ultimately able to consolidate them within a sovereign state

**Conclusion:**

The Kurdish struggle remains emblematic of statelessness in modern geopolitics—a quest for identity and autonomy amidst fragmented communities and complex international dynamics.

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Inspired by Shashank Reddy's "A Defining Moment" *(The Indian Express, March 26, 2025),* this essay examines the legal clash between Elon Musk's X and the Indian government over Section 79(3)(b) of the IT Act—not just as corporate resistance, but as a defining moment for India's digital future, exposing key tensions between free speech and state control, legal ambiguity and regulatory clarity, and national sovereignty and global tech power.

## India's Digital Crossroads: Free Speech, Regulation, and the Battle Between Government and Global Tech

**Introduction: A Legal Fight with Global Stakes**

India, home to one of the world's largest internet-using populations, is standing at a digital crossroads. The latest lawsuit filed by Elon Musk's X (formerly Twitter) against the Indian government might seem like a routine disagreement over content, but it is far from ordinary. At the heart of the issue is a deep debate about how much control the state should have over the internet, how much freedom individuals should enjoy online, and how global companies can operate within a national legal framework without being silenced or exploited.

This legal confrontation is about the government's use of a provision known as Section 79(3)(b) of the Information Technology (IT) Act, 2000. This section has been used to demand content takedowns from social media platforms, often through the recently introduced "Sahyog portal." X argues this method bypasses the more detailed and transparent process set out in Section 69A of the same Act, raising fears of unlawful censorship. But beyond the technicalities of law, this case has massive implications for democracy, governance, and even international diplomacy.

**Understanding the Law: Safe Harbour vs. State Power**

To grasp the core of this legal battle, we need to understand two parts of the IT Act: Section 79 and Section 69A.

Section 79 provides a legal cushion—known as a safe harbour—to online platforms like X. It protects them from being blamed for things users post, just like how a post office is not blamed for the contents of the letters it delivers. But there's a catch: this protection vanishes under Section 79(3)(b) if the platform fails to remove illegal content once it has been told about it by the government or becomes aware of it on its own.

In contrast, Section 69A lays out a formal, step-by-step procedure for blocking content. It includes a review process and judicial oversight, aiming to ensure that such takedowns are not arbitrary and that free speech is not unjustly harmed.

What X is protesting is that the Indian government is relying more and more on 79(3)(b)—which is vague and lacks clear checks—rather than the more careful and lawful 69A. Through the Sahyog portal, the government can now send takedown notices quickly and easily, without needing to explain much or provide a route for appeal. This, X claims, turns the platform into a judge of what's legal or not, a job better suited for courts.

**The Threat to Free Expression and Due Process**

The deeper worry here is not just legal—It is philosophical and ethical. If a government can force a platform to remove content without transparency, it can quietly remove voices it does not like. This could hurt free speech, a core part of any healthy democracy.

Worse, platforms like X may start removing content preemptively—not because It is illegal, but to avoid getting into trouble. This chilling effect can silence criticism, humour, activism, and debate, damaging public discourse.

Also, when the government avoids the procedure set by Section 69A, it weakens legal accountability. Citizens and platforms do not get a fair explanation or a chance to fight back. It creates a one-sided system where power flows only in one direction: from the government to the platforms.

**The Shreya Singhal Precedent: A Legal Compass**

This is not the first time Indian courts have had to think about online content and censorship. In the Shreya Singhal v. Union of India (2015) case, the Supreme Court clearly said that content can only be taken down through Section 69A, because it includes proper safeguards and procedures. This ruling declared that freedom of speech cannot be limited casually or secretly.

Many legal experts believe that the current use of Section 79(3)(b), especially through the Sahyog portal, may be against the spirit of that judgement. It opens up the possibility that 79(3)(b) is being misused or misunderstood, and that it might even be legally invalid if it bypasses what the court has already ruled.

**A Shadow of Uncertainty: How Law and Policy Drift Apart**

The larger concern here is the lack of clarity in how these laws are applied. Section 79(3)(b) is not detailed. There's no clear rulebook for how platforms should respond to notices, how quickly they must act, or what happens if they disagree. It leaves room for confusion, mistakes, and even abuse.

When governments have power without clear limits, it can lead to overreach. On the other hand, platforms without guidance might overreact and take down more content than necessary, just to stay safe. Neither of these outcomes is good for users, democracy, or trust in digital systems.

**Drafting a Better Future: The Digital India Act**

This lawsuit also brings into focus the urgent need for a better digital law. India is already planning to replace the outdated IT Act with a new Digital India Act. But unless this new law clearly defines the rules of the road, the same problems will repeat.

For a healthier digital environment, the government must:

- Define what counts as "unlawful content" in clear terms.
- Outline transparent processes for issuing takedown notices.
- Provide appeal systems for platforms and users.
- Respect the balance between security and freedom.

Only then can platforms operate fairly, and users feel protected both from harmful content and unjust censorship.

**The Global Angle: India, Musk, and American Interests**

What makes this lawsuit even more significant is that It is not just about India. It is also about the world.

Elon Musk is more than just the CEO of X. He is now seen as a key influencer in the American government, especially under Donald Trump's administration. And his companies—Tesla, Starlink, and X—are expanding rapidly in India after years of slow progress.

The lawsuit comes just as Musk's other ventures, like Starlink (for satellite internet) and Tesla (electric cars), have received support and clearances from Indian regulators. This timing suggests the lawsuit might be part of a bigger strategy—to push for more favourable rules for Musk's businesses, including his AI tool, Grok, which is built into X.

Meanwhile, American tech giants like Google and Meta are watching closely. If X wins this case, it could set a powerful precedent for others to demand similar freedoms, not just in India, but globally. On the other hand, if the Indian government wins, it might embolden other countries to tighten their grip on digital content too.

**Diplomacy Behind Closed Doors**

While the courtroom battle grabs headlines, the real decisions might not come from judges but from negotiations behind closed doors. The Indian government has publicly said it might act against Grok if it spreads harmful content. But privately, it has also hinted at discussions with X about its AI systems.

This shows a curious truth: in tech regulation, politics and diplomacy often matter more than law. Sometimes, what looks like a lawsuit is really a bargaining chip. The outcome might not be a legal judgement, but a compromise shaped by business interests, trade deals, and political alliances.

**The Bigger Picture: Who Controls the Internet?**

At the root of it all lies a bigger question: Who controls the internet? Is it governments, tech companies, courts, or the people?

India, like many countries, wants to protect national security and prevent harm online, which are reasonable goals. But doing this without clear laws can harm freedom. Social media platforms have great influence, but they should not act as judges or lawmakers.

What this case teaches us is that power must come with accountability—whether It is in the hands of governments or corporations. And when it comes to something as important as speech and communication, the rules must be clear, fair, and open to challenge.

**Conclusion: Choosing the Right Path in the Digital Age**

The legal clash between X and the Indian government is much more than a courtroom drama. It is a turning point in the story of India's digital journey. It is about freedom vs. control, clarity vs. confusion, and cooperation vs. confrontation.

Whether resolved through courts or quiet conversations, the outcome of this case will shape how people in India express themselves online, how companies operate across borders, and how democracy adapts to the challenges of the internet age.

India now has the chance to show that it can be both strong and fair, both secure and free. With thoughtful laws, transparent processes, and a commitment to democratic values, India can lead the world in building a digital space that works not just for governments and companies, but for the people. (1,432 words)

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Based on Arzan Tarapore's *"China's Ties—Beware Conciliation Without Deterrence"* (The Hindu, March 25, 2025), this essay examines India's warmer diplomatic tone and growing economic ties with China as part of a pragmatic strategy for national growth and regional stability—one that must be balanced by strong military readiness and strategic alliances to avoid compromising sovereignty.

# Between Peace and Power: India's Balancing Act in Its China Policy

**Introduction**

In recent years, India's foreign policy towards China has taken a more measured and conciliatory tone. Prime Minister Narendra Modi's public remarks emphasising dialogue and cooperation mark a shift from the tense standoff that followed the 2020 Galwan Valley clashes. On the surface, this seems like a positive step toward peace. However, behind these gestures of goodwill lies a more complex picture of rivalry, caution, and strategic calculation. This essay discusses India's delicate balancing act between diplomacy and deterrence, and how economic priorities, geopolitical uncertainties, and historical tensions shape this relationship. The essay also argues that while conciliation may be necessary for India's growth, it must not replace preparedness. True stability will only come from maintaining a position of strength.

**From Conflict to Conciliation: A Diplomatic Shift**

In 2020, the India-China relationship suffered a major blow when violent clashes erupted in the Galwan Valley. This marked the first deadly border skirmish between the two nations in decades, shaking diplomatic ties and stirring nationalist sentiment across India. Trust plummeted, military tensions soared, and bilateral dialogues largely stalled.

Yet, surprisingly, trade between the two nations not only continued but grew to record levels. Recently, Prime Minister Modi's language towards China has softened, calling for dialogue and cooperation. India and China have even agreed to disengage troops from several flashpoints along the disputed border. These developments suggest a calculated attempt by India to stabilise the relationship.

But is this a real change in policy or simply a change in tone? Many observers believe it's a bit of both. While India remains cautious, it recognises the value of reducing immediate tensions with its powerful neighbour—especially as it focuses on economic growth and domestic priorities.

**Economic Development: The Driving Force Behind Conciliation**

India's foreign policy decisions are closely tied to its economic goals. With aspirations of becoming a $5 trillion economy, the Indian government is prioritising investment, infrastructure, job creation, and technological advancement. These ambitions cannot flourish amid regional instability or military conflict.

China is India's largest trading partner. Indian industries, particularly in electronics and pharmaceuticals, are heavily reliant on Chinese imports. Although India has launched initiatives like "Atmanirbhar Bharat" (Self-Reliant India) to reduce this dependency, it cannot untangle itself from Chinese supply chains overnight.

Therefore, peace—or at least a working relationship—with China is economically sensible. By reducing the risk of another military crisis, India can better focus on pressing domestic issues like inflation, unemployment, and rural development. In this way, conciliation becomes a tool not of weakness, but of strategic pragmatism.

**Strategic Autonomy: Navigating a Complex Global Landscape**

India does not operate in a vacuum. Its foreign policy is influenced by global events— especially shifts in the behaviour of major powers like the United States. The return of Donald Trump to the White House has introduced fresh uncertainties. During his first term too, Trump had been unpredictable, often favouring transactional deals over long-standing alliances. This time too so far he shown a willingness to strike deals with rivals like Russia and China, sometimes at the expense of allies.

India, which has deepened ties with the United States over the last two decades, now faces an important question: Can it count on American support in a crisis, especially against China? This doubt is especially significant given that India has increasingly relied on U.S. intelligence and logistical support during border tensions.

To guard against this unpredictability, India is adopting a "multi-alignment" strategy. Instead of tying itself closely to any single country or alliance, India engages with a variety of

partners—including the U.S., Japan, Australia, France, and others—on a case-by-case basis. This gives India flexibility,

reduces dependence, and helps it build capabilities without compromising its strategic independence.

**The Ever-Present Rivalry: Why Conciliation Isn't Enough**

Despite India's shift in tone, the fundamental nature of its relationship with China has not changed. The rivalry is structural. Both countries are rising powers with competing interests in Asia. They dispute thousands of kilometres of border and vie for influence over regional organisations, sea routes, and smaller neighbouring countries.

China's actions have shown that it is not afraid to use force to assert its claims. Its growing military presence along the border, partnerships with India's traditional rival Pakistan, and assertive diplomacy all signal its intent to dominate the region. The 2020 Galwan clash was a reminder of how quickly things can escalate.

In this context, relying solely on goodwill and dialogue is risky. History has shown that peace cannot be maintained by words alone. Without the ability to deter or respond to aggression, conciliation may turn into submission.

**Military Preparedness: A Critical Need**

A major concern among analysts is that India's softening approach may lead to complacency in defence. Over the past decade, India's defence spending has declined as a percentage of both GDP and the national budget. Modernisation efforts—such as upgrading fighter jets, developing submarines, and improving border infrastructure—have moved slowly.

Building military strength is not something that can be done overnight. It requires years of planning, funding, and training. Every delay weakens India's ability to respond if future conflicts arise.

Military power plays a key role in deterrence. It is not just about fighting wars, but preventing them. A strong military makes diplomacy more effective by giving it credibility. As the saying goes: "Speak softly, but carry a big stick." India's diplomatic softening should be matched with a hard edge of readiness.

**Strategic Partnerships and Joint Operations**

One way India is strengthening its military posture without formal alliances is through joint exercises and defence cooperation. Exercises like "Malabar"—involving the U.S., Japan, and Australia—help Indian forces practice with others and improve their capabilities. India also conducts joint operations and shares intelligence with partners in Europe and Southeast Asia.

These partnerships help India stand firm without being tied down. They send a message to China that India is not alone, while still allowing New Delhi to maintain its independent foreign policy.

Importantly, these activities also help prepare the Indian military for real-life scenarios. Practising together, sharing knowledge, and coordinating plans can significantly improve response times and operational effectiveness.

**Avoiding the Trap of Over-Conciliation**

There is a real danger that India's shift in tone could be misunderstood—either at home or abroad—as a sign of weakness. Some may see it as backing down, or worse, as a willingness to accept Chinese dominance in the region.

To avoid this, Indian leaders must clearly communicate that dialogue does not mean defeat. Peace efforts must be backed by strong policy decisions, continued investments in defence, and clear red lines that cannot be crossed.

This also requires political will. Tough choices—like spending more on the military, reforming command structures, and building infrastructure in remote border areas—must be made, even if they are not popular or politically convenient. Short-term peace should not come at the cost of long-term security.

**Conclusion: Stability Without Submission**

India's changing approach to China is not about abandoning national pride or bowing to a powerful neighbour. Rather, it is a reflection of strategic maturity. India is choosing to engage with China not because it has forgotten the past, but because it understands the future must be built on both dialogue and deterrence.

To ensure this future, India must walk a fine line. It must continue to seek peace, but not at the cost of preparation. It must strengthen economic ties while reducing strategic vulnerability. It must build friendships globally, without becoming overly dependent on any one nation.

In other words, India must embrace a balanced, forward-looking strategy—one that values peace, but is always prepared for the storm. Only by combining diplomacy with deterrence can India ensure that stability never turns into submission. (1,293 words)

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Based on Shatadru Chattopadhayay's "Degrowth and the Reimagining of Indian Agriculture" (ORF, March 24, 2025), this essay critiques the extractive, growth-focused model of global agriculture and advocates for a degrowth approach in India. It calls for a shift from high-input, industrial farming to regenerative, community-led practices that prioritise ecological balance, farmer well-being, biodiversity, and local self-sufficiency. Blending ancient Indian knowledge with modern science, it outlines a sustainable, just alternative to the current system—one that is both urgently needed and ultimately unavoidable.

## Rethinking Growth: Cultivating a Sustainable Future for Indian Agriculture

**Industrial Agriculture and Its Discontents**

For decades, Indian agriculture has been rooted in the belief that more is better — more fertilisers, more water, more

mechanisation, more yield. This idea, born during the Green Revolution, was initially hailed as a triumph. Yields shot up, hunger seemed to recede, and India stepped into the global arena as a food-producing powerhouse. But beneath this surface of apparent success lies a story of deep distress. Farmlands have been stripped of their natural fertility, water tables have plummeted, and the very farmers who feed the nation are often hungry themselves. As of 2024, nearly 147 million hectares of land in India were degraded, while 76% of the population faced some level of water scarcity. And despite the bounty, India still ranked a lowly 105th on the Global Hunger Index in 2021. Why? Because the dominant model of agriculture is deeply flawed — it treats nature as a machine and farmers as mere tools. The pursuit of yield has come at the cost of everything else: soil, water, biodiversity, and human lives. Smallholder farmers, who make up the backbone of Indian agriculture, are burdened by debt, locked into cycles of chemical dependency, and often unable to make ends meet. Meanwhile, large corporations continue to profit from seeds and agrochemicals, controlling inputs and siphoning away wealth from rural communities. The Green Revolution, while effective in solving short-term food shortages, has created a long-term socio-ecological crisis.

**Introducing Degrowth: A New Vision for Agriculture**

Enter the philosophy of degrowth — not a call for decline, but for a redefinition of progress. Degrowth challenges the obsession with GDP and endless economic expansion, especially when such growth is extractive and unequal. It proposes instead that we measure success by the health of our soil, the nutrition on our plates, the strength of our communities, and the harmony between humans and the Earth. In agriculture, degrowth does not mean growing less food — it means growing differently. It urges us to replace industrial monocultures with diverse, regenerative farming systems that work with nature, not against it. This shift involves valuing local knowledge, supporting community-led food systems, and reducing dependency on harmful inputs and distant markets. Degrowth aligns seamlessly with ancient Indian ideals like Sarvodaya (the welfare of all) and Gram Swaraj (village self-governance), which call for self-reliance, ethical living, and community well-being. Through this lens, Indian agriculture can be reimagined — not as a race for profits, but as a living system that sustains life, culture, and future generations.

**Regenerative Agriculture: Healing the Land**

At the heart of the degrowth approach is regenerative agriculture — a suite of practices designed to restore degraded ecosystems while still producing food. Unlike conventional methods that strip the land bare, regenerative farming seeks to rebuild it. It uses techniques like crop rotation, composting, agroforestry, cover cropping, and no-till farming to revive soil life, store carbon, and conserve water. In India, the success stories are growing. In Andhra Pradesh, natural farming initiatives have helped farmers reduce costs and improve resilience. In Maharashtra, farmers using regenerative techniques reported up to 30% less input costs and 20–30% higher yields. Globally, examples from Brazil, Mount Kenya, and even corporate partnerships in Europe show that regenerative practices can work across scales. These methods also mitigate climate change, as healthier soils capture more carbon and reduce the need for fossil fuel-based inputs. Unlike industrial systems that depend on a constant flow of chemicals and energy, regenerative agriculture builds independence and resilience into the very fabric of farming. It is not just a technique — it is a philosophy of care, one that sees the farm not as a factory, but as a living, breathing ecosystem.

**Empowering Farmers Through Local Economies**

Another pillar of degrowth is the creation of vibrant, localised agricultural economies. Today, smallholder farmers are often at the mercy of middlemen and market fluctuations. Farmer Producer Organisations (FPOs) offer a powerful alternative. These collectives allow farmers to pool resources, access better prices, and reclaim control over their produce. But their impact goes beyond economics. FPOs foster cooperation, encourage innovation in sustainable practices, and help cut down the environmental costs of long-distance transport.

For instance, vegetable FPOs in Maharashtra have set up direct-to-consumer markets, reducing spoilage and emissions. Through FPOs, farmers can experiment with seed sharing, composting, and local processing — all within a framework that supports mutual aid and ecological balance. This model decentralises food systems and strengthens communities, making agriculture not just a job, but a shared endeavour. Degrowth envisions an economy where value is created and retained locally, not extracted and shipped away. FPOs are a real-world manifestation of this vision, offering hope and dignity to millions of farmers.

**Wasting Less, Feeding More**

One of the most shocking contradictions in Indian agriculture is the coexistence of hunger and waste. Every year, India throws away nearly 78 million tonnes of food — enough to feed over 370 million people. This waste happens at every step: crops rot on farms for lack of storage, spoil in transit, and get discarded in homes and restaurants. Yet millions go to bed hungry. Degrowth calls this out for what it is — a systemic failure, not a production problem. Reducing food waste is one of the simplest and most impactful steps we can take. Better storage facilities, decentralised cold chains, farmer training, and public awareness campaigns can make a huge difference. Community initiatives like food banks and fridges can redistribute surplus to those in need. And importantly, tackling waste requires us to rethink how we value food — not as a commodity, but as nourishment, culture, and a shared responsibility. In a world of plenty, no one should starve. The issue is not scarcity — it is mismanagement. Degrowth reminds us that true abundance lies in smarter systems and stronger communities, not in producing more at any cost.

**Changing What and How We Eat**

Degrowth also means looking at our plates. Modern diets, especially in cities, are increasingly dominated by ultra-processed, calorie-dense, nutrient-poor foods. These foods, often cheap and convenient, come with hidden costs — rising obesity, diabetes, and heart disease, along with huge environmental footprints. The promotion of water-guzzling crops and industrial livestock farming adds to the crisis. Degrowth encourages a dietary shift: towards seasonal, local, plant-based foods that are good for both people and the planet. Traditional Indian diets, rich in pulses, millets, and vegetables, offer a model of health and sustainability. Millets, for example, are climate-resilient, water-efficient, and nutrient-dense — a perfect antidote to the wheat-rice monoculture. Community-supported agriculture schemes can bring farmers and consumers closer, fostering awareness and mutual benefit. Food is not just fuel — it is identity, culture, and choice. By changing what we eat and how we think about food, we can support farmers, restore ecosystems, and improve our own health. Degrowth offers a path to mindful consumption, rooted in respect for nature and balance.

**Reviving Local Economies with Alternative Currencies**

A particularly innovative idea in the degrowth vision is the use of local currencies — systems of exchange that keep value within a community. These could be time banks, bartering networks, or region-specific digital credits. In agriculture, local currencies can help farmers trade seeds, tools, and services without relying on unstable national markets. They build resilience and reduce dependence on global supply chains. In Kerala, experiments with the "Gram" currency have shown that these systems can work in real-world settings, promoting local trade and solidarity. While the idea may seem radical, it draws on age-old traditions of mutual support and village economies. Scaling up such models would require legal support, community engagement, and smart digital tools, but the payoff could be immense — a robust, circular economy that empowers people instead of corporations. Degrowth challenges us to rethink not just what we grow, but how we trade and value it. In this reimagined economy, wealth is not hoarded, but shared; not extracted, but cultivated.

**Redefining Success: Beyond Growth and GDP**

At the core of the degrowth argument is a simple but profound question: what does it mean to succeed? Today, we measure progress in tonnes of grain, GDP figures, and export earnings. But these numbers hide a painful truth — that while production rises, well-being often falls. Degrowth proposes a different set of metrics. Imagine an agricultural report card that measures how many people are well-nourished, how many soils have regained fertility, how many farmers are free from debt, how much biodiversity has returned to the fields. These are the outcomes that truly matter. Success should be about thriving communities, not swelling bank accounts; about resilience, not revenue. In Indian thought, the ideas of Sarvodaya and Gram Swaraj remind us that the economy should serve people, not the other way around. Degrowth does npt reject modernity— it reframes it. It calls for smart policies, ethical technology, and humane systems, all guided by ecological limits and social justice. It is not about going backwards — it is about moving forward differently.

**Conclusion: A Future Worth Growing**

India's agricultural future stands at a crossroads. The current path — built on extraction, inequality, and short-term gains — is faltering. The signs are everywhere: empty aquifers, sick soils, indebted farmers, and growing hunger despite surplus stocks. But there is another way — a path that leads towards regeneration, equity, and dignity. Degrowth and regenerative agriculture offer not a utopia, but a grounded, achievable vision based on cooperation, ecology, and wisdom. It is a vision where agriculture heals rather than harms, where villages thrive instead of emptying, and where food is a gift, not just a product. This transformation woill not happen overnight. It will take policy reforms, community action, education, and courage. But the seeds of change are already being sown — in small farms, in grassroots movements, in conversations like this. As students, citizens, and future leaders, we must ask ourselves: what kind of world do we want to grow? The answer begins in our fields, our kitchens, and our hearts. Let us plant the future — together, wisely, and well.(1,659 words)

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Based on Amit Kapoor's "The 15-Minute City India Needs" (Business Standard, March 20, 2025), this essay explores how India's cities are changing. While green buildings are growing, poor transport causes pollution, traffic, and stress. The 15-minute city idea can help by making daily needs reachable within a short walk or bike ride. With better public transport, walking paths, and mixed-use spaces, Indian cities can become greener, healthier, and more liveable.

## The 15-Minute City: A Vision for India's Sustainable Urban Future

**Introduction**

As India's cities grow, they are evolving into what some call "two-hour cities," where commuting is a daily struggle. While skyscrapers with green certifications rise, the average city dweller spends hours navigating congested streets, breathing polluted air, and relying on private vehicles. This urban paradox highlights the need for a fundamental shift in how cities are designed. The 15-minute city concept offers a compelling alternative, one where homes, workplaces, schools, healthcare, and recreational spaces are within a 15-minute reach on foot or by bicycle. By rethinking urban zoning, prioritising pedestrian-friendly infrastructure, and enhancing public transport, Indian cities can become more liveable, equitable, and environmentally sustainable.

**The Concept of the 15-Minute City**

The idea of the 15-minute city was developed by scientist Carlos Moreno and has since been embraced by urban planners worldwide. The principle is simple: all residents should have access to six essential functions—living, working, commerce, healthcare, education, and entertainment—within a 15-minute walk or bike ride from their homes. This approach focuses on four key principles:

1. **Density** – Compact urban planning to ensure services are nearby.
2. **Proximity** – Bringing essential services within short distances.
3. **Diversity** – Encouraging mixed-use neighbourhoods that integrate residential, commercial, and recreational spaces.
4. **Digitalisation** – Using technology to enhance access to urban services.

Several global cities, including Paris, Barcelona, and Melbourne, have adopted the 15-minute city concept with great success. Paris, for example, has pedestrianised streets, expanded cycling lanes, and repurposed public spaces to make local living easier. Barcelona's "superblocks" limit car access, prioritising pedestrians and cyclists. If implemented thoughtfully, this model can significantly improve India's urban experience as well.

**India's Current Urban Challenges**

Indian cities were once built for people, not cars. The old quarters of Jaipur, Hyderabad, and Varanasi had markets, homes, and workplaces in close proximity, making daily life convenient and community-oriented. However, rapid and often unplanned urbanisation has led to a different reality. Today's metropolises—Delhi, Mumbai, Bengaluru, and others—are designed around road networks, with residential areas far from workplaces, resulting in long commutes and car-dependent lifestyles.

**Congestion and Pollution:** The dominance of private vehicles has led to severe congestion. Despite expanding metro networks in cities like Delhi, Mumbai, and Bengaluru, poor last-mile connectivity makes public transport unattractive. Weak pedestrian infrastructure and unregulated fares for auto-rickshaws and taxis add to the problem. As a result, most people rely on personal cars and motorbikes, leading to increased carbon emissions. Air pollution from vehicle exhaust has reached hazardous levels in cities like Delhi, which often ranks among the most polluted in the world.

**Fragmented Urban Planning:** Unlike European or Japanese cities that prioritise mixed-use development, Indian cities follow outdated zoning models that separate residential areas from commercial and industrial zones. Office hubs such as Bengaluru's Whitefield or Delhi's Gurgaon require long commutes, straining transport infrastructure. Instead of prioritizing compact, walkable spaces, urban expansion in India is largely driven by real estate interests, sacrificing green spaces and public areas.

**Loss of Community Spaces**: With roads taking precedence over footpaths and urban greenery, community spaces have dwindled. Traditional public spaces like parks, marketplaces, and neighbourhood squares are being replaced by malls and gated communities. This shift has not only reduced opportunities for social interaction but also contributed to social inequality, as low-income groups often find themselves pushed to the peripheries with limited access to essential services.

**How the 15-Minute City Can Transform India**

Implementing the 15-minute city model can bring a host of benefits to India's urban centres, improving sustainability, economic efficiency, and overall quality of life.

**1. Reducing Travel Times and Pollution**

By ensuring that workplaces, schools, and markets are within walking or cycling distance, the 15-minute city can cut down the need for long commutes. This reduces vehicle emissions, improves air quality, and encourages healthier lifestyles through increased walking and cycling. Research by the **TUC** shows that the **average person spends 59 minutes a day commuting,** which is **five minutes longer than a decade ago,** despite the rise in remote working. Outside major cities, most commuters (70%) still travel by car. Even a study by **Nature**, creating more sustainable and intelligent cities is a pressing need, as they account for over **60% of greenhouse gas emissions.** This requires a rethink of current urban policies, particularly those related to transport.

**2. Promoting Mixed-Use Neighbourhoods**

Shifting towards **mixed-use zoning** would bring **jobs, homes,** and **recreational areas** closer together. Instead of isolated residential colonies and distant commercial hubs, cities should promote developments where people can live, work, and socialise in the same area. This approach not only enhances convenience but also fosters a sense of community.

**3. Strengthening Public Transport and Last-Mile Connectivity**

For those who do need to travel beyond a 15-minute radius, public transport must be seamless and efficient. Expanding metro and bus networks is important, but equally critical is ensuring last-mile connectivity—safe, well-maintained sidewalks, cycle lanes, and affordable auto-rickshaw or e-rickshaw options.

**4. Revitalising Public Spaces**

Cities need more parks, pedestrian-friendly streets, and community gathering areas. Investing in urban greenery not only enhances aesthetics but also helps mitigate the urban heat island effect, reduces air pollution, and improves mental well-being. Copenhagen and Singapore have successfully integrated green spaces into their city designs, and Indian cities can follow suit.

**5. Encouraging Non-Motorised Transport**

Indian cities should prioritise infrastructure for walking and cycling. Dedicated cycle lanes, well-lit pedestrian pathways, and traffic-calmed streets can make non-motorised transport safer and more appealing. Pune and Chennai have made progress in promoting cycling, but these initiatives need wider adoption.

**6. Leveraging Digital Connectivity**

The digital revolution can support the 15-minute city concept by enabling more remote work, online education, and digital healthcare services. By reducing the need for daily **travel, technology can further enhance urban efficiency.**

Challenges and Considerations While the 15-minute city offers a promising model, implementing it in India comes with challenges.

- **Restructuring Existing Urban Spaces** – Many Indian cities have already been developed in a car-centric manner, requiring extensive redesign and investment.
- **Addressing Socioeconomic Inequality** – Policies must ensure that 15-minute city initiatives benefit all income groups, avoiding gentrification that could push lower-income residents to the outskirts.
- **Balancing Density with Liveability** – Increasing urban density is necessary, but it must be done thoughtfully, preserving green spaces and public amenities.
- **Changing Public Perceptions** – Many people associate car ownership with social status. Encouraging walking, cycling, and public transport will require cultural shifts and public awareness campaigns.

Despite these challenges, cities like Pimpri-Chinchwad, Surat, and Srinagar are already taking steps to improve accessibility and sustainability, showing that transformation is possible.

In addition to this, while it is being implemented in parts of **Europe** and **Asia**, it has faced strong criticism in **North America** and the **UK**. According to **Bloomberg**, conspiracy theorists and far-right influencers have labelled it a ***"totalitarian plot,"*** with **Canadian commentator Jordan Peterson** calling it a **"perversion"** orchestrated by ***"tyrannical bureaucrats."*** Some critics claim it could lead to "climate lockdowns" or travel restrictions, allegedly tied to organisations like the **World Economic Forum** (WEF). In the UK, the term has become controversial. Oxford abandoned it after protests earlier this year, with officials describing it as "toxic and incendiary." **British MP Nick Fletcher** even dismissed it as a ***"socialist concept."***

**Conclusion**

The future of India's cities lies not in endless expansion and car dependency but in smarter, people-centric planning. The 15-minute city model presents a viable path forward, one that prioritises accessibility, sustainability, and community well-being. By promoting mixed-use development, improving public transport, revitalising public spaces, and investing in pedestrian and cycling infrastructure, Indian cities can become healthier, more efficient, and more inclusive. The journey will require policy shifts, public participation, and infrastructural investment, but the benefits—a cleaner environment, reduced congestion, and a better quality of life—make it a goal worth pursuing.

The time to rethink India's urban future is now. Instead of continuing on the path of car-centric "two-hour cities," India must embrace the vision of 15-minute cities, where convenience, sustainability, and human well-being are at the heart of urban design. (1,148 words)

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This essay builds on Swathi Kalyani's "Mapping India's Geospatial Intelligence" (Deccan Herald, March 22, 2025) to argue that geospatial intelligence is no longer limited to satellites and maps—it is a strategic way of thinking and decision-making that can shape India's future by enhancing security, improving lives, and addressing complex challenges with clarity and precision.

## India's Geospatial Awakening: How Mapping Intelligence Can Power the Nation's Future

**The Rise of Geospatial Intelligence: A New Kind of Power**

In the past, maps were drawn by explorers and cartographers who travelled across unknown lands. Today, we no longer need to sail ships or climb mountains to understand the Earth. Instead, we rely on geospatial intelligence—a modern, high-tech system that collects, studies, and uses information about the Earth's surface to make smart decisions. This information comes from satellites in space, drones in the air, sensors on the ground, and computer systems called Geographic Information Systems (GIS). But GEOINT, as it is often called, is not just a clever tool—it is a kind of thinking that helps us understand what is happening, where, and why.

In the 21st century, knowledge is power, and geospatial intelligence is a new kind of power. It tells us where to build roads, when floods might strike, where forests are shrinking, or even where enemies may be gathering at our borders. It helps governments prepare for natural disasters, monitor the environment, plan cities, and protect their people. That is why nations around the world are racing to develop stronger GEOINT capabilities—not just to survive, but to lead. And for India, with its vast landscape, large population, and growing ambitions, geospatial intelligence is not just useful—it is essential.

**Global Competition: Where the World Stands—and Why India Must Act**

The race for geospatial dominance is well underway. The United States has long been a leader in this field, with powerful systems like GPS and agencies like the National

Geospatial-Intelligence Agency (NGA). However, **China is rapidly gaining ground,** having launched its own satellite system called **BeiDou,** which now offers greater satellite coverage and better precision in certain parts of the world than even GPS. China is using geospatial technology to expand its influence through massive projects like the Belt and Road Initiative, giving it access to resources and strategic routes across Asia, Africa, and Europe. These satellites not only support civilian needs but also military operations—providing information for surveillance, planning, and even targeting.

India cannot afford to fall behind in this new technological arena. Our own navigation system, NavIC, is a strong achievement, but it currently covers only India and nearby regions and lacks full integration into common devices. Moreover, while our space programme, led by ISRO, has made us proud through missions like Chandrayaan and Mangalyaan, we still depend heavily on foreign systems for precise location data. This dependency poses a risk. In situations of conflict or international tension, these systems can be turned off or manipulated—as seen during the Russia-Ukraine war when GPS signals were jammed. If India wants to protect its borders, manage its resources, and become a global leader, it must strengthen its geospatial independence.

**India's Journey So Far: Milestones, Missions, and Missed Opportunities**

India has not been idle in the geospatial space. Over the past few years, we have made important progress. The launch of the National Geospatial Policy 2022 was a turning point. This policy opened up geospatial data that was previously restricted and invited the private sector to join the mission of building a digital, mapped India. It also outlined a vision for creating a Geospatial Knowledge Infrastructure (GKI)—a smart system where data is not just collected, but interpreted and turned into practical knowledge that people can use. The National Geospatial Mission, announced with funding of ₹100 crore, aims to build high-resolution maps, improve land records, and support planning for cities and villages alike.

We are also using GEOINT in national programmes. PM Gati Shakti uses mapping to plan infrastructure like roads and railways. PM SVAMITVA helps villagers claim property rights through drone-based mapping of land. Mission Mausam looks at historical climate patterns to plan for environmental change. These examples show how geospatial tools can improve governance and development.

Yet, India still faces serious hurdles. Many departments collect their own data but do not share it, leading to duplication and confusion. The private sector is small and underfunded. Data policies, though improving, remain unclear in some areas. And perhaps most importantly, India lacks the human capital—the thinkers, analysts, and decision-makers—who can transform data into insights. Without the right people, even the best satellites are of limited use.

**Geospatial Intelligence Is Not Just a Tool—It Is a Way of Thinking**

What makes geospatial intelligence truly powerful is not the machines or the data, but the way it helps us think. As explained by scholars Bacastow and Bellafiore, GEOINT is not only about "what we see from space," but about how we reason through space and time. In their redefinition, GEOINT is "actionable knowledge"—knowledge that can guide smart decisions. This means analysts must be trained not only in operating GIS software or reading satellite images, but in asking deeper questions: Why is this happening here? How will it change over time? What can be done about it?

This concept—geospatial reasoning—is the missing piece in many countries, including India. It is one thing to detect deforestation using satellite images. It is another to understand why it is happening, who is responsible, how it affects water systems, and how policy can stop it. True GEOINT combines data, human insight, and decision-making. It is both a science and an art—a bridge between raw information and real-world solutions.

The National Geospatial Policy echoes this idea by promoting the creation of knowledge, not just data. But for this to work, India needs to change how it trains its people. Schools and universities must go beyond teaching tools and focus on building minds that can think spatially—who can understand geography not just as maps, but as a living, moving, dynamic force that shapes our lives.

**Building India's Geospatial Future: A Five-Pillar Strategy**

If India wants to emerge as a true geospatial power, it must follow a clear, five-pillar strategy that addresses both technology and thought.

**First, invest in human capacity.** Universities must offer specialised courses in geospatial sciences. More importantly, these should teach reasoning skills—not just technical ones. Students should learn how to study patterns, solve spatial problems, and connect geography with economics, security, environment, and society. India should also establish a National Centre for Geospatial Reasoning—a think tank that brings together researchers, policy- makers, and innovators.

**Second, democratise data access.** India must build a single, secure, and user-friendly platform where all publicly funded geospatial data is available. This will help not just the government but farmers, city planners, entrepreneurs, and researchers. Of course, sensitive data should be protected, but unnecessary restrictions must be removed. Open data can lead to open innovation.

**Third, empower the private sector.** India needs more startups like Pixxel, which specialises in hyperspectral imaging. To encourage this, the government must offer tax benefits, research grants, and partnerships with ISRO and public institutions. Private innovation will not only fill gaps in technology but also create jobs and economic value.

**Fourth, use GEOINT across sectors.** From agriculture to defence, every ministry must adopt geospatial intelligence in

daily operations. In farming, drones can check soil health and advise on watering. In defence, real-time satellite images can monitor troop movements. In climate change, geospatial tools can predict floods and fires. GEOINT must become part of everyday governance.

**Fifth, ensure security and ethics.** As India opens up data, it must also protect it. We need strong data governance frameworks that ensure privacy, prevent misuse, and build public trust. At the same time, analysts must be trained to think ethically and consider the human impact of their work.

**Conclusion: From Maps to Minds—India's Geospatial Awakening**

India is at a turning point. The tools are ready, the policies are in place, and the potential is enormous. But the true test lies ahead: will India invest not only in machines, but in minds? Will it see GEOINT not just as a technical task, but as a national mission that requires learning, reasoning, and vision?

Geospatial intelligence can guide India's future—helping us build smarter cities, grow more food, prevent disasters, and protect our borders. But for that to happen, we must treat GEOINT as a way of thinking, not just a field of science. We must train a new generation of geo-thinkers who can see patterns in space, connect dots across time, and turn data into direction. Only then will India move from being a country that uses maps, to one that leads the world in making sense of them. (1,415 words)

# BOOK REVIEW

## THE WORLD IN 2050 - HOW TO THINK ABOUT THE FUTURE

When the **UN Secretary General Antonio Guterres,** spoke of "geopolitically challenging times", he was clear about the cracks witnessed in different regions of the world, disrupting the balance in the global order. Amidst geoeconomic fragmentation and geopolitical instability, **Hamish McRae** presents his vision in this book for global politics moving towards **2050.**

The book provides a detailed examination of five fundamental forces—**demography, the environment, trade and finance, technology,** and **governance**—that will shape the global future over the next three decades. Combining historical perspective with economic analysis, it offers projections that balance optimism with caution.

The author identifies demographic shifts as one of the most significant drivers of change by 2050. He explores how ageing populations in nations, such as **China, Europe,** and the **United States,** will create economic challenges, including labour shortages, rising healthcare costs, and reduced productivity. These countries will need to adapt their economies to accommodate older citizens while maintaining growth. In contrast, **Africa** will experience rapid population growth, becoming the youngest continent by 2050. This demographic profile offers immense potential for economic development if investments in education and infrastructure are prioritised. India's young population is also highlighted as a key advantage, positioning the country to become a global leader in innovation and workforce capacity.

*"In 2050, some two-thirds of the world's population will be middle class or rich."*

McRae emphasises that demographic trends will significantly **influence migration patterns.** Ageing societies may increasingly rely on immigration to fill labour gaps and sustain economic activity. However, he warns that managing immigration effectively will require careful governance to avoid social tensions.

**Climate change** and **environmental sustainability** are central themes in McRae's analysis. He stresses that the world faces critical challenges related to resource scarcity, rising temperatures, and extreme weather events. Without decisive action, these issues could lead to catastrophic consequences for ecosystems and economies. Despite these concerns, McRae remains optimistic about **humanity's ability to innovate solutions for environmental problems.** He highlights advancements in renewable energy technologies, carbon capture systems, and sustainable agricultural practices as opportunities to mitigate climate risks. Countries like **India** and **China** are expected to play crucial roles in this transition due to their large-scale investments in green energy initiatives.

McRae also discusses the **geopolitical implications of climate change,** especially when it comes to the aspect of **common but differentiated responsibilities.** Water scarcity and resource competition could exacerbate tensions between nations unless cooperative frameworks are established. He underscores the importance of global collaboration in addressing environmental challenges collectively.

**Global trade dynamics** are poised for transformation by 2050, according to McRae. He predicts a shift from **manufacturing-based economies** toward service-oriented industries (servicification as also observed by the Economic Survey 2024-25) as technology continues to redefine production processes. Emerging markets will increasingly focus on **exporting services** rather than goods. **India's thriving IT sector** exemplifies this trend, with its expertise in software development and digital services driving economic growth. Similarly, **China's** transition from a manufacturing powerhouse to a **consumer-driven economy** reflects broader changes in global trade patterns (McRae calls **China** a **hungry teenager** that has witnessed astounding growth over the last four decades).

The author also examines financial systems' evolution over the coming decades. He anticipates **greater integration of digital currencies and blockchain technologies (majorly virtual digital assets**) into mainstream finance, enabling faster transactions and reducing costs. However, he warns that these innovations could create regulatory challenges and exacerbate inequalities if not managed carefully.

Next, **technological advancements** are expected to be a defining force by 2050. McRae explores how innovations in **artificial intelligence (AI), robotics, biotechnology, and quantum computing** will revolutionise the limiting view instead of encompassing varied sectors. AI-driven automation is projected to enhance productivity but may displace traditional jobs, necessitating reskilling programmes for workers globally. In healthcare, breakthroughs in personalised medicine and gene editing could extend lifespans and improve quality of life significantly. India's burgeoning tech industry positions it as a major player in shaping technological progress by 2050. Meanwhile, China's investments in AI research and digital

infrastructure highlight its ambitions to lead globally in innovation.

However, McRae also addresses ethical concerns surrounding technology use, such as **data privacy issues** and **AI governance**, and calls for international frameworks to regulate emerging technologies responsibly.

The final pillar focuses on **governance models** and their impact on **global stability.** McRae analyses the ongoing tension between **authoritarian regimes** and **democratic systems worldwide.** While democracies offer **greater transparency** and adaptability, authoritarian governments may provide **faster decision-making** during crises. He predicts that governance structures will evolve into more decentralised models as technology enables citizens to participate directly in policymaking processes through digital platforms. However, this shift could also lead to fragmentation if not managed effectively.

India's democratic system is highlighted as a strength that fosters **innovation** and **inclusivity** despite challenges like corruption or bureaucratic inefficiencies. Conversely, China's centralised governance model allows for **rapid policy implementation** but raises concerns about individual freedoms. McRae argues that international cooperation will be essential for addressing shared challenges such as climate change regulation or technological ethics by 2050.

**Conclusion:**

The author ends by arguing that there could be *"broadly positive outcomes for the welfare of our species and our planet."* He examines various sources of disruption, such as political instability in the US and pandemics, and then discusses stabilising factors, including shifts in globalisation and a more cooperative China.

In our analysis, the conclusion feels unsatisfactory. Many predictions are cautious, and several scenarios rely on subjective judgment. This uncertainty may be inevitable in an age where rapid changes are intensified by global interdependencies and communication technologies, but it often leads to ambiguity. The outlook for Europe suggests a decline in the European Union's cohesion, with its transformation into a more flexible association and a reduction in its political and economic influence.

## EMPIRE OF LABOR: HOW THE EAST INDIA COMPANY COLONIZED HIRED WORK

**Introduction**

Titas Chakraborty's Empire of Labor: How the East India Company Colonized Hired Work (California University Press, 2025) is a thought-provoking and deeply researched book that sheds light on how the East India Company (EIC) controlled workers in Bengal between 1651 and 1817. It explores how the company, which started as a trading enterprise, transformed the local labour system to suit its own commercial and political interests. While we often think of colonial rule in terms of military conquest and political control, Chakraborty's work highlights a different, yet equally important, aspect—how the EIC shaped the daily lives of workers and gradually took away their freedoms.

**Contention**

One of the key ideas in the book is that labour under the East India Company was neither completely free nor entirely forced. The traditional understanding of colonial labour often suggests that workers either had full freedom to choose their employment or were enslaved or indentured. However, Chakraborty challenges this idea by presenting a complex picture where workers had limited choices and were increasingly controlled by colonial laws and policies. Her book argues that the EIC imposed labour restrictions by criminalising desertion and making it difficult for workers to negotiate better wages. This was not an entirely new practice but built upon older European labour laws, such as those used in England since the time of Queen Elizabeth. As N.M. Joshi had noted in 1921, colonial labour laws ensured that "the employers should have a hold upon the workmen, that the workers should not be able to leave their masters" (qtd., p. 1). These laws, inherited from Britain, were designed to discipline workers and create a labour force that was bound to the company's economic interests.

Through legal measures, police enforcement, and economic policies, the company made it increasingly difficult for workers to leave their jobs, demand higher wages, or seek other employment. This was a stark contrast to Bengal's earlier labour system, where workers freely moved between employers and used their mobility to negotiate better conditions. However, the company gradually restricted these freedoms by strengthening its police force and introducing stricter regulations. Desertion, once common among European sailors and soldiers seeking better pay, was eventually outlawed. By the mid-18th century, the EIC had imposed legal and military controls to prevent workers from leaving, demonstrating its growing dominance over labour. The company also used judicial power to enforce strict discipline, punishing those who resisted under laws that criminalised their actions. As Chakraborty explains, these changes "fundamentally transformed the experience of work" (p.3). They replaced traditional labour practices with a system where the company had near-total control over workers' mobility and conditions. This transformation was not just about enforcing discipline but also about how the British justified their rule.

Empire of Labor examines how the East India Company (EIC) reshaped hired labour in Bengal, contrasting its policies with precolonial Mughal and Nawabi rule. A key method of colonial control was the British administration's use of "custom" — "a discursive category that the British colonial state deployed" to justify its rule while reinterpreting traditions to serve its own interests (p. 17). By presenting

itself as a protector of Indian customs, the British legitimised their interventions while restructuring labour systems to benefit colonial governance. Both Warren Hastings and Edmund Burke, despite their political rivalry, recognised tradition as a powerful tool for maintaining control. This approach allowed the British to assert dominance while claiming to preserve indigenous practices. Even the Utilitarians, who otherwise promoted social reform, upheld this rhetoric to justify continued colonial rule. By framing exploitation as preservation, the British reinforced their authority while absolving themselves of responsibility for the economic hardships they imposed. This manipulation of the concept of tradition had a profound impact on workers across different occupations, as Empire of Labor illustrates through its detailed examination of various labour groups.

**Summary**

The book takes a close look at different groups of workers, including boatmen, silk reelers, European sailors, and soldiers, to show how colonial labour practices evolved over time. Before the EIC took control, Bengal's labour system was quite flexible. Workers often moved freely between jobs, choosing their employers based on wages, working conditions, or personal agreements. Many artisans and agricultural workers were part of patron-client relationships, where employers provided them with resources and protection in exchange for their labour. This was very different from the structured and regulated labour system that existed in Britain at the time, where laws such as the Master and Servant Acts controlled workers' rights and mobility.

When the EIC established itself in Bengal, it initially struggled to enforce strict labour policies because the local system was so fluid. Unlike in Europe, where the government played a significant role in regulating labour, Bengal had no single authority managing workers. Instead, employment was based on informal agreements and traditional customs. However, as the company expanded its power, it began to introduce new policies to control workers more effectively. Over time, it imposed regulations that restricted workers' ability to switch employers, demanded strict discipline, and ensured that wages remained low to maximise company profits.

One of the most compelling sections of the book focuses on the boatmen, who played a vital role in Bengal's economy. The vast river networks of the region made boat transportation essential for trade and communication, and the EIC, along with the Dutch East India Company (VOC), relied heavily on boatmen to move goods and military personnel. These workers, however, were not easy to control. Because of their mobility, they often resisted company regulations by deserting, demanding higher wages, or refusing to work under unfavourable conditions. The EIC tried to enforce stricter supervision and organisation over the boatmen, but their ability to move freely gave them a degree of bargaining power. This created a constant struggle between the company, which wanted to impose discipline, and the workers, who sought to protect their independence.

European sailors and soldiers in the EIC's service faced similar challenges. Although they were crucial to the company's military expansion, they were often treated as disposable labourers. Many of them switched employers frequently, sometimes deserting to work for rival European companies or even local Indian rulers who offered better pay. The EIC attempted to reduce desertion by increasing wages and enforcing military discipline, but these measures were not always successful. By the mid-18th century, the company had become more powerful and could exert greater control over its European workforce. Desertion became increasingly difficult, and workers had fewer options to escape harsh conditions.

Another important case study in the book is that of the silk reelers, who were among the first workers to experience industrial-style labour management under European supervision. Silk production had long been a key industry in Bengal, with artisans working in traditional Mughal karkhanas (royal workshops) to supply both local and international markets. The EIC sought to take control of this industry by introducing a factory-like system where work was more regulated, and wages were kept low. Initially, silk reelers resisted these changes, maintaining their independence and bargaining power. However, by the 1770s, the company had successfully imposed stricter controls by introducing European machinery and work policies. This led to a decline in the status of silk workers, who lost their autonomy and became increasingly dependent on the company.

As the 18th century progressed, the EIC's control over labour became more rigid, especially with the introduction of colonial policing. By the late 1700s and early 1800s, the company had developed a system where workers, including boatmen, sailors, and soldiers, were constantly monitored and restricted by colonial police forces. Laws were introduced to criminalise desertion and mobility, making it nearly impossible for workers to leave their jobs without facing legal consequences. This marked a significant change from the earlier period, where workers still had some room to negotiate their wages and conditions. The increased use of policing and legal enforcement allowed the EIC to extract labour more efficiently while minimising worker resistance.

**Critical Evaluation**

Understanding how the above policies were crafted and implemented requires a closer examination of the broader colonial labour system. One of the greatest strengths of Empire of Labor is its detailed and well-researched analysis of colonial labour practices. Chakraborty draws from a wide range of historical sources, including records from both the English and Dutch East India Companies, judicial archives, and Bengali literary texts, providing a deeper understanding of how colonial labour systems evolved. The book challenges the idea that British colonial policies were entirely foreign to India, arguing instead that the East India Company (EIC)

merged British labour laws, such as the Master and Servant Acts, with local customs to create a distinct colonial workforce. This system was not simply imposed but carefully shaped to serve the EIC's economic interests. As Chakraborty explains, the EIC "combined the wisdom of labour control in the metropole accumulated over four centuries with their specific experience in Bengal" to enforce new work regulations (p. 232). By tightening control through police forces, wage restrictions, and contract enforcement, the British regulated workers' mobility, making them increasingly dependent on the company.

This blending of metropolitan and local labour practices ensured that the EIC's governance over Bengal's workforce was both profitable and deeply rooted in colonial authority. More significantly, it reveals how colonial rule was not just about dominance through military conquest but also about economic engineering. By manipulating labour structures, the British altered Bengal's economic landscape in ways that had lasting effects on worker rights and social hierarchies, shaping labour relations well into the post-colonial period. This insight challenges simplistic narratives of colonial rule, highlighting the strategic depth behind British economic policies in India.

**Bottom of Form**

However, the book is not without its challenges. One of the main difficulties is that it is written in a highly academic style, which might make it less accessible to younger readers or those unfamiliar with historical theories. Some of the concepts, such as "colonial modernity" and "police terror," are not always explained in simple terms, making certain sections harder to understand. Besides, while the book does an excellent job of highlighting worker resistance, it sometimes overlooks the economic realities that forced workers to remain in their jobs. Not all workers actively resisted colonial control—many simply had no other choice but to continue working under the EIC's conditions. A more balanced discussion of both resistance and survival strategies could have strengthened the argument.

Another potential limitation is that the book focuses primarily on Bengal, with little comparison to other regions of India. While Bengal was a major centre of EIC activity, similar labour policies were also implemented in other parts of India. A broader geographical analysis would have helped readers understand whether the trends observed in Bengal were unique or part of a larger colonial labour strategy across India.

**Conclusion**

Despite some minor shortcomings, Empire of Labor makes a significant contribution to our understanding of colonial history, labour relations, and economic systems. It challenges the conventional view that British rule was solely about political domination, instead highlighting how the East India Company (EIC) controlled the workforce in ways that maximised profits. The book's focus on different groups of workers—both Indian and European—adds complexity to the discussion, demonstrating how colonial labour policies were not uniform but shaped by multiple factors, including race, occupation, and local economic conditions. By drawing on extensive archival sources and Bengali literary texts, Chakraborty offers a multi-layered account of how colonial rule reshaped labour practices in Bengal, replacing flexible precolonial systems with rigid, coercive structures. This book stands alongside seminal works such as E.P. Thompson's The Making of the English Working Class (1963) and Ranajit Guha's Elementary Aspects of Peasant Insurgency in Colonial India (1983), both of which explore themes of labour, resistance, and power. However, Empire of Labor distinguishes itself by merging labour history with the history of state formation, illustrating how governance was deeply intertwined with economic control. It also aligns with Clare Anderson's studies on penal labour such as Convicts in the Indian Ocean: Transportation from South Asia (2000), Subaltern Lives: Biographies of Colonialism in the Indian Ocean World, 1790–1920 (2012), and A Global History of Convicts and Penal Colonies (2018). By demonstrating that the regulation of workers was integral to the expansion of colonial rule, Chakraborty moves beyond conventional narratives that focus solely on military conquest and trade. Her argument that the EIC's rise to power involved not only territorial expansion but also the restructuring of labour relations challenges earlier scholarship that assumes colonial labour regimes emerged primarily in the nineteenth century. Chakraborty also engages with broader historiographical debates on capitalism and labour coercion. By showing how the EIC dismantled precolonial labour freedoms and imposed new hierarchies of discipline, her work resonates with studies such as Sven Beckert's Empire of Cotton (2014) and Jan Lucassen's The Story of Work (2021), which examine how colonial capitalism transformed labour structures worldwide.

One of the book's most original contributions is its use of Bengali literary sources alongside Dutch and English archives, adding a multilingual and cross-cultural dimension to the study of colonial labour. This approach challenges Eurocentric narratives that often overlook indigenous perspectives and demonstrates how workers' experiences were recorded and understood within local traditions. Furthermore, by foregrounding the everyday struggles of boatmen, silk reelers, sailors, and soldiers—both indigenous and European—Chakraborty shifts the focus from elite actors and trade networks to the labouring classes, highlighting their agency and resistance in the face of colonial oppression.

Ultimately, Empire of Labor redefines colonial rule as a labour regime, making it an essential text for scholars of South Asian history, global labour studies, and colonial capitalism. More than just a history of exploitation, it is a history of resilience, showing how workers navigated and sometimes resisted the constraints imposed upon them. While the book's academic style may present challenges for general readers, its detailed analysis and fresh perspective make it an indispensable resource for those interested in

history, economics, and social justice. By examining how the EIC's policies shaped Bengal's workforce and altered labour dynamics in the long term, Chakraborty compels us to reconsider the nature of colonial control. Empire of Labor sheds light on a lesser-known aspect of British rule and challenges us to rethink the meaning of labour freedom and coercion, both in the past and in its lasting impact on modern India.

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