INSTITUTE OF BASIC EDUCATION

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Way to a Bright Future

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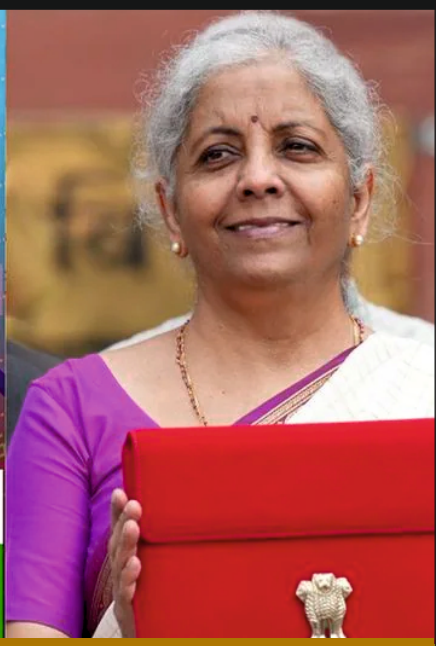

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Subject – Indian History, Heritage and Culture

Battle of Bhima Koregaon (1818)

Sub Topic: *Significant Issues and Events of Modern India History*

Context:

January 1, 2025, marked **207 years since the Battle of Bhima Koregaon**, fought on January 1, 1818, during the **Third Anglo-Maratha War (1817-1819)**.

- Initially regarded as an insignificant military engagement, the battle now symbolises the **struggle for Dalit equality and rights**.

Battle Overview

- A small force of **500 men under Captain F.F. Staunton** held off **20,000 Horse and 8,000 Infantry** of **Peshwa Baji Rao II**, who was threatening British garrisons at Kirkee and Poona.
- **Mahars**, an untouchable caste from Maharashtra, dominated Staunton's unit. Despite overwhelming odds, the Peshwa's troops inexplicably withdrew, giving the British a significant victory.
- The **1st Regiment Bombay Native Infantry**, which included many Mahars, was honoured for its bravery.

Formation of the Mahar Regiment

- **Initial Attempts**: A **Mahar Regiment** was first formed during the **Great War**, but it was disbanded.
- **Reestablishment**: The **Mahar Regiment** was reestablished in **1945** and has since participated in all of India's post-independence conflicts.

Legacy

- An **obelisk near the Bhima River** marks the battle site.
- The event is legendary as untouchable Mahar men defeated the **Brahmin Peshwa**, head of the Kunbi-Maratha Empire.
- The battle is now a pivotal point in the narrative of Dalit rights and empowerment.

The Mahars' Martial Tradition

- **Pre-Koregaon Roles**: Under the *Balutedar*[1] system in Maharashtra, Mahars served as watchmen, gatekeepers, porters, messengers, and guides. Their duties required carrying weapons and enhancing their martial skills.
- **Role in Maratha Empire**: Chhatrapati Shivaji employed Mahars in his army for roles such as **scouts, boundary referees, and fort guards**. Mahars also served Shivaji's successors, **Chhatrapati Sambhaji and Rajaram**.
- **British Era**: Mahars transitioned to serving as sepoys in the **British East India Company**. Apart from Bhima Koregaon, Mahars also fought in the **Second Anglo-Sikh War**, **Second Afghan War**, and served in the **Bombay Marine (naval force)**.

Impact of British Military Service on the Mahars

- **Socio-Economic Transformation**: Military service offered the community benefits like **pay and pensions, access to education and training, enhanced social status, and personal satisfaction**.
  - Exposure to Western practices helped Mahars realise they could overcome caste-based discrimination.
- **Role in Dalit Rights Movement**: **B.R. Ambedkar**, a Mahar, greatly benefited from the education and social mobility military service provided. Ambedkar's upbringing among educated ex-army men instilled pride and influenced his fight for Dalit rights.

1. A hereditary caste system in villages of Maharashtra, India, where specific castes provided services to the village in exchange for village produce. The system was abolished in 1959.

Challenges: The Martial Races Policy

- **De-listing in 1893**: The British adopted the controversial **martial races policy**, prioritising recruitment of communities perceived as martial and loyal post-1857 Revolt. Mahars were excluded from recruitment under this policy.
- **Petitions for Reinstatement:** Mahars petitioned the British in 1895 and again between 1904 and 1910, led by Ambedkar during the latter attempt. The petitions reflected the community's desire to retain the socio-economic benefits of military service.

Subject – Geography

Tibet Earthquake

Sub Topic: *Physical Geography, Earthquakes*

Context:

Recently Tibet was hit by a powerful **earthquake measuring around 7 on the Richter scale**, resulting in significant loss and damage.

More on News

- The **earthquake claimed** the lives of approximately **100 people and caused the destruction of about 1,000 homes**.
- The **epicentre of the earthquake was located about 75 kilometres northeast of Mount Everest**, near the border with Nepal, although no major damage was reported in Nepal.
- According to the **United States Geological Survey (USGS)**, at least **10 earthquakes of magnitude 6 or above** have occurred in this region over the past century.

Location Details

- **Tingry County**: Located about 4-5 km above sea level with a population of around 7,000 people.
- **Spiritual Significance**: The county is home to the Panchen Lama of Tibetan Buddhism.
- **Tourist Impact**: The region is a gateway to Mount Everest but has fewer tourists during winter. Access to the region has been closed by Chinese authorities since the quake.

Why is the Region Earthquake-Prone?

- **Tectonic Plate Movements**: The Earth's crust and upper mantle consist of **15 major and minor tectonic plates**. Earthquakes result from movements along **faults**—fractures in tectonic plates.
- **Mechanism of Earthquake Formation**: Friction at the edges of tectonic plates prevents them from moving smoothly. When accumulated stress overcomes this friction, it releases energy as **seismic waves**, causing the ground to shake.
  - For instance, the **2023 Turkey earthquake** was caused by interactions between the **African, Eurasian, and Arabian plates**.
- **Role of Convection Currents**: Rising **temperature and pressure** within the Earth's mantle create **convection currents** that drive the movement of tectonic plates.

Geological Context and Significance

- **Lhasa Terrane**: The quake's mainshock may have originated in the **Lhasa terrane**, an important geological feature in Tibet.
- **Hydroelectric Project**: The Lhasa terrane is also home to China's large hydroelectric project, which could impact the Yarlung Tsangpo River (Brahmaputra), raising concerns about its perennial status and effects on downstream regions like **Arunachal Pradesh and Assam (India)**.
- **Himalayan Water Significance**: The Himalayan region is referred to as the **third pole** due to its vast **water reserves (rivers, glaciers, lakes), affecting millions who rely on it**. Earthquakes can destabilise glaciers, lakes, and rivers, potentially causing floods and other disasters.

The Himalayan Region: A High-Risk Zone

- **Formation of the Himalayas**: The **Indian plate** collided with the **Eurasian plate** around **40–50 million years ago**, uplifting the land to form the Himalayan mountain range.
  - The **Eurasian plate** is now subsiding beneath the Indian Plate, a process that continues today.
- **Convergence Rate**: The **India-Eurasia plate collision** occurs at a relative rate of **40-50 mm per year**, making the region highly seismically active.
- **Peculiar Tectonic Activity**: In addition to the **Indian plate** subducting under the Himalayas, the **Eurasian Plate** is being subducted beneath the **Pamir mountains**, creating multiple fault lines.

- This region serves as a **convergence point** for several seismic forces.

- **Historical Earthquakes**: Since 1950, at least **five earthquakes of magnitude greater than 7** have hit the **Hindu Kush region**.

Threat of Future Earthquakes

- **Seismic Hazard in Western Himalayas**: The **western Himalayas** are among the world's most dangerous seismic zones. The **2,500-km stretch** from **Hindu Kush to Arunachal Pradesh** is considered overdue for a major earthquake (magnitude >8).
- **Energy Accumulation**: The continuous interaction of tectonic plates stores enormous **elastic energy** along fault lines, which can only be released through massive quakes.
- **Research Insights**: A **2017 study** in *Quaternary International* analysed incomplete ruptures of the **Main Himalayan Thrust**, including the **Gorkha earthquake of 2015**.
  - Lead author **Roger Bilham** highlighted the presence of **reservoirs of elastic energy** waiting to be released in the Himalayas in the form of seismic waves.
- **Unpredictability and Risk**: Earthquakes remain inherently **unpredictable**, but the potential damage from a significant event in this region could be catastrophic.

Ring of Fire

Sub Topic: *Physical Geography, Earthquakes*

Context:

A powerful earthquake with a preliminary magnitude of 6.9 struck the Kyushu region in southwestern Japan, according to the **Japan Meteorological Agency (JMA)**. The quake's epicentre was located at a depth of 30 kilometres.

*A tsunami is a **series of large ocean waves** typically **caused by significant disturbances in or near a body of water.** The primary triggers include **underwater earthquakes, volcanic eruptions, landslides, and, in rare cases, meteorite impacts**. The term "tsunami" originates from Japanese, where "tsu" means harbour and "nami" means wave, reflecting the phenomenon's devastating impact on coastal areas. Tsunamis can cause catastrophic damage when they reach land, leading to: coastal flooding, loss of life (2004 Indian Ocean tsunami led to over 230,000 deaths across multiple countries), and environmental damage.*

More on News

- Tsunami advisories were issued for **Miyazaki Prefecture in Kyushu** and nearby **Kochi Prefecture**, warning of **potential waves up to one meter high.**
- Residents in coastal areas of Kochi were urged to evacuate as a precaution.
- Although no significant damage has been reported so far, **public broadcaster NHK confirmed that a 20-centimeter tsunami had already reached Miyazaki city,** home to approximately 400,000 residents.
- The JMA is also i**nvestigating whether this earthquake is linked to the Nankai Trough**, which was the subject of a megaquake advisory issued last August.

Ring of Fire

- The Ring of Fire, a **vast chain of hundreds of volcanoes and seismic activity sites,** spans the **Pacific Ocean in a horseshoe-shaped belt** approximately 40,250 kilometres long.
- This **geologically active zone** traces the meeting points of multiple tectonic plates, including the **Pacific plate, Eurasian plate, North American plate, and Philippine Sea plate,** among others.
- The Ring of Fire **extends through 15 countries,** such as Japan, the United States, Indonesia, Mexico, Canada, and Chile.

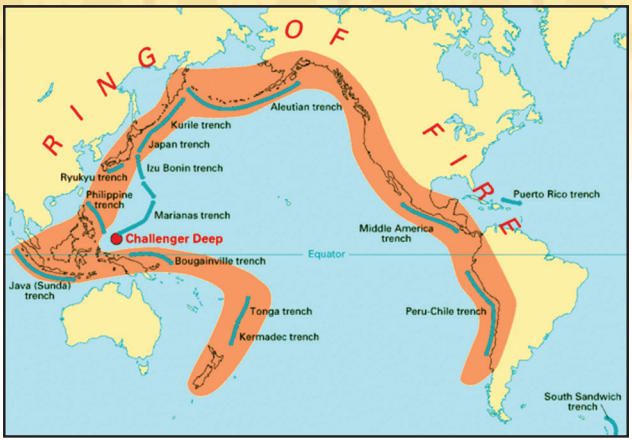
Why Does the Ring of Fire Experience Frequent Earthquakes?

- The intense earthquake activity within the Ring of Fire arises **from the constant interaction between tectonic plates.** These plates slide past, collide, or move over and under one another.
- Due to the **rough edges of the plates,** they often get stuck, even as the plates themselves continue to shift.

Subject – Indian Society

Smart Cities Mission

Sub Topic: *Urbanisation*



- **Earthquakes occur when the plates eventually move enough to release built-up stress,** causing the stuck edges to suddenly unstick along faults.
- **Japan**, situated on the Pacific Ring of Fire, is **particularly vulnerable to seismic events because it lies at the intersection of four tectonic plates**: the **Pacific plate, Philippine Sea plate, Okhotsk plate, and Eurasian plate.**

*The Ring of Fire is **home to about 75% of the world's volcanoes** and **90% of its earthquakes**. It **contains between 750 to 915 active or dormant volcanoes**, contributing to its title as a **ring** of fire due to the frequent volcanic activity 45. Major volcanoes include: **Mount Tambora** (Indonesia, 1815), **Krakatoa** (Indonesia, 1883), **Mount St. Helens** (USA, 1980), and **Mount Pinatubo** (Philippines, 1991). This region has been the epicentre for some of the most powerful earthquakes in history: **Valdivia Earthquake** (Chile, 1960) - Magnitude 9.5, **Alaska Earthquake** (1964) - Magnitude 9.2 and **Tōhoku Earthquake** (Japan, 2011) - Magnitude 9.0.*

Why Are There So Many Volcanoes in the Ring of Fire?

- The abundance of volcanoes in the Ring of Fire is primarily **due to tectonic plate movement,** particularly the **process of subduction.**
  - Subduction occurs **when one tectonic plate is forced under another**, creating deep oceanic trenches.
- As the **downgoing plate is pushed into the Earth's mantle**, it heats up, causing volatile materials to mix and form magma.
  - This magma rises through the overlying plate, eventually erupting as a volcano.
- The **Ring of Fire hosts the majority of the planet's subduction zones**, making it home to a significant number of active volcanoes.
- This geological process underpins the region's dramatic volcanic activity and underscores its susceptibility to natural disasters.

Context:

Nearly a decade ago, the Indian government launched the **Smart Cities Mission,** envisioning **100 smart cities as the new lighthouses of urbanisation.**

More on News

- Announced in June 2015, the initiative aimed to **create models of modern urban development across the country.**
- However, as time has passed, these ambitious plans have largely been relegated to the annals of India's urbanisation history, with the promise of "smart cities giving way to disillusionment.

Smart Cities Mission (SCM)

The Smart Cities Mission (SCM) was launched by the Government of India with the objective of **promoting sustainable and inclusive urban development** across 100 selected cities. The mission aims to enhance core infrastructure, improve the quality of life for citizens, and create a clean and sustainable environment through the application of smart solutions. Each city is required to establish a **Special Purpose Vehicle (SPV)** to implement projects, including retrofitting existing areas and developing new ones. As of December 2024, significant progress has been made, with over 7,800 projects completed out of 8,075 tendered, utilising approximately ₹147,704 crores of the allocated budget. The **mission aligns with sustainable development goals (SDGs)** and emphasises liveability, economic viability, and sustainability in urban planning.

What Went Wrong with Smart Cities?

- The concept of smart cities was **built around the Internet of Things (IoT),** a framework that operates effectively in advanced economies where basic urban utilities are already well-established.
- In India, however, **where millions still struggle to access fundamental services, "smart cities" became synonymous with providing essential amenities rather than sophisticated technological solutions.**
- The initiative focused on **two primary components:**
  - **Pan-City Proposals:** These involved IT-enabled services like waste management and urban mobility.

- **Area-Based Development (ABD):** This targeted specific zones within cities for retrofitting, redevelopment, and greenfield projects.

- A critical flaw in the mission's governance model was its **reliance on Special Purpose Vehicles (SPVs),** private company-like entities **established under the Companies Act.**
- By bypassing traditional city councils, **the initiative assumed that private management would deliver better results,** excluding local governments from meaningful participation in urban development.

The Shimla Experience

- Shimla, the capital of Himachal Pradesh, was **initially left out of the Smart Cities Mission.**
- After legal challenges in the Himachal Pradesh High Court, it was **granted the smart city tag.** The city's plan adhered to the guidelines, including both pan-city initiatives and ABD projects.
- Shimla's **ABD projects** aimed to **retrofit 244 acres of land with improved pedestrian crossings,** enhanced vehicular mobility on circular roads, and upgraded transport corridors.
- Proposals also included **underground ducting, parking facilities, eco-adventure tourism, and water security measures** through stormwater and spring water management.
- Redevelopment plans targeted Lower Bazar, Ganj Bazar, and Krishnanagar, where unsafe, dilapidated structures were to be replaced with earthquake-resistant buildings designed to boost tourism.
- The **total estimated investment** for Shimla's smart city transformation was ₹2,906 crore, sourced from public-private partnerships (₹897.80 crore), municipal bonds (₹101.77 crore), external borrowings (₹205.57 crore), and government schemes (₹348.49 crore).
- However, **only ₹707 crore—just 24% of the budget—has been spent so far**, with ₹53 crore allocated to completed projects and ₹654 crore to ongoing ones.
  - Notably, the anticipated **PPP contributions have yet to materialise.**

Disappointing Outcomes

- Despite its ambitious vision, the Shimla smart city plan has **fallen short of expectations.**
- **Redevelopment projects** in Lower Bazar, Middle Bazar, and Krishnanagar **remain untouched, and traffic congestion in the city has worsened.**
- **Plans for non-motorised mobility have been neglected,** while funds were instead diverted to less impactful projects, such as ₹2 crore spent on flower pots.
- Large, visually intrusive structures were built for escalators that remain non-operational, obstructing Shimla's renowned valley views.

Key Lessons from the Smart City Mission

- As the Smart Cities Mission nears its conclusion, the reasons for its shortcomings are evident.
- **Projects lacking robust urban governance and meaningful public involvement are destined to fail.**
- The **exclusion of city councils** from decision-making processes and the absence of accountability have **left the initiative adrift.**

Shimla's experience serves as a cautionary tale, highlighting the need for inclusive governance, community engagement, and strategic planning. Without these elements, even the most promising visions of urban transformation risk fading into oblivion.

Subject – Polity, Governance, Constitution

India among 25 nations with high religious restrictions

Sub Topic: *Fundamental Rights, Judiciary, Government Policies & Interventions*

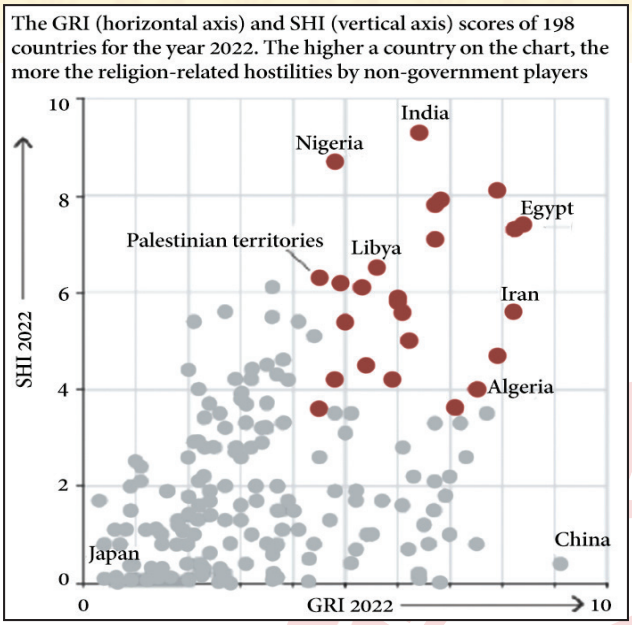
Context:

The Pew Research Center's report on government restrictions and social hostilities related to religion provides insights into how these issues manifest in the 25 most populous countries, which collectively house about three-quarters of the world's population. The report examines two key indices: the **Government Restrictions Index (GRI)** and the **Social Hostilities Index (SHI)**.

About GRI and SHI

- The **Government Restrictions Index (GRI)** tracks laws, policies, and actions that regulate or limit religious beliefs and practices. Examples include policies banning

certain religious practices, unequal treatment of religious groups, and bureaucratic requirements for religious registration.



- The **Social Hostilities Index (SHI)** measures religion-related hostilities involving individuals, groups, or social norms. This includes harassment, mob violence, terrorism, militant activities, and conflicts over religious conversions or attire.

Key Findings of the Report on GRI and SHI and Changes from the Past Report

Overall Trends

- **Highest Restrictions: Egypt, India, Pakistan, Iran, and Nigeria** had the highest combined GRI and SHI scores among the 25 most populous countries.
- **Lowest Restrictions:** Japan, South Africa, the United States, the United Kingdom, and the Democratic Republic of the Congo exhibited the lowest combined scores.
- **Global Trends:**
  - From 2007 to 2022, **countries with "high" or "very high" GRI scores increased from 20% to 30%,** and SHI scores rose from 20% to 23%, reflecting a growing trend of restrictions and hostilities.

Government Restrictions Index (GRI)

- Countries with the **highest GRI scores**: China, Egypt, Iran, Indonesia, and Russia, all in the "very high" category.
- Countries with the **lowest GRI scores**: **Japan, South Africa, Brazil, the Democratic Republic of the Congo,** and the UK. Japan and South Africa were in the "low" category.
- **Changes in GRI Scores**:
  - The **Philippines moved from the "low" to "moderate"** category due to government actions like "red-tagging" perceived by critics.
  - The Democratic Republic of the Congo shifted from "low" to "moderate" due to a modest score increase.

Social Hostilities Index (SHI)

- Countries with the **highest SHI scores**: **India, Nigeria, Pakistan, Egypt**, and Bangladesh. **India scored 9.3/10, the highest globally.**
- Countries with the **lowest SHI scores**: China, Japan, the U.S., South Africa, and Vietnam.
- **Changes in SHI Scores**
  - **Iran** saw a significant increase in its SHI score from 2.8 to 5.6, moving from the "moderate" to "high" category.
  - **Italy shifted from "moderate" to "high"** due to religion-related terrorist recruitment.

Indian Government Stand on Such Reports

- Governments **often dismiss such reports,** citing biases or methodological flaws.
- They argue that these studies **do not fully account for cultural, historical, or security contexts.**
- For instance, countries with high GRI scores like China and India **often defend their actions as necessary for maintaining public order and secularism.**

Religious Restrictions by Governments with Percentages:

- **Harassment by Governments:** Reported in **94%** (186 of 198) of countries.
- **Government Interference in Worship:** Occurred in **86%** (170 of 198) of countries.
- **Preferential Treatment of Religions:** Seen in 20 of the 32 countries with high GRI but low SHI scores.

Delimitation and Population Control

Sub Topic: *Indian Constitution, Elections, Statutory Bodies*

GS PAPER I: *Population and Associated Issues*

Context:

The **proposed delimitation exercise** in India has stirred significant concerns, particularly among the southern states like Andhra Pradesh and Tamil Nadu.

More on News

- Chief Ministers N. Chandrababu Naidu and M.K. Stalin have voiced their discontent over the **potential loss of parliamentary seats due to the states' successful fertility transition**, which has led to a reduced population share compared to northern regions.
- This issue resonates not only with politicians but also with the general populace in southern India.
- The concern is rooted in a **paradox: states that have excelled in family planning initiatives may find themselves penalised through reduced representation in Parliament.**

Delimitation refers to the **process of redrawing the boundaries of electoral constituencies** for the Lok Sabha (House of the People) and State Legislative Assemblies adhering to the principle of ***One Vote, One Value***. This exercise is **crucial for ensuring fair representation based on population changes over time.** The process is governed by the **Delimitation Commission Act**, which establishes an independent body whose **decisions are final and cannot be challenged in court**.

The first delimitation exercise in India was conducted in **1952**, followed by subsequent exercises in **1963, 1973**, and most recently in **2002,** based on the 2001 Census data. The last significant change to constituency boundaries occurred after the **1971 Census**, and since then, the number of Lok Sabha and Assembly seats has been **frozen until 2026 due to constitutional amendments**.

Fertility and Political Representation

- **Andhra Pradesh: Andhra Pradesh's Chief Minister, Mr. Naidu**, highlighted the **state's earlier legislation barring individuals with more than two children from contesting local body elections.**
  - Although the **law was repealed,** he **suggested a reversal**, potentially encouraging larger families through state benefits.
- **Tamil Nadu:** Similarly, Tamil Nadu's Chief Minister, Mr. Stalin, humorously suggested **aiming for larger families,** emphasising the irony of the situation where fewer children could mean fewer Lok Sabha seats.
- **Disproportionate Impact:** The crux of the matter lies in the **disproportionate impact of fertility transitions on political representation.**
  - **Southern states**, which have achieved lower fertility rates, **now face a demographic disadvantage in determining parliamentary constituencies.**

Lessons from China and Beyond

- Global examples illustrate that **reversing fertility decline is a challenging, often futile endeavour.**
- **China's one-child policy,** though successful in population control, **created long-term challenges** such as an imbalanced population composition, a strained marriage market, and an ageing population with increasing dependency burdens.
- Attempts to incentivise higher fertility in countries like **Japan and South Korea have also met with limited success.**
- Quick regulatory measures to manipulate fertility often lead to **unintended consequences.**
- Instead, the **focus should be on maintaining a balanced population composition** that sustains development without disrupting natural demographic transitions.

The Indian Context

- India's **demographic divide,** characterised by a **wide disparity in population counts between regions,** complicates the issue of fair political representation.
- A ***one person, one vote*** principle may seem ideal, but it **risks creating skewed representation favouring populous regions** over those that have achieved development through population control.
- The solution could lie in **revising the criteria for political representation** to account for demographic and developmental factors.

- Representation **could be weighted by characteristics such as education and socio-economic development,** rather than relying solely on population counts.

Impact on Women and Society

- Encouraging higher fertility rates comes with significant implications for women.
- The **personal costs of childbearing**, compounded by inadequate state support, make such initiatives less feasible.
- Women bear the **brunt of reproductive responsibilities**, and any attempt to reverse fertility trends must address these challenges through robust social support systems and compensation mechanisms.

Digital Personal Data Protection (DPDP) Rules, 2025

Sub Topic: *Government Policies & Interventions*

Context:

The Government of India has released the draft **Digital Personal Data Protection (DPDP) Rules, 2025**, for public consultation.

More on News

- These rules aim to **operationalise the Digital Personal Data Protection Act, 2023,** ensuring robust data protection while fostering innovation and economic growth.

Citizen-Centric Framework

Citizens are at the centre of the framework, with rights to:

- **Informed Consent:** Clear and accessible consent mechanisms for personal data processing.
- **Data Erasure:** Rights to demand deletion of personal data.
- **Grievance Redressal:** User-friendly platforms to address complaints digitally.
- **Parental Consent:** Verifiable parental consent for processing children's data, ensuring online safety.

Balance Between Innovation and Regulation

- **Fostering Growth:** Strikes a balance between data protection and enabling innovation.
- **Graded Responsibilities:** Provisions to reduce compliance burdens for startups and MSMEs, while **significant data fiduciaries (SDFs)** face stricter obligations like annual audits and impact assessments.
- **Stakeholder Transition:** Adequate timelines for businesses, from small enterprises to large corporates, to achieve compliance.

Digital-First Approach

Born Digital: The rules embrace a **digital by design** philosophy:

- The **Data Protection Board (DPB)** will operate as a **fully digital office.**
- Citizens can file complaints and seek adjudication online, without physical presence.
- Digital workflows for consent management and grievance redressal to ensure transparency and efficiency.

Procedural Clarity for Compliance

- **Detailed Consent Notices: Notices must:**
  - Specify purposes of data processing.
  - Include descriptions of personal data, goods, or services enabled by processing.
  - Provide clear mechanisms for exercising data rights.
- **Consent Managers:**
  - Must be registered entities in India with robust technological platforms.
  - Act as intermediaries enabling citizens to grant or deny consent.
  - Subject to penalties and cancellation for defaults.

Data Security and Breach Notification

- **Minimum Safeguards:** Access controls, encryption, masking, tokenisation, and secure contractual obligations.
- **Breach Reporting:** Immediate notification to the DPB and affected individuals.
  - Detailed breach reports are to be submitted within 72 hours.

Cross-Border Data Transfers and Localisation

- **Localisation Concerns:** Potential mandates for certain data to be stored in India.
  - Open-ended requirements for cross-border data transfers may impact global operations.
- **Algorithmic Accountability:** Significant data fiduciaries must meet additional due diligence for using algorithmic software.

Addressing Stakeholder Concerns

- **Inclusive Framework:** Inputs from businesses, startups, and global best practices have shaped the draft rules.
- **Annual Compliance Measures:** SDFs to conduct annual data protection impact assessments and audits.
  - Sector-specific rules to complement the core framework.
- **Penalty Framework:** Factors such as severity and mitigation efforts to be considered in imposing penalties.

Awareness and Citizen Engagement

- **Education Campaigns:** Comprehensive initiatives to educate citizens about their rights and responsibilities under the DPDP Act.
- **Feedback Mechanism:** Public consultation is open until February 18, 2025, on the MyGov platform.
  - Businesses are encouraged to provide feedback and prepare for implementation.

Challenges and Concerns

- **Implementation Hurdles:** Stringent timelines for compliance may pose challenges for smaller entities.
  - Potential consent fatigue due to detailed, rigid consent requirements.
- **Costs and Complexities:** Financial burdens for verifiable parental consent mechanisms.
  - Expensive adjustments are required for breach reporting and cross-border compliance.

Way Forward

- **Collaborative Dialogue:** Stakeholders are urged to engage in consultations to refine the rules actively.
- **Preparatory Measures:** Businesses should audit existing processes and align with new requirements during the consultation period.
- The draft DPDP Rules represent a pivotal step towards establishing a secure and innovative digital ecosystem in India. While they reflect a forward-looking approach to governance, effective collaboration and dialogue are critical for their successful implementation.

Accessibility Rules Based on Principles

Sub Topic: *Institutions And Bodies Constituted For The Protection And Betterment Of These Vulnerable Sections.*

Context:

In a landmark judgment in **Rajive Raturi v. Union of India (2024)**, the Supreme Court **declared Rule 15 of the Rights of Persons with Disabilities (RPwD) Rules, 2017, violative of the Rights of Persons with Disabilities Act, 2016.**

More on News

- The Court highlighted that **while the Act imposed a mandatory obligation** on the government to ensure accessibility, **Rule 15 adopted a discretionary tone,** creating a gap between legislative intent and implementation.

*India ratified the **United Nations Convention on the Rights of Persons with Disabilities in 2007.** Subsequently, Parliament enacted the Rights of Persons with Disabilities (RPWD) Act in 2016, replacing the earlier legislation.*

Implications of the Judgment

- **Rule 15** served as the **statutory foundation for accessibility guidelines** issued by various ministries and departments, including the Ministry of Housing and Urban Affairs' guidelines **for barrier-free environments** and the Ministry of Road Transport and Highways' bus body code.
- By striking it down, these guidelines lost their statutory authority.
- The **Court directed the government to develop minimum mandatory accessibility requirements** within three months, ensuring uniformity across sectors.
- This judgment underscores the **fragmented nature of accessibility guidelines** and the absence of universal principles to address inclusivity.
- Moving forward, a **principle-based framework is essential** to create comprehensive, intersectional accessibility standards.

Understanding Accessibility and Reasonable Accommodation

- The Court examined the **interplay between accessibility and reasonable accommodation,** both rooted in the **constitutional principle of substantive equality.**
- **Accessibility ensures standardised inclusivity from the outset,** while reasonable accommodation provides tailored solutions to address specific challenges in particular contexts.
- **Both are complementary,** with accessibility laying the groundwork for inclusivity and reasonable accommodation addressing residual barriers.
- As technology evolves, so must accessibility tools. The rise of Artificial Intelligence and the Internet of Things necessitates a **dynamic approach to digital accessibility**, ensuring inclusivity in rapidly changing environments.

Phased Realisation of Accessibility

- The Court criticised the **current approach** to accessibility guidelines for **focusing on long-term goals without establishing enforceable minimum standards** for immediate implementation.
  - It called for a **phased realisation model**, where the baseline for accessibility standards progressively advances.
- **Canada's roadmap to full accessibility by 2040,** which includes **periodic reviews every five years,** offers a model for harmonising accessibility standards over time.
  - A similar approach could help India adapt to evolving needs and challenges.
- The **RPwD Act's broad definition of barriers,** encompassing both tangible and intangible obstacles such as attitudinal barriers, **necessitates evolving accessibility parameters.**
- **Accessibility must align with the evolving understanding of disability**, which is increasingly seen as arising from environmental factors rather than individual limitations.
- This perspective underscores the **need for universal design principles** that extend beyond persons with disabilities to include vulnerable groups such as women, children, and the elderly.

Best Practices

- **Karnataka Mobile Adalats:** Providing access to justice for individuals with disabilities in remote areas by addressing rights violations directly.
- **Mission Vatsalya & ICDS:** Ensuring special provisions for children with disabilities within **Child Care Institutions (CCIs).**
- ***Brazilian Model* – Workforce Inclusion:** Mandating that companies with over 100 employees allocate 2%-5% of their workforce to individuals with disabilities, enforced through fines and penalties.
- ***Japanese Model* – Subsidiaries for Employees:** Encouraging the creation of suitable working conditions for employees with disabilities through subsidies and support systems.

Strengthening Social Audits

- **Section 48 of the RPwD Act mandates regular social audits** of government schemes to ensure they address the needs of persons with disabilities.
- However, the **lack of standardised guidelines** under the RPwD Rules has **created inconsistencies** in scope and methodology, leading to gaps in implementation.
- **Clear and operationalised social audit guidelines** can improve accountability, identify service delivery bottlenecks, and address changing disability-related challenges.
  - For instance, **auditing schemes that provide assistive technologies could lead to better targeting and enhanced service delivery.**

Streamlining Rules for Effective Implementation

- The **earlier accessibility rules** suffered from **excessive bureaucratic complexity,** with **overlapping mandates from different ministries.**
  - For example, a **sporting complex faced conflicting guidelines** from the ministries of Urban Affairs, Sports, and Transport, increasing compliance costs and causing **delays in grievance redressal.**

- To address this, the **new rules must be clear, actionable, and streamlined.**
- Establishing a **nodal authority**—whether a sectoral regulator or the Ministry of Social Justice and Empowerment—**could resolve jurisdictional ambiguities and ensure effective implementation.**

This judgment is a critical step toward achieving inclusivity and universality in accessibility standards, reaffirming the rights of persons with disabilities and setting a robust framework for the future.

Subject – Social Justice

The UJALA and SLNP Schemes

Sub Topic: *Government Policies & Interventions, Welfare Schemes*

Context:

The **UJALA (Unnat Jyoti by Affordable LEDs for All)** scheme, launched on **5th January 2015** by **Prime Minister Narendra Modi**, has marked its **10th anniversary** in 2025.

More on News

- UJALA has distributed over **36.87 crore LED bulbs**, resulting in annual electricity savings of **₹19,153 crore.**
- Additionally, the Street Lighting National Programme (SLNP), launched alongside UJALA, has installed **1.34 crore LED streetlights** in urban and rural areas, resulting in further energy savings and emission reductions.

UJALA Scheme:

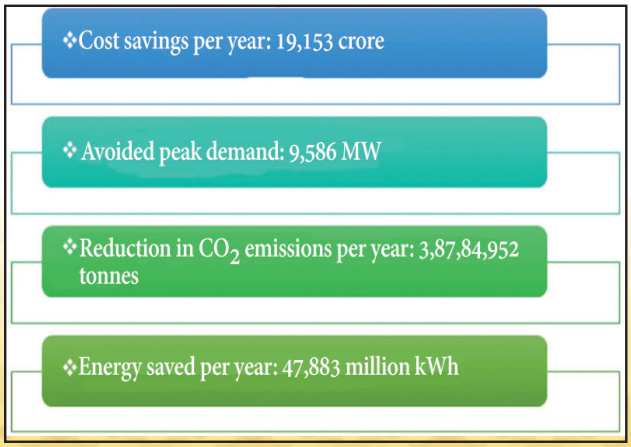
- Initially introduced as the **Domestic Efficient Lighting Programme (DELP)**, UJALA's mission has been to revolutionise household lighting by providing affordable, energy-efficient LED bulbs, tube lights, and fans to millions of Indian households.
- This initiative, a collaboration between **Energy Efficiency Services Limited (EESL)** and **DISCOMs** under the **Ministry of Power**, has brought energy-saving technologies into the homes of millions, addressing challenges such as high electricity costs and carbon emissions.
- The scheme has evolved into the **world's largest zero-subsidy domestic lighting programme**, driving India towards significant **energy savings**, **carbon emissions reduction**, and **economic efficiency**.

Why UJALA Was Needed?

- Traditional lighting systems like **Incandescent Lamps (ICLs)** and **Compact Fluorescent Lamps (CFLs)** consumed substantial electricity and were costly for consumers.
- A **7W LED bulb** provides the same light as a **14W CFL** or a **60W ICL**, saving up to **90% energy** compared to ICLs and **50% compared to CFLs**.
- In 2014, LED bulbs were priced between **Rs 450–500**, making them unaffordable compared to CFLs and ICLs. UJALA addressed this barrier by offering affordable pricing through competitive bidding.

Impact of UJALA on Consumers and the Environment

- UJALA made **LED bulbs** are available at **Rs 70** per bulb, **Rs 220** per LED tube light, and **Rs 1,110** per energy-efficient fan.
- **Energy consumption** was drastically reduced:
  - **1 LED bulb** consumes only **1 unit of electricity** for 140 hours, compared to **2 units for CFLs** and **9 units for ICLs**.
  - **The annual cost of ownership** is **Rs 12** for an LED bulb, compared to **Rs 40** for CFLs and **Rs 108** for ICLs, highlighting the economic advantages of LED lighting.
- These price reductions and energy efficiencies have resulted in:
  - Significant **savings on electricity bills** for consumers.
  - Enhanced **economic viability** and **environmental sustainability** through reduced **carbon emissions**.



Street Lighting National Programme (SLNP)

- Launched simultaneously with UJALA on **5th January 2015**, **SLNP** focuses on replacing conventional streetlights with **smart, energy-efficient LED streetlights** in both urban and rural areas.
- It was implemented by **Energy Efficiency Services Limited (EESL)** in collaboration with **Urban Local Bodies (ULBs)**, **Municipal Bodies**, and **Gram Panchayats (GPs)**.
- **EESL** manages the upfront investment for municipalities and recoups costs via **monthly or quarterly annuities**. EESL ensures **95% uptime** for the streetlights, enhancing **public safety** and reducing operational costs for municipalities.
- **Energy Savings**: The programme has resulted in savings of over **9,001 million units (MUs)** of electricity annually.
- **Reduction in Peak Demand:** SLNP has helped reduce peak demand by 1,500 MW and has cut CO emissions by over 6.2 million tonnes annually.

Achievements of National Health Mission

Sub Topic: *Issues Related to Health*

Context:

The **National Health Mission (NHM)** has emerged as a **cornerstone of India's public health advancements**, contributing significantly to reducing maternal mortality, tuberculosis (TB) incidence, and sickle cell anemia while expanding human resources and fostering an integrated response to health emergencies.

More on News

- In an assessment report (2021–2024) presented to the Union Cabinet on January 22, 2025, the Central Government highlighted the **NHM's key achievements over the past three years,** emphasising its role in transforming healthcare delivery at the grassroots level.

National Health Mission (NHM)

It is a flagship programme launched by the Government of India in 2013, aiming to enhance healthcare access and improve public health outcomes across the country. It subsumed the earlier **National Rural Health Mission (NRHM)** and **National Urban Health Mission (NUHM),** focusing on providing equitable, affordable, and quality healthcare services.

Key Components of NHM:

- **Reproductive, Maternal, Newborn, Child, and Adolescent Health (RMNCH+A):** Initiatives like **Janani Suraksha Yojana (JSY)** and **Janani Shishu Suraksha Karyakram (JSSK)** aim to improve maternal and child health.
- **Communicable Diseases Control:** Focus on diseases such as tuberculosis (TB), malaria, leprosy, and HIV/AIDS through programmes like the **National Vector-Borne Disease Control Programme (NVBDCP).**
- **Non-Communicable Diseases (NCDs):** Screening and management initiatives for diabetes, hypertension, and cancer through the **National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases, and Stroke (NPCDCS).**
- **Urban Health:** The NUHM component focuses on improving health services in urban areas.
- **Health System Strengthening:** Enhancing healthcare infrastructure and human resources across states.

Funding Mechanism:

- The NHM is financed through a **cost-sharing model** between the central government and states:
- The funding ratio is typically **60:40,** with a higher share of **90:10** for northeastern states.

Strengthening Healthcare Workforce

According to the report, the mission **facilitated the engagement of:**

- 2.69 lakh healthcare workers in FY 2021–22, including general duty medical officers, specialists, staff nurses, AYUSH doctors, allied healthcare workers, public health managers, and 90,740 community health officers (CHOs).
- 4.21 lakh additional workers in FY 2022–23, with 1.29 lakh CHOs.
- 5.23 lakh healthcare professionals in FY 2023–24, including 1.38 lakh CHOs.

Milestones in Maternal and Child Health

The NHM has been instrumental in reducing maternal and child mortality, achieving outcomes that surpass global averages:

- The **Maternal Mortality Ratio (MMR) declined by 83%** since 1990, compared to the global decline of 45%.
- The **Under-5 Mortality Rate (U5MR) fell from 45 per 1,000 live births in 2014 to 32 in 2020,** reflecting a 75% reduction since 1990, compared to the global reduction of 60%.
- The **Infant Mortality Rate (IMR) dropped from 39 per 1,000 live births in 2014 to 28 in 2020.**
- The **Total Fertility Rate (TFR)** decreased from 2.3 in 2015 to 2.0 in 2020, as per the National Family Health Survey (NFHS-5).

These indicators suggest India is well-positioned to meet its **U.N. Sustainable Development Goals (SDG) targets** for maternal, child, and infant mortality ahead of the 2030 deadline.

Progress in Disease Elimination

The NHM has also achieved significant success in combating infectious diseases:

- The incidence of **tuberculosis (TB)** reduced from 237 cases per 1,00,000 population in 2015 to 195 in 2023, while the mortality rate dropped from 28 to 22 in the same period.
- Efforts against **malaria** led to a 13.28% decline in cases and a 3.22% reduction in deaths in 2021 compared to 2020.
- The **kala-azar** elimination target was achieved, with all endemic blocks recording fewer than one case per 10,000 population by the end of 2023.
- The **Measles-Rubella Elimination Campaign** under **Intensified Mission Indradhanush 5.0** vaccinated over 34.77 crore children, achieving 97.98% coverage.

Through its holistic approach, the National Health Mission has transformed India's public health landscape, addressing longstanding challenges and building resilience against health emergencies.

Subject – International Relations

Competitive Regionalism in the Indian Ocean

Sub Topic: *Groupings & Agreements Involving India and/or Affecting India's Interests, Bilateral Groupings & Agreements, India and its Neighbourhood*

Context:

In recent decades, the Indian Ocean has emerged as a vital geopolitical and economic theatre, drawing attention from regional and global powers. This shift has been driven by economic growth, strategic concerns, and the evolving significance of the Indo-Pacific region.

Phases of Indian Ocean Geopolitics

(a) Post-Cold War: "Strategic Inertia" and Its Reasons

After the Cold War, the Indian Ocean witnessed relative neglect as **global powers turned their attention elsewhere.** The **absence of major conflicts** and limited economic development in the littoral states contributed to this phase of **"strategic inertia."**

Key reasons

- **Limited Economic Activity**: The region's economies were underdeveloped.
- **Focus on Other Regions**: Strategic priorities lay in Europe and East Asia.

(b) Changes Post-21st Century in Indian Ocean Geopolitics

- **Rise of Asian Economies and Its Implications**
  - The economic rise of **India**, **China**, and Southeast Asian nations has enhanced the Indian Ocean's importance as a critical trade corridor.
  - The region now **facilitates vital global trade routes,** carrying a significant share of the world's oil and goods. This economic surge has brought increased investments and competition among regional players.
- **Indo-Pacific as a Unified Strategic Theatre:**The emergence of the **Indo-Pacific** as a single strategic concept has further elevated the Indian Ocean's profile.
- **Institutionalism:** The growing strategic importance of the Indian Ocean has spurred **institutional regionalism**. Organisations like the **Indian Ocean Rim Association (IORA)**, established in 1997, highlight the region's evolving geopolitical identity.

Two Models of Regionalism and Geopolitical Rivalry in the Indian Ocean

- **IORA:** The **Indian Ocean Rim Association (IORA)** represents an intergovernmental framework emphasising diplomatic dialogue, regional cooperation, and **maritime security**. It promotes a sense of **regional identity** rooted in shared geography and economic interests.
- **China-Indian Ocean Forum:** Since 2021, China has hosted the **China-Indian Ocean**

Forum, focusing on the **Blue Economy** and fostering bilateral partnerships. While the forum aims to facilitate dialogue among littoral states, it primarily serves China's strategic goals, positioning Beijing as a key player in the Indian Ocean.

Comparison of the Two Models

- **IORA**
  - **Geographic Focus**: Rooted in the Indian Ocean's geography.
  - **Collaborative Approach**: Encourages multilateral cooperation.
  - **Agency for Littoral States**: Respects the sovereignty and autonomy of member nations.
- **China-Indian Ocean Forum**
  - **China-Centric**: Reflects China's strategic interests rather than regional needs.
  - **Client-Patron Dynamic**: Relies on bilateral relationships, often creating dependencies.
  - **Geographic Disconnect**: China, as a non-Indian Ocean state, lacks a natural role in the region.

Geography and Regionalism: China as an Outlier

Regionalism in the Indian Ocean is fundamentally shaped by **geography**. Littoral states, due to their proximity, share common interests and challenges. China's involvement, despite its economic power, represents a **geographic anomaly**, as it is not an Indian Ocean state. This disconnect undermines the credibility of its regional aspirations.

Why IORA is a Better Model?

IORA's emphasis on **regional identity, multilateralism**, and shared geography makes it a more sustainable model for cooperation. It avoids the **power asymmetry** evident in China's approach and prioritises collective security and economic development over unilateral interests.

India-EU Green Hydrogen Partnership: A New Era in Clean Energy

Sub Topic: *Bilateral Groupings & Agreements Involving India and/or Affecting India's Interests*

Context:

The India-EU green hydrogen collaboration represents a transformative initiative aimed at fostering sustainability, decarbonisation, and energy security.

Green Hydrogen: The Clean Energy Powerhouse

- Green hydrogen, derived from water splitting using renewable electricity, offers a zero-emission alternative to fossil fuels.
- It can decarbonise hard-to-abate sectors like steel, cement, and transportation while supporting energy storage and grid stability.
- By 2050, green hydrogen could account for up to 24% of global electricity demand, according to BloombergNEF.

India-EU Partnership: A Synergistic Collaboration

- The partnership leverages India's vast renewable energy resources and the EU's advanced technology.
- The framework, outlined at the 10th India-EU Energy Panel, focuses on infrastructure development, regulatory cooperation, and supply chains.
- The third phase of the India-EU Clean Energy and Climate Partnership (2025–2028) prioritises green hydrogen, offshore wind, and energy efficiency.

India's National Green Hydrogen Mission

- Launched in January 2023 with an INR 19,744 crore outlay, the mission aims to make India a global hub for green hydrogen.
- Targets include producing 5 million metric tonnes annually by 2030, creating 600,000 jobs, and attracting investments worth INR 8 trillion.

EU Hydrogen Strategy and Global Initiatives

- The EU aims to achieve 40 GW of electrolyser capacity and produce 10 million tonnes of renewable hydrogen annually by 2030.
- Initiatives like hydrogen valleys and cross-border energy networks are driving infrastructure and market integration.
- The Global Gateway strategy bridges investment gaps and fosters international collaboration on green hydrogen.

Scaling India's Hydrogen Economy

- India's renewable energy potential and the EU's technological expertise create ideal conditions for green hydrogen production.
- Collaborations, such as Reliance Industries teaming up with Denmark's Stiesdal A/S, are reducing production costs.

- Joint ventures like the GreenH Electrolysis project and a US$ 500 million gigafactory by Greenko and John Cockerill are advancing electrolyser manufacturing in India.

Overcoming Challenges

- **High Costs of Production:**
  - Technological advancements have significantly reduced green hydrogen production costs, bringing them down from US$10–15/kg to US$4–6/kg.
  - India and the EU are collaborating on R&D to improve electrolyser efficiency and develop next-generation technologies.
- **Sluggish Demand:**
  - Limited demand is addressed through initiatives like the India-Middle East-Europe Economic Corridor (IMEC), announced at the G20 Summit 2023.
  - IMEC's connectivity and dedicated hydrogen pipelines can scale production and expand global markets.
- **Regulatory Disparities:**
  - Differences in regulatory frameworks, such as the EU's Carbon Border Adjustment Mechanism, pose challenges.
  - A November 2024 roadmap aims to harmonise policies on infrastructure, technology cooperation, and supply chains.

Envisioning a Sustainable Future

- By combining renewable energy, technology, and innovation, India and the EU are laying the foundation for a sustainable, decarbonised energy future.
- Green hydrogen is poised to unlock energy security and resilience, ensuring a cleaner tomorrow for generations to come.

India and the UK in 2025

Sub Topic: *Bilateral Groupings & Agreements Involving India and/or Affecting India's Interests*

Context:

India-UK relations, historically underwhelming, have gained momentum post-Brexit, with both nations aiming to align their global aspirations.

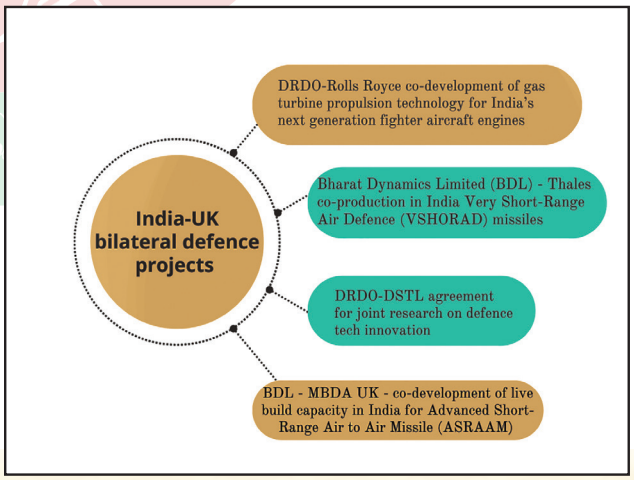
More on News

- Labour's 2024 victory has brought political stability in the UK, complementing India's continued leadership under the Prime Minister.
- Both countries **prioritise deeper cooperation** in trade, security, technology, and global challenges, reinforcing their shared vision in an evolving geopolitical landscape.

Key Areas of Cooperation

Trade and Investment

- **Economic Growth:** India aims to increase **exports to $2 trillion by 2030** under initiatives like **Make in India.**
- **FTA Negotiations: India-UK Free Trade Agreement (FTA)** aims to double bilateral trade (currently £42 billion) by 2030.
  - **India seeks:** Reduced tariffs for textiles, gems, and liberalised skilled worker mobility.
  - **UK seeks:** Lower tariffs on automobiles, alcohol, and greater services sector access.
- **Challenges:** Tariffs, migration policies, and climate action-linked taxes.
- **FDI:** UK is India's top FDI destination (£9.3 billion in 2021), while British FDI in India was £19.1 billion.
- **Bilateral Mechanisms:** Roadmap 2030, **EFD, JETCO, and CEOs Forum guide investments.**



Security and Defence

- **Indo-Pacific Collaboration:** Shared concerns over China; UK and India focus on **IOR stability, maritime security, and QUAD-AUKUS alignment.**

- **Maritime Cooperation:** Joint naval exercises, interoperability, and participation in regional forums (IORA, IPOI).
- **Defence Ties:** 2+2 mechanism, British Open General Export License, and support for Make in India.
- **Defence Trade:** Opportunity for the UK to support India's indigenisation and reduce reliance on Russia.
- **Opportunities and Caveats**
  - **Opportunities:** Scaling bilateral trade, diversifying supply chains, boosting defence partnerships.
  - **Caveats:** Limited UK resources, Labour's Europe focus, and overlapping challenges with Russia-Ukraine conflict.

Tech and Innovation

- **Science & Innovation Council** (since 2010) promotes joint research.
- **UK-India Technology Security Initiative (TSI)** launched in 2023 for collaboration in AI, quantum computing, semiconductors, biotechnology, etc.
- **Emerging Tech Exchange Programme** facilitates cooperation on cutting-edge tech.
- Focus on **climate action and green tech** with initiatives like India-UK Green Hydrogen Hub and Climate Finance Leadership Initiative.
- **Financial tech collaboration** through UPI and RuPay cards in the UK.
- Cybersecurity partnership since 2021.
- **UK and India co-produced AstraZeneca COVID-19 vaccine.**

Diaspora, Migration, and People-to-People Ties

- The Indian diaspora in the UK (1.6 million, 2.5% of UK population) contributes over 6% to the British economy.
- Indians are the **largest homeowners** in the UK, with 71% owning property.
- Over 65,000 Indian-owned businesses in the UK.
- Indian-origin professionals dominate the UK's National Health Service (NHS).
- Indian diaspora acts as a **"living bridge"** influencing UK politics, culture, business, and more.
- Increasing Indian migration post-Brexit, especially skilled professionals.
- India-UK **Migration and Mobility Partnership (MMPA)** under implementation to ease migration for students and professionals.
- **Young Professionals Scheme (2023)** allows 3,000 Indian professionals to work in the UK for two years annually.

Tensions and Divergences

- **Colonial legacies** and issues like **Khalistani and Pakistan extremism** hinder progress; Indian High Commission vandalised in 2023.
  - A BBC documentary in 2023 portraying Prime Minister Narendra Modi negatively was condemned by India, despite Sunak's disapproval.
  - **Canada-UK tensions** over India's alleged involvement in **Hardeep Singh Nijjar's** murder may impact security cooperation.
- **Extradition issues:** India's requests for fugitives are often rejected by Britain.
  - Labour Party critical of India's Kashmir policy under Corbyn; new leadership seeks better ties with India.
- **Russia-Ukraine war:** India's neutral stance is respected by the UK, with mutual understanding.
- **China policy divergence:** UK's stance on China shifted from engagement to security concerns; differences with India on Chinese relations.
  - Labour's China policy is unclear, balancing cooperation, competition, and challenges.

Looking Ahead

- The **Technology Security Initiative (TSI)** will be crucial for the relationship, focusing on AI, semiconductors, and quantum computing.
- **India-UK cooperation** may grow through mutual interests and shared values, insulating ties from historical and diaspora issues.
- India and the UK, as global economic and technological powers, stand to benefit from deeper cooperation.

India's Foreign Secretary Meets Taliban's Foreign Minister in Landmark Interaction

Sub Topic: *Bilateral Groupings & Agreements Involving India and/or Affecting India's Interests*

Context:

Recently, **Indian Foreign Secretary** Vikram Misri held a meeting with Afghanistan's acting Foreign

Minister Mawlawi Amir Khan Muttaqi in **Dubai.** This marks the **highest-ranking interaction** between India and the Taliban administration since the group seized power in Kabul in August 2021. India **has not officially recognised the Taliban** regime but has maintained a **cautious engagement** strategy driven by humanitarian and regional stability concerns.

India's Continued Humanitarian Assistance

India has consistently supported the Afghan people through humanitarian aid since 2021. This includes:

- 50,000 metric tonnes of wheat
- 300 tonnes of medicines
- 27 tonnes of earthquake relief materials
- COVID-19 vaccines and other medical supplies

The ongoing support underscores India's commitment to alleviating the suffering of the Afghan populace despite the complex political situation.

Focus Areas of Discussion

- **Material Support for Afghanistan:** India committed to providing additional assistance to Afghanistan, focusing on **health sector improvements and refugee rehabilitation.**
- **Enhancing Trade via Chabahar Port:** Both sides agreed to promote the use of the Iranian port of Chabahar to facilitate trade and humanitarian assistance.
- **Strengthening Sports Cooperation:** Discussions also touched upon strengthening sports collaboration, with **cricket serving as a potential avenue** for fostering goodwill between the two countries.
- **Development Projects:** India indicated its willingness to resume development projects in Afghanistan. These projects were paused after the Taliban took control in 2021, making this a significant development in India's policy.
- **Visa Facilitation and Diplomatic Cooperation:** Afghanistan sought India's support in improving visa facilities for Afghan businessmen, patients, and students.
- **Regional Security and Stability:** The Taliban assured India that Afghanistan poses no security threat and emphasised its focus on a balanced, economy-oriented foreign policy.

Key Reasons for Engagement

- **Geopolitical Flux**
  - **Pakistan**: Adversarial relations due to **airstrikes** and tension with the Taliban.
  - **Iran**: Preoccupied with **Israel's direct attacks and weakened influence** over the Taliban.
  - **Russia**: Distracted by the Ukraine war and seeking alliances, including with the Taliban.
  - **China**: Deepening ties with the Taliban, eyeing **Afghanistan's resources for the Belt and Road Initiative (BRI).**
- **Strategic Timing**
  - **Avoiding Isolation**: India aims to maintain relevance after years of investment in Afghanistan (USD 3 billion).
  - **Anticipation of Trump's Return**: Expected US engagement with the Taliban under a new administration.
- **Security Concerns**
  - **Core Focus**: Prevent anti-Indian terrorist groups from operating on Afghan soil.
  - **Taliban's Role**: Fighting ISIS-K, ensuring Indian interests, and protecting embassy facilities.

Changing Regional Dynamics

- **Pakistan's Waning Influence:** Airstrikes and Taliban's independence from Islamabad.
- **Russia's Alignment:** Removing Taliban from its terrorist organisation list in December 2024.
- **Iran's Shift:** Reduced ability to pressure the Taliban amid domestic and external challenges.

India's Long-Term Vision

- **Sustained Engagement:** Ensure a foothold in Afghanistan's development and security matrix.
- **Balancing Security with Principles:** While women's rights remain a concern, stability and counter-terrorism are priorities.

Significance of the meeting:

- **Diplomatic Evolution:** The meeting marks a step forward in India-Taliban relations, with New Delhi upgrading its engagement from **Joint Secretary-level discussions to a meeting involving the Foreign Secretary.**
- **Strategic Context**
  - **Pakistan Factor:** The Taliban's strained ties with Pakistan over **Tehrik-i-Taliban**

Pakistan (TTP)-linked militancy present an opportunity for India to expand its influence. India's **condemnation of Pakistan's airstrikes on Afghan territory** highlights its stance against Islamabad's actions.

- **Impact on India-Pakistan Relations:** India's outreach to the Taliban is expected to **raise tensions with Pakistan,** already strained over cross-border militancy. India condemned Pakistan's December 2024 airstrikes on Afghan territories, accusing Islamabad of blaming neighbors for its internal issues.

- **China Factor:** With Beijing deepening ties with the Taliban **to access Afghanistan's resources,** India is **countering China's growing influence in the region.**

- **Balancing Humanitarian and Strategic Interests:** While India has not recognised the Taliban regime, it continues to prioritise the Afghan people's needs through humanitarian aid and economic cooperation, carefully balancing its strategic goals.
- **Absence of Human Rights Discourse:** The meeting did not address critical issues like women's rights in Afghanistan, an area where the Taliban has faced global criticism for regressive policies. This omission underscores the **pragmatic focus of the talks on trade, security, and development.**
- **Refugee Crisis:** India's commitment to assisting Afghan refugees follows **Pakistan's mass expulsions of over 780,000 undocumented foreigners,** including Afghans, since 2023.

China's Long Game in Africa

Sub Topic: *Groupings & Agreements Involving India and/or Affecting India's Interests, Bilateral Groupings & Agreements, India and its Neighbourhood*

Context:

In 2022, China took a bold step in shaping Africa's political future by establishing the **Mwalimu Julius Nyerere Leadership School in Tanzania.**

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- Costing an estimated $40 million, the institution **aims to train Africa's future political leaders**, aligning them with governance principles rooted in the **Chinese Communist Party's (CCP) ideology.**

Fostering Historical Ties

- The school's first cohort of 120 officials hailed from countries with long-standing relationships with China, including **South Africa, Mozambique, Angola, Namibia, Zimbabwe, and Tanzania.**
- These nations, **governed by liberation parties born from anti-colonial struggles**, are also part of the **Former Liberation Movements of Southern Africa coalition.**
- By targeting these nations, **China aims to deepen its influence and fortify relationships** with its policymakers.
- This leadership school represents a **platform for Africa's ruling liberation parties to enhance their governance capabilities** through Chinese-provided educational resources.
- It exemplifies **China's broader strategy** to promote a governance model centered on the primacy of the ruling party and state control.

Diplomacy as a Tool of Influence

- **Global influence** often stems from the ability to mediate conflicts and foster international dialogue.
- Historically, the **United States** has played a dominant role in this space.
- However, **China is increasingly stepping into the role of global mediator**, as seen in its **involvement in the Saudi Arabia-Iran and Niger-Benin disputes.**
- By positioning itself as a mediator, China **not only enhances its global image but also strengthens its foothold in Africa,** a continent of 55 nations with substantial sway in international forums.
- Beijing recognises the **importance of African support in reshaping the global order,** often complementing and occasionally **countering the Western-led system.**

A History of Engagement

- During Africa's **independence movements, Beijing supported military and governance efforts** while investing in infrastructure and industrial projects to bolster the continent's economies.
- These historical ties remain a cornerstone of China's expanding influence in Africa.
- Annual **study tours** for African officials, comprising lectures, cultural exchanges, and visits to Chinese provinces, have been a **key part of China's public diplomacy.**

Expanding Political Education

- With the Nyerere Leadership School, China has expanded its influence to a new level, **targeting Africa's political elites through formal training programmes.**
- This move aligns with **China's admission during the 8th Forum on China-Africa Cooperation** in 2021 that it maintains ties with over 100 political parties across 51 African nations.
- **Beyond Tanzania**, other nations are following suit. **Kenya has expressed interest** in establishing a leadership school modelled on the CCP's Central Party School.
- **China's funding extends to refurbishing existing institutions,** such as Zimbabwe's Herbert Chitepo School of Ideology.
- These initiatives seek to propagate governance models emphasising stability and centralisation.

India and Africa

India's engagement with Africa has significantly strengthened over the years, positioning **India as Africa's third-largest trading partner** after the European Union and China. As of 2023-24, **trade** between India and Africa reached approximately **USD 83 billion,** with Indian exports valued at USD 45 billion and imports at USD 38 billion. India's investments in Africa have also grown, amounting to around USD 75 billion, with plans to increase this to USD 150 billion by 2030. Key sectors of cooperation include **infrastructure, energy, agriculture, and healthcare,** facilitated by initiatives such as the **India-Africa Forum Summit** and **concessional lines of credit.** The establishment of the **African Continental Free Trade Area (AfCFTA)** further enhances trade opportunities, allowing India to leverage lower tariffs and improve regional connectivity.

Strategic Investments in Governance and Infrastructure

- China's influence in Africa extends **beyond political schools.**
- It is accompanied by **significant investments in infrastructure.**
  - For instance, China **funded Kenya's new foreign ministry headquarters** as the two nations celebrated 60 years of diplomatic relations.
- Such projects symbolise the **intertwining of diplomatic relationships** with developmental initiatives.

The Long Game in Africa

- China's approach to Africa is **grounded in decades of patient diplomacy.**
- The Nyerere Leadership School is merely one **part of its comprehensive strategy to embed itself deeply within Africa's political structures.**
- Recognising the potential for regime changes, China has **strategically cultivated relationships with opposition parties** to maintain its influence during political transitions.

China's engagement in Africa is not solely about economic investments or military might. It extends to the **subtle art of diplomacy and shaping governance ideologies.** By embedding itself within Africa's political and institutional frameworks, China is ensuring its long-term influence over the continent's governance systems.

India's Pursuit of Data Embassies: Learning from Estonia and Partnering with the UAE

Sub Topic: *Bilateral Groupings & Agreements Involving India and/or Affecting India's Interests*

Context:

The Indian government is contemplating on establishing a data embassy in the UAE learning from the Estonia model.

The Estonia Model - A Lesson in Cybersecurity Resilience

- In 2007, **Estonia faced a debilitating cyberattack** that **disrupted critical infrastructure** across the country. In response, **Estonia became the first nation to establish a digital backup** of its citizens' data in a foreign land, specifically Luxembourg.
- This innovative arrangement, termed a **data embassy,** ensured that the **country's critical data** remained secure and accessible even during unforeseen events.
- The Luxembourg data embassy **serves as a cornerstone of Estonia's robust cybersecurity and data sovereignty strategy,** setting a precedent for other nations.

Understanding Data Embassies:

- Data embassies are **physical or virtual facilities in foreign nations** that **store critical government or national data.**
- These embassies are **governed by bilateral agreements,** granting them a **status similar to traditional diplomatic missions.**
- Data embassies enable nations to **safeguard their digital assets** while maintaining sovereignty over the data stored abroad.

India's Collaboration with the UAE - A Landmark Initiative

- India is exploring a similar model, with plans to establish a **data embassy in collaboration with the United Arab Emirates (UAE).** This agreement, if finalised, will mark the first such initiative between two large economies.
- This move underscores India's commitment to leveraging international partnerships to bolster its data security infrastructure. The agreement will **encompass bilateral terms that align with the Vienna Convention on Consular Relations (1963),** ensuring mutual benefits and clearly defined operational protocols.

The Utility and Purpose of Data Embassies

- **Contingency Planning During Natural Calamities:** By maintaining backups in geographically distant locations, nations can ensure data availability during earthquakes, floods, or other natural disasters.
- **Mitigating Geopolitical Risks:** Data embassies provide a secure option for protecting sensitive information amidst political unrest or cyberattacks.
- **Facilitating Corporate Data Localisation:** These embassies can act as hubs for companies from the **host nation,** allowing them to **localise data without being subjected to local data regulations.** This **fosters international business** operations while **maintaining data sovereignty.**
- **Ensuring Smooth Data Flow:** With data being a critical resource in the digital age, data embassies help maintain seamless access and exchange of information.

Challenges in Establishing Data Embassies

- **Policy Hurdles:** Ensuring that data embassies comply with international laws and do not circumvent local regulations is a key challenge. For instance, allowing companies to use embassy facilities may lead to conflicts with the host nation's data laws.

The Government's Perspective and Current Stand:

- The Indian government **recognises the strategic importance of data embassies** in safeguarding its digital infrastructure.
- The former **Minister of State (MoS) for IT, Rajeev Chandrasekhar, highlighted the inclusion of data embassies** in India's emerging data laws.
- However, the **finer details of their role and specifications are yet to be finalised.** The government's primary focus remains on creating robust legal frameworks to guide bilateral agreements and operational protocols for data embassies.

- **Operational Complexities:** The management and operation of data embassies, particularly when outsourced to local entities, require stringent cybersecurity measures and specialised legislation.
- **Cybersecurity Penalties:** There is a need for robust penalties and enforcement mechanisms to address potential breaches or mishandling of data.

India-Singapore Collaboration in Renewable and Strategic Partnership

Sub Topic: *Bilateral Groupings & Agreements Involving India and/or Affecting India's Interests*

Context:

India and Singapore are exploring the **possibility of establishing a renewable energy corridor** between the two nations.

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- Both **India and Singapore have ambitious clean energy goals.**
  - India aims to install **500 GW of non-fossil fuel-based power capacity by 2030** and achieve **net-zero emissions by 2070.**
  - **Singapore,** on the other hand, plans to expand its use of renewable energy sources such as solar, wind, and hydrogen to reach its **net-zero emissions target by 2050.**
- The proposed energy corridor between India and Singapore represents a **significant step in fostering regional collaboration for sustainable development** while accelerating the global shift toward renewable energy.

Importance of Cross-Border Energy Interconnections

- **India's ambition** to strengthen cross-border power transmission **aligns with its broader renewable energy goals.**
- In April 2023, reports indicated **India's interest in establishing dedicated power transmission links with countries like Singapore, Saudi Arabia, and the UAE.**
- The country currently maintains interconnections with neighbouring nations such as **Bhutan, Nepal, Bangladesh, and Myanmar.**
- This initiative **supports the International Solar Alliance's** "One Sun, One World, One Grid" project.

India-Singapore Relations

- India and Singapore maintain a **robust and multifaceted relationship** characterised by strong political, economic, and cultural ties.
- As of January 2025, the **bilateral relations are underscored by several key developments and strategic initiatives.**

Key Highlights of India-Singapore Relations

- **Strategic Partnership:** The India-Singapore Strategic Partnership, established in **November 2015**, serves as the **foundation for cooperation across various sectors**, including trade, defence, and technology.
  - This partnership was **further enhanced during Prime Minister Narendra Modi's visit to Singapore in September 2024,** marking a significant milestone in their diplomatic ties as both nations prepare to celebrate **60 years of formal relations.**
- **Economic Cooperation:** Singapore is **one of India's largest trading partners,** with the **Comprehensive Economic Cooperation Agreement (CECA)** facilitating trade and investment.
  - This agreement has **eliminated tariff barriers and streamlined regulations**, promoting collaboration in sectors like information technology, biotechnology, and infrastructure development.
  - In 2025, **Singapore remains a crucial player in India's economic landscape**, with ongoing discussions around emerging areas such as fintech, green economy initiatives, and skill development.
- **Defence and Security Ties:** The defence relationship between India and Singapore has strengthened significantly over the years.
  - Both nations engage in **regular military exercises and dialogues** aimed at enhancing security cooperation in the **Indo-Pacific region.**
  - The establishment of the **India-Singapore Defence Ministers' Dialogue** exemplifies this commitment to mutual security interests.
- **Cultural and People-to-People Links:** The cultural ties between India and Singapore are deep-rooted, with a significant Indian diaspora contributing to the social fabric of Singapore.
  - This community fosters cultural exchanges and strengthens bilateral relations through shared heritage and values.
- **Regional Cooperation:** Singapore plays a pivotal role in India's **"Act East" policy,** facilitating India's engagement with Southeast Asia.
  - This strategic positioning is crucial for India's broader geopolitical interests in the Indo-Pacific region.

Recent Developments

- **State Visit by Singaporean President:** The recent state visit by President Tharman Shanmugaratnam to India highlights ongoing diplomatic engagement. During this visit, discussions focused on enhancing bilateral cooperation across various sectors.
- **Bilateral Meetings:** The inaugural meeting of the **India-Singapore Ministerial Roundtable took place in September 2022**, focusing on areas such as digital connectivity and food security, which are vital for future collaboration.

India and Singapore share a robust partnership rooted in mutual respect, focusing on economic, security, and cultural collaboration to address global and regional challenges.

India's BrahMos Missile Exports: Strengthening Defence Diplomacy in Southeast Asia

Sub Topic: *Bilateral Groupings & Agreements Involving India and/or Affecting India's Interests*

Context:

India's **BrahMos missile exports** mark a significant stride in its ambition to emerge as a global

arms exporter and a **strategic counterbalance to China in Southeast Asia.** By integrating defence diplomacy with its **Act East Policy**, India is reshaping regional power dynamics, fostering security collaborations, and asserting its geopolitical influence.

BrahMos Missile: A Technological Marvel

- **Development and Key Features**
  - **Joint Collaboration**: Co-developed by India and Russia, based on the Russian **P-800 Oniks** missile.
  - **Supersonic Speed**: Reaches speeds up to **Mach 2.8**, enabling rapid target engagement.
  - **Stealth Technology**: Radar-absorbent coating ensures low detectability.
  - **Precision and Versatility**: Multi-platform adaptability for deployment on land, sea, air, and underwater platforms.
  - **Export Versions**: Capped at a 290 km range to comply with **Missile Technology Control Regime (MTCR)** guidelines.
- **Operational Utility**
  - Inducted into Indian armed forces in **2007, becoming a cornerstone of India's strategic defence capabilities.**
  - High **precision, stealth, and adaptability** make it a preferred choice for coastal and maritime defence.

Strategic Importance of BrahMos for India in Southeast Asia

- **Countering Chinese Influence**
  - **Anti-Ship Capabilities**: Offers recipient nations an effective deterrent against China's naval activities in contested areas like the **South China Sea**.
  - **Regional Tensions**: Addresses security concerns arising from China's militarisation of artificial islands and aggressive territorial claims.
- **Strengthening Maritime Defence**
  - **Philippines**: Enhances defence along critical areas like the **Scarborough Shoal**.
  - **Vietnam**: Fortifies its position in disputed waters, including the **Spratly Islands**.
  - **Indonesia**: Secures vulnerable chokepoints such as the **Malacca, Sunda, and Lombok Straits**.
- **Enhancing Defence Diplomacy**
  - **Long-Term Collaborations**: Agreements include training, maintenance, and logistical support.
  - **SAGAR Doctrine**: Aligns with India's vision of **Security and Growth for All in the Region** to promote regional stability.
- **Expanding Global Defence Footprint**
  - **BrahMos as a Benchmark**: Establishes India's capabilities in high-end defence systems.
  - **Broader Exports**: Acts as a springboard for other indigenous arms exports.

India's Defence Export Success

- Major Deals in Southeast Asia
  - **Philippines**: Signed a **USD 375 million contract** in 2022 for three missile batteries, with deliveries completed in 2024. Additional systems are under negotiation.
  - **Vietnam**: Nearing finalisation of a **USD 700 million deal** for five missile batteries, signalling a diversification from Russian-origin Yakhont systems.
  - **Indonesia**: Engaged in a **USD 450 million deal**, leveraging national currency transactions to deepen bilateral trade ties.
- Expanding Opportunities
  - **Malaysia and Thailand**: Exploring potential procurement, reflecting growing regional interest.
  - **Reduction of Russian Influence**: BrahMos deals highlight a shift in defence procurement patterns, reducing reliance on Russia amid global uncertainties.

Strategic Implications for China

- Escalating Tensions
  - **Deterrence Effect**: BrahMos deployments create a significant deterrent against Chinese naval platforms, including **aircraft carriers** and **coastguard vessels**.
  - **Security Concerns**: Target areas like the **Spratly Islands** directly challenge China's territorial claims.
- Regional Stability Risks
  - **Arms Race**: China views BrahMos proliferation as fuelling militarisation in Southeast Asia.
  - **Grey-Zone Tactics**: Reports since 2024 indicate increased Chinese activities aimed at countering BrahMos' strategic impact.

Challenges and Policy Shifts

- Initial Barriers
  - **Competition**: Faced rivalry from Russian Yakhont missiles during the 2010s.
  - **Intellectual Property Disputes**: Early conflicts with Russia over technology sharing.
  - **Cautious Diplomacy**: India's initial hesitance to avoid provoking China.
- Post-Galwan Policy Shift
  - **Assertive Strategy**: Galwan clashes in 2020 prompted India to adopt a robust defence export approach.
  - **Indigenous Inputs**: Technological advancements reduced dependency on Russian support, enhancing self-reliance.

Future Prospects for BrahMos

- Technological Advancements
  - **BrahMos-II Development**: **Hypersonic version (Mach 5+)** under development will further enhance India's offerings.
  - **Indigenous Upgrades**: Strengthened technology transfer agreements to benefit recipient nations.
- Expanding Defence Market
  - **New Buyers**: Potential deals with African and Middle Eastern nations.
  - **Economic Growth**: Defence exports surged from ₹686 crore in 2013-14 to ₹21,083 crore in 2023-24, reflecting a robust growth trajectory.

World Economic Forum Global Risk Report 2025

Sub Topic: *Global Groupings & Agreements Involving India and/or Affecting India's Interests*

Context:

The **World Economic Forum (WEF) released its 20th Global Risks Report**, highlighting critical challenges facing the world.

- The report underscores heightened geopolitical tensions, environmental crises, and the proliferation of misinformation as significant risks.
- It emphasises the need for multilateral cooperation in an increasingly fragmented global landscape.

Key Findings of the Global Risk Report 2025

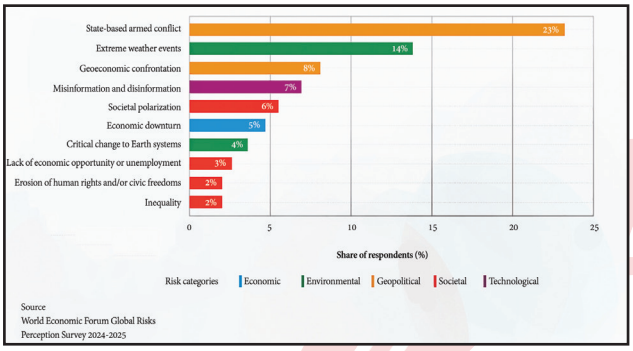
- **Geopolitical Fragmentation**: State-based armed conflict is identified as the most immediate risk for 2025.
- **Environmental Crises**: Long-term risks are dominated by environmental challenges such as extreme weather events, biodiversity loss, and ecosystem collapse.
- **Misinformation and Disinformation**: For the second consecutive year, these factors lead short-term risks, threatening stability and governance trust.
- **Economic Protectionism**: Research highlights the increasing prominence of industrial policies, non-tariff barriers, and restrictive trade measures.

Risks Faced by India

- **Top Five Risks Identified**:
  - **Water Supply Shortage**: Threats to availability and management of water resources.
  - **Misinformation and Disinformation**: Challenges in addressing governance

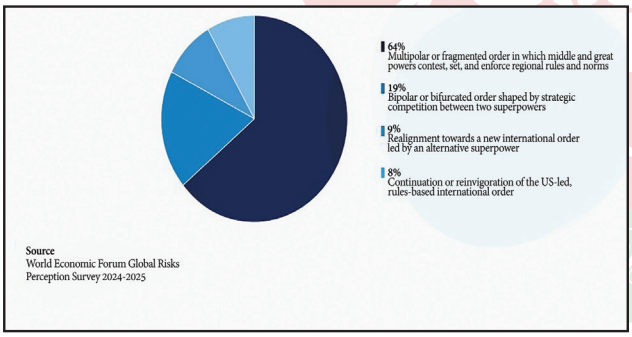
trust and societal stability.

- **Erosion of Human Rights and Civic Freedoms**: Increasing concerns over civic liberties.
- **Pollution (Air, Water, Soil)**: Ongoing environmental degradation affecting public health and ecosystems.
- **Labour and Talent Shortages**: Challenges in workforce availability and skill development.



- **Trade Routes and Energy Security**:
  - India's trade routes and energy supply **are vulnerable to instability in critical regions.**
  - Geopolitical tensions **could disrupt supply chains** and impact economic growth.

Solutions to Global Challenges



- **Bridging the East-West Divide**:
  - **India and Gulf nations can act as key intermediaries,** fostering multilateral cooperation between Western and Eastern powers.
  - Collaboration can address trade and energy challenges, mitigating disruptions.
- **Strengthening Multilateral Frameworks**:
  - Promote international agreements focused on climate action and economic stability.
  - Develop frameworks to combat misinformation and ensure transparency in governance.
- **Improving Resource Management**:
  - Strengthen water resource management systems.
  - Develop policies for efficient energy utilisation and reduce dependency on volatile regions.
- **Skill Development and Workforce Readiness**:
  - Invest in education and skill training programmes to address labour shortages.
  - Encourage private-public partnerships to enhance talent retention and development.
- **Enhancing Governance Trust**:
  - Strengthen mechanisms to combat misinformation and disinformation.
  - Foster civic engagement and uphold human rights to build public confidence in governance structures.
- **Expand Regional Organisations' Role**
  - **Main Point:** Strengthen the role of regional organisations (e.g., African Union) in peacekeeping and mediation to manage regional tensions more effectively.
  - **Recommendation:** Enhance their future capacity for both peacekeeping and conflict mediation.
- **Diversify Supply Chains**
  - **Main Point:** Build resilience in supply chains to mitigate risks from geopolitical volatility.
  - **Strategies:**
  - Invest in geopolitical risk foresight and scenario planning.
  - Assess supplier vulnerabilities and reputational risks linked to conflicts.

US withdrawal from WHO

Sub Topic: *Important International Institutions, Global Groupings & Agreements Involving India and/or Affecting India's Interests*

Context:

The **United States (US)**, under President-elect Donald Trump, **is expected to formalise its withdrawal from the World Health Organisation**

(WHO), a move that could have far-reaching consequences for global health.

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- While the **US's role as a global health leader has faced criticism** before, this decision signals a **significant shift in priorities, compelling the global health community to reassess its strategies,** address emerging challenges, and adapt to a transformed landscape.

Allegations of Bias and Accountability

- **Bias:** In 2020, then-President Trump initiated steps to withdraw from WHO, **citing alleged bias in favour of China and the organisation's failure** to hold China accountable for its handling of the COVID-19 outbreak.
- **During COVID-19:** Critics accused WHO of **delaying its declaration of COVID-19 as a Public Health Emergency of International Concern (PHEIC)**, echoing earlier criticisms of its slow response during the 2013 MERS-CoV outbreak and the 2014 Ebola crisis.
  - During the COVID-19 pandemic, concerns over **China's influence on WHO grew as the country delayed sharing critical data** and resisted early acknowledgment of human-to-human transmission.
  - WHO officials, including Maria van Kerkhove, called for greater transparency, urging China to provide additional pandemic-related samples. However, these requests largely went unanswered, exacerbating the **perception of the organisation's lack of accountability.**
- **Politicisation of COVID-19 Origins:** The U.S. withdrawal coincides with unresolved debates over COVID-19's origins. While the Republican-led subcommittee suggests a lab leak in Wuhan, Democrats dismiss it as politicised, and intelligence agencies remain divided, deepening uncertainty and geopolitical tensions.

Reassessing U.S. Global Health Leadership

- The Trump administration's skepticism toward global health efforts is not new.
  - Historically, the **US has been a dominant force in global health leadership,** channeling significant funding to combat infectious diseases and linking its security and economic development to the well-being of the Global South.
  - However, the **COVID-19 pandemic exposed vulnerabilities in this approach.**
- Despite extensive investments, the **US was unprepared for the pandemic,** facing its largest economic contraction since the **Great Depression and recording over 1.2 million COVID-19-related deaths.**
  - While the Biden administration sought to restore global health leadership by reversing Trump's 2020 withdrawal from WHO, **domestic political polarisation and global geopolitics limited the effectiveness of these efforts.**
  - **Vaccine nationalism**, inequities in global vaccine distribution through initiatives like COVAX, and the rise of vaccine diplomacy by Russia and China further undermined U.S. leadership in global health.

The Impact of a U.S. Withdrawal

- **Funding Cuts:** As **one of WHO's largest contributors**, providing **nearly $1.28 billion in funding for 2022–2023**, the U.S. exit would **disrupt global health programmes,** reduce technical expertise, and weaken international health surveillance and response capabilities.
  - Programmes under the **US Agency for International Development (USAID)**, the **National Institutes of Health (NIH)**, and initiatives addressing HIV/AIDS, malaria, and tuberculosis **could face severe funding cuts.**
- **Deprioritisation:** Additionally, key efforts like the **United Nations Population Fund (UNFPA)**, the **President's Emergency Plan for AIDS Relief (PEPFAR),** and **Cancer Moonshot** are likely to be deprioritised.
- **Reproductive Health Programmes:** The reimposition of a **"global gag rule,"** restricting funding for organisations providing abortion-related services, could further impact global **reproductive health programmes.**
- **U.S. Health Policy:** However, the withdrawal may also signal a **recalibration of U.S. global health policy.**
  - Initiatives like **Operation Warp Speed** demonstrated the potential of American biotechnology and pharmaceutical industries to respond swiftly to novel threats.
  - Going forward, U.S. investments in health innovation may be **driven by intellectual**

property rights, geopolitical competition, and biosecurity considerations rather than direct engagement in global health systems.

The Role of the Global South

- **Addressing Power Vacuum:** With the U.S. realigning its global health priorities, the Global South must prepare to **address the resulting power vacuum.**
- **Expanding China's Influence:** A reduction in U.S. funding **may create opportunities for China to expand its influence** through initiatives like the **Health Silk Road.**
- **Europe's Role: While Europe could also step in**, resource constraints—exacerbated by conflicts in Ukraine and West Asia—may limit its capacity to fill the gap.
- **Reforming WHO:** This shift presents a **critical moment for the Global South to advocate for reforms within WHO,** including increased transparency, accountability, and equity.
  - The **contentious negotiations over the Pandemic Treaty and mechanisms** like the **Pathogen Access Benefit Sharing (PABS) system** highlight the need for alternative solutions that prioritise fairness and inclusivity.
- **BRICS: Countries like India, alongside BRICS nations,** can take a leading role in **reshaping global health governance.**
  - By promoting **localisation and channeling foreign aid** through local organisations, these nations can address health challenges from the ground up.
- **Building Resilience:** Additionally, **incorporating biosecurity into national security frameworks** and combating misinformation can help build **resilience against future health crises.**

Rethinking Global Health

- The **U.S. appears determined to redefine the role of global health** in its foreign policy.
- **Domestic politics, COVID-19, and geopolitical tensions have overshadowed the benefits of deeper engagement** in global health.
- While a complete withdrawal from global health efforts may not be prudent, this shift **underscores the urgent need for the Global South** to reevaluate the global health landscape.
- This moment presents **an opportunity for reform, innovation, and collaboration,** ensuring that the global health agenda addresses the needs of all nations, especially those most vulnerable.

The path forward requires bold leadership, strategic planning, and a commitment to building a more equitable and effective global health system.

Subject – Indian Economy & Agriculture and Banking

Meal Data And Hunger

Sub Topic: *Food Security*

Context:

India continues to grapple with **food insecurity and undernutrition** despite significant efforts to address these challenges.

More on News

- The 2023 **State of Food Security and Nutrition in the World (SOFI)** report estimates that **74 million Indians were undernourished** between 2020 and 2022, highlighting persistent food insecurity and hunger.
- The **Global Hunger Index (GHI)** 2023 **ranked India 111th out of 125 countries,** emphasising high rates of child stunting, wasting, and undernourishment.
- Recent data from the **NSS Household Consumption Expenditure Survey (HCES)** 2022-23 sheds light on **meal consumption patterns,** offering valuable insights into the state of hunger in India.

Meal Consumption Patterns in India

- The HCES 2022-23 defines a **meal** as **one or more readily eatable food items, typically centred on cereals.**
- Analysis of the data reveals that **only 3.2% of the population consumed fewer than 60 meals in the 30 days** preceding the survey—a threshold **indicating hunger.**
- **Most people (over 90%) consumed between 60 to 90 meals** during this period, averaging two to three meals daily.
- **Daily meal patterns** further highlight that:
  - **56.3%** of the population consume **three meals daily.**
  - **42.8%** consume **two meals daily.**
  - **0.1% eat only one meal daily.**
  - **0.8% consume no meals,** which includes **infants reliant on milk.**

- Overall, **99.1% of the population consumes at least two or three meals daily.**
  - However, 2.5% of the population, equivalent to approximately 35 million people, consumed fewer than 60 meals a month, indicating occasional meal skipping or hunger.

Interpreting Hunger in India

- Based on the definition of two meals per day, the **intensity of hunger in India appears relatively low.**
- Yet, the **absolute numbers remain substantial.** With a population of approximately 1.4 billion**, even small percentages translate into millions.**
  - 35 million people consumed fewer than 60 meals in the 30 days preceding the survey.
  - **93.8 million people** (6.7% of the population) **could not maintain their usual daily meal frequency over a month.**
- This data highlights the **ongoing prevalence of hunger,** even as the majority meets basic meal frequency requirements.

Beyond Meal Frequency: Food Quality and Security

- While the HCES data provides insights into meal frequency, it **does not account for the nutritional quality of food consumed**—a crucial aspect of food security.
- **Undernourishment extends beyond meal frequency**, encompassing issues of food diversity, safety, and nutritional adequacy.
- For instance, the **74 million undernourished people** identified in the SOFI report reflect a **broader issue of food insecurity,** which is influenced by the **balance and nutritional value of the food consumed.**
- **Hunger and food insecurity**, therefore, **need to be assessed separately** to capture both the quantity and quality of food consumption.

Initiatives to Tackle Hunger and Food Security

National Food Security Act (NFSA): Enacted in 2013, the NFSA provides **legal entitlements to food** for a significant portion of the population. It covers up to **75% of the rural population and 50% of the urban population**, amounting to approximately 81 crore beneficiaries. Beneficiaries receive subsidised food grains through the **Targeted Public Distribution System (TPDS)**, which includes both Priority Households and **Antyodaya Anna Yojana categories.**

Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY): Launched to alleviate hardships faced by the poor during the COVID-19 pandemic, this scheme provides free **food grains to approximately 81.35 crore beneficiaries.** The government has **extended PMGKAY for an additional five years** starting from January 2024, ensuring continued support for vulnerable populations.

PM POSHAN Abhiyaan: This scheme aims to improve the nutritional status of children in government and government-aided schools. It encourages regular school attendance among disadvantaged students by providing nutritious meals, thereby addressing both hunger and educational outcomes.

Integrated Child Development Services (ICDS): Launched in 1975, ICDS aims to provide food, preschool education, and primary healthcare to children under six years, pregnant women, and lactating mothers.

Public Distribution System (PDS): The PDS plays a crucial role in ensuring food security by distributing essential commodities at subsidised rates to low-income households.

National Food Security Mission: Launched in 2007, this mission aims to increase the production of staple crops like rice, wheat, and pulses through area expansion and productivity enhancement.

Mid-Day Meal Scheme: This centrally sponsored scheme provides free meals to school children in Classes I-VIII in government and aided schools.

Addressing Food Insecurity

- **Improved Data Collection:** The absence of detailed public data on food quantity, quality, and nutritional value limits the ability to assess food security comprehensively.
- **Policy Alignment:** Policies must focus on regional disparities in food access, affordability, and distribution.
- **Holistic Solutions:** Addressing hunger requires targeted interventions that go beyond meal frequency to ensure balanced and diverse diets.

Achieving zero hunger in India necessitates a multi-pronged approach that integrates data-driven policy-making, targeted nutrition programmes, and robust food distribution systems.

Consumption Jump, Slower Capex

Sub Topic: *Growth & Development, Mobilisation of Resources, Government Budgeting*

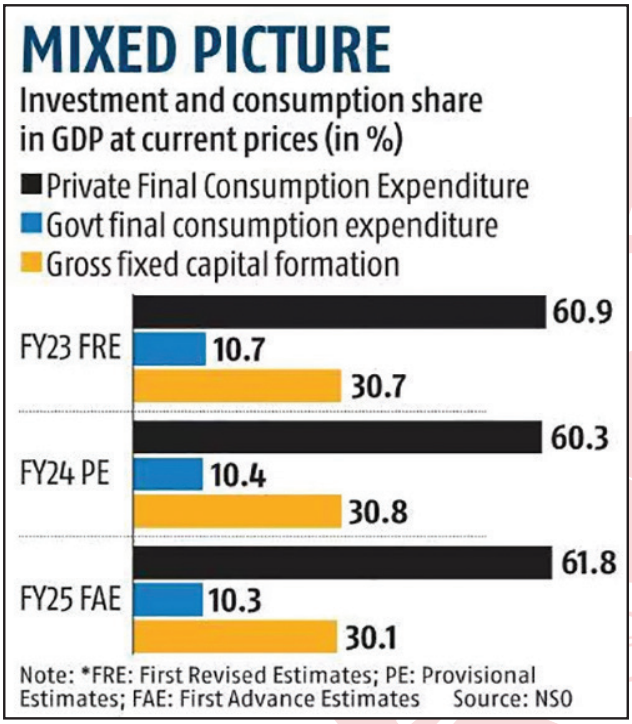
Context:

Growth in infrastructure investment is expected to moderate in the current financial year (FY25)

compared to FY24, driven by a slowdown in government capital expenditure and sluggish private investments.

More on News

- This projection is based on the **first advance estimates of GDP for FY25**, released by the **National Statistics Office (NSO).**
- However, an **uptick in rural spending may contribute to higher overall consumption** growth this year.



Decline in Investment Demand

- The NSO data indicates that the **share of Gross Fixed Capital Formation (GFCF),** a measure of infrastructure investment, is **likely to decline to 30.1% of GDP in FY25, down from 30.8% in FY24 in nominal terms.**
- **Growth in investment demand in real terms** is projected to **slow to 6.4% in FY25,** compared to 9% in the previous financial year.
- **Government capital expenditure,** which played a key role in reviving investments post-pandemic, **has moderated due to general elections and the government's focus on fiscal consolidation.**
- **Private investments have also remained muted,** with activity limited to specific sectors like chemicals, renewables, and roads.
  - This scenario reflects a **counter-cyclical approach,** where the government's fiscal policies are adjusting in response to economic conditions—reducing spending during an election period while aiming for long-term stability and growth.
- Aditi Nayar, chief economist at ICRA, expressed optimism that **GFCF growth might exceed NSO projections,** supported by an **expected pickup in government capital expenditure and some recovery in private investments** in the second half of FY25, following election-related disruptions earlier in the year.

Rise in Consumption Spending

- The share of **Private Final Consumption Expenditure (PFCE),** representing household consumption, is **projected to increase to 61.8% of GDP in FY25,** compared to 60.3% in FY24 in nominal terms.
- Growth in private spending is expected to rise to 7.3% in FY25, up from 4% in FY24 in real terms.
- There are **signs of recovery in rural consumption,** including increases in rural real wages and two-wheeler sales.
  - FMCG companies have also reported improved rural demand, although urban demand remains subdued.

Rural Consumption Outlook

- Rural consumption, which **accounts for about 60% of India's private consumption,** is set to benefit from healthy kharif production and promising prospects for the rabi season.
- **Higher agricultural growth** this year is expected to support rural consumption.
- **Declining food inflation** will boost discretionary spending, especially among low-income households with a larger share of food in their consumption basket.

Barbell Strategy

- To navigate these economic challenges effectively, employing a **Barbell Strategy** within an **Agile framework** could be beneficial.
- This strategy **involves balancing investments between very safe assets** (such as public infrastructure) **and high-risk opportunities** (like emerging sectors).
- By maintaining this dual focus, **policymakers can ensure that while they safeguard against downturns through stable investments,**

they also capitalise on potential high-growth areas that may arise as economic conditions evolve.

- The **Economic Survey 2020-21** stated that the Indian government adopted this approach. The Barbell approach allowed for **better targeting of vulnerable businesses** during the pandemic, **reducing its economic impact significantly**. Over the past two years, this strategy enabled the government to use various High-Frequency Indicators (HFIs) from both public and private sources. This helped them continuously monitor the situation and adjust policies in real time, according to the survey.

While infrastructure investment growth is slowing, driven by reduced government and private spending, a recovery in rural consumption is expected to offset this trend and support overall GDP growth in FY25.

Impacts of Rupee Weakening

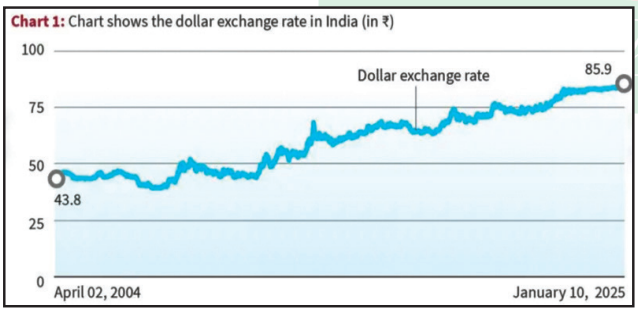
Sub Topic: *Growth & Development, Mobilisation of Resources*

Context:

The **Indian rupee has experienced a sharp devaluation** against the US dollar after remaining relatively stable for over two years.

More on News

- This shift raises important questions about the factors driving the devaluation, its implications, and the broader context of India's exchange rate policy.



Understanding Exchange Rate Regimes

- **Exchange Rates:** Exchange rates can broadly be classified into **nominal and real exchange rates.**
  - **Nominal:** The **nominal exchange rate reflects the price of one unit of foreign currency in terms of domestic currency.**
  - **Real:** In contrast, the **real exchange rate** accounts for the **relative price of domestic goods vis-à-vis foreign goods,** incorporating domestic and international price levels.
- **Influences:** Exchange rate dynamics **depend on demand-supply conditions** in the foreign exchange market, **influenced by current and capital account flows.**
  - While the current account is shaped by net exports, the capital account reflects foreign investment inflows and outflows.
- **Measures:** Central banks adopt **various exchange rate policies** to manage currency value, including **fixed, floating, and managed-floating regimes.**
  - In a **fixed exchange rate regime**, the central bank maintains a **constant exchange rate by buying or selling foreign reserves.**
  - In a **floating exchange rate regime**, the **currency value adjusts freely based on market demand and supply.**
  - In a **managed-floating regime**, the central bank intervenes to **balance currency stability and foreign reserve levels.**

India primarily operates under a managed-floating exchange rate system, with **periodic interventions by the Reserve Bank of India (RBI)** to manage currency fluctuations.

India's Exchange Rate Policy Evolution

- **Last Decade:** Over the last decade, the **RBI has followed a managed-float strategy** with **asymmetrical interventions.**
  - During excess demand for foreign currency, the **RBI allowed the rupee to depreciate while selling foreign reserves.**
  - However, in periods of excess supply, it **accumulated reserves**, resisting nominal appreciation to protect export competitiveness.
    - This approach led to a **gradual devaluation** of the rupee throughout the 2010s.
- **Post-Covid:** In the **post-COVID period (2022–2024),** the RBI temporarily **shifted to a quasi-fixed exchange rate regime,** maintaining the rupee's stability despite

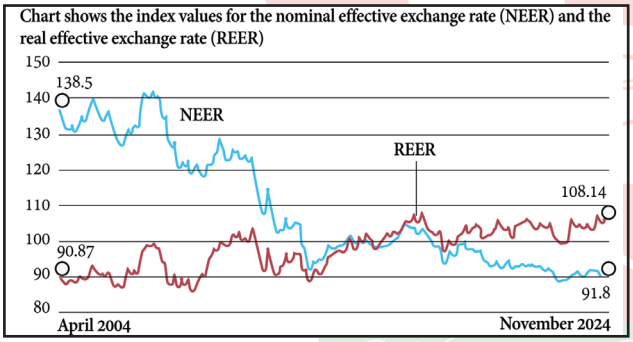
rising current account deficits and capital outflows.

- This stability was **achieved by depleting foreign reserves.**
- However, the **recent sharp devaluation suggests the RBI has reverted to its earlier managed-floating strategy,** allowing the rupee to depreciate in response to rising imports, capital outflows, and higher crude oil prices.

Implications of Rupee Depreciation

Nominal exchange rate depreciation has **both positive and adverse macroeconomic effects:**

- **Boosting Net Exports:** A weaker rupee makes Indian goods cheaper in global markets, potentially increasing net exports.
  - However, this **depends on the real exchange rate** and whether it depreciates alongside the nominal exchange rate.
- **Rising Domestic Prices:** Depreciation raises the cost of imported raw materials, increasing firms' variable costs. Firms often pass these higher costs to consumers, leading to inflation.



Structural Challenges and Divergence

- **Divergence:** Since the mid-2010s, a growing divergence **between India's nominal effective exchange rate (NEER) and real effective exchange rate (REER)** has emerged.
  - While the **rupee's nominal value has depreciated,** the real exchange rate has appreciated due to rising domestic prices.
  - This trend **differentiates India from most other countries**, where NEER and REER typically move in tandem.
- **Non-Financial Firms:** The rise in domestic prices can be partially attributed to **increasing markups by non-financial firms.**
  - Analysis of data from the **Centre for Monitoring Indian Economy (CMIE)** reveals that after declining until the mid-2010s, markups began rising, contributing to higher domestic prices.

Policy Questions and Future Directions

The current devaluation highlights **critical policy challenges:**

- Should India revert to its 2010s exchange rate strategy, or is a new, explicit framework required?
- What objectives should guide India's exchange rate policy—stabilising inflation, boosting exports, or protecting reserves?

The RBI's recent policy shifts appear inconsistent, lacking clear communication. Moving forward, a systematic and transparent approach to exchange rate management is necessary to address the dual challenges of inflationary pressures and constrained export recovery.

Bailing out a PSU

Sub Topic: *Banking Sector & NBFCs, Mobilisation of Resources*

Context:

The Union Cabinet approved a ₹11,440 crore package to **revive the struggling Rashtriya Ispat Nigam Limited (RINL), operator of the Visakhapatnam Steel Plant.**

Key components of the package

- ₹10,300 crore equity infusion.
- Conversion of ₹1,140 crore working-capital loans into 7% non-cumulative preference shares redeemable after 10 years.

Current Financial Challenges

- RINL's liabilities have risen to over ₹35,000 crore, with loan repayment and interest defaults.
- The bailout aims to stabilise RINL's finances, secure working capital, and achieve its production capacity of 7.3 million tonnes annually.

Disinvestment Process in India

Disinvestment in India refers to the government's process of reducing its stake in public sector enterprises (PSEs) to raise funds, improve efficiency, and reduce fiscal deficits. It is **managed by the Department of Investment and Public Asset Management (DIPAM)** under the **Ministry of Finance.**

Process of Disinvestment:

- **Identification of PSEs:** The government identifies public sector enterprises for disinvestment based on their strategic importance, financial performance, and market conditions.
- **Approval:** The **Cabinet Committee on Economic Affairs (CCEA)** approves the disinvestment plan for specific companies.
- **Valuation:** The enterprise's valuation is determined through due diligence, market analysis, and consultations with financial advisors.

Mode of Disinvestment:

- **Minority Disinvestment:** Government retains majority control (>51%).
- **Majority Disinvestment:** Government transfers management control but retains some stake.
- **Complete Privatisation:** Government sells 100% ownership.

Status as of January 2025:

- **Targets for FY 2024-25:** The government set a disinvestment target of **₹50,000 crore for FY25 as per the Union Budget**. This is higher than the revised target of **₹30,000 crore for FY24.**
- **FY 2023-24 Performance:** The government **raised only ₹12,504 crore,** about 24.5% of the original target of ₹51,000 crore. Successful transactions included minority stake sales in **Coal India, NHPC, and IPOs like Indian Renewable Energy Development Agency (IREDA)**.

Challenges:

- Strategic sales like Bharat Petroleum Corporation Ltd (BPCL) were canceled due to **lack of buyer interest.**
- **Delays in privatisation processes** for entities like SCI and BEML due to **public resistance and complex demergers**.

Funding Source Uncertainty

- The Ministry of Steel's budget for 2024-25 has no provision for the ₹10,300 crore equity infusion, with only ₹620 crore allocated for RINL, to be raised via unspecified "other" routes.
- The infusion is expected to be funded from unspent capital outlay (~₹62,593 crore) allocated for new schemes in the 2024-25 budget.

Abandonment of Privatisation Plans

- In January 2021, the government approved the 100% disinvestment of RINL. However, this plan has now been shelved.
- Previous efforts at privatisation included interest from the Adani Group in 2022, but these were discontinued post-2024 elections.

Shift in Policy Approach

- The decision to revive RINL reflects a broader shift away from the government's stated policy of strategic disinvestment.
- The merger of RINL with Steel Authority of India Limited (SAIL) and land sales to other PSUs were considered but not pursued.

Decline in PSU Financial Health

- Over the past five years, PSUs' capacity to raise funds independently has declined significantly.
- Internal and extra-budgetary resource generation by PSUs fell from ₹6.4 trillion in 2019-20 to ₹3.2 trillion in 2023-24.
- Dependence on government support increased from 25% to 61% of PSUs' total capital outlay in the same period.

Strategic Disinvestment Slowdown

- Several disinvestment plans for key PSUs like Bharat Petroleum, Shipping Corporation of India, and Container Corporation have stalled or been abandoned.
- Recent sales, like that of Ferro Scrap Nigam for ₹320 crore, have been rare exceptions.

Questions on Future Policy Direction

- The reliance on government support underscores the **inversion of the strategic disinvestment policy** into one of strategic investments in PSUs.
- **Key questions remain:**
  - Will PSUs generate more internal resources in 2025-26?
  - Will reliance on government funding decrease?
  - Will the government return to its disinvestment agenda?

Budget 2025-26 Expectations

- Finance Minister Nirmala Sitharaman's Budget presentation is expected to shed light on the government's stance on PSU reforms and strategic disinvestment.

- In the absence of clarity, the government may need to formally revise its disinvestment policy to reflect the current approach.

India's Path to Future Skills

Sub Topic: *Skill Development and Employment*

Context:

India has been ranked second globally in its preparedness for future jobs, particularly in areas like artificial intelligence (AI) and green skills, as per the QS World Future Skills Index 2025.

More on News

- Only the **United States stands ahead in this domain.**
- However, despite this impressive ranking, the **report reveals significant challenges in other critical areas, positioning India as a** "future skills contender."

Key Indicators Measured and India's Performance

The QS World Future Skills Index **evaluates countries based on four broad indicators** to assess readiness for the evolving global job market:

- **Skills Fit:** Assesses the alignment between graduate skills and employer requirements.
  - On this parameter, India ranks **last among the top 30 countries.**
  - The report highlights a **significant gap between workforce skills and employer needs,** pointing to challenges in India's higher education system in keeping pace with the demands of a rapidly changing economy.
- **Future of Work:** Evaluates the preparedness of the job market for the skills needed in future jobs.
  - **India excels in this category**, ranking **second** globally, just behind the United States and ahead of Germany and Canada.
  - This reflects the **country's strong demand for digital, AI, and green skills** in job postings, driven by the transition to technology-driven and sustainable industries.
- **Academic Readiness:** Measures how well higher education aligns with future work demands.
  - India ranks **26th,** with a score of 89.9.
  - Although higher education is making strides, it still lags behind in fostering creativity, problem-solving, and entrepreneurial thinking.
- **Economic Transformation:** Examines a country's capacity to support future skills growth through key metrics like innovation and sustainability.
  - India ranks **40th on this parameter**, with a score of 58.3.
  - While the **country receives full marks for economic capacity,** it **performs poorly on sub-parameters like innovation and sustainability**, scoring only 15.6 out of 100.

Insights on India's Education System

The report underscores **significant shortcomings** in India's education system and workforce preparedness:

- India's **graduates face challenges in acquiring skills** required for a rapidly changing job market.
- There is a **noticeable gap in fostering entrepreneurial and innovative mindsets** among students.
- **Collaboration between universities and industries** is insufficient, leading to a misalignment between education and workforce demands.

The **QS World University Rankings for 2025** highlight **India's significant progress in higher education**, with the **Indian Institute of Technology Bombay (IITB) leading at 118th globally**, followed by **IIT Delhi at 150th.** The number of Indian institutions in the rankings has surged from 11 in 2015 to 46 in 2025, reflecting a commitment to academic excellence and research output. Key indicators like Citations per Faculty demonstrate strong research capabilities, with **Anna University achieving a perfect score in this category.** Additionally, **IIT Delhi ranked first in India for sustainability efforts,** indicating a growing focus on environmental issues. This upward trajectory enhances India's reputation as a competitive player in global education and underscores the importance of continued investment and support in the higher education sector.

Recommendations for Improvement

To address these challenges, the report suggests the following measures:

- **Curriculum Revamp:** Universities must embed creativity, problem-solving, and entrepreneurial thinking into their curricula.

- **Industry Collaboration:** Strengthening partnerships between higher education institutions and industries to align education with real-world demands.
- **Lifelong Learning:** Policymakers should prioritise reskilling programmes to keep the workforce relevant and productive in the long term.

While India's high ranking in the Future of Work indicator reflects its potential to lead in emerging industries, significant reforms in education, innovation, and sustainability are essential for the country to fully realise its potential. Aligning higher education with workforce needs and investing in continuous skill development will be critical to positioning India as a global leader in the future job market.

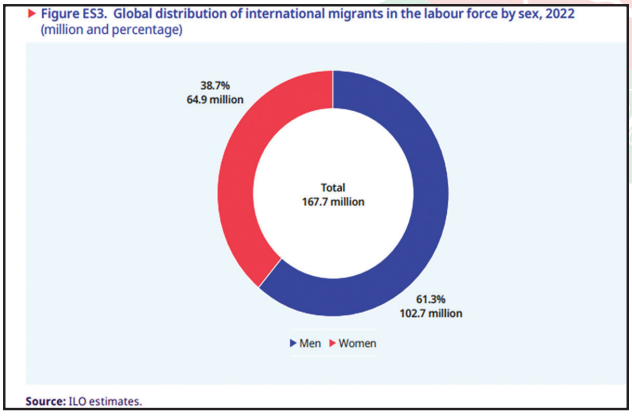
ILO report on international migrants

Sub Topic: *Skill Development and Employment*

Context:

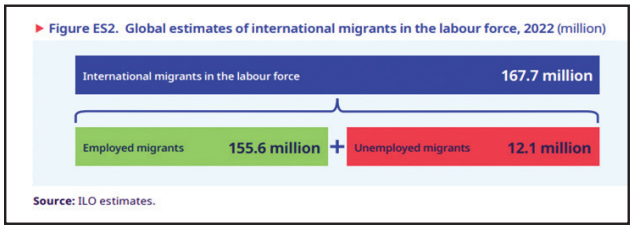
The **fourth edition of the Global Estimates on International Migrant Workers** was released by the **International Labour Organisation (ILO).**

- The report highlights the **critical role of International Migrants (IMs)** in addressing labour market shortages in host countries and contributing remittances to their home nations.



Key Findings of the ILO Report

- In 2022, IMs made up **4.7% of the global labour force** (167.7 million individuals), with over **30 million more** workers compared to 2013.
- Approximately **155.6 million IMs** were employed, while **12.1 million** were unemployed but available for work. The **annual growth rate** of the IM workforce between 2019 and 2022 slowed to **less than 1%**, primarily due to the **COVID-19 pandemic**.



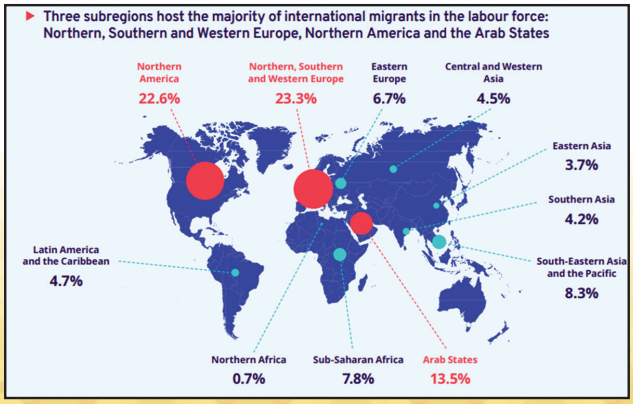
- The gender composition in 2022 showed **4.7% of global male employment** and **4.4% of global female employment** comprised IMs.

ILO Report on Age and Gender

- **Male IMs** accounted for **61.3% of the employed IM population** (102.7 million).
- **Female IMs** comprised **38.7% of employed IMs** (64.9 million), yet their **numbers have consistently risen** since 2015.
- **Prime-age workers** (25-54 years) dominated the IM workforce, making up **74.9% (125.6 million)** in 2022.
- Younger IMs (aged 15-24) formed **9.3% (15.5 million)**, while workers aged **55-64 and 65+** accounted for **12.5% and 3.4%, respectively**.

Economic Sectors of IMs

- The **services sector** was the primary employer of IMs, attracting **68.4% of all IMs**.
  - Female IMs were more prevalent, with **80.7% working in services** compared to **60.8% of male IMs**.
  - The dominance of IMs in services has been consistent, exceeding **67% since 2013**.
- In the **industry sector**, IMs constituted **24.3%**, aligning closely with non-migrant workers at **24.2%**.



- The **agriculture sector** attracted only **7.4% of IMs**, significantly lower than the **24.3% share** of non-migrants.

Country-wise Composition of IMs

- **High-income countries** were the largest absorbers of IMs, accounting for **68.4% (114 million)** in 2022, especially in the **care sectors**.
- **Upper-middle-income countries** hosted **17.4% (29.2 million)** of IMs.
- **Northern, Southern, and Western Europe** housed **23.3% of IM workers**, showing a marginal increase since 2013.
- **North America** had **22.6% of the IM workforce** in 2022, a slight decrease over the decade.
- **Arab states** saw their IM workforce drop to **13.3% in 2022**, a **three-percentage point decline** since 2013.

Importance of International Migrants

- IMs fill **labour shortages** in critical sectors such as **care services, hospitality, and construction**.
- They significantly contribute to **economic growth** and **poverty alleviation** through **remittances** sent to their home countries.
- In host nations, IMs bolster the **care economy** and address the challenges of **ageing populations**.
- Their participation enhances **cultural diversity** and **economic dynamism**.

Issues Faced by International Migrants

- **Unemployment**: IMs experience disproportionate levels of **job insecurity and unemployment**, as evidenced by the **12.1 million unemployed** in 2022.
- **Gender Inequality**: Female IMs face **lower workforce participation rates** and **greater vulnerability** to exploitation.
- **Legal and Social Barriers**: Many IMs face challenges in securing **legal status**, accessing **healthcare**, and overcoming **discrimination**.
- **Vulnerability to Economic Shocks**: IMs are often the first to lose jobs during economic downturns, as seen during the **COVID-19 pandemic**.

Key Initiatives for International Migrants

- **International Organisation for Migration (IOM)**
  - **Established**: 1951
  - **Role**: Leading inter-governmental organisation in the field of migration.
  - **Focus Areas**: Migration management, humanitarian assistance, and policy guidance.
- **International Labour Organisation (ILO)**
  - **Advocacy**: Promotes the rights of migrant workers and fair labour migration practices.
  - **Conventions**: Develop international standards to safeguard migrant workers' rights.
- **International Convention on Migrant Workers' Rights**
  - **Adoption**: 1990 by the United Nations General Assembly.
  - **Purpose**: Protects the rights of migrant workers and their families globally.
- **Global Compact for Migration**
  - **Adopted**: 2018
  - **Significance**: The first intergovernmental agreement addressing all dimensions of international migration.
  - **Objective**: Ensures safe, orderly, and regular migration.

Subject – Science & Technology

Bridging the Civilian-Defence Divide in Space Sector

Sub Topic: *Achievement in the Field Of Space Technology*

Context:

India's **ambitious space programme** has grown remarkably, driving technological innovation, economic opportunities, and scientific exploration.

More on News

- However, as the country's reliance on space assets increases, critical questions arise: **Who protects India's space assets? Who defends against strategic and tactical threats from orbital and outer space?**
- These questions **necessitate a reassessment of the current structure of India's Space Commission**, the highest decision-making body for all matters related to space.

Current Structure and Limitations

- Established to guide and oversee the space

programme, the **Space Commission** has **predominantly civilian representation.**

- The **inclusion of new members** in 2020, such as the **Chairman** of the Indian National Space Promotion and Authorisation Centre **(IN-SPACe)** and the National Security Advisor **(NSA),** expanded its mandate.
- Yet, the Commission **remains heavily influenced by the Indian Space Research Organisation (ISRO),** whose chairman also leads the Commission.
- While **ISRO's** role in civilian and commercial space activities is vital, it is **not equipped to address defence-related space challenges**, as it seeks to avoid association with militarisation.
- This **civilian-centric approach excludes key stakeholders** like the **Defence Space Agency (DSA) and the Integrated Defence Staff (IDS)**, entities tasked with safeguarding India's strategic interests in space.
- The **absence of defence representation raises concerns** about the Commission's ability to holistically address the country's comprehensive space security needs.

The Role of Defence in Space

- In 2019, **India established the DSA under the IDS**, alongside the Defence Cyber Agency and the Armed Forces Special Operations Division.
- Although **still in its formative years, the DSA is crucial for defending India's space assets.**
- Its **exclusion from the Space Commission leaves a significant gap** in strategic planning and decision-making.

The necessity of defence representation becomes even more apparent in light of recent developments:

- **Spy Satellite Deployment:** In October 2024, the Cabinet Committee on Security approved the third phase of the Space-Based Surveillance Project.
  - This phase includes the launch of 52 intelligence satellites, managed by the IDS through the National Security Council Secretariat (NSCS).
  - Civilian agencies like ISRO are not involved in building these satellites, with the responsibility falling on the Defence Research and Development Organisation (DRDO) and domestic commercial space players.
- **Defence-Driven Space Ecosystem:** The Ministry of Defence (MoD) is emerging as a key operator and customer of space assets.
  - Initiatives like the **Innovation in Defence Excellence (IDEX) scheme** and **Mission DefSpace Challenge** have spurred early-stage space companies, creating a defence-driven ecosystem that operates outside ISRO's civilian purview.
- **Civil-Military Collaboration:** The interplay between civilian and military space domains is vital.
  - The Indian Navy and Air Force's involvement in the **Human Spaceflight Programme** highlights this complementary relationship, which will deepen as projects like **Gaganyaan and the Bharatiya Antariksha Station progress.**

The Case for Reform

India's space programme has outgrown its earlier structure, where ISRO and the Department of Space operated as sole authorities. With diverse stakeholders, including commercial players and defence agencies, contributing to the ecosystem, the Space Commission must evolve to reflect this reality.

Options for reform include:

- **Integrating Defence Representation:** Incorporate defence stakeholders like the Chief of Defence Staff and representatives from the DSA into the Space Commission.
  - This would ensure that tactical and strategic needs are accounted for in space policymaking.
- **Establishing a Separate Defence Space Commission:** If integrating defence representation within the existing Commission proves unfeasible, creating a dedicated body for military space activities could address the gap.
- **Balancing Civilian and Defence Interests:** A restructured Space Commission with equal representation for civilian, commercial, and military stakeholders would align India's space governance with its multifaceted objectives.
- Space technology is inherently dual-use, serving both civilian and military purposes. As India's space programme continues to expand, its governance structure must

adapt to address emerging challenges and opportunities.

SpaDeX Docking Mission: Pioneering Space Docking Technology for India

Sub Topic: *Achievement in ihe Field Of Space Technology*

Context:

The Indian Space Research Organisation (ISRO) recently achieved a significant milestone in the SpaDeX (Space Docking Experiment) mission by bringing two satellites, **SDX01 (Chaser) and SDX02 (Target),** within a **proximity of three meters in low Earth orbit.** This achievement follows setbacks caused by unexpected drift between the satellites.

More in News - Present State of the Mission

- **Launch:** The SpaDeX mission was **launched on December 30, 2024, aboard the PSLV-C60** from the Satish Dhawan Space Centre, Sriharikota, Andhra Pradesh. The mission **aims to demonstrate in-space docking capabilities,** a crucial technology for India's ambitious space exploration and infrastructure projects.
- **Current Hinderance:** On January 12, 2025, **ISRO successfully maneuvered the SpaDeX satellites to a distance of 15 meters and then closer to three meters,** holding steady before returning the satellites to a safe distance for further analysis. This **marked a significant recovery** after the docking experiment was postponed earlier due to alignment challenges and unexpected drift.
- **ISRO's ultimate goal is to achieve complete docking,** which would position India as the **fourth country globally—after the United States, Russia, and China**—to demonstrate space docking technology.

About SpaDeX Docking Mission and Why It Was Initiated:

The SpaDeX mission was conceived as a **cost-effective technology** demonstrator to:

Objectives:

- **Develop and demonstrate technology** for rendezvous, docking, and undocking of two small spacecraft in low Earth orbit.
- **Facilitate future missions** requiring multi-launch payload assembly, such as **Chandrayaan-4's lunar** sample return and the **Bharatiya Antariksh Station (BAS).**
- Demonstrate **electric power transfer** between docked spacecraft and composite spacecraft control.

Mission Concept:

Two identical satellites, SDX01 (Chaser) and SDX02 (Target), weighing approximately 220 kg each, were launched into a 470 km circular orbit with a 55° inclination. After launch, a controlled relative drift between the satellites was induced to simulate real docking conditions. Step-by-step maneuvers brought the satellites closer, using advanced sensors and propulsion systems to ensure precision.

Application Use of SpaDeX Mission - Docking Technology

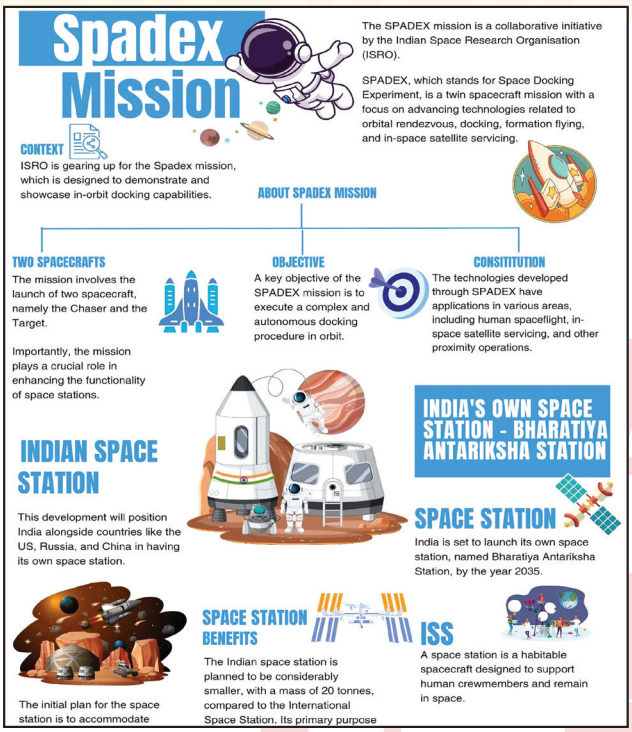
- **Human Spaceflight Missions**: Essential for sending astronauts to the Moon and beyond.
- **Sample Return Missions**: Chandrayaan-4 plans to dock a transfer module with a re-entry module to bring lunar samples back to Earth.
- **Space Stations**: Docking is critical for assembling and operating modular space stations, such as the planned Bharatiya Antariksh Station.
- **In-Space Robotics**: Enables the assembly and maintenance of large structures in orbit.
- **Multi-Launch Payload Integration**: Facilitates missions requiring components to be launched separately and joined in orbit.

Significance of This Docking Experiment for India

- **Global Recognition**: Successful docking will place India among an elite group of nations with docking capabilities.
- **Lunar Missions**: Enables missions like Chandrayaan-4 to return lunar samples.
- **Space Station Assembly**: Supports the 2028 launch of India's first space station module.
- **Technological Advancements**: Demonstrates indigenous capabilities in autonomous docking, propulsion, and inter-satellite communication.
- **Cost-Effectiveness**: Sets a benchmark for low-cost, high-precision space technologies.

Challenges in SpaDeX Mission

- **Precision Docking**: Achieving sub-meter alignment at orbital speeds with minimal relative velocity (around 10 mm/s).



- **Sensor Calibration**: Fine-tuning sensors like Laser Range Finders, Rendezvous Sensors, and Proximity Docking Sensors for real-time adjustments.
- **Drift Management**: Arresting unexpected drift between satellites without jeopardising mission objectives.
- **Autonomous Operations**: Ensuring flawless execution of rendezvous and docking algorithms under constrained conditions.
- **Small Satellite Constraints**: Managing finer precision and lower tolerances compared to docking large spacecraft.
- **Radiation and Environmental Factors**: Accounting for space radiation and debris impact on satellite operations.

CROPS: A Milestone in Space Biological Research

Sub Topic: *Achievement in the Field Of Space Technology*

Context:

The **Compact Research Module for Orbital Plant Studies (CROPS)** is an experimental module developed by ISRO to explore **plant growth in microgravity**.

- It aims to ensure sustainable food production in space and enhance astronaut engagement during long-duration missions.

What is CROPS?

- CROPS stands for **Compact Research Module for Orbital Plant Studies**, an unmanned experimental module for growing plants in space.
- It is an airtight container simulating **Earth-like conditions**, excluding gravity, to study plant growth.

Key Features of CROPS-1

- **Dimensions:** 300 mm diameter and 450 mm height.
- **Soil Medium:** Neutral, highly porous clay pellets premixed with **slow-release fertiliser** for controlled nutrient delivery.
- **Seed Preparation:** Seeds were sterilised with ethanol, pasted to a polypropylene tissue using organic gum, and inserted into the soil.
- **Environmental Conditions:** Maintained at **20-30°C**, with 20.9% oxygen, 400–600 ppm CO_2, and 50–60% humidity.
- **Water Supply:** Pure water stored in a pressurised tank and delivered via **electric valve** and capillary action.
- **Illumination:** LEDs (warm and cool) provided **16-hour light** and **8-hour darkness** for photosynthesis.

Objectives and Achievements of CROPS-1

- **Objective:** Demonstrate seed germination and plant growth up to the **two-leaf stage** in microgravity within 5–7 days.
- **Plant Chosen:** Cowpea (**Vigna unguiculata**) due to its short germination time.
- **Success:** Seeds germinated by the fourth day, and two leaves were visible by the fifth day, achieving all objectives.

Methods of Growing Plants in Space:

- **Hydroponics**: Plants are grown in a liquid solution that delivers water and nutrients, without the need for soil.
- **Aeroponics**: Plants are grown in air, with minimal water and no soil. This method reduces water use by 98%, fertiliser by 60%, and eliminates pesticides.

- **Soil-like Media**: Some plants are grown in media that mimics soil, such as the method used by ISRO.

Characteristics of CROPS-1 Experiment

- **Mini Greenhouse:** Maintained Earth-like air and temperature.
- **High Precision:** Sensors monitored carbon dioxide, oxygen, temperature, and soil moisture.
- **Controlled Illumination:** LEDs simulated day-night cycles for optimal plant growth.
- **Robust Design:** Vibration isolators protected the module during launch.

Ideal Plants for Space Farming

- **Leafy greens** (lettuce, spinach, kale) are ideal due to their quick growth, minimal space requirement, and high nutrient content.
- **Beans and peas** are useful for protein and for fixing nitrogen, enriching the medium.
- **Radishes and carrots** are compact and grow well in space.
- **Wheat and rice** are suitable for long-term sustenance.
- **Tomatoes and strawberries** are also viable for cultivation.

Challenges

- **Microgravity**: The lack of gravity makes it difficult for plant roots to grow downward, and water does not flow to the roots efficiently. Nutrient delivery is challenging, and **radiation can damage plant DNA**.
- **Light Conditions**: Limited light, especially in outer space, can hinder photosynthesis, causing plants to consume more oxygen than they produce.
- **Temperature Fluctuations**: Space experiences extreme temperature variations.

Significance of Growing Plants in Space

- **Sustainability:** Provides a reliable food source for long-duration missions, reducing dependency on resupply missions.
- **Oxygen Production:** Plants release oxygen through photosynthesis, maintaining a breathable atmosphere.
- **Mental Health Benefits:** Tending to plants reduces stress and improves astronauts' well-being.
- **Closed-Loop Life Support:** Plants recycle carbon dioxide and organic waste, creating a sustainable ecosystem.

Future of CROPS and Space Farming

- **Longer Missions:** Future CROPS experiments aim to sustain plant growth for 30–45 days, supporting life beyond the two-leaf stage.
- **Advanced Controls:** Active regulation of humidity, oxygen, carbon dioxide, and soil moisture is planned for extended experiments.

Nuclear Power and Private Sector

Sub Topic: *Nuclear Technology*

Context:

After years of state monopoly in the nuclear power sector, **India is set to welcome private investment with the launch of Bharat Small Reactors (BSRs).**

More on News

- These small-sized nuclear reactors, with a capacity of **up to 220 megawatts (MW),** mark a **significant shift in India's energy landscape.**
- The state-owned **Nuclear Power Corporation of India Limited (NPCIL)** issued a public notice **inviting private sector participation in developing BSRs.**
- This initiative **follows the announcement in the Union Budget 2024-25** which emphasised the role of private capital in expanding nuclear power capacity.

Key Features of the Bharat Small Reactors Initiative

The **Request for Proposal (RFP)** issued by NPCIL outlines the business model for private participation:

- **Private Financing:** Selected companies will fund the entire project.
- **Captive and Commercial Use:** Companies can utilise electricity generated for self-use, sell it to third parties, or trade it on the open market.
- **Construction and Oversight:** While the private entity will construct the reactor, it will do so under the supervision of NPCIL. Once completed, the asset will be transferred to NPCIL for operation.
- **Vendor Selection:** Private companies must choose vendors from an NPCIL-approved list.

Opportunities and Challenges

- The initiative aligns with **India's goal of increasing the share of non-fossil fuels in its energy mix.**
- The **country's current nuclear power generation capacity**, entirely developed by government entities, **stands at 7.4 gigawatts (GW).**
- By involving private players, India **aims to expedite the development of nuclear energy infrastructure.**
- However, **industry experts have expressed concerns about the stringent conditions** in the RFP.
  - The requirement for NPCIL oversight and post-construction transfer of assets could deter private players.
  - A power-sector executive noted that while private investment in nuclear power was long overdue, these caveats might limit enthusiasm.

Private Sector Response

- **Tata Power:** In September, Tata Power signed a **memorandum of understanding with the Government of Rajasthan** to invest ₹1.2 trillion over 10 years.
  - The plan includes a nuclear power plant, 10 GW of renewable energy capacity, 2 GW of solar module manufacturing, and investments in transmission and distribution.
- **Larsen & Toubro (L&T):** L&T executives highlighted the company's extensive experience in the nuclear sector through collaborations with NPCIL.
  - The company's Heavy Engineering division is pre-qualified to supply components for small modular reactors.

Advantages of Bharat Small Reactors

- **Modularity and Scalability:** BSRs can be constructed in a modular fashion, allowing for easier deployment and scalability according to demand.
- **Cost-Effectiveness:** Utilising domestic technology for BSRs is anticipated to significantly lower costs compared to foreign models, making them financially attractive.
- **Reduced Exclusion Zones:** The required exclusion zone for BSRs is smaller than that for traditional reactors, facilitating their installation in more diverse locations.

Sector Outlook

- The RFP represents a **significant step towards involving the private sector in nuclear energy development.**
- However, the **reaction of private companies will depend on the practicality** of the conditions imposed and the long-term benefits of their participation.
- The initiative has the potential to transform India's nuclear power industry and enhance its energy security while contributing to the nation's broader climate goals.

Bridging Gaps in Biosecurity

Sub Topic: *Achievement in the Field of Biotechnology*

Context:

The release of information in December 2024 about a **biosafety lab breach in Australia in August 2023 underscored the critical role of timely, accurate communication in biosecurity.**

More on News

- The breach involved the theft of dangerous pathogens, including the **Hendra virus, lyssavirus, and hantavirus.**
- In June 2024, an **MIT study on AI and biotechnology raised concerns about weaponisable biological agents,** prompting the International Gene Synthesis Consortium (IGSC) to reassure the public about safeguards and emphasise the need for clear communication to maintain trust in industry standards.

Global Biosecurity Practices

INTERPOL's Global Biosecurity Enhancement Programme: Launched in September 2023, this five-year programme aims to bolster law enforcement and partner agencies' capabilities to prevent, prepare for, and respond to biological threats.

International Health Regulations (IHR): The IHR (2005) is a legally binding framework that requires countries to develop capacities to detect, assess, report, and respond to public health emergencies. This includes the management of biological threats that can cross borders, ensuring a coordinated global response.

Codex Alimentarius Commission (CAC): The CAC develops food safety and quality standards that include biosecurity measures related to food products. These standards are crucial for maintaining public health and preventing the spread of diseases through contaminated food.

Cartagena Protocol on Biosafety: This protocol focuses on the safe handling, transport, and use of living modified organisms (LMOs) resulting from modern biotechnology. It aims to protect biodiversity from potential risks posed by GMOs while ensuring that countries can manage these risks effectively.

The Role of Biosecurity Regulations in India

Biosecurity regulations are designed to **mitigate biological risks while enabling scientific progress.** In India, several mechanisms for public communication and crisis management already exist:

- **National Disaster Management Authority (NDMA):** The NDMA formulates policies, plans, and guidelines for disaster management, including biological threats. It also operates SACHET, a portal providing disaster-related information.
- **Ministry of Health and Family Welfare (MoHFW):** The MoHFW leads responses to health emergencies, with support from the **National Centre for Disease Control (NCDC)**, which conducts disease surveillance and coordinates containment measures.
- **Urban Surveillance Units:** The ministry's operational guidelines enhance disease monitoring in densely populated urban areas through early warning systems, risk mapping, and real-time data integration.

Challenges in Information Dissemination

- **Uneven Access to Information:** Despite tools like **SACHET,** limited internet and smartphone access in rural areas often results in patchy information dissemination.
- **Coordination Gaps:** Lack of synergy between central authorities like the NDMA and MoHFW and ground-level workers (e.g., ASHA workers, nurses) hampers the smooth diffusion of information, particularly during nationwide crises.
- **Delays in Public Communication:** Delayed or unclear updates during emergencies, such as the COVID-19 pandemic, exacerbated fears and confusion, leading to the adoption of unverified treatments and protection measures.

Solutions for Effective Biosecurity and Communication

- **Strengthening International Frameworks:** India, a signatory to the **International Health Regulations (IHR),** could adopt best practices like the **U.S.'s Integrated Public Alert and Warning System (IPAWS)**, which uses push notifications to ensure timely communication during crises.
- **National Oversight and Regulation:** Existing structures like the NDMA and **Department of Biotechnology (DBT)** should be reinforced to ensure safe management of hazardous agents and biotechnology innovation.
- **Monitoring Dual-Use Research:** As technologies like **CRISPR and gene synthesis** advance, India must establish a dedicated committee to oversee dual-use research and development.
  - This body, under the DBT or MoHFW, could work alongside international agencies like the **National Science Advisory Board for Biosecurity (NSABB)** to maintain ethical standards and public trust.
- **Ethics and Public Trust:** Ethical reviews must remain integral to biosecurity governance.
  - Organisations like the IGSC have emphasised the need for transparency and credibility in biotechnology communication.
- **Collaborating with the Private Sector:** The private industry must be involved in creating adaptive biosecurity frameworks.

India's ongoing collaboration with international bodies like the World Health Organisation (WHO) and the Centers for Disease Control and Prevention (CDC) reflects its commitment to strengthening biosecurity governance. However, the country must go further by addressing gaps in communication and adopting a more integrated approach to public information dissemination.

Rhodamine B

Sub Topic: *Achievement in the Field of Biotechnology*

Context:

The issue of **Rhodamine B** use in consumable products highlights a critical public health concern and a need for robust regulatory measures.

What is Rhodamine B?

- **Rhodamine-B** is a **fluorescent dye** primarily used in the **textile, leather**, and **cosmetic industries** to produce brilliant pinks, greens, and blues. It is **also fluorescent** and used in scientific research.

- The dye is **low-cost**, which makes it a popular choice in food colouring.
- It has been **illegally used** as a food colouring agent in products like **cotton candy**, **sweets**, **manchurian dishes**, **pakodas**, and **Chinese food sauces** to make the items look more appealing, especially to children.
- The dye is classified as **unsafe for human consumption**, with serious concerns about its carcinogenic properties and its impact on public health. Children and vulnerable individuals are more at risk due to their reduced ability to metabolise harmful substances.

Health Risks

- **Allergic reactions**: Rhodamine-B can cause irritation in the **lips, tongue**, and **eyes**, as well as **upper respiratory issues** such as allergies.
- **Toxicity**: Long-term consumption can lead to **cell death** and damage to vital organs like the **kidneys**, **liver**, and brain tissues, including the **cerebellum** and **brainstem**.
- **Carcinogenic potential**: Evidence suggests that prolonged exposure to Rhodamine-B may increase the risk of **stomach cancer** and other **tumours**, making it a **carcinogen**.
- **Health complications**: Issues like **gastric burning**, **irritation**, and **acidity** can be managed with treatment, but the long-term effects, particularly the cancer risk, are of serious concern.

Global Actions Against Rhodamine B

- **United States**: The FDA has long prohibited its use in food products and issued a further ban in January 2025 due to rising concerns, particularly regarding children's exposure to processed foods like candies and baked goods.
- **European Union**: The EU has classified Rhodamine B as a substance of very high concern, restricting its use in cosmetics and other consumer goods due to its potential health risks.

Rhodamine B in India

- **Tamil Nadu**: In February 2024, Tamil Nadu banned cotton candy production and sale after Rhodamine B was detected in samples, citing violations of the **Food Safety and Standards Act of 2006**.
- **Karnataka**: In March 2024, Karnataka followed suit by banning the use of Rhodamine B in street foods like Gobi Manchurian and cotton candy, enforcing penalties including up to seven years of imprisonment and fines of ₹10 lakh for violators.
- **Puducherry and Himachal Pradesh**: Both regions imposed similar bans on cotton candy containing Rhodamine B in 2024 to protect consumers from the dye's harmful effects.

India's Food Safety Concerns

- **Weak Research Infrastructure**: Lack of independent research on food dyes' impact on public health, especially considering Indian dietary practices. Need for collaboration between **FSSAI** and academic/research institutions.
- **Knowledge Gaps**: Limited public awareness of food standards and safety. Urgent need for education campaigns, leveraging digital and social media to inform consumers about harmful additives and the importance of food label scrutiny.
- **FSSAI's Role**: Experts stress the need for proactive measures, rather than reactive bans, including Routine testing for harmful dyes, and strict enforcement against violations by both major manufacturers and small vendors.

Regulations on Food Colouring in India

- The **Food Safety and Standards Authority of India (FSSAI)** mandates that only **permitted synthetic food colours** should be added to food. The list of approved colours includes:
  - **Red**: Ponceau 4R, Carmoisine, Erythrosine
  - **Yellow**: Tartrazine, Sunset Yellow FCF
  - **Blue**: Indigo Carmine, Brilliant Blue FCF
  - **Green**: Fast Green FCF
- **Rhodamine B** is **not approved** for use in food under the **Food Safety and Standards Regulations of 2011**.

Moving Forward

- **Policy and Regulation**: Develop a **rapid response mechanism** to address emerging food safety concerns. Align Indian regulations with global best practices to protect consumers.
- **Community Engagement**: Promote awareness of safe food additives through campaigns. Engage local self-help groups, NGOs, and influencers to educate vulnerable communities.
- **Industry Accountability:** Encourage food manufacturers to prioritise safety over

aesthetics. Introduce incentives for adherence to safety standards.

India's Strategic Imperative for Sovereign AI

Sub Topic: *Awareness in the Field of Artificial Intelligence*

Context:

India, aiming to be one of the top three global economies, is positioning AI as a central pillar for its growth. Prime Minister **Narendra Modi** has invested in both **semiconductors** and AI, acknowledging their importance for India's future.

What is Sovereign AI?

- Sovereign AI refers to a nation's ability to develop, control, and deploy AI capabilities using its own infrastructure, data, workforce, and business networks.
- This involves not just operating AI systems but having complete control over the entire data journey, from collection to analysis.
- The race for AI supremacy is not just about technological advancements but also about how nations will drive economic growth and competitiveness in this decade. Countries that rely solely on foreign AI risk compromising their strategic independence, data sovereignty, and economic capabilities.

The Growing Power of AI

- AI has evolved significantly over the past few years. In 2018, a 340-million parameter model was considered substantial, but today models like **ChatGPT** have 1.8 trillion parameters, and others, such as **Gemini** and **DeepSeek**, have billions more.
- However, the growth of AI is concentrated in just a few companies and countries, primarily in the U.S. and China. This concentration poses risks of AI **weaponisation**, **data sovereignty issues**, and the **dominance of Big Tech**.
- As AI's impact continues to grow across all sectors, nations must ensure they are not left vulnerable to external control over their AI infrastructure and data.

Sovereign AI: A Strategic Goal for India

- Sovereign AI is about India developing its own AI technologies and capabilities, enabling it to manage and deploy them for its benefit. This approach will safeguard India's **economic sovereignty**, **data privacy**, and **national security** while also contributing to global AI research.
- Without independent AI capabilities, India risks compromising its **strategic independence**, especially in an increasingly competitive and digitised world.
  - **Yuval Harari**, author and historian, warns that AI could offer "godlike powers" but could also threaten humanity if not managed wisely.

The Economic and National Security Imperatives of AI

- **AI's Impact on Economy**: AI is not just a tool for **digitisation** but a transformative force that will disrupt industries such as **manufacturing**, **healthcare**, **digital governance**, and more.
  - Nations with strong AI capabilities will have a competitive edge, ensuring their **intellectual property** is protected, boosting **innovation**, and enhancing **industrial competitiveness**.
  - For India, AI can play a crucial role in achieving its goal of becoming a **$1 trillion digital economy**.
    - India's youth-driven innovation ecosystem is thriving, with AI applications being developed on **global models**, but real **Sovereign AI** means building AI from the ground up.
- **Data Sovereignty**: A significant aspect of Sovereign AI is the control over **data sovereignty**. Many AI platforms scrape and use Indian data without consent or attribution, raising concerns about privacy and ownership.
  - Sovereign AI allows India to curate and process its own datasets, safeguarding its citizens' data and protecting it from misuse or external coercion.
- **National Security in the 21st Century**: AI is revolutionising **national security** by enhancing military operations, **cyber defence**, **intelligence gathering**, and **surveillance**.
  - AI systems are increasingly used for threat detection, autonomous systems (like drones), and cyber defence. Countries relying on foreign AI technologies for their national security are exposing themselves to risks of **vulnerability** and **exploitation** by adversaries.

- Given the growing geopolitical tensions and the increasing role of AI in defence, **Sovereign AI** is essential for India's autonomy in protecting its strategic interests.

Challenges in Developing Sovereign AI

- **Data Privacy**: Ensuring data privacy and security is paramount. Nations must develop robust data governance frameworks to protect sensitive information.
- **Infrastructure**: Building a strong digital infrastructure is essential for supporting AI development. This includes investing in high-performance computing, data centres, and AI research facilities.
- **Workforce Development**: Developing a skilled workforce capable of working with AI technologies is crucial. This involves education and training programmes to equip people with the necessary skills.

Path Forward

- While **complete AI self-reliance** may not be feasible, India must prioritise developing its **Sovereign AI capabilities** to maintain control over critical sectors like **cybersecurity**, **defence**, and **economic infrastructure**.
- Strategic partnerships with trusted international players will be important to **co-develop** technologies while ensuring that India's interests remain safeguarded.
- India's approach should also involve **policy frameworks** like the **Digital India Act** and **IndiaDataSets programme** to regulate and manage the development and use of AI technologies while ensuring citizen privacy and security.

AI Regulation Report

Sub Topic: *Awareness in the Field Of Artificial Intelligence*

Context:

Last week, the **Ministry of Electronics and Information Technology (MeitY)** released its **Report on the Regulatory Framework for AI in India.**

More on News

- While the **recommendations in the report are largely pragmatic and non-controversial,** the underlying **principles raise questions about whether the approach will hinder India's AI industry from reaching its full potential.**

Overreliance on Global North Principles

- A significant critique of the report lies in its **heavy reliance on regulatory frameworks developed by countries in the Global North.**
  - While studying these approaches can be valuable, adopting them without adapting to India's unique socio-economic context may lead to challenges.
- **For developed nations, AI is often viewed as a tool to enhance the efficiency of already well-functioning systems.**
  - As such, **they can afford to prioritise mitigating risks** over reaping benefits.
  - In contrast, **India sees AI as a transformative necessity**—a critical tool to bridge gaps and deliver benefits to underserved and marginalised communities.
  - For India, overly cautious regulation might stifle innovation and prevent the country from leveraging AI's full potential.

Techno-Legal Measures: A Misguided Focus?

- The report places considerable emphasis on **techno-legal solutions for regulation**, but this approach may not always be appropriate.
  - For instance, the **suggestion to use the MeitY consent artifact to determine liability for AI-related harms is problematic.**
- The report proposes assigning immutable, unique identities to participants in the AI ecosystem, tracked using the consent artifact.
  - However, this approach conflicts with the privacy-by-design principles of the **Data Empowerment and Protection Architecture (DEPA).**
  - Consent managers, by design, cannot access the content being transferred or establish unique identities.
  - Modifying the system for such purposes would undermine its core principles and practical functionality.

Lack of Actionable Solutions for Copyright Concerns

- The report also discusses copyright challenges linked to AI development and deployment.
- However, instead of providing clear solutions, it **calls for yet another round of consultations.**

- Amending the **Indian Copyright Act** to include fair use provisions and text-and-data mining exemptions—similar to those in other countries—would have been a practical recommendation.
- The absence of such actionable suggestions leaves developers without the clarity they need to innovate confidently.

Positive Recommendations to Build On

Despite these concerns, the report includes several commendable recommendations:

- **No AI-Specific Legislation:** The report rightly concludes that existing laws and regulations are sufficient to address the risks posed by AI, avoiding the need for specific AI legislation.
- **Regulatory Training:** It emphasises the need to train regulators and law enforcement agencies on the potential harms of AI, enabling them to adapt their oversight strategies effectively.

Institutional Recommendations

The report proposes two significant measures:

- **An Inter-Ministerial AI Coordination Committee:** This would oversee AI governance across sectors, addressing the cross-cutting nature of AI-related challenges.
- **A Technical Advisory Secretariat:** Tasked with providing technical advice and evaluating AI incidents, this body would ensure swift and informed decision-making.

A Balancing Act

- If judged solely on its recommendations, the report offers a balanced **mix of agile governance and light-touch supervision.**
- However, the thinking that underpins these recommendations suggests a **Western-centric, risk-averse approach.**
- If this mindset extends to enforcement, India's AI companies may find it difficult to innovate in a highly competitive global landscape.

India's unique developmental challenges demand a regulatory framework that prioritises AI's transformative potential over excessive caution. Striking the right balance between risk and opportunity will determine whether this framework becomes a catalyst for progress or a barrier to innovation.

Subject – Environment, Biodiversity and Disaster Management

The Cheetah Reintroduction Project: Challenges and Solutions

Sub Topic: *Conservation*

Context:

The reintroduction project has faced both successes and challenges, including the birth of cubs and the unfortunate deaths of several cheetahs.

Background

- **Cheetah Extinction in India:** Cheetahs became extinct in the 1950s in India.
- **Reintroduction Initiative:** The **first African cheetahs** were introduced into **Madhya Pradesh's Kuno National Park (KNP) on September 17, 2022**, by Prime Minister Narendra Modi.
- **Project Timeline:** The project, conceived in 2009, faced delays due to legal hurdles. The Supreme Court initially blocked it in 2012 but allowed it in 2020.
- **Current Status:** Since 2022, 20 cheetahs have been brought from South Africa and Namibia, with 12 cubs born in India. Presently, there are **24 cheetahs in Kuno**, all confined to enclosures.

Expansion Plans

- The project is expanding beyond Kuno National Park (KNP) to include the **Gandhi Sagar Wildlife Sanctuary** in Madhya Pradesh and the **Mukundara Hills Tiger Reserve** in Rajasthan.
- Additionally, a **cheetah breeding centre** has been approved for **Banni Grasslands** in Gujarat, which is expected to play a crucial role in the species' long-term conservation.
- An extensive **cheetah corridor** is also in development, connecting Kuno, Gandhi Sagar, and Mukundara Hills across several thousand square kilometres and 21 districts in Madhya Pradesh, Uttar Pradesh, and Rajasthan.
  - This corridor aims to allow cheetahs to move safely between reserves, helping avoid overcrowding and inbreeding. However, there are several concerns about this ambitious plan.

Key Challenges

- **High Mortality Rate:** Deaths due to drowning, maggot infestations, heart and renal failure, and infighting. Attempts to release cheetahs from enclosures have been largely unsuccessful.
- **Prey Base Decline:** In Kuno, prey density has reduced drastically:
  - Spotted **deer density dropped** from 69.36 per sq km (2013) to 17.5 per sq km (2024). Gandhi Sagar Wildlife Sanctuary and Mukundara Hills Tiger Reserve have even lower prey densities.
- **Human-Wildlife Conflict:** Villages near corridors and reserves rely heavily on forests for resources, leading to potential conflicts. Scattered cheetahs risk being poisoned, electrocuted, or caught in snares.
- **Inadequate Infrastructure:** Managing free-roaming cheetahs requires trained personnel and equipment, which is unavailable across the proposed cheetah corridors.
- **Proposed Corridor Challenges:** Plans for a cheetah corridor connecting KNP, Gandhi Sagar, and Mukundara Hills face issues:
  - Lack of uninterrupted forested areas and inadequate prey density outside protected areas.
- **Economic and Social Concerns:** Promised tourism-based jobs may not materialise if cheetahs remain scattered. Local communities may resist the project if tangible benefits are not realised.
- **Legal Implications:** The project risks violating rights guaranteed under **Article 21 and 300-A** of the Indian Constitution if it endangers lives or property.
  - The **Bhartiya Nyaya Sanhita (BNS)** could deem negligence in addressing **human-wildlife conflicts as criminal liability**.

Global Experiences and Recommendations: Fenced Reserves as a Solution

- African nations use fenced reserves extensively. Successful Indian examples include fenced **rhino habitats in Dudhwa National Park** and **gaur enclosures in Bandhavgarh**.
- **Advantages**
  - Prevents human-wildlife conflicts, poaching, and illegal grazing.
  - Ensures prey animals stay within protected areas.
  - Supports higher wildlife densities if prey is adequate.
  - Easier management of cheetah populations, enabling genetic diversity through periodic exchanges.
- **Criticism of Fenced Reserves:** Critics label them as "zoos," but fenced reserves like **South Africa's Kruger National Park** thrive with wildlife while maintaining natural animal behaviours.
- **Cost Considerations:** While fences are expensive, their long-term management costs are lower than open systems.

Potential Actions for Kuno and Beyond

- **Expand and Fence Kuno National Park:** Kuno can expand to approximately 1,800 sq km by adding adjacent forest areas. Erecting a boundary fence around the park could significantly reduce conflicts and poaching.
- **Focus on Habitat Restoration:** Address prey depletion through habitat restoration and translocation of herbivores. Prevent overgrazing by local livestock within the protected area.
- **Develop Sustainable Tourism:** A fenced reserve could create predictable wildlife sightings, boosting tourism and local employment.
- **Scientific Monitoring and Management:** Periodic evaluation of prey density and habitat conditions. Use fenced areas as breeding grounds and sources for introducing cheetahs to other protected areas.
- **Strengthen Local Engagement:** Involve local communities in conservation efforts. Ensure tangible benefits like jobs and compensation for losses due to wildlife.
- **Legislative Safeguards:** Ensure compliance with constitutional rights and avoid liability under the BNS by prioritising human safety.

Groundwater Nitrate Contamination

Sub Topic: *Conservation, Environmental Pollution & Degradation, Irrigation*

Context:

India's groundwater is grappling with rising levels of chemical contamination, with excessive nitrates, fluoride, and uranium posing significant health and environmental challenges. According

to the **Central Groundwater Board (CGWB),** the number of districts with excessive nitrate levels surged from 359 in 2017 to 440 in 2023, marking a worrying seven-year high.

Reasons for Nitrate Accumulation:

- The excessive use of **nitrogenous synthetic fertilisers**, largely driven by subsidies, is the primary contributor to rising nitrate levels.
- These fertilisers **leach into groundwater, particularly in agricultural zones** where irrigation practices rely heavily on groundwater extraction.
- **Poor regulation of fertiliser application** and inefficient irrigation systems further aggravate the problem.

State of Excess Nitrates in Groundwater

- The presence of nitrates in groundwater exceeding the safe limit of **45 mg/litre** has reached alarming levels.
- In 2023, **56% of India's districts** recorded excessive nitrate contamination, based on an analysis of 15,239 groundwater samples, with **19.8% of samples surpassing safe nitrate limits**.
- While this proportion is slightly lower than the **21.6% in 2017**, the total number of affected districts has significantly increased, highlighting a growing regional disparity.

Sources of Excess Nitrate Accumulation in Groundwater

- **Synthetic Fertilisers:** Overuse in agriculture leads to nitrate leaching into groundwater.
- **Improper Waste Disposal:** Unregulated disposal of sewage and industrial waste contributes to nitrate buildup.
- **Livestock Farming:** Animal waste and manure are significant sources of nitrates in groundwater.

Distribution of Nitrate Contamination Across India

Nitrate contamination is more pronounced in certain states, with **regional hotspots** revealing worrisome trends:

- **Rajasthan:** 49% of tested samples exceeded safe limits.
- **Karnataka:** 48% of tested samples were contaminated.
- **Tamil Nadu:** 37% of samples showed excessive nitrate levels.

States in **central and southern India** are experiencing rising contamination:

- **Maharashtra:** 35.74% of tested samples.
- **Telangana:** 27.48%.
- **Andhra Pradesh:** 23.5%.
- **Madhya Pradesh:** 22.58%.

Other Contaminations: Fluoride and Uranium

Beyond nitrates, groundwater contamination by **fluoride** and **uranium** is another critical concern:

- **Fluoride contamination** is severe in **Rajasthan, Haryana, Karnataka, Andhra Pradesh,** and **Telangana**, posing long-term health risks like dental and skeletal fluorosis.
- **Uranium contamination** has crossed unsafe levels (30 ppb) in **Rajasthan, Gujarat, Haryana, Punjab, Tamil Nadu, Andhra Pradesh,** and **Karnataka**. The highest concentrations are reported in **Rajasthan** and **Punjab**, exacerbated by overexploitation of groundwater resources.

Seasonal variations are notable, with nitrate contamination rising post-monsoon (**32.66%**) compared to pre-monsoon levels (**30.77%**).

Impact of Excess Nitrate, Fluoride, and Uranium Contamination

- **Health Risks:**
  - Excess nitrates can lead to **methemoglobinemia (blue baby syndrome)** in young children, a condition that reduces the blood's oxygen-carrying capacity.
  - Fluoride exposure causes **skeletal and dental fluorosis**.
  - Prolonged uranium ingestion can result in **kidney damage** and potential carcinogenic effects.
- **Environmental Consequences:**
  - Nitrate accumulation in water bodies leads to **eutrophication**, disrupting aquatic ecosystems.
  - Chemical contaminants degrade soil and water quality, impacting agriculture and biodiversity.

What Should Be Done

- **Fertiliser Regulation:** Promote the use of **biofertilisers** and **organic farming practices** to reduce dependence on nitrogenous synthetic Fertilisers.
- **Groundwater Management:**

- Develop and enforce policies for **sustainable groundwater extraction**.
- Invest in **artificial groundwater recharge** techniques to dilute contaminants.

- **Monitoring and Awareness:**
  - Expand the scope of groundwater quality monitoring to ensure timely detection of contaminants.
  - Raise public awareness about the health risks associated with nitrate, fluoride, and uranium contamination.

Multistakeholder Approach to Urban Climate Action

Sub Topic: *Climate Change*

Context:

India's rapid urbanisation has brought significant economic progress, with **urban areas generating nearly 80% of the country's GDP.**

More on News

- Currently, over **30% of India's population resides in cities**, a figure **projected to reach 40% by 2030.**
- However, this **growth comes with challenges**, as cities worldwide face existential threats from the escalating climate crisis.
- **Extreme weather events have increased in frequency**, causing immense loss of life and property.

Climate Change and Social Vulnerabilities

- **Exacerbating Inequalities:** The climate crisis **exacerbates existing social inequities,** with vulnerable groups—including low-income communities, informal settlers, women, and marginalised populations—bearing the brunt of its impacts.
- **Access:** Limited access to infrastructure and basic services compounds their vulnerabilities, threatening livelihoods and deepening inequalities.
- **Comprehensive Approach:** Addressing these interconnected challenges requires a **comprehensive approach** to building urban resilience, ensuring no one is left behind.

Governments' Role in Building Resilience

- **Sustainability and Equity:** Governments and policymakers are critical in driving sustainability and equity in urban development.
- **Integrating Resilience:** By integrating climate resilience into urban planning, prioritising infrastructure in vulnerable areas, and **adopting inclusive policies** that address the needs of marginalised communities, governments can pave the way for long-term sustainability.
- **Customised Solutions:** Local governments, in particular, can customise solutions to align with the unique dynamics of their cities.
- **Localised Interventions:** Evidence suggests that city-level climate action plans can effectively guide localised interventions tailored to community needs.

The Power of a Multistakeholder Approach

- **Civil Society:** While governments play a central role, the importance of non-state actors—**civil society organisations (CSOs), philanthropists, and local communities**—cannot be overstated.
  - India's civil society, **comprising over 3.1 million registered organisations**, has been **instrumental in advancing sustainability and equity** across urban landscapes.
- **Proximity to Communities:** CSOs have a unique advantage due to their close proximity to communities, deep understanding of local contexts, and ability to advocate for equitable interventions.
  - Historically, they have worked with vulnerable groups such as the urban poor, women, migrants, and people with disabilities, who are disproportionately affected by climate change.
- **Effective Solutions:** Several Indian organisations, such as **Mahila Housing Trust, Waste Warriors, Saahas, and Biome Environmental Trust**, have successfully implemented solutions for heat stress, water management, disaster resilience, and waste management.
- **Bridge:** Additionally, CSOs act as a bridge **between policy and on-ground implementation,** ensuring community needs are reflected in urban planning processes.
  - Organisations like **Janaagraha and Reap Benefit** have further contributed by providing research, data, and advocacy to strengthen climate governance.

Strengthening Collaboration Through Philanthropy

- **Funding:** By offering **long-term and flexible funding,** philanthropic organisations can enable grassroots initiatives, facilitate

sectoral research, and implement city-level pilot projects for resilience.

- **Risk Appetite:** Philanthropy also has a **higher risk appetite**, allowing it to complement the efforts of governments and multilateral agencies in driving climate action.
  - The **India Philanthropy Report 2023** revealed that over **90% of new-generation donors are prioritising climate change as a key cause.**
- **Insufficient Investments:** Current funding for environment and sustainability initiatives **stands at less than INR 200 crore (approximately $28 million),** a small fraction of the overall philanthropic landscape.
  - Most of this funding is **concentrated in states like Maharashtra, Karnataka, and Andhra Pradesh**, leaving vulnerable regions underserved.

The path to resilient and inclusive cities lies in collaboration. Governments, civil society, philanthropy, and communities must join forces, leveraging their unique strengths to create sustainable urban landscapes.

Subject – Internal Security

Bharatpol: A Revolutionary Step in International Crime Investigation

Sub Topic: *Cyber Crime, Security Challenges Through Communication Networks*

Context:

Recently, Union Home Minister and Minister of Cooperation **Shri Amit Shah** inaugurated the **BHARATPOL portal** at Bharat Mandapam, New Delhi. Developed by the **Central Bureau of Investigation (CBI)**, this initiative is a pivotal milestone in enhancing India's capabilities in **international investigations** and **crime control mechanisms**.

About Bharatpol

- Bharatpol is a **digital portal** developed by the CBI to facilitate seamless **international cooperation** for Indian law enforcement agencies. By integrating advanced technologies and frameworks, Bharatpol acts as a **broadcast hub** for real-time actions against **transnational crimes** through **INTERPOL's global network**.
- This platform replaces traditional methods like letters, emails, and faxes, which often cause delays in investigations, thereby ensuring **swift and efficient collaboration**.

Key Features of Bharatpol

- **Real-Time Information Sharing**
  - Enables Indian law enforcement agencies to access **real-time assistance** from INTERPOL's global network of **195 member nations**.
  - Accelerates processes like the issuance of **Red Corner Notices** and other critical alerts.
- **Integration of Law Enforcement Agencies:** Unifies **central and state police forces** into a **single digital framework**.
- **Advanced Technological Capabilities**
  - **Connect Module**: Links Indian law enforcement with INTERPOL, ensuring secure and structured communication.
  - **INTERPOL Notices Module**: Facilitates efficient drafting, issuance, and tracking of INTERPOL notices.
  - **Broadcast Module**: Expedites requests for international assistance.
  - **Resources Module**: Simplifies document exchange and training resource management.
- **Access to INTERPOL Databases:** Offers Indian agencies access to **19 types of INTERPOL databases**, empowering them to analyse, prevent, and address complex crimes effectively.

Role of the CBI and INTERPOL Liaison Officers:

The **CBI**, as the **National Central Bureau (NCB)** for INTERPOL in India, plays a pivotal role in facilitating international cooperation on criminal cases.

- **INTERPOL Liaison Officers (ILOs)** and **Unit Officers (UOs)** will now use Bharatpol for real-time interactions, replacing outdated communication methods.
- This transition enables a **more efficient exchange of intelligence** and enhances coordination with INTERPOL's global network.

Key Modules of Bharatpol

- **Connect Module**: Provides secure communication for **tracking criminals and transmitting INTERPOL notices.**

- **INTERPOL Notices Module**: Enables efficient drafting and management of various colour-coded INTERPOL notices.
- **References Module**: Acts as a comprehensive repository of resources and guidance documents for **cross-border investigations.**
- **Broadcast Module**:Facilitates real-time updates and requests for assistance from INTERPOL member nations.
- **Resources Module**:Simplifies access to templates, resources, and capacity-building tools for **effective utilisation of international cooperation tools.**

Why Was Bharatpol Developed?

Bharatpol addresses the **rising threats of transnational crimes**, including:

- **Cybercrime**
- **Financial fraud**
- **Online radicalisation**
- **Organised crime**
- **Drug trafficking**
- **Human trafficking**

With the growing **complexity of global crimes**, Bharatpol was developed to provide **real-time international assistance** for tracking and prosecuting criminals effectively.

Impact on Law Enforcement

- **Enhanced Crime Control:** Bharatpol will strengthen efforts to combat **drug trafficking**, **arms smuggling**, **cybercrime**, **human trafficking**, and **cross-border terrorism**.
- **Trial in Absentia:** New provisions in criminal laws allow for the **prosecution of fugitives in absentia**, simplifying **extradition processes** and ensuring **fair judicial practices**.
- **Capacity Building:** Comprehensive **training programmes** will familiarise law enforcement with the effective utilisation of Bharatpol's tools, including drafting and managing INTERPOL notices.

Significant Outcomes of Bharatpol

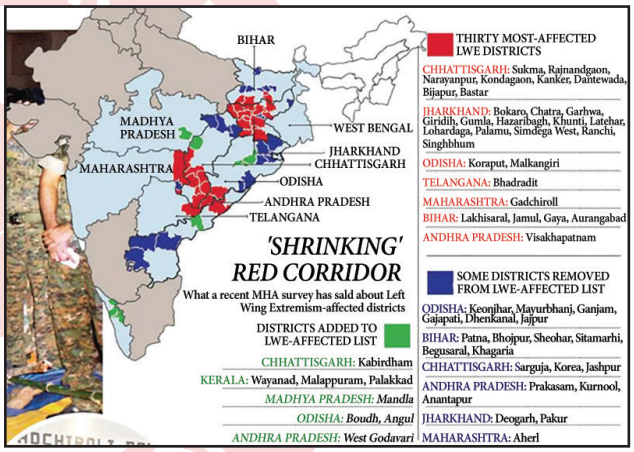
- **Bringing Criminals to Justice**: Bharatpol ensures that fugitives fleeing India will face **trial and punishment**, regardless of their location.
- **Enhanced Extradition Processes**: Since 2021, India has extradited over **100 wanted criminals**, including **26 in 2024**, through INTERPOL channels.
- **Technological Advancement**: Bharatpol employs **cutting-edge technology** to analyse and prevent global crimes, empowering young officers to devise **innovative crime prevention strategies**.

Shrinking Maoist Strongholds

Sub Topic: *Left Wing Extremism, Linkages Between Development & Spread of Extremism, Terrorism in Hinterland & Border Areas*

Context:

Recently, eight security personnel were killed in Bijapur, Chhattisgarh, when Maoists detonated an improvised explosive device (IED).



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- This is the **deadliest attack in over 600 days**, following an IED blast in Dantewada in April 2023 that killed 10 District Reserve Guard personnel and a civilian.
- The most severe attack before that was in April 2021, when 22 personnel were killed in Sukma.
- Despite reduced Maoist influence over the past decade, the **attack highlights the persistent threat in areas where they remain active.**

Trends in Maoist-Related Violence

- **Casualties in Chhattisgarh:** There is a decline in incidents with massive casualties since 2010.
  - The deadliest attack occurred in April 2010 in Dantewada, where 76 security personnel were killed.
- **Fatalities in Recent Years:** The fatalities are declining among civilians and security forces

across India in Maoist-related incidents.

- In 2023, 24 security personnel were killed, the second-lowest number since 2000.
- This year, nine personnel have died so far, surpassing one-third of last year's total.

- **Insurgent Losses:** 2023 was the third deadliest year for Maoists, with 296 insurgents killed.
  - The deadliest year was 2006, with 343 Maoists killed.

Geographical Concentration

- **Bastar Region as a Stronghold:** Most recent incidents occurred in south Chhattisgarh, particularly in the Bastar region.
  - 30% of left-wing extremism-related deaths in Chhattisgarh between 2020 and 2025 were in Bijapur.
  - Over 65% of fatalities occurred in districts such as Sukma, Dantewada, Narayanpur, Kanker, and Bastar.
- **State-wise Decline:** 80% of left-wing extremism-related deaths in 2024 occurred in Chhattisgarh.
  - Other affected States like **Andhra Pradesh/Telangana, Jharkhand, Maharashtra, Odisha, and West Bengal** have seen a significant decline in incidents.

Factors Behind Declining Influence

- **Geographical Contraction:** Maoist influence has shrunk significantly over the past decade.
  - Tribal communities, once a major support base, have increasingly distanced themselves from the Maoist cause.
- **Electoral Trends:** Decline in NOTA (None of the Above) votes in Maoist-affected areas reflects this shift.
  - In the 2023 Chhattisgarh elections, only 1.3% of voters chose NOTA, compared to higher shares in the past.

The latest attack in Bijapur serves as a stark reminder of the continuing threat posed by Maoists, even as their geographical and operational influence has waned. While fatalities among security forces and civilians have decreased, sustained vigilance and efforts are essential to address this long-standing issue.

Subject – Indian History, Heritage and Culture

Namdhari Sikhs and the Kuka Rebellion

Sub Topic: *Significant Issues and Events of Modern India History*

Context:

Punjab Chief Minister Bhagwant Mann paid tribute at the **Namdhari Shaheed Smarak in Malerkotla on January 17,** marking the **Kuka Martyrs' Day**.

- **A Sikh sect founded by Satguru Ram Singh in 1857**, known for their distinctive high-pitch recitation of Gurbani.

Founder of Namdhari Sect – Satguru Ram Singh

Born on **February 3, 1816, in Bhaini village near Ludhiana**, Satguru Ram Singh founded the Namdhari Sect on April 12, 1857, at Bhaini Sahib.

He advocated for a **boycott of British products and institutions**, making the Namdhari movement a direct challenge to British authority.

Ram Singh also became a secular leader, organising the Kukas with appointed Governors and military training for young men.

Events of January 1872

- **Cow Slaughter Agitation**: On January 13, 1872, about 200 Namdharis, led by Hira Singh and Lehna Singh, clashed with government officials in Malerkotla over cow slaughter.
- **Conflicts**: The Namdharis also attacked the Malaudh Fort in Ludhiana on January 15, 1872.
- **Brutal Retribution**: In retaliation, British authorities executed 66 Kukas on January 17 and 18, 1872, by placing them in front of cannons and blowing them up.
- **Notable Kuka Martyrs**:
  - **Bishan Singh**: A 12-year-old martyr who was executed after refusing to renounce his sect and even tugged at the beard of the British official. He was dismembered before being killed.
  - **Waryam Singh**: A short but courageous man who stood on stones to face the cannon fire and sacrificed his life rather than bow to the British.

Who Are the Namdharis?

- **Sect Origin**: Namdharis, also called Kukas due to their high-pitched recitation of Gurbani (*kook* means cry or scream in Punjabi), are a Sikh sect founded by Satguru Ram Singh in Ludhiana on April 12, 1857.
- **Social Reforms**: Ram Singh advocated for social reforms, including:
  - Boycotting alcohol and meat.
  - Challenging the status quo in Punjab.
- **Predecessor to the Swadeshi Movement**: Promoted the boycott of foreign goods, British services, and educational institutions. These ideas prefigured the Swadeshi and Non-Cooperation Movements of the 20th century.

The Kuka Rebellion

- Despite the **failure of the 1857 Rebellion**, Namdharis resisted British rule through local uprisings.
- **Sporadic violence between Namdharis and British officials culminated** in the events of January 1872.
- **Aftermath:**
  - **Exile of Leaders**: Satguru Ram Singh and other leaders were exiled to Rangoon (present-day Yangon, Myanmar), where they remained until their deaths.
  - **Namdhari Beliefs**: Namdharis believe Ram Singh is still alive and will return one day. They wear white in mourning for his absence.
- **Legacy:** The Kuka Movement not only challenged British authority but also inspired future nationalist movements through its principles of self-reliance, civil disobedience, and unwavering sacrifice.

Namdharis Today

- **Population**: Approximately two lakh Namdharis reside in Punjab today.
- **Leadership Schism**: After the death of Satguru Jagjit Singh in 2012, the sect split into two factions:
  - Followers of Thakur Dilip Singh (based in Sirsa, Haryana).
  - Followers of Sangrur Uday Singh (based in Bhaini Sahib, Ludhiana, the original Namdhari seat).

This rebellion and its martyrs remain a symbol of the Namdharis' unwavering resistance and dedication to their faith and principles.

Subject – Geography

Winter Storm and Polar Vortex

Sub Topic: *Important Geophysical Phenomena*

Context:

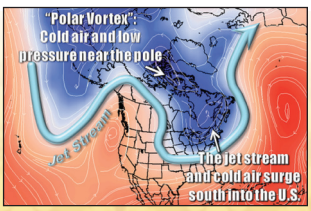
A **winter storm** in the United States has caused at least **five deaths** and widespread disruptions, including **school closures**, **dangerous road conditions**, and **power outages**.

More on News

- The extreme weather is linked to the **polar vortex**, which has expanded southwards, bringing cold air into much of the United States.
- The storm has affected **60 million people** across **30 states**, with **seven states** (Maryland, Virginia, West Virginia, Kansas, Missouri, Kentucky, Arkansas) declaring emergencies.
- The **National Weather Service** has issued warnings for **severe thunderstorms**, **tornadoes**, and **hail** in certain regions in the coming days.

What Is the Polar Vortex?

- **Definition**: The **polar vortex** is a large area of low-pressure, cold air swirling around both of the Earth's polar regions like a wheel.



- **Types of Polar Vortex**:
  - **Tropospheric Polar Vortex** – Occurs in the lowest layer of the atmosphere, up to **15 km** high, where most weather events happen.
  - **Stratospheric Polar Vortex** – Occurs higher in the atmosphere, between **15 km to 50 km**. It disappears during summer and is strongest in autumn.

When Does the Polar Vortex Cause Extreme Cold?

- **Weakened Polar Vortex**: The **North Pole's polar vortex** sometimes weakens and shifts southward from its usual position.
  - As it weakens, cold arctic air can migrate southward, bringing **chilly winds** to regions like the **U.S., parts of Europe, and Asia**.
- **Impact on the Jet Stream**: A strong polar vortex keeps the **jet stream** (a narrow band of strong winds in the upper atmosphere) on a circular path, separating cold air in the north from warm air in the south.
  - When the polar vortex weakens:
    - The jet stream becomes **wavy and unstable**.
    - High-pressure systems disrupt its path, pushing cold air southward.
  - This process can cause unusually **cold weather as far south as Florida**.

Impact of Climate Change on the Polar Vortex

- **Ongoing Research**: Scientists are actively studying how **climate change** influences the polar vortex and whether rising global temperatures are causing it to destabilise more frequently.
- **Hypothesis of Weakening**: As the **polar regions warm faster** than other parts of the Earth, the temperature contrast between the poles and the equator decreases. This could weaken both the polar vortex and the jet stream, making them more susceptible to disruptions.
- **Expert Insights**: According to the director of the Meteorology Undergraduate Programme at Rutgers University: Global warming weakens the polar vortex and the jet stream, increasing their likelihood of being dislodged southward.

- "The planet is not warming uniformly. It's warming more at the pole, overall decreasing the strength of the polar vortex."

Subject – Polity, Governance, Constitution

Grey Birthday for the Election Commission of India

Sub Topic: *Constitutional Bodies, Transparency & Accountability*

Context:

On June 17, 1949, Dr. B.R. Ambedkar, while introducing the **constitutional provision to establish the Election Commission of India (ECI)**, warned against executive interference in electoral processes.

More on News

- He emphasised the **sanctity of electoral rolls as fundamental to democracy,** asserting that their independence must be protected as a fundamental right.
- On January 25, as India marks the **75th anniversary of the ECI**—also observed as **National Voters Day**—concerns over its effectiveness in safeguarding electoral integrity persist, raising doubts about its commitment to the vision of India's founding leaders.

Election Commission of India (ECI)

It is a **constitutional authority** responsible for administering elections in the country.

Overview:

- **Establishment:** The ECI was established on January 25, 1950, and is celebrated as National Voters' Day.
- **Headquarters:** Located at Nirvachan Sadan, New Delhi.
- **Composition:** The ECI consists of a **Chief Election Commissioner and two other Election Commissioners.** This multi-member structure was **reinstated in 1993 after being briefly reverted to a single-member body.**

Powers and Functions: The ECI operates under **Article 324** of the Indian Constitution and has several critical responsibilities:

- **Conducting Elections:** The ECI oversees elections for the Lok Sabha (House of the People), Rajya Sabha (Council of States), State Legislative Assemblies, and the offices of the President and Vice President.
- **Electoral Roll Management:** It prepares and periodically updates electoral rolls, ensuring that all eligible voters are registered.
- **Election Schedule:** The ECI decides the schedules for elections, including dates for nominations, voting, counting, and results announcement.
- **Political Party Recognition:** It grants recognition to political parties and allocates election symbols, ensuring fair competition among candidates.
- **Model Code of Conduct:** The ECI issues a Model Code of Conduct for political parties and candidates to maintain fairness during elections.
- **Dispute Resolution:** It acts as a quasi-judicial body to settle disputes concerning political party recognition and election symbols.
- **Monitoring Campaign Expenditure:** The ECI sets limits on campaign expenditures for candidates and monitors compliance.

Alarming Trends in Maharashtra

- Dr. Ambedkar's warnings about electoral roll manipulation resonate with recent developments in Maharashtra's 2024 State elections.
- The **ECI reported 9.7 crore registered voters for the election, exceeding the central government's Health Ministry estimate of 9.54 crore adults in the state.**
  - This anomaly suggests a **voter enrollment rate nearing or exceeding 100%** of the adult population—a first for Maharashtra.
- The **surge in voter registration** occurred in just six months between the 2024 Lok Sabha and the State elections, **during which 48 lakh new voters were added to the rolls.**
- In stark contrast, **only 32 lakh new voters had been added during the preceding five years.**

- The scale and speed of this sudden voter enrollment are unprecedented, raising questions about its legitimacy.

Unexplained Voting Patterns

- Analysing the election results reveals further discrepancies.
- The BJP-led Mahayuti alliance gained 72 lakh more votes in the State elections compared to the Lok Sabha elections held just six months earlier.
- However, a shift of only 24 lakh votes from the Congress-led Maha Vikas Aghadi (MVA) alliance accounted for this increase.
- The remaining 48 lakh votes, it appears, came from newly registered voters—exactly matching the ECI's official data on new enrollments.
- The uniformity in voting patterns among these new voters is puzzling.
  - Were these genuine voters, or were the rolls inflated with dubious entries?
  - Were documents thoroughly verified during voter registration?
  - These unanswered questions cast a shadow over the credibility of the election process.

The Role of the ECI

- The ECI's silence on these anomalies is troubling.
- Transparency demands that the **Commission release all relevant data and clarify these irregularities.**
- Deflecting responsibility by pointing to the **failure of opposition parties to identify discrepancies** in real time does not absolve the ECI of its constitutional duty to ensure free and fair elections.

Strengthening Electoral Integrity

- The Maharashtra episode underscores the **need for systemic reforms** to protect the sanctity of electoral rolls.
- One **solution lies in leveraging Aadhaar to eliminate duplicate and ghost entries** through biometric verification.
- While safeguards must be implemented to ensure no eligible voter is excluded, Aadhaar-based verification can serve as a robust mechanism to enhance the credibility of voter rolls.

Subject – Social Justice

UDISE+ Reports decline in School Enrolment

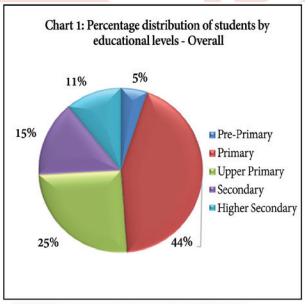
Sub Topic: *Issues related to Child and Education*

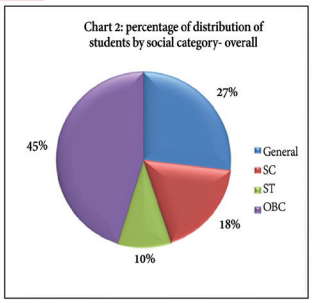
Context:

The Unified District Information System for Education Plus **(UDISE+) 2023-24 report** reveals a concerning trend in India's school education system. With a **significant decline in student enrolment and school numbers,** the report highlights challenges that **threaten universal education access,** a key focus of the National Education Policy (NEP) 2020 and Sustainable Development Goals (SDGs).

Key Findings of the Report on Dropout Rate

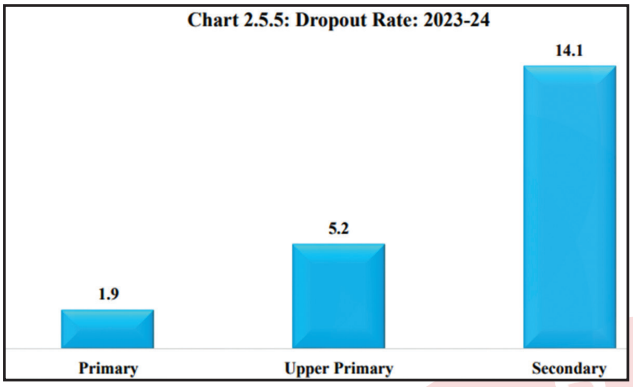
- **The UDISE+ 2023-24 report reveals several alarming trends:**





  - **Enrolment Decline**: Total student enrolment (Grade 1-12) **dropped by 1.22 crore (6%) in 2023-24,** falling from 25.18 crore in 2022-23 to 24.8 crore.
  - **School Closures**: The total number of schools **decreased by 87,012 since 2017-18,** with government schools comprising 76,883 of these closures.
  - **Efficiency Metrics**: Despite methodology changes, indicators like dropout, retention, and transition rates remain comparable, reflecting systemic challenges.
- **Dropout Rate Vis-à-Vis Population and Standard**
  - The dropout rate varies significantly across education levels and regions. While **primary school enrolment remains relatively stable, higher dropout rates are observed in secondary and higher secondary levels,** particularly in states with fewer secondary schools. For instance:

- **West Bengal**: 79% of schools are primary, but only 3.5% are secondary.
- **Chandigarh**: 45% of schools are higher secondary, but primary schools constitute just 6.1%.



- These disparities highlight **structural bottlenecks** that hinder progression and retention.

- **Distribution Across States of Dropout Rate:** State-level analysis reveals significant variations:
  - **Jammu and Kashmir**: 4,509 school closures.
  - **Assam**: 4,229 school closures.
  - **Uttar Pradesh**: 2,967 school closures.
  - Other affected states include Madhya Pradesh (2,170 closures) and Maharashtra (1,368 closures). These trends reflect uneven impacts of policy changes and regional disparities in resource allocation.

About UDISE+ Data Report:

- **Introductions:** Introduced in **2018-19, UDISE+** serves as a **centralised platform** for **collecting school-level data across India.** The system enables real-time, accurate reporting of key metrics like enrolment, dropout rates, and teacher statistics.
- **Major Transformation:** A major transformation began in **2022-23** with the introduction of **individual student-level data collection.** This methodology **leverages Aadhaar numbers and unique Educational IDs (EIDs)** to eliminate duplication and enhance governance.

Reasons for the Drop

- **Change in Methodology (2022-23 Onwards):** The shift to individual-level data collection significantly impacted reported enrolment figures:
  - **Duplicate Removal**: Earlier data often included students changing schools multiple times, inflating enrolment figures.
  - **Overestimated Enrolments**: Historical figures were **inflated by 5-6%**, leading to misrepresentation.
- **Other Contributing Factors**
  - **School Closures**: Reduced access due to school mergers or closures often disrupts student continuity, particularly in rural areas.
  - **Logistical Challenges**: Longer travel distances discourage re-admission, especially for economically weaker families.
  - **Unexplained Variations**: The UDISE+ report offers limited clarity on other factors driving the enrollment dip.

Key Implications of the Findings on Dropout Rate

- **Funding Under Scrutiny:** The decline in enrolment raises questions about the allocation and utilisation of education funds:
  - **Samagra Shiksha Scheme**: Despite reduced enrolment, **spending under the scheme increased from ₹32,515 crore in 2022-23 to ₹37,010 crore** in 2024-25.
  - **Ghost Beneficiaries**: Duplicate or inflated enrolment figures likely led to resource misallocation, undermining scheme effectiveness.
- **Impacts on Students**
  - **Dropouts**: School closures and logistical challenges exacerbate dropout rates, particularly in rural and underserved regions.
  - **Retention Gaps**: Limited availability of secondary and higher secondary schools further discourages progression.
- **Broader Impacts**
  - **Policy Effectiveness**: Accurate data is essential for assessing the impact of NEP 2020 and SDG-linked initiatives.
  - **Equity Concerns**: Regional and socio-economic disparities underscore the need for targeted interventions.

Dedicated Ministry for Senior Citizens

Sub Topic: *Mechanisms, Laws, Institutions and Bodies Constituted for the Protection and Betterment Of Vulnerable Sections*

Context:

The **Supreme Court** of India recently **allowed a petitioner to make a representation to the central government seeking the creation of a dedicated Ministry for senior citizens.**

More on News

- The Bench, led by Justice P.S. Narasimha, humorously remarked that **even judges were part of the senior citizen demographic.**
- However, it clarified that the **court could not intervene or direct the government to create such a Ministry.**
- Currently, matters concerning senior citizens fall under the **Ministry of Social Justice and Empowerment;** however, they are **often grouped with other marginalised communities** such as drug addicts and beggars.

Petition's Case for a Senior Citizens' Ministry

- **Focused Policies:** India is witnessing a **rapid increase in its elderly population,** which requires **focused attention to their welfare, policies, and services.**
  - Without a dedicated Ministry, critical aspects such as **healthcare, financial assistance, pensions, and social support** may remain inadequately addressed, potentially leading to detrimental impacts on the societal and economic structure.
- **Growing Ageing Population:** The petition cited the *India Ageing Report 2023 – Caring for Our Elders: Institutional Responses*, which noted that in 2022, **India had 149 million people aged 60 and above, comprising 10.5% of the population.**
- **Article 21:** The petitioner emphasised that senior citizens, as a **vulnerable class,** fall under the **ambit of Article 21 of the Constitution**, which guarantees the **right to a dignified life.**

How Are Ministries Created in India?

- The creation of a Ministry in India involves the **executive powers of the President, exercised on the advice of the Prime Minister and the Union Cabinet,** under **Article 77** of the Constitution of India.
- **Article 77** states that ***all executive actions of the Government of India shall be taken in the name of the President.***
- It also **enables the President to make rules for the more convenient transaction of government** business and for its allocation among Ministers.
- The **Government of India (Allocation of Business) Rules, 1961** further outlines the **distribution of subjects among various Ministries and Departments.**
- A new Ministry can be created when the government determines that a specific area of governance requires exclusive focus and coordination.
  - This decision is generally driven by socio-economic demands, legislative needs, or emerging priorities.
  - Examples of such creations include the **Ministry of Electronics and Information Technology (2016)** and the **Ministry of Cooperation (2021)**, established to address evolving governance challenges in their respective fields.

Need for a Separate Ministry

- **Rapidly Ageing Population:** India is projected to have **one of the largest ageing populations in the world.**
  - By 2050, senior citizens are expected to constitute **19.5% of the total population.**
- **Focused Policy Implementation:** An exclusive Ministry can streamline the formulation and execution of policies related to health care, pensions, social security, housing, and digital literacy for the elderly.
- **Holistic Approach to Elderly Care:** A dedicated Ministry would centralise and integrate these efforts for better efficiency and accountability.
- **International Best Practices:** Countries like **Japan and Sweden**, which also face ageing populations, **have dedicated bodies for senior citizens**, enabling them to effectively address the challenges and opportunities of an ageing society.
- **Constitutional and Ethical Obligation:** Under **Article 21**, senior citizens have the right to live with dignity.

- **Economic Implications:** The elderly contribute significantly to the economy through savings, consumption, and informal caregiving roles.

While the Supreme Court refrained from directing the creation of a Senior Citizens' Ministry, the petitioner's plea underscores the pressing need for a dedicated government body to address the challenges of India's ageing population.

Human Metapneumovirus (HMPV)

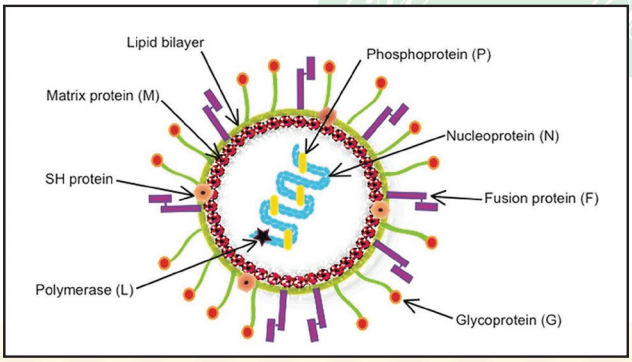
Sub Topic: *Issues related to health*

Context:

Human metapneumovirus (HMPV) is a respiratory virus causing mild cold-like infections, with children, the elderly, and those with weakened immune systems being most vulnerable. Recent reports indicate a rise in cases in northern China, prompting increased global attention.

The Current Situation in China

- **Monitoring System:** China's disease control authority is piloting a system to monitor pneumonia of unknown origin. This initiative aims to establish protocols for handling unknown pathogens.
- **Rising Cases:** Mid-December data shows an upward trend in respiratory infections, particularly HMPV, in northern provinces, especially among individuals under 14 years.
- **Social Media Concerns:** Viral posts showed crowded hospitals, sparking rumours of an emergency. However, neither China's CDC nor WHO has declared an official emergency.



What is Human Metapneumovirus?

- **Classification:** Identified in 2001, HMPV belongs to the Pneumoviridae family, which includes respiratory syncytial virus (RSV), measles, and mumps.
- **Infection Pattern:** Common in winter and early spring, it affects the upper and lower respiratory tracts.

Symptoms and Complications

- **Symptoms:** Include cough, sore throat, runny nose, fever, and wheezing. The incubation period is 3–6 days.
- **Complications:** In some cases, it leads to bronchitis or pneumonia, requiring medical care. Most infections resolve with rest and supportive care.

Transmission of HMPV

- **HMPV spreads through:**
  - **Respiratory secretions** like coughs and sneezes.
  - **Close contact**, such as shaking hands or hugging.
  - **Touching contaminated surfaces** like doorknobs and keyboards, followed by touching the face, nose, or eyes.

Treatment and Prevention

- **Treatment:** There is no vaccine or specific antiviral. Treatment focuses on over-the-counter medications for symptom relief. Antibiotics are ineffective.
- **Prevention:**
  - Wash hands frequently with soap and water.
  - Avoid close contact with infected individuals.
  - Avoid touching the face, nose, and mouth.
  - Wear masks to prevent transmission.

Global Context of HMPV

- **Not New or China-Specific:** HMPV has existed for over 60 years and is a common respiratory pathogen worldwide.
- **Spread Beyond China:** Neighbouring countries like Japan are also reporting cases. Japan recorded 718,000 cases as of mid-December, with 94,259 flu patients in one week alone.

India's Response

- **Health Ministry's Monitoring:** India's National Centre for Disease Control (NCDC) is closely observing respiratory infections and collaborating with international agencies.
- **Recent Data:** From December 16–22, there was a rise in acute respiratory infections,

including seasonal influenza, rhinovirus, RSV, and HMPV.

- However, overall cases remain lower than the previous year.

Key Takeaways

- **No Emergency Declared:** Despite social media claims, HMPV is not a new or COVID-like crisis, and no global or national emergency has been declared.
- **Focus on Prevention:** Personal hygiene and preventive measures remain critical, particularly for vulnerable populations such as children and individuals with pre-existing lung conditions.

India's Growing Healthcare Crisis

Sub Topic: *Issues related to health*

Context:

India is facing a growing healthcare crisis with an **alarming rise in non-communicable diseases (NCDs)**, which now account for **65%** of all **deaths**, up from **50%** **in 2010-13 (National Family Health Survey-5)**.

More on News

- While life expectancy in India is increasing, the **onset of diseases like heart disease, stroke, diabetes, and cancer is occurring earlier**, contributing to an escalating **financial and social burden**.
- **One in four adult men is hypertensive**, and **one in eight adults is diabetic**. Breast, lung, and cervical cancers are rising, with diagnoses occurring earlier than global averages.

The Cost of Delayed Diagnosis and Lack of Preventive Measures

- **Missed Opportunities**: Millions of cases could be better managed and at lower costs if diagnosed earlier.
- **Perception of Cost**: Comprehensive health checks in metro cities cost ₹8,000–₹15,000, making them unaffordable for many.
- **Need for Early Screening**: Regular screenings can significantly reduce severe disease outcomes.
  - Screening tools include mammograms, pap smears, X-rays, CT scans, echocardiography, treadmill stress tests, ultrasounds, and blood tests.

Escalating Economic Burden

- **Union Budget Allocation**: **₹87,657 crore** was allocated to the Ministry of Health and Family Welfare in 2024 — a **13%** increase but still insufficient for India's healthcare needs.
- **Current Health Expenditure**: Estimated at **₹7.9 lakh crore (2021-22)**, growing faster than inflation, with households shouldering **50%+** of the cost.
- **Projected NCD Costs**: By 2030, NCDs are projected to impose a **₹280 lakh crore economic burden**, equivalent to ₹2 lakh per household.

Government Role and Policy Recommendations

- **Revise Tax Incentives**: **Section 80D** of the Income Tax Act offers a ₹5,000 deduction for health checks, unchanged since the Finance Act, 2013.
  - **Proposal:** Increase the deduction limit to ₹15,000 in the Union Budget for 2025-26 to align with **12–14% healthcare inflation**.
  - **Estimated cost to the exchequer:** ₹5,000 crore, a worthwhile investment for long-term savings.
- **Early Intervention**: Strengthen early intervention capabilities through **Ayushman Health and Wellness Centres**, and **use AI-enabled imaging** for lower-cost screenings at scale.
- **Private Sector Involvement**: Encourage insurers and private health providers to offer **subsidised screening** for individuals between **40-60 years**, e.g., annual or bi-annual mammograms for women after 40.
- **Subsidised Screenings and Awareness**: Promote subsidised screenings via tax incentives, insurers, and private healthcare providers. Proceeds from healthcare cess or the proposed **35% GST** slab on tobacco and sugar products should be used to fund preventive programmes.

Subject – International Relations

Quad and Indo-Pacific

Sub Topic: *Regional Groupings & Agreements Involving India and/or Affecting India's Interests, Bilateral Groupings & Agreements*

Context:

India and other member nations of the **Quad reaffirmed their strong commitment to a free, open,**

and peaceful Indo-Pacific amid growing **concerns over China's expanding military influence in the region.**

More on News

- Marking the **20th anniversary of Quad cooperation**, the Foreign Ministers of India, the U.S., Australia, and Japan issued a **joint statement emphasising their shared vision for regional stability and prosperity.**
- The Quad, **initially formed in 2004 to coordinate disaster relief efforts** following the **Indian Ocean earthquake and tsunami,** has **evolved into a significant coalition addressing key challenges in the Indo-Pacific,** including maritime security, infrastructure, and connectivity.
- **India, set to host the next Quad Summit in late 2025,** continues to play a pivotal role in advancing the grouping's initiatives and fostering collaboration in the Indo-Pacific.

About Quad

- The Quad, formally known as the **Quadrilateral Security Dialogue,** is **an informal strategic forum** comprising four nations: the United States, India, Australia, and Japan.
- **Established in 2007**, the Quad **aims to promote a free, open, and prosperous Indo-Pacific** region through various cooperative measures.

Objectives and Significance

- **Promoting Regional Stability:** The Quad seeks to ensure stability in the Indo-Pacific region **amid rising geopolitical tensions,** particularly concerning China's increasing influence.
- **Maritime Cooperation:** The group emphasises maritime security, ensuring freedom of navigation and overflight in international waters.
- **Humanitarian Assistance and Disaster Relief:** The Quad nations collaborate on humanitarian efforts, as seen during the 2004 Indian Ocean tsunami response that initially brought them together.
- **Joint Military Exercises:** The Quad conducts joint military drills, such as the **Malabar exercises,** enhancing interoperability among member forces.

Criticism and Challenges

- **Asian NATO:** The Quad has faced criticism for being perceived as an ***Asian NATO,*** with some viewing it as **an attempt to contain China.**
- **Escalating Tensions:** Critics argue that **this could escalate tensions rather than foster cooperation**.
- **Differing Views:** Member **nations have differing views** on how to approach their relationship with China, complicating unified action within the Quad framework.

The future of the Quad hinges on its **ability to adapt to changing geopolitical dynamics and maintain cohesion among its members.** Continued dialogue and collaboration will be crucial in addressing both regional security issues and broader global challenges.

EU-India Strategic Compact

Sub Topic: *Bilateral Groupings & Agreements Involving India and/or Affecting India's Interests*

Context:

The **EU-India partnership** has seen significant progress, with the Roadmap to 2025 (launched in 2020) serving as a strategic framework to address shared goals.

More on News

- Both parties, as **unions of diversity,** uphold common values of democracy, rule of law, and human rights, aiming to promote a rules-based international order.
- However, as the **roadmap approaches its renewal in 2025,** the relationship requires deeper collaboration to address unresolved challenges and adapt to a rapidly changing global context, including Russia's invasion of Ukraine, China's authoritarian rise and Geopolitical shifts following Donald Trump's re-election.

The Need for a New Strategic Compact

The EU-India partnership must go beyond the existing roadmap to address limitations and

explore new opportunities. Key areas for enhanced collaboration include:

- **Strengthened Foreign Policy and Security Cooperation:** Shift from disarmament and counter-terrorism to **comprehensive military cooperation,** including:
  - **Joint technology transfers,** co-production, and sales to reduce India's dependence on Russian arms.
  - Build on models like the EU-Japan defence cooperation and the Indo-French partnership.
  - **Leverage geopolitical needs** to fast-track initiatives, with a strong commercial opportunity of over $100 billion in defence sales.
- **Pragmatic Climate Collaboration:** Avoid contentious policies like the **Carbon Border Adjustment Mechanism (CBAM)**, seen by India as unilateral and counterproductive.
  - Focus on **climate finance and sustainable public-private partnerships** to foster a green transition globally.
  - Build common ground to position the EU-India partnership as a model for addressing climate challenges in developing economies.
- **Conclusion of a Free Trade Agreement (FTA): Address stalled negotiations** and prioritise key areas like agriculture, manufacturing, and critical technology standards (e.g., data protection).
  - Emphasise geoeconomic security in diversifying supply chains away from China.
  - Recognise the urgency of **trade multilateralism** and India's growing significance, with bilateral trade at €124 billion in 2023 and increasing foreign investment.
- **Balanced Migration Policies:** Transition from framing migration as one-way (Indian workers and students to Europe) to a more reciprocal model.
  - Recognise India as an emerging destination for European workers, fostering mutual benefits and addressing immigration-skeptic electorates.
- **Inclusion of Animal Welfare and Ethical Connectivity:** Extend collaboration on sustainability to include animal welfare, e.g., bans on live animal exports.
  - Position ethical connectivity projects as vital for biodiversity, zoonotic disease prevention, and the well-being of all species.
  - Leverage India's traditional ethos of environmental responsibility and the EU's growing advocacy for animal rights.
- **Reimagined Multilateralism:** Advocate for reforms in global institutions, such as expanding the UN Security Council's P-5 for inclusivity.
  - Promote minilateral initiatives to deepen integration among like-minded partners.
  - Recognise India as a bridge to the Global South, enabling more inclusive and representative multilateral frameworks.

How the EU Can Avoid Missteps?

- **Respect the Global South Identity:** Acknowledge India's leadership in the Voice of the Global South and its unique perspectives on global order.
  - **Avoid dismissive rhetoric** (e.g., Josep Borrell's "garden vs. jungle" analogy), which alienates partners in the Global South.
- **Recognise India's Unique Liberal Traditions:** Appreciate India's distinct values and traditions, which often surpass traditional Asian and Western dichotomies.
  - **Avoid misinformed criticisms** (e.g., the European Parliament's resolution on Manipur in 2023) that lack cultural and contextual understanding.
- **Adopt Empathy Toward Developing Nations:** Focus on partnership rather than preaching, recognising historical inequalities and colonial legacies.
  - Support countries like India in achieving shared goals, such as combating climate change, through resource-sharing and equitable policies.

The EU-India partnership has significant untapped potential to influence global politics, economics, and governance. By avoiding past pitfalls and focusing on shared synergies, both powers can strengthen their cooperation across critical areas.

Henley Passport Index 2025

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

Context:

India's ranking in the Henley Passport Index for 2025 dropped by five points to **85th**, down from **80th** in 2024. India's consistent fluctuations in the index highlight the challenges it faces in enhancing its

global mobility through visa-free or visa-on-arrival agreements.

Key Highlights:

- **Top-Ranking Countries**:
  - **Singapore** retains the top spot in 2025, providing visa-free access to **195 destinations**.
  - **Japan** follows in second place with access to **193 countries**.
  - **Finland**, **France**, **Germany**, **Italy**, **South Korea**, and **Spain** share third place, each granting access to **192 destinations**.
- **Countries at the Bottom**:
  - **Pakistan** and **Yemen** share the **103rd** position, with access to only **33 countries**.
  - Other bottom-ranked countries include **Iraq** (31 countries), **Syria** (27 countries), and **Afghanistan** (26 countries).
- **Notable Climbers**:
  - **China** was one of the biggest climbers, rising from **94th** in 2015 to **60th** in 2025, gaining access to **40 more destinations**.
  - The **United Arab Emirates (UAE)** has made significant progress, climbing **32 spots** since 2015, now ranked **10th** globally with access to **185 destinations**.

About the Henley Passport Index:

- The **Henley Passport Index**, developed by Henley & Partners, evaluates global passports based on their visa-free and visa-on-arrival access to 227 travel destinations.
- Drawing on exclusive **data from the International Air Transport Authority (IATA)**, the index has become the leading global benchmark for passport mobility.
  - The index analyses **199 passports globally**.
  - Over the past decade, **only 22 passports have experienced a decline** in their rankings.
    - The **U.S.** was the second-biggest faller, dropping **7 places** from **2nd to 9th**. Other notable fallers include **Vanuatu** (dropped 6 places) and the **UK** (dropped from 1st to 5th).

Factors Influencing India's Ranking:

India's Performance Over the Years

- **2025 Rank:** 85th
- **2024 Rank:** 80th
- **Lowest Rank:** 90th in 2021
- **Best Rank:** 71st in 2006

- Within the Henley Passport Index, a **passport's effectiveness** is measured by the **number of destinations one can visit visa-free**, or with visa-on-arrival.
- India's current ranking allows its citizens **visa-free access to 57 destinations**. Not a small number, but there's plenty of room for improvement compared to powerhouses like **Singapore, whose passport offers travel to 195 countries** without the need for a prior visa.

Key Trends and Migration Insights:

- According to Henley & Partners, the demand for alternative citizenship and residency options has grown significantly, driven by geopolitical volatility and jurisdictional risks.
  - In 2024, **U.S. nationals** accounted for 21% of all investment migration applications, surpassing Turkish, Filipino, Indian, and British applicants combined.
  - Countries like **China** have emerged as significant gainers, while **Venezuela**, the U.S., and **Vanuatu** have experienced notable declines.

The Path Forward for India:

- One of the most crucial factors affecting passport strength is **diplomatic relationships**, which shape the access levels for citizens.
- Strengthening these relationships, **establishing new visa agreements,** and **improving internal security measures** could enhance India's passport ranking in the future.

Dispute over Indus Water Treaty

Sub Topic: *Bilateral Groupings & Agreements Involving India And/Or Affecting India's Interests*

Context:

The **World Bank-appointed Neutral Expert,** Michel Lino, has affirmed his authority to address India and Pakistan's differences over the design of hydroelectric projects under the **Indus Waters Treaty,** a decision welcomed by India.

More on News

- While the NE's ruling provides a **pathway to address technical disputes**, it does not advance India's request to renegotiate the IWT, a demand it raised in January 2023.

- The **unresolved differences** between the two countries regarding the treaty's dispute resolution mechanisms continue to pose challenges.

India's Call for Treaty Renegotiation

- India has been **seeking to revise the treaty to address its concerns** about the dispute resolution process.
- Since January 2023, it **has written to Pakistan four times** to initiate talks, but **Pakistan has not yet formally responded.**
- The last meeting of the **Permanent Indus Commission (PIC)**, a bilateral body established under the treaty, took place in May 2022 in New Delhi.
- **India subsequently decided to suspend further PIC meetings** until progress was made on renegotiating the treaty.

*The **Indus Waters Treaty (IWT),** signed on September 19, 1960, between India and Pakistan, is a water-distribution agreement **brokered by the World Bank**. It allocates control over the waters of the Indus River system, **granting India rights to the three eastern rivers—Ravi, Beas, and Sutlej** – while **Pakistan controls the three western rivers—Indus, Chenab, and Jhelum.** The treaty allows India to utilise western river waters for limited irrigation and unrestricted non-consumptive purposes such as hydroelectric power generation. A key feature of the treaty is the **establishment of the Permanent Indus Commission to resolve disputes** and facilitate cooperation between the two nations.*

Diverging Interpretations of Dispute Resolution

- The IWT outlines a **three-step dispute resolution mechanism:** initial attempts at **resolution by the PIC**, escalation to a **World Bank-appointed Neutral Expert**, and finally, **adjudication by a Court of Arbitration** if earlier efforts fail.
- India insists that **each step must be fully exhausted** before progressing to the next stage.
  - However, **Pakistan has bypassed India's concurrence and moved forward unilaterally.**
- The issue **first surfaced in 2016 when Pakistan called for the establishment of a Court of Arbitration.**
  - Initially, both nations appeared to agree on appointing a Neutral Expert.
  - However, the **World Bank later decided that convening both a Neutral Expert and a Court of Arbitration** simultaneously could result in "contradictory outcomes."
  - Despite this, in 2022, the World Bank facilitated the appointment of both the NE and the chairman of the Court of Arbitration.
- **India has since refused to participate in the Court of Arbitration proceedings** in The Hague, arguing that the treaty does not permit parallel mechanisms.
  - Pakistan maintains its actions align with the treaty.

In the coming months, the Neutral Expert is expected to hear submissions from both India and Pakistan regarding the hydroelectric projects in question. The resolution of these disputes will test the efficacy of the IWT's dispute resolution framework and the ability of both nations to navigate their longstanding differences over water-sharing and project development.

Subject – Indian Economy & Agriculture and Banking

Surging Government Bond Yields

Sub Topic: *Monetary Policy, Banking Sector & NBFCs*

Context:

Government bond yields rose sharply, with the benchmark 10-year yield recording its biggest single-day increase in over seven months.

More on News

- The yield closed at 6.85%, its highest level since November 22, compared to the previous close of 6.7724%. This marked the steepest rise since June 4, 2023.
- The surge was driven by a **rally in US Treasury yields** following **stronger-than-expected economic data,** alongside pressure from a tumbling rupee.

***Government bond yield** refers to the **interest rate that a national government pays to service its outstanding bonds,** reflecting the return investors can expect from these securities. It is a crucial indicator in the financial markets, influencing borrowing costs for governments and investment decisions for individuals and institutions.*

Economic Implications of Bond Yields

- **Interest Rates and Monetary Policy:** Government bond yields are closely linked to the central bank's monetary policy.

- A **rising yield often signals expectations of higher interest rates,** while declining yields can indicate lower rates ahead.
- Recent trends suggest that slowing economic growth may prompt the Reserve Bank of India (RBI) to consider rate cuts, potentially influencing borrowing costs for consumers and businesses.

- **Investment Climate: Higher bond yields typically attract foreign investment** as they offer better returns compared to other markets.
  - Conversely, if yields rise too quickly, it may deter investment due to increased borrowing costs for companies and consumers.
  - The current yield levels suggest a cautious investment climate amid concerns over economic growth slowing to 6.4% for FY25, the lowest in four years.
- **Inflation Expectations:** Bond yields also reflect inflation expectations.
  - **As inflation eases**—evidenced by a drop from 6.21% in October to 5.48% in November 2024—**yields may stabilise or decrease further**, indicating a more favourable economic environment for consumers and businesses alike.
- **Government Financing:** The government relies on bond issuance to finance its deficit and fund various projects.
  - **Lower yields reduce the government's borrowing cost,** allowing for increased public spending on infrastructure and social programmes, which can stimulate economic growth.
- **Market Sentiment and Risk Perception:** Changes in bond yields can signal shifts in market sentiment regarding economic stability and risk appetite.
- A decline in yields often reflects increased demand for safer assets during uncertain times, while rising yields may indicate greater confidence in economic recovery and growth prospects.

LEADS 2024 Report

Sub Topic: *Infrastructure, Industrial Growth, Industrial Policy*

Context:

Recently, the **Logistics Ease Across Different States (LEADS) 2024** report and the **Logistics Excellence, Advancement, and Performance Shield (LEAPS) 2024** awards were launched by the Union Minister of Commerce and Industry.

More on News

- The Minister called for the **adoption of green logistics,** inclusivity in the workforce, and the **integration of advanced technologies** like Artificial Intelligence, Machine Learning, and Data Analytics to propel the logistics industry forward.
- The Minister also recommended that **states leverage public-private partnerships (PPPs)** and focus on multi-modal hubs for in-land container depots.
- He introduced the **LEAD framework—Longevity, Efficiency and Effectiveness, Accessibility and Accountability, and Digitalisation** of processes—to transform logistics and prepare India for its ambitious goal of becoming a developed nation by 2047.

Logistics Performance Index (LPI)

According to the **World Bank's Logistics Performance Index (LPI) Report 2023, India ranks 38th out of 139 countries**, improving **from 44th in 2018 and 54th in 2014.**

Key Initiatives and Reforms: Inter-Ministerial Co-ordination, National Trade Facilitation, PM Gati-Shakti National Master Plan, National Logistics Policy, Unified Logistics Interface Platform (ULIP), Logistics Data Bank and NLP Marine.

Key Components of the LPI: Customs Performance, Infrastructure Quality, Ease of Arranging Shipments, Logistics Services Quality, Tracking and Tracing and Timeliness.

LEADS 2024 Report Highlights

- The **sixth edition** of the LEADS report **evaluates logistics performance across four pillars:**
  - **Logistics Infrastructure,**
  - **Logistics Services,**
  - **Operating and Regulatory Environment, and**
  - **Sustainable Logistics (introduced this year).**
- The report **identifies actionable insights for states and union territories** to advance logistics reforms and strengthen India's position as a global economic powerhouse.

Category	Achievers	Fast Movers	Aspirers
Coastal Group	Gujarat, Karnataka, Maharashtra, Odisha, Tamil Nadu	Andhra Pradesh, Goa	Kerala, West Bengal
Landlocked Group	Haryana, Telangana, Uttar Pradesh, Uttarakhand	Bihar, Himachal Pradesh, Madhya Pradesh, Punjab, Rajasthan	Chhattisgarh, Jharkhand
North-Eastern Group	Assam, Arunachal Pradesh	Meghalaya, Mizoram, Nagaland, Sikkim, Tripura	Manipur
Union Territories	Chandigarh, Delhi	Dadra and Nagar Haveli and Daman and Diu, Jammu and Kashmir, Lakshadweep, Puducherry	Andaman and Nicobar Islands, Ladakh

LEAPS 2024 Awards

The LEAPS 2024 awards **celebrated exceptional contributions to the logistics sector** across various categories:

Category	Subcategory	Awardee
Core Logistics	Air Freight	Kerry Indev Logistics Pvt Ltd
	Maritime Freight	Visakha Container Terminal Pvt Ltd
	Multimodal Transport	Avana Logistek Ltd
	Rail Freight	DP World Rail Logistics Pvt Ltd
	Road Freight	CJ Darcl Logistics Ltd
	Warehousing (Industrial)	APM Terminals India Pvt Ltd
	Warehousing (Agriculture)	Globus Warehousing and Trading Pvt Ltd
Startups	Logistics Operations	Myzek Logistics Pvt Ltd
	Logistics Technology	Sarvodaya Infotech Pvt Ltd
MSMEs	Logistics Service Provider	Shipwaves Online Ltd
Institutions	Education & Skill Development	Indian Institute of Management, Mumbai
Special Categories	E-commerce Logistics	Delhivery Ltd
	Multimodal Logistics	Pushpak Logistics Solutions LLP

Key Initiatives for Capacity Building

- **PM GatiShakti Course:** The Minister also launched the **PM GatiShakti Course** offered by **GatiShakti Vishwavidyalaya.**
  - This 15-hour **programme on infrastructure planning and national development** will be accessible on platforms like **iGOT Karmayogi and UGC SWAYAM.**
  - It will also be **integrated into the curriculum of Central and State Administrative Training Institutes.**
- **Logistics Cost Framework Report:** Additionally, the **Logistics Cost Framework Report by NCAER** was also launched.
- Developed with inputs from NITI Aayog, transport ministries, and industry stakeholders, the framework introduces a hybrid methodology to assess logistics costs, incorporating EXIM and domestic cargo data.

The Digital Crop Survey

Sub Topic: *E-Technology in the Aid of Farmers, Buffer Stocks & Food Security, Public Distribution System (PDS)*

Content:

The Digital Crop Survey represents a groundbreaking initiative by the Indian government to revolutionise the way agricultural data is collected, processed, and utilised.

About the Digital Crop Survey

- The **Digital Crop Survey employs advanced applications and tools** for collecting detailed agricultural data. A mobile application and a dedicated portal have been developed for surveyors to **gather information on crop patterns, land holdings, and geotagged images of surveyed plots.**
- Launched under the Ministry of Agriculture's ₹2,817 crore Digital Agriculture Mission, this initiative aims to replace the traditional **Patwari-Girdawari system** with a more robust, accurate, and technology-driven approach. **By FY26, the government plans to achieve pan-India coverage of digital crop surveys,** ensuring real-time and reliable data for agricultural planning and policymaking.
- Initially piloted in six districts of Gujarat in 2023-24, **the programme has already scaled to 436 districts for the Kharif 2024 season.**

Current State of Crop Production Survey

- In the **fiscal year 2023-24, the digital crop survey spanned 11 states,** generating data used for the first advance estimates of food grain production for 2024-25. Notably, the **states of Uttar Pradesh, Madhya Pradesh, Gujarat, and Odisha** have shown significant progress, with digital surveys revealing increased rice cultivation in Uttar Pradesh.
- **Furthermore, 10 million unique farmer IDs, or Kisan Pehchaan Patras, have been issued,** consolidating critical information on land holdings and crop patterns. The government **aims to extend this identification system to 110 million farmers nationwide** in the coming years.

Technologies Used in Digital Crop Survey

The Digital Crop Survey integrates cutting-edge technologies to enhance data accuracy and reliability:

- **Remote Sensing**: Used to generate precise crop maps and area estimations.
- **Geospatial Analysis**: Facilitates the identification and mapping of cultivated areas.
- **Artificial Intelligence (AI)**: Enables advanced data analysis for yield forecasting and policy insights.
- **Geo-Tagging**: Ensures verification and validation of field-level data.

These technologies are complemented by partnerships with institutions such as the Space Application Center, Indian Agricultural Research Institute, and Indian Statistical Institute. The revamped **Forecasting Agricultural output using Space, Agro-meteorology, and Land (FASAL) project** also leverages these tools for data collection.

Significance of Digital Crop Survey

The digital survey provides plot-level, geotagged crop data, serving as a single source of truth. Its benefits include:

- **Accurate Production Estimates**: Enables more precise forecasts and policy interventions.
- **Enhanced Scheme Delivery**: Assists in implementing MSP-based procurement, crop insurance, and credit-linked loans.
- **Efficient Fertiliser Use**: Promotes balanced and sustainable agricultural practices.
- **Improved Data Transparency**: Facilitates evidence-based decision-making and stakeholder collaboration.

Impact of Digital Crop Survey Till Now on Policy and Implementation

The Digital Crop Survey has already made a significant impact on agricultural policy and implementation:

- **Policy Decisions**: Reliable data has informed the distribution of subsidies and the planning of procurement mechanisms.
- **Increased Accuracy**: The system has reduced errors common in manual surveys, ensuring better resource allocation.
- **Data-Driven Insights**: Enabled the identification of crop diversification trends and emerging agricultural challenges.

The Larger Picture

The **Digital Crop Survey is a cornerstone of India's digital public infrastructure (DPI)** for agriculture. By integrating central and state-level systems, the initiative aims to provide farmer-centric services, including access to soil health data, livestock information, and crop advisory services. The UPAg portal further ensures data triangulation and cross-verification, enhancing the robustness of agricultural statistics.

As the survey expands nationwide, it **promises to transform India's agricultural landscape by improving policy effectiveness, ensuring equitable resource distribution,** and empowering farmers with actionable insights. The **Digital Crop Survey exemplifies the potential of technology** in addressing systemic challenges and fostering sustainable agricultural growth in India.

New US Restrictions on AI Chip Exports

Sub Topic: *Liberalisation, Fiscal Policy*
Science & Technology: *Artificial Intelligence*

Context:

The United States has introduced **stringent restrictions** on the export of **advanced AI chips**. These measures are part of the **Interim Final Rule on AI**, aimed at controlling the global diffusion of **cutting-edge AI technology**.

- Countries are classified into three tiers to determine their level of access to these technologies, reflecting **national security concerns** and **technological leadership priorities**.

The US Interim Final Rule on AI: A Comprehensive Overview

Tier Categorisation and Access Levels

- **Tier 1 (No Restrictions)**
  - Includes **18 allied nations**: the **UK**, **Japan**, **Australia**, etc.
- **Tier 2 (Import Caps and Licensing Requirements)**
  - Includes nations like **India**, **Israel**, and **Singapore**.
  - Cap: **50,000 advanced GPUs** until 2027, extendable to **100,000 GPUs** via government agreements.
  - Institutions can apply for **National Verified End User (NVUE)** status to procure up to **320,000 GPUs** over two years.
- **Tier 3 (Complete Ban)**
  - Includes arms-embargoed nations like **China**, **Russia**, and **Iran**.
  - Exception: Chip orders with a computational power equivalent to **1,700 GPUs** do not require licenses or count towards national caps.

Why the US Imposed These Restrictions

- **Addressing Security Concerns**
  - Targeting adversarial nations such as **China**, **Iran**, and **Russia**.
  - Prevent misuse of AI technologies in **military applications** or **cyber warfare**.
- **Regulating AI Development**
  - Ensures AI innovation progresses within **trusted environments**.
  - Reduces risks of **unauthorised technology transfers** and maintains US dominance in **AI development**.

India's Growing AI Market:

- India's AI market is projected to reach **$17 billion by 2027**, growing at **25-35% annually**.
- Increasing demand for **AI applications across industries** necessitates a **robust AI infrastructure**.

Potential Impact on India

- **Implications for the ₹10,000-Crore IndiaAI Mission**
  - India (in **Tier 2**) is capped at **50,000 GPUs** until 2027.
  - Aligns with IndiaAI's goal of building a **10,000-GPU compute infrastructure** but could limit **long-term ambitions**.
- **Constraints on Scaling AI Infrastructure**
  - **Large-scale AI data centres**, critical for advanced AI research, may face delays.
  - **Reliance**, **E2E**, and **CtrlS** could encounter difficulties scaling GPU-dependent operations.

Steps India Can Take to Tackle the Restrictions

- **Strategic Engagement with the US**
  - Collaborate to secure **General NVUE authorisations** for increased GPU procurement.
  - Highlight India's role as a **non-re-exporter** of computer ICs to improve licensing terms.
- **Strengthening Domestic Capabilities:**
  - Invest in **domestic semiconductor manufacturing**.
  - Build partnerships with global chipmakers like **Nvidia** and **AMD**.

Response from Chipmakers

- **Nvidia** and other AI chipmakers have criticised the restrictions.
- Concerns include stifling **innovation** and weakening the **global competitiveness** of US firms.
- Nvidia argues that restricting widely available technologies, such as **consumer-grade GPUs**, could harm the broader **AI ecosystem**.

Diamond Imprest Authorisation (DIA) Scheme

Sub Topic: *Changes in Industrial Policy, Government Policy & Implementations*

Context:

The Department of Commerce, Government of India, has launched the **Diamond Imprest Authorisation (DIA) Scheme** on January 21, 2025, with the objective of **strengthening the global competitiveness of India's diamond industry.**

More on News

- Designed to **enhance value addition and promote exports,** the scheme introduces a **streamlined process for the duty-free import of natural cut and polished diamonds.**
- The DIA Scheme is set to be **implemented from April 1, 2025.**

Key Features of the DIA Scheme

- **Duty-Free Imports:** The scheme allows for the duty-free import of natural cut and polished diamonds of less than ¼ carat (25 cents).
- **Export Obligation:** Beneficiaries must achieve a 10% value addition as part of their export obligations.
- **Eligibility:** Only diamond exporters with Two Star Export House status or above, and annual exports of at least USD 15 million, can avail of this scheme.

Diamond Mining

India has a rich history of diamond mining, with the primary focus currently on three states: **Madhya Pradesh, Andhra Pradesh, and Chhattisgarh.** The most significant diamond mine in India is the **Majhgawan mine** located in the **Panna district of Madhya Pradesh,** operated by the National Mineral Development Corporation (NMDC). This mine is the only industrial-scale diamond mine in the country, with a production capacity of approximately 84,000 carats per year. **Madhya Pradesh accounts for about 90% of India's diamond resources, with the Panna region alone holding substantial deposits.** Other notable areas include the diamond fields in Andhra Pradesh, particularly in **Anantapur,** and some occurrences in Chhattisgarh and Odisha. Historically, India was the world's primary source of diamonds until other deposits were discovered globally, but it remains a **key player in the diamond cutting and polishing industry, especially in Surat, Gujarat.**

Rationale Behind the Scheme

- The DIA Scheme is inspired by **beneficiation policies implemented by diamond-mining countries** such as **Botswana, Namibia, and Angola.**
- These policies **require diamond manufacturers to establish cutting and polishing facilities,** ensuring local value addition.
- By introducing this scheme, the Indian **government aims to retain the country's leadership in the diamond value chain,** preventing investments by Indian diamantaires from shifting to diamond-mining destinations.

Benefits of the Scheme

- **Support for MSMEs:** The scheme provides a level playing field for Indian diamond exporters, especially small and medium enterprises (MSMEs), enabling them to compete effectively with larger global players.
- **Job Creation:** The scheme is expected to generate employment opportunities for skilled craftsmen, diamond assorters, and workers involved in processing semi-finished diamonds.
- **Boosting Domestic Industry:** By encouraging diamond processing within India, the scheme aims to protect the domestic diamond industry and sustain associated jobs.
- **Addressing Industry Challenges:** India's diamond sector has been facing challenges, including a **steep decline in exports and significant job losses.**
  - The DIA Scheme is positioned as a **countermeasure to these issues,** ensuring the **rejuvenation of the diamond industry.**

The DIA Scheme is expected to result in increased exports of cut and polished diamonds from India, ensuring the sustainable growth of the industry while creating opportunities for employment and economic development.

Wage Payments under MGNREGS

Sub Topic: *Employment, Growth & Development*

Context:

A study published in the *Indian Journal of Labour Economics* found no statistically significant difference in **timely wage payments** or **payment rejections** between the Aadhaar-Based Payment System (ABPS) and standard bank account-based methods.

More on News

- The study is titled "**MGNREGA as a technological laboratory: analysing wage payment delays as a result of two digital interventions**," authored by researchers from **Lib Tech India**.
- The study analysed **3.14 crore MGNREGS transactions** totaling ₹4,602 crore from **10 states** during **2021-22**.

Background

- **Mandatory ABPS Implementation**: The Union government made **ABPS mandatory** for Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) wage payments from **January 1, 2024**. The government claims ABPS enhances efficiency, transparency, and savings.
- **Concerns from Workers**: Workers report frequent wage **misdirection** under ABPS. **Mismatches between Aadhaar details and job cards** have led to the deletion of many workers from the system.
- **Payment Rejections**: **ABPS payment rejections** are **centralised** and harder to resolve compared to account-based payments, where issues can be solved **locally** by block-level computer operators.

Key Findings on Payment Timeliness

- **36% of account-based payments** were processed within **seven days**.
- **39% of ABPS payments** were processed within **seven days**.
- The **time difference** between the two systems in processing payments was **marginal**.

Implications

- **Technology and Access Issues**: The findings challenge the claims of superior efficiency and transparency associated with ABPS.
- **Need for Resolution Mechanisms**: Addressing centralised rejection issues and worker grievances should be prioritised.
- **Inclusion Concerns**: Ensuring no worker is excluded due to technical mismatches is critical for the scheme's equitable implementation.

About MGNREGS

- Initiated in **2005** under the Mahatma Gandhi National Rural Employment Guarantee Act 2005.
- It provides at least **100 days of work at specified wage rates for each rural household annually**.
- The **Ministry of Rural Development (MoRD)**, in partnership with state governments, oversees the scheme's implementation.
- **Objectives:**
  - Strengthen the **livelihood** resources of the poor.
  - Ensure **social inclusion**.
  - Strengthening **Panchayati Raj Institutions** (PRIs).
- **Eligibility**: **All rural households** are eligible to register under MGNREGS. Any adult member (**above 18 years old**) of a registered household can apply for work.
- The government sets minimum wages for MGNREGA work, received annually **based on inflation.**
- **MGNREGA 2.0:**
  - **Expansion of Work Types**: **30 new types of works incorporated** into the programme's list.
  - **Innovative Utilisation of MGNREGA Labour**: MGNREGA labour (up to Rs 4,500) can be utilised for building toilets under the Total Sanitation Campaign.
  - **Health Insurance:** Rashtriya Swasthya Bima Yojana is extended to individuals who have worked for at least 15 days under MGNREGA.

Corridors for Bullet Train

Sub Topic: *Railway Infrastructure*

Context:

The **Indian government proposes expanding high-speed train coverage**, linking new routes with the **Golden Quadrilateral highway network**, which connects northern, eastern, southern, and western India.

More on News

- The **cost of these new high-speed rail corridors** is expected to be about **half of the ₹1.65 trillion budget** for the 508-km Mumbai-Ahmedabad project. Savings will depend on the level of indigenisation in rail technology.
- **Indian Railways' Integrated Coach Factory in Chennai** may be tasked with developing a faster version of the semi-high-speed Vande Bharat trains.

What is a Bullet Train?

Bullet trains refer to Japan's Shinkansen high-speed trains, known for their speed and sleek, bullet-like appearance. These trains generally operate at speeds above 250 km/h.

Origins: The first bullet train was built in Japan to connect various regions with Tokyo.

Key Highlights

- **Collaboration with Japan**: The government plans to collaborate with Japan **to manufacture high-speed trains domestically**, leveraging Japan's advanced bullet train technology, **including the Shinkansen trains** that run at **speeds** of **260-320 km/h**.
- **Mumbai-Ahmedabad Project**: The Mumbai-Ahmedabad high-speed rail (MAHSR) project, which is under construction, serves as the **pilot for India's high-speed rail system**. The learning curve associated with this project is now reportedly absorbed, and the government is confident about the design.
- **Speed of Trains**: Current Indian trains like the **Vande Bharat Express run at semi-high speeds of 160 km/h**, with **a new 180 km/h version being tested**. The speed limits for these trains are **based on the capacity of Indian rail tracks**.
- **Golden Quadrilateral of High-Speed Trains**: The new corridors **aim to complete a golden quadrilateral of high-speed rail**, connecting major metros and making travel faster between them.

Benefits of Bullet Trains in India

- **Decongestion**: Bullet trains would provide an alternative mode of transport, helping to reduce traffic congestion on roads and highways.
- **Boost to Inter-State Travel**: Faster trains would encourage more interstate travel and benefit businesses in cities.
- **Relieve Railways**: Bullet trains would ease the burden on the existing railway system, which currently carries a heavy population.

Procurement Challenges and Cost Comparisons

- **Rolling stock procurement** from Japan is **delayed** due to unresolved contractual discussions.
- Japan originally proposed E5 Shinkansen trains (2016) but now plans to supply the advanced E10 Shinkansen version.
- Indian state-run BEML was awarded a contract **worth ₹866.87 crore** to manufacture indigenous Bullet trains, with a per-coach cost of ₹27.86 crore.
- Japanese Bullet train coaches are estimated to cost over ₹46 crore per coach.

Future High-Speed Corridors

- The National High-Speed Rail Corporation Ltd (**NHSRCL**) has **identified seven other high-speed rail corridors**, including:
  - Detailed Project Reports (DPRs) have been submitted for four high-speed corridors (**Delhi-Varanasi, Delhi-Ahmedabad, Nagpur-Mumbai, and Mumbai-Hyderabad**).
  - One DPR (**Delhi-Amritsar**) was submitted in July 2024, and two more (**Chennai-Mysore and Varanasi-Howrah**) are expected in 2024-25.

Future Trends in Bullet Train Corridor Design

- **Innovative Materials and Technologies:** New materials can enhance track durability and reduce maintenance costs.
- **Integration with Other Transportation Forms:** Future corridors may connect seamlessly with maglev or hyperloop systems.
- **Multi-modal Transportation Hubs:** Designing hubs that facilitate transfers between different transport modes enhances overall efficiency.
- **Smart Corridors:** Implementing AI and IoT technologies can optimise operations, improve safety, and enhance passenger experiences.

Subject – Science & Technology

Meta and Fact-Checking

Sub Topic: *Achievement in the Field Of IT, Computer*

Context:

Meta is undergoing a significant transformation in its approach to fact-checking, transitioning from an independent third-party programme to a Community Notes model.

More on News

- This shift, announced by CEO Mark Zuckerberg, **aims to empower users to add context and facts directly beneath posts**, moving away from reliance on external fact-checkers.

Changes in Fact-Checking Norms

- Since its inception in 2016, Meta's independent fact-checking initiative was **designed to combat misinformation on platforms like Facebook and Instagram.**
- This programme **involved certified fact-checkers from the International Fact-Checking Network (IFCN)** who evaluated the accuracy of posts.
- However, **Meta has now decided to discontinue this programme,** citing **concerns over perceived biases among fact-checkers and excessive censorship** of legitimate discourse.
- The new Community Notes system will allow users to collaboratively flag and contextualise potentially misleading content, fostering a more decentralised approach to information verification.

Reasons for the Shift

- **Bias Concerns:** The company claims that independent fact-checkers have shown biases in their evaluations, limiting free expression and political debate.
- **Censorship Issues:** There are assertions that the previous system overly restricted discussions on sensitive topics, such as immigration and gender identity.
- **User Empowerment:** By enabling users to contribute context, Meta aims to create a more inclusive environment for discourse while focusing enforcement on severe violations only.

Impact on India

- Currently, Meta has **not implemented the Community Notes model in India.**
- Experts note that **while this shift does not violate Indian laws regarding misinformation, it raises concerns about the future of local fact-checking organisations** that depend on funding from Meta.
- The change **could jeopardise jobs and financial stability** for many small fact-checking entities in India that rely heavily on partnerships with Meta for their operations.

Legal Context and Global Perspectives

- **Fact Check Unit in India & SC's Ruling:** The Supreme Court of India has previously **ruled against certain governmental measures** aimed at regulating misinformation, **emphasising constitutional rights over censorship.**
- **Misinformation vs Disinformation:** Misinformation refers to false or misleading information spread without harmful intent, while disinformation involves deliberate falsehoods aimed at deception.
- **Misinformation Law in Turkiye:** Turkiye has enacted laws targeting misinformation that **impose penalties on those spreading false information online,** reflecting a stringent approach compared to Meta's new model.
- **Rabat Plan of Action:** This international framework emphasises the **importance of freedom of expression** while addressing hate speech and misinformation, advocating for balanced approaches that protect both rights and public safety.

As Meta navigates these changes, the effectiveness of the Community Notes model will be closely scrutinised, particularly regarding its impact on misinformation and the quality of discourse across its platforms.

Shift to Smaller Language Models (SLMs)

Sub Topic: *Achievement in the Field Of IT, Computer*

Context:

The trend of scaling LLMs began with **GPT-3** (175 billion parameters) by OpenAI in 2020, followed by **GPT-4** (1.7 trillion parameters). However, by 2024, the focus shifted towards **smaller language models** due to diminishing returns from scaling LLMs further.

What is SLM?

- Small Language Models (SLMs) are distinguished by their **compact generative AI structures**.
- They feature fewer parameters and **utilise a reduced volume of training data**.
- The reduced footprint results in lower memory and processing demands.
- SLMs are **well-suited for on-device deployments** and applications prioritising resource efficiency.
- SLMs are compact versions of larger language models (LLMs), **broadening high-quality model options for customers** and offering practical choices.

Development of Smaller Language Models (SLMs)

- In 2024, **Big Tech firms** began exploring **smaller models**:

- **Google DeepMind** released **Gemini Ultra**, **Nano**, and **Flash** models.
- **OpenAI** and **Meta** launched smaller versions like **GPT-4o mini** and **Llama 3**.
- **Anthropic AI** launched **Claude 3** and **Haiku** alongside **Opus**.

Advantages of Small Language Models

- **Cost and Efficiency**: SLMs are cheaper, require less time and computational resources, and are ideal for specialized tasks.
- **Specific Use Cases**: They excel at focused applications rather than general AI tasks, making them suitable for edge devices like smartphones.
- **Examples:**
  - **Mistral AI**, a startup, offers small models that are as efficient as LLMs for specific use cases.
  - **Microsoft's Phi-3-mini**, with **3.8 billion parameters**.
  - **Apple Intelligence**, running on iPhones and iPads, uses on-device SLMs for specific applications.

Drawbacks of Small Language Models

- **Limited Complexity**: While efficient for basic tasks like language translation, SLMs struggle with complex benchmarks such as coding or solving logical problems.
- **Performance Ceiling**: Smaller parameter counts inherently limit their problem-solving capacity compared to Large Language Models (LLMs).

Use Cases for Large vs. Small Models

- **Small Language Models (SLMs)**: Great for focused, simpler tasks such as **translation**, **basic customer service**, and other specific applications. Example: **WhatsApp** using Llama 8B for language learning.
- **Large Language Models (LLMs)**: Excel at more complex tasks like **coding**, **logical reasoning**, and solving intricate problems.
- **The analogy to human brains:** Just like **humans** have large brains for complex tasks, **LLMs** have a larger parameter size for more advanced capabilities, while **SMs** are designed for narrower, simpler tasks.

Relevance for India

- In **India**, where AI adoption is growing but resources may be limited, **SMs** are ideal due to their **affordability** and ability to meet specific needs.
- Projects like **Visvam** from **IIIT Hyderabad** are building **small language models** tailored for **healthcare**, **agriculture**, **education**, and promoting **language and cultural diversity**.
- **Sarvam AI** is also working to create AI solutions that cater to the needs of **a billion Indians**.

National Broadband Mission (NBM) 2.0

Sub Topic: *Achievement in the Field Of IT, Computer*

Context:

Union Minister of Communications, Jyotiraditya Scindia, has announced the launch of the **National Broadband Mission (NBM) 2.0**, aimed at significantly enhancing broadband connectivity in rural India.

More on News

- The primary goal is to provide **broadband connectivity to 170,000 villages** across India.
- Ensure **60 out of every 100 rural households** have broadband access.
- The Mission encourages using **Power Sector Assets**, such as electricity transmission lines and ground cabling, to transport **fibre optic cables**.

Key Objectives of NBM 2.0

- **Expanding Connectivity:** The government plans to extend optical fibre cable (OFC) connectivity from the current 50,000 villages to **270,000 villages** by 2030, ensuring **95% uptime**.
- **Enhanced Broadband Speeds:** The initiative aims to increase fixed broadband download speeds from the national average of **63.55 Mbps** to at least **100 Mbps** by 2030.
- **Broadband for Anchor Institutions:** The mission targets providing broadband services to at least **90% of anchor institutions** such as schools, primary health care centres, Anganwadi centres, and panchayat offices.
- **Sustainable Energy for Mobile Towers:** The government also aims to make at least **30% of all mobile towers** in the country run on sustainable energy by 2030.
- **Reducing Right of Way Application Time:** The disposal time for Right of Way

applications will be reduced from the current **60 days** to **30 days** by 2030.

Right of Way and Wireless Connectivity

- **Right-of-way** permissions for fibre cables and telecom towers should be streamlined through coordination between **Union and State governments**.
  - The Mission aims to expand **wireless connectivity** and improve **5G services** by enhancing street furniture infrastructure across the country.
- The definition of broadband in India includes mobile internet with speeds greater than **2Mbps**.

Additional Initiatives

- Launched the **Sanchar Saathi** mobile app, which allows users to report suspicious calls and messages directly from their mobile phone logs.
  - The portal includes features like **Chakshu**, to report fraud communications and tools to disable handsets in case of theft or misuse of multiple SIMs under an individual's name.
- **Intra Circle Roaming (ICR)** at 4G mobile sites: This initiative, funded by the **Universal Service Obligation Fund** (now called **Digital Bharat Nidhi**), will allow telecom towers to provide **4G services from multiple telecom operators** at **27,836 sites** in rural and remote areas.

Vision for Rural Digital Empowerment

- The mission aims to create a **robust digital infrastructure** for rural India, enhancing connectivity and empowering communities with faster internet access.
- Focus on sustainable and inclusive digital growth to bridge the rural-urban digital divide.

Bolstering Navy's Underwater Power

Sub Topic: *Achievement in the Field Of Defence Technology*

Context:

The **Ministry of Defence** has signed **two significant contracts worth ₹2,867 crore to enhance the Indian Navy's underwater capabilities,** focusing on retrofitting Kalvari-class submarines with advanced **air-independent propulsion (AIP)** systems and integrating **electronic heavyweight torpedoes (EHWT)** to increase their firepower.

More on News

- A ₹1,990-crore contract was signed with **Mumbai-based Mazagon Dock Shipbuilders Limited (MDL)** for constructing an AIP plug developed by the **Defence Research and Development Organisation (DRDO)** and integrating it into the submarines.
- A second contract worth ₹877 crore was signed with **France's Naval Group** for the integration of torpedoes to bolster the firepower of these diesel-electric submarines.

Air-Independent Propulsion (AIP)

- These systems are **advanced technologies that enable non-nuclear submarines to operate without the need for atmospheric oxygen,** allowing them to remain submerged for extended periods.
- **Working Mechanism:** AIP systems generate power using various methods, primarily **producing oxygen internally**. The main types include: **High Test Peroxide (HTP), Stored Liquid Oxygen (LOX), Stirling Engines and Fuel Cells**.
- **Advantages of AIP:** Increased Underwater Endurance, Enhanced Stealth, Flexibility in Design and Operational Versatility.

Significance

- The DRDO-developed AIP technology is expected to **significantly enhance the endurance of conventional submarines,** allowing them to **remain submerged for longer durations.**
- This initiative **aligns with India's 'Aatmanirbhar Bharat' (self-reliant India) mission**, with the AIP project alone **generating approximately three lakh man-days of employment.**
- The **integration of EHWT is a collaborative effort involving the Indian Navy, DRDO, and the Naval Group.**
- The **Kalvari-class (Scorpene) submarines**, constructed at MDL with technology transfer from Naval Group, are **versatile assets capable of anti-surface and anti-submarine warfare,** long-range strikes, special operations, and intelligence missions.
- The **Indian Navy currently operates five Kalvari-class submarines**, with the **sixth and final vessel, Vagsheer,** expected to join the fleet soon under the ₹23,562-crore **Project 75 programme.**

Project 75

Project 75, particularly its **extension Project 75I**, is a significant initiative by the Indian Navy aimed at **enhancing its submarine capabilities through indigenous construction and advanced technology integration**, including Air Independent Propulsion (AIP) systems.

Genome India Project

Sub Topic: *Biotechnology*

Context:

The Department of Biotechnology recently announced a platform and framework for sharing its dataset of **10,000 human genomes**, created as part of the Genome India Project.

What is Genome Sequencing?

- The **human genome** is an instruction manual inherited from parents, containing the genetic information that determines physical traits and predispositions to diseases.
- It is written using **four letters** (A, C, G, T) that represent the bases forming 3 billion base pairs in the complete genome.
- **Process of sequencing:** Genetic material is extracted from blood and cut into smaller, tagged fragments. A sequencer decodes these fragments, which are then assembled into a complete genome using the tags.

About Genome India Project

- Approved in **2020**, the project involves **20 scientific institutions** collaborating to sequence 10,000 genomes.
- **Diverse Representation**: Initially, the project completed the sequencing of **10,000 healthy genomes** from individuals representing **99 ethnic groups**.
  - The goal is to expand this to **1 million genomes**, including those with specific diseases, in order to capture the genetic makeup of all **4,635 population groups** identified in India.
- **Disease-Specific Insights**: Sequencing the genomes of individuals with specific diseases, such as **cancers, diabetes, neurological conditions, chronic conditions, and rare genetic disorders**, can provide critical insights for developing targeted treatments and diagnostics.
- **Policy Formulation and Innovation**: The amassed genetic data will be instrumental in formulating healthcare policies and fostering innovations in personalised medicine.

How Does the Database Help?

- **Genetic Risk Factors**: Identifies genetic factors responsible for diseases, leading to targeted therapies and diagnostic tests.
- **Discovery of New Variants**: Identified 135 million genetic variations, 7 million of which are unique to India.
- **Population-Level Data**: Helps understand the frequency of genetic variations causing diseases, such as the **MYBPC3 mutation** (cardiac arrest risk in 4.5% of Indians) and the **LAMB3 mutation** (skin condition in 4% of people near Madurai).
- **Rare Diseases**: Aids in identifying rare diseases and developing gene therapies.
- **Resistance to Medications**: Identifies genetic variants that make certain medications or anaesthetics ineffective, such as in the Vaishya community in South India.

Data Sharing Framework

- **Managed Access:** Data will only be available to Indian researchers and partner institutes through government-approved proposals.
- **Anonymity Measures:**
  - **Double-blinding:** Data is encoded at two stages to prevent breaches of anonymity.
  - Secure sharing via a central database.

Impacts and Future Potential

- **Healthcare Advancements**: Understanding the genetic basis of diseases and developing **precision medicine** tailored to the Indian context.
- **Targeted Interventions**: Creating specific healthcare interventions essential for various ethnic groups.
- **Research and Development**: Facilitating cutting-edge research in genomics, enabling the development of **genomic chips** tailored for Indian demographics.

Global Genome Sequencing Initiatives

- **Human Genome Project**: The first complete human genome was sequenced in 2003.
- **1,000 Genome Project**: Published 1,092 human genomes in 2012.
- **UK Project**: Sequenced 100,000 genomes by 2018.

- **European Effort**: Aims to sequence 1+ million genomes across 24 countries.

RNA, Not DNA, Drives Acute Sunburn

Sub Topic: *Biotechnology*

Context:

We have long believed that sunburn damages DNA, causing cell death and inflammation. However, a new study on mice and human skin cells shows this isn't entirely true. The main cause of sunburn's acute effects is RNA damage, not DNA. The study aimed to understand **how UV radiation harms the skin** and uncovered that RNA damage triggers inflammation and cell death.

Key Findings

- A recent study **challenges the long-held belief that DNA damage** is the primary cause of sunburn.
- Research reveals **RNA damage**, specifically to messenger RNA (mRNA), as the main trigger for sunburn effects, including inflammation and cell death.
- Published in *Molecular Cell*, the study highlights the role of **ZAK-alpha protein** and the **ribotoxic stress response (RSR)** in the skin's reaction to UV radiation.

RNA Damage and the Ribotoxic Stress Response

- **Role of mRNA**
  - mRNA acts as a **carrier of genetic instructions from DNA to ribosomes** for protein synthesis.
  - UV radiation damages mRNA, activating cellular stress responses.
- **ZAK-alpha Protein**
  - ZAK-alpha **monitors mRNA damage,** initiating the RSR.
  - This leads to **inflammatory signaling, recruitment of immune cells,** and skin inflammation.
- **Study Observations**
  - In mice and human skin cells, **RNA damage was the first response to UV radiation.**
  - Mice without the **ZAK gene showed no inflammation or cell death,** confirming its central role.

Implications for Skin Health

- **Acute Effects of UV Radiation**
  - RNA damage triggers immediate responses like skin inflammation, epidermal thickening, and programmed cell death.
- **Distinct Roles of RNA and DNA Damage**
  - RNA damage is central to acute sunburn reactions, while DNA damage may play a secondary or delayed role.
  - Findings suggest implications for **skin immunity** and **skin cancer (carcinogenesis)**.

Subject –Environment, Biodiversity and Disaster Management

Climate Change and the Water Cycle

Sub Topic: *Climate change*

Context:

The *2024 Global Water Monitor Report*, produced by an international research team, highlights how the planet's water cycle has intensified, resulting in extreme weather events such as intense storms, flooding, and prolonged droughts. These changes are directly linked to the ongoing rise in global temperatures.

More on News

- A **2022 study in *Nature*** found that the global water cycle has intensified by **7.4%** since 1970.
- The **IPCC's sixth assessment report** predicts **long-term changes** to the water cycle, including more frequent and severe droughts and rainfall events.

What is the Water Cycle?

- The **water cycle** refers to the continuous movement of water in various forms—solid, liquid, and gas—across the Earth's surface, underground, and in the atmosphere.
- It is driven primarily by the Sun's energy, which causes evaporation, transpiration, and precipitation. This cycle is essential for

life, ensuring the availability of water and regulating weather patterns, such as rainfall and temperature fluctuations.

How Climate Change Impacts the Water Cycle?

- **Increased Evaporation**: Rising global temperatures accelerate evaporation rates, which in turn means that the atmosphere can hold more moisture. For every 1°C rise in temperature, the atmosphere can hold about 7% more moisture.
- **More Intense Storms**: The excess moisture leads to more intense, frequent, and longer storms, contributing to severe **flooding**.
- **Dry Regions and Droughts**: On the flip side, some areas are experiencing **droughts** as soils dry up faster due to increased evaporation. When it does rain, much of it runs off into rivers and streams, leaving the soil parched and increasing the risk of drought.
- **Erratic Water Cycle**: As global temperatures rise, the water cycle is becoming more erratic. Regions are seeing increased dry spells while others face heavier rainfall, leading to unpredictable and dangerous weather.

Key Findings of the 2024 Report

- **Record-breaking Water-related Disasters**: In 2024, water-related disasters caused **8,700+ fatalities**, displaced **40 million people**, and led to economic losses of over **$550 billion** globally.
- **Increase in Dry Months**: There were **38% more record-dry months** in 2024 compared to the baseline period (1995-2005), indicating a trend of increasing drought severity.
- **Increased Rainfall Extremes**: The report also noted a dramatic rise in rainfall extremes:
  - **27% more frequent** record-high monthly rainfall events compared to the year 2000.
  - **52% more frequent** daily rainfall records.
- **Decreasing Terrestrial Water Storage (TWS)**: Dry regions saw a continuing decline in **terrestrial water storage**, including groundwater and surface water. However, some regions like **Western, Central, and Eastern Africa** saw improvements.
- **Regional Projections for 2025**: **Droughts** are expected to worsen in **Northern South America**, **Southern Africa**, and parts of **Asia**. **Flood risks** may increase in regions such as the **Sahel** and **Europe**, where wetter conditions could cause more extreme precipitation events.

What This Means for the Future

- If global temperatures continue to rise—potentially by **2.6–3.1°C by 2100**—the water cycle will become even more erratic, with severe consequences:
  - More intense storms and flooding in some regions.
  - Extended droughts and dry spells in others.
  - Strain on water resources, agriculture, and infrastructure.

Solutions and Mitigation Strategies

- **Global Emissions Reductions**: Limiting global warming to **below 1.5°C** requires dramatic cuts in greenhouse gas emissions.
- **Water Resource Management**: Investing in infrastructure for **rainwater harvesting**, **efficient irrigation**, and **drought-resistant crops**. Enhancing **early warning systems** for floods and droughts.
- **Adaptation Policies**: Designing **climate-resilient cities** to manage extreme rainfall and water shortages. Protecting and restoring natural ecosystems like **wetlands** to regulate water flow.
- **Global Collaboration**: Sharing real-time data on precipitation, soil moisture, and water storage to predict and respond to changes effectively.

Flamingo Festival 2025

Sub Topic: *Biodiversity, Conservation*

Context:

The highly anticipated **Flamingo Festival 2025** is set to take place from **January 18 to 20** in the scenic Tirupati district of Andhra Pradesh, India.

More on News

- This vibrant festival, held after a gap of five years, celebrates the arrival of thousands of migratory birds, including the iconic Greater Flamingos, at the **Pulicat Lake** and **Nelapattu Bird Sanctuary.**
- Andhra Pradesh Chief Minister has emphasised hosting the festival as a **State-level event**, ensuring robust infrastructure development under the **Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)**.

Key Highlights

- **Migratory Birds**: The star attraction of the festival is the impressive sight of flamingos and other migratory birds flocking to the

region. Birdwatchers and nature enthusiasts can witness over **200 bird species** during this season, including Grey Pelicans, Painted Storks, Glossy Ibis, and Common Kingfishers.

- **Multiple Locations**: The event will be spread across five key locations: **Nelapattu**, **BV Palem**, **Atakanitippa**, **Sri City**, and **Sullurpeta**. Each location offers unique experiences ranging from birdwatching spots to eco-friendly biodiversity sessions.
- **Educational Activities**: The festival provides an excellent opportunity for visitors, particularly students, to learn about the rich biodiversity. The Environmental Education Centre in Doravarisatram Mandal will host educational activities focusing on the importance of migratory birds and their role in the ecosystem.
- **Cultural Programmes**: Alongside the birdwatching activities, the Government Junior College campus in Sullurpeta will host various cultural programmes. These programmes aim to celebrate the local culture and traditions, creating a festive atmosphere for all attendees.
- **Tourist Attractions**: Visitors can enjoy boating facilities at BV Palem and explore the beautiful wetlands of Pulicat Lake, which serve as a vital feeding ground for many bird species.

Ecological Significance

- The **Nelapattu Bird Sanctuary** is Southeast Asia's largest breeding ground for Grey Pelicans, with about 1,500 pelicans nesting there annually. The sanctuary, which spans **460 hectares**, supports a rich variety of flora and fauna, making it a significant ecological hotspot.
- Many of these migratory birds travel from distant regions such as Ladakh, Tibet, China, and even Australia, showcasing the global importance of the sanctuary.

Bharat Climate Forum

Sub Topic: *Climate Change, Environmental Impact Assessment*

Context:

The **Bharat Climate Forum** was launched with the goal of accelerating **cleantech manufacturing** in India, with a focus on self-reliance (Atmanirbhar Bharat) and addressing the climate crisis.

More on News

- This national platform aims to **unify stakeholders from policy, industry, finance**, and research to accelerate clean tech manufacturing in the country.
- The forum is hosted by the Centre for Indigenous Economic Understanding (**CIEU**) and Dalberg Advisors, with support from key governmental bodies such as the Ministry of New and Renewable Energy (**MNRE**), **NITI Aayog**, and the International Solar Alliance (**ISA**).
- Alongside this launch, India's active participation in global initiatives like **LeadIT (Leadership Group for Industry Transition)** underscores its dedication to achieving sustainable industrial transformation.

Objectives and Initiatives

- **Clean Energy Generation and Storage**: Promoting the development and deployment of renewable energy sources like solar, wind, hydrogen, and battery storage.
- **Manufacturing for Net-Zero**: Establishing robust domestic manufacturing capabilities to create jobs, reduce import dependencies, and ensure energy security.
- **E-mobility and Green Transportation**: Supporting the transition to electric vehicles and other green transportation solutions.
- **Climate Finance and Investment Mobilisation**: Encouraging investments and partnerships to drive research, innovation, and commercialisation of cleantech solutions.
- **Industrial Decarbonisation and Clean Energy Transition**: Reducing carbon emissions across various industrial sectors.

The Urgency of Self-Reliance in Clean Technology

- Achieving net-zero emissions by 2070 demands bold and coordinated efforts, particularly in building a **robust domestic manufacturing ecosystem** to support renewable energy, green mobility, and sustainable industries. India's interim climate targets reflect this ambition:
  - Reducing GDP emissions intensity by **45%** from 2005 levels by 2030.
  - Achieving **50%** of installed electricity capacity from non-fossil sources by 2030.

- Creating a 2.5–3 billion tonne CO carbon sink by 2030.

- **Economic Potential of Cleantech**: Dalberg estimates suggest cleantech manufacturing could create a domestic market worth USD 120-150 billion annually by 2030, generate export opportunities of USD 40-45 billion, and provide 50 million new jobs by 2070.

India's Role in Global Climate Action: LeadIT

- India's leadership extends beyond domestic efforts through its co-leadership of **LeadIT (Leadership Group for Industry Transition)**, a coalition of nations and companies committed to decarbonising heavy industries.
- Launched by **India and Sweden** at the **UN Climate Action Summit 2019**, LeadIT focuses on creating pathways for sustainable industrial transformation.
- **India plays a critical role in:**
  - Advancing clean energy adoption in hard-to-abate sectors like steel, cement, and chemicals.
  - Promoting collaborative efforts to align industrial growth with global climate targets.

Addressing Challenges and Opportunities

- **India's Climate Goals**: India's ambitious climate targets include achieving net-zero emissions by 2070 and scaling up non-fossil fuel capacity to 500 GW by 2030. Despite progress in renewable energy, challenges like import dependence for solar and wind infrastructure persist.
- **NK Singh**, chairman of the 15th Finance Commission, highlighted the need for a **national environment council** under the Prime Minister to address global challenges:
  - Trade protectionist measures like the **EU's Carbon Border Adjustment Mechanism (CBAM)** and deforestation regulations pose significant risks to India's exports and climate efforts.
  - Global uncertainties demand a focused and strategic approach to secure India's position in the evolving climate and trade landscape.
- National Co-Convener of Swadeshi Jagran Manch, emphasised that self-reliance in climate technology is not only an economic imperative but also a **strategic necessity**:
  - Global players are increasingly safeguarding their patented cleantech solutions, making it critical for India to build its own ecosystem for electric vehicles, solar energy, and hydrogen.

Hollongapar Gibbon Wildlife Sanctuary

Sub Topic: *Biodiversity, Conservation*

Context:

The **Standing Committee of the National Board for Wildlife (NBWL)** has approved **oil and gas exploratory drilling** in the eco-sensitive zone (ESZ) of **Hollongapar Gibbon Wildlife Sanctuary** in Assam.

- This decision was made during the **81st meeting** of the committee, raising concerns about balancing energy development with wildlife conservation.

Background:

- In November 2024, a **site inspection** was conducted by representatives from the **Ministry of Environment, Forest and Climate Change (MoEFCC)**, the **Wildlife Institute of India (WII)**, and Assam's Forest Department.
- The inspection found that **exploratory drilling** would cause **minimal damage** to the environment but stated that **commercial drilling** would not be permitted.
- The inspection team recommended **no oil or gas extraction** within the ESZ, even if hydrocarbon reserves were discovered.

The Project Details

- **Objective:** The project aims to conduct exploratory drilling based on seismic mapping results to identify potential hydrocarbon reserves.
- The proposed drilling project, led by an oil exploration company, covers an area of **4.4998 hectares**.
  - This includes a **1.44-hectare well pad** and a **3.0598-hectare access road** in the **AA-ONHP-2017/4 block**. The site is located approximately **13 kilometres** from the sanctuary.
- The sanctuary's ESZ extends over **264.92 square kilometres**, linking it with adjacent

forest areas in **Assam** and **Nagaland** to preserve crucial biodiversity corridors.

About Hollongapar Gibbon Sanctuary

- **Location and Size:** The **Hollongapar Gibbon Wildlife Sanctuary** is located in **Jorhat district** of **Assam**, covering an area of **20.98 square kilometres**.
- **Historical Background:** The sanctuary was known as **Hoollongapar Forest** during the **British period** in **1881** before being designated as a wildlife sanctuary.
- **Ecological Significance:** The sanctuary is home to the **Hoolock gibbon**, India's only ape species, and six other primate species. It acts as a critical biodiversity refuge and provides forest corridors to the **Dissoi Valley Reserve Forest** and habitats in **Nagaland**.
  - The sanctuary's fragile ecosystem is at risk, especially if the exploratory activities are followed by commercial drilling or extraction in the future.

Environmental Safeguards and Conditions

- The NBWL has imposed **stringent conditions** to minimise environmental impact:
- **Real-time digital surveillance** to monitor operations.
- Submission of **detailed operational plans** to regulatory bodies before work begins.
- **Minimal tree felling** during the exploration process.
- **Strict pollution control measures** to safeguard the environment.
- **Prohibition on oil and gas extraction** within the ESZ, even if reserves are found.

Ecological and Conservation Implications

- The sanctuary's ecological importance lies in its unique role as a **biodiversity hotspot**, particularly for the endangered **Hoolock gibbon**.
- The ESZ serves as a crucial buffer zone and ensures connectivity with surrounding forests, making any intrusion into this space a subject of concern.
- Conservationists have highlighted the need for vigilance to ensure exploratory activities do not disturb the fragile ecosystem.

Subject – Internal Security

Reimposition of Protected Area Regime (PAR) in Northeast India

Sub Topic: *Role of External State and Non-State Actors in Creating Challenges to Internal Security.*

Context:

The Ministry of Home Affairs (MHA) recently **reimposed restrictions under the Protected Area Regime (PAR) in Manipur, Nagaland, and Mizoram.** This decision comes against the backdrop of rising ethnic violence, border security concerns, and the influx of refugees from Myanmar.

About the MHA Orders

Key Developments

- **2010 Relaxation:** PAR restrictions were **relaxed for Manipur, Nagaland, and Mizoram** to promote tourism and reflect an improved security environment. These relaxations, initially for **one year, were extended periodically until December 31, 2027.**
  - **Conditions for Exemption:**
    - Citizens of Afghanistan, China, and Pakistan required prior MHA approval.
    - Myanmar nationals visiting beyond 16 km of the Indo-Myanmar border needed MHA approval.
    - Foreigners were required to register with FROs within 24 hours of arrival.
- **2023 Withdrawal:** The relaxation **was abruptly ended** on December 17, 2024, **citing renewed security threats.**

About PAR and Areas Covered

- **Definition:** The Protected Area Regime (PAR) restricts foreigners from entering designated areas in India without prior government permission. It is governed by the **Foreigners (Protected Areas) Order, 1958.**
- **Purpose:**
  - Monitor foreign movement in sensitive regions near international borders.
  - Ensure national security in vulnerable areas.

- **Areas Covered:** PAR **applies to regions between the Inner Line and the International Border** in the following states and union territories:
- **Protected Areas:**
  - **Entire States:**
    - Manipur, Mizoram, Nagaland, Arunachal Pradesh
    - Sikkim (partially)
  - **Parts of States:**
    - Himachal Pradesh, Jammu & Kashmir, Ladakh, Rajasthan, Uttarakhand

Restricted Areas:

- Entire Andaman & Nicobar Islands **(since 1963)**
- Parts of Sikkim

Key Rules for Foreigners under PAR

- **General Rules:**
  - **Permit Requirement:** Foreigners need a PAP, except Bhutanese nationals.
  - **Mandatory Registration:** Foreigners must register with the Foreigners Regional Registration Office (FRRO) or local authorities within 24 hours of arrival.
  - **Additional Restrictions:**
    - Citizens of **Afghanistan, China, and Pakistan,** or individuals of Pakistani origin, need prior MHA approval.
    - Myanmar nationals must register, even if visiting with an e-tourist visa.
- **Exceptions:**
  - **Diplomats and UN Officials:** Special instructions are issued by the Ministry of External Affairs (MEA).

Reasons Why PAR Been Reimposed

- **Ethnic Violence in Manipur:**
  - Ongoing clashes since May 2023 between the **Kuki-Zo tribal groups** and the **Meitei community.**
  - Chief Minister N. Biren Singh has linked the unrest to "outsiders and foreign hands."
- **Myanmar Refugee Influx:**
  - Following Myanmar's 2021 military coup, over 44,000 undocumented migrants (primarily **Kuki-Chin-Zo ethnic group**) sought refuge in Manipur and Mizoram.
- **Border Security Concerns:**
  - India shares a 1,643 km border with Myanmar, passing through Arunachal Pradesh, Nagaland, Manipur, and Mizoram.
  - The **Free Movement Regime (FMR),** which allowed border residents to cross freely within 16 km, was suspended in January 2024.

Gulf of Mexico

Context:

U.S. President-elect Donald Trump proposed renaming the Gulf of Mexico as the "Gulf of America."

- It is often referred to as the **Mediterranean of the Americas** due to its significant size, location, and connection to various regions.

A **gulf** is an **inlet** of the ocean into the land, typically characterised by being **larger** and **more deeply indented** than bays. **Gulfs** are often formed due to **plate tectonics** and are sometimes connected to the ocean by **narrow water passages**, though this connection can vary geographically.

About the Gulf of Mexico

- The **Gulf of Mexico** is a **marginal sea** of the **Atlantic Ocean** and holds the title of the **world's largest gulf**.
- It spans an area of approximately **1,507,639 km²**.
- The Gulf of Mexico is **situated** on the **southeastern coast of North Ameri**.
- It is **bordered** by the **US states** (Mississippi, Louisiana, Texas, Alabama, and Florida) to the north, northeast, and northwest.
  - To the **south and southwest**, it is bordered by the **Mexican states** (Campeche, Quintana Roo, Tabasco, Tamaulipas, Veracruz, Yucatan).
  - To the **southeast**, it is bordered by the island of **Cuba**.
- **Rivers:** The **Mississippi River** and the **Rio Grande** are the major rivers that drain into the Gulf of Mexico.
- **Connections to Other Water Bodies**: The Gulf connects to the **Caribbean Sea** through the **Yucatan Channel** (between Cuba and Mexico).
  - It connects to the **Atlantic Ocean** via the **Straits of Florida** (between Cuba and the US).
- **Size**: The Gulf of Mexico is the **9th largest water body** in the world. It measures approximately **1,600 km** from **west to east** and about **900 km** from **north to south**.
- **Climate**: The climate of the Gulf of Mexico region varies from **tropical** to **subtropical**.

- **Marine Life**:
  - **Marine Flora**: Includes **seagrasses**, **mangroves**, **marine algae**, and **marsh grasses**, which provide habitats for marine life.
  - **Marine Fauna**: **Organisms** range from microorganisms (benthos, meiofauna) to larger animals like crabs, sea pens, and crinoids. The Gulf supports a wide range of marine animals including **fishes**, **plankton**, **bivalves**, **shrimps**, and **manatees**.

Species in News

Gaddi Dog of the Himalayas Officially Recognised by ICAR-NBAGR

Context:

The Indian Council of Agricultural Research-National Bureau of Animal Genetic Resources (ICAR-NBAGR) recently recognised the **Gaddi dog**, an **indigenous breed from the Himalayan region.** This recognition marks a significant step in conserving this rare and endangered canine breed.

About the Gaddi Dog

- **Location:** The **Gaddi dog**, also known as the **Bhote Kukur** or **Bhotia dog**, is a hardy and strong breed primarily found across the Himalayan range from **Jammu and Kashmir to Arunachal Pradesh**, with significant populations in **Himachal Pradesh.**
- **Nomenclature:** These dogs are named after the **Gaddi shepherds of Himachal Pradesh**, who rely on them to guard their flocks against predators like **snow leopards** and wolves.

Key Characteristics

- **Appearance**: **Medium-sized,** robust build with long, predominantly black fur and occasional white markings. They are distinguished by their **massive, arched necks** and harmonious body structure.
- **Behavior**: Known for their **strength, loyalty,** and ability to fend off wild carnivores, earning them nicknames such as the "**Indian Panther Hound**" and "**Indian Leopard Hound**."
- **Breeding**: These dogs have a **litter size of 4-8 pups,** and a lifetime **whelping capacity of 8-12.**
- **Origins**: Believed to have descended from the **Tibetan Mastiff**, although they are less bulky and have unique characteristics such as a lion-like tufted mane.

Reason for This Step

The recognition of the Gaddi dog by ICAR-NBAGR aims to **address the alarming decline in the breed's population.** According to estimates, **fewer than 1,000 Gaddi dogs remain today** due to:

- **Dilution of the gene pool**: A lack of breeding programmes has led to crossbreeding and loss of purebred individuals.
- **Lifestyle changes**: The decline of the nomadic lifestyle among Gaddi shepherds has reduced the demand for these dogs.
- **Unregulated breeding**: The absence of scientific validation and recognition allowed breeders to misrepresent the Gaddi dog.

Criteria for Selection as an Official Breed

To qualify as an official breed, the following criteria were applied:

- **Morphological and genomic characterisation**: Comprehensive studies conducted by researchers, including those at the **Conservation-Cum-Propagation Centre for Gaddi Dogs** in Himachal Pradesh.
- **Breed-specific traits**: Distinctive physical and behavioural characteristics that set the breed apart from others.
- **Geographic uniqueness**: Adaptation to the **cold Himalayan climate** and its historical significance to local communities.

Benefits of Being Recognised as an Official Breed

The recognition of the Gaddi dog brings several advantages, including:

Other Breeds Recognised

The Gaddi dog joins the ranks of three other officially recognised indigenous breeds:

- **Rajapalayam** (Tamil Nadu)
- **Chippiparai** (Tamil Nadu)
- **Mudhol Hound** (Karnataka) This makes the Gaddi dog the first officially recognised Himalayan dog breed.

- **Preservation of genetic resources**: Defined characteristics will help maintain the breed's purity.
- **Conservation programmes**: The Animal Husbandry Department can now initiate census and breeding initiatives.
- **Increased demand**: Registration will likely boost demand for Gaddi dogs, both as working dogs for shepherds and as pets for households in colder regions.
- **Regulation of breeders**: Recognition provides guidelines to ensure ethical breeding practices.

Olive Ridley Turtles

Context:

Over the past two weeks, around **300 to 350 olive ridley turtle carcasses have washed ashore along Tamil Nadu's coastline,** particularly in Chennai, raising alarm among conservationists.

Early Spike in Mortalities

- Olive ridley turtles typically **arrive near the Tamil Nadu coast between September and October to breed,** with their nesting season spanning late November to March.
- While some deaths during this period are expected, the unusually high number of carcasses this early in the season has raised red flags.

The **olive ridley turtle (Lepidochelys olivacea)** is the **smallest and most abundant species of sea turtle**, known for its distinctive heart-shaped, olive green carapace. Adults typically measure between 2 to 2.5 feet (62-70 cm) in length and weigh between 77 to 100 pounds (35-45 kg). These turtles **inhabit tropical and subtropical waters across the Pacific, Atlantic, and Indian Oceans**. A notable feature of the olive ridley is its **unique nesting behaviour known as *arribada***, where thousands of females come ashore simultaneously to lay eggs, with each clutch averaging over 110 eggs that incubate for approximately 52 to 58 days. Despite their abundance, olive ridley turtles are classified as ***Vulnerable*** by the **International Union for Conservation of Nature (IUCN)** due to threats such as direct harvesting, incidental capture in fisheries, and habitat loss. Their **diet consists mainly of crustaceans, molluscs, jellyfish, and fish,** and they are capable of diving to depths of around 500 feet (150 m) in search of food.

Causes of Death

- The primary cause of olive ridley turtle deaths during mating and nesting season is **accidental entanglement in fishing nets.**
  - These turtles, which mate in nearshore waters, often get caught in the long fishing nets of commercial trawlers. **Unable to surface for air, they asphyxiate and die.**
- Post-mortem examinations of carcasses revealed **lesions on the lungs, indicating suffocation.**
  - Other signs include **bulging eyes and swollen necks, consistent with drowning.**

Preventive Measures

- Experts suggested that a **comparative analysis of fish catch data** from Chennai's harbours this year versus previous years could help determine whether a spike in fish landings has contributed to the increased deaths.
- There is a need for **stricter enforcement of turtle-excluding devices (TEDs)** in fishing nets.
  - These devices allow turtles and other bycatch to escape through a flap in the net.

Olive Ridley Nesting Process

- Olive ridley turtles **nest along several coastal states in India,** with mass nesting primarily occurring in **Odisha, Andhra Pradesh, and Tamil Nadu.**
- In Odisha, beaches like ***Gahirmatha and Rushikulya*** witness the arrival of lakhs of female turtles annually.
- Each turtle lays between 100 and 110 eggs in nests made using their flippers.
  - After covering the nests with sand to protect them from predators, they return to the sea.
  - Hatchlings emerge after 45-60 days and make their way to the ocean.
- In areas with high human disturbance or predation, Forest Departments set up hatcheries where eggs are carefully relocated, incubated, and later released as hatchlings near the sea.

The recent deaths underscore the urgent need for conservation efforts and stricter regulations to protect olive ridley turtles.

Economic Survey 2024-25 & Union Budget 2025-26

Economic Survey 2024-25

Economic Survey 2025

It provides an elaborated analysis of the economic performance of the country over the previous year (2024-2025) and includes key policy recommendations for the upcoming fiscal year (2025-2026).

Structure of the Economic Survey 2025

The Economic Survey 2025 is divided into two parts:

- **Part A:** Focuses on economic trends, key challenges, and policy recommendations that shape the government's approach to economic management.
- **Part B:** Provides detailed statistical analysis of various sectors, including agriculture, industry, services, infrastructure, healthcare, and environmental concerns.

Economic Survey 2025 History

The Economic Survey was first presented in 1950-51 as part of the Union Budget and since 1964, it has been presented as a stand-alone document. This change was made to ensure an elaborated review of economic developments in the previous year before budget release.

Why is the Economic Survey Released Before the Budget?

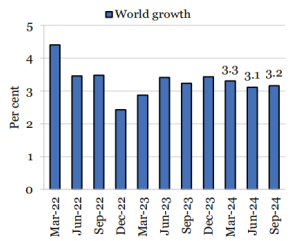
The Economic Survey is released a day before the Union Budget to ensure transparency and build the foundation for budget decisions. It offers an economic overview by analyzing growth trends, challenges, and opportunities while highlighting key issues such as inflation, fiscal deficit, unemployment, and sectoral performance.

The Economic Survey helps to shape policy direction, influencing budget allocations and reforms. Understanding the linkage between the Economic Survey and the Budget is important, as it reflects the government's economic strategy, policy priorities, and governance approach.

GLOBAL ECONOMIC SCENARIO

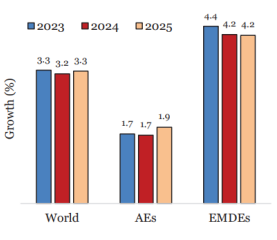
- The year witnessed unprecedented electoral activity on the political front, with more than half of the global population voting in major elections across countries.
  - adverse developments like the Russia-Ukraine conflict and the Israel-Hamas conflict increased regional instability.
  - These events impacted energy and food security, leading to higher prices and rising inflation.
  - Cyberattacks also became more frequent and severe, with growing human and financial consequences due to the increasing digitisation of critical infrastructure.
- Geopolitical risks and policy uncertainty, especially around trade policies, have also contributed to increased volatility in global financial markets.
  - The global economy grew by 3.3 per cent in 2023. The International Monetary Fund (IMF) has projected growth of 3.2 per cent and 3.3 per cent for 2024 and 2025, respectively.

Chart I.1: Resilient global growth trends in 2024



Source: OECD Economic Outlook, Volume 2024 Issue 2.

Chart I.2: Steady growth outlook across country groups



Source: IMF WEO (January 2025)
Note: AEs- Advanced Economies, EMDEs- Emerging market and developing economies

- Over the next five years, global growth is expected to average around 3.2 per cent, which is modest by historical standards.

DOMESTIC ECONOMY REMAINS STEADY AMIDST GLOBAL UNCERTAINTIES

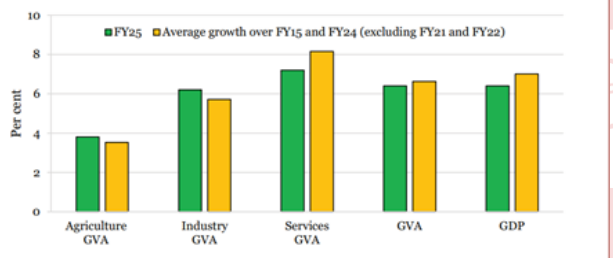
- As per the first advance estimates released by the National Statistical Office, Ministry of Statistics & Programme Implementation (MoSPI), the real gross domestic product (GDP) growth for FY25 is estimated to be 6.4 per cent.
- From the angle of aggregate demand in the economy, private final consumption expenditure at constant prices is estimated to

grow by 7.3 per cent, driven by a rebound in rural demand.

- PFCE as a share of GDP (at current prices) is estimated to increase from 60.3 per cent in FY24 to 61.8 per cent in FY25.

- This share is the highest since FY03. Gross fixed capital formation (GFCF) (at constant prices) is estimated to grow by 6.4 per cent.
  - On the supply side, real gross value added (GVA) is also estimated to grow by 6.4 per cent.
- The agriculture sector is expected to rebound to a growth of 3.8 per cent in FY25. The industrial sector is estimated to grow by 6.2 per cent in FY25.
  - Strong growth rates in construction activities and electricity, gas, water supply and other utility Economic Survey 2024-25 12 services are expected to support industrial expansion.
- Growth in the services sector is expected to remain robust at 7.2 per cent, driven by healthy activity in financial, real estate, professional services, public administration, defence, and other services.

Chart I.20: Despite global uncertainty, India's growth remains close to decadal average (at constant prices)



Source: Calculations based on Statement 13: Annual and Quarterly Estimates of GDP at constant prices, MoSPI
Note: FY25 values are First Advance Estimates.

Analysis of GDP by expenditure categories:

- India's GDP at constant (2011-12) prices grew by 6.7 per cent and 5.4 per cent in Q1 and Q2 FY25, respectively.
  - This implied a real GDP growth of 6.0 per cent in the first half of the current fiscal.

Chart I.29: GDP growth in H1 FY25 at 6.0 per cent

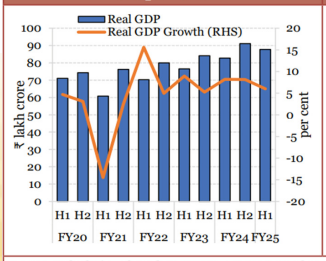
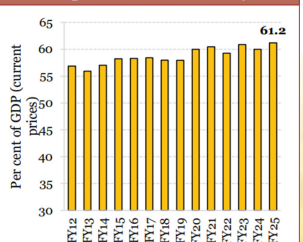


Chart I.30: Highest share of private consumption in H1 across all years

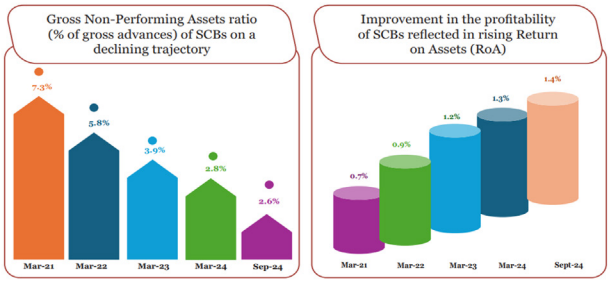


Source: Calculations based on Statement 13: Annual and Quarterly Estimates of GDP at constant prices and Statement 14: Annual and Quarterly Estimates of GDP at current prices, MoSPI

Improvement in asset quality of banks

- The GNPA ratio of SCBs has declined consistently from its peak in FY18 to a 12- year low of 2.6 per cent at the end of September 2024.
- Lower slippages and a reduction in outstanding GNPAs through recoveries, upgradations, and write-offs have led to this decrease.
- Lower GNPAs and higher provisions accumulated in recent years also contributed to a decline in net NPAs at around 0.6 per cent at the end of September 2024.

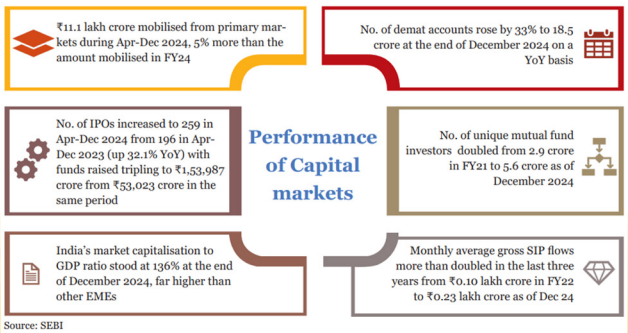
Improvement in asset quality of banks



Source: RBI Financial Stability Report, various issues

Development in capital markets

- As of December 2024, the Indian stock market has achieved new highs, with intermittent corrections, in the midst of geopolitical uncertainties, currency depreciation and domestic market volatility challenges.
- Investor participation has been a contributor, with number of investors growing from 4.9 crore in FY20 to 13.2 crore as of 31 December 2024.
- This growth, combined with active listing activity and recent measures by the regulator, viz. Securities and Exchange Board of India (SEBI), to temper excesses, is expected to foster sustainable market expansion.



Source: SEBI

Developments in the pension sector:

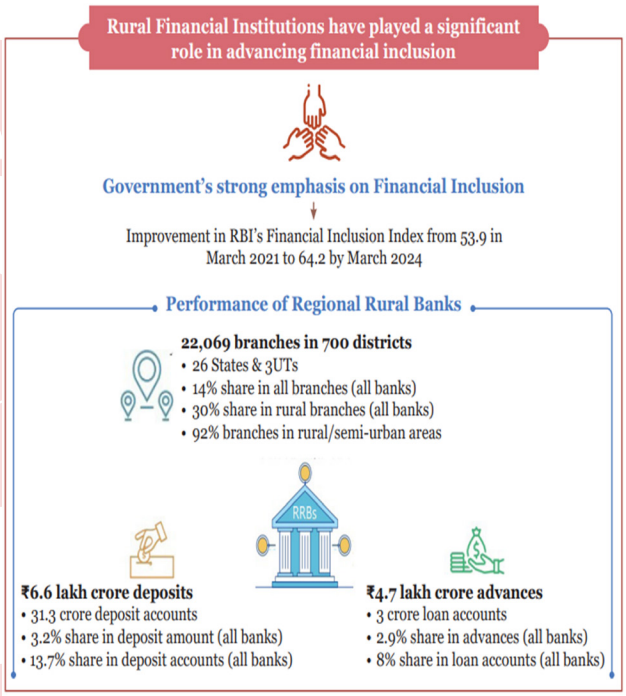
- The World Economic Forum (WEF) has highlighted that, for the first time in history,

globally, the number of people aged 65 and over has surpassed the number of children aged five and younger.

- According to the Mercer CFA Institute Global Pension Index61, 2024, India's overall index value has moderated from 45.9 in 2023 to 44 in 2024.
- India's pension sector has grown significantly since the introduction of the National Pension System (NPS) and Atal Pension Yojana (APY).
- As of September 2024, the total number of subscribers reached 783.4 lakh, showing a YoY growth of 16 per cent from 675.2 lakh in September 2023.
- The number of APY subscribers, which includes its earlier version, NPS Lite, rose from 538.2 lakh in March 2023 to 629.1 lakh in September 2024.
- APY subscribers comprise approximately 80.3 per cent of the overall pension subscriber base.
- Disaggregated data from the Pension Fund Regulatory and Development Authority of India (PFRDA) indicates significant improvements in terms of gender in the subscriber demographic for APY.
- On 24 August 2024, the government approved Unified Pension Scheme (UPS) for Government employees that will be implemented along with the present NPS, and will be effective from FY26.
- Additionally, the extension of NPS to children through the NPS Vatsalya68 is expected to contribute to this empowerment.

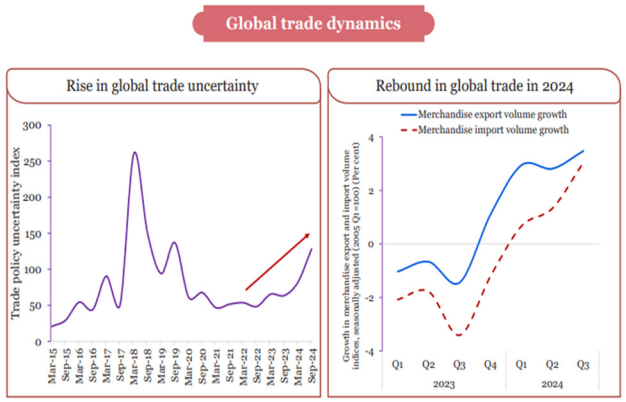
Cybersecurity aspects of India's financial sector

- Cyberspace has emerged as a multifaceted and rapidly evolving global environment where interactions among individuals, software, and services are facilitated by the widespread proliferation of information and communication technology (ICT) devices and networks.
- With technological advancements, the Indian financial sector is witnessing a digital transformation that has enhanced efficiency and accessibility and increased exposure to diverse cyber threats.
- These threats, ranging from phishing and ransomware to Distributed Denial of Service (DDoS) attacks, SMSing, and fake/malicious mobile applications, pose serious challenges to the financial system's stability.
- As per the information reported to and tracked by the Indian Computer Emergency Response Team (CERT-In)88, the number of observed and handled cybersecurity89 incidents stood at 11.6 lakh, 14 lakh and 13.9 lakh during 2020, 2021 and 2022, respectively.
- India's Tier 1 ranking in the Global Cybersecurity Index (GCI) 2024, with a commendable score of 98.49 out of 100, signifies a significant milestone in its cybersecurity journey.
- This recognition places India among the world's 'role-model' nations in cybersecurity.



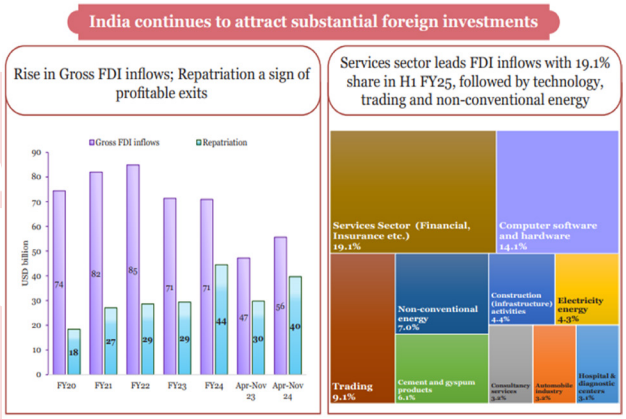
EXTERNAL SECTOR: GETTING FDI RIGHT

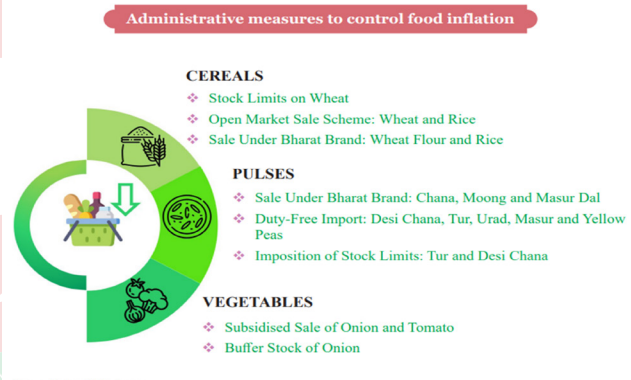
- Various indicators are used to monitor global risks and uncertainties and measure policy-related uncertainty's impact on global economic activity.
- These include the Geopolitical Risk (GPR) index3 , which tracks adverse geopolitical events through newspaper articles; the Trade Policy Uncertainty (TPU) index4 , which covers the frequency of articles mentioning trade policy uncertainty and heightened trade tensions, and the Global Economic Policy Uncertainty (GEPU) index5 , which is a GDP-weighted average of national Economic Policy Uncertainty (EPU) indices for 21 countries.
- These indices capture changes occurring in economies constituting about 71 per cent of global output.



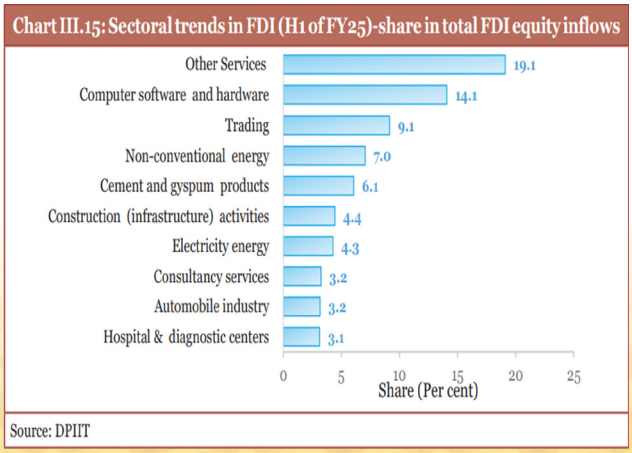
Performance of FDI flows

- FDI recorded a revival in FY25, with gross FDI inflows increasing from USD 47.2 billion in the first eight months of FY24 to USD 55.6 billion in the same period of FY25, a YoY growth of 17.9 per cent.
- Over the long term, FDI inflows into India have surpassed the USD 1 trillion mark from April 2000 to September 2024, solidifying the country's position as a safe and significant global investment destination.
- According to data from the Department for Promotion of Industry and Internal Trade (DPIIT), the cumulative FDI inflows, which include equity inflows, reinvested earnings, and other capital, reached USD 1,033.4 billion during this period.
- From a sectoral perspective, the services sector90 remains the largest recipient of FDI, accounting for 19.1 per cent of total equity inflows in H1 of FY25.
- Other significant sectors attracting foreign investments include computer software and hardware (14.1 per cent), trading (9.1 per cent), non-conventional energy (7 per cent), and cement & gypsum products (6.1 per cent).





Source: Various PIB releases



Source: DPIIT

Recent initiatives in the rail system

- **Gati shakti multi-modal Cargo Terminal (GCT):** 91 GCTs commissioned and 234 locations approved by October 31, 2024.
- **Net zero carbon emission:** Indian Railways targets 30 GW of renewable energy by 2029-30, with 375 MW of solar and 103 MW of wind commissioned as of October 2024.
- **Major economic corridors:** 434 projects valued at ₹11.17 lakh crore have been identified under three railway corridors, mapped on the PM GatiShakti portal.
- **Public Private Partnership (PPP):** 17 projects have been completed (₹16,434 crore) and 8 ongoing (₹16,614 crore) under the PPP model.

Major projects

- **Mumbai-Ahmedabad High-Speed Rail Project:** Sanctioned in December 2015, this 508 km project, supported by Japan, has a revised cost of ₹1.08 lakh crore. As of October 2024, it has achieved 47.17 per cent physical progress with an expenditure of ₹67,486 crore.
- **Dedicated Freight Corridors (DFCs):** As of November 2024, 2,741 km (96.4 per cent) of the planned 2,843 km DFC network has been commissioned. DFCs have transformed logistics in India by facilitating increased freight volumes without passenger train interference.

Box VI.2: Steps for enhancing passenger amenities in railways

Indian Railways is undertaking several initiatives to enhance passenger experience and station amenities. Key projects mainly focus on station redevelopment, affordable healthcare, improving catering services and supporting local artisans.

- **Amrit Bharat Station Scheme:** Under this initiative, aimed at enhancing railway station amenities, 1337 stations have been identified for redevelopment; work has started in 1197 of them.
- **Pradhan Mantri Bhartiya Janaushadhi Kendras (PMBJKs):** In the pursuit to enhance the wellness and welfare of passengers passing through railway stations, 50 PMBJKs were started in railway station premises. In addition, on November 13, 2024, 18 new PMBJKs were inaugurated, providing affordable medications and healthcare services at railway stations.
- **Food and catering services:** A new policy for managing mobile catering was introduced on November 14, 2023. As of November 23, 2024, this has resulted in the establishment of 557 Base Kitchens servicing 468 pairs of trains.
- **One Station One Product Scheme:** This scheme is operational at 1,900 stations, featuring 2,163 outlets that benefit 79,380 local artisans by providing sales opportunities for their products.
- **Passenger amenities:** Train Indication Boards have been provided at 1,351 stations, Coach Guidance Systems at 866 stations, and Wi-Fi availability at 6,112 stations, enhancing passenger experience.

Box VI.4: Development of national highways – progress from a project-based approach to a corridor-based approach

The shift from project-based national highway development to corridor-based approach helped increase the highway length from 91,287 km in 2014 to 1.46 lakh km in 2024. This approach takes into account evolving regional and national needs.

- **Bharatmala Pariyojana:** Launched in October 2017, it aims to develop 34,800 km of National Highways. By 2024, approximately 76 per cent of the projects (26,425 km) has been awarded, and 18,926 km have been constructed.
- **Char Dham Mahamarg Pariyojna:** As of 2024, road project to connect all four dhams through highway with total length of 825 km and 620 km has been completed.
- **National High-Speed Corridors (HSCs):** Length of HSCs expanded from 93 km in 2014 to 2,474 km in 2024.
- **4-lane and above - National Highways (excluding HSCs):** The length grew approximately 2.5 times, from about 18,300 km to 45,900 km between 2014 and 2024.

Box VI.6: Major achievements and initiatives in port sector

Infrastructure Development

- **Vadhavan Mega Port:** The port is being developed with over ₹76,000 crore investment; this port will have nine container terminals and various berths.
- **Tuticorin International Container Terminal:** Inaugurated in September 2024, it is designed to handle 6 lakh twenty-foot equivalent units (TEUs) annually and accommodate container vessels up to 10,000 TEUs.
- **Outer harbour at Tuticorin:** This project aims to boost port capacity by 4 million TEUs with two 1,000-meter terminals.

Port-led Industrialisation

- **Port-Led Industrialisation:** Union Cabinet approved 12 new industrial smart cities with an investment of ₹ 28,602 crore across 10 states, along with 8 additional sanctioned projects.
- **Utilisation of salt lands:** Around 25,000 acres of salt lands have been identified to enhance port sector infrastructure.

International Linkages

- **Chabahar Port and INSTC:** Shahid Beheshti Port at Chabahar connects Mumbai to Eurasia via the INSTC, reducing transport costs and time, leading to a 43 per cent increase in vessel traffic and a 34 per cent rise in container traffic for FY24.
- **Sittwe Port, Myanmar:** Sittwe Port, part of the Kaladan Project, offers an alternative route to north-eastern states, reducing transport costs between Kolkata and Mizoram.

PPP Projects

- The Central Government approved 98 PPP projects, including 23 captive projects, worth around ₹69,800 crore, excluding the Vadhavan Port Project with a PPP investment of ₹38,000 crore. Currently, 56 projects valued at ₹41,480 crore are operational, increasing port capacity by approximately 550 million tonnes per annum (MTPA).

Box VI. 7: Inland waterways transformation: key projects and initiatives

India is enhancing waterway connectivity to the North-East by developing waterways in Bangladesh and funding 80 per cent of the ₹305 crore project. India is also investing ₹1,010 crore to improve the Brahmaputra and Barak rivers and the Indo-Bangladesh Protocol route. Key initiatives include:

- **Harit nauka Guidelines:** Launched in January 2024, these guidelines aim to green 1,000 inland vessels over the next ten years.
- **Cargo promotion Scheme:** This initiative encourages cargo owners to switch from rail and road to inland waterways transport, promoting it as a sustainable alternative.
- **River cruise tourism:** Improved waterways have benefited both cargo and tourism, with 82,587 passengers on day cruises by October 2024 and a fivefold increase in night cruise passengers to 11,431 in FY24 compared to FY19.
- **Jal Marg Vikas Project on NW-1:** This project enhances cargo transport on the Ganga-Bhagirathi-Hooghly river system, achieving 65 per cent physical progress with a revised cost of ₹5,061.15 crore.
- **Jal Marg Vikas Project II (Arth Ganga):** Focused on sustainable development, this project includes the construction of community jetties and navigation improvements, with 49 out of 60 approved community jetties already commissioned.

Box VI.9: Providing connectivity in difficult terrains

Telecom infrastructure is being strengthened through Bharat Net Project, extending broadband to villages, and enhancing mobile coverage in the North-East, border areas, and islands. Key efforts include:

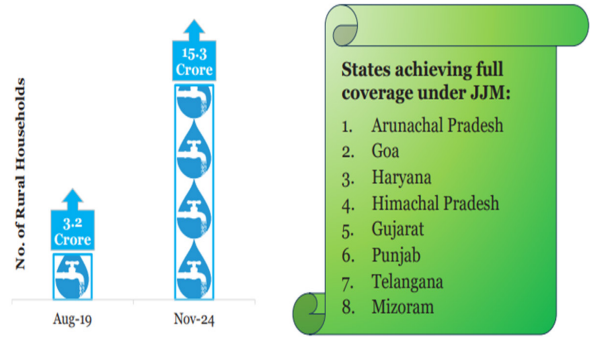
- **Bharat Net Project** to connect all Gram Panchayats and villages with broadband. As of December 2024, 6.92 lakh km of Optical Fibre Cable (OFC) has been laid, 2.14 lakh GPs are service-ready (including 5,032 via satellite, 12.04 lakh FTTH connections have been installed.
- **Comprehensive telecom development plan for north-eastern region:**
  Mobile Services: 1,358 sites providing services in uncovered villages and highways. Arunachal Pradesh and Assam: 671 towers cover 1,178 villages. Meghalaya: 433 towers cover 622 villages and 3 highways.
- **Telecom development for islands:**
  - Andaman & Nicobar Islands: Submarine OFC connectivity completed, with 205 Gbps bandwidth utilised and satellite bandwidth increased from 2 Gbps to 4 Gbps.
  - Lakshadweep Islands: Submarine OFC project (1,869 km) commissioned in January 2024, enabling 5G and FTTH services.
- **Mobile services in uncovered areas:**
  - Border Villages Scheme: 319 villages covered with 4G (295 towers).
  - LWE-Phase I & II: 297 towers upgraded to 4G under Phase I. 1,106 towers commissioned under Phase II, covering 1,162 locations.
- **Aspirational districts scheme:**
  - 502-Village Scheme: 215 towers commissioned, covering 251 villages across 112 districts in 4 states.
  - 7,287-Village Scheme: 2,497 sites commissioned, covering 3,804 villages in 5 states.

Table VI.1: Achievement under the standard uniform framework to evaluate cities

Protocol	Description	Progress
ODF certified	Complete access to toilets by citizens and ensuring that nobody goes out for open defecation at any time of day or night.	4,576 ULBs
ODF+	ODF and all community and public toilets are clean, hygienic and functional while following basic cleanliness criteria.	3,913 ULBs
ODF++	ODF+ and complete faecal sludge from toilets is safely contained, transported, and treated while ensuring that no untreated sludge is discharged in the open.	1,429 ULBs
Water+	ODF++ and ensuring that no untreated liquid waste (including wastewater) is discharged without proper treatment and ensuring maximum reuse of treated wastewater.	64 ULBs

Rural infrastructure

Progress under Jal Jeevan Mission: Access to safe piped drinking water



Source: Ministry of Jal Shakti

Box VI.13: Initiatives driving urban transformation

Several initiatives are being implemented to foster sustainable urban development and governance. These efforts focus on enhancing climate resilience, promoting data-driven decision-making, and improving infrastructure and citizen services across cities. These initiatives include:

- **Climate Smart Cities Assessment Framework (CSCAF):** Launched in 2019, this public assessment framework aims to enhance climate-sensitive development in cities. CSCAF 2.0 was introduced in 2020, evaluating 126 cities via 28 indicators across five thematic areas. The upcoming CSCAF 3.0 is currently being developed.
- **DataSmart cities strategy:** promotes data-driven governance with the data maturity assessment framework to assess cities' readiness to adopt data solutions, focusing on systemic and sectoral pillars.
- **National urban innovation stack:** facilitates collaboration within urban ecosystems by leveraging urban data, supporting data-driven governance.
- **National urban learning platform:** A scalable platform designed for capacity building among urban local bodies, offering a comprehensive approach to improve urban management capabilities.
- **City investments to innovate, integrate and sustain challenge:** supports innovative urban projects with significant funding, promoting circular economy practices. The second phase was approved in 2023 to fund climate-resilient infrastructure in a maximum of 18 cities.
- **Urban learning internship programme:** Launched in 2020, TULIP connects urban local bodies with youth, offering internship opportunities to enhance skills and experience in urban transformation. As of now, more than 49,000 internship opportunities have been posted across the nation, out of which over 14,500 internships are ongoing and completed.
- **National Urban Digital Mission:** seeks to establish shared digital infrastructure across cities, enhancing citizen-centric governance and service delivery by 2024.

Box VI.14: Space-based infrastructure monitoring platforms

ISRO's advanced geospatial platforms are playing a pivotal role in infrastructure monitoring and management. These initiatives support a range of projects, from rural development and electrical infrastructure to judicial and urban planning, enhancing efficiency and tracking progress.

- **ISRO's Bhuvan Platform:** supports infrastructure monitoring under schemes like MGNREGA and the watershed component of PMKSY at different stages of implementation.
- **Electrical infrastructure management:** Bhuvan facilitates the management of electrical infrastructure in Maharashtra and Telangana through Web-GIS portals.
- **NyayaVikas Portal for judicial infrastructure:** Developed in collaboration with the Department of Justice, this portal monitors 2,840 judicial projects using Web GIS and mobile geotagging, with over 7,900 geotags created to track progress.
- **Urban geospatial databases for AMRUT Cities:** ISRO has created large-scale 2D urban geospatial databases for 238 AMRUT cities, assisting in developing GIS-based master plans for urban planning.

BOX-VII.2: India's Innovation Landscape: Major Milestones...

- There is a more than 2-fold increase in patent filing since 2014-15, and patent grants have increased by more than 17-fold from 2014-15.
- There is a marked growth in resident filings which increased to more than 50 per cent of the total filings in FY24 from 28 per cent in FY15.
- The patent filings by domestic educational institutes have tripled from 7405 in 2021-22 to 23306 in FY24.
- Patent filings by women applicants increased from 15 in FY15 to 5183 in FY24.
- India's rank in the Global Innovation Index has improved to 39th in 2024 among 133 economies from 81st position in 2015. It ranks 1st among the 38 lower middle-income group economies and 1st among the 10 economies in Central and Southern Asia[17].
- India holds the 7th position in intangible asset intensity, surpassing the growth rates of many high-income economies and matching the intangible investment intensity of Germany and Japan (as a share of GDP).[18]
- India holds 4th position in Science and Technology Cluster Ranking 2024 by WIPO with 4 cities among the world's top 100 science and technology clusters[19].

Nonetheless, the Global Innovation Report 2024 notes that India needs to enhance human capital, improve access to finance and, reduce regulatory burdens further and improve infrastructure for innovation ecosystem.

BOX IX.4 : Kisan Rin Portal: Streamlining Agri Credit for Farmers' Prosperity

KISAN RIN PORTAL

The Kisan Rin Portal (KRP) launched in September 2023 addresses key challenges in the Modified Interest Subvention- Kisan Credit Card (MISS-KCC) scheme. Previously, banks had to submit claims for Interest Subvention (IS) and Prompt Repayment Incentive (PRI) manually to the Reserve Bank of India (RBI) and NABARD, leading to significant delays and inefficiencies. The Kisan Rin Portal digitises this process, ensuring farmers and lending institutions benefit from quicker, seamless transactions, improving access to credit for agricultural needs.

- **Empowering Farmers with Seamless Access to Credit:** The portal simplifies the process, enabling access to low-cost credit not only for traditional cropping activities but also for dairy, poultry, fisheries, and beekeeping.
- **Benefiting Financial Institutions: Banks and Cooperatives:** With the portal, banks can submit automated digital claims, streamlining the entire process. This not only improves efficiency but also helps banks track and manage claims more effectively, facilitating prompt disbursal of benefits.
- **Reaching the Grassroots: Training and Support:** The KRP's impact extends to over 453 banks nationwide, with 1.89 lakh branches and 4.65 lakh users actively involved in processing claims.
- **Current Success and Achievements:** By 31 December 2024, it had processed claims worth ₹108336.78 crore including Interest Subvention (IS) and PRI. About 5.9 crore farmers that are currently getting benefitted under the MISS-KCC scheme, have been mapped through KRP.

BOX-X.2 Mangrove Initiative for Shoreline Habitats & Tangible Incomes (MISHTI)

The 'Mangrove Initiative for Shoreline Habitats & Tangible Incomes (MISHTI)' was introduced in the Union Budget for 2023-24. It aims to promote and conserve mangroves, which are unique natural ecosystems known for their high biological productivity and carbon sequestration capabilities. Additionally, mangroves serve as a protective barrier for coastlines against cyclones, typhoons, and tidal waves.

The objective is to restore mangrove forests through reforestation and afforestation measures along India's coast. This will be achieved by adopting the best practices established in India and worldwide, all within a realistic timeline. The aim is to enhance sustainable livelihood options for coastal communities and improve the support and services the mangrove ecosystem provides to the community and the economy.

The programme will cover approximately 540 square kilometres across nine coastal states and four UTs over five years (2023-2028). It will create approximately 22.8 million man-days of employment with an estimated carbon sink of 4.5 million tons of carbon, creating potential areas for nature tourism and livelihood potential for local communities.

The programme is being implemented in convergence mode, with funding from the State Compensatory Afforestation Fund Management and Planning Authority (CAMPA), National CAMPA, Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and other sources. State forest departments are the primary implementing agencies of the programme. Gap funding to support the core and support activities under MISHTI is through National-CAMPA.

As of 30 November 2024, six states and UTs: Andhra Pradesh, Gujarat, Odisha, West Bengal, Kerala, and Puducherry have been allocated funds under the program. This funding is intended to treat 3,836 hectares under the National CAMPA program, based on the annual plans submitted by these states for their first-year activities. Additionally, through collaboration with other initiatives, including State CAMPA, the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), and various state-specific programs, a total of 22,560.34 hectares of degraded mangrove areas have been brought under restoration across 13 states and UTs.

Source: Based on inputs from the Green India Mission Directorate, MoEFCC.

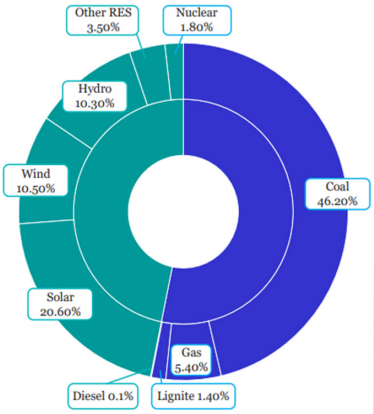
Progress towards India's NDCs

Renewable energy

Against the updated NDC target of 50 per cent by 2030, installed electricity generation capacity from non-fossil fuel sources has reached 46.8 per cent as on 30 November 2024

Forest cover

As per the latest Forest Survey of India 2024, an additional carbon sink of 2.29 billion tonnes CO2 eq. has been created between 2005 and 2023 against the NDC target of creating an additional carbon sink of 2.5 to 3 billion tonnes CO2 eq. by 2030



Climate initiatives

India's achievements on its climate commitments is attributed to a wide variety of schemes, policies, financial incentives and regulatory measures to boost renewable energy and green investments

Box XI.1: Evidence on the distribution of benefits from the PDS

Food subsidies constitute the largest fiscal outlay in the government's large set of social schemes. In 2022-23, Union government spent 6.5 per cent of its budget on the PM Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY) to provide free and subsidised food rations. As food subsidies were expanded (and consolidated under the PMGKAY) as part of the emergency fiscal response to COVID-19, the Union food subsidy bill increased from 0.5 per cent to one per cent of GDP between FY19 and FY23. Microdata from the HCES 2022-23 confirm that most households currently purchase food rations—at a subsidised price or free of cost—via the PDS and PMGKAY entitlements. The widespread coverage of ration cards protects low income and vulnerable populations.

The survey also provides insights into the allocation of these benefits across different segments of the population. In 2022-23, 84 per cent of the population had access to a ration card, including 59 per cent who reported holding a Below Poverty Line (BPL), *Antyodaya Anna Yojana* (AAY), or Priority Household (PHH) card in their household. In practice, 74 per cent of the population actively consumes food rations (or kerosene) via the PDS/ PMGKAY, with rice and wheat as the most commonly consumed food. Coverage of ration cards is higher in rural areas (at 89 per cent of the population) compared to urban areas (72 per cent).

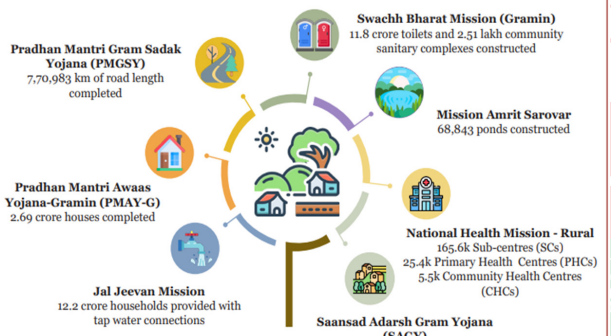
Experiments in integrating structured peer learning in India's Education system

The **Nalli-Kali (joyful learning in Kannada) programme**, launched in 1995 in Karnataka's Mysuru district, focuses on peer and group work to create a collaborative classroom environment that supports self-paced, personalised learning. It is now the primary pedagogy for Grades 1-3 in Karnataka to develop age-appropriate skills.[31]

The **Prerana model of education**, implemented in Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu, and Telangana[32] through the Sikshana Foundation, also emphasises peer learning and group work.[33] Small groups of four to five students collaborate on classroom activities, teaching and learning from each other.

Involve Learning Solutions Foundation[34] is working with educators in six districts across Uttar Pradesh, Bihar, and Karnataka states to integrate structured peer teaching into government schools, directly aligning with NIPUN Bharat's FLN goals. The model pairs among students identified as 'Student Champions' with 'Learners.' Each Student Champion, with better subject mastery, is trained further to support a group of four learners, their peers

Powering rural economy



Health for all

Affordable Medicine and Immunisation

Over 14000 Jan Aushadhi Kendras

Full immunisation coverage for FY 2023-24 at 93.5 per cent nationally

Insuring health and building Care

Ayushman Bharat Pradhan Mantri Jan Arogya Yojana: Over 36.36 crore Ayushman cards have been issued

Over 1,75,560 Ayushman Arogya Mandirs operationalised with a footfall of over 370 crore

Disruptive technology provides seamless and equitable Healthcare.

72.81 crore ABHA ids created

Under U-WIN 1.7 crore pregnant women & 5.4 crore children tracked; 26.4 crore vaccine doses monitored

E-Sanjeevani: Serving 31.19 crore patients

Chart XI.4. Initiatives for CwSN

PMeVidya Series
NCERT's *'Teaching learning interventions for inclusive classrooms'* promotes inclusive pedagogy with ISL interpreters for accessibility.

Inclusive Cell in CBSE Schools
To facilitate equitable and barrier free environment and full participation

Disability Screening- PRASHAST
Covers 21 disabilities, available in 23 languages through a mobile app.
Over 10 lakh users and 61.57 lakh screenings completed since 2022.

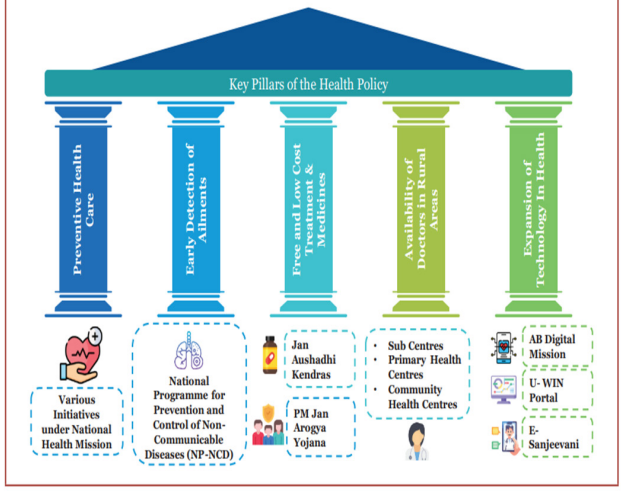
Accesible content
4250+ ISL Videos, 10,500-Word ISL Dictionary on DIKSHA, 24/7 educational channel on PM eVidya, and DTH Channels.
377 NCERT Talking Bookson e-Pathshala and third-party TTS apps , and 4048 Audio Chapters on DIKSHA

Inclusive Education
National Guidelines and Implementation Framework on Equitable and Inclusive Education (NGIFEIE) (2021–2030) has been developed to provide a roadmap for creating inclusive schools, ensuring no child is left behind.

Capacity Building and Training
5-day capacity-building program for **60 lakh** teachers under NISHTHA (2023-24).
Additional **online training** for 15,964 teachers on digital resources and assistive technologies.
Module on Inclusive Education for in-service **training of general teachers under Samagra Shiksha.**

Source: Department of School Education and Literacy, MoE

Chart XI.5 Key pillars of health policy[92]



SANKALP[36]

32,262 women (67 per cent of beneficiaries) trained in entrepreneurship between 2021 to 2024.

Department for Promotion of Industry and Internal Trade

Start-up Support[37]
10 per cent of the Fund of Funds for Start-ups is reserved for women.

Women Entrepreneurship Platform[38]
Launched in 2018 to aggregate and showcase policies, with NSA awards recognizing women-led start-ups.

Ministry of Food Processing Industries

PM Micro Food Processing Scheme[39]
SHG members receive ₹40,000 seed capital and 50 per cent branding/marketing grants.

Ministry of Tribal Affairs

Adivasi Mahila Sashaktikaran Yojana[40]
Loans up to ₹2 lakh at 4 per cent interest for ST women.

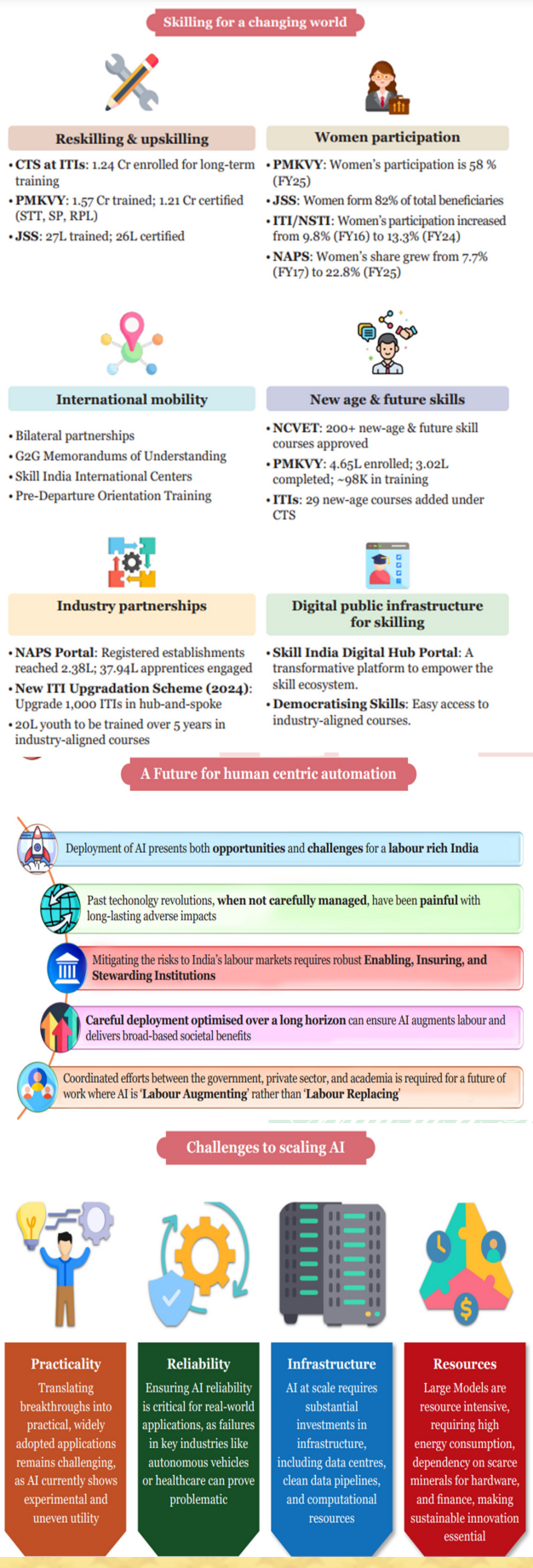
Ministry of Cooperation[41]

NCDC Support[42]
₹6,426 crore disbursed for women cooperatives; 25,385 registered cooperatives.

Nandini Sahakar Scheme
2 per cent interest subvention for innovative cooperative projects.

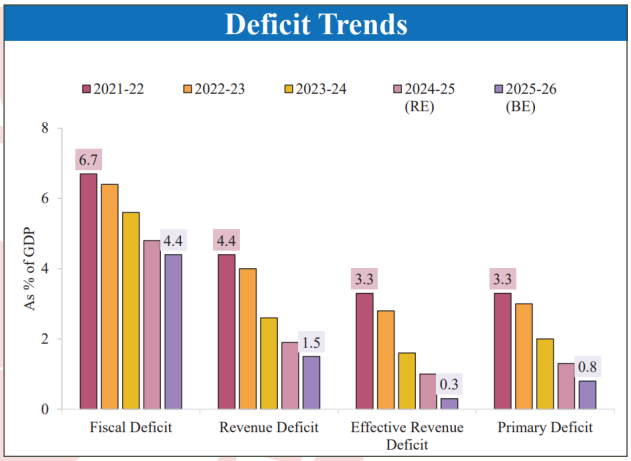
Swayam Shakti Sahakar Yojna
Working capital loan to support women SHGs.

Budget 2025-26



Budget at Glance

The Budget for 2025-26, presented by Finance Minister Nirmala Sitharaman, focuses on accelerating growth, ensuring **inclusive development**, and **enhancing the spending power of India's rising middle class.** Built on the vision of a **Viksit Bharat**, the Budget emphasises **ten key areas: agricultural growth, rural prosperity, inclusive development, boosting manufacturing, supporting MSMEs, employment-led development, innovation, energy security, exports, and urban reforms.**



Key initiatives include the **Prime Minister Dhan-Dhaanya Krishi Yojana** to enhance agricultural productivity, a **Mission for Aatmanirbharta in Pulses**, and the establishment of a **Makhana Board in Bihar**. For MSMEs, **credit guarantees** are enhanced, and a new **Fund of Funds for Startups** is introduced. The Budget also prioritises **clean tech manufacturing**, **nuclear energy development**, and **infrastructure projects** through public-private partnerships.

On the taxation front, the Budget introduces significant reforms to **simplify the tax regime,** reduce compliance burdens, and **encourage voluntary compliance.** Personal income tax slabs are revised to benefit the middle class, with **no tax payable on incomes up to ₹12 lakh under the new regime.** Indirect tax reforms aim to boost domestic manufacturing, promote exports, and reduce input costs. The **fiscal deficit** is estimated at **4.4% of GDP for 2025-26,** with a focus on fiscal consolidation. Overall, the Budget aims to strengthen India's global competitiveness, foster innovation, and ensure sustainable and inclusive growth.

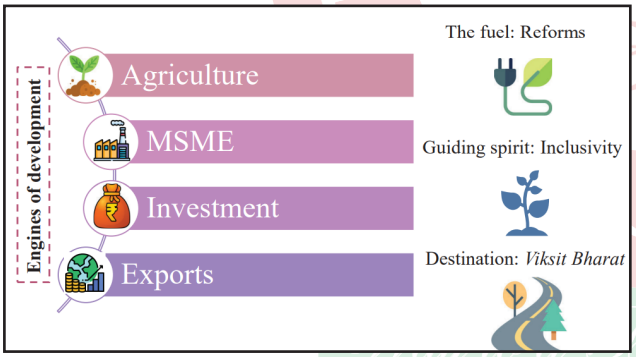
Overall Budget

The **2025 Budget** continues the government's efforts to accelerate growth, ensure inclusive development, boost private investment, uplift

household sentiments, and enhance the middle class's spending power. As **Finance Minister Nirmala Sitharaman** presents her eighth consecutive budget, the country navigates an economic transition after strong post-pandemic growth, **averaging 8%**. However, growth momentum has moderated, with Q2 2024-25 at 5.4%, prompting a renewed focus on economic stimulation. The RBI projects 6.6% GDP growth, while the NSO estimates 6.4%, with inflation at 5.2%, exceeding the RBI's 4% target.

Agriculture as the 1st Engine

- **Prime Minister Dhan-Dhaanya Krishi Yojana (Developing Agri Districts Programme):** Covers **100 low-productivity districts** through scheme convergence & specialised measures.
  - Key focus areas:
    - Agricultural productivity enhancement.
    - Crop diversification & sustainable farming.
    - Post-harvest storage at Panchayat & Block levels.
    - Improved irrigation facilities.
    - Long-term & short-term credit availability.
    - Expected to benefit 1.7 crore farmers.



- **Rural Prosperity and Resilience Programme:** Addresses under-employment in agriculture through skilling, investment, & technology.
  - Focus on rural women, young farmers, youth, marginal & small farmers, and landless families.
  - Global best practices & multilateral development bank support.
  - **Phase-1:** Covers 100 developing agri-districts.
- **Mission for Aatmanirbharta in Pulses:** 6-year mission focusing on Tur, Urad, and Masoor.
  - Central agencies **(NAFED & NCCF)** to procure all offered produce for next 4 years.
- **Comprehensive Programme for Vegetables & Fruits:** Boosts production, efficient supply chains, processing, & remunerative prices.
  - Institutional mechanisms, farmer producer organisations (FPOs) & cooperatives for implementation.
- **Makhana Board in Bihar:** Focus on production, processing, value addition & marketing of Makhana.
  - Organises farmers into FPOs, provides training & access to Govt. schemes.
- **National Mission on High Yielding Seeds:** Strengthens research & development of pest-resistant, climate-resilient, high-yield seeds.
  - Commercial availability of 100+ new seed varieties (post-July 2024).
- **Fisheries Development:** India is the 2nd-largest fish producer; seafood exports at ₹60,000 Cr.
  - Sustainable fisheries framework for Exclusive Economic Zone & High Seas.
  - Focus on Andaman & Nicobar & Lakshadweep Islands.
- **Mission for Cotton Productivity:** 5-year mission to enhance cotton productivity, sustainability & extra-long staple varieties.
  - Science & technology support for higher incomes & quality supply.
  - Aligns with 5F vision for textile sector rejuvenation.
- **Enhanced Credit through Kisan Credit Cards (KCC):** Loan limit increased from ₹3 lakh to ₹5 lakh under the Modified Interest Subvention Scheme.
- **Urea Plant in Assam:** New plant at Namrup, Assam with 12.7 lakh metric tons annual capacity for Atmanirbharta in urea production.
- **India Post as a Rural Economic Catalyst:** 1.5 lakh rural post offices & India Post Payment Bank to support rural entrepreneurship & MSMEs.
  - Transformed into a large public logistics organisation for entrepreneurs, SHGs, MSMEs & businesses.
- **Support to NCDC:** Government to enhance lending support to NCDC for the cooperative sector.

Rs. in Crore	Investment		Turnover	
	Current	Revised	Current	Revised
Micro Enterprises	1	2.5	5	10
Small Enterprises	10	25	50	100
Medium Enterprises	50	125	250	500

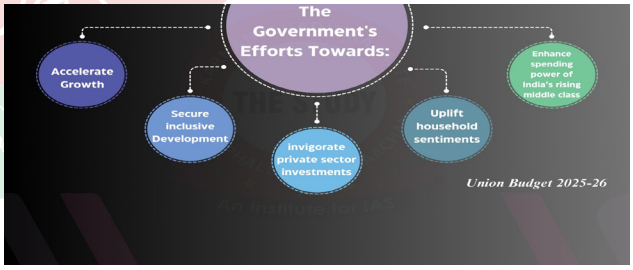
The budget's agriculture-first approach marks a shift toward structural reform rather than short-term support. By integrating productivity enhancements, credit access, sustainable farming, and rural entrepreneurship, it sets a foundation for long-term rural economic resilience. However, efficient execution and market-driven strategies will determine the actual impact.

MSMEs as the 2nd engine

- MSME Classification & Credit Enhancement:
  - **Revised MSME Classification:** Investment & turnover limits increased to 2.5x and 2x, respectively. Higher investment & turnover limits will allow larger businesses to stay within the MSME category, ensuring continued policy benefits as they scale.
  - **Credit Guarantee Expansion:** Micro & Small Enterprises: Increased from ₹5 Cr to ₹10 Cr → ₹1.5 lakh Cr additional credit in 5 years. Credit guarantee expansion reduces default risks for lenders, promoting easier loan disbursal, especially for Micro & Small Enterprises and startups.
  - **Startups:** Increased from ₹10 Cr to ₹20 Cr; 1% guarantee fee for loans in 27 focus sectors.
  - **Exporter MSMEs:** Guarantee cover for term loans up to ₹20 Cr. Exporter MSMEs receiving term loan guarantees signals a push for global market competitiveness, aligning with India's export-oriented growth strategy.
- Financial Support & Entrepreneurship:
  - **Micro Enterprise Credit Cards:** ₹5 lakh limit; 10 lakh cards to be issued in the first year.
  - **New Fund of Funds for Startups:** ₹10,000 Cr fresh contribution to support **Alternate Investment Funds** (AIFs).
- First-time Entrepreneur Scheme:
  - 5 lakh women, SC/ST entrepreneurs, to get term loans up to ₹2 Cr over 5 years.
  - Includes **online capacity building for entrepreneurship** & management skills.
- Sector-Specific Initiatives:
  - **Labour-Intensive Sectors:** Special policy and facilitation measures to boost employment.
  - **Footwear & Leather Industry:** Focus Product Scheme to enhance productivity & quality.
    - Support for design, component manufacturing, & machinery.
    - **Expected outcome:** 22 lakh jobs, ₹4 lakh Cr turnover, ₹1.1 lakh Cr exports.
  - **Toy Industry:** Scheme to develop clusters, skills, & manufacturing ecosystem.
    - **Aim:** Make India a global hub for innovative & sustainable toys.
  - **Food Processing Sector:** National Institute of Food Technology, Entrepreneurship & Management in Bihar.
    - **Benefits:** Higher farmer incomes, skill development & employment for youth.
- Manufacturing & Clean Tech Development
  - **National Manufacturing Mission:** Supports small, medium, & large industries under Make in India.
    - Provides policy support, execution roadmap, governance & monitoring framework.
  - **Clean Tech Manufacturing:** Focus on domestic value addition in green technologies.
    - **Key areas:** Solar PV cells, EV batteries, motors & controllers, electrolysers, wind turbines, high-voltage transmission equipment, & grid-scale batteries.

Investment as the 3rd engine

- Investing in People



  - **Saksham Anganwadi & Poshan 2.0:** Nutritional support for 8 crore children, 1 crore pregnant/lactating women, and 20 lakh adolescent girls; cost norms to be enhanced.
  - **Atal Tinkering Labs:** 50,000 labs in Govt. schools over five years to foster curiosity, innovation, and scientific temper.
  - **Broadband for Schools & PHCs: BharatNet** to provide broadband to all Govt. secondary schools and rural primary health centers.

- **Bharatiya Bhasha Pustak Scheme:** Digital Indian language books for school and higher education.
- **National Centres of Excellence for Skilling:** Five centres with global partnerships for advanced manufacturing skills.
- **IIT Expansion:** Infrastructure expansion in five IITs (post-2014) for 6,500 students; IIT Patna hostel capacity to increase.
- **AI Centre for Education:** New AI Centre of Excellence with ₹500 crore allocation.
- **Medical Education Growth:** 10,000 new UG/PG medical seats next year; 75,000 target in five years.
- **Day Care Cancer Centres:** All district hospitals to get centers in three years; 200 to be set up in 2025-26.
- **Urban Livelihoods:** New scheme for socio-economic upliftment of urban workers.
- **PM SVANidhi Expansion:** Higher loans, UPI-linked credit cards (₹30,000 limit), capacity-building support.
- **Gig Worker Welfare:** ID cards, e-Shram registration, and PM Jan Arogya Yojana healthcare for 1 crore workers.

- Investing in the Economy
  - **PPP in Infrastructure:** 3-year project pipeline for each ministry; states can seek IIPDF support.
  - **State Infrastructure Support:** ₹1.5 lakh crore for 50-year interest-free state loans for capital expenditure and reforms.
  - **Asset Monetisation Plan (2025-30):** ₹10 lakh crore reinvestment with regulatory and fiscal adjustments.
  - **Jal Jeevan Mission:** 100% rural potable tap water coverage by 2028 with enhanced outlay.
  - **Urban Reforms & Challenge Fund:** ₹1 lakh crore fund for urban areas through the model of '***Cities as Growth Hubs***', '***Creative Redevelopment of Cities***' and '***Water and Sanitation***', ₹10,000 crore allocation for 2025-26.
  - **Power Sector Reforms:** Incentives for state electricity distribution and intra-state transmission; additional **0.5% GSDP borrowing for states**.
  - **Nuclear Energy Mission:** 100 GW by 2047; ₹20,000 crore for Small Modular Reactors (5 to be operational by 2033).
  - **Shipbuilding Boost:** Policy revamp, infrastructure listing, credit notes for shipbreaking, and shipbuilding clusters.
  - **Maritime Development Fund:** ₹25,000 crore for industry growth, with 49% Govt. contribution.
  - **UDAN Regional Connectivity:** 120 new destinations, 4 crore passengers in 10 years, support for helipads/smaller airports.
  - **Greenfield Airport in Bihar:** Additional airports alongside Patna expansion & Bihta brownfield airport.
  - **Western Koshi Canal Project:** Support for 50,000 hectares of farmland in Mithilanchal, Bihar.
  - **Mining Sector Reforms:** State Mining Index, best practices sharing, policy for critical mineral recovery.
  - **SWAMIH Fund 2:** ₹15,000 crore fund for 1 lakh housing units; 40,000 units to be completed in 2025.
  - **PM Gati Shakti Data:** Private sector access for better project planning.
  - **Tourism Growth:** Top 50 destinations via challenge mode, HML listing for hotels, enhanced travel connectivity.
    - MUDRA loans for homestays, skilling, incentives for states, streamlined e-visas.
    - Special focus on Buddhist tourism.
    - Medical Tourism & "Heal in India": Private sector partnerships, visa facilitation, capacity building.
- Investing in Innovation
  - **R&D & Innovation:** ₹20,000 crore for private-sector-led R&D.
  - **Deep Tech Fund of Funds:** To support next-gen startups.
  - **PM Research Fellowship:** 10,000 fellowships in IITs/IISc over five years with enhanced support.
  - **Gene Bank for Crops:** Second Gene Bank with 10 lakh germplasm lines for food security.
  - **National Geospatial Mission:** Geospatial infra development for land records, urban planning, and infra projects.
  - **Gyan Bharatam Mission:** National Digital Repository for Indian manuscripts, covering 1 crore documents.

Exports as the 4th engine

- Export & Trade Promotion:
  - **Export Promotion Mission:** Joint initiative by Ministries of Commerce, MSME, and Finance to enhance exports, ease credit access, and support MSMEs against non-tariff barriers.
  - **BharatTradeNet (BTN):** A digital public infrastructure for trade documentation and financing, aligned with global standards.
  - **Global Supply Chains:** Support for domestic manufacturing to integrate with global supply chains, with facilitation groups for select sectors.
  - **Industry 4.0 & Electronics:** Government support for skilled youth in high-tech industries like electronics.
  - **Global Capability Centres (GCCs):** National framework to promote GCCs in tier-2 cities by improving infrastructure and talent availability.
  - **Air Cargo Warehousing:** Infrastructure upgrade for high-value perishable horticulture produce, with streamlined screening and customs.
- Reforms & Financial Sector:
  - Tax Reforms:
    - Faceless assessment, taxpayer charter, and faster returns.
    - New income-tax bill to be introduced.
  - **FDI in Insurance:** Limit raised from **74% to 100%** for companies investing premiums in India.
  - **India Post Payment Bank:** Expanded services in rural areas.
  - **Infrastructure Credit:** NaBFID to launch a Partial Credit Enhancement Facility for corporate bonds.
  - **Grameen Credit Score:** Public Sector Banks to introduce credit scoring for SHG members and rural borrowers.
  - **Pension Sector:** Coordination forum for regulatory alignment and new pension products.
  - **KYC Simplification:** Revamped Central KYC Registry in 2025 with a streamlined update system.
  - **Company Mergers:** Faster approvals and wider scope for fast-track mergers.
  - **Bilateral Investment Treaties (BITs):** Revamp the BIT model for better foreign investment opportunities.
- Regulatory & Business Reforms:
  - **Ease of Doing Business:** Light-touch regulatory framework with updates to outdated laws.
  - **High-Level Committee for Regulatory Reforms:** Review of non-financial sector regulations and licensing within a year.
  - **Investment Friendliness Index:** New index in 2025 to promote competitive federalism among states.
  - **Financial Regulation Review:** Mechanism under FSDC to assess and refine financial sector policies.
  - **Jan Vishwas Bill 2.0:** Decriminalisation of 100+ legal provisions for business-friendly reforms.
- Fiscal Policy
  - **Fiscal Consolidation:** Commitment to reducing fiscal deficit to ensure Central Government debt remains on a declining path.
    - 6-year roadmap detailed in the FRBM statement.
  - Revised Estimates (2024-25):
    - **Total receipts (excluding borrowings):** ₹31.47 lakh crore.
    - **Net tax receipts:** ₹25.57 lakh crore.
    - **Total expenditure:** ₹47.16 lakh crore.
    - **Capital expenditure:** ₹10.18 lakh crore.
    - **Fiscal deficit:** 4.8% of GDP.
  - Budget Estimates (2025-26):
    - **Total receipts (excluding borrowings):** ₹34.96 lakh crore.
    - **Net tax receipts:** ₹28.37 lakh crore.
    - **Total expenditure:** ₹50.65 lakh crore.
    - **Fiscal deficit:** 4.4% of GDP.
  - Deficit Financing:
    - **Net market borrowings (dated securities):** ₹11.54 lakh crore.
    - **Gross market borrowings:** ₹14.82 lakh crore.
    - Remaining financing from small savings & other sources.

Indirect Taxes

- **Customs Tariff Rationalisation:** Seven more tariff rates removed, leaving only eight (including zero rate).
- **Relief on Import of Drugs & Medicines:** 36 new lifesaving drugs exempted from Basic Customs Duty (BCD).

- **Support for Domestic Manufacturing & Value Addition:**
  - **Critical Minerals:** Full BCD exemption on Cobalt powder, Lithium-ion battery scrap, Lead, Zinc, and 12 more minerals.
  - **Textiles:** Two more shuttle-less looms fully exempted. Revised BCD on knitted fabrics: "20% or ₹115/kg, whichever is higher".
  - **Electronics:** BCD on Interactive Flat Panel Display (IFPD) increased from 10% to 20%.
  - **Lithium-Ion Batteries:** 35 capital goods exempted for EV battery manufacturing.
  - **Shipping:** BCD exemption on shipbuilding materials extended for 10 years.
  - **Telecommunication:** BCD on Carrier Grade Ethernet Switches reduced from 20% to 10% (to align with Non-Carrier Grade switches).
- Export Promotion:
  - **Handicrafts:** Export period extended from 6 months to 1 year, with an additional 3-month extension if required.
  - Nine more items added to the duty-free input list.
  - **Leather Sector:** BCD fully exempted on Wet Blue Leather to support domestic processing & jobs.
    - Crust Leather export duty (20%) removed to facilitate exports by small tanners.
  - **Marine Products:** BCD on Frozen Fish Paste (Surimi) reduced from 30% to 5% to boost seafood exports.
    - BCD on Fish Hydrolysate reduced from 15% to 5% to aid fish & shrimp feed production.
  - **Railway Goods MRO:** Time limit for export of repaired railway goods extended from 6 months to 1 year, further extendable by another year.
- Trade Facilitation Measures:
  - **Provisional Assessment Time Limit:** Now capped at 2 years, extendable by 1 year, to reduce uncertainty.
  - **Voluntary Compliance Scheme:** Importers/exporters can voluntarily declare material facts & pay duty with interest without penalty.
    - Not applicable if audit/investigation has begun.
  - **Extended Time for End-Use Compliance:** End-use period for imported inputs extended from 6 months to 1 year for better planning.
    - Quarterly statements replace monthly compliance filings.

Direct Tax

TDS/TCS Rationalisation

- Reduced number of TDS rates & increased thresholds.
- **Senior citizens:** Interest TDS threshold doubled (₹50,000 → ₹1 lakh).
- **Rent TDS threshold:** Increased from ₹2.4 lakh → ₹6 lakh.
- **Liberalised Remittance Scheme (LRS):**
  - TCS threshold increased from ₹7 lakh → ₹10 lakh.
  - TCS removed for education loans from specified financial institutions.
- TCS on sale of goods omitted.
- Higher TDS deduction to apply only for non-PAN cases.
- TCS late payment decriminalised (similar to TDS provisions).

Encouraging Voluntary Compliance

- Time limit to file updated returns extended from 2 years → 4 years.

Reducing Compliance Burden

- **Charitable trusts/institutions:** Registration period extended from 5 years → 10 years.
  - Minor defaults by charitable entities won't attract disproportionate consequences.
- **Self-occupied properties:** Taxpayers can now claim two properties as nil annual value without conditions.

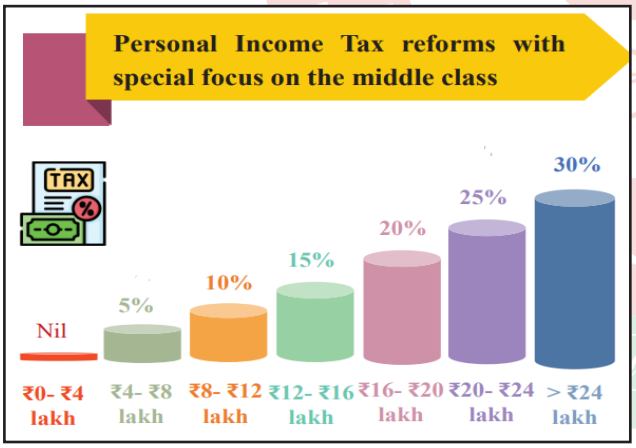
Ease of Doing Business

- **Transfer Pricing:** New scheme for 3-year block period for arm's length pricing.
- **Safe Harbour Rules:** Expanded scope for international tax certainty.
- **National Savings Scheme (NSS):** Withdrawals from old accounts (post 29 Aug 2024) exempted from tax.
- **NPS Vatsalya Accounts:** Same tax benefits as normal NPS accounts.
- **Paperless tax processing:** Digitalisation of appellate orders operationalized.

- **Vivad Se Vishwas Scheme:** 33,000 taxpayers settled disputes.

Promoting Employment & Investment

- **Electronics Manufacturing:** Presumptive taxation for non-residents servicing resident companies.
  - Safe harbour rules for non-residents storing components for electronics manufacturing.
  - Tonnage Tax Scheme extended to inland vessels under Indian Vessels Act, 2021.
- **Start-ups:** Incorporation period for tax benefits extended till 1st April 2030.
- **International Financial Services Centre (IFSC):**
  - Tax benefits extended for ship leasing units, insurance offices, treasury centres.
  - Cut-off for commencement in IFSC extended till 31st March 2030.
- **Alternate Investment Funds (AIFs):** Tax certainty on securities gains for Category I & II AIFs.
- **Sovereign Wealth & Pension Funds:** Infrastructure investment deadline extended to 31st March 2030.



Personal Income Tax Reforms (Middle Class Focus)

- Nil tax slab increased to ₹12 lakh under the new tax regime (₹12.75 lakh for salaried taxpayers).
- **Tax Rebate (for ₹12 lakh income & below) ensures zero tax liability.**
- **Tax benefits under new structure:**
  - **₹12 lakh income:** ₹80,000 tax savings (100% of existing tax).
  - **₹18 lakh income:** ₹70,000 tax savings (30% of existing tax).
  - **₹25 lakh income:** ₹1,10,000 tax savings (25% of existing tax).

Revenue Impact (Revenue Foregone)	
Direct Tax	₹1 lakh crore.
Indirect Tax	₹2,600 crore.

The government's reliance on strong tax receipts to meet fiscal deficit targets is vulnerable to **economic fluctuations**, with a **slowdown** potentially reducing revenue and increasing borrowing costs, **limiting fiscal flexibility**. Global challenges like **inflation and geopolitical risks** add complexity, impacting both revenue generation and borrowing expenses.

However, the budget demonstrates the **government's commitment to disciplined fiscal management,** with a focus on reducing public debt and investing strategically in infrastructure and growth. This gradual fiscal deficit reduction aligns with **India's long-term objectives, promoting economic stability, attracting investments, and supporting sustainable growth for future prosperity.**

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