



CURRENT AFFAIRS

CONSOLIDATION

JULY
2025
PART-I



C-171/2,
Block-A,
Sector-15,
Noida



641, Mukherjee Nagar,
Opp. Signature
View Apartment,
New Delhi



21,
Pusa Road,
Karol Bagh
New Delhi



Tashkent Marg,
Civil Lines,
Prayagraj,
Uttar Pradesh



Tonk Road,
Vasundhara Colony,
Jaipur,
Rajasthan



Burlington Arcade Mall,
Burlington Chauraha,
Vidhan Sabha Marg,
Lucknow



12, Main AB Road,
Bhawar Kuan,
Indore,
Madhya Pradesh

E-mail : care@groupdrishti.in

Phone: +91-87501-87501

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Polity and Governance

Highlights

- Mizoram's Refugees Crisis
- Maharashtra's Rollback of Hindi as Third Language
- Aadi KARMAYOGI and TALASH
- Special Intensive Revision of Electoral Rolls
- Legislative Productivity in India
- Legality of Phone Tapping
- 2nd Edition of the NER District SDG Index
- National Commission for Minorities
- Custodial Torture in India
- National Sports Policy 2025
- Debate Over 'Socialist' and 'Secular' in the Preamble
- 10 Years of Digital India

Mizoram's Refugees Crisis

Why in News?

Mizoram has been grappling with the **challenge of managing a growing refugee crisis** since **Myanmar's 2021 military coup**, providing shelter to thousands from Myanmar, Bangladesh, and Manipur.

- In early 2025 around 4,000 refugees from **Myanmar's Chin State** entered Mizoram after armed clashes, further straining the State's already fragile humanitarian situation.

How is Mizoram Managing the Influx of Refugees?

- **Ethnic Ties and Humanitarian Grounds:** Cross-border movement has long been common in Mizoram due to ethnic ties, even before the **Free Movement Regime (FMR)** was formalised in 1968.
 - Mizoram's dominant **Mizo community** shares close ethnic, cultural, and familial bonds with the **Chin of Myanmar, the Bawm of Bangladesh, and the Kuki-Zo of Manipur**, all belonging to the larger **Zo ethnic group**.
 - This shared identity has led to a **sense of solidarity**, with Mizos extending support to the refugees, particularly those from Myanmar.
- **Community Support:** Various organizations, including the Young Mizo Association (YMA), church groups, and local individuals, have been providing food, shelter, and basic needs to the refugees.

- The state's civilian response has been one of compassion, despite the mounting strain on local resources.

- **Mizoram Government's Position:** The Mizoram government, citing ethnic and humanitarian reasons, has refrained from **deporting refugees**.

- However, growing local pressure has led some villages to impose restrictions on their movement and trade, citing concerns over legal violations and border security.

- **Limited Assistance from the Centre:** Initially hesitant, the Centre has provided Rs 8 crore in relief funds to assist Mizoram in managing the crisis.

- However, local authorities have expressed dissatisfaction with the support, as it is seen as **inadequate in addressing the growing challenges**.

RIISING INFLUX OF MYANMAR REFUGEES

Here are the nine districts of Mizoram where refugees from the neighbouring country are taking shelter



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What is the Legal Framework Governing Refugees in Mizoram?

- **Refugee Definition under International Law:** As per the **1951 UN Refugee Convention and its 1967 Protocol**, a *refugee* is someone who is outside their country of origin and is **unable or unwilling to return due to a well-founded fear of persecution**. This fear may be based on their race, religion, nationality, membership of a particular social group, or political opinion.
 - An **asylum seeker** is one whose claim for refugee status is yet to be adjudicated.
 - **Refugees are not illegal migrants**, as they flee persecution, whereas illegal migrants voluntarily cross borders in search of better economic opportunities.
- **India's Position:** India is not a signatory to the 1951 Refugee Convention or its 1967 Protocol, and it **does not have a national refugee law**.
 - Refugees in India are governed primarily under the **Foreigners Act, 1946**, and are often dealt with through laws related to immigration and national security like the **Indian Passport Act, 1920**, the **Repatriation of Prisoners Act, 2003**, and relevant rules such as the Passport (Entry into India) Rules, 1950.
- **FMR and Border Control:** The **FMR** is a 1968 bilateral arrangement between India and Myanmar that allows hill tribe members to cross the border. It aims to maintain cross-border cultural ties, enable trade, and support **India's Act East Policy**.
 - Originally permitting 40 km of travel, the limit was **reduced to 10 km from the border**. Assam Rifles guard the Myanmar border, while State officials issue border passes under the FMR.
 - Border residents can travel **without a visa or passport** but require a **QR code-enabled border pass**. Biometric data is recorded and uploaded to a centralized portal to check against a negative list.
 - Despite its goals, concerns **over security, smuggling, and migration** have led to tighter controls.

- **UNHCR:** Refugees registered with the **United Nations High Commissioner for Refugees (UNHCR)**, get limited protection and services but lack government-issued documents.
 - As a result, they can't access welfare schemes or open bank accounts, leaving them excluded.

Note: The **Mizoram (Maintenance of Household Registers) Bill, 2019** currently under consideration, aims to identify and track foreign nationals residing in the state. It seeks to help distinguish between **Mizos, refugees, and illegal immigrants**.

Maharashtra's Rollback of Hindi as Third Language

Why in News?

The Maharashtra government scrapped its government resolutions (GRs) mandating Hindi as a **compulsory third language** from Grades 1 to 5 in Marathi and English medium schools.

- Though the move was in line with **National Education Policy (NEP), 2020**, which promotes multilingualism through the **three-language formula**, it was withdrawn due to concerns over linguistic identity, cultural hegemony, and the feasibility of implementation.
- The government has appointed a committee under renowned economist **Dr. Narendra Jadhav** to study the three-language policy.

What are the Issues in Implementing the Three Language Policy?

- **Pedagogical Challenges:** Neuroscientific research supports early exposure to multiple languages (ages 2–8), but this does not equate to formal classroom instruction.
 - For effective learning, children must first develop foundational literacy in their mother tongue before taking on additional languages.
 - Introducing three languages from Grade 1 may weaken core literacy in the primary language.

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- **Federal Concerns:** Education is a subject on the **Concurrent List**. Mandating Hindi as a compulsory language without proper state consultation undermines federal spirit in educational matters.
 - The **Three Language policy** has been criticized for allegedly promoting Hindi at the cost of regional languages. In states like Tamil Nadu, it was seen as an act of linguistic centralization.
 - Rooted in the Dravidian movement, Tamil Nadu adopted a **two-language policy Tamil and English in 1968** rejecting the three-language formula. This stance continues today. In 2019, Tamil Nadu's strong opposition led to the removal of mandatory Hindi from the draft NEP, 2020.
- **Deviation from NEP 2020 Intent:** NEP 2020 primarily emphasizes learning in the **mother tongue (referred to as 'R1')** and an additional **second language (R2- a language other than R1)**, not three languages, in early years.
- **Cultural and Societal Concerns:** Civil society groups argue that compulsory Hindi may discourage the use of local tribal or minority languages.
 - Critics termed this a **"backdoor imposition of Hindi"**, questioning the opaque decision-making. Critics have pointed out that some state-level policies enforcing Hindi were introduced without adequate consultation with expert language committees or public stakeholders.
- **Administrative and Infrastructure Issues:** Many schools, particularly in rural areas, lack qualified teachers for all three languages. This results in uneven quality of instruction.
 - Designing age-appropriate, integrated curricula for three languages at the foundational level is difficult. It may **overburden both students and teachers, leading to rote learning** and poor comprehension.

Note: Kothari Commission (1964–66) proposed the three-language formula to promote national integration and cultural exchange through a common educational framework. This was later adopted in the National Policy on Education, 1968.

What Does the NEP 2020 Lay Down on Language?

- **Medium of Instruction:** NEP 2020 recommends the use of mother tongue, local, or regional languages as the medium of instruction until at **least Grade 5**, ideally till Grade 8 and beyond.
 - NEP 2020 promotes **bilingual teaching**, encouraging the use of the home language or mother tongue along with English as mediums of instruction, especially in early grades.
- **Multilingualism:** The current three-language formula proposed by NEP 2020 has considerably departed from NEP, 1968 which emphasised study of **Hindi, English and a modern Indian language** (preferably one of the southern languages) in Hindi-speaking States and Hindi, English and a regional language in non-Hindi speaking States.
 - In contrast, the NEP 2020 states that it **provides greater flexibility in the three-language formula**, and that **no language will be imposed on any State**.
 - It also encourages the inclusion of classical languages, such as Tamil, Telugu, Kannada, Malayalam, and others, as part of the three-language formula.
- **Foreign Languages:** The NEP 2020 introduces the option for students to learn foreign languages, such as **Korean, Japanese, French, German, and Spanish**, at the secondary level.
 - The **Central Board of Secondary Education (CBSE)** has outlined that students will learn two Indian languages until Class 10, with the option to choose one Indian language and one foreign language in Classes 11 and 12.

Mother Tongue in Schools

- The 8th **All India School Education Survey (AISES)**, by **National Council of Educational Research and Training (NCERT)** shows a decline in the use of mother tongue as the medium of instruction. At the primary stage, 86.62% of schools used the mother tongue in 2009, down from 92.07% in 2002.
 - The drop is seen in both rural (from 92.39% to 87.56%) and urban areas (from 90.39% to 80.99%).

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What are the Constitutional Provisions Regarding Language?

- **Article 29:** Protects the right of citizens to conserve their distinct language and culture.
- **Article 343:** Declares **Hindi in Devanagari script** as the official language of the Union; allows continued use of English for official purposes for 15 years from 1950 (later extended by legislation).
- **Article 346:** Governs the **official language for communication** between states and with the Union. Hindi may be used if the states involved agree.
- **Article 347:** Allows the **President to recognize a language** as an official language of a state or part thereof, if a substantial section of the population demands it.
- **Article 350A:** Directs states to provide primary education in the mother tongue for linguistic minority children.
- **Article 350B:** Provides for a **Special Officer for Linguistic Minorities**, appointed by the President, to report on the implementation of safeguards for linguistic minorities.
- **Article 351:** Obligates the Union to promote Hindi while enriching it with elements from other Indian languages.
- **Eighth Schedule:** Lists **22 officially recognized languages**, including Hindi, Bengali, Tamil, Telugu, Urdu, and others, referred to as “Scheduled Languages.”

What are the Arguments For and Against Three-Language Policy?

Arguments For

- **Promotes Multilingualism and Cognitive Growth:** Learning multiple languages improves memory, problem-solving, and overall academic performance.
 - Enhances children’s ability to think flexibly and understand diverse perspectives.
- **Supports National Integration:** Three-Language Policy encourages communication across linguistic groups. It helps students from different regions understand and respect India’s cultural and linguistic diversity.

- **Improved Job Prospects:** Knowing multiple languages boosts opportunities in fields such as tourism, technology, international relations, and media.

Arguments Against

- **Political Sensitivities:** In some states, the policy is seen as Hindi imposition, fuelling regional identity politics and the “sons of the soil” sentiment, which prioritizes local rights, language and culture.
- **Burden on Students and Schools:** Students already struggle with basic literacy; a third mandatory language may overload them. Children from monolingual homes may find it stressful or confusing.
- **Implementation Challenges:** Efforts to introduce unrelated languages (e.g., Tamil in Haryana) have failed due to poor planning and lack of demand.

Aadi KARMAYOGI and TALASH

Why in News?

The Ministry of Tribal Affairs has launched the **first Regional Process Lab (RPL)** under the **Aadi KARMAYOGI**, which focuses on strengthening local governance.

- Simultaneously, the **National Education Society for Tribal Students (NESTS)**, an autonomous organization under the Ministry of Tribal Affairs, launched the **TALASH (Tribal Aptitude, Life Skills and Self-Esteem Hub)** programme to support the growth of tribal students.

What is Aadi KARMAYOGI?

- **About:** Aadi KARMAYOGI is a **National Mission for Responsive Governance**, designed to build a cadre of **20 lakh tribal grassroots functionaries and village-level change leaders**, who will drive inclusive development and strengthen last-mile service delivery in tribal areas.
 - The mission aligns with **Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyaan (PM JANMAN)** and **Dharti Aaba Janjatiya Gram Utkarsh Abhiyan (DAJGUA)**, emphasizing convergence, community involvement, and capability enhancement.

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➤ Objectives:

- **Build Local Leadership:** Develop **State Master Trainers (SMTs)**, District Master Trainers (DMTs), and Block-level trainers.
- **Strengthen Last-Mile Delivery:** Enhance service delivery and implementation of tribal welfare schemes in remote areas.
- **Promote Community-Centric Governance:** Empower tribal communities with dignity, empathy, and purpose.

➤ Implementation: SMTs from five southern states Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, and Telangana are being trained at the RPL in Bengaluru.

- These trainers will go on to lead **State Process Labs (SPLs)**, which will then train DMTs. The programme also involves civil society organisations to encourage participatory learning and ensure the training fits local contexts, supporting ongoing learning and leadership.
- The Aadi Karmayogi Mission supports **responsive governance through local-level planning**, quick grievance redressal, and joint implementation. It brings together departments like Tribal Affairs, Rural Development, Women and **Child Development**, Jal Shakti, Education, and Forests.

What is TALASH?

- **About:** Launched by the NESTS in collaboration with **United Nations Children's Fund (UNICEF)** India, TALASH is an innovative platform designed to support the holistic development of over **1.38 lakh students** across **Eklavya Model Residential Schools (EMRSs)** in India.
- The TALASH platform prepares tribal students to navigate the **challenges of a competitive world** by equipping them with essential life skills and career clarity. It also aligns with the **National Education Policy (NEP) 2020**, emphasizing inclusive, equitable education for all.
- TALASH is rolling out in phases. So far, 189 teachers from 75 EMRSs are trained. By the end of 2025, it will cover all EMRSs.
- **Key Features of TALASH:**
 - **Psychometric Assessments:** Based on the **National Council of Educational Research and Training (NCERT)** 'Tamanna' framework, students

take an aptitude test and receive a personalized career card.

- **Career Counselling:** Helps students align their aspirations with their strengths and interests.
- **Life Skills and Self-Esteem Modules:** Offers interactive lessons to build confidence and emotional intelligence.
- **E-Learning for Teachers:** Empowers teachers with digital tools and training to guide and mentor students effectively.

Note: Tamanna (Try And Measure Aptitude And Natural Abilities) is an aptitude test developed by NCERT and **Central Board of Secondary Education** under the Ministry of Education. It helps students of Classes IX and X understand their strengths across various dimensions.

- The test is voluntary, has no pass or fail, and is meant to guide rather than impose subject choices.

Special Intensive Revision of Electoral Rolls

Why in News?

The **Supreme Court (SC)** is reviewing the **Election Commission of India's** Special Intensive Revision (SIR) of electoral rolls in **Bihar** and suggested accepting **Aadhaar**, voter ID, and **ration cards** as valid documents for **voter enumeration**.

- However, the SC **rejected the argument** made by **petitioners** that the ECI lacked the authority to carry out the revision.

What are Key Facts Regarding the Special Intensive Revision of Electoral Rolls?

- **About Electoral Rolls:** An **Electoral Roll** (also known as a **Voter List** or **Electoral Register**) is the **official list of all eligible and registered voters** within a specific constituency.
 - It is used to **verify voter identities** and ensure a **fair and transparent electoral process** during elections.
 - The Electoral Rolls are prepared by the ECI under the **Representation of the People Act (RP Act), 1950**.

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- It excludes **non-citizens** (Section 16) and includes **citizens** aged **18 or above** who are **ordinarily resident** in the **constituency** (Section 19).
- **About Special Intensive Revision: SIR** is a **focused, time-bound house-to-house voters' verification** process conducted by **Booth Level Officers (BLOs)** to **update and correct** the electoral rolls before major elections.
- It ensures that the **voter list** is **accurate, inclusive, and free from discrepancies** by allowing **new registrations, deletions, and modifications**.
- **Section 21** of the **RP Act, 1950** empowers the **ECI** to prepare and **revise electoral rolls**, including conducting a **special revision** at any time with **recorded reasons**.
- **Constitutional Basis of SIR: Article 324** vests the **ECI** with the power to **supervise and control** the preparation of **electoral rolls** and conduct of elections.
- **Article 326** guarantees **universal adult suffrage**, allowing **citizens aged 18 and above** to **vote**, unless **disqualified** by law due to **criminal conviction, unsound mind, or corruption**.
- **Judicial Stand:** The Supreme Court in the **Mohinder Singh Gill v. The Chief Election Commissioner Case, 1977** upheld the **ECI's broad powers** under **Article 324** to ensure **free and fair elections**, including ordering **re-polls** if needed, and emphasized that **judicial review** is restricted during elections as per **Article 329(b)**.
- It clarified that **ECI can act independently** if laws under **Articles 327 and 328** are silent on any aspect.
- It also noted that while **natural justice** is important, the **ECI** can take **swift and practical decisions** in exceptional situations.

- **Previous Electoral Roll Revision: SIRs** were conducted in **1952–56, 1957, 1961, 1965, 1966, 1983–84, 1987–89, 1992, 1993, 1995, 2002, 2003, and 2004** in various parts of the country. In **Bihar**, the last SIR was held in **2003**.

Note: **Article 327** deals with the power of **Parliament** to make provision with respect to **elections to Legislatures**.

- **Article 328** deals with power of the **Legislature of a State** to make provision with respect to **elections to such Legislature**.

Election Commission of India (ECI)

About

- **Autonomous Constitutional Authority** - Administers Union/state election
 - LS, RS, State LA, the offices of the President and VP
- Estd - **25th Jan 1950** (National Voters' Day)



Constitutional Provisions

Part XV - Article 324 to 329

Structure

- 1 Chief Election Commissioner and 2 Election Commissioners **appointed by President**
- **Tenure- 6 years, or up to the age of 65 years**, whichever is earlier
- Retiring ECs – **eligible for further appointment by the govt.**
- **Removal of CEC-** Resolution on the **ground of proven misbehaviour or incapacity**, with majority of 2/3rd members present and voting, supported by more than 50% of the total strength of the house



Major Roles and Responsibilities

- Determining Electoral Constituencies
- Preparing/Revising electoral rolls
- Notifying the schedules and dates of elections
- **Registering political parties and granting them the status of national or state parties**
- Issuing the Model Code of Conduct (MCC) for political parties
- Advising the President on **matters concerning the disqualification of MPs**



Challenges

- Truncated Tenure of CEC
- Executive Influence in Appointments
- Dependence on Centre for Finance
- Lack of Independent Staff



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What is the Need for Special Intensive Revision of Electoral Rolls?

- **Error-Free and Updated Voter List:** SIR helps remove ineligible voters, add newly eligible or previously missed voters, and correct errors in the electoral roll to ensure accuracy and prevent fraud.
 - SIR facilitates re-registration of migrants and shifting populations and ensures voter lists align with updated constituency boundaries.
- **Safeguarding Democratic Legitimacy:** SIR supports the idea of “one person, one vote” by removing ghost voters and duplicates, helping maintain public trust in the democratic system through careful checks.
- **Boosting Voter Participation:** SIR promotes civic participation through awareness drives and ensures accessible voter registration via door-to-door surveys and online options, especially benefiting marginalized groups.
- **Addressing Technological & Policy Upgrades:** SIR supports digital integration of electoral rolls and facilitates policy reforms like remote voting for migrants to enhance accessibility and efficiency.
 - E.g., Bihar became the first Indian state to pilot mobile e-voting in municipal polls via the **E-SECBHR app**, using blockchain, facial recognition, biometric scanning, and voter ID verification.

What Concerns are Associated with Special Intensive Revision of Electoral Rolls?

- **Risk of Mass Disenfranchisement:** The exclusion of widely used IDs like Aadhaar, ration cards, or even voter IDs can disproportionately impact underprivileged voters.
 - Traditionally, electoral rolls include individuals aged 18 and above based on their ordinary residence, but the current exercise also considers their place of birth.
- **Impact on Migrant Workers:** Frequent moves by migrant workers, students, and seasonal labourers make it hard to prove residence, risking their

exclusion from voter lists due to difficulty in updating details.

- **Suspensions of a Stealth National Register of Citizens:** Requiring documents like birth certificates or legacy data may act as a **de facto citizenship test**, raising concerns of systematic exclusion of marginalized and minority groups.
 - Growing concerns exist that SIR may be applied discriminatorily, thereby undermining electoral integrity and equitable representation.
- **Lack of Public Consultation:** Top-down implementation and excessive documentation requirements risk undermining universal suffrage, especially for illiterate and homeless populations.

Legislative Productivity in India

Why in News?

Lok Sabha Speaker, while speaking at the **National Conference of Urban Local Bodies (ULBs)** Chairpersons highlighted the need to enhance legislative productivity and discourse quality.

What is the Status of Legislative Productivity in India?

- **About:** Legislative Productivity refers to the efficiency and effectiveness with which legislative bodies such as the Parliament and State Legislatures carry out their core functions such as lawmaking, executive oversight, budget approval, and debate on issues of national/public importance.
- **Status:**
 - **Number of Sitting Days:** Parliament's sitting days have declined from around 135 days/year in the 1st Lok Sabha to just around 55 days/year in the **17th Lok Sabha**.
 - **Length of Each Sitting:** Longer sittings are essential for in-depth legislative deliberation. However, in the **2023 Budget Session**, Lok Sabha and Rajya Sabha functioned for only 33% and 24% of scheduled time respectively, making it the **6th shortest Budget Session since 1952**.

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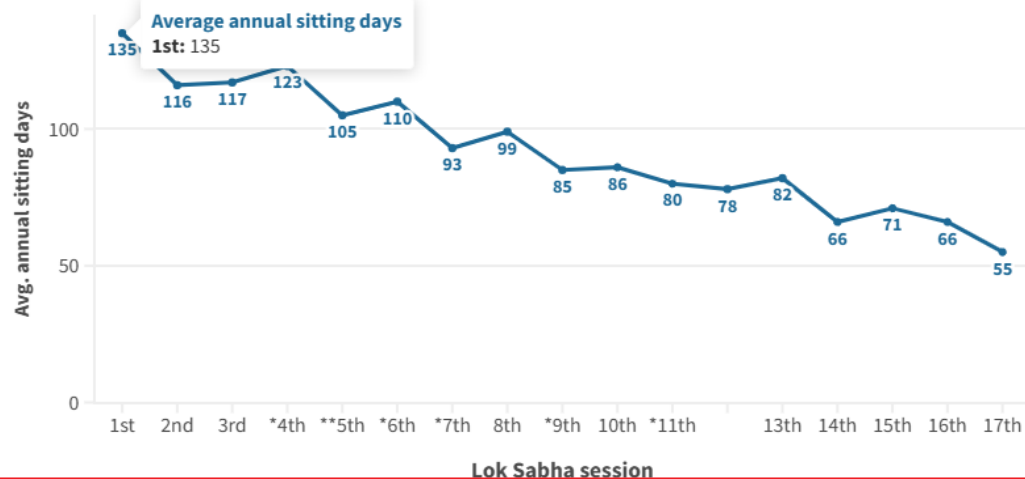
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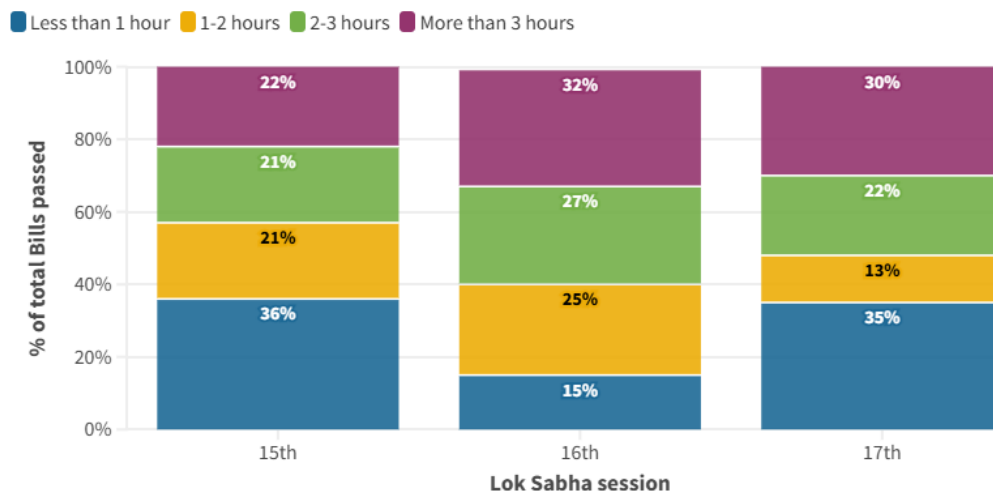


Average annual sitting days



- **Number of Members Present:** A strong quorum is vital for meaningful debate and informed decision-making. In the 17th Lok Sabha (2019–2024), average MP attendance was 79%, but debate participation remained low, with MPs averaging only 45 debates each.
- **Level of Disruption:** Frequent disruptions, such as slogan shouting and walkouts, drastically reduce debate time. The 15th Lok Sabha (2009–14) lost over 30% of its scheduled time to disruptions, severely affecting legislative productivity.
- **Examination by Parliamentary Committees:** In the 17th Lok Sabha, only 10% of Bills were referred to committees, a sharp drop from the 14th LS (60%), 15th (71%), and 16th (25%), with just 14 Bills reviewed. Additionally, increasing party-line divisions within committees in recent years have undermined bipartisan scrutiny, affecting the quality of legislative review.
- **Functioning of Debates: Question Hour & Zero Hour,** essential tools for executive accountability, remain underutilized or absent. In the 17th Lok Sabha, Question Hour functioned for only 19% of scheduled time in Lok Sabha and 9% in Rajya Sabha.

Time taken to pass bills



Source: PRS India • The Hindu Graphics

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- **Introduction of Private Member Bills:** Since **Independence**, over **300** such Bills have been introduced, but only **14** have been passed, with the **last one in 1970**.
- **Delayed Constitutional Requirements:** The **Deputy Speaker** post under **Article 93** has remained **vacant** throughout the **17th Lok Sabha**, despite the constitutional requirement of election "as soon as possible."
- **Decline in Consensus-Driven Lawmaking:** The tradition of building **consensus between the government and the Opposition** has **weakened** significantly, leading to the passage of key Bills with **minimal debate and frequent disruptions**.
 - The limited use of **joint sittings**, only **3 times since 1950**, highlights the **erosion of mechanisms meant to resolve legislative deadlocks**.

What are the Key Implications of Lower Productivity of Legislature?

- **Oversight Weakening:** Fewer **sitting days**, frequent **disruptions**, and underutilized **Question Hour** reduce the legislature's ability to hold the **executive accountable**, weakening **parliamentary scrutiny** and enabling unchecked decision-making.
- **Poor-Quality Lawmaking:** Bypassing **Parliamentary Committees** and passing Bills in haste often without debate, compromises the **rigour, legality, and effectiveness** of legislation, increasing the risk of **judicial review and implementation challenges**.
- **Opposition Marginalisation:** Limited time for **debates**, absence of **Private Member Bills**, and curbed **Opposition participation** dilute **inclusive lawmaking**, hinder **consensus-building**, and weaken the role of dissent in a democracy.
- **Public Trust Erosion:** Perceived legislative dysfunction undermines **citizen confidence** in **democratic institutions**, leading to **political apathy**, reduced **electoral participation**, and erosion of institutional legitimacy.

- **Executive Overreach:** Reduced legislative engagement enables the **executive** to bypass the legislature through **ordinances, delegated legislation, and executive orders**, upsetting the **constitutional balance of power** and weakening **checks and balances**.

What Measures Have Been Taken to Improve Legislative Productivity in India?

- **Code of Conduct for MPs:** A formal **code of conduct** guides the behavior of **Members of Parliament (MPs)**, aiming to uphold **decorum**, reduce **disruptions**, and promote **constructive participation** in legislative business.
- **Adoption of Technology:** Parliament has adopted **digital tools** to enhance legislative efficiency. **Live streaming** of proceedings has increased **public scrutiny**, promoting greater **accountability** and disciplined behavior by MPs.
 - Initiatives like **e-Vidhan (NeVA)** aim to make all **State Legislatures paperless**, ensuring real-time updates and improved transparency in legislative functioning.
- **Strengthening the Committee System:** A **robust system of parliamentary committees**, including **Departmentally Related Standing Committees**, is used to examine **Bills, policies, and executive actions** in detail.
 - This allows for incorporation of **expert input** and strengthens the **quality and depth** of legislative deliberations.
- **Disciplinary Mechanisms:** To address **unruly behavior**, Parliament enforces **disciplinary actions** such as **suspension or expulsion** of MPs who violate rules. These measures aim to **uphold the dignity of the House** and **ensure orderly functioning**.
- **Capacity Building for Legislators:** Training sessions, workshops, and handbooks conducted by bodies like the **Lok Sabha Secretariat, PRS Legislative Research, and NGOs** equip **Legislators** with knowledge of procedures and best practices.

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Legality of Phone Tapping

Why in News?

Recently, the **Madras High Court** and the **Delhi High Court** gave **contrasting rulings** on whether the government can legally tap phones to **prevent crimes**, especially in cases involving **economic offences (bribery)**.

What are Key Legal Facts Related to Phone Tapping?

- **About:** It is the **monitoring or recording of telephone conversations** by a **third party**, typically **without the knowledge or consent** of the people involved.
 - It is often done by **government agencies** for **security, intelligence, or law enforcement purposes**.
- **Law Governing Phone Tapping:**
 - **Indian Telegraph Act, 1885:** Section 5(2) of the Act allows the **central or state governments** to intercept phone calls during **public emergency or public safety** concerns.
 - **Information Technology Act, 2000:** It governs surveillance of **digital communications** (emails, WhatsApp, etc.).
 - **Indian Post Office Act, 1898:** Applies to **postal communications**.
- **Safeguards Against Phone Tapping:** Rule 419A of **Indian Telegraph Rules, 1951** provides **procedures** for phone tapping, including a **Review Committee** to check misuse.
 - Surveillance must follow **constitutional safeguards**, particularly **Article 19(1)(a)** (freedom of speech and expression) and **Article 21** (right to life and privacy, as upheld in the **Puttaswamy judgment, 2017**).
- **Delhi High Court Ruling:** In the **Aakash Deep Chouhan v. CBI Case, 2020**, the court affirmed that **surveillance to prevent incitement to an offence** is **legally permissible** and ruled that **phone tapping** was **justified under the law**.
 - It held that **corruption in public projects** can endanger **economic security**, qualifying as a matter of **public safety**.

- **Madras High Court Ruling:** In the **P. Kishore v. Secretary to Government Case, 2018**, the court **quashed the 2011 interception order** issued by the **Ministry of Home Affairs** in connection with a **suspected economic offence**, stating there was **no public emergency or clear threat to public safety**.
 - It also stated that the **phone tapping** was **unlawful** as it **failed to meet the procedural standards** laid down by the **Supreme Court in People's Union for Civil Liberties v. Union of India Case, 1997**.
- **Supreme Court Ruling 1997:** As per the **Supreme Court ruling in People's Union for Civil Liberties vs Union of India Case 1997:**
 - Only the **Home Secretary** of the **Centre or State** can authorise phone tapping. **Delegation** of this power **below** the rank of **Joint Secretary** is **not allowed**.
 - Every phone-tap order must be **reviewed** within **two months** by a **review committee** comprising:
 - **At the Centre:** Cabinet Secretary, Law Secretary, Telecom Secretary.
 - **At the State:** Chief Secretary, Law Secretary, and one other member (excluding the Home Secretary).
- **Non Admissibility of Evidence:** If a **phone-tap order** is **unlawful**, the information gathered is **inadmissible in court**, protecting **privacy** and **free speech rights**.

2nd Edition of the NER District SDG Index

Why in News?

NITI Aayog (National Institution for Transforming India) has launched the **2nd edition** of the **North Eastern Region (NER) District Sustainable Development Goals (SDG) Index** for 2023-24, building on the first edition launched in 2021.

What is the NER District SDG Index?

- **About:** The NER District SDG Index is a composite tool designed to monitor district-level progress on selected SDG indicators. Developed collaboratively

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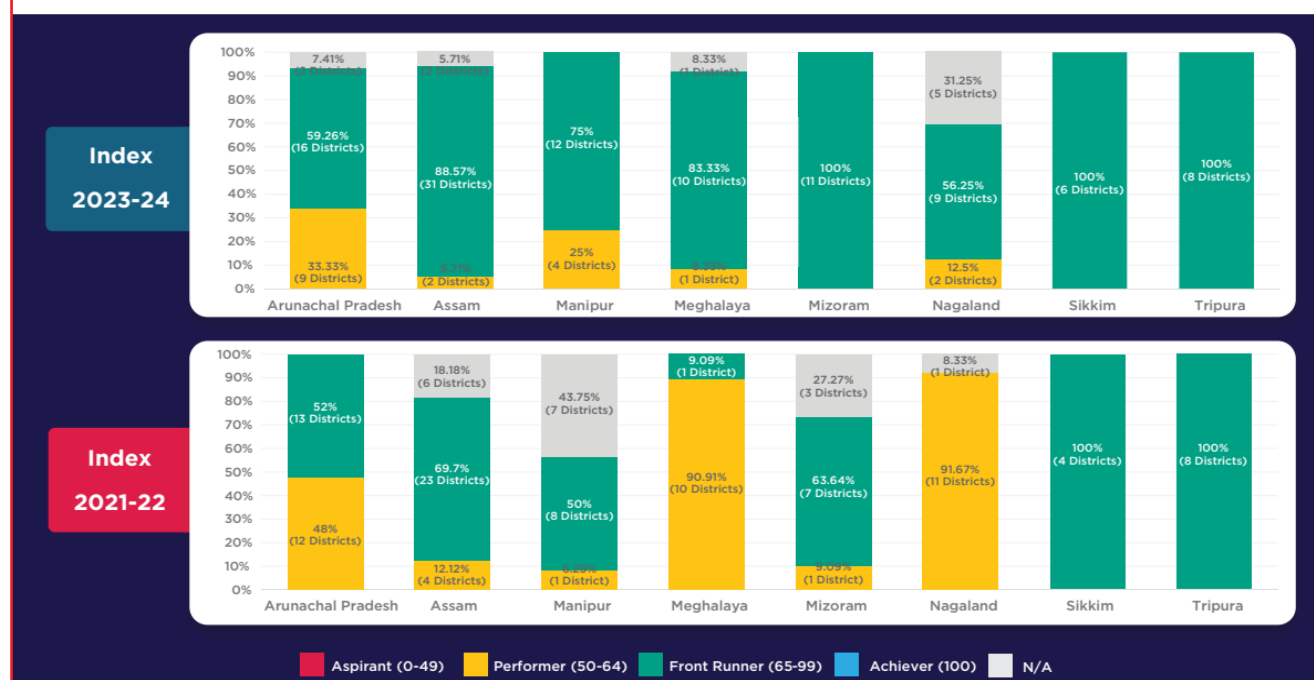
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by NITI Aayog, the **Ministry of Development of North Eastern Region (MoDoNER)**, and with technical support from **United Nations Development Programme (UNDP)**.

- The index covers all 121 out of 131 (92%) districts across the eight Northeastern states.
- Based on **NITI Aayog's national SDG Index** methodology, the districts are ranked into four categories based on their composite scores: **Achiever** (Score = 100), **Front Runner** (Score 65–99), **Performer** (Score 50–64), and **Aspirant** (Score < 50).
- **Key Findings of the NER District SDG Index 2023-24:** In the 2023-24 edition, 85% of NER districts are in the Front Runner category (score 65–99), up from 62% in the previous edition, indicating significant improvement in overall district performance.
 - All districts in **Mizoram, Sikkim and Tripura** have achieved **Front Runner status**, with no districts falling in the Aspirant or Achiever categories.
 - **Mizoram** has the **highest-scoring district** in the entire NER (Hnahthial at 81.43) and Arunachal Pradesh has the lowest-scoring district in the entire region (Longding at 58.71).
 - **Sikkim** has the **narrowest range (5.5 points)** in terms of the score of the highest and lowest district, showing the most consistent performance across its districts.
- **Importance of NER District SDG Index:** The NER District SDG Index facilitates **evidence-based planning and resource allocation**.
 - The Index helps identify development gaps, guide targeted interventions, ensure efficient resource deployment, and support the **localisation of SDGs** through a **cooperative federalism** approach.
 - It aligns national development programmes with local needs for more focused and effective outcomes.
 - This initiative brings together states, NITI Aayog, and MoDoNER to foster sustainable and inclusive development in the region, aligning with India's broader **Viksit Bharat @2047** vision.

FIGURE C. STATE-WISE OVERALL PERFORMANCE COMPARED TO THE PREVIOUS EDITION



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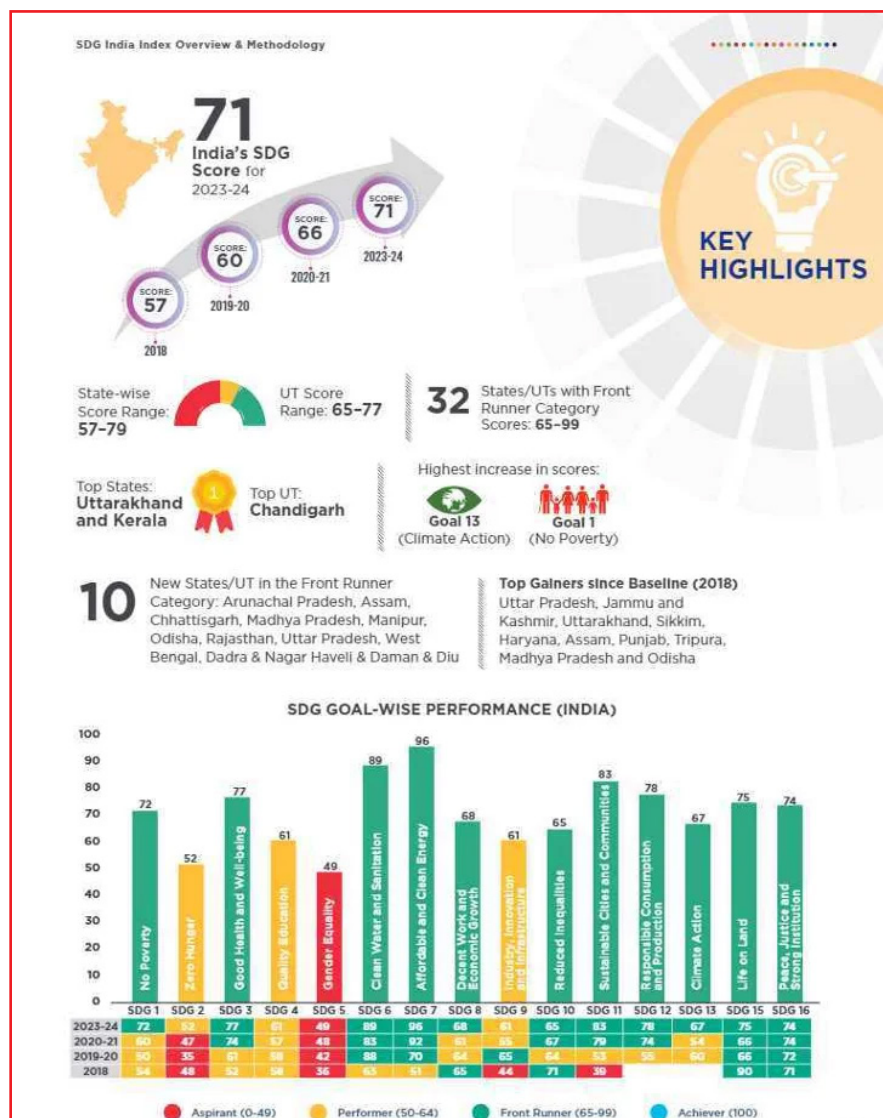


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NITI Aayog's National SDG Index

- **About:** It tracks states' and UTs' progress on 16 Sustainable Development Goals using 113 indicators aligned to the National Indicator Framework. The SDG Goal 14 (Life Below Water) has not been included in the calculation of the Composite Score for the Index as it solely pertains to the nine coastal States.
 - States/UTs are categorised as Aspirants (0–49), Performers (50–64), Front-Runners (65–99), and Achievers (100), with scores reflecting progress toward India's 2030 SDG targets and vision of Viksit Bharat @2047.
- **SDG India Index for 2023-24:** India's SDG score rose to **71** (from 66 in 2020-21 and 57 in 2018), driven by gains in poverty reduction, economic growth, and climate action.
 - **Top Performers:** Kerala and Uttarakhand topped with scores of 79.
 - **Lowest Performers:** Bihar (57) and Jharkhand (62).
 - **Top Performing Goals:** **Goal 13 (Climate Action)** score rose from 54 to 67, and **Goal 1 (No Poverty)** improved from 60 to 72.
 - Goals 1, 8, and 13 are now in the *Front Runner* category (score between 65–99).



National Commission for Minorities

Why in News?

The **National Commission for Minorities (NCM)** has been functioning without a Chairperson and several members since **April 2025**, following the retirement of its previous leadership.

What is the National Commission for Minorities?

- **About:** It is a **statutory body** established under the **National Commission for Minorities Act, 1992**, with the vision to **safeguard and protect** the interests of minority communities.

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- The first statutory Commission was constituted on **17th May 1993**.
- **Genesis:** The **Minorities Commission (MC)** was established in **1978** through a **Ministry of Home Affairs Resolution** and was moved to the newly created **Ministry of Welfare** in **1984**.
- In **1988**, the **Ministry of Welfare** excluded **linguistic minorities** from the Commission's jurisdiction.
- **Composition:** It consists of a **Chairperson**, a **Vice-Chairperson**, and **five Members**, all **nominated by the Central Government** but **absence of a full body** has led to concerns over **inefficiency**.
 - Each member must belong to one of the **six notified minority communities**: **Muslim, Christian, Sikh, Buddhist, Parsi, and Jain**.
- **Powers and Tenure:** It has **quasi-judicial powers** and each member serves a **three-year term** from the date they assume office.
- **Removal:** The **Central Government** may remove the **Chairperson or any Member** of the NCM if they:
 - Are **adjudged insolvent**,
 - Take up **paid employment** outside their duties,
 - **Refuse or become incapable** of acting,
 - Are declared of **unsound mind** by a court,
 - **Abuse their office**, or
 - Are **convicted** of an offence involving **moral turpitude**.

Who are Minorities in India and what are their Constitutional Safeguards?

- **About Minorities:** The **Constitution of India** does not provide a definition for the term '**Minority**', but the Constitution recognises **religious and linguistic minorities**.
 - The **NCM Act, 1992** defines a minority as "a community **notified** as such by the **Central government**."
- **Minority Communities:** As per a **1993 notification** by the **Ministry of Welfare**, the **Government of India** initially recognized **five religious communities**—**Muslims, Christians, Sikhs, Buddhists**, and **Zoroastrians (Parsis)**—as **minority communities**.

- Later, in **2014**, **Jains** were also notified as a **minority community**.
- **Minorities Population:** According to the **2001 Census**, these six communities together constitute **18.80% of India's population**.

Religion	Number (In crores)	%
Muslims	17.22	14.2
Christians	2.78	2.3
Sikhs	2.08	1.7
Buddhists	.84	0.7
Jains	.45	0.4
Total	23.37	19.30

Source: Census 2011

- While the **2011 Census** does not mention the **Parsi population**, it is **estimated at around 57,000**.
- **Safeguards Related to Minorities:**
 - **Article 29:** Right of any section of citizens to conserve their distinct language, script, or culture.
 - **Article 30:** Right of minorities to establish and administer educational institutions.
 - **Article 347:** Special provision relating to the language spoken by a section of the population of any State.
 - **Article 350-A:** Provision for facilities for instruction in mother-tongue at the primary stage.
 - **Article 350-B:** Provision for a **Special Officer for Linguistic Minorities** and his duties.

Custodial Torture in India

Why in News?

The **custodial death** in Tamil Nadu has once again brought the issue of **custodial torture** into the spotlight.

What is Custodial Torture?

- **About:** Custodial torture refers to the **infliction of physical or mental suffering** on individuals held in **police or other authorities**.
 - It represents a **serious violation of human rights and dignity** and frequently results in **custodial**

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deaths—fatalities that occur while a person is under custody.

➤ Types of Custodial Torture:

- **Physical Torture:** Beatings, electric shocks, suffocation, sexual violence, forced stress positions, and denial of medical care.
- **Psychological Torture:** Threats, humiliation, sleep deprivation, solitary confinement, and mock executions.
- **Coercing detainees into admitting crimes** through extreme duress.

➤ Custodial Torture in India:

- **Custodial Deaths:** Between 2016 and 2022, Tamil Nadu (highest among southern states) reported 490 custodial deaths, while the national total stood at 11,656. Uttar Pradesh recorded the highest number with 2,630 deaths.
- **Abuse of Preventive Detention Law:** In 2022, Tamil Nadu detained 2,129 people under preventive laws, accounting for half of India's total.
 - **Scheduled Castes (SCs)** faced disproportionate custodial violence, making up 38.5% of detainees despite being only 20% of the population in Tamil Nadu.

What are the Constitutional and Legal Safeguards in Place Against Custodial Torture?

Constitutional Provisions

- **Article 14:** Article 14 ensures equality before the law, affirming that no one, including law enforcement agencies or officials, is above the law.
- **Article 21:** Article 21 guarantees the **right to life and personal liberty**, which includes the freedom from torture and other cruel, inhuman, or degrading treatment or punishment.
- **Article 20(1):** Article 20(1) states that no person can be convicted for an act that was not an offence under the law at the time it was committed, thereby prohibiting excessive or retrospective punishment.
- **Article 20(3):** Article 20(3) protects an individual from being compelled to self-incriminate, safeguarding

the accused from coerced or forced confessions through torture or pressure.

Legal Provisions

- **Section 120 of Bharatiya Nyaya Sanhita (2023):** It penalizes those who intentionally cause hurt or grievous hurt to extract confessions, information, through violence or coercion.
- **Section 35 of Bharatiya Nagarik Suraksha Sanhita (BNSS, 2023):** It mandates that arrests and detentions follow valid reasons, documented procedures.
- **Section 22 of Bharatiya Sakshya Adhiniyam (2023):** It invalidates confessions made under inducement, threat, coercion, or promise.

International Provisions

- **United Nation Charter, 1945:** It mandates that prisoners be treated with dignity, affirming that their fundamental rights and freedoms remain protected under the **International Covenant on Civil and Political Rights** (ICCPR-India is a signatory).
- **Universal Declaration of Human Rights (1948):** It protects individuals from torture, cruel treatment, and enforced disappearances, ensuring the right to dignity and security.

Click Here to Read: [UN Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment \(UNCAT\), 1984](#)

What are the Challenges in Curbing Custodial Torture?

- **Lack of Specific Anti-Torture Legislation:** India signed the UN Convention Against Torture (UNCAT) in 1997 but has not yet ratified it.
 - While torture is indirectly addressed in laws like the Protection of Human Rights Act, 1993, there is no standalone law criminalizing it, making existing provisions vague, inadequate, and lacking stringent penalties.
- **Weak Enforcement & Impunity:** Between 2017 and 2022, out of 345 judicial inquiries into custodial deaths, there were 123 arrests and 79 chargesheets, but zero convictions.
 - In 74 human rights violation cases involving illegal detention, torture, or deaths, only 3 convictions were recorded against the police.

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- **Overburdened Institutions: Human Rights Commissions (NHRC/SHRCs)** lack binding powers and depend on government funding, limiting their effectiveness.
 - **Prison overcrowding** (at 130% capacity) and **lack of independent oversight**—with no effective police complaints authority in many states—create conditions that facilitate abuse and inhuman treatment.
- **Fear of Reprisal Among Victims:** Victims often refrain from reporting torture due to fear of retaliation, lack of legal aid, and threats when filing complaints.
 - **Marginalized groups** (Dalits, minorities, tribals) are especially vulnerable due to inadequate victim protection and compensation mechanisms.
- **Judicial and Systemic Failures:** Lengthy judicial proceedings, compounded by overburdened courts, witness intimidation, and inadequate fast-track courts, delay justice in custodial death cases.
 - Additionally, poor compliance with the **D.K. Basu Guidelines (1996)**—mandating arrest memos, medical exams, and legal access, along with ineffective magisterial inquiries, reflects a systemic failure and a lack of political will to enforce accountability or reform policing practices.

Key Recommendations to Prevent Custodial Torture

- **Law Commission of India:** In its 273rd Report (2017), the Law Commission of India recommended ratification of **UNCAT 1984**, and enact a specific law to implement its provisions, highlighting the urgent need to criminalize torture.
 - The Commission also submitted a **draft Prevention of Torture Bill, 2017** for the government's consideration.
- **Judicial Ruling:**
 - **DK Basu vs State of West Bengal Case, 1997:** It laid down guidelines to prevent custodial torture and promote transparency in arrests and detentions.
 - It affirmed that while police have the right to investigate, they are prohibited from using third-degree methods, and in cases of custodial violence by public servants, the State is also held accountable.

- **State of Uttar Pradesh vs Ram Sagar Yadav Case, 1985:** In incidents of custodial torture, the responsibility to prove innocence rests with the concerned police officer.
- **Nambi Narayanan Case, 2018:** It emphasized the severe psychological impact resulting from wrongful prosecution and custodial abuse.
- **National Human Rights Commission (NHRC):** The NHRC recommended that District Magistrates and Superintendents of Police must report any incidents of custodial torture to the Secretary General within 24 hours.
 - Failure to comply may be viewed as an attempt to conceal or suppress the incident.

National Sports Policy 2025

Why in News?

The Union Cabinet has approved the **National Sports Policy (NSP) 2025 (Khelo Bharat Niti 2025)**, replacing the **National Sports Policy, 2001**. It outlines a roadmap to make India a global sporting powerhouse with a focus on the **2036 Olympics**.

What are the Key Pillars of the National Sports Policy 2025?

- **Pillars of NSP 2025:**
 - **Excellence on the Global Stage:** Focuses on strengthening sports from grassroots to elite levels through early talent identification, development of competitive leagues and infrastructure, and creation of world-class training and coaching systems.
 - It also aims to enhance National Sports Federations' governance, promote sports science and technology, and train coaches, officials, and support staff.
 - **Sports for Economic Development:** It promotes sports tourism, startups, and private investment to strengthen India's role in the global sports economy.
 - **Sports for Social Development:** The policy emphasizes the role of sports in promoting social

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inclusion by encouraging participation from marginalized groups, reviving traditional and indigenous games, and fostering diaspora engagement and volunteering.

- **Sports as a People's Movement:** To make sports a national movement, the policy aims to promote mass participation and a fitness culture through campaigns, introduce fitness indices for institutions, and improve access to sports facilities across the country.
- **Integration with Education (NEP 2020):** Aligned with National Education Policy 2020, it seeks to integrate sports into school curricula and train educators to foster early sports engagement.
- **Strategic Framework:**
 - **Governance:** NSP 2025 aims to establish a legal and regulatory framework to ensure transparency and accountability in sports administration.
 - **Private Sector Participation:** Mobilize private investments via **Public-Private Partnerships (PPPs)**, **Corporate Social Responsibility (CSR)** and innovative funding initiatives.
 - **Technology and Innovation:** Use **Artificial Intelligence (AI)**, **data analytics**, and emerging technologies for performance tracking and program delivery.
 - **Monitoring and Evaluation:** Set up a national framework with **Key Performance Indicators (KPIs)** and **time-bound targets** for regular progress tracking.
 - **Model Policy for States:** Serve as a guide for **States and Union Territories** to create or update their own sports policies aligned with national goals.

How has India's Sports Policy Evolved?

- **State of Sports in India Post-1947:** India hosted the **first Asian Games in 1951**, signaling its regional aspirations. In 1954, the **All-India Council of Sports (AICS)** was created to advise the government and support elite athletes.
- However, modest funding meant Indian athletes often missed international events due to financial constraints.

- Despite limited state support, legends like **Milkha Singh, Gurbachan Singh, Praveen Kumar Sobti, and Kamaljeet Sandhu** brought India glory in athletics. Meanwhile, India's men's hockey team dominated the Olympics from the 1920s to the 1980s.
- **Beginning of India's Sports Policy:** The now Ministry of Youth Affairs & Sports (MYAS) began as the **Department of Sports in 1982 during the IX Asian Games in New Delhi**. It was renamed the **Department of Youth Affairs & Sports in 1985** during the **International Youth Year**.
 - In 2000, it was elevated to a full-fledged Ministry, and later bifurcated into two departments as Youth Affairs and Sports.
 - **In 1984**, India introduced its **first National Sports Policy (NSP)** that focused on infrastructure, mass participation, and elite excellence.
 - It advocated integration of sports with education (formalized in the National Policy On Education 1986).
 - The Sports Authority of India (SAI) was established in 1986 to implement policies.
 - Between 1986 and 2000, sports saw uneven implementation due to its **status as a State subject**, with low budgets and limited public or market engagement.
- **Impact of Liberalisation on Indian sports:** The **1991 economic reforms** and the rise of cable television significantly boosted sports visibility and public interest, especially among the **urban middle class**, which began engaging with sports beyond just cricket.
 - In response, the **1997 Draft Sports Policy** proposed States focus on mass sports and the Centre on elite athletes, but it was never enacted.
- **Indian Sports in the 21st Century:** The MYAS launched a **revised National Sports Policy (2001)** focused on mass participation and international success.
 - While sports gained budgetary support, Olympic medals remained limited—**Rathore (2004)**, **Bindra (2008)**, **Vijender and bronzes in boxing from Vijender Singh (2008) and Mary Kom (2012)**.

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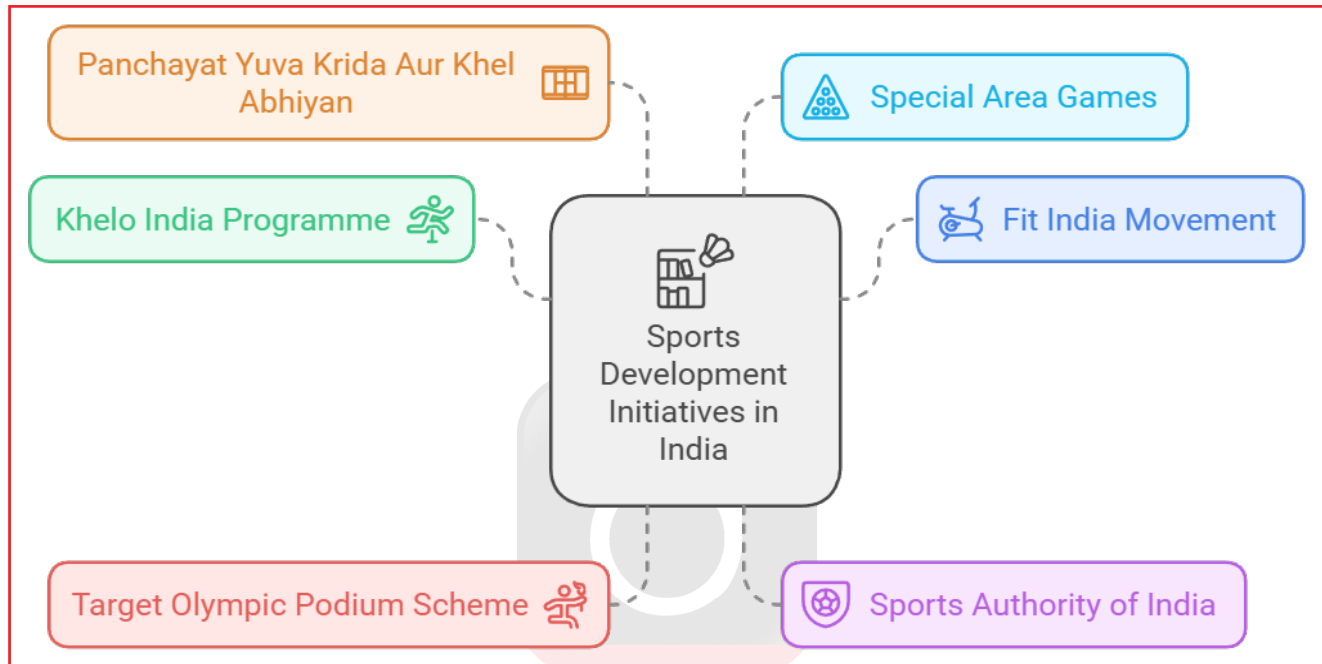
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- The **National Sports Development Code (2011)** aimed to reform NSFs, addressing governance and doping, but faced implementation challenges.

➤ **Major Sports Schemes:**

- **Target Olympic Podium Scheme (2014):** Coaching and support for elite athletes.
- **Khelo India (2017):** Talent scouting across schools/universities.
- **Fit India Movement (2019):** Encouraged fitness at the grassroots level.



What are the Challenges in India's Sports Ecosystem?

- **Governance and Ethical Failures:** India's sports governance suffers from politicisation, **red tape**, and **lack of professionalism**. Mismanagement cases, such as the **Wrestling Federation of India sexual harassment case (2023)** and **Indian Olympic Association (IOA)'s suspension by International Olympic Committee (2022)**, reflect systemic issues.
 - Poor athlete support, seen in incidents like **Vinesh Phogat** missing Olympic qualification over a minor weight issue, exposes gaps in scientific coaching and planning.
- **Cricket-Centric Sports Market:** Cricket dominates media, sponsorships, and funding. In **2023, cricket dominated 87% of India's sports market, leaving just 13%** for all other sports like football, hockey, and badminton.
 - Other sports like athletics, hockey, or wrestling get minimal visibility and investment.
- **Low Athlete Representation:** Although India sent its **largest-ever Olympic contingent of 117 athletes to the Paris 2024 Games**, the number remains significantly lower than countries like the U.S. (594), France (572), and Australia (460).
 - This highlights persistent gaps in grassroots talent scouting and early-stage athlete development, despite India's large population.
- **Lack of Structured Talent Scouting:** India lacks a streamlined grassroots scouting system. Rural and tribal talent often goes unnoticed.

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- For example, Tulsidas Balamram (Indian footballer) was discovered by chance, highlighting the need for systemic scouting.
- **Gender Disparity in Participation:** Women face fewer opportunities, infrastructure gaps, and social stigma.
 - **49% of girls drop out of sports** (six times higher than boys) due to safety concerns, lack of role models, and body image issues. **21% of women athletes report childhood abuse**, undermining safe and equal participation (UNESCO, 2024).
- **Overemphasis on Academics:** Cultural pressure prioritizes academics over sports as a career. Parents and schools often treat sports as extracurricular, not essential. This limits early sports participation and physical literacy.

Debate Over 'Socialist' and 'Secular' in the Preamble

Why in News?

A renewed debate has emerged over the inclusion of the words “socialist” and “secular” in the **Preamble**, added during the **Emergency** via the **42nd Amendment Act, 1976**. Critics argue that these terms were inserted **without wide consultation** and **may not align with India's inherently secular civilisational ethos**.

- The discussion has reignited questions about their **constitutional legitimacy and contemporary relevance**.

What is the Preamble of the Indian Constitution?

- **About:** The **Preamble** is the **introductory statement** of the Constitution of India, outlining the **core values, guiding principles, and objectives** upon which the **Constitution** is based.
 - It **reflects the aspirations of the people** and serves as a **key to understanding the Constitution's spirit**.
 - The philosophy underlying the Constitution of India was summed up in the **Objectives Resolution**, which was adopted by the Constituent Assembly on **22nd January, 1947**.

- **Insertion of 'Socialist' and 'Secular':** Originally, when the Constitution came into effect on **26th January 1950**, the **Preamble** declared India as a **Sovereign Democratic Republic**, committed to securing:
 - **Justice** (social, economic, and political),
 - **Liberty** (of thought, expression, belief, faith, and worship),
 - **Equality** (of status and opportunity), and
 - **Fraternity** (assuring individual dignity and national unity).
- The **42nd Constitutional Amendment Act, 1976**, enacted during the **National Emergency, (1975-77)** added the terms '**Socialist**' and '**Secular**' to the Preamble.
 - **Socialist** signified the **state's commitment to reducing inequality** and **ensuring distributive justice** through a **mixed economy model**.
 - **Secular** reaffirmed the principle of **equal respect for all religions**, ensuring that the **state maintains neutrality in religious matters without endorsing any faith**.
 - The word “**Integrity**” was added alongside “**unity**” in the expression “**unity and integrity of the Nation**”.
- While many changes made during the Emergency were later reversed through the **44th Amendment (1978)**, the **additions to the Preamble remained enacted**.

What does 'Secularism' Mean in the Indian Context?

- **About:** Indian secularism is a **unique and inclusive model** that ensures **equal respect and treatment of all religions**. It seeks to **prevent inter-religious and intra-religious domination**, while ensuring that the **State maintains principled distance from all faiths**. Rather than being anti-religious, it **upholds pluralism, tolerance, and constitutional morality**.
- **3-fold Strategy of Indian Secularism:**
 - **Principled Distance:** The **Indian State maintains neutrality** and does **not favour or promote any religion**.
 - **No religious instruction or celebration in government schools**

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- No religious symbols in courts or public offices
 - Ensures equal treatment of all religions in public life
 - State remains equidistant from all faiths
- **Non-Interference:** The State respects religious sentiments and avoids unnecessary intrusion into religious practices, as long as they don't violate Fundamental Rights or Constitutional provisions.
 - **Example:** Religious communities managing their own places of worship and festivals.
 - **Selective Intervention:** The State intervenes when religious practices contradict constitutional values such as equality, dignity, and justice.
 - **Eg:** Abolition of untouchability (Article 17), Reform of personal laws (ensuring gender equality), Laws enabling equal inheritance rights for women etc.
- **Secularism Before the 42nd Amendment, 1976:** Before the 42nd Amendment in 1976, the word “secular” was not explicitly mentioned in the Preamble, but the spirit of secularism was embedded in the Constitution.
- Key provisions included [Article 14](#) (equality before law), [Articles 15 & 16](#) (prohibition of discrimination on religious grounds), [Articles 25-28](#) (freedom of religion), and [Article 44](#) (Uniform Civil Code as a Directive Principle), Collectively upholding the secular character of the Indian State.
- **Indian vs. Western (US) Secularism:**

Key Differences Between Indian and Western Secularism

Aspect	Western Model	Indian Model
Relationship Between State & Religion	Strict separation – Religion and State operate in mutually exclusive spheres.	Principled distance – Flexible engagement between State and religion.
Intervention in Religious Matters	No State interference as long as religion stays within legal bounds.	State can intervene to reform regressive or discriminatory practices (e.g., abolition of untouchability, ban on sati, child marriage).
Religious Funding/Education	No State funding to religious institutions.	State can provide aid to minority-run institutions under Articles 29 & 30.
Public Display of Religion	Religion is strictly private; no space in public policy or institutions.	Religion is allowed in public life but with constitutional checks (e.g., religious holidays, boards like Waqf/Endowments).
Purpose of Secularism	Ensure neutrality and non-involvement.	Ensure equal respect and reform, without imposing uniformity.

What were the Key Dilemmas in Explicitly Including the Term ‘Secular’ in the Constitution?

- **Constitutional Role vs. Ideological Proclamation:** Dr. B.R. Ambedkar believed that the Constitution should serve as a framework of governance and not impose fixed ideological commitments.
- He argued that social and political ideals must evolve through the will of the people over time, rather than be dictated by the Constitution.

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- **Risk of Superficial Symbolism:** Pandit Jawaharlal Nehru believed that adding 'secular' would be a **symbolic gesture** lacking real impact, stating that secularism must be **lived, practiced, and protected**, not merely declared in words.
- **Fear of Misinterpretation:** Many members including Loknath Misra and HV Kamath feared that explicitly using the term might be **misconstrued as anti-religious or irreligious**, potentially **alienating religious communities in a deeply spiritual and diverse society**.
- **Need for Legislative Flexibility:** Including the word 'secular' was seen by some as **limiting the future legislative scope** of the State, especially **when reforming religious practices for social justice** (e.g., abolishing untouchability or reforming personal laws).

What are the Arguments in Favour & Against the Inclusion of the word "Socialist" or "Secular" in Indian Constitution?

Arguments in Support of Inclusion

- **The Constitution is Inherently Secular and Socialist:** Even before the **42nd Amendment, 1976**, secularism and socialism were implicit in various provisions.
 - **Article 14, 15, 16, 25-28** protect religious freedom and prohibit discrimination.
 - **Directive Principles (Part IV)** reflect socialist goals such as equitable distribution of wealth, social justice, and state welfare.
- **Historical and Political Context:** Inclusion of the terms "secularism" and "socialism" in the Preamble reaffirmed India's religious neutrality and the political will of the time, as the **2nd Amendment 1976** sought to **enshrine these values**, which were later retained by the **44th Amendment, 1978**.
- **Judicial Endorsement:**
 - In **Kesavananda Bharati Case (1973)**, the Supreme Court (SC) ruled secularism and socialism as **part of the basic structure**, which **cannot be removed or amended even by Parliament**.
 - In **S. R. Bommai v. Union of India (1994)**, SC reaffirmed secularism as a basic feature of Indian democracy.

- In **Minerva Mills v. Union of India (1980)**, the SC held that the socialist objectives in the DPSPs are fundamental to the Constitution, and in certain cases, **Articles 39(b) and 39(c) can override Articles 14 and 19 to uphold socialism and economic justice**.
- In **Dr. Balram Singh v. Union of India (2024)**, the Supreme Court dismissed petitions challenging the insertion of the words "**socialist**" and "**secular**" into the Preamble, upholding their validity and alignment with the Constitution.

Arguments Against Inclusion

- **Against Original Intent:** Critics argue that **Dr. B.R. Ambedkar and the framers** believed the values of "**socialist**" and "**secular**" were already inherent in the Constitution's provisions, **making explicit inclusion unnecessary**.
 - They contended that inserting these terms during the **Emergency (1976)** was a "**betrayal**" of constitutional ethos, amounting to **tampering with the Constitution's soul** amid democratic suppression.
- **Imposition of Western Ideas:** Experts, critics argue that socialism and secularism are **Western constructs** alien to **Indian civilizational ethos**, emphasizing that Indian spiritual traditions promote a "**positive alignment**" with religion, unlike the **strict church-state separation** seen in Western secularism.
- **Procedural Concerns:** Preamble, adopted at the **end of the Constitution's drafting** and **formally enacted on 26th November 1949**, represents the **guiding soul and foundational vision of the Constitution**.
 - Critics argue that amending it retrospectively **undermines its sanctity**.

10 Years of Digital India

Why in News?

On **1st July 2025**, India celebrated **10 years of Digital India**, a **flagship initiative** launched in **2015** to bridge the digital divide and empower citizens through **technology**.

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- Over the past decade (2015-25), Digital India has revolutionized internet access, governance, **financial inclusion**, and **digital infrastructure**, positioning India as the world's third-largest digital economy.

What are Achievements of Digital India Since its Launch?

- **Digital Infrastructure:**
 - **Telecom & Internet Growth:** Between 2014 and 2025, telephone connections rose from 93.3 crore to 120 crore (with **tele-density** increasing from 75.23% to 84.49%), while internet users grew by 285% and broadband connections surged by 1,452%.
 - **5G Revolution:** In just 22 months, 4.74 lakh 5G towers were installed, covering 99.6% of districts, while data costs fell sharply from Rs 308/GB (2014) to Rs 9.34/GB (2022).
 - **BharatNet for Rural India:** 2.18 lakh **Gram Panchayats** have been connected through 6.92 lakh km of **optical fibre**, and 4G connectivity now reaches 6,15,836 villages across India.
- **Digital Finance:**
 - **Unified Payments Interface (UPI):** As of April 2025, **UPI** facilitated 1,867.7 crore transactions worth Rs 24.77 lakh crore, accounting for 49% of global real-time transactions (2023); it is now operational in 7+ countries.
 - **Aadhaar & Direct Benefit Transfer (DBT):** By April 2025, 142 crore **Aadhaar** IDs had been generated, enabling Rs 44 lakh crore to be transferred via **DBT**, which removed 5.87 crore fake ration cards and 4.23 crore duplicate LPG connections.
 - **ONDC & GeM:** By 2025, the **Open Network for Digital Commerce (ONDC)** had onboarded lakhs of sellers, while the **Government e-Marketplace (GeM)** has over 22.5 lakh sellers and 1.6 lakh government buyers.
- **AI and Semiconductors:** The **IndiaAI Mission (2024–29)** has deployed over 34,000 GPUs by May 2025 to boost AI innovation, compute capacity, startups, and ethical AI frameworks, anchored by pillars like IndiaAI Innovation Centre, AIKosh, FutureSkills, and Safe & Trusted AI.
 - The **India Semiconductor Mission** supports chip and display manufacturing with 50% capital assistance; 6 projects worth Rs 1.55 lakh crore have been approved (5 under construction).
- **Citizen Empowerment:** **Karmayogi Bharat** and **iGOT** have on boarded 1.21 crore officials, issuing 3.24 crore learning certificates, while platforms like **DigiLocker** (with 53.92 crore users) and the **UMANG App** (offering 2,300+ services in 23 languages with 8.34 crore users) have enhanced digital access and governance.
 - **BHASHINI** is breaking language barriers in digital platforms by supporting 35+ Indian languages, offering 1,600 AI models, and integrating with services like IRCTC and **NPCI**, promoting linguistic inclusivity in digital services.

What is the Digital India Initiative?

- **About:** Digital India initiative was launched on 1st July 2015, to transform India into a digitally empowered society and knowledge-based economy by strengthening digital infrastructure, ensuring digital delivery of services, and promoting financial inclusion.
- **Objective:**
 - **Bridging the Digital Divide:** Digital India aims to reduce the gap between digitally empowered citizens and those with limited access to technology.
 - **Ensuring Inclusive Digital Access:** It promotes equal participation in the digital ecosystem, enabling access to education, healthcare, and government services for all.
 - **Driving Economic Growth:** By leveraging technology and innovation, the initiative supports nationwide economic development.

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- **Improving Quality of Life:** It seeks to raise **living standards** by integrating **technology** into key areas of **daily life**.
- **Nine Pillars of Digital India Initiative:**
 - **Broadband Highways:** It aims to expand **high-speed internet** nationwide for better **connectivity**.
 - **Universal Mobile Access:** It ensures **mobile coverage** in remote areas to boost **digital inclusion**.
 - **Public Internet Access:** It sets up **Common Service Centres** in underserved regions to improve **affordable access** and **digital literacy**.
 - **E-Governance:** It streamlines **government services** for better **efficiency, transparency, and citizen engagement**.
 - **E-Kranti:** It delivers **government services online** via platforms like **MyGov.in** enhancing **accessibility**.
 - **Information for All:** It promotes **digitisation of records** and **open data** for innovation.
 - **Electronics Manufacturing:** It boosts **local production**, reducing imports and creating **jobs**.
 - **IT for Jobs:** It builds **youth IT skills** through missions like **Digital Literacy** and **Skill India**.
 - **Early Harvest Programs:** It addresses urgent digital needs like **online certificates, digital attendance, and public Wi-Fi**.



- **Digital India Initiatives:** Aadhaar (unique **12-digit biometric IDs**), **BharatNet** (high-speed broadband to rural areas), **Digital Locker** (secure cloud storage of documents), **BHIM UPI** (secure digital payments), **eSign** (online document signing using digital signatures), **MyGov** (citizen participation in governance) etc.

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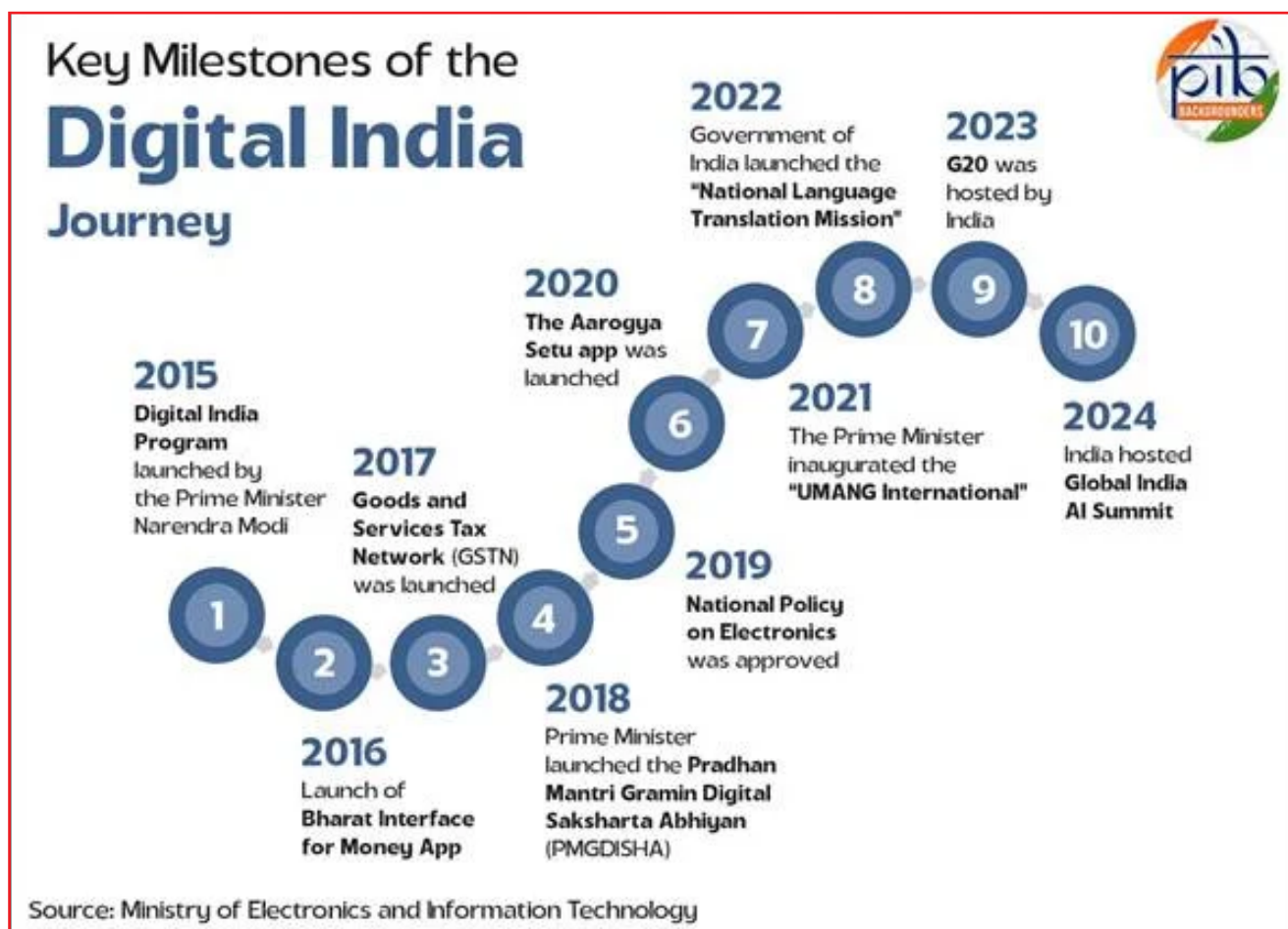
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➤ Key Milestones:



What are the Key Issues Associated with the Digital India Initiative?

- **Digital Divide**: India's digital growth remains uneven, with **rural internet penetration** and **digital literacy** at only **37%** (2023), highlighting stark gaps across regions and socio-economic groups.
- **Cybersecurity Threats**: Rising digital use has led to **13.91 lakh cyber security incidents** (2022), but India faces a **8 lakh cyber security professional shortage**, exposing weak **cyber defenses**.
- **Data Privacy**: Despite the **Digital Personal Data Protection (DPDP) Act, 2023**, concerns persist over **enforcement** and **data misuse**, with **61% of companies** reportedly breaching consent norms.
- **Infrastructure Bottlenecks**: **Low broadband speeds**, **patchy 5G**, and poor **fiber-optic coverage**, especially in remote areas, limit digital access; India ranks **25th** in mobile internet speed (2024).
- **Regulatory Challenges**: **Frequent policy shifts**, **overlapping jurisdictions**, and delays in **spectrum auctions** hinder 5G rollout and burden businesses with **data localization costs**.
- **Public Digital System Issues**: Platforms like **CoWIN** and **Aadhaar** face **scalability**, **accuracy**, and **fraud** challenges, especially in non-urban areas.
- **Environmental Impact**: Digital growth has increased **e-waste** from **1.01 MT (2019–20)** to **1.751 MT (2023–24)**, worsened by weak **e-waste management** and **high energy use** in data centers.



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Economic Scenario

Highlights

- India's Sluggish Corporate Investment
- Catastrophe Bonds for Natural Disasters
- India's Infrastructure Challenge
- Declining Household Savings & Rising Liabilities
- Initiatives Driving the Agricultural Growth in India
- Exploring the Opportunities and Challenges of GM Crops
- Urban Centres as Catalysts of India's Growth
- VRRR Auction to Absorb Excess Liquidity
- Unlocking Cooperatives' Potential in Empowering MSMEs
- Bridging the Gaps: Strengthening India's Gig Economy
- NITI Aayog Report on Chemical Industry
- Reforming the Global Sovereign Credit Rating System and MDBs
- RECLAIM Framework for Mine Closure
- Rules for Promotion of Agroforestry
- RDI Scheme for Private Sector R&D
- Voluntary Amalgamation of Co-operative Banks
- Employment Linked Incentive Scheme

India's Sluggish Corporate Investment

Why in News?

India's **corporate investment** remains sluggish despite government support. The **June 2025 Index of Industrial Production (IIP)** growth fell to a nine-month low of 1.2%, highlighting **weak industrial activity**, raising concerns about India's growth and employment prospects.

Why is Corporate Investment Sluggish in India?

- **Weak Demand:** Investment decisions are primarily driven by expected demand. Despite higher profits post-tax reforms (**corporate tax cut from 30% to 22% in 2019**), low consumer demand has disincentivized expansion.
 - The **Economic Survey 2024-25** noted that while corporate profits soared, **hiring and wage growth remained low**, and private sector **Gross Fixed Capital Formation (GFCF)** in machinery rose only 35% in four years. Without a revival in demand, profits alone are not an incentive for investment.
 - The **Reserve Bank of India (RBI) Monetary Policy Committee (MPC)** reduced rates and eased liquidity to spur investment, but **low demand** has

hurt business confidence. But without demand, firms avoid borrowing, fearing poor returns.

- Capacity underutilization discourages further investment as firms prefer to operate existing assets more efficiently.
- **Lower Investment to GDP Ratio:** Corporate investment to GDP ratio has been significantly lower in recent years. In FY2022-23, corporates invested 12% of GDP, compared to 16% during the growth surge years (2004-2008).
 - This decline reflects reduced confidence in **long-term growth prospects**. This level of investment is inadequate for achieving **India's target of over 8% structural growth**, which would require a 35% or more investment rate.
- **Low Multiplier Effect of Government Capex:** The government has stepped up **infrastructure spending (Capex)** of Rs 11.21 lakh crore (3.1% of GDP) earmarked in FY2025-26) to boost growth and support recovery.
 - Despite higher public spending, private investment remains sluggish due to **long project timelines, high import content, and low job creation** from machine-heavy infrastructure, limiting the consumption boost.
- **Delayed Loan Disbursement:** It can take two to three years for disbursement of loans, particularly for **large-scale infrastructure projects**.

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- For example, credit to the infrastructure sector in November 2023 grew at only 2.1%, compared to 11.1% in November 2022.
- According to RBI data, loans to the roads sector in November 2023 grew by only 6.4%, compared to 14% the previous year.
- In contrast, personal loans grew 30.1% in 2023, indicating household demand but not industrial appetite.
- **Global Trade Headwinds:** Protectionist policies globally, including tariff regimes in key markets like the US, have weakened export-led investment opportunities.

Economic Theories of Investment and Profits

- In a pure **capitalist economy** (one without any State intervention or access to external markets), **investment and profit are tightly linked**, but which causes which is debated.
- According to economists like **Tugan Baranovsky**, **Luxemburg**, and **Kalecki** the relationship between profits and investment is crucial to understanding the investment cycle.
- **Tugan Baranovsky's View:** Investment can drive its own demand. As long as investment in consumption and capital goods stays proportionate, the economy can keep growing, even without strong consumer demand.
- **Luxemburg:** While investment leads to profits, it doesn't guarantee that firms will invest. Under capitalism, **decisions are made individually, not collectively**.
 - In a slowdown, adding capacity makes no sense if existing factories are underused.
 - Collective investment could revive the economy, but capitalism lacks such coordinated planning.
- **Kalecki:** Argued that **investment drives profits**, not the other way around. But firms invest **only if they expect demand**. Without **external stimulus**, the economy gets stuck in a cycle of low demand and low investment.

What are India's Measures to Boost Investment?

- **Make in India** and **Startup India** to support manufacturing and innovation

- **PM GatiShakti** for integrated infrastructure and logistics
- **National Industrial Corridor Programme (NICDP)** to develop manufacturing zones
- **Production Linked Incentive (PLI) Schemes** to boost sector-specific output
- **Ease of Doing Business (EoDB) reforms** and compliance reduction
- **National Single Window System (NSWS)** for investor facilitation
- **India Industrial Land Bank** to provide land availability information
- **Project Monitoring Group (PMG)** to remove project implementation bottlenecks
- Over 90% of **Foreign Direct Investment (FDI)** inflows are under the automatic route, reducing red tape. Most sectors are open to 100% FDI, except those of strategic importance.
- **Project Development Cells (PDCs)** have been created in all key ministries to coordinate investment proposals and support investors.

Catastrophe Bonds for Natural Disasters

Why in News?

India's **limited disaster insurance coverage** increases financial vulnerability during **natural disasters**. In light of rising climate-induced disasters, **Catastrophe Bonds (Cat Bonds)** present a strategic option for enhancing **disaster risk financing and resilience**.

Bonds

- **Bonds** are **debt instruments** where an investor **lends money** to a government, corporation, or other entity for a fixed period.
- In return, the investor receives **regular interest payments** (called **coupons**) and gets back the **principal amount** at the end of the bond's term (maturity).

What are Catastrophe Bonds?

- **About:** **Catastrophe Bonds** are **insurance-linked securities** that transfer the financial risk of natural

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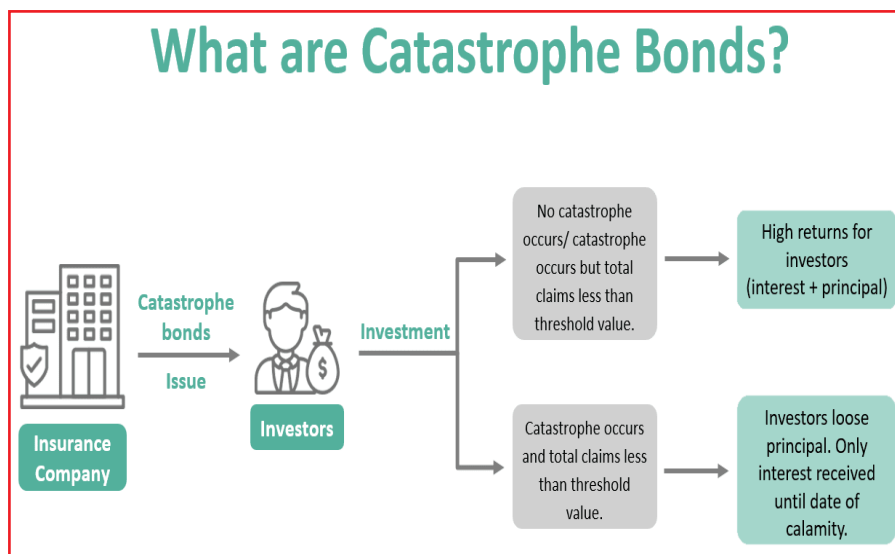


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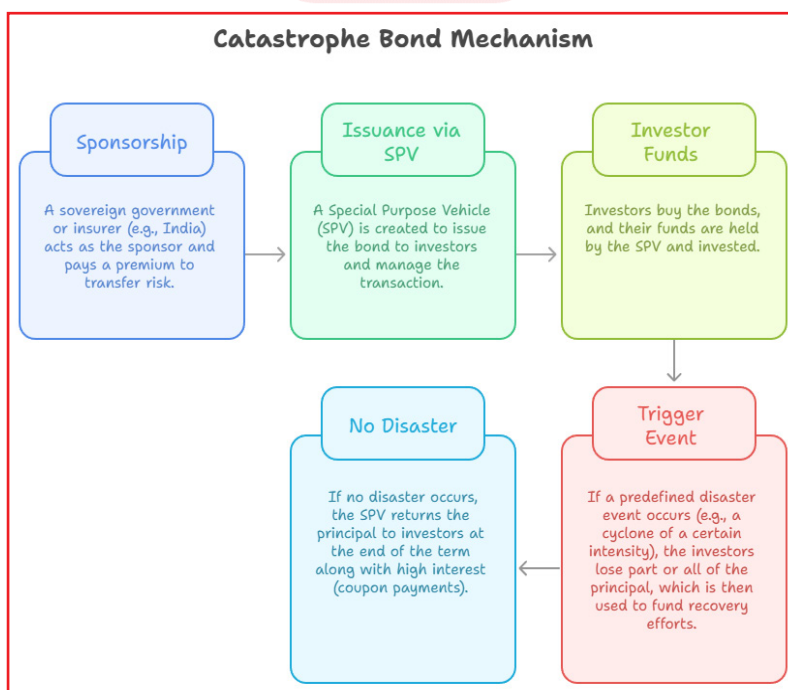


disasters (**earthquakes, cyclones, or floods**) from governments or insurers to private investors through global financial markets.

- These hybrid instruments combine insurance and bond features, raising quick funds for post-disaster relief.
- Investors earn high returns for bearing the risk but may lose their investment if a major disaster occurs.
- Primarily purchased by **institutional investors** like **pension funds** and **hedge funds** due to their **complexity and high investment thresholds**.
- **Cat-bonds** are now increasingly attracting **retail investors**, especially after becoming the **best-performing hedge fund strategy in 2023**.



➤ Working Mechanism:



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➤ **Key Features:**

- **High Returns:** Investors are compensated with **higher returns** than regular government or **corporate bonds**, due to the risk of losing the principal.
 - **Diversification:** Cat bond risks are **not correlated** with financial market movements, offering **diversification**.
 - **Quick Capital Mobilization:** Enables **faster payouts** post-disaster, reducing dependence on delayed aid or budget reallocation.
 - **Multi-Year Coverage:** Can provide **multi-year disaster protection** for governments.
 - **Fiscal Buffer:** Reduces pressure on central and state government finances after disasters.
 - **Investor Vigilance:** Encourages **improved disaster preparedness** and investment in risk mitigation technologies.
- **Global Trends:** Since their inception in the late 1990s, over **USD 180 billion** in Cat Bonds have been issued globally, with around **USD 50 billion** currently active.

What is the Significance of Catastrophe Bonds for India?

- India, being highly vulnerable to **climate-related disasters** such as **cyclones, floods, and earthquakes**, faces rising challenges in **disaster risk financing** as insurers raise premiums or exit the market.
- Since **FY 2021-22**, the government has been allocating **USD 1.8 billion** annually for disaster mitigation, making India well-positioned to explore **Cat Bonds** potentially in partnership with intermediaries like the **World Bank** or **Asian Development Bank (ADB)**.
- India can lead a **South Asian Cat Bond** initiative to cover transboundary disaster risks like **earthquakes in Nepal, Bhutan, and India**, or **cyclones impacting India, Bangladesh, and Sri Lanka**.
 - A regional approach would **spread risk**, **reduce premium costs**, and enhance **financial resilience** against natural disasters across participating countries.

India's Infrastructure Challenge

Why in News?

The **collapse** of the **Mahisagar River Bridge** in **Vadodara** due to **structural failure**, killing **20 people**, highlights growing concerns over **infrastructure** quality amid **similar incidents** nationwide.

Similar Instances of India's Poor Infrastructure

- **Gujarat:** The **2022 Morbi suspension bridge collapse** claimed **135 lives**.
- **Maharashtra:** The **Palava Bridge** on **Kalyan-Shil Road** was **closed within two hours** of opening due to **structural defects**, while the **Pune Pedestrian Bridge** over the **Indrayani River** collapsed under **tourist weight**.
- **Assam:** The **Harang Bridge** collapsed (**June 2025**) after **two overloaded trucks** crossed during **heavy rain**, cutting off **Barak Valley** from **Tripura, Mizoram, and Manipur**.
- **Madhya Pradesh:** The **Aishbagh rail overbridge** in **Bhopal**, featuring a **hazardous 90-degree turn**, triggered **public outrage**.
- **Bihar:** In **2024**, at least **12 bridges** collapsed within **20 days**. In **2025**, the collapse of **Munger's Bichli Pul** over the **Gandak River** isolated **80,000 residents**.

What are the Reasons Behind India's Poor Infrastructure?

- **Corruption & Substandard Materials:** Contractor mafia and kickbacks (reward for awarding the deal) allow **politically linked firms** to use **poor-quality materials** for higher profits.
 - **Ghost projects and fund misuse**, especially in **Bihar**, cause **weak structures**, like **Purnea's illegal ghost bridge** built for a land scam.
- **Poor Maintenance & Overloading:** Neglect of old bridges, like those in **Morbi** and over the **Indrayani River**, led to collapse due to **lack of inspection and reinforcement**.

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- **Overloading**, as seen in Assam's Harang Bridge, causes failures when **traffic rules** are ignored and **heavy vehicles go unchecked**.
- **Engineering Flaws: Poor planning**, seen in Bhopal's Aishbagh rail overbridge and Indore's under-construction bridge, results in **unsafe infrastructure**.
 - **Lack of expert oversight** and **technical review** leads to **structural flaws** in many projects.
- **Lack of Accountability: Poor accountability** follows disasters like Morbi and Mahisagar, with **officials and contractors rarely punished**.
 - **Lax safety regulations** and the **absence of strict bridge audits** let **unsafe structures** remain in use.
- **Climate & Environmental Factors**: In Assam and Bihar, **floods** and river erosion weaken bridge foundations, yet **preventive action is lacking**.
 - **Unplanned urbanization** in cities like Mumbai and Pune leads to **stressed infrastructure**.
- **Political Interference: Rushed inaugurations** of **incomplete projects** (like the Palava Bridge), **bypassing safety checks**.
 - **State-centre mismanagement**, including **bureaucratic delays** and **fund disputes**, stalls many infrastructure projects.

What is the Current State of Infrastructure Development in India?

- **Highways and Roads**: India holds the position of having the **world's second-largest road network** (after the **United States**), with **National Highways** extending to **1,46,145 km** as of **2024**.
- **Railways**: India's first bullet train project, designed for speeds of **280 km/h**, is expected to be **completed by 2026**.
 - The past decade has seen a **decline in consequential accidents**, despite notable incidents like the **Kanchenjunga Express crash**.
- **Civil Aviation**: India is the **world's third-largest domestic aviation market**, with the number of operational airports rising from **74 in 2014** to **157 in 2024**.
 - Under the **Regional Connectivity Scheme (RCS)-UDAN**, millions of passengers have benefited by **December 2024**.

- **Maritime Sector**: India aims to rank among the **top five shipbuilding nations by 2047**.
 - Major projects like the **Galathea Bay mega port** and the **India-Middle East-Europe Economic Corridor** are underway to enhance **trade connectivity**.
- **Urban Metro**: The **metro network** expanded from **248 km in 2014** to **945 km by 2024**, now operating in **21 cities** and serving **1 crore daily commuters**.
 - The **Namo Bharat train** on the **Delhi-Meerut RRTS corridor** strengthens **regional connectivity** and improves **urban transportation**.
- **Ropeways Development**: Under the **Parvatmala Pariyojana**, around **60 km of ropeway projects** were slated for award by **FY 2024-25**, including the **Varanasi Urban Ropeway** and the **Gaurikund-Kedarnath Ropeway**.

Government Initiatives for Infrastructure Development

- **PM Gati Shakti Scheme**
- **Bharatmala scheme**
- **National Infrastructure Pipeline (NIP)**
- **Sagarmala Project**
- **Ude Desh Ka Aam Nagrik (UDAN)**

Declining Household Savings & Rising Liabilities

Why in News?

India's **household savings pattern** is undergoing a significant transformation, raising concerns about **long-term economic stability** and **domestic capital formation**.

What is the Current Trend in Household Savings in India?

- **Falling Gross Savings Rate**: India's gross domestic savings rate fell from **34.6% of GDP in 2011-12** to **29.7% in 2022-23**, marking a **four-decade low**, while **household net savings**, which traditionally made up **60% of total savings**, have also declined.
- **Rising Household Debt**: Household liabilities peaked at **6.4% of GDP (FY24)**, near the **2007 high (6.6%)**, driven by **borrowing for consumption, housing, and education**.

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- **Saving Pattern: Physical savings** (gold, real estate) increased from **59.7% in 2019–20 to 71.5% in 2023–24**, while **financial savings** declined from **40.3% to 28.5%**.
 - Within financial savings, **bank deposits** dropped from **58% (FY12) to 37% (FY23)**, while investments in **equities, and mutual funds** nearly doubled (Rs 1.02 lakh crore in FY21 to Rs 2.02 lakh crore in FY23).
- **Urban vs. Rural Divide: Urban households** increasingly invest in **financial instruments** (mutual funds, equities) due to better **financial access**, while **rural households** continue to prefer **cash and physical assets**, highlighting gaps in **financial inclusion**.
- **Post-Pandemic & Inflationary Pressures:** While **Covid-19** initially boosted savings due to reduced spending, the trend **reversed as the economy reopened**, with **high inflation eroding disposable incomes** and **low real interest rates** making traditional savings like fixed deposits less attractive.

Household Savings and Household Debt

- **About:** Household savings refer to the portion of a household's **disposable income** that is **not spent on consumption** but is set aside for future use, typically in the form of **bank deposits, investments, insurance, or physical assets** like gold or property.
- **Types:** Household (HH) savings in India comprise **net financial savings (NFS)** and **physical savings**.
 - **NFS** is calculated by subtracting **financial liabilities** (annual borrowing) from **gross financial savings (GFS)**, which includes **currencies, deposits, insurance, provident and pension funds (P&PF), shares & debentures, small savings, and others**.
 - **Physical savings** mainly include **residential real estate** (about two-thirds) and **machinery/equipment** owned by HH-sector producers.
- **Household Debt:** It refers to all **household debts** (including those of non-profits serving households) that must be **repaid with interest or principal** to creditors **by a set future date**.

- **Initiatives Related to Household Savings:** **Sukanya Samriddhi Scheme, Kisan Vikas Patra Scheme, Mahila Samman Savings Certificate, National Pension System (NPS)** etc.

What are the Implications of Low Household Savings Rate and Rising Household Debt?

- **Reduced Domestic Capital Formation:** Reduced household savings, a key source for **investment and capital formation**, may slow **GDP growth** and increase dependence on **foreign capital (FDI, external borrowing)**, heightening **external vulnerabilities**.
- **Consumption-Driven Growth:** Lower savings reflect higher **consumption spending**, which can boost short-term demand but reduce **long-term investment capacity**. It risks **debt-fueled growth bubbles** like the **2008 US subprime crisis**.
- **Pressure on Fiscal and Monetary Policy:** A fall in **private savings** may compel the government to boost **public savings** through **higher taxes or spending cuts**, while the **RBI faces a trade-off—low interest rates** discourage savings, whereas **high rates** raise borrowing costs.
- **Rising Household Debt Stress:** Rising household debt, especially through **unsecured loans, credit cards, and personal loans**, increases the risk of **loan defaults** and potential **debt traps** if incomes don't rise proportionally, leading to higher **Non-Performing Assets (NPAs)**.
- **Social and Inequality Concerns:** Lower savings weaken household **emergency resilience** and increase reliance on **borrowing for essentials**, leading to **long-term financial instability**, while declining **provident/pension savings** and a shift to **market-linked investments** raise the risk of **retirement insecurity**.

Paradox of Savings

- **About:** The **Paradox of Savings** (or **Paradox of Thrift**) is an **economic theory** that suggests while **saving money** is good for an **individual**, if **everyone saves more simultaneously**, it can **hurt the overall economy**.

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- **Key Idea:** When households **raise savings and cut spending**, it reduces **aggregate demand**, leading to **lower production**, which prompts businesses to **cut jobs and incomes**.
 - As a result, **declining incomes** may cause the economy's **overall savings to decrease rather than increase**.
 - E.g., In a **recession**, if people **fear job losses** and **save more** instead of **spending**, **businesses earn less revenue** → **lay off workers** → **unemployment rises** → **incomes fall** → **savings shrink**.
- **Origins and Development of the Theory:** The concept was notably popularized by **John Maynard Keynes** in his influential **1936 work, *The General Theory of Employment, Interest, and Money***.
 - Keynesian economists argue that **consumer spending drives economic growth**, and **savings are transformed into investments** aimed at producing goods for these markets.
 - However, if **consumer demand is insufficient**, it can lead to a decline in such investments, thereby **hampering economic growth**.

Initiatives Driving the Agricultural Growth in India

Why in News?

At the **16th Agriculture Leadership Conclave**, the Union Minister of Commerce and Industry, highlighted major initiatives driving agricultural growth in India, focusing on soil health, credit access, digital innovation, and global trade.

What are the Initiatives Driving the Agricultural Growth in India?

- **Minimum Support Price (MSP) Enhancements:** **MSP** for several crops has seen significant increases, with pulses and oilseeds witnessing up to 98% higher MSP, directly benefiting farmers by ensuring remunerative prices for their produce.
- This policy aims to reduce farmers' vulnerabilities to market fluctuations and provide a financial cushion for their efforts.
- **Soil Health Cards:** Over **25 crore Soil Health Cards** have been distributed. SHCs provide farmers with vital information on the health of their soil, guiding them on the type and amount of fertilisers to use, thereby improving crop yield and reducing over-reliance on harmful chemicals.
- **Kisan Credit Card (KCC):** Ensures wider access to **crop loans and agricultural credit**, supporting timely inputs and farm activities.
 - As of 2024, there are 7.75 crore active **KCC accounts** with Rs 9.81 lakh crore in outstanding loans. Additionally, 1.24 lakh KCCs have been issued for fisheries and 44.4 lakh for animal husbandry activities.
- **PM-KISAN Samman Nidhi:** It is a **Central Sector scheme** with 100% funding from Government of India. Under the scheme an income support of 6,000/- per year in three equal installments will be provided to all land holding farmer families.
 - The fund will be directly transferred to the bank accounts of the beneficiaries.
 - As of 2024, **11.8 crore farmers have received financial assistance**, making it one of the world's largest **Direct Benefit Transfer (DBT)** schemes.
- **e-NAM Integration:** **1,400 mandis** have been linked with the **electronic National Agriculture Market (e-NAM)** to improve transparency and price realisation.
- **Fertiliser Subsidies:** The Indian government budgeted over **Rs 1.67 lakh crore— nearly 70% of India's agriculture budget**—for fertiliser subsidy for the financial year 2025-26. Fertiliser subsidies are nearly 40% of India's total subsidy spending.
- **Free Trade Agreements (FTAs):** India's **FTAs** with **Australia, UAE, EFTA nations, and the UK** have opened up new international markets for Indian agri-products.
- **Digital Agriculture:** Emphasis on **AI, geospatial tech, weather forecasting, and vertical farming** to modernize the farm sector.

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- The **Digital Agriculture Mission**, approved in 2024, aims to build a farmer-centric digital ecosystem. It includes key components like **AgriStack**, which digitizes farmers' data, land, and crop details to ensure access to services like credit and insurance.
- **Support to Farmer Producer Organisations (FPOs):** The **"Formation and Promotion of 10,000 FPOs" scheme**, launched in 2020, aims to empower small and marginal farmers by collectivising them for better market access, reduced input costs, and improved incomes.
 - As of February 2025, around 30 lakh farmers (40% women) have joined FPOs.
 - FPOs are supported by multiple ministries including Agriculture, and Food Processing. A **dedicated Credit Guarantee Fund** ensures improved credit access, enhancing the viability of FPOs and boosting rural entrepreneurship.
- **Agri-Exports and Value Addition:** India's agriculture and fisheries exports have reached Rs 4.5 lakh crore and hold the potential to scale up to Rs 20 lakh crore.
- **Infrastructure and Irrigation:** Investments in **warehousing, cold chains, drip irrigation**, and organic/natural farming practices are being scaled up.
 - The **Agricultural Infrastructure Fund (AIF) scheme**, has been expanded to strengthen agrarian infrastructure through broader project eligibility, including viable community farming assets, integrated processing projects, and convergence with **PM-KUSUM** to promote clean energy.
 - From 2015-2025, 96.97 lakh ha has been covered under micro irrigation through **Per Drop More Crop (PDMC) Scheme**, which includes 46.37 lakh ha under drip irrigation and 50.60 lakh ha under sprinkler irrigation.

India's Agricultural Growth

- The **agriculture & allied sector grew at 5% annually** (FY17–FY23), with gross value added (GVA) share rising from 24.38% (2014-15) to 30.23% (2022-23). Agriculture income rose by 5.23% annually over the last decade.

- In FY24, India's agri-food exports reached USD 46.44 billion (11.7% of total exports). The share of processed food rose from 14.9% in FY18 to 23.4% in FY24, highlighting growing value addition.

Exploring the Opportunities and Challenges of GM Crops

Why in News?

Amid ongoing trade negotiations, the US is pushing India to open its agriculture market to **genetically modified (GM) crops**. However, India has firmly stated that agriculture and dairy are 'sacrosanct red lines,' warning that allowing GM crop imports could threaten farmers' livelihoods and food safety.

What are Genetically Modified (GM) Crops?

- **About: Genetically Modified (GM) crops** are plants whose **DNA is altered** using modern **genetic engineering technology** to introduce or enhance desirable traits such as **pest resistance, drought tolerance, or nutritional enhancement**.
- **Global Adoption:** GM crops were first **commercialized in the USA in 1994** with the **Flavr Savr tomato**, engineered to **delay ripening**.
 - As per the **International Service for the Acquisition of Agri-biotech Applications (ISAAA)**, by **2019**, over **17 million farmers** across **29 countries** cultivated more than **190 million hectares** of GM crops.
- **Regulatory Framework in India:** GM crops in India are regulated under the **"Rules for the Manufacture, Use, Import, Export and Storage of Hazardous Microorganisms, Genetically Engineered Organisms or Cells"** (Rules, 1989) under the **Environment Protection Act, 1986**
 - It provides a **comprehensive regulatory framework** for all activities involving **GMOs**, covering **research and large-scale use**, including **manufacture, import, storage, sale, and export**.
 - They apply to **genetically engineered organisms, related products, food items**, and extend to **new**

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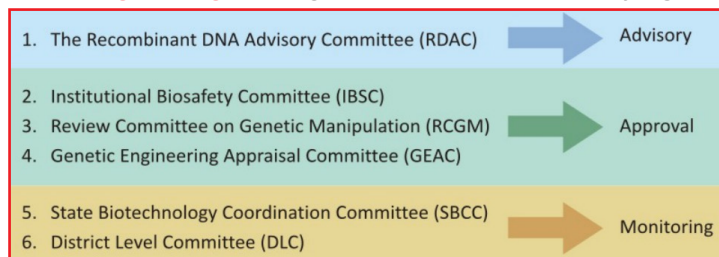
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gene technologies like cell hybridization and **genetic engineering**, forming the basis of India's biosafety regime.



Genetically Modified Crops

About

- Genetic modification of plants involves adding a specific stretch of DNA into the plant's genome, giving it new or different characteristics
- Also called Transgenic crops

Global Cultivation

- Top 5 GM growing countries - USA, Brazil, Argentina, India and Canada
- Major GM Crops - Soybean, maize, cotton and canola

Concerns

- Manipulation of GM Seed Cost
- Seeds don't create viable offsprings
- Insect-resistant plants harm non-targeted species too
- Intermixing violates natural plants' intrinsic values

Objective

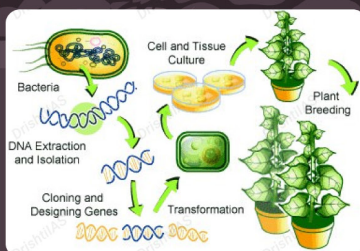
- Increase yield
- Increase tolerance to herbicides
- Improve nutritional value
- Provide resistance to disease/drought

GM Crops in India

- Bt cotton - only one GM crop approved. (90% of India's total cotton acreage) (resistance against pink bollworm)
- Ht Bt cotton - resistance against glyphosate (herbicide)
- DMH-11 mustard - recommended for commercial use (high yield)
- Golden rice - probably the best variety of GM rice (Vitamin A)

GM Crop Regulation

- Statutory Provision:**
 - Rules for Manufacture, Use, Import, Export and Storage of Hazardous Microorganisms (HM) Genetically Engineered Organisms or Cells, 1989 under the Environment Protection Act (1986).
- Statutory Bodies:**
 - Genetic Engineering Appraisal Committee (GEAC) (under MoEF&CC) - administers commercial release of GMC
 - Recombinant DNA Advisory Committee (RDAC)
 - Institutional Biosafety Committee (IBSC)
 - Review Committee on Genetic Manipulation (RCGM)
 - State Biotechnology Coordination Committee (SBCC)



Cartagena Protocol on Biosafety (2000)

- It seeks to protect biological diversity from the potential risks posed by Living Modified Organisms resulting from modern biotechnology.
- India is a signatory to this protocol.

What is the Status of GM Crop Adoption in India?

- **Approved GM Crop:** Bt cotton is the only genetically modified crop approved for commercial cultivation in India (since 2002). It now covers over 90% of India's cotton area, around 12 million hectares.
 - Bt cotton led to a 193% increase in production between 2002 and 2014, making India the second-largest global cotton exporter by 2011-12.
 - It also contributed to higher farmer incomes and reduced pesticide use.
 - Since 2015, cotton yields have declined from 566 kg/ha (2013-14) to around 436 kg/ha (2023-24).
 - India now lags behind China and Brazil, with pest resurgence and absence of updated GM traits cited as key reasons.
- **Pending GM Crop Approvals:**
 - **Bt Brinjal:** Approved by the Genetic Engineering Appraisal Committee (GEAC) in 2009, but placed under an ongoing moratorium due to public and political concerns.
 - **HT-Bt Cotton (Herbicide Tolerant):** It is a herbicide-tolerant GM variant, is not approved for commercial use in India but is illegally cultivated in several states, including Gujarat, Maharashtra, Telangana, and Andhra Pradesh. It is estimated to cover 15-25% of total cotton acreage.
 - **GM Mustard (DMH-11):** Granted environmental clearance in 2022, but its commercial release is on hold pending Supreme Court and regulatory approvals.
 - **Other Crops:** GM variants of chickpea, pigeonpea, and sugarcane are at different stages of research, field trials, and regulatory deliberation.

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What are the Key Benefits of Genetically Modified (GM) Crops?

- **Enhanced Pest & Disease Resistance:** GM crops like **Bt cotton** produce their own insecticides, effectively controlling pests like **bollworms**.
 - Reduced pesticide use **lowers costs, improves yields, and minimizes environmental harm**, especially in pest-prone regions.
- **Climate Resilience & Resource Efficiency:** GM crops are developed to withstand **drought, salinity, and heat**, making them vital in the context of **climate change**.
 - For instance, **drought-tolerant maize** in **Kenya** has improved yields in dry seasons.
 - Additionally, GM crops like **C4 rice** and nitrogen-efficient variants aim to **maximize output** while using **less water, fertilizer, and land**.
- **Nutritional Enhancement (Biofortification):** GM technology enables the development of crops fortified with essential nutrients, addressing **hidden hunger**.
 - Eg: **Golden Rice** (beta-carotene for Vitamin A), **iron-rich rice**, and **zinc-enhanced wheat**, targeting malnutrition in countries with **limited dietary diversity** and poor access to micronutrients.
- **Reduced Post-Harvest Losses:** GM crops with **extended shelf life** (**Flavr Savr tomato**) help reduce **post-harvest losses**, especially in regions lacking refrigeration and cold storage.
 - Herbicide-tolerant crops enable **no-till farming**, reducing **soil erosion, carbon emissions**, and preserving **ecosystem health** by minimizing pesticide use.
- **Innovations in Medicine & Environmental Cleanup:** GM crops are being researched for **biopharming** i.e producing **vaccines and therapeutic compounds** in plants like bananas and potatoes, potentially lowering healthcare costs and increasing access.
 - Moreover, **phytoremediation** (use of plants to **clean up environmental pollutants**) using GM plants such as **modified poplars** helps absorb **heavy metals and toxins**.

CONTRIBUTIONS OF BIOTECH CROPS TO FOOD SECURITY, SUSTAINABILITY, AND CLIMATE CHANGE SOLUTIONS

INCREASE CROP PRODUCTIVITY



BIOTECH CROPS CONTRIBUTE TO FOOD, FEED, AND FIBER SECURITY
US\$261.3 BILLION
FARM INCOME GAINS IN 1996-2020 FROM PLANTING BIOTECH CROPS

REDUCED PRODUCTION COSTS
LESS PLOWING
LESS PESTICIDE SPRAYS
LESS LABOR

MORE AFFORDABLE FOOD

CONSERVE BIODIVERSITY

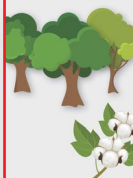


BIOTECHNOLOGY IS A LAND-SAVING TECHNOLOGY INCREASING YIELDS WITH LESS LAND
183 MILLION HECTARES
CONSERVED LAND DUE TO PRODUCTIVITY OF BIOTECH CROPS

PREVENTS
DEFORESTATION

PROTECTS
BIODIVERSITY

PROVIDE A BETTER ENVIRONMENT



IN 1996-2020, BIOTECH CROPS HELPED REDUCE PESTICIDE APPLICATION BY
748.6 MILLION KGS
DECREASED ENVIRONMENTAL IMPACT FROM HERBICIDE & INSECTICIDE USE BY **17.3%**

INSECT RESISTANT COTTON
LARGEST CHANGE IN PESTICIDE USE
SAVED 339 MILLION KG INSECTICIDES

REDUCE CO2 EMISSIONS



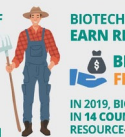
BIOTECH CROPS HELPED SAVE **39 BILLION KGS CO2**
REDUCED FUEL USE **14.6 BILLION LITERS**
EQUIVALENT TO REMOVING **25.9 MILLION CARS**
OFF THE ROAD FOR 1 YEAR

REDUCED RELEASE OF GREENHOUSE GASES FROM GM CROPPING AREAS

HELP ALLEVIATE POVERTY AND HUNGER



BIOTECH CROPS UPLIFTED THE LIVES OF **17 MILLION FARMERS** AND THEIR FAMILIES TOTALING **>65 MILLION PEOPLE**
SINCE 1996, BIOTECH CROPS HAVE PROVIDED FOOD, FEED, AND SHELTER TO THE WORLD'S 8.2 BILLION POPULATION



BIOTECH CROPS HELP FARMERS EARN REASONABLE INCOMES
BETTER LIVELIHOODS FROM HIGHER YIELDS
IN 2019, BIOTECH CORN WAS PLANTED IN 14 COUNTRIES, BENEFITTING SMALL, RESOURCE-POOR FARMERS

SOURCES:

Graham Brookes, 2022. Genetically Modified (GM) Crop Use 1996-2020: Impacts on Carbon Emissions. *GM Crops & Food* 13:1, pages 242-261.
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FOR MORE INFORMATION, VISIT THE ISAAA WEBSITE:
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What are the Key Challenges in GM Crop Adoption in India?

- **Environmental and Health Concerns:** GM crops may cause **gene flow to wild species**, leading to herbicide-resistant **superweeds**, while **Bt crops** can harm non-target insects and reduce **biodiversity** through monoculture.
 - Health concerns include potential **allergens, nutritional changes**, and long-term safety highlighted by the **StarLink corn**

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incident (2000), where animal-feed-only GM corn entered the human food chain.

- **Regulatory and Policy Constraints:** India's GM crop approvals are delayed due to **regulatory opacity**, **prolonged moratoriums**, and **political hesitancy**, even for scientifically cleared crops like **Bt brinjal** and **GM mustard**.
 - Policies such as the **Cotton Seed Price Control Order (2015)** and **mandatory tech transfer provisions** have **discouraged private R&D**, hindering biotech innovation.
- **Socio-Economic and Ethical Issues:** There are concerns over **market concentration**, **seed dependence**, and **high input costs** for small farmers.
 - Ethical issues such as **"playing God"**, **food sovereignty**, and **community rights** challenge public acceptance.
 - Cases like Monsanto's (US-based agricultural biotech company) enforcement of **Intellectual Property Rights** over GM seeds has led to global disputes over **trait fees**, **seed sovereignty**, and **patentability**, in India, the US and Canada.
- **Coexistence, Contamination, and Illegal Cultivation:** Coexistence of **GM and non-GM crops** poses challenges due to **cross-pollination**, risking **organic certification** and **market access** (**Oregon GM wheat case, 2013**).
 - In India, **HT-Bt cotton** is **illegally cultivated** on up to **25% of cotton acreage**, leading to **biosafety risks** and a **black market for unregulated seeds**.
- **Resistance Development & Global Competitiveness:** Overuse of GM traits has triggered **pest and weed resistance**, diminishing the effectiveness of **Bt cotton** and **glyphosate-tolerant crops**, requiring constant innovation.
 - India's **declining cotton exports** and turning **net importer in 2024–25** signal a loss of **global competitiveness** due to delayed GM adoption and innovation stagnation.

Urban Centres as Catalysts of India's Growth

Why in News?

India is undergoing a rapid urban transformation, with the urban population expected to reach **675 million by 2035** and **70 million more residents by 2045**. This rapid urbanization will shape the economic and social trajectory of India for decades to come.

- However, urban challenges in Indian Cities continue to hinder the full potential of this transformation.

Why are Cities Central to India's Economic Future?

- **Economic Engines:** Cities contribute nearly **60% of India's Gross Domestic Product (GDP)** while occupying only **3% of land**, highlighting their role as hubs of productivity and innovation.
 - Just 15 cities including Mumbai, Delhi, Bengaluru, Chennai, and Hyderabad account for 30% of India's GDP. These cities are expected to contribute an additional 1.5% to GDP growth by 2047.
- **Agglomeration Benefits:** Higher population densities in urban centres lead to **greater economic output**, **better job creation**, and **innovation** through clustering of industries and services.
 - India's growing urban population is anticipated to increase its economic productivity by an additional 1.5% annually, thereby facilitating substantial growth in national output.
- **Global Competitiveness:** Well-functioning cities improve **ease of doing business**, attract foreign investment, and support India's ambitions to become a **USD 5 trillion economy by 2026** and **USD 40 trillion by 2047**.
- **Infrastructure Efficiency:** Urban areas with efficient **transport, housing, energy, and logistics systems** lower operational costs and boost industrial growth.
- **Innovation Hubs:** Cities foster **startups, R&D, and technology adoption**, becoming centres of digital and service-sector transformation.

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- **Social Opportunity:** Urbanisation offers pathways for **poverty reduction, education, and healthcare access**, linking economic development with improved human development outcomes.

What are the Challenges Faced by Urban India?

- **Congestion and Traffic Management:** Urban residents spend an average of 1.5-2 hours daily stuck in traffic. This congestion increases pollution, wastes time, and hampers productivity.
 - Most Indian cities lack comprehensive, efficient, and integrated public transport systems. This results in over-dependence on private vehicles, which further exacerbates traffic congestion.
 - **Eg. Jharkhand's capital Ranchi has only 41 buses for a population of 1.46 million.**
 - According to the **Asian Development Bank**, India loses up to USD 22 billion annually due to urban transport inefficiencies, logistics delays, and poor infrastructure.
- **Air Pollution:** In 2023, India was home to **42 of the 50 most polluted cities** in the world, up from 39 in 2022. The primary contributors to poor **air quality** include vehicular emissions, construction dust, and **biomass** burning.
 - Poor air quality leads to respiratory diseases, affecting millions of urban residents, especially in cities like Delhi, Mumbai, and Bengaluru.
- **Water Scarcity:** Nearly half of India's rivers are polluted, leading to inadequate water availability for urban areas. Inadequate treatment and wastewater management further strain water resources.
 - Cities lose up to 40-50% of piped water in transmission due to outdated infrastructure, exacerbating water scarcity.
- **Solid Waste Management:** Indian cities **generate over 150,000 tonnes of solid waste** daily, but only a small portion is processed sustainably. Many cities lack effective waste segregation and recycling systems.
 - Poor waste management contributes to pollution, health hazards, and unclean urban environments, making cities less livable.
- **Inadequate Sanitation:** Many urban areas, particularly informal settlements, lack access to **proper sanitation facilities**.
 - **Inadequate sewage systems and sewage leakages** into water bodies continue to be a challenge in many cities.
- **Affordable Housing Shortage:** India faces a **shortage of 10 million affordable homes, a number expected to triple by 2030**. The urban **poor often live in informal settlements or slums**, which lack basic infrastructure like clean water, sanitation, and electricity.
 - This growing shortage not only leads to overcrowded slums but **also creates urban ghettos, raising security challenges and increasing the potential for communal or religious violence**.
 - Additionally, the increasing demand for urban space drives property prices up, making affordable housing inaccessible to many.
- **Urban Flooding:** Many cities face **urban flooding** due to inadequate drainage systems, encroachment of stormwater drains, and rapid urbanization.
 - The **2018 floods in Kerala and the 2015 floods in Chennai** are prime examples of how urban infrastructure struggles to cope with extreme weather events.
- **Weak Municipal Finances:** Most Indian cities struggle to generate sufficient revenue through local taxes and municipal bonds. **Less than 0.2% of India's GDP (1.1% in the OECD) is raised through property taxes**.
 - Many cities rely on central government funding for urban development projects, but the funds allocated are often insufficient or inefficiently utilized.
- **Digital Infrastructure Deficits:** India's internet speed is much lower compared to cities in countries like Singapore, Hong Kong, and Seoul.
 - This hampers the growth of digital businesses and slows down overall economic growth.
- **Urban Heat Island:** Higher temperatures lead to **increased use of air conditioning**, raising electricity demand, especially during peak summer. This burdens urban power grids and increases carbon emissions.

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- Urban Heat Islands increase health risks for vulnerable groups, reduce green cover and biodiversity, strain water resources, raise flood risk, and degrade infrastructure and urban livability.

What are India's Initiatives for Promoting Growth and Sustainability in the Urban Sector?

- [Swachh Bharat Mission](#)
- [Smart Cities Mission](#)
- [National Urban Livelihood Mission](#)
- [PM SVANidhi Scheme](#)
- [Pradhan Mantri Awas Yojana \(Urban\)](#)
- [Atal Mission for Rejuvenation and Urban Transformation \(AMRUT\)](#)
- [Scheme for Special Assistance to States for Capital Investment](#)

VRRR Auction to Absorb Excess Liquidity

Why in News?

The [Reserve Bank of India \(RBI\)](#) is set to conduct a 7-day [Variable Rate Reverse Repo \(VRRR\)](#) auction worth Rs 1 lakh crore to absorb surplus [liquidity](#) from the banking system.

What are Key Facts Regarding VRRR Auction and Liquidity?

- **About VRRR:** VRRR is a [monetary policy tool](#) used by the [RBI](#) to absorb **excess liquidity** through **auctions**, where banks bid at **variable interest rates** for placing **short-term deposits** with the [RBI](#).
 - In contrast, the **Reverse Repo Rate** is a **fixed rate** set by the [RBI](#) at which banks **park excess funds** without bidding, making **VRRR** more **flexible** and **market-driven**.
- **Reason for VRRR Auction:** [RBI](#) aims to bring the **overnight rates** on the **Tri Party Repo Dealing System (TREPS)** closer to the **lower bound** of the [Liquidity Adjustment Facility \(LAF\)](#) corridor, currently between **5.25%** and **5.75%**.

- **TREPS** is an **electronic trading platform** in India that facilitates **collateralized short-term borrowing and lending** between **banks, mutual funds, NBFCs**, and other **financial institutions**.
 - It operates under the **oversight of RBI** and is managed by the [Clearing Corporation of India \(CCIL\)](#).
 - **Tri-Party Structure:** Involves **three parties** i.e., the **borrower**, the **lender**, and a **third-party agent (CCIL)**.
- **LAF corridor** is a **monetary policy tool** used by [RBI](#) to regulate **short-term liquidity** and stabilize **interest rate fluctuations** in the banking system.
 - It comprises two main rates: the **Repo Rate (upper bound)**—the rate at which banks borrow from the [RBI](#), and the **Reverse Repo Rate (lower bound)**—the rate at which banks deposit excess funds with the [RBI](#).
 - **Repo/Reverse Repo** uses [RBI's fixed interest rate](#) for **overnight liquidity**, while **VRR/VRRR** operates through **competitive bank bidding** in **auctions** for **dynamic liquidity management**.
- **About Liquidity:** **Liquidity** refers to the **ease of accessing money or cash-equivalents** for **transactions, spending, or investment**, indicating the **availability of funds** in the financial system.
 - It is influenced by [monetary policy](#), **interest rates**, [repo/reverse repo operations](#), and **government spending**.
- **Reasons for Liquidity Surplus:** **Liquidity injections** through [open market operations](#) (such as **G-sec purchases**), **term Variable Rate Repo (VRR)** auctions, and **dollar/rupee buy-sell swaps** have collectively **boosted liquidity** in the economy.

Unlocking Cooperatives' Potential in Empowering MSMEs

Why in News?

As India celebrates the [International Day of Cooperatives](#) (5th July, 2025) and marks **four years** of the [Ministry of Cooperation](#), the focus is on **harnessing the**

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potential of **cooperatives** and **MSMEs**, especially through initiatives like the **PM Vishwakarma scheme** to **empower artisans** and promote **inclusive economic growth**.

How Can Cooperatives Contribute to Boosting the MSME Sector in India?

- **Financial Empowerment & Resource Pooling:** Cooperatives allow MSMEs to pool **financial resources**, reducing reliance on **high-interest informal loans**.
 - For example, under the **PM Vishwakarma scheme**, artisan cooperatives can access credit at **lower interest rates (5–7%)** compared to individual borrowers.
 - Additionally, cooperatives help MSMEs share resources like **machinery and raw materials**, lowering costs and improving operational efficiency, **particularly for small-scale producers**.
- **Enhanced Market Access:** Cooperatives can help MSMEs tap into **larger markets** through **collective marketing, branding, and quality certifications**.
 - This boosts **visibility** and **competitiveness**, allowing **smaller businesses** to **expand their reach** and gain access to **national and global markets**.
- **Technology Adoption:** Cooperatives can set up **cluster-level training centers** for **skill upgradation** (e.g., **carpentry, pottery, tailoring**) and **modern techniques** like **digital tools and automation**.
- **Synergy with Government Schemes:** Cooperatives can act as an effective **delivery mechanism** for **government schemes** like the **PM Vishwakarma**, ensuring **MSMEs**, particularly **artisans**, receive **financial, technical, and market support**.
 - This **integration** enhances the **reach and impact** of government initiatives aimed at **MSME development**.
- **Sustainable & Inclusive Growth:** MSME cooperatives like **Lijjat Papad** and **SEWA** empower **women entrepreneurs** and support **rural empowerment**, while **waste-sharing** and **recycling initiatives** promote the **circular economy**.

PM VISHWAKARMA SCHEME

Vishwakarma Jayanti is celebrated to honour Vishwakarma – the architect of the gods in Hindu Mythology

Vishwakarma is also believed to be the architect of mythical city Lanka and the great image of Jagannatha at Puri in Odisha

OBJECTIVE

- To uplift traditional artisans and craftspeople
- Preservation of India's rich cultural heritage of traditional crafts
- Transitioning to the formal economy and global value chain

IMPLEMENTING MINISTRIES

- Ministry of MSMEs (Nodal Ministry)
- Ministry of Skill Development and Entrepreneurship
- Department of Financial Services (Ministry of Finance)

TYPE OF SCHEME

- Central Sector Scheme

TIMELINE

- 5 years from (FY23-24 to FY 27-28)

FEATURES

- Collateral-free credit support of up to Rs 3 lakhs @ interest rate of 5%
- PM Vishwakarma certificate and an I-card for enrolled artisans and craftspeople

REGISTRATION

- Common Service Centres in villages

COVERAGE - 18 TRADITIONAL TRADE SECTORS

- Carpenters
- Boat Makers
- Armourers
- Blacksmiths
- Hammer and Tool Kit Makers
- Locksmiths
- Goldsmiths
- Potters
- Sculptor, Stone breakers
- Cobblers
- Masons
- Basket/Mat/Broom Makers /Coir Weavers
- Doll & Toy Makers
- Barbers
- Garland makers
- Washermen
- Tailors
- Fishing Net Makes

STIPEND AND INCENTIVES

- Rs 500 for skill training (stipend)
- Rs 1,500 to purchase modern tools
- Rs 15,000 as toolkit incentive

SIGNIFICANCE

- Recognition/support of artisans and their integration in global supply chain



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What are Cooperatives in India?

- **About:** Cooperatives are **people-centred enterprises** owned and run by members to fulfill their **economic, social, and cultural needs**.
 - India hosts one of the **world's largest cooperative networks**, with over **800,000 cooperatives** across sectors like **agriculture, credit, dairy, housing, and fisheries**.
- **Evolution of Cooperative Sector in India:**
 - **First Five-Year Plan (1951–56):** Emphasized **promotion of cooperatives** for comprehensive community development.
 - **Multi-State Co-operative Societies Act, 2002:** Provides for the **formation and functioning of multi-state cooperative societies (MSCS)**.
 - **97th Constitutional Amendment Act, 2011:** Made formation of cooperatives a **fundamental right** (Article 19).
 - Introduced a new **Directive Principle** (Article 43-B) on cooperative societies.
 - Added **Part IX-B (Articles 243-ZH to 243-ZT)** titled "*The Co-operative Societies*".
 - Empowered **Parliament** to enact laws for **MSCS** and **state legislatures** for other cooperatives.
 - **Establishment of the Union Ministry of Cooperation (2021)** provides a **dedicated policy framework**, and **empowered grassroots governance** under the vision of "*Sahakar se Samridhi*".
 - **The Multi-State Co-operative Societies (Amendment) Act, 2022** introduced an **Election Authority**, created a **Rehabilitation Fund**, and allowed **state-level mergers**.
- **Key Contributions:**
 - **Employment Generation:** Cooperatives provide **13.3% of India's direct employment**, engaging 29 crore members across 8.14 lakh societies, creating livelihoods in both rural and urban areas.

- **Agricultural Development:** Cooperatives disburse **15% of short-term agricultural credit**, manage 30% of sugar production, and handle 35% of fertilizer distribution
- **Financial Inclusion:** With **20% of cooperatives in banking**, they provide affordable credit to farmers and small businesses, enhancing financial access in remote areas.
- **Food Security:** Cooperatives like **Amul, NAFED, and IFFCO** play a pivotal role in milk production, dairy exports, and the distribution of agro-products.
- **Women Empowerment:** Cooperatives like **SEWA** and **Lijjat Papad** empower women, promote self-help groups (SHGs).

Notable Cooperatives in India:

- **Primary Agricultural Credit Societies (PACS):** Grassroot arms of the **short-term cooperative credit structure**, linking farmers with **Scheduled Commercial Banks, RBI, and NABARD**.
- **AMUL (Anand Milk Union Limited):** A dairy giant and **White Revolution** pioneer, AMUL is a **federation of milk producers in Gujarat** that helped make India the **world's largest milk producer**.
- **IFFCO (Indian Farmers Fertiliser Cooperative):** One of the **world's largest fertiliser cooperatives**, **IFFCO** provides **quality fertilisers and agricultural inputs** to farmers across India.
- **HOPCOMS (Horticultural Producers' Cooperative Marketing and Processing Society):** Known for its **farm produce outlets**, ensuring **fair returns** to farmers.
- **Lijjat Papad (Shri Mahila Griha Udyog Lijjat Papad):** A **women's cooperative** empowering women through **papad production**.

Click Here to Read: [What are MSMEs?, Role of MSMEs in India's Economic Growth?](#), [Recommendations by NITI Aayog on MSMEs](#).

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INDIA'S MSME SECTOR

(MSME - Micro, Small and Medium Enterprises)

Manufacturing Enterprises and Enterprises rendering Services

Classification	MICRO	SMALL	MEDIUM
Investment in Plant and Machinery or Equipment	≤ ₹1 crore	≤ ₹10 crores	≤ ₹50 crores
Annual Turnover	≤ ₹5 crore	≤ ₹50 crores	≤ ₹250 crores

MSME regulation

- **Nodal Ministry:** Ministry of Micro, Small, and Medium Enterprises
- **Act:** Micro, Small, and Medium Enterprises Development Act, 2006

Key MSME States - Maharashtra (17.74%), TN (10.20%), UP (9.34%), Gujarat (7.43%) and Rajasthan (7.38%)

Share of MSMEs in Indian Economy

- India's Total Exports: 45%
- India's GDP: 30%
- Total Manufacturing Output: 38.4%
- Provides employment to ~11 crore people

Challenges

- Only 16% of SMEs get access to timely finance
- ~86% of manufacturing MSMEs in India are unregistered
- Outdated technology, lower productivity levels, lack of necessary skills and branding expertise
- Delayed payments from larger enterprises or govt agencies

Government Initiatives and Support

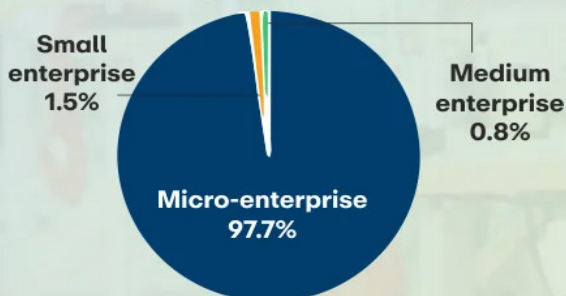
Administrative Support:

- CHAMPIONS 2.0 Portal
- Mobile App for Geo-tagging of Cluster Projects and Technology Centers
- Udyam Assist Platform
- ASPIRE Scheme
- Zero Defect & Zero Effect (ZED)

Financial Support

- Raising and Accelerating MSME Performance (RAMP) Scheme
- Trade Receivable Discounting System (TReDS)
- Prime Minister's Employment Generation Programme (PMEGP)
- Pradhan Mantri Mudra Yojna (PMMY)
- Credit Guarantee Trust Fund for Micro & Small Enterprises (CGTMSE)
- Interest Subsidy Eligibility Certificate (ISEC)

Registered MSMEs in India in FY24 (as of march 2024*)



International
MSME Day 27th June



What Challenges Limit the Effectiveness of Cooperatives in Empowering MSMEs in India?

- **Misconceptions:** Many MSME owners perceive cooperatives as government-controlled or political bodies, not as business enablers.

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- There is a **lack of awareness** about various **cooperative models** like **producer cooperatives**, **credit societies**, and **marketing federations**.
- **Weak Financial Support:** **Cooperative banks** often face **liquidity crises**, limiting **MSME lending**, while **traditional banks** hesitate to lend to cooperatives due to **perceived risk** and **lack of credit history**.
- **Regulatory Complexity:** **Multiple laws** like the **Cooperative Societies Act**, **State Cooperative Laws**, and **GST compliance** create confusion, while **excessive bureaucracy** delays **registration** and **operational approvals**.
- **Lack of Digital Adoption:** Many **cooperatives operate in isolation**, missing **economies of scale**, and **low tech adoption** (e.g., **digital accounting**, **e-commerce**) limits their **market reach**.
- **Governance Deficits:** Many **cooperatives suffer from poor transparency**, **accountability**, and **internal audits**, weakening their role as **reliable intermediaries** for **MSMEs**.

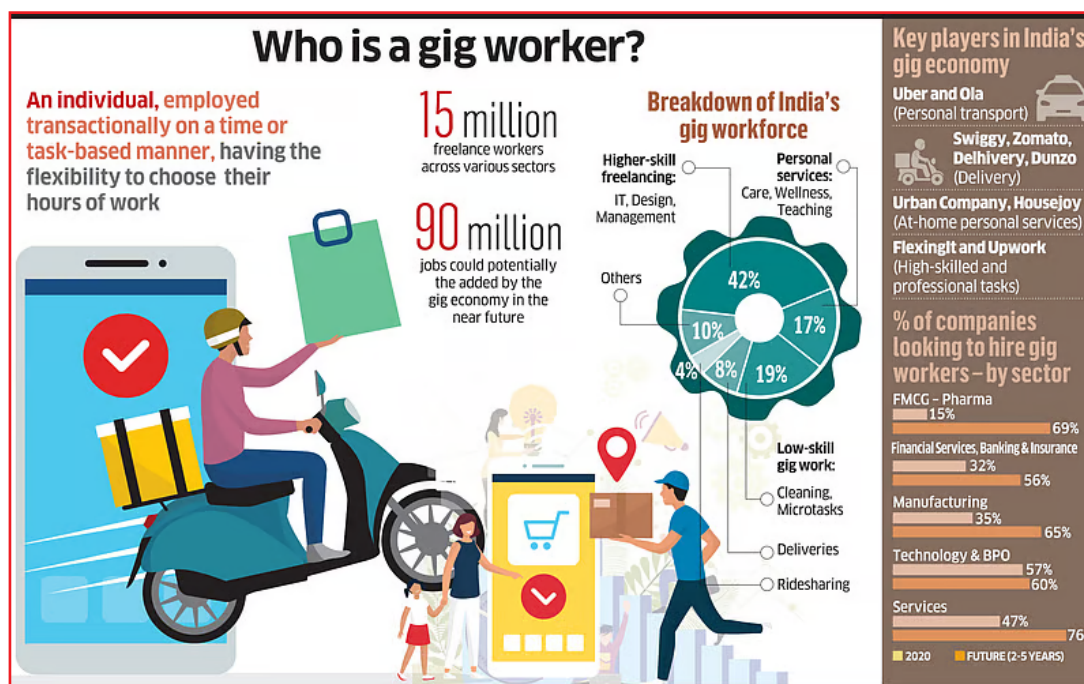
Bridging the Gaps: Strengthening India's Gig Economy

Why in News?

The **Union Budget 2025-26** formally recognised **gig and platform workers**, extending social protection schemes to them. However, the **Periodic Labour Force Survey (PLFS)** still lacks a **dedicated classification**, creating a gap between **policy intent** and **data clarity**, which hampers **inclusive and effective policymaking**.

What is the Gig Economy and What are the Current Gaps in Its Classification?

- **About:** The gig economy is a **labour market based on short-term, flexible, and task-based work**, often facilitated by **digital platforms**.
- As per **section 2(35) of Code on Social Security, 2020**, a gig worker is “a person who performs **work or participates in a work arrangement** and **earns from such activities outside the traditional employer-employee relationship**.”
- They are usually **freelancers or independent contractors**, paid per task instead of regular wages. Examples include **food delivery**, **ride-hailing**, and **online freelance services**.



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➤ Key Segments:

Exhibit 3

Gig worker segments in India

Perceived level of skill

Life stage



High-skill



Purpose Fulfillers: Hair and beauty professional, cook, tutor, jobs chosen on the basis of **flexible** hours, nearby location and safe work environment. Personality development is a key driver too



Aspiring Entrepreneurs: Mechanic, technician, carpenter, electrician. Having trust in their skill set, they seek job regularity or continuity and learning opportunities to master skill sets



Moderate-skill



Ambitious Hustlers: Data entry operator, telecaller, LIC agent. Determined to make a career in their current field of work, they aspire for growth in terms of learning and rising in designation with promotions



Hopeful Balancers: Cab driver, auto driver. Though driven by the need to earn a good pay, salary growth potential and non-monetary **benefits like medical/life/vehicle** insurance too play a key role



Semi-skill



Financial Contributors: Domestic help, health care worker. Motivated to earn a good salary to provide a helping hand to fund household expenses and also build a savings corpus. Flexible schedule and nearby work location are also critical



Financially Strapped Solo Earners Construction worker, food delivery agent. With low-skill level and high dependency for household income, their key job choice drivers are a good salary and regularity or continuity of job. Also seek non-monetary **benefits** like health insurance to save money in long term



Student



Earn to Burn: Telecaller, data entry operator. Students seeking to earn salary for discretionary spending. Job choice primarily driven by a **flexible** schedule, potential for personality development (soft skills, confidence, etc.) and respectable job title



Millennial Providers: Food delivery agent, package delivery agent, data entry operator. Students financially supporting families as well as funding own education look for jobs that pay well. A **flexible schedule** is important too

Contribution of gig income to household income

Low (up to 50%)

High (more than 50%)

- **Status and Classification Gap:** India had **7.7 million gig workers** in **2020–21**, projected to reach **23.5 million** by **2029–30** (NITI Aayog), mostly in **medium-skilled jobs**.

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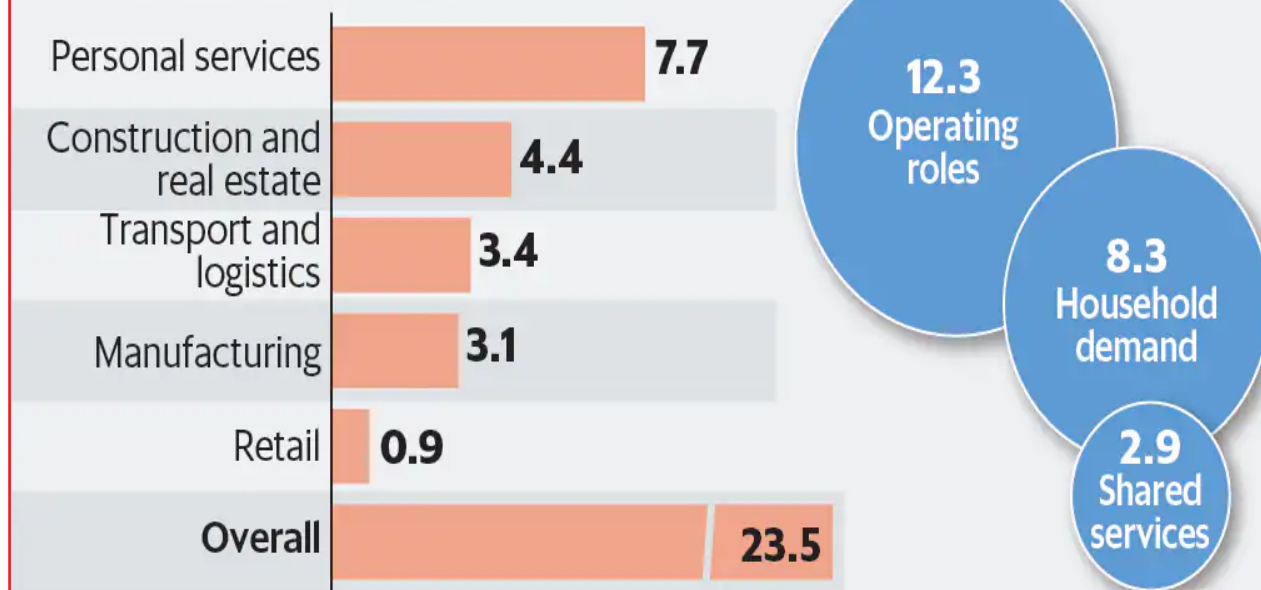
Growing gigs

Construction, manufacturing, retail, transportation and logistics sectors may create around 70 million 'gigable' jobs within 8-10 years.

No. of gig jobs projected (in mn)

Gig workers may service 23.5 million jobs in three to four years

Type of gig roles



Source: Unlocking the Potential of Gig Economy in India Report

- However, the **PLFS** does not have a distinct classification for gig workers, grouping them under broad categories like **self-employed** or **casual labour**.
- Although gig and platform workers are technically included under **“economic activity,”** their unique work conditions—characterized by **algorithmic control**, **lack of formal contracts**, **irregular hours**, and **multi-platform engagement**—are not adequately captured.
- This **classification gap** leads to:
 - **Exclusion from welfare schemes**, as PLFS data guides beneficiary targeting.
 - **Misrepresentation of employment conditions**, masking job insecurity and income volatility.
 - **Policy blind spots**, weakening evidence-based labour reforms.
 - **Legal ambiguity**, affecting enforcement under the **Code on Social Security, 2020**.

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What is the Periodic Labour Force Survey (PLFS)?

ABOUT

The PLFS was launched by the National Statistics Office (NSO) in 2017 with the aim of generating labour force statistics at more frequent intervals.

OBJECTIVES OF PLFS

- ✓ To estimate key employment and unemployment indicators such as **Worker Population Ratio (WPR)**, **Labour Force Participation Rate (LFPR)**, and **Unemployment Rate (UR)** at three-month intervals for urban areas using the Current Weekly Status (CWS) approach.
- ✓ To estimate the same indicators annually for both rural and urban areas, using both **Usual Status (Principal activity status (ps) + Subsidiary economic activity status (ss))** and CWS approaches.

INDICATORS

LFPR: The percentage of persons in the labour force (employed or seeking employment) in the total population.

- $LFPR = (\text{Number of Employed} + \text{Number of Unemployed}) / \text{Total Population} \times 100$.

WPR: The percentage of employed persons in the total population.

- $WPR = (\text{Number of Employed Persons}) / \text{Total Population} \times 100$.

UR: The percentage of unemployed persons among the total labour force.

- $UR = (\text{Number of Unemployed Persons}) / (\text{Number of Employed} + \text{Number of Unemployed}) \times 100$.

ACTIVITY STATUS

- **Usual Status (ps+ss):** This is based on the activity status over the last 365 days prior to the survey date. It considers: **ps** (the activity in which a person spent the majority of their time) and **ss** (any secondary economic activity performed for at least 30 days in the past year).
- **CWS:** This approach captures the activity status over the 7 days preceding the survey date.

What are the Key Factors Driving the Gig Economy in India?

- **Expanding Digital Access:** With over **936 million internet** and **650 million smartphone users**, especially in rural areas, **affordable connectivity** is enabling more people to join digital platforms for **gig work**.
- **E-Commerce and Startup Growth:** The rise of **startups** and **online businesses** has increased demand for **flexible workers** in logistics, content, marketing, and delivery services.

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- **Consumer Demand for Convenience:** Urban consumers increasingly prefer **quick services** like **food delivery** and **online shopping**, creating more gig roles in delivery and support.
- **Availability of Low-Cost Labour:** **High unemployment**, surplus of **semi-skilled workers**, and **limited social security** push many towards **low-paid gig jobs** as a livelihood option.
- **Changing Work Preferences:** Younger workers are drawn to the **flexibility**, **remote work**, and **work-life balance** that gig work offers over traditional jobs.

Top reasons for working in the gig economy



What is the Significance of the Gig Economy in India's Economic Growth?

- **Informal to Formal Transition:** Gig platforms (e.g., **Zomato**, **Swiggy**) absorb labour from **agriculture** and **informal sectors**, offering **structured earnings**.
 - Festival seasons in 2023 saw **40–50% earning surges**, highlighting economic impact and sectoral resilience.
- **Inclusive Workforce Participation:** The gig economy enhances **financial autonomy** and **social mobility** for **marginalised groups**, especially **women** and **rural workers**.
 - Around **28%** of gig workers are **women**, many engaged in **flexible, home-based services** through platforms like **UrbanClap**, particularly in **Tier-II and Tier-III cities**.
- **Entrepreneurial Ecosystem:** Over **80%** of gig workers are **self-employed**, promoting an **entrepreneurial mindset** through platforms like **Uber**, fostering innovation in **transport, delivery, and freelancing**.

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- **Digital & Economic Growth:** The gig economy drives **digital adoption** through increased use of **smartphones, digital payments**, and online services. By integrating gig work into the mainstream, it supports **tech-led economic growth**.
 - In **2023**, platforms like **Blinkit** and **Swiggy** reported a **40–50% surge in earnings** during festivals, highlighting gig workers' role in boosting **e-commerce and consumption**.
- **Tax Revenue and Formalisation:** Gig platforms boost India's **tax base** by formalising payments through **digital transactions** and enabling the government to tap into previously **untaxed economic activity**.
 - In **2024**, the government introduced regulatory frameworks, including **e-Shram registration** for gig workers, to monitor and organise the sector.
 - Their inclusion under social security schemes like **Ayushman Bharat PM-JAY** further institutionalized the workforce, opening new channels for **sectoral expansion and governance**.

What are the Major Challenges Facing the Gig Economy in India?

- **Absence of Social Security Protections:** The **Code on Social Security, 2020** recognizes gig workers but **fails to guarantee full labor rights**, including regulated working hours, minimum wages, and dispute resolution.
 - A 2024 NITI Aayog report shows 90% of gig workers lack savings and are vulnerable during emergencies.
 - Existing schemes like **Ayushman Bharat PM-JAY** and **e-Shram** offer fragmented support,
 - PM-JAY covers hospitalization, while e-Shram provides accident insurance but lacks income security, paid leave, or pensions, reflecting a gap in comprehensive social protection.
- **Income Instability & Exploitative Conditions:** Gig workers in India earn Rs **15,000–Rs 20,000 per month**, often below minimum wage.
 - Over 70% face financial strain due to platform commissions. The **"Prisoners on Wheels" report** reveals **78% work over 10 hours daily** under

algorithmic pressure, causing physical and mental exhaustion.

- **Arbitrary Deactivation & Customer Harassment:** Sudden account deactivations, reported by **83% of cab drivers** and **87% of delivery workers** cause income loss and insecurity.
 - Additionally, **72% of drivers** and **68% of delivery workers** face **customer misbehaviour**, reflecting poor **grievance redressal** and lack of **platform accountability**.

India's Key Initiatives Related to Gig Workers

- [Code on Social Security, 2020](#)
- [e-Shram Portal](#)
- [Pradhan Mantri Shram Yogi Maandhan Yojana](#)
- [Rajasthan's Platform-Based Gig Workers \(Registration and Welfare\) Act, 2023](#)

NITI Aayog Report on Chemical Industry

Why in News?

NITI Aayog released its report titled '**Chemical Industry: Powering India's Participation in Global Value Chains**', outlining an **ambitious roadmap** for India to become a **global chemical manufacturing powerhouse**.

- The report envisions India achieving a **12% share in global chemical value chains (GVC)** and a **USD 1 trillion output by 2040**.

What is the Status of the Chemical Industry in India?

- **Global Standing:** India ranks as the **6th largest chemical producer globally**, contributing over **7% to the manufacturing GDP**.
 - The chemical sector supports critical industries such as **pharma, textiles, agriculture, and construction**.
- **Feedstock Utilization:** India shows **over-concentration in bulk chemical production**, with **87% of benzene** used for **alkylbenzene, chlorobenzene, and cumene**, unlike the **global trend** where only **25%** is used similarly and more goes to **complex derivatives**.

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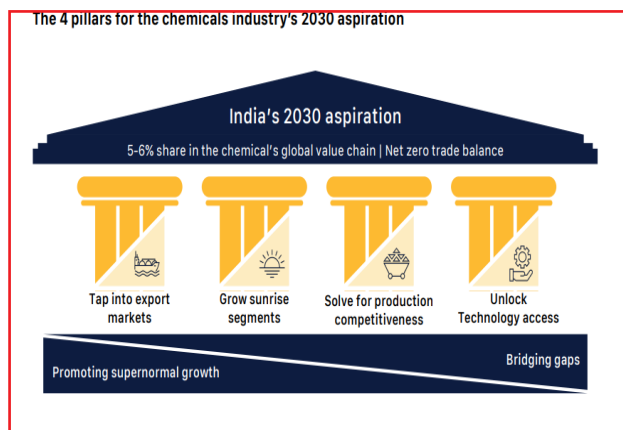
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- **Low Share in Global Value Chains (GVC):** India holds only a **3.5% share in global chemical value chains**, with a **USD 31 billion trade deficit (2023)**.
 - The sector remains **fragmented**, dominated by **MSMEs**, with growth concentrated in **Gujarat, Maharashtra, and Tamil Nadu**.
- **Skill and Innovation Gaps:** There is a **30% shortage of skilled professionals**, especially in **green chemistry, nanotechnology, and process safety**.
 - **R&D investment** is just **0.7% of industry revenue**, well below the **global average of 2.3%**, limiting innovation in **high-value and sustainable chemicals**.
- **Import Dependence:** The sector is heavily **import-dependent**, sourcing over **60% of critical Active Pharmaceutical Ingredients (APIs)** from **China**, and other feedstocks from **Gulf countries**.
- **Regulatory Bottlenecks:** clearances and regulatory delays add to operational costs, with delays of up to **12-18 months for approvals**.

What are the Opportunities in India's Chemical Industry?

- **Rising Domestic Demand:** India's **consumer and industrial growth** is fueling demand in **agrochemicals** (4th-largest producer), **pharmaceuticals** (3rd-largest drug producer), and **construction & automotive** (paints, adhesives, polymers).
 - **Refinery expansions** (e.g., Reliance, Nayara, BPCL) will further **boost petrochemical** production.
- **Job Creation:** The sector is expected to generate **7 lakh skilled jobs by 2030**, particularly in areas such as **petrochemicals, research, and logistics**.
- **Global Supply Chain Shift:** India can capture the **shifting global chemical trade from China**, especially in **dyes & pigments, surfactants, textile chemicals, and electronic chemicals** used in **semiconductor and EV battery manufacturing**.
- **Green & Sustainable Chemicals:** The global shift toward **bio-based and green chemicals** is creating demand for **bio-plastics, and bio-lubricants** where **India's sugar and biomass resources** can support the production of **bio-based chemicals**.



What are the Proposed Policy Interventions by NITI Aayog to Promote Chemical Industry?

- **World-Class Chemicals Hubs:** Establish hubs by forming an **Empowered Committee** with a **dedicated Chemical Fund** for shared infrastructure and **Viability Gap Funding (VGF)**.
- **Port Infrastructure:** Set up a **Chemical Committee** for ports and develop **8 high-potential chemical clusters** near ports to enhance **logistics and export capabilities**.
- **OPEX Subsidy Scheme:** Introduce an **OPEX Subsidy Scheme** to incentivize **incremental production** based on **import reduction, export potential, single-source dependency, and end-market criticality**.
- **Develop & Access Technologies:** Promote **self-sufficiency and innovation** by disbursing **R&D funds** for **industry-academia collaboration** via **DCPC** and partnering with **MNCs** to bridge **technological gaps**.
- **Fast-Track Environmental Clearances:** Simplify and expedite **Environmental Clearances (EC)** through an **audit committee under DPIIT** to ensure **compliance**.
- **Secure FTAs:** Pursue **targeted FTAs** with **tariff quotas** and **duty exemptions** on **critical raw materials and feedstocks**; improve **FTA awareness, origin proof procedures, and export competitiveness**.
- **Talent & Skill Upgradation:** Expand **ITIs** and **specialized training institutes** to meet the growing demand for **skilled labor**, and strengthen **industry-academia partnerships** for courses in **petrochemicals, polymer science, and industrial safety**.

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Chemical Industry: Powering India's participation in Global Value Chains

77

Proposed policy interventions and potential impact by 2030

Establish world-class chemicals hubs in India

01

02

Develop existing port infrastructure for storage and handling of chemicals

03

Introduce an opex subsidy for chemicals with high import dependence, export potential, and end-market criticality

04

Develop and access technologies to enhance self-sufficiency and foster innovation

05

Fast-track environmental clearance with transparency and accountability

06

Securing FTAs to support industry growth

07

07
Policy interventions

Talent and skill upgradation in the chemical industry



Net zero

India trade balance in chemicals by 2030



5-6%

Production share in the Global Value Chain by 2030 (from 3-3.5% in 2023)



700K

Additional employment generation by 2030



220-280 \$ bn

India production of chemicals by 2030



35-40 \$ bn

Additional exports in 2030 vs 2023

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India's Initiatives to Support the Chemical Industry

- **Production linked incentive (PLI) Scheme:** [PLI Scheme](#) for Promotion of Domestic Manufacturing of Critical Key Starting Materials (KSMs), Drug Intermediates and APIs aims to boost domestic production by encouraging the establishment of Greenfield plants.
- **PCPIR:** The Petroleum, Chemicals and Petrochemicals Investment Region (PCPIR) set up at Paradip has attracted investments worth USD 8.84 billion, resulting in employment of about 40,000 people.
- **Jan Aushadhi Kendras:** The Government aims to open 25,000 [Jan Aushadhi Kendras](#) to ensure affordable access to medicines.

Reforming the Global Sovereign Credit Rating System and MDBs

Why in News?

At the 4th International Conference on Financing for Development (FFD4) held in Seville, Spain, India's Finance Minister advocated for reforming the global [sovereign credit rating systems](#) and [multilateral development banks \(MDBs\)](#) to promote equity, inclusivity, and sustainable development.

What are Multilateral Development Banks?

Click Here to Read: [Multilateral Development Banks](#)

What is the Sovereign Credit Rating System?

- **About:** A Sovereign Credit Rating is an independent evaluation of a country's creditworthiness, providing investors with insights into the risk level of investing in its debt, including political risks.
 - Beyond accessing external debt markets, countries seek such ratings to help attract [Foreign Direct Investment \(FDI\)](#).
- **Credit Rating Agencies:** The Big Three global rating agencies are Standard & Poor's (S&P), Moody's, and Fitch Ratings, all of which are based in the United States.

- Other notable agencies include DBRS (Canada), JCR (Japan), and Dagong (China).
- **Rating Scales:** Credit ratings range from AAA (highest) to D (default).
 - Ratings from AAA to BBB- (S&P/Fitch) or Aaa to Baa3 (Moody's) are considered investment grade; anything lower is speculative or junk grade.

S&P	Moody's	Fitch	Score
<i>Investment grade</i>			
AAA	Aaa	AAA	1
AA+	Aa1	AA+	2
AA	Aa2	AA	3
AA-	Aa3	AA-	4
A+	A1	A+	5
A	A2	A	6
A-	A3	A-	7
BBB+	Baa1	BBB+	8
BBB	Baa2	BBB	9
BBB-	Baa3	BBB-	10

- **Parameters Used:** Sovereign credit ratings are based on key parameters such as a country's [GDP](#) growth rate, [fiscal deficit](#) and public debt levels, [inflation](#) and monetary stability, political stability and governance, [balance of payments \(BoP\)](#), and [foreign reserves](#) including current account balance.
- **Impact of Ratings:** A higher rating lowers borrowing costs for governments and improves investor confidence.
 - A [downgrade](#) raises borrowing costs and may trigger [capital outflows](#).
- **India's Sovereign Credit Rating:** India's sovereign credit rating stands at Baa3 from Moody's and BBB- from S&P and Fitch, all representing the lowest investment grade, though India maintains that its strong macroeconomic fundamentals warrant a higher rating.

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Sovereign Credit Rating (SCR) in India

- In India, there are **six credit rating agencies** namely, **CRISIL, ICRA, CARE, SMERA, Fitch India and Brickwork Ratings**.
- Each **credit rating agency** uses its own methodology to assess entities like **companies, governments, non-profits, and securities**.
 - They evaluate factors such as **financial statements, debt levels, repayment history, and creditworthiness**, providing investors with insights to make **informed investment decisions**.
- The **SEBI (Credit Rating Agencies) Regulations, 1999** of the **Securities and Exchange Board of India Act, 1992** govern credit rating agencies in India.
- **CareEdge (parent company CARE Ratings Ltd)** became the **first Indian credit rating agency** to enter the **global scale ratings space**, including sovereign ratings.

Why does India Want Reforms in the Current Sovereign Credit Rating System?

- **Bias Against Developing Economies:** Despite having **strong macroeconomic fundamentals**, India holds a **BBB- rating** (just above junk status), whereas countries like **Italy and Spain**, with **weaker growth and higher debt levels**, receive **better credit ratings**.
 - For instance, **Italy's debt-to-GDP ratio is averaged 118%**, yet it is rated **BBB by S&P**, compared to **India's BBB-** (debt-to-GDP ratio is **80%**).
 - In December 2023, **finance ministry economists** had questioned the **three big global rating agencies** for keeping **India's rating static at the lowest investment grade for the last 15 years** despite it moving up the ladder from **12th largest to become 5th largest economy**.
- **Flawed Debt Assessment:** Despite India's debt being largely **domestic and low-risk**, rating agencies assess it like **foreign currency debt** and often **overlook India's high growth**, which makes its debt more **sustainable** than that of **stagnant economies like Japan or the USA**.
- **Overemphasis on Perceptual Factors:** Credit ratings often rely on **subjective factors like political stability**

surveys, which may be **biased or outdated**, while India's strong **GDP growth**, **USD 600+ billion forex reserves**, and **key reforms like GST and Insolvency and Bankruptcy Code (IBC)** are frequently **underweighted**.

- **Pro-Cyclical Downgrades:** During economic stress (e.g., **Covid-19**), agencies often **downgrade countries**, raising borrowing costs when funds are most needed. E.g., in **2020**, **Moody's downgraded India's rating from Baa2 to Baa3** despite **stimulus measures**.
- **Conflict of Interest:** Most global rating agencies, including **Moody's, S&P, Fitch**, are paid by the entities they rate, raising concerns about **credibility, independence, and developed-world bias**.
 - There is a **lack of Global South-led alternatives**, limiting **balanced perspectives** in sovereign credit assessments.
- **Failure to Predict Major Crises:** Rating agencies **failed to predict the 2008 financial crisis**, assigning high ratings to risky assets, which **damaged their credibility**, yet their assessments still **heavily influence global capital flows**.
 - They also **lack transparency** in sovereign rating methodologies, and the absence of a **uniform global standard** affects **objectivity and fairness**.

RECLAIM Framework for Mine Closure

Why in News?

The **Ministry of Coal** launched the **RECLAIM Framework** to ensure **just and sustainable mine closures** through **inclusive community participation**.

What is RECLAIM Framework?

- **About:** An **India-specific policy tool** developed by the **Coal Controller Organisation (Ministry of Coal)** in partnership with the **Heartfulness Institute**, aimed at **guiding inclusive and sustainable mine closures**.
- **Objective:** To ensure a **just, inclusive, and locally relevant transition** for **mining-affected communities** by promoting **community participation, ecological restoration, and long-term socio-economic recovery**.

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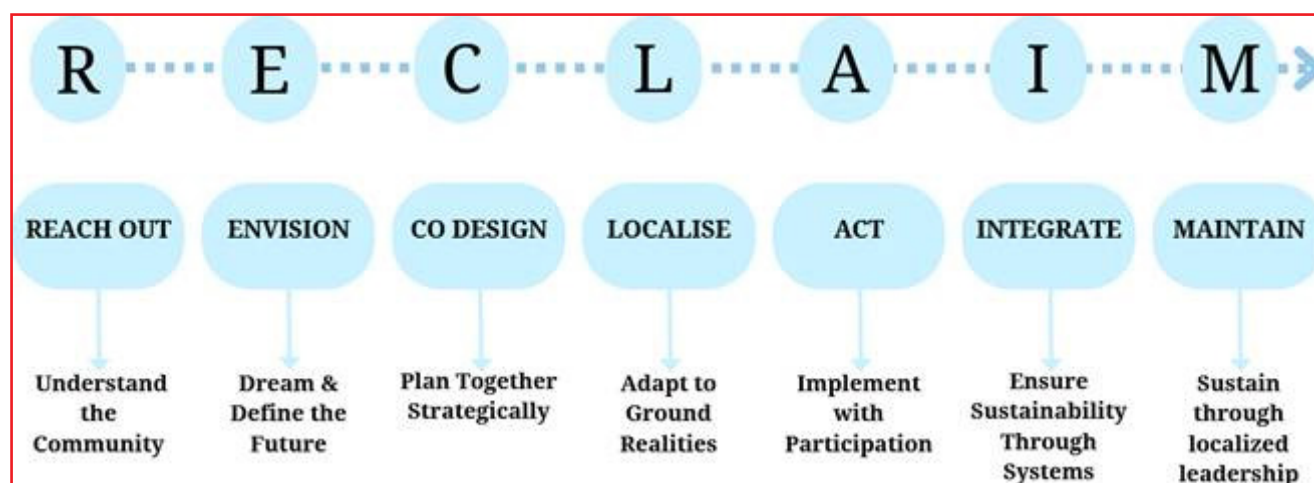
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- It focuses on **gender inclusivity, vulnerable groups**, and **convergence with Panchayati Raj Institutions** to build resilient post-mining economies.
- **Key Features:**
 - It promotes **community-centric planning** through **local participation**, with emphasis on **gender equity, vulnerable groups**, and **livelihood diversification**.
 - It ensures **institutional convergence** by aligning with **Panchayati Raj Institutions** and **local governance structures**, and provides **actionable, field-tested tools and methodologies** tailored to Indian mining regions for effective implementation.
- **Phases of Implementation:** **Pre-Closure** (needs assessment, capacity building), **Closure** (participatory plan execution), and **Post-Closure** (monitoring, livelihood support, asset repurposing).
- **Significance:**
 - Mitigates **socio-economic and environmental impacts** of mine closures
 - Supports **SDGs** and promotes **transparency, accountability, and trust**
 - Serves as a **replicable model** for other resource-dependent sectors and states.



What are the Key Challenges Related to Coal Mine Closure?

- **Gap Between Policy and Practice:** Despite **mine closure guidelines** since 2009, only **3 coal mines** have been formally closed.
 - Of the **299 non-operational mines (2024)**, only **8 applied for closure**, while the rest **remain abandoned or discontinued without scientific closure**, causing ecological degradation, methane emissions, and increased risks of accidents and illegal mining.
- **Lack of Proper Rehabilitation:** Unsustainable mining and degradation of local resources have led to **unemployment** and **forced migration**, reducing **community capacity and resource availability** during mine closure. This hampers **local participation** and poses a major challenge to implementing **effective and inclusive closure**.
- **Lack of Land Return Framework:** The **lack of clear mine closure and land return policies** often results in land **being transferred to other departments or used for renewable projects without scientific closure** or community consultation, delaying just transition efforts, especially in states like Jharkhand.
 - The **2024 draft Coal Bearing Areas (CBA) Amendment Bill** proposes returning unused land to original owners, but **lacks enforcement clarity**.

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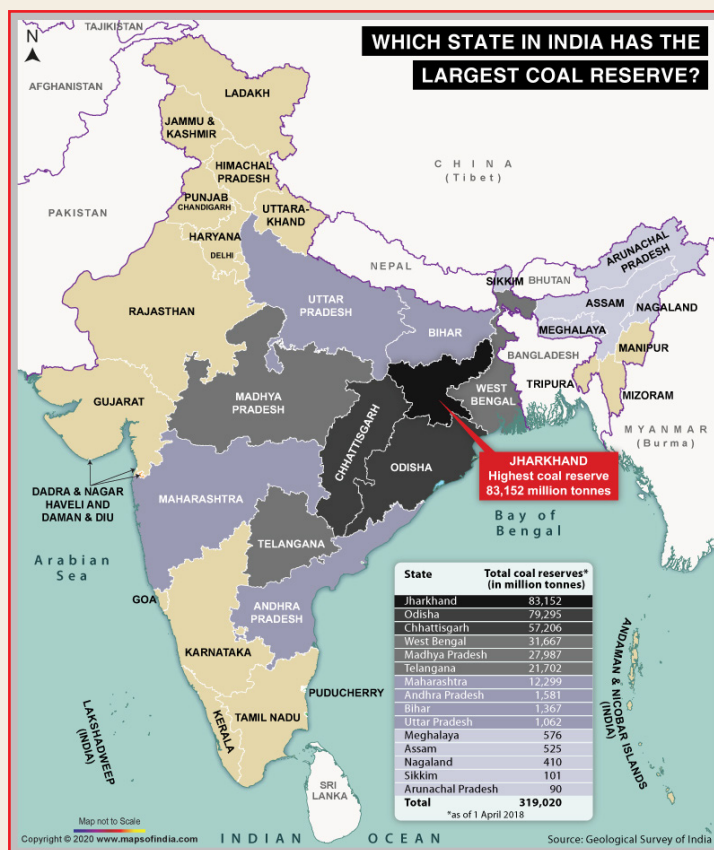
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- **Technological & Economic Challenges:** India's mine closure plans are mostly **technical**, neglecting **social, economic, and environmental justice** aspects.
 - **High escrow requirements** (Rs 14 lakh/ha for opencast mines) deter mine operators from undertaking closure activities.

About Coal

- **About:** Coal is a **fossil fuel** formed from the **remains of ancient vegetation**, found in the form of **sedimentary rock**, and often referred to as '**Black Gold**' due to its high economic value.
 - It is a **conventional energy source** widely used for **domestic fuel, thermal power generation**, and in **industrial sectors** like **iron and steel** and **railway steam engines**.
- **Global Producers:** As of 2025, top 5 coal-producing countries are **China, India, Indonesia, United States** and **Russia**.
- **Coal Distribution in India:**
 - **Gondwana Coal Fields:** Gondwana coal contributes **98% of India's coal reserves** and **99% of its production**, providing **superior and metallurgical-grade coal**.
 - Major deposits are in the **Damodar (Jharkhand–West Bengal), Mahanadi (Chhattisgarh–Odisha), Godavari (Maharashtra), and Narmada (Madhya Pradesh)** valleys.
 - **Tertiary Coal Fields:** Tertiary coal fields (15–60 million years old) have **lower carbon content** but are **rich in moisture and sulphur**.
 - They are mainly found in **extra-peninsular regions** such as **Assam, Meghalaya, Nagaland, Arunachal Pradesh, Jammu & Kashmir, Darjeeling foothills (West Bengal), Rajasthan, Uttar Pradesh, and Kerala**.



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➤ Classification of Coal:

- **Anthracite (80–95%):** Highest carbon content, limited presence in **Jammu & Kashmir**.
- **Bituminous (60–80%):** Most abundant, found in **Jharkhand, Odisha, Chhattisgarh, West Bengal, and Madhya Pradesh**.
- **Lignite (40–55%):** Lower grade, high moisture, found in **Tamil Nadu, Rajasthan, and Assam (Lakhimpur)**.
- **Peat (<40%):** Initial stage of coal formation with low heating value.

Rules for Promotion of Agroforestry

Why in News?

The **Ministry of Environment, Forest and Climate Change (MoEFCC)** has issued **Model Rules for Felling of Trees on Agricultural Lands** to streamline permissions, promote **agroforestry**, boost rural incomes, and reduce pressure on natural forests.

- The rules mandate a **digital portal** with remote sensing and image recognition for transparency and monitoring. This aligns with India's commitments under **UNFCCC**, **CBD**, and supports **SDGs 2, 13, and 15**.

What are the Key Highlights of Model Rules by MoEFCC for Promoting Agroforestry?

- **Simplified Regulations:** Uniform procedures for tree registration, felling, and timber transit on agricultural lands; overrides conflicting state rules for legal clarity.
- **NTMS Portal:** Centralized **National Timber Management System (NTMS)** enables farmers to register plantations, apply for felling permits, and track applications using **geo-tagged data, KML files, and photos**.
- **Tree-Based Categorization:** Felling of **more than 10 trees** requires physical verification by empanelled agencies, while **10 or fewer trees** can be self-declared by farmers on the NTMS portal for an automated NOC.
- **Institutional Mechanism:**
 - **State Level Committee (SLC)** under 2016 Wood-Based Industries Guidelines to promote agroforestry.

- **Divisional Forest Officers (DFOs)** to supervise empanelled agencies for compliance.

- **Technology-Driven Monitoring:** Use of **remote sensing, image recognition, and digital tools** for real-time monitoring and transparency.
- **Market Linkages:** Encourages use of **locally sourced timber**, reducing imports. Promotes cultivation of high-value species (e.g., teak, eucalyptus, poplar) to boost farmer income.

What is Agroforestry?

- **About: Agroforestry** (agriculture with trees), is a **land-use system** where **trees are grown together with crops and/or livestock** on the **same land** to improve **farm productivity, livelihoods, and environmental sustainability**.

- By combining trees with agriculture, it ensures **better use of land and supports rural livelihoods in an eco-friendly way**.
- **Agroforestry** was formally promoted in India through the **National Agroforestry Policy, 2014**.
- In India, agroforestry covers **28.4 million hectares**, which is **8.65% of the country's total land area**.

Difference Between Social Forestry and Agroforestry

Aspect	Social Forestry	Agroforestry
Definition	Forestry outside conventional forests to meet local community needs.	Integration of trees with crops and/or livestock on the same land.
Primary Objective	Fulfill basic needs like fuel, fodder, and timber for rural and underprivileged communities.	Improve farm productivity, livelihoods, and environmental sustainability.

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Target Group	Focused on collective/ community benefits, especially poor and marginalized.	Primarily benefits individual farmers through improved land use.
Examples	Plantation on village commons, wastelands, roadsides.	Growing fruit/ fodder trees alongside crops on private farms.
Policy Backing	Supported through community afforestation programmes and joint forest management.	Institutionalized by the National Agroforestry Policy, 2014.

➤ **Components:**

- **Trees on farms and in agricultural landscapes**, providing fodder, fuel, timber, fruits, or income.

- **Tree-crop combinations** like cocoa, coffee, oil palm, and rubber.
- **Farming in or near forests**, helping manage land near forest edges sustainably.

➤ **Types of Agroforestry:**

- **Farm Forestry:** Tree cultivation by **farmers on their own land**, often for commercial purposes.
 - Promoted by **National Commission on Agriculture (NCA) (1976)** to integrate forestry with farm operations.
- **Extension Forestry:** Raising trees in **non-forested, degraded areas** to expand green cover.
 - **Mixed Forestry:** Combines fuelwood, fodder, and fruit trees on **wastelands or village commons**.
 - **Shelterbelts:** Rows of **trees/shrubs to protect against wind**, sun, and soil erosion.
 - **Linear Strip Plantations:** **Fast-growing trees planted along roads**, canals, and railway lines.

Agroforestry and its attributes



It is a combination of practicing agriculture and forestry together on same land

What are the components of agroforestry?

There are three main components of agroforestry — crops, trees and livestock.

What are the major agroforestry systems based on the type of component?

Agroforestry systems are classified into three categories based on the types of components: Agrisilviculture (crops + trees), silvopastoral (pasture/livestock + trees); and Agrosilvopastoral (crops + pasture + trees).

What are the major attributes that agroforestry systems should possess?

There are three attributes of agroforestry systems:

Productivity: Production of preferred goods and increasing productivity of land

Sustainability: Conserving the production potential

Adoptability: Acceptance of the prescribed practice

What are the trees suitable for rainfed areas?

Neem, Pongamia, Sandalwood and Anjan tree among others

What are the tree crops suited for saline / sodic lands?

Eucalyptus, Casuarina, Pongamia, Neem and Flame of Forest among others



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What are the Key Benefits of Agroforestry?

- **Economic Contribution:** Agroforestry meets nearly half of India's fuelwood needs, two-thirds of small timber demand, 60% of raw material for paper pulp, and around 9–11% of green fodder demand.
 - It supports rural livelihoods through diverse products like fruit, fodder, fuel, fibre, fertiliser, and timber, enhancing income, food security, and resilience to crop failure.
- **Environmental Benefits:**
 - **Carbon Sequestration & Climate Mitigation:** Agroforestry, with adequate support, can sequester over 2.5 billion tonnes of CO₂-equivalent by 2030. Integrated Afforestation, Reforestation, and Revegetation (ARR) projects further enhance its role as a carbon sink, supporting land restoration and climate resilience, contributing to India's net-zero target by 2070.
 - **Improved Soil Fertility:** Nitrogen fixing trees grown in the agro forestry systems are capable of fixing about 50 -100 Kg N/ha/year. Leaf litter decomposition forms humus, recycles nutrients, and improves soil health, reducing the need for chemical fertilisers and supporting organic farming.
 - **Ecological Sustainability:** Agroforestry improves soil health, water retention, nutrient cycling, and biodiversity, reducing dependency on agrochemicals.
 - It also aids in integrated pest management by hosting diverse species that naturally regulate pests, while enhancing climate resilience through ecological stability.
- **Support for Global Commitments:** Agroforestry contributes to India's international targets like creating an additional carbon sink of 2.5–3 billion tonnes of CO₂-equivalent by 2030 and achieving Land Degradation Neutrality over 26 million hectares.
 - It also aligns with 9 out of 17 Sustainable Development Goals (SDGs).
- **Renewable Energy Promotion:** Agroforestry supports the generation of sustainable biomass-based energy, contributing to clean and renewable energy goals.

BENEFITS OF AGROFORESTRY



Efficient use of water and other soil nutrients

The systematic planting and management of woody and non-woody perennials, and other agricultural crops in agroforestry help to use the water and soil nutrients efficiently.



Increases soil fertility

Different components of agroforestry especially those that are nitrogen fixers can help to improve soil fertility



Provides income to the farmer

By producing a variety of products, agroforestry systems reduce the risk associated with price fluctuations and crop failures.



Improves biodiversity

Trees and other woody perennials in agroforestry create a complex structure that serves as niches for various animals.



Reduces soil erosion

On sloping areas, trees and shrubs typically have deep and extensive root systems that help bind the soil, making it more resistant to erosion.

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What are the Key Government Initiatives on Agroforestry?

- **National Agroforestry Policy (NAP), 2014:** India became the **first country** to adopt a dedicated agroforestry policy, promoting integrated agriculture–forestry systems on private and community lands.
 - It called for **ministerial convergence**, **simplified felling and transit rules**, **institutional support** (e.g., CAFRI), and **research–extension linkages**.
 - The policy laid the foundation for the **Sub-Mission on Agroforestry (SMAF)** and inspired similar policies in **ASEAN, Rwanda, Nepal, and Ethiopia**.
- **Sub-Mission on Agroforestry (SMAF), 2016:** Launched under the **National Mission for Sustainable Agriculture (NMSA)**, SMAF aims to **promote tree plantation on farmlands**, especially for **small and marginal farmers**, by providing incentives for **seedling procurement, plantation, protection, and extension**.
 - It integrates with schemes like **MNREGA, RKVY, and NABARD**.
- **All India Coordinated Research Project (AICRP), 1983:** Initiated by ICAR, AICRP is a national research network focused on **developing and improving agroforestry systems** suited to India's diverse agro-climatic zones.
- **GROW:** Launched by **NITI Aayog**, **GROW (Greening and Restoration of Wasteland with Agroforestry)** aims to restore **26 million hectares of degraded land by 2030** and contribute to India's **carbon sink target of 2.5–3 billion tonnes CO₂-equivalent** under the **Paris Agreement**.
 - It uses **Remote Sensing, GIS**, and the **Agroforestry Suitability Index (ASI)** on the **Bhuvan Portal** to guide interventions at national, state, and district levels.

What are the Key Challenges in Effective Utilization of Agroforestry Policy?

- **Regulatory & Institutional Fragmentation:** Varying **tree felling and transit rules** across States, poor coordination among forestry, agriculture, and rural development departments hinder uniform implementation.

- **Low Awareness and Technical Capacity:** Farmers lack awareness of policy benefits, ecological value, and best practices.
 - **Shortage of trained extension staff and limited access to scientific knowledge** on species selection, plantation techniques, and **integrated pest management** restrict adoption.
- **Financial and Market Constraints:** **High initial investment**, long gestation period, lack of insurance and **agroforestry-specific credit schemes** make it financially risky.
 - Weak linkages with **wood-based industries** and absence of price assurance reduce profitability.
- **Digital and Monitoring Gaps:** **Low digital literacy and poor connectivity** limit use of the **National Timber Management System (NTMS)**.
 - Inadequate real-time monitoring affects **traceability, transparency**, and compliance, especially for smallholders.
- **Research and Perception Barriers:** Lack of **region-specific R&D on tree-crop models** and climate-resilient species, along with **farmer risk aversion, uncertainty in returns** affects confidence and large-scale adoption.

RDI Scheme for Private Sector R&D

Why in News?

The Union Cabinet approved a **Rs 1-lakh crore Research Development and Innovation (RDI) scheme** that aims to **incentivise the private sector** to invest in **basic research** that would translate into **innovative products and technologies**.

What is the Research Development and Innovation (RDI) Scheme?

- **About:** It is an initiative of the **Ministry of Science and Technology** to boost private sector investment in **basic and applied research** to drive the **development of innovative technologies and products**.

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- This is an **exclusive fund designed for the private sector**, in contrast to the **Anusandhan National Research Foundation (ANRF)**, which primarily provides grants to academic institutions.
- **Scope:** It promotes R&D in **sunrise** and strategic sectors by **reducing risk** and providing **concessional funding** to private players. The funds will be utilized in **four key ways**:
 - **Promoting private R&D and innovation**, especially in sunrise sectors such as **biotechnology**, **robotics**, **drones**, and **climate change**;
 - **Financing transformative projects** aimed at achieving a higher level of **technology readiness**;
 - **Supporting the acquisition of critical or strategically important technologies**; and
 - **Establishing a Deep Tech Fund of Funds** as an alternative financing channel for **startups in the deep tech sector**.
- **Administration & Governance:** The **Governing Board of the ANRF**, chaired by the **Prime Minister**, will provide the **overall strategic direction** for the **RDI Scheme**, while the **Department of Science and Technology** will act as the **nodal department** for its implementation.
- A **Special Purpose Fund (SPF)** within the **ANRF** will serve as the **custodian of funds**, distributing mainly **long-term concessional loans** to **second-level fund managers**.
 - These managers will finance **R&D projects** through **low or zero-interest loans**, offer **equity support** for **start-ups**, and may contribute to **Deep-Tech or other RDI-focused Funds of Funds (FoFs)**.
- **Funding Structure:** The funds will be allocated through the **Union Budget** as a **50-year interest-free loan** to the **ANRF**, which will be **leveraged to create a multiplier effect**.
- Funds will be provided only to products with a certain level of **development and market**

potential, including **high-risk TRL-4 (Technological Readiness Level -4) projects** that often lack financial support.

Note

- India's **Gross Expenditure on R&D (GERD)** increased from **Rs 60,196 crore in 2011** to **Rs 1.27 lakh crore in 2021**, but remains low at **0.64% of GDP**.
- The goal is for **India's private sector** to eventually **surpass government funding in basic research**, as seen in **advanced tech nations**.
- India ranks **6th globally** in **patent filings**, with **64,480 applications in 2023**, a rise from **42,951 in 2013–14**.

What are the Challenges Facing Private Sector Participation in R&D in India?

- **Low R&D Spending by Private Sector:** India's industry invests only **0.2% of GDP in R&D**, far below the **US (2.7%)**, **South Korea (3.9%)**, and **UK (2.1%)**, as many businesses prioritise **short-term gains over long-term research**.
- **Weak Industry-Academia Collaboration:** Collaboration between **academia and industry** is hindered by a **lack of trust and alignment**, with universities often focused on **theoretical research** while businesses seek **market-ready solutions**.
 - Additionally, **disputes over Intellectual Property (IP) ownership** further impede effective partnerships.
- **Market & Funding Challenges:** **Low commercial viability**, particularly in **early-stage or deep-tech innovations**, deters corporate investment.
 - The **"valley of death" phase (Technological Readiness Level 3–6)**—when technologies move from lab to market—is often **underfunded and abandoned**.
 - There is also an **over-reliance on public funding** (e.g., **DST, MeitY schemes**), while **private firms**

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face entry barriers in defense and strategic R&D, largely dominated by DRDO.

- **Inadequate IP Protection & Enforcement:** Lengthy patent approvals (3–6 years) and high litigation costs deter innovation, while **weak enforcement** causes revenue losses in sectors like **pharma generics** and **software piracy**.
- **Shortage of Skilled R&D Talent:** Brain drain continues as top researchers move abroad for **better opportunities**, while **skill mismatch** in areas like **AI** and **advanced materials** limit domestic R&D capacity.
 - Additionally, the **high cost** of setting up **advanced labs** (e.g., **semiconductor fabs**, **biotech labs**) and **limited access** to **government-funded infrastructure** (e.g., **CSIR labs**) further restrict private sector R&D.
- **Low-risk Appetite:** Cultural barriers such as a **fear of failure** and **hierarchical workplaces** discourage risk-taking and stifle researcher creativity.

8 Years of GST

Why in News?

As **Goods and Services Tax (GST)** completes 8 years since its launch on **1st July 2017**, experts acknowledge its success in **tax integration** and **digitisation**, while emphasizing the need for **simplification**, **rate rationalisation**, and **reduced compliance burden**.

What are the Key Achievements of GST over the Past 8 years?

- **Record Revenue Growth:** GST revenues have **consistently grown**, with the highest-ever gross collection of **Rs 22.08 lakh crore in FY 2024-25**, with an average monthly collection of **Rs 1.84 lakh crore**.
 - This growth has **outpaced nominal GDP**, reflecting **better compliance**, **reduced tax evasion**, and increased **economic formalization**.

- **Digital Transformation & Compliance Efficiency:** GST has undergone **digitization**—from **manual filings** to **e-invoicing**, **real-time credit matching**, **automated returns**, and **e-way bills**—reducing **errors and fraud**.
 - While **MSMEs**, once hesitant, now see it as a gateway to **credit**, **government procurement**, and **national market access**.
- **Expanded Taxpayer Base:** As of **30th April, 2025**, India boasts over **1.51 crore active GST registrations**, marking a significant increase from **65 lakh in 2017**.
 - This growth underscores the success of GST in **formalizing the economy** and enhancing tax compliance.
- **Ease of Doing Business:** GST has **removed inter-state tax barriers**, lowering **logistics costs** and enhancing **supply chain efficiency**, while the elimination of **entry taxes** and **octroi** has led to further **business cost savings**.
 - GST's '**One Nation, One Tax**' framework replaced the **multi-layered tax system**, reducing **cascading effects** while the **Input Tax Credit (ITC)** mechanism ensured **seamless credit flow**, lowering **business costs** and boosting **competitiveness**.
- **Efficient Refund Processing:** Automated **Integrated GST (IGST)** refunds via the **Customs ICEGATE portal** have sped up processing to **within a week**, with **₹1.18 lakh crore** disbursed in **FY25**, boosting **exporter liquidity**.

What is the Goods and Services Tax (GST)?

- **About:** The **101st Amendment Act, 2016** introduced a **unified indirect tax system** across India by **subsuming multiple central and state taxes** under GST.
 - GST is a **value-added tax** levied on the supply of all goods and services.
 - It replaced **central taxes** like **Excise Duty**, **Additional Excise Duties**, and **Service Tax**, and **state taxes** like **VAT**, **Central Sales Tax**, and **Luxury Tax**.

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What is it?

- GST aims to stitch together a common market by dismantling fiscal barriers between states
- It is a single national uniform tax levied across the country on all goods and services

Present Situation

- The Centre and states levy multiple taxes such as excise duty, octroi, central sales tax (CST), value-added tax (VAT) and entry tax, among others

Why amend the Constitution?

- Under current laws, only the Centre can impose taxes on services
- GST will empower states to collect service taxes

What about tax rates?

- There has been no agreement yet on tax rates for various goods and services
- States want the rate to provide relief to common citizens and small businessmen while preventing loss of revenue for states
- A panel headed by chief economic adviser Arvind Subramanian has recommended a revenue-neutral rate of 15% to 15.5%, with a standard rate of 18%
- The revenue-neutral rate is the rate at which there will be no revenue loss to the Centre and states under GST

Compensating states

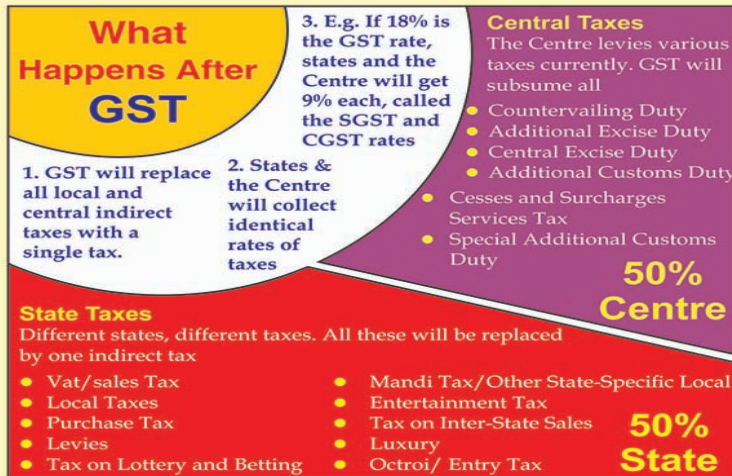
- States want 100% compensation for the first five years, and want this specified in the main law through "fool proof" wording
- In the original Bill, the Centre had proposed 100% compensation for first three years, and 75% and 50% for the next two years, respectively
- The Centre has acceded to the states' demand and modified the Constitution Amendment Bill

Inter-state movements

- The Centre would collect the Integrated Goods and Services Tax (IGST) on inter-state supplies
- IGST has been designed to ensure seamless flow of input tax credit from one state to another
- The IGST rate would roughly be equal to CGST plus SGST

What next

- More discussion on rates in the months ahead



- Rates may be specified in subordinate legislation—SGST law, CGST law by later this year.
- Its backbone GST Network (GSTN) to be tested after rates are finalised; GSTN will enable real-time tax returns, registrations, input credit etc.

Price impact

- The impact on prices is unknown
- Experts say GST will make most services costlier
- The 13th Finance Commission estimates prices of agricultural goods will increase by 0.61% to 1.18%, while prices of manufactured items will fall by 1.22% to 2.53%
- It will lower the overall tax inputs and make exports competitive

Timeline

2006-07: The govt moots a proposal for GST in the Budget; negotiations with states begin

2008: The govt. constitutes the empowered committee (EC) of state finance ministers

2009: The committee releases its first discussion paper

2011: The UPA govt. introduces the Constitution Amendment Bill for GST in Lok Sabha (LS)

Aug 2013: The Parliamentary Standing Committee submits its report; the govt incorporates recommendations of the committee in the Bill

Sep. 2013: Revised bill sent to the empowered committee

Dec 2014: The Constitution Amendment Bill introduced in the LS

May 2015: LS passes the Bill

August 2015: Congress insists on

capping GST rate at 18%, and specifying the same in the Constitution Amendment Bill

July 2016: The Centre and states agree against capping GST rate in the Constitution Amendment Bill

Aug 2016: Rajya Sabha passes Constitution Amendment Bill Industry hails reforms, says will make doing business easier

➤ Main Features:

- **Supply-Based Taxation:** GST is levied on the **supply of goods and services**, unlike earlier taxes which were imposed on **manufacture, sale, or service provision**.
- **Destination-Based System:** GST operates as a **destination-based consumption tax**, replacing the older **origin-based taxation** model.
- **Multiple Tax Slabs:** GST is imposed at **five different rates-0%, 5%, 12%, 18%, and 28%**, with **product classification** guided by the **GST Council**.
- **Dual Structure:** GST has a **dual framework**, where both the **Centre (CGST)** and the **States (SGST)** levy tax on the **same transaction value**.

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- Imports of **goods and services** are considered **inter-state supplies** and attract **IGST**, in addition to applicable **customs duties**.
- **Governance: GST Council** is a key decision making body. **Goods and Services Tax Network (GSTN)** provides an IT system for the **GST portal**.
- The **Centre and States** decide **CGST, SGST, and IGST** rates based on the **recommendations** of the **GST Council**.

What are Key Challenges in the Current GST Framework?

- **Exclusion of Items: Petroleum products and alcohol for human consumption** remain outside **GST**, leading to **tax cascading** and **cash flow issues** due to **ineligible ITC**.
- While **states levy VAT** under **Entry 54 of the State List** and **Article 366(12A)**, raising concerns over **revenue loss** and **fiscal autonomy** if included under **GST**.
- **Delay in GST Appellate Tribunal (GSTAT):** The long-delayed **GST Appellate Tribunal (GSTAT)**, though recently notified, remains **non-functional in several states**, leading to a **backlog of appeals in High Courts**, **prolonged adjudication**, and **uncertainty for taxpayers**.
- **Complex Rate Structure:** **GST** currently has five main slabs along with **special rates** of 0.25%, 1%, and 3% (mainly for **gold, silver, and diamonds**), leading to **classification disputes**, **frequent litigation**, and **working capital issues** in **inverted duty structure** sectors.
- Though the original intent was to **rationalise a three-rate system**, there has been **no significant progress** despite **expert recommendations** and **GST Council** discussions.
- **Procedural and Compliance Hassles:** Despite progress in **automation and digitalisation**, **procedural challenges** persist, including **high-value litigations on minor issues**, **over-regulation**, and **frequent rule changes with complex notifications**.
- Experts note that these **procedural hassles** often **overshadow** the government's broader efforts at **simplification**.

- **Interpretational Ambiguities:** Ambiguities in interpreting **intermediary services**, **intra-company transactions**, and **employee secondment** under **GST** persist despite circulars, causing **compliance grey areas**, **operational hurdles**, and increasing **litigation risks** for businesses.

Voluntary Amalgamation of Co-operative Banks

Why in News?

Saraswat Co-operative Bank (SCB), the largest **Urban Co-operative Bank (UCB)** in India, has received **in-principle approval** from the **RBI** to acquire the fraud-hit **New India Co-operative Bank (NICB)** under the **RBI's Voluntary Amalgamation Scheme** for **UCBs**.

What is RBI's Voluntary Amalgamation Scheme for UCBs?

- **About:** The **Voluntary Amalgamation Scheme** is a regulatory framework introduced by the **RBI** to facilitate the **voluntary merger of two or more UCBs**. Its primary objective is to ensure **financial stability** and protect the interests of **depositors**.
- This scheme is governed by the **Master Direction on Amalgamation of Urban Co-operative Banks, 2020**, issued under:
 - **Section 35A** of the **Banking Regulation Act, 1949**, which grants the **RBI** the authority to issue directions to banks in public interest or for proper management.
 - **Section 44A**, which addresses the voluntary amalgamation of banking companies, including **UCBs**.
 - **Section 56**, which extends the provisions of the Act to co-operative banks, with necessary modifications.
- Amalgamation is permitted only when specific conditions related to **financial soundness** and **depositor protection** are met. Approvals are required from the **boards, shareholders**, and the **RBI**.

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- **Legal Backing:** The scheme is legally supported by the **Banking Regulation (Amendment) Act, 2020**, which strengthens the RBI's authority to direct, approve, or reject UCB amalgamations to ensure financial stability and protect depositor interests.

- In these mergers, the **Amalgamated Bank is the weaker UCB** transferring its business, while the **Amalgamating Bank is the stronger UCB** acquiring it.

➤ **Conditions for Amalgamation:**

- **Positive Net Worth:** The merger can proceed if the **amalgamated bank has a positive net worth**, with the stronger bank ensuring full protection of depositors' funds.
- **Without Government Support:** If the amalgamated bank has a **negative net worth**, the stronger bank may merge while voluntarily protecting all depositors' funds, without external assistance.
- **With Government Support:** If the amalgamated bank has a negative net worth, the merger can proceed with full depositor protection, backed by financial support from the State Government.

➤ **Approval Process for Amalgamation:**

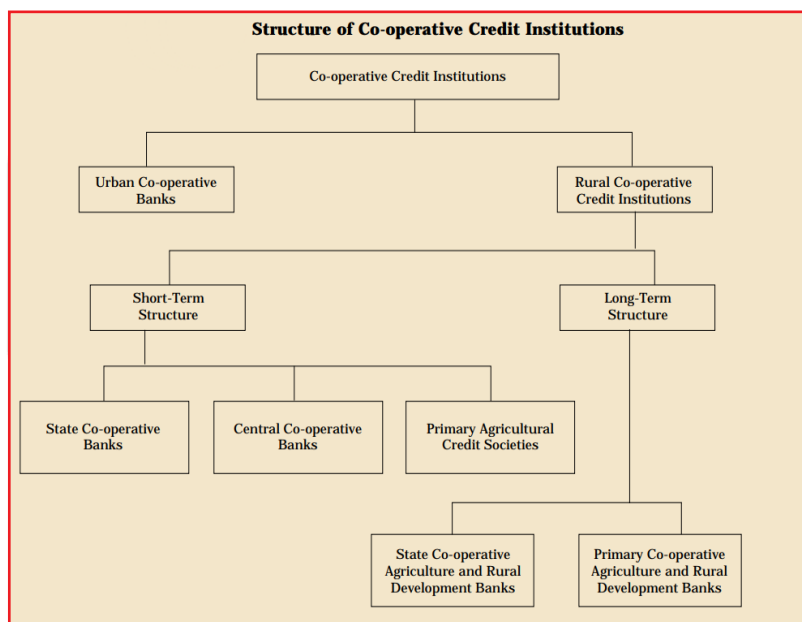
- **Board Approval:** The amalgamation requires approval from a **two-thirds majority of the total board members** of both the amalgamating and amalgamated UCBs, not just those present and voting.
- **Shareholder Approval:** Approval from **two-thirds of shareholders (in number and value)** of each UCB is required, with the shareholders present in person at a specially convened meeting.

- **RBI Sanction:** After obtaining board and shareholder approvals, the draft amalgamation scheme must be submitted to the relevant **Regional or Central Office of the RBI for final approval.**

- **Applicability:** Applicable to all **Primary (Urban) Co-operative Banks**, including both **single-state** and **multi-state** UCBs.

What are Co-operative Banks?

- **About:** Co-operative Banks are financial institutions set up as **Co-operative Societies**, registered under either the **State Co-operative Societies Acts** or the **Multi-State Co-operative Societies Act, 2002**, and engaged in **banking business.**
- **Objective:** To provide **affordable credit** to **farmers, small businesses, self-employed, and low-income groups**, especially in **rural and semi-urban areas.**



- **Ownership & Governance:** Owned and managed by their **members**, who are also the **customers**.
 - It follows the **"one person, one vote"** principle, ensuring democratic control.
- **Regulatory Framework:** Co-operative banks operate under a **dual regulatory system:**
 - **RBI's Role:**
 - The **RBI regulates co-operative banks** under the **Banking Regulation Act, 1949**, ensuring compliance with **capital adequacy, lending norms, and financial supervision.**
 - It has the authority to **cancel a bank's license** if it fails to meet regulatory norms or ceases operations.

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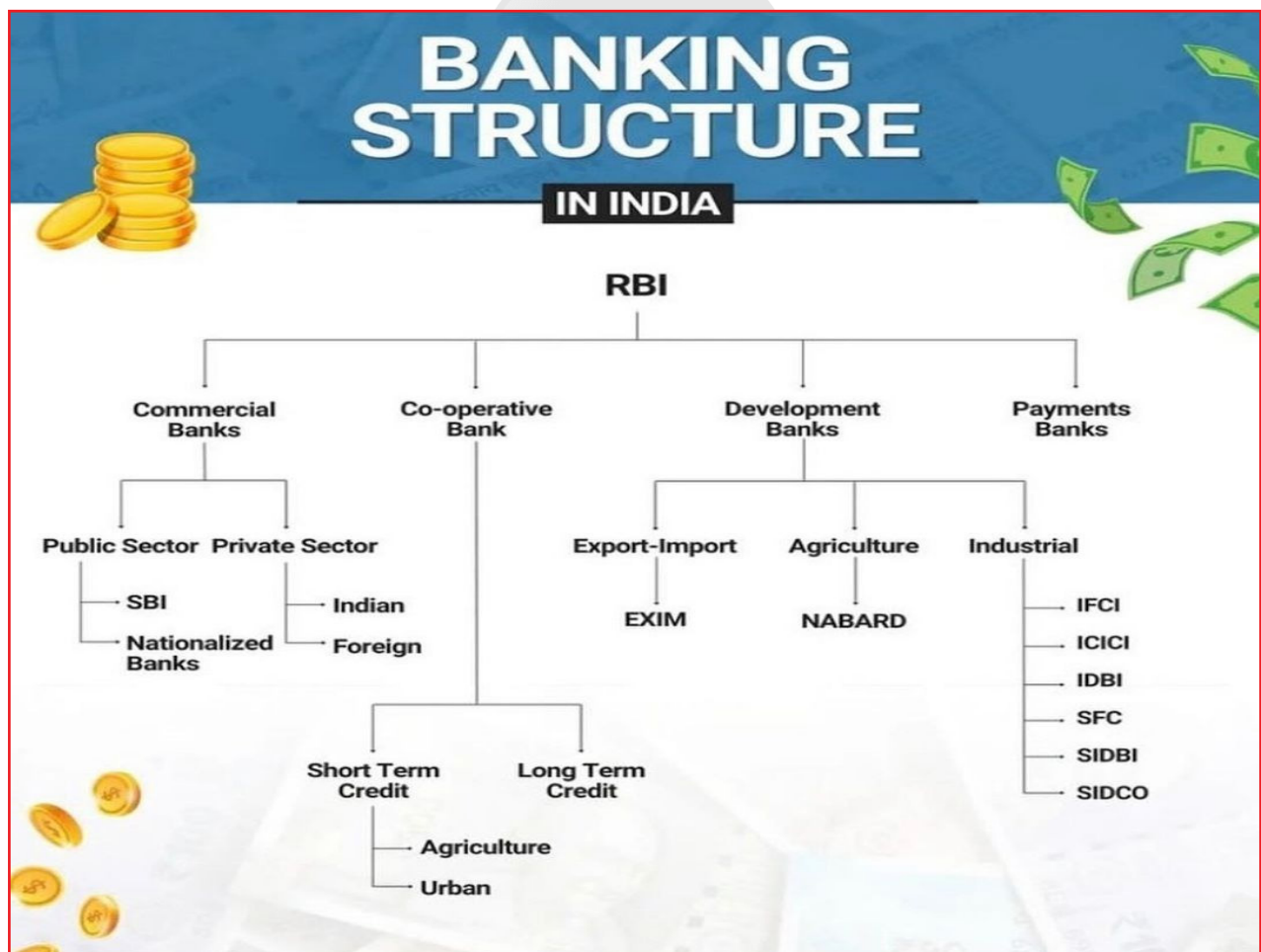
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- The Banking Regulation (Amendment) Act, 2020 has enhanced RBI's powers to intervene in the management and governance of Urban Co-operative Banks (UCBs).
- Registrar of Co-operative Societies (RCS):
 - The administrative functions are overseen by the respective state governments or the central government through the RCS).

What is the Significance of UCBs in India?

- **Promoters of Financial Inclusion:** UCBs play a crucial role in serving small borrowers, micro-businesses, and low-income groups in urban and semi-urban areas, thereby enhancing financial access.
- **Community-Centric Operations:** Their localised focus allows UCBs to better understand and meet community-specific credit needs with customised financial services.
- **Priority Sector Lending (PSL) Obligations:** UCBs are mandated to allocate 65% of their adjusted net bank credit (ANBC) to PSL in FY 2024–25, with a target to increase it to 75% by March 2026, supporting key sectors like MSMEs, housing, and education.
- **Support to Non-Agricultural Urban Sectors:** Historically restricted to non-agricultural lending until 1996, UCBs now play an important role in financing urban development and small-scale enterprises, complementing commercial banks in credit outreach.



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Recent Developments in Co-operative Banking and Regulations

- **National Co-operative Policy (2025–2045):** Launched by the Union Government, the 20-year policy aims to establish **one co-operative in every village** and create **2 lakh new PACS by February 2026**, promoting **grassroots financial inclusion, rural development**, and the vision of “**Sahakar se Samridhi**.”
- **Reforms in Priority Sector Lending (PSL) Norms:** From **April 2025**, UCBs are required to allocate **60% of Adjusted Net Bank Credit (ANBC)/ Credit Equivalent of Off-Balance Sheet Exposures (CEOBE)** to PSL, revising older benchmarks.
 - For Small Finance Banks (SFBs), the **PSL mandate has been reduced from 75% to 60%** from FY 2025–26 to align them with universal banks and enhance operational flexibility in lending.
- **Enhanced Regulatory Oversight by RBI:** In FY 2024–25, the RBI intensified its supervision of UCBs by **issuing 215 penalties, cancelling 7 licenses**, and placing **23 UCBs under restrictions** for violations including **KYC breaches, high NPAs, and frauds**. Key reforms included:
 - **Revised prudential norms** for increased loan ceilings, relaxed provisioning timelines, and adjusted real estate exposure limits.
 - **Extension of Prompt Corrective Action (PCA)** to UCBs (from April 2025).
 - **Master Direction on Fraud Management (2024)**, introduced early warning systems and accountability mechanisms for fraud risk mitigation.
- **Digital & Institutional Strengthening:** RBI mandated **Core Banking System (CBS) adoption for all UCBs by March 2025**, supported by **NABARD and fintechs**.
 - The government launched **NUCFDC** to offer **shared digital infrastructure** and services. Policy reforms aim to **streamline PACS liquidation and registration**, replacing defunct units with tech-enabled, well-governed cooperatives.

Employment Linked Incentive Scheme

Why in News?

The Union Cabinet approved the **Employment Linked Incentive (ELI) Scheme**, announced in the **Union Budget 2024–25** as part of a broader **Rs 2 lakh crore youth employment package**.

- The ELI Scheme has a budget outlay of around Rs 1 lakh crore and will be implemented from **August 2025 to 31st July 2027**.

What is the Employment Linked Incentive Scheme?

➤ Key Components:

- **Part A: Incentives for First-Time Employees**
 - It targets 1.92 crore first-time **Employees' Provident Fund Organization (EPFO)**-registered employees, offering a one-month EPF wage (up to Rs 15,000), paid in two installments (after 6 and 12 months of service), with the latter contingent on completing a financial literacy programme.
 - A portion will be deposited in a fixed savings account to promote long-term saving habits.
- **Part B: Support to Employers**
 - Employers hiring additional workers (salary ≤ Rs 1 lakh) will get up to Rs 3,000/month for 2 years.
 - EPFO-registered firms must hire **2 additional employees** (for firms with <50 employees) and **5 additional employees** (for firms with ≥50 employees), with minimum 6 months' retention.
 - Aims to boost employment across sectors, especially manufacturing, targeting creation of 2.6 crore jobs.
- **Incentive Payment Mechanism:** All payments to the First Time Employees under Part A of the Scheme will be made through **DBT (Direct Benefit Transfer) mode** using **Aadhar Bridge Payment System (ABPS)**.

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- Payments to the Employers under Part B will be made directly into their Permanent Account Number-linked Accounts.

➤ Significance:

- **Boost Private Sector Hiring:** Encourages recruitment by reducing hiring costs through incentives, particularly for first-time jobseekers.
- **Youth Employment Focus:** Targets fresh graduates and new entrants with wage support and social security coverage.
- **Job Retention and Upskilling:** Incentives linked to retention and financial literacy promote workforce stability.
- **Promote Formalisation:** Through EPFO-linked payments, it supports transition from informal to formal employment.
- **Reduce Inequality:** Prioritises economically disadvantaged youth, supporting inclusion and mobility.

Job Growth in India

- India's labour market witnessed strong momentum in FY 2023-24, with 4.67 crore new jobs added across the economy. Growth has been observed across both formal and informal sectors.

Informal Sector:

- 10.01% employment growth recorded (23–24 Year over Year (YoY)), as per the **Annual Survey of Unincorporated Sector Enterprises (ASUSE)** by the Ministry of Statistics.
- The **"Other Services" sector** (transport, accommodation and food services, information and communication, health, education, real estate, etc.) contributed significantly, employing over 12 crore workers, up by more than 1 crore from the previous year.

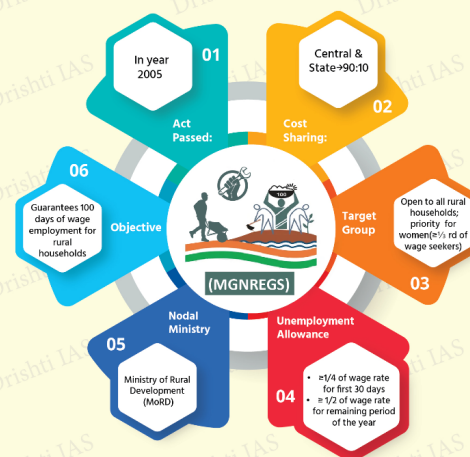
Formal Sector (first half of 2024-25):

- **Employees' Provident Fund (EPF)** enrollments rose by 2.3%, reaching 6.1 million.
- **Employees' State Insurance Corporation (ESIC)** enrollments grew 5.2% to 9.3 million.
- **National Pension System (NPS)** enrollments increased 6.8%, indicating growth in higher-quality job opportunities.

- These indicators point to **improving job quality** and expanding **social security coverage**, as also acknowledged in the **latest Monthly Economic Review** by the Finance Ministry.

Major Employment Generation Schemes

Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)



• Prime Minister's Employment Generation Programme (PMEGP)

- **Launch Year** → 2008
- **Objective** → Credit-linked subsidy programme – self-employment opportunities micro-enterprises in non farm sector
- **Nodal Agency** → Khadi and Village Industries Commission (KVIC)
- **Eligibility** → Indian citizens; Age 18-35 yrs (General); 18-40 yrs (SC/ST/OBC/PH/Women)

• Aajeevika - Deendayal Antyodaya Yojana-National Rural Livelihoods Mission (DAY-NRLM)

- **Launch Year** → 2011 (restructured & renamed in 2016)
- **Objective** → Creating sustainable self-employment & skilled wage employment through financial assistance
- **Nodal Ministry** → MoRD
- **Eligibility** → Rural poor households (focus on women), SHGs, & vulnerable communities
- **Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY)** → Subcomponent of NRLM

• Rural Self Employment and Training Institutes (RSETIs)

- **Launch Year** → 2009
- **Objective** → Providing dedicated infrastructure for training & skill upgradation of rural youth → promote entrepreneurship
- **Funded By** → MoRD
- **Eligibility** → Rural youth

• National Career Service (NCS) Project

- **Launch Year** → 2015
- **Objective** → Offers job matching services, career counseling, vocational guidance, & information on skill development
- **Nodal Agency** → Ministry of Labour and Employment
- **Eligibility** → Accessible to job seekers & employers across various sectors

• Deendayal Antyodaya Yojana-National Urban Livelihoods Mission (DAY-NULM)

- **Launch Year** → 2013
- **Objective** → Alleviate poverty & vulnerability among urban poor → by providing access to self-employment & skilled wage employment opportunities
- **Nodal Agency** → Ministry of Housing and Urban Poverty Alleviation (MoHUPA)
- **Eligibility** → Urban Poor (women, street vendors, unemployed youth etc.)

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International Relations

Highlights

- Five Pillars for a Sustainable India-Brazil Relations
- India-Namibia Relations and Africa
- India-Argentina Relations
- 17th BRICS Summit
- India - Trinidad and Tobago Relations
- India and Ghana Relations
- QUAD At Sea Ship Observer Mission

Five Pillars for a Sustainable India-Brazil Relations

Why in News?

India's Prime Minister paid a **state visit to Brazil** where both countries reaffirmed their commitment to deepening the **India-Brazil Strategic Partnership**, established in **2006** and agreed to enhance bilateral relations centered on **five priority pillars**.

- India's Prime Minister was conferred **Brazil's highest state honour**, the **Grand Collar of the National Order of the Southern Cross**.

Note: India's Prime Minister arrived in **Brasilia (capital of Brazil)** after attending the **17th BRICS Summit 2025** (6th-7th July 2025) in **Rio de Janeiro (Brazil)**.

- India will assume the **BRICS Chairship** and host the **18th BRICS Summit** in 2026.

What are the Five Priority Pillars Agreed Upon to Enhance India- Brazil Bilateral Relations?

- **Defense and Security Cooperation:** India and Brazil signed agreements on the **Exchange and Mutual Protection of Classified Information** to deepen strategic cooperation, and on **Combating International Terrorism and Transnational Organized Crime**.
 - They also launched a **Cybersecurity Dialogue** for information sharing.

- **Food & Agricultural Security:** India and Brazil stressed the urgent need for **concrete action on sustainable agriculture**, and ensuring **food access**, with plans for **joint R&D in agricultural productivity, animal genetics, and biotechnology**.
 - They voiced **opposition to trade barriers** impacting **food security**, and affirmed support for the **Global Alliance Against Hunger and Poverty**.
- **Energy Transition & Climate Action:** India and Brazil emphasized the importance of **sustainable biofuels** and **flex-fuel vehicles** in **decarbonizing transport** and promoting **sustainable development**, while pledging to strengthen the **Global Biofuels Alliance** (GBA), of which **both countries** are **founding members**.
 - India also extended support to **Brazil's UNFCCC COP30 Presidency** (to be held in **Belem, Brazil, November 2025**) and the **Tropical Forests Forever Fund**.
- **Digital Transformation and Emerging Technologies:** Both countries agreed to convene the **Joint Commission on Scientific and Technological Cooperation** to enhance collaboration in key areas such as **digital public infrastructure, artificial intelligence, quantum technologies, renewable energy, and outer space**.
- **Industrial Partnerships in Strategic Areas:** India and Brazil identified key sectors for collaboration, including **pharmaceuticals, mining and critical minerals**, and **oil & gas**.
 - They agreed to address **non-tariff barriers**, fast-tracking the **enforcement** of the **Bilateral**

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Investment Cooperation and Facilitation Treaty (2020) and the Protocol amending the Convention for Avoidance of Double Taxation (2022), and launching a Brazil-India Business Council to strengthen private sector engagement.



What are the Key Highlights of India-Brazil Relations?

- **Political & Diplomatic Ties:** Diplomatic relations between India and Brazil were established in 1948, with India maintaining an embassy in Brasília and a Consulate General in Sao Paulo.
 - The Strategic Partnership, established in 2006, has served to strengthen and deepen bilateral ties.
- **Trade & Economic Engagement:** Bilateral trade in 2024–25 stood at USD 12.2 billion with key Indian exports including petrochemicals, agrochemicals, pharma, and engineering goods, while Brazil exported crude oil, soy oil, sugar, gold, and iron ore to India.
 - Indian investments in Brazil total around USD 6 billion whereas Brazilian investments in India are around USD 1 billion.
- **Defense & Security Cooperation:** The 2003 Defence Cooperation Agreement, ratified in 2006, established a Joint Defence Committee (JDC), and the **2+2 Political-Military Dialogue** held its first meeting in 2024.
- **Space & Technology Collaboration:** India launched Brazil's **Amazonia-1 satellite** in 2021 and Brazil is interested in India's Digital Public Infrastructure (DPI).

- **Energy & Biofuels Partnership:** India and Brazil co-founded the Global Biofuels Alliance (2023), operate Joint Working Groups on Oil & Gas and Bioenergy, and Brazil ratified the **International Solar Alliance (ISA)** in 2022.
- **Cultural & People-to-People Ties:** India opened its first cultural centre in Latin America in Sao Paulo in May 2011, and Brazil hosts a vibrant Yoga and Ayurveda community.
 - The Indian diaspora, estimated at around 4,000, consists primarily of professionals and businesspeople.

What are the Challenges in India-Brazil Relations?

- **Limited Economic Diversification:** Bilateral trade, at USD 12.2 billion in 2024–25, remains modest, constrained by non-tariff barriers such as strict sanitary, and phytosanitary, affecting agricultural trade.
 - Trade is constrained by over-reliance on commodities, with Brazil exporting raw materials and India exporting refined products, leading to limited value-added trade.
- **Geographical Distance:** Trade competitiveness is reduced by high transportation costs and lengthy shipping routes, while connectivity bottlenecks and limited direct flights hinder business, tourism, and people-to-people exchanges.
- **Competition in Agriculture & Biofuels:** India and Brazil face rivalry in global sugar and ethanol markets, leading to competition over collaboration, while differences over subsidy policies, especially Brazil's opposition to **India's sugar subsidies** at the **WTO**, have caused friction.
- **Cultural & Awareness Gaps:** Cultural understanding remains limited, with Brazilians often associating India with yoga/spirituality and Indians viewing Brazil through football/carnival, compounded by limited media and academic exchanges between the two countries.
- **Diverging Global Priorities:** India and Brazil have different regional priorities—India focuses on the Indo-Pacific, while Brazil emphasizes Latin America.

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- They also face **multilateral alignment challenges**, with **divergent positions** in **WTO**, and **climate negotiations**, particularly on **agriculture subsidies** and **carbon emissions**.

India-Namibia Relations and Africa

Why in News?

- India's **Prime Minister** undertook a **State Visit to Namibia** (1st by an Indian PM in 27 years), addressed the **Namibian Parliament**, and reaffirmed **India's commitment** to a **partnership with Africa** rooted in **dialogue rather than dominance**.
- He was also conferred **Namibia's highest civilian award** – the **Order of the Most Ancient Welwitschia Mirabilis** – becoming the **first Indian leader** to receive this honour.
 - Namibia submitted letters of acceptance to join the **Coalition for Disaster Resilient Infrastructure (CDRI)** and the **Global Biofuels Alliance**, and became the **first country globally** to sign a **licensing agreement** to adopt **UPI technology**.

Namibia

- **Geographical Location:** Namibia is a **Southern African nation** with its **western boundary** formed by the **Atlantic Ocean**.
 - It shares its **northern borders** with **Angola** and **Zambia**, while **Botswana** lies to its **east** and **South Africa** borders both its **eastern** and **southern** regions.



- **Climate:** Namibia, acknowledged as the **driest nation in sub-Saharan Africa**, is home to several major deserts, including the **Namib**, the **Kalahari**, the **Succulent Karoo**, and the **Nama Karoo**.
- **Colonial History:** In **1884**, the **German Empire** established **colonial rule** over much of the region, naming it **German South West Africa**.
- **Important Rivers:** **Zambezi**, **Okavango**, and **Kunene** are **important rivers** in Namibia.

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Welwitschia Mirabilis

- **About:** *Welwitschia mirabilis* (national plant of Namibia) is a rare, ancient plant native to the Namib Desert in Namibia and southern Angola, often called a “living fossil” due to its remarkable longevity and unique features.
 - Namibia’s highest civilian award – the Order of the Most Ancient *Welwitschia Mirabilis* is named after this plant.
- **Appearance:** It has only two broad leaves that grow continuously, becoming twisted and tattered but never falling off. A woody stem and deep taproot help it endure arid conditions.
- **Longevity:** Some specimens are over 1,500 years old, making them among the oldest living plants.
- **Habitat:** Found only in the Namib Desert, it relies on Atlantic fog for moisture due to scarce rainfall.
 - Many desert-dwelling animals, such as zebras, oryx, and black rhinoceros, feed on the leaves of *Welwitschia* as a vital source of water.

What are the Key Highlights of the India-Namibia Relations?

- **Historical and Political Ties:** India was among the first countries to raise Namibia’s independence at the United Nations in 1946, extended material and diplomatic support to South West Africa People’s Organisation (SWAPO led Namibia’s liberation struggle).
 - Full diplomatic relations were established in 1990, while Namibia opened its resident Mission in New Delhi in March 1994.
- **Cheetah Translocation Project:** 8 cheetahs translocated from Namibia to India in 2022, marking the world’s first intercontinental translocation of a major carnivore species.
- **Capacity Building & Defence Cooperation:** India offers scholarships to Namibians under Indian

Technical and Economic Cooperation Programme (ITEC), along with annual defence training slots.

- Since 1996, an IAF Technical Team has trained Namibian Air Force helicopter pilots, and India has provided 2 Chetak and 2 Cheetah helicopters.
- **Development Assistance:** India provided 30,000 Covishield doses to Namibia, and established the India-Namibia Centre of Excellence in IT (INCEIT) and an India Wing at the University of Namibia.
- **Economic Relations:** Bilateral trade stood at USD 568.40 million in 2024–25, with key sectors including mining, energy, agriculture, education, infrastructure, health, and trade.
 - A Preferential Trade Agreement (PTA) is under negotiation between India and the Southern African Customs Union (SACU), with Namibia as coordinator.
- **Indian Community in Namibia:** Around 450 Indians/NRIs/PIOs reside in Namibia. The India-Namibia Chamber of Commerce and Industry (INCCI) and India-Namibia Friendship Association (INFA), established in 2016 and 2020 respectively, promote business and community engagement.

Why is Africa Strategically Important to India?

- **Geopolitical and Maritime Safeguards:** Africa’s geographical position at crossroads of the Indian and Atlantic Ocean is vital for securing India’s maritime trade routes and enhancing naval influence.
 - India’s first overseas naval base in Mauritius (2024) under the Necklace of Diamonds strategy underscores efforts to safeguard sea lanes and counter piracy and terrorism.
- **Rising Economic Power:** India-Africa bilateral trade reached USD 98 billion in 2022–23, including USD 43 billion from mining and mineral sectors.
 - The African Continental Free Trade Area (AfCFTA), operational from 2021, creates a single market of

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1.4 billion people, boosting prospects for Indian exports and investments.

- **Securing Critical Minerals:** The **Democratic Republic of Congo** alone provides over 70% of the world's **cobalt**, essential for EV batteries and renewables.
 - Nigeria and Angola help meet India's energy needs, with Africa's share in India's crude imports rising amid global supply volatility.
- **Diplomatic Leverage:** India's successful push for the **African Union's** permanent **G20** membership in 2023 marked a diplomatic milestone, boosting Africa's global economic role.
 - Joint efforts at the **WTO** on **intellectual property** waivers for **Covid-19** vaccines and agriculture reflect a shared commitment to equitable global governance, and enhancing India's **Global South** leadership.
- **Geopolitical Ally:** With its 54 nations, Africa constitutes a powerful bloc in global forums, emerging as a key geopolitical partner for India, with mutual support for each other's representation in the **UN Security Council**.
 - As global power shifts, a strong India-Africa partnership serves to counterbalance regional powers like China.
- **Strong Diaspora:** The 3 million-strong Indian diaspora in Africa acts as a bridge between the two regions, having historically contributed to African economies.
 - India is leveraging this link through initiatives like **Pravasi Bharatiya Divas**, which in 2019 focused on the African diaspora to boost economic and cultural ties.

What are the Key Obstacles in Deepening India-Africa Ties?

- **Sluggish Investment Activity:** Despite growing ties, Indian investments in Africa trail behind China and the West due to risk perception, limited market

knowledge, and strong competition, limiting India's economic influence.

- **Credibility Issues with Indian Exports:** A persistent perception in some African markets views Indian products as lower in quality compared to Western or Chinese alternatives, affecting sectors like pharmaceuticals and machinery.
 - The 2022 tainted syrup incident in Gambia, which caused over 60 child deaths, further hurt India's reputation and market share.
- **Diplomatic Dilemma:** India's Africa engagement has been criticized for over-focusing on East and Southern Africa, with less attention to other regions.
 - In 2022–23, exports to South Africa alone reached USD 8.47 billion, while West Africa, despite its economic potential, remains under-engaged, risking missed opportunities.
- **Complex Security Landscape:** Africa's security crises, marked by 9 coups (2020–2023) and armed conflicts, along with weak governance and rising radicalization, hinder India's security and economic partnerships with Africa.
- **Resource Competition:** India–China competition for African oil and gas has heightened tensions, leading to inflated prices and diplomatic strain as African nations balance ties with both Asian powers.
 - E.g., in 2006, India lost a bid for oil assets in Angola to China.

India-Argentina Relations

Why in News?

The Prime Minister of India visited Argentina for the first time in 57 years, commemorating 75 years of diplomatic relations and 5 years of Strategic Partnership.

- He was awarded the "Key to the City of Buenos Aires," recognizing India's growing global prominence and the strengthening of bilateral ties.

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Argentina

- **Capital:** Buenos Aires
- **Location:** Southern South America, 8th largest country (area wise) globally and 2nd largest in South America (after Brazil).
 - It borders **Chile** (W/S), **Bolivia & Paraguay** (N), **Brazil** (NE), **Uruguay & Atlantic Ocean** (E).
- **Topography:** Divided into 4 key regions- **Andes Mountains** (with highest peak **Cerro Aconcagua**), **Northern region**, **Pampas** (agricultural heartland), and **Patagonia** (south).
- **Economy:** Resource-rich, industrialized economy with a **skilled workforce**; among **South America's largest economies**.



What are the Key Highlights of the PM's State Visit to Argentina?

- **Strategic and Economic Engagement:** India and Argentina agreed to **expand India–MERCOSUR Preferential Trade Agreement (PTA)** to boost bilateral trade and economic ties.
 - Focus areas include **trade diversification**, reducing reliance on **primary commodities**, and enhancing **investment in emerging sectors**.
- **Energy Security and Critical Mineral Cooperation:** Both nations committed to **shale energy collaboration**, leveraging Argentina's **2nd largest shale gas** and **4th largest shale oil** reserves.
 - India also signalled interest in expanding **oil & gas cooperation** under the **ONGC Videsh & Argentina's state-owned energy company YPF**, to support its growing energy needs.

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- **Defence & Digital Cooperation:** India and Argentina agreed to boost **defence manufacturing** via **co-development and tech transfer**, and expand adoption of India's **Digital Public Infrastructure** like **UPI, telemedicine, and digital health**, enhancing strategic and tech partnerships.
- **Shared Democratic Values & Soft Power Diplomacy:** Both leaders reaffirmed commitment to **democratic values, South-South cooperation, and multilateralism**.
 - PM's visit to **General San Martín's (Argentinian statesman national hero) statue** symbolised strong **people-to-people ties** and India's rising **soft power in Latin America**.

What are Key Areas of Cooperation Between India & Argentina?

- **Political Relations:** India established an **embassy in Buenos Aires in 1949**, while Argentina has maintained a **Consulate General in Mumbai since 2009**.
 - India and Argentina celebrated **75 years of diplomatic relations in 2024** and their diplomatic relations were elevated to a **Strategic Partnership in February 2019**, after a visit by the President of Argentina to India.
 - India and Argentina share **strong democratic ties** rooted in **shared values** and **mutual respect**.
- **Economic Cooperation:** India-Argentina trade reached **USD 5.2 billion in 2024**, with **53.9% growth in 2025**. India is Argentina's **4th largest trading partner**. The **India-Argentina Business Council (IABC)** plays a key role in promoting trade and investment.
 - **Key exports from India:** Petroleum products, agrochemicals, textiles, and pharmaceuticals
 - **Key Imports to India:** Soybean oil, leather, and cereals.
 - The **India-MERCOSUR PTA** is a trade agreement signed in **2004** and operational since **2009**, between **India** and the **MERCOSUR** bloc (a Latin American trading bloc established in 1991).
 - It offers **tariff concessions** on select goods to boost **bilateral trade** and aims to strengthen economic ties, potentially paving the way for a future **Free Trade Agreement (FTA)**.
- **Energy and Critical Minerals:** Argentina, part of the **Lithium Triangle**, supplies **lithium, copper, and rare earth elements** vital for India's **clean energy transition**.
 - Indian PSU **KABIL** has secured strategic **lithium exploration and mining concessions** in **Argentina** enhancing India's **resource security** and reducing reliance on external sources.
 - Existing bilateral accords in other energy sectors include **HAL-Argentine Air Force collaboration** (defence), and the **Heavy Water Board-Nuclear Electric Company** partnership (nuclear energy).
- **Technical and Development Cooperation:** India has strengthened development cooperation with Argentina through **ITEC scholarships, ICCR programs, and capacity building initiatives**.
 - The **India-Argentina Centre of Excellence in IT (IA-CEIT)**, established at the National University of Hurlingham with C-DAC support, promotes skill development.
 - Argentina has also participated in **ISRO's UNNATI program** and space training courses at IIT Kanpur.
- **Cultural and Values-Based Relations:** India and Argentina share **deep cultural ties** and **democratic values**, reinforced through shared advocacy for **South-South cooperation**.
 - Argentina has a **strong presence of Indian cultural institutions** (Art of Living, ISKCON, etc.),
 - Events like **International Day of Yoga (IDY), Ayurveda Day, and Gandhi@150** have seen large participation.
 - Literary and intellectual links were celebrated through **Tagore@160** events.

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Note:

- **Prime Minister Indira Gandhi** visited Argentina in **1968** during her South America tour and met noted Argentine intellectual **Victoria Ocampo** and conferred on her an **honorary doctorate from Visva-Bharati University**, founded by Rabindranath Tagore.
- **Rabindranath Tagore**, during his **1924** visit en route to **Peru** fell ill in **Buenos Aires** and was hosted by Argentine intellectual, writer **Victoria Ocampo**.
 - He composed **Purabi**, dedicating it to her.
 - The meeting forged a lasting cultural bond and **Ocampo promoted Indian thought through her magazine Sur**, deepening Argentina's interest in Indian **music, dance, yoga, and spirituality**.

How Have India's Relations with Latin America Evolved over the Years?

- **Historical Background:** India shares **long-standing cultural and ideological linkages** with Latin America through personalities like **Pandurang Khankhoje** (who advanced agriculture in Mexico) and **M.N. Roy** (founder of the Indian and Mexican Communist parties).
 - Bilateral ties were formalized with **PM Nehru's 1961 visit to Mexico** and **Indira Gandhi's tour of 8 Latin American and Caribbean (LAC) nations in 1968**, laying a diplomatic foundation.
 - India's participation in the **BRICS Summit (Brazil, 2014)** renewed India's strategic outreach to the region.
 - India launched the **FOCUS LAC Programme (1997)** and signed **trade agreements with 7 LAC nations** to promote bilateral trade and economic collaboration.
- **Economy, Trade & Commerce:**
 - **Trade Figures:** India–LAC trade reached **USD 43.2 billion in 2023**, and is projected to touch **USD 100 billion by 2027**.
 - **Trading Partners:** **Brazil (top)**, **Mexico**, **Colombia**, **Peru**, **Argentina**.

- **Strategic Economic Fit:** Latin America is seen as a **"goldilocks zone"** for India, striking a balance between the **strict regulations of markets like the US and Europe** and the lower competition levels found in African markets.
- **PTA Signed:** India has signed **Preferential Trade Agreements (PTAs)** with **Chile** and the **Mercosur bloc**. **Mercosur** is now advancing toward a **Common Market**.
- **Political and Bilateral Cooperation:** India's **foreign policy approach toward Latin America and the Caribbean (LAC)** is witnessing a strategic recalibration.
 - In **April 2023**, **External Affairs Minister of India** undertook the **first-ever official visit to Guyana, Panama, Colombia, and the Dominican Republic**.
 - **Brazil** is India's **most politically connected partner** in the region, with active collaboration in **multilateral forums like BRICS, IBSA (India, Brazil and South Africa)** and the **G20**.
 - Both regions align on **strategic autonomy**, with India's doctrine resonating with Latin America's **Active Non-Alignment (ANA)** stance, especially evident in **shared positions on global issues like the Russia–Ukraine conflict**.
- **Cultural Ties:** **Mahatma Gandhi's** legacy of **non-violence** holds deep relevance in Latin America.
 - His philosophy is actively promoted by civil society groups, notably **Palas Athenas in Brazil**, reinforcing shared **ethical and ideological values** between India and the region.

Click Here to Read: [Significance of Latin America for India, Challenges in Deepening Engagement with Latin American Nations](#)

17th BRICS Summit

Why in News?

India's Prime Minister took part in the **17th BRICS Summit** held in **Rio de Janeiro, Brazil**, under the theme **"Strengthening Global South Cooperation for More**

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Inclusive and Sustainable Governance,” and signed the Rio de Janeiro Declaration.

- **Indonesia** officially joined BRICS, while **Belarus, Bolivia, Kazakhstan, Cuba, Nigeria, Malaysia, Thailand, Vietnam, Uganda, and Uzbekistan** were welcomed as BRICS partner countries.
- India will assume the **BRICS Chairship** and host the **18th BRICS Summit** in 2026.

What are the Key Outcomes of the 17th BRICS Summit?

- **Global Governance Reform:** BRICS backed expansion of the **UN Security Council** to include more **permanent members** from **Asia, Africa, and Latin America** for greater **Global South** representation, urged **IMF** and **World Bank** reforms to reflect **Emerging Markets and Developing Countries’ (EMDCs)** role, and supported a rules-based **WTO**.
- **Sustainable Development:** BRICS adopted the **Leaders’ Framework Declaration on Climate Finance** to mobilize resources for **developing countries** and endorsed an **MoU on the BRICS Carbon Markets Partnership** to enhance cooperation in **carbon pricing** and **emissions trading**.
- **Peace and Security:** BRICS reaffirmed “**African Solutions to African Problems**”, called for a **Gaza ceasefire** and **two-state solution**. BRICS leaders condemned the **Pahalgam attack**, and India stressed that terrorism must be **rejected on principle**, not treated as a matter of **convenience**.
- **Financial Cooperation:** BRICS advanced talks on a **Cross-Border Payments Initiative** to reduce **US dollar** reliance, supported the **New Development Bank’s** expansion, and the **BRICS Multilateral Guarantees (BMG)** pilot to de-risk investments.
- **Technology and Digital Economy:** BRICS adopted the **Leaders’ Statement on Global AI Governance**,

concluded the **Data Economy Governance Understanding** and agreed to form a **BRICS Space Council** for **collaborative space exploration**.

- **Health and Social Development:** BRICS launched the **Partnership for the Elimination of Socially Determined Diseases (Tuberculosis)** to tackle health disparities.
- **Condemnation of CBAM:** BRICS nations have ‘condemned and rejected’ the **Carbon Border Adjustment Mechanisms (CBAM)** of the **European Union (EU)** and similar restrictive trade measures, saying they **undermine their transition** to a cleaner economy.
 - CBAM is an EU’s **tax on imported goods** with more **carbon emissions**, meant to **stop carbon leakage** but making items like **Indian steel and cement** less competitive in the **European market**.

What is BRICS?

- **About:** The acronym ‘**BRIC**’ was coined by British economist **Jim O’Neill** in **2001** to represent the emerging economies of **Brazil, Russia, India, and China**.
 - **BRIC** began functioning as a formal group during the **G-8 Outreach Summit** in **2006**, held its **first summit** in **Russia** in **2009**, and became **BRICS** with the inclusion of **South Africa** in **2010**.
- **Members:** The initial **five BRICS members** were **Brazil, Russia, India, China, and South Africa**. In **2024**, **Iran, the United Arab Emirates (UAE), Egypt, and Ethiopia** joined the group while **Indonesia** joined in 2025.
 - **Saudi Arabia** has not yet **formalised** its BRICS membership, while **Argentina**, initially expected to join in 2024, later **opted out**.

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BRICS Expands Footprint in the Global South

G7 and BRICS member countries (as of Jan. 13, 2025)



* Ethiopia/Egypt/UAE/Saudi Arabia/Iran formally joined on Jan. 1, 2024, Indonesia on Jan. 6, 2025

Source: Statista research



statista

- **Significance:** BRICS accounts for 45% of the world's population and 37.3% of global GDP, surpassing the EU's 14.5% and the G7's 29.3%.
- **Key Initiatives of BRICS:** New Development Bank (2014), [Contingent Reserve Arrangement \(CRA\)](#), [BRICS Grain Exchange](#), BRICS Rapid Information Security Channel, STI Framework Programme (2015) etc.

How is BRICS Redefining Power Dynamics in Global Governance?

- **Energy Security:** With Iran, Saudi Arabia, and the UAE joining, BRICS now accounts for around 44% of global crude oil production positioning it as a key player in ensuring [energy security](#) and influencing oil prices and supply chains.
- **Neutral Space for Strategic Dialogue:** In times of bilateral tensions, such as the [India-China Doklam standoff](#), BRICS offers a neutral, non-Western diplomatic platform for dialogue encouraging constructive engagement.
- **Instrument for Multilateral Reform:** BRICS provides India and others a collective forum to push for reforms in global institutions like the [UN Security Council](#), WTO, IMF, and World Bank to reflect current global realities.
- **Inclusivity and Global Engagement:** The inclusion of new countries, many of which are WTO members (except Ethiopia and Iran), shows the group's effort to expand its global footprint and engage a broader coalition of non-Western nations.

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- **Emerging Political and Economic Bloc:** BRICS is increasingly seen as a **counterbalance to the G7** and a **rising force in the G20**, addressing economic and political issues like inequality and underrepresentation amid declining Western influence.

What are the Key Challenges Hindering BRICS Functioning in the Current Global Order?

- **Lack of Permanent Seat and Secretariat:** BRICS does not have a **permanent seat or a dedicated secretariat**, which weakens its institutional framework. The absence of a permanent structure makes decision-making processes slower and less streamlined.
- **Geopolitical Contradictions:** BRICS operates on a **consensus basis**, but its **expansion complicates decision-making** due to contradictions like **UAE and Egypt's US alliances** and **Iran's adversarial stance**, risking potential **ineffectiveness** akin to the **NAM** and **G77**.
- **Weakening BRICS Economies & Untapped Potential:** **China's economic slowdown** (growth dropped from 5.2% in 2023 to 4.6% in 2024, with projections falling to 3.4% by 2028), coupled with **Russia's decline amid war and sanctions**, undermines BRICS' capacity to drive global economic transformation.
 - Additionally, despite accounting for **more than 18% of global trade**, intra-BRICS trade remains **low at just 2.2% (2022)**. The proposed **BRICS Credit Rating Agency (CrRA)** failed to materialize due to lack of consensus, highlighting institutional inertia within the bloc.
- **Limited Influence on Global Institutions:** **BRICS+ countries hold only 19% voting power** in the **IBRD**, compared to **40% by the G7**, limiting BRICS+ influence on global financial policy.
 - The **New Development Bank (NDB)** lacks sufficient funds to match the **World Bank, IMF, or AIIB**.
- **Slow Dedollarization:** While **Iran, Russia, and China** trade in their own currencies, **de dollarisation** efforts

remain **inconsistent**, and a common BRICS+ currency appears **unlikely** after recent expansion.

India - Trinidad and Tobago Relations

Why in News?

Prime Minister Narendra Modi's visit to **Trinidad and Tobago**, marked the first Indian Prime Ministerial visit since 1999.

- During the visit, he was conferred with the country's highest civilian honour, **The Order of the Republic of Trinidad and Tobago**, for his global leadership, strong diaspora engagement, and humanitarian efforts during the Covid-19 pandemic.

Trinidad and Tobago

- **Geography & Location:** Trinidad and Tobago is located in the southeastern West Indies (Caribbean) and comprises two main islands Trinidad and Tobago, along with several smaller islands.
 - It lies **northeast of Venezuela and northwest of Guyana**, separated from **Venezuela by the Gulf of Paria** and narrow channels.
- **Capital:** Port of Spain (Trinidad).
- **Economic Aspects**
 - **Natural Resources:** Oil & gas, asphalt, agriculture (sugarcane)
 - **Key Economic Activities:** Petroleum refining, LNG exports, agriculture, tourism.
- **Environment & Biodiversity:** Trinidad has rainforests, swamps (Caroni, Nariva), and mangroves.
 - **Notable species:** Scarlet Ibis (national bird), manatees, ocelots, caiman, agouti.
 - **Pitch Lake:** World's largest natural reservoir of asphalt deposit (Trinidad).
 - **Mountain Range:** Northern Range, part of the Andes extension.

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What are the Key Outcomes of the PM's State Visit to Trinidad and Tobago?

- **Cooperation in Disaster Resilient Infrastructure and Biofuels:** Trinidad and Tobago agreed to join India's global initiatives, the Coalition of Disaster Resilient Infrastructure (CDRI) and the Global Biofuel Alliance (GBA).
- **Indian Grant Assistance for Quick Impact Projects (QIPs):** India will fund up to five projects annually (each ≤ USD 50,000) for grassroots community development.
 - This will focus on addressing immediate developmental needs in the country.
- **Pharmaceutical Cooperation and Medical Treatment:** An MoU was signed to **enhance collaboration in the pharmaceutical sector**.
 - This agreement will improve access to affordable, quality generic medicines from India and enable the provision of medical treatment in India for people in Trinidad and Tobago.
- **Diplomatic Training and Capacity Building:** An agreement was reached for the **training of Trinidad and Tobago diplomats** in Indian institutes, as well as by Indian experts.
 - This initiative is expected to enhance **diplomatic skills and bilateral relations**.
- **Diaspora Engagement and Support for Education:**
 - India announced that the Overseas Citizens of India (OCI) card facility would be extended to the **6th generation of Indian diaspora members** in Trinidad and Tobago (previously available only to the 4th generation).
- **Digital Support:** Both sides agreed to collaborate on India Stack solutions such as **DigiLocker**, and **e-Sign**.
 - Trinidad and Tobago is the **first Caribbean nation to adopt the Unified Payments Interface (UPI)**.

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- **Support to Agriculture and Healthcare:** India gifted the first batch of agro-machinery worth USD 1 million, as agreed under the 2024 MoU, to Trinidad and Tobago's **National Agricultural Marketing and Development Corporation (NAMDEVCO)**, and extended support for millet cultivation, seaweed-based fertilizers, and natural farming.
- **Strengthening Regional Ties and Counterterrorism Cooperation:** Both leaders pledged to strengthen counterterrorism cooperation, deepen **India-Caribbean Community (CARICOM) ties**, and enhance solidarity among Global South nations.
- **Cultural Diplomacy:** Two **Indian Council for Cultural Relations (ICCR) Chairs in Hindi and Indian Studies** will be re-established at the University of the West Indies in Trinidad and Tobago.
 - India has also extended help to train the Hindu religious priests (Pandits) of Trinidad and Tobago and the Caribbean region.
 - This will promote cultural exchange and deepen understanding of Indian languages and culture.
 - PM Narendra Modi gifted holy water from the **Saryu River and Mahakumbh**, and a replica of the Ram Mandir to Prime Minister of Trinidad and Tobago **Kamla Persad-Bissessar**, honouring her **Bihari roots**.

How are India - Trinidad and Tobago Relations Evolved Over Time?

- **Historical Ties:** India and Trinidad & Tobago share deep-rooted ties dating back to 1845, when the first Indian indentured workers (**mostly Bhojpuri Girmitiyas**) arrived aboard the '**Fatel Razack**'.
 - Their descendants now make up **40–45% of the population**, playing a vital role in the country's socio-economic fabric.
 - Bilateral relations, formally established in 1962, have remained warm and dynamic.
- **Economic and Commercial Relations:** India and Trinidad and Tobago signed a **Most Favoured Nation (MFN)** status trade agreement in **1997**, which continues to facilitate trade between the two nations.

- The bilateral trade has shown growth post-pandemic, with major exports from India including **pharmaceutical products, vehicles, and iron**.
- **India's Exports to Trinidad and Tobago: USD 120.65 million (2024-25)**
- **India's Imports from Trinidad and Tobago: USD 220.96 million (2024-25)**
- **Development Partnership:** During the pandemic, a USD 1 million '**Bringing High and Low Technology (HALT)**' project was implemented in Trinidad & Tobago under the India-UNDP Fund.
 - It included 8 mobile healthcare robots, a telemedicine system, hand hygiene stations, and related equipment, and was completed in August 2024.

The Indentured Labour System and the Bhojpuri Girmitiyas

- **Indentured labour system:** It was introduced post-slavery, involving individuals agreeing to work for a fixed period in return for passage, food, and shelter.
 - While presented as a contract system, it was **exploitative**, with harsh working conditions, poor wages, and restricted mobility.
 - Workers often faced **penalties for absence**, lived under constant surveillance, and endured racial and physical abuse.
 - Women, recruited mainly to "balance" the gender ratio, faced **gendered discrimination and sexual exploitation**.
 - Mahatma Gandhi strongly opposed the indentured labour system. In 1917, after a bill for its abolition was rejected, he launched a nationwide agitation and met Viceroy Lord Chelmsford. The system was officially abolished in 1920.
- **Girmitiyas:** The term Girmitiyas (derived from 'agreement') refers to **Indian indentured labourers** who were taken to British colonies like Trinidad and Tobago, Fiji, Mauritius, and Guyana during the 19th and early 20th centuries under the indentured labour system.

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- Most of them came from Bhojpuri- and Awadhi-speaking districts such as Chhapra, Ballia, Ara, Banaras, Siwan, Gopalganj, and Azamgarh in present-day Uttar Pradesh and Bihar.

How are India-CARICOM Relations?

- **About:** Caribbean Community (CARICOM) was established in 1973 through the **Treaty of Chaguaramas** in Trinidad & Tobago, CARICOM evolved from the **Caribbean Free Trade Association (CARIFTA)** to promote economic integration and cooperation.
- The **CARICOM consists of 15 Member States and 6 Associate Members.**
 - The 15 members include: Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad & Tobago.
- CARICOM's Chairmanship rotates every six months among member states. Its Secretariat, based in **Georgetown, Guyana**, is led by a Secretary-General.
- **India-CARICOM Relations:**
 - **Capacity Building and Developmental Assistance:** India has provided continuous capacity building and developmental assistance to CARICOM countries.
 - India committed **USD 14 million grant for Community Development Projects (CDPs)**, with USD 1 million allocated for each CARICOM country.
 - USD 150 million Line of Credit** was announced for projects on solar, renewable energy, and climate change.
 - **Educational and Diplomatic Cooperation:** India offers higher education opportunities to students from Caribbean countries through the **Indian Technical and Economic Co-operation (ITEC)** programme.

- **India-CARICOM Summit:** The **2nd India-CARICOM Summit was held in 2024** in Georgetown, Guyana.
 - The partnership is built on seven key pillars: capacity building, agriculture and food security, renewable energy and climate change, innovation, technology and trade, cricket and culture, ocean economy, and healthcare.

India and Ghana Relations

Why in News?

Prime Minister Narendra Modi's state visit to Ghana, the first by an Indian PM in over 30 years, marked a historic milestone in **India-Africa relations**.

- During the visit the PM Narendra Modi was conferred with the **country's highest civilian honour - The Officer of the Order of the Star of Ghana**.

Ghana

- **Location:** Ghana (capital Accra) is a West African country bordered by Côte d'Ivoire to the west, Burkina Faso to the north, Togo to the east, and the Gulf of Guinea and the Atlantic Ocean to the south.
- **Significance:** Ghana, the **first Black African country** south of the Sahara to gain independence in 1957, was named after the medieval Ghana Empire.
 - It is known for its **vast gold resources**, it was called the **Gold Coast**. Cacao, introduced in the 19th century, remains a key export.
 - Since the 1990s**, Ghana has seen political stability, economic recovery, and is now cited as a model for democratic governance and reform in Africa.
- **Mountains and Lakes:** **Mount Afadjato, Mount Djebobo, and Mount Torogbani** are all located east of the Volta River in Ghana, near the border with Togo. These mountains are part of the **Togo-Atakora mountain range**.
 - Lake Volta is one of the largest artificial lakes in the world.

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What are the Key Outcomes of the PM's State Visit to Ghana?

- **Bilateral Cooperation:** The two countries agreed to elevate the relationship to a **Comprehensive Partnership**.
- **Strategic Offers:** India offered to share its digital public infrastructure experiences, including the Unified Payments Interface (UPI).
 - India reaffirmed its role as a strong voice for the Global South, thanking Ghana for its support.
- **Memorandums of Understanding (MoUs) Signed:**
 - **MoU on Cultural Exchange Programme (CEP):** To promote greater cultural understanding and exchanges in art, music, dance, literature, and heritage.
 - **MoU between Bureau of Indian Standards (BIS) and Ghana Standards Authority (GSA):** Aimed at enhancing cooperation in standardisation, certification, and conformity assessment.
 - **MoU between the Institute of Traditional & Alternative Medicine (ITAM), Ghana and the Institute of Teaching & Research in Ayurveda**

(ITRA), India: To collaborate in traditional medicine education, training, and research.

- **MoU on Joint Commission Meeting:** To institutionalise high-level dialogue and review bilateral cooperation mechanisms on a regular basis.

How India and Ghana Relations Evolved Over Time?

- **Early Diplomatic Ties:** India opened a representative office in **Accra in 1953** and established full diplomatic relations in 1957, the same year Ghana gained independence.
- **Shared Global Platforms:** India and Ghana are founding members of the **Non-Aligned Movement** and have consistently aligned on global issues such as **decolonisation and South-South cooperation**.
- **Institutional Mechanisms:**
 - **India-Ghana Joint Commission (1995)** facilitates regular high-level dialogue.
 - **Joint Trade Committee** and **Foreign Office Consultations** strengthen trade and diplomatic coordination.

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- **Economic Relations:** India is a key trading partner for Ghana, with bilateral trade crossing USD 3 billion in 2024-25.
 - Ghana exports gold, **cocoa**, and cashew nuts to India, while India exports pharmaceuticals, agricultural machinery, and textiles.
 - The **trade balance** is typically in favor of Ghana, driven primarily by gold exports (70% of total imports).
 - Indian pharmaceuticals play a crucial role in supporting Ghana's healthcare system, and Indian companies have invested nearly USD 2 billion in about 900 projects across Ghana.
- **Development Projects and Financial Assistance:** India has extended over **USD 450 million** in **concessional lines of credit (LoCs)** and grants to Ghana supporting projects in rural electrification, sugar and fish processing.
 - India supported the **Tema–Mpakadan railway project**, including a 300-metre bridge over the **Volta River**, as part of the **Ghana–Burkina Faso connectivity corridor**, boosting Ghana's infrastructure, connectivity, and trade.
- **Digital Collaboration:** Ghana–India Kofi Annan Centre of Excellence in ICT (2003) is West Africa's top IT research and education hub.
 - Pan-African e-Network offers telemedicine and tele-education through Indian institutions.
 - Over 1,100 Ghanaians trained under the **Indian Technical and Economic Cooperation (ITEC) programme**.
 - Ghana joined **India's e-VidyaBharati and e-AarogyaBharati (e-VBAB) Network Project**, under which India offers online scholarships to African students in fields like IT, healthcare, business, tourism, and arts through reputed Indian institutions.
- **Indian Community:** The Indian community in Ghana, over 15,000 strong, is served by a Hindu temple, Gurudwara, and a Hindu monastery. ISKCON (mostly run by Ghanaians) and cultural centres actively promote Indian traditions.
 - Prime Minister Narendra Modi was welcomed with the chant "Hare Rama Hare Krishna,"

showcasing the deep cultural connection between the two nations and India's rising soft power.

India-Africa Relations

- **Economic Relations:** As of February 2025, India is **Africa's 4th largest trading partner**, with **USD 100 billion** in bilateral trade.
 - Indian investments in Africa have reached **USD 75 billion**, with a target to **double by 2030**.
- **Development and Capacity Building:** India has extended over **USD 12 billion in concessional credit** for over **200 projects** in infrastructure, energy, and agriculture.
 - Initiatives like **ITEC, Pan-African e-Network, e-VBAB** foster human capital development.
- **Amplifying Africa's Voice:** During **India's G20 presidency**, India strongly advocated for the African Union's permanent membership.
 - Platforms such as the **India-Africa Forum Summit** are being utilized to foster deeper cooperation.
- **Strategic and Maritime Security Ties:** Africa's location in the **Indian Ocean region** is critical for **India's maritime security and sea lanes**.
 - India's **first overseas naval base in Mauritius (2024)**, and **India-Africa Army Chiefs Conclave (2023)** reflect growing defence cooperation.
- **Energy and Critical Minerals Security:** Africa supplies vital **crude oil** (e.g., **Nigeria, Angola**) and **critical minerals** like **cobalt and manganese**, key for **India's clean energy transition**.
- **Cultural & Historical Foundations:** Strong ties through the **Indian diaspora**, **shared colonial histories**, and mutual inspiration from **freedom movements** (e.g., **Gandhi–Mandela**).
- **Technology and Innovation Collaboration:** India is partnering in **Africa's digital transformation**, smart cities, and fintech through **Indian IT and startups**.
 - India committed **USD 2 billion for solar projects** in Africa under the **International Solar Alliance**.
- **India-Japan-Africa Trilateral Engagement:** Through the **Asia-Africa Growth Corridor (AAGC)**, India leverages **Japan's capital**, **India's tech**, and **Africa's youth** for inclusive growth.

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QUAD At Sea

Ship Observer Mission

Why in News?

The Coast Guards of QUAD nations (India, Japan, the United States, and Australia) launched the 'QUAD At Sea Ship Observer Mission' in line with the **Wilmington Declaration (2024)** adopted during the **6th QUAD Summit** (4th in-person Quad Leaders' Summit) held in **Delaware, USA**.

What is QUAD At Sea Ship Observer Mission?

- **About:** It is a **first-of-its-kind maritime cooperation initiative** aimed at strengthening **interoperability, maritime domain awareness (MDA), and operational coordination** to uphold a **rules-based order in the Indo-Pacific**.
 - As part of the **cross-embarkation initiative**, officers, including **women officers**, are deployed aboard partner nations' **Coast Guard vessels** (currently the **USCGC Stratton**, sailing to **Guam**).
- **Objective:** The mission focuses on **joint training in Standard Operating Procedures (SOPs), patrolling, and search and rescue (SAR) operations**, while promoting **maritime diplomacy, gender inclusion**, and aligning with India's **SAGAR Vision, MAHASAGAR Doctrine (Mutual and Holistic Advancement for Security and Growth Across Regions)** and the **Indo-Pacific Oceans Initiative (IPOI)**.

What is the Wilmington Declaration?

- **About:** The **Wilmington Declaration** is a joint statement adopted at the **QUAD Leaders' Summit** held in **Wilmington, USA**, in **September 2024**.

- It outlines the QUAD's shared vision for a **Free, Open, Inclusive, and Rules-Based Indo-Pacific**, reaffirming the grouping as a **"force for good"**, highlighting deeper alignment on **strategic, security, health, technological, and economic cooperation** across the region.

➤ Key Highlights of Declaration

- **Indo-Pacific & Maritime Security:** Reaffirmed commitment to a **free, open Indo-Pacific**, launched **QUAD At Sea Ship Observer Mission** and **MAITRI** for interoperability and maritime domain awareness.
- **Infrastructure & Connectivity:** Initiated **Quad Logistics Network**, **Ports of the Future Partnership**, and expanded fellowships to **2,200+ experts**.
- **Technology & Cybersecurity:** Strengthened cooperation on **semiconductors, supply chains**, and cybersecurity through **Quadrilateral Information-Sharing Network (QUIN)**.
- **Climate, Space & People-to-People Ties:** Implemented **Q-CHAMP (Quad Climate Change Adaptation & Mitigation Package)**, promoted **Earth Observation** for disaster response, and expanded **Quad Fellowship** for leadership in science and policy.

What is the QUAD?

- **About:** The **Quadrilateral Security Dialogue (QUAD)** is a **strategic forum** comprising **India, Australia, Japan, and the United States**, aimed at ensuring **peace, stability, and prosperity** in the **Indo-Pacific region**.
 - It promotes a **free, open, inclusive, and rules-based order**, while enhancing regional **resilience and cooperation**.

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- **Origin:** The Quad originated in the aftermath of the **2004 Indian Ocean tsunami**, where **India, Japan, the US, and Australia** coordinated humanitarian assistance.
 - It was formally proposed in **2007 by Japanese PM Shinzo Abe**, but became inactive following **Australia's withdrawal in 2008** due to Chinese pressure. The dialogue was **revived in 2017** amid rising concerns over **China's assertiveness** in the Indo-Pacific, leading to the **first Leaders' Summit in 2021**.
- **Objectives:** It aims to address regional and global challenges through cooperation in **health, climate and clean energy, infrastructure, emerging technologies, cybersecurity, maritime security, counter-terrorism**, and **Humanitarian Assistance and Disaster Relief (HADR)**.
- **Expansion Potential:** "QUAD-plus" meetings have included nations like **South Korea, New Zealand, and Vietnam**, indicating potential for future expansion.



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Social Issues

Highlights

- World Population Day 2025 and India's Youth
- India Becomes 4th 'Most Equal' Country Globally
- UN Women & the Global Gender Agenda

World Population Day 2025 and India's Youth

Why in News?

World Population Day, observed on 11th July, was established by the UN in 1989 to raise awareness about population issues and **reproductive health** rights.

- The **theme** for World Population Day 2025 is "Empowering young people to create the families they want in a fair and hopeful world," which focuses on **empowering youth** to make informed choices about **sexual and reproductive health**.

What is the Status of Youth in India?

- Youth Demographic Profile:** According to **UNICEF**, India has the **world's largest youth population**, with **371 million** people in the **15 to 29 age group**.
 - As per the **Technical Group on Population Projections (2021)**, youth (**15–29 years**) accounted for **27.2%** of the population in 2021, but are projected to decline to **22.7% by 2036**.
- Demographic Significance:** A large youth population enhances **workforce participation** and reduces **dependency ratios**, creating a **demographic dividend** for growth.
- Policy & Governance:** Department of Youth Affairs, under the **Ministry of Youth Affairs and Sports**, is the **nodal agency** for youth-related policies and programs.
 - Its twin objectives are **personality development** and **nation-building**.
- Evolution of Youth Policy:**
 - National Youth Policy, 1988:** It was India's first structured youth policy, stressing their **role in**

national development and focusing on **personality and skill development**.

- National Youth Policy 2003:** The **National Youth Policy 2003**, replacing the 1988 policy, defined youth as **13–35 years** and aimed to promote **patriotism, social justice, and national integration**.
- National Youth Policy 2014:** **National Youth Policy 2014** replaced the 2003 policy, defines youth as **15–29 years**, and envisions **empowering them to realize their full potential** and enable **India to excel on the global stage**. It outlined **5 key objectives** and **11 priority areas**.

NYP-2014: Objectives and Priority Areas	
Objectives	Priority Areas
Create a productive workforce that can make a sustainable contribution to India's economic development	<ul style="list-style-type: none"> Education Employment and skill development Entrepreneurship
Develop a strong and healthy generation equipped to take on future challenges	<ul style="list-style-type: none"> Health and healthy lifestyle Sports
Instil social values and promote community service to build national ownership	<ul style="list-style-type: none"> Promotion of social values Community engagement
Facilitate participation and civic engagement at all levels of governance	<ul style="list-style-type: none"> Participation in politics & governance Youth engagement
Support youth at risk and create equitable opportunity for all disadvantaged and marginalized youth	<ul style="list-style-type: none"> Inclusion Social justice

- National Youth Policy 2024:** The Government has updated the **National Youth Policy (NYP) 2014** and released a draft for **NYP 2024**, outlining a **10-year vision** for youth development aligned with the **Sustainable Development Goals (SDGs)**. **Key highlights are:**
 - Roadmap to achieve youth development goals by **2030**.

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- Alignment with **NEP 2020** to enhance **career and life skills**.
- Promotion of **leadership, volunteering, and technology-driven empowerment**.
- Focus on **mental and reproductive health, sports, and fitness**.
- Commitment to **safety, justice, and support for marginalized youth**.

What Opportunities Does India's Youth Population Present?

- **Demographic Dividend Advantage:** A **youth-dominated population** leads to a **lower dependency ratio** and more **economically active citizens**, which can boost **GDP growth** and **per capita income**.
 - According to the **World Bank** and **NITI Aayog**, tapping this potential could add up to **USD 1 trillion** to India's **GDP** by 2030.
- **Innovation and Entrepreneurship:** Driven by **young entrepreneurs**, India's **startup ecosystem** has flourished, with the **Startup India** initiative playing a key role in promoting a **youth-led culture of innovation**.
- **Global Workforce Advantage:** India's **youth workforce** can address **global talent shortages** in sectors like **tech, healthcare, and engineering**, while **competitive labor costs** position the country as a prime hub for **manufacturing and services**.
 - E.g., Facing an ageing population, **Germany** and **Japan** are turning to **India** to fill its **labour gap** with **skilled workers**.
- **Social & Cultural Influence:** Indian **youth are challenging stereotypes**, advancing **gender equality**, and leading **social change**, while also expanding **India's soft power** globally through **films, music, and digital content**.
 - E.g., Youth-led movements like **Pinjra Tod** (Break the Cage) fight for women's rights and freedom.
- **Strengthening Democracy:** Engaging **youth** through initiatives like the **National Service Scheme (NSS)** fosters **civic awareness, leadership, and strengthens democratic accountability**.

- E.g., Through **Swachh Bharat Abhiyan**, the **Prime Minister** mobilized **youth** as key drivers of **cleanliness, behavioural change, and community leadership**.

What are the Key Challenges Faced by Youth in India?

- **Sexual & Reproductive Health Issues:** India faces a high rate of **unintended pregnancies (36%)** and **unmet reproductive goals (30%)**, with **23%** experiencing both.
 - Though **child marriage** has declined, it still exists at **23.3%** nationally (**NFHS-5**).
- **Gender Inequality:** **Patriarchal norms** limit **young women's autonomy** in **education, employment, and decision-making**, with many lacking access to **gender-sensitive workplaces, skills training, and financial independence**.
- **Mental Health Crisis:** Youth are facing a **mental health crisis** marked by **increasing stress, anxiety, and depression**, along with a **lack of accessible support and persistent stigma**.
 - In **2020-22**, India recorded over **60,700 deaths** due to suicide in the **15–29 age group**, the highest in the world.
- **Employment Crisis:** A **skill mismatch** between **education and job market needs** has led to **rising unemployment** among **educated youth**, while many are forced into **unstable gig economy jobs with limited benefits**.
- **Substance Abuse:** Youth are increasingly vulnerable to **drug addiction**, driven by **peer pressure and stress**, with a **lack of adequate rehabilitation facilities** worsening the issue.

Government's Initiatives Related to Youth

- **National Youth Policy-2014**
- **Pradhan Mantri Kaushal Vikas Yojana**
- **YUVA: Prime Minister's Scheme For Mentoring Young Authors**
- **PM-DAKSH (Pradhan Mantri Dakshta Aur Kushalta Sampann Hitgrahi)**
- **Pradhan Mantri Mudra Yojana**

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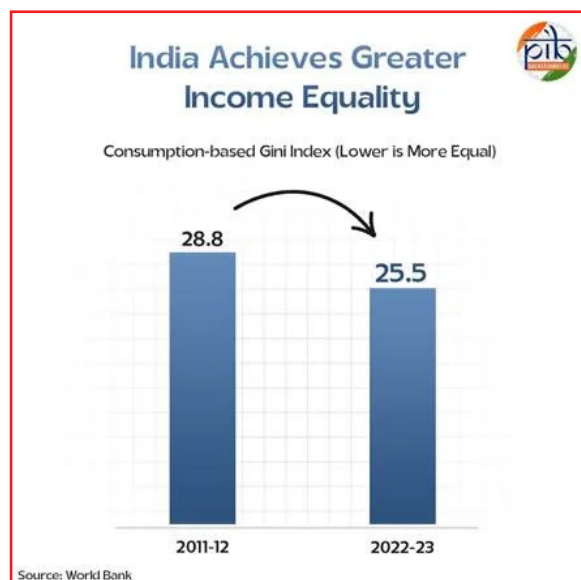
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India Becomes 4th 'Most Equal' Country Globally

Why in News?

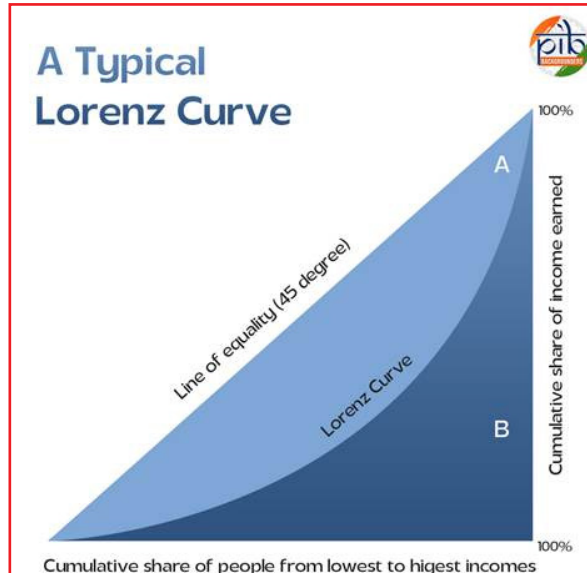
India is not only the world's fourth-largest economy but is also ranked among the most equal societies today. According to the World Bank, India's Gini Index stands at 25.5, making it the **fourth most equal country globally**.



What is the Gini Index?

- **About:** The Gini index, or Gini coefficient, was developed in **1912 by Italian statistician Corrado Gini**. It measures **income inequality within a population**.
 - The index is derived from the **Lorenz curve**, which plots the cumulative percentage of **total income received against the cumulative percentage of recipients**, starting with the poorest.
 - The Gini coefficient quantifies the area between the **Lorenz curve and the line of perfect equality (a 45-degree line)**, with values ranging from 0 (perfect equality) to 1 (maximum inequality), or **0 to 100 when expressed as a percentage** (where 0 indicates perfect equality and 100 indicates maximum inequality). A lower Gini value reflects a more equitable society.

A Typical Lorenz Curve



- **India and Gini Index:** India's Gini Index was 28.8 in 2011, declining steadily to 25.5 in 2022, reflecting consistent progress in social equity.
 - India's score of **25.5** places it in the **"moderately low inequality"** category (Gini scores between 25 and 30).
 - Notably, India ranks ahead of countries with higher inequality scores, including **China (35.7)**, and the **US (41.8)**.
- **Significance for India:** India now ranks **more equal than all G7 and G20 countries**.
 - The low score challenges conventional assumptions of India as a highly unequal society, particularly when viewed through urban-rural and inter-state disparities.
 - It indicates broad-based income growth, particularly among the lower income brackets.



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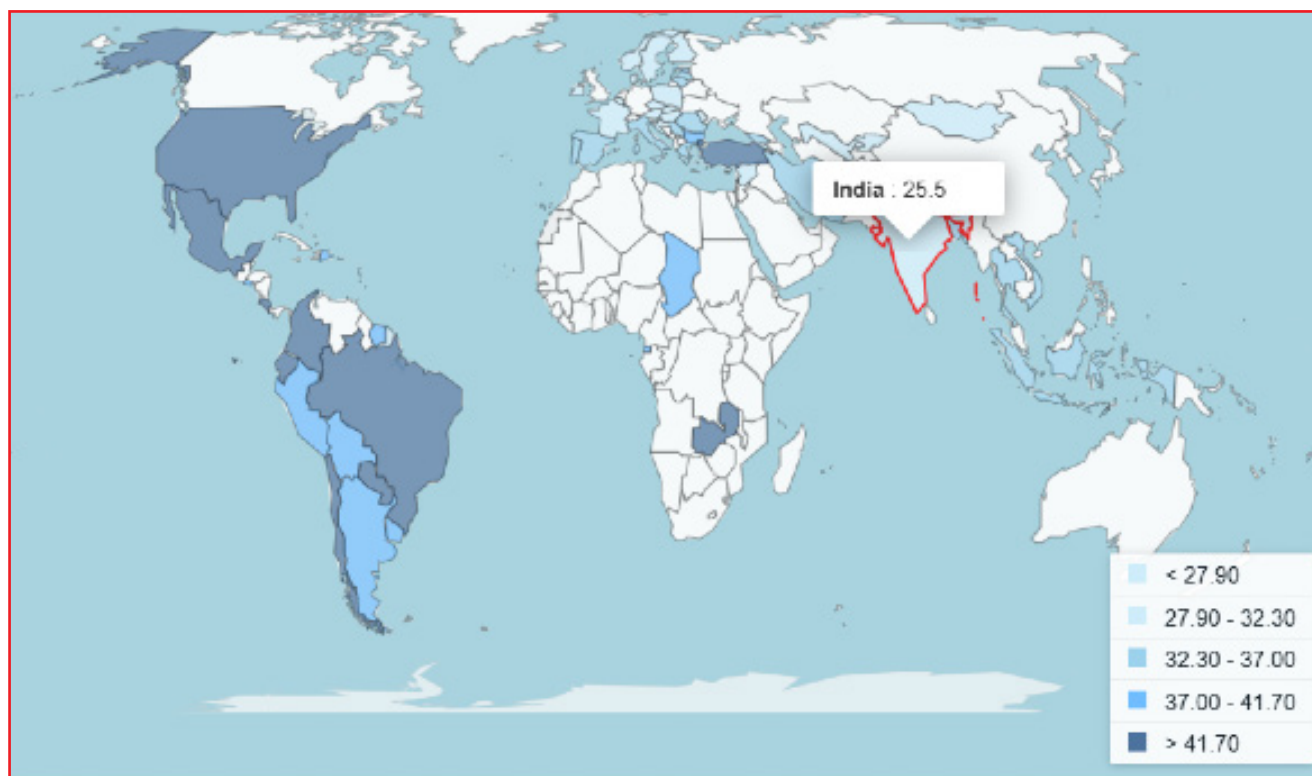


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What are the Key Drivers Behind India's Equity Success?

- **Poverty Reduction:** As per the [World Bank's Spring 2025 Poverty and Equity Brief](#), 171 million Indians have been lifted out of extreme poverty since 2011.
 - The World Bank has revised its global extreme poverty threshold from **USD 2.15/day to USD 3/day (based on 2021 prices)** to account for global inflation. This new benchmark reflects a more realistic cost of basic living.
 - At the USD 3/day threshold, India's extreme poverty rate for 2022–23 stands at 5.3%, down from 27.1% in 2011–12.
 - In absolute terms, the number of people in **extreme poverty fell from 344.47 million to 75.24 million.**
- **Welfare Schemes for Equity:**
 - **PM Jan Dhan Yojana:** [Financial inclusion](#) has been at the heart of India's social equity push.
 - As of **June 2025** over **55.69 crore people** hold [Jan Dhan accounts](#), giving them direct access to government benefits and formal banking services.
 - **Aadhaar and Digital Identity:** As of July 2025, more than **142 crore Aadhaar cards** have been issued. This system forms the backbone of welfare delivery by ensuring that benefits reach the right person at the right time through reliable authentication.
 - **Direct Benefit Transfer (DBT):** The [DBT system](#) has streamlined welfare payments, reducing leakages and delays. Cumulative savings have reached Rs 3.48 lakh crore as of 2023, reflecting its efficiency and scale.
 - **Ayushman Bharat:** Provides health coverage of up to ₹5 lakh per family per year. As of July 2025, over **41.34 crore Ayushman Cards** have been issued.
 - The [Ayushman Bharat Digital Mission](#) has further strengthened this effort, with over **79 crore health accounts** created to link individuals to digital health services.

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- **Stand-Up India:** As of July 2025, more than 2.75 lakh applications have been sanctioned, with total funding of Rs 62,807 crore. This initiative empowers individuals from disadvantaged communities to participate in economic growth on their own terms.
- **Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY):** As of 2024, the scheme has reached **80.67 crore beneficiaries**, offering free food grains and ensuring that no one is left behind during times of crisis.
- **PM Vishwakarma Yojana:** Traditional artisans and craftspeople are vital to India's economic and cultural fabric. The **PM Vishwakarma Yojana** supports them with collateral-free loans, toolkits, digital training, and marketing support.
 - As of July 2025, 29.95 lakh individuals have registered under the scheme, helping preserve livelihoods and promote inclusive growth across rural and semi-urban areas.

- The richest **1% hold over 40% of total national wealth, while the bottom 50% own only 3%.**
- These highlight deep income and wealth inequality, which consumption-based measures like the Gini Index of 25.5 may not fully reflect.
- **Outdated Poverty Line:** India still relies on the **Rangarajan Committee's 2014 poverty line** (estimated as Monthly Per Capita Expenditure of Rs. 1407 in urban areas and Rs. 972 in rural areas), which may not reflect **current cost-of-living realities**.
 - Without an updated benchmark, welfare schemes may not **adequately target** the truly poor.
- **Unequal Access to Opportunities:** Gaps persist in **education, healthcare, digital access, and employment**, especially for rural populations, women, SCs/STs, and informal workers.
 - **Equality in outcomes** remains limited despite improvements in consumption.

What are the Challenges and Structural Concerns Undermining India's Equity Achievements?

- **High Poverty Despite Low Inequality Index:** At the **USD 3.65/day poverty threshold** (suitable for lower-middle-income countries), **India's poverty rate was 28.1% in 2022.**
 - Over **300 million people** still live in poverty, questioning the sustainability of equality claims.
- **Wage and Income Disparity:** Wage disparity remains significant, the top **10% earn 13 times more than the bottom 10% (2023–24).**
 - The Gini coefficient for income in 2023 is **0.410, higher than 0.371 in 1955**, showing a long-term rise in income inequality.

UN Women & the Global Gender Agenda

Why in News?

On the eve of the 30th anniversary of the **Beijing Declaration and Platform for Action**, the 25th year of **UNSC Resolution 1325 on Women, Peace and Security (WPS)**, and its own 15th anniversary, **UN Women** warned that **women's rights are facing a "historic and precarious moment"** due to **rising violence, deepening poverty, and increasing digital and political exclusion.**

What are the Key Issues

Faced by Women as per UN Women?

- **Political Backlash & Lack of Representation:** In 2024, nearly **1 in 4 countries** reported a **backlash against**

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women's rights, with women still holding only 64% of the legal rights men have, and 51% of countries restricting women from doing the same jobs as men.

- Additionally, nearly 75% of lawmakers are men, and only 4% of official development assistance in 2021–2022 focused on gender equality.
- **Disproportionate Impact of Violence:** In 2023, 85,000 women and girls were intentionally killed, with one killed every 10 minutes by a partner or close relative.
 - Between 2020 and 2023, 8 in 10 peace talks and 7 in 10 mediation efforts included no women, reflecting their continued exclusion from peace processes.
- **Economic Inequality:** Globally, women earn 20% less than men for work of equal value and perform 2.5 times more unpaid care work than men.
- **Food and Education Insecurity:** 47.8 million more women than men face moderate/severe food insecurity, despite women making up the majority of small-scale farmers who produce 1/3 of the world's food.
 - 119 million girls remain out of school, and 39% of young women don't complete upper secondary education.
- **Climate Vulnerability:** By 2050, climate change could drive 158 million more women and girls into extreme poverty, even as women make up only 28% of environment ministers worldwide.
- **Poor Health Access:** Nearly 800 women die every day from preventable pregnancy-related causes.

Challenges to Women's Empowerment in India

- **Low Female Labour Force Participation (FLFPR):** India's FLFPR rose from 23.3% (2017–18) to 41.7% (2023–24) but remains below the global average (50%) and men's rate (77.2%), limited by societal norms, care responsibilities, and lack of flexible jobs.

- **Domestic Burden:** Women spend 236 minutes/day on unpaid domestic work vs 24 minutes by men, restricting access to education, skills, and formal employment.
- **Gender Pay Gap:** Women earn 29.4% less in urban and 51.3% less in rural areas than men.
 - 81% work in the informal sector, lacking job security and benefits.
- **Digital Divide:** Only 54% of women own a mobile phone vs 82% of men, and just 33% have used the internet vs 57% of men (NFHS-5), limiting access to education, jobs, and digital finance.
- **Gender-Based Violence:** India reported 4.4 lakh crimes against women in 2022, and 29.3% of married women (18–49) faced spousal violence (NFHS-5, 2019–21).

What is the Beijing Declaration and Platform for Action (BPfA)?

- **About:** The Beijing Declaration and Platform for Action (1995), adopted during the 4th World Conference on Women in Beijing, China, serves as a landmark global framework for advancing the rights of women and girls.
 - It outlines strategic objectives focused on legal protection, access to essential services, youth engagement, and driving social transformation.
 - India is a signatory to BPfA.
- **Areas for Action:** The declaration highlighted 12 critical areas requiring urgent attention to achieve gender equality and outlined strategies to ensure equal opportunities for everyone. Key focus areas include:

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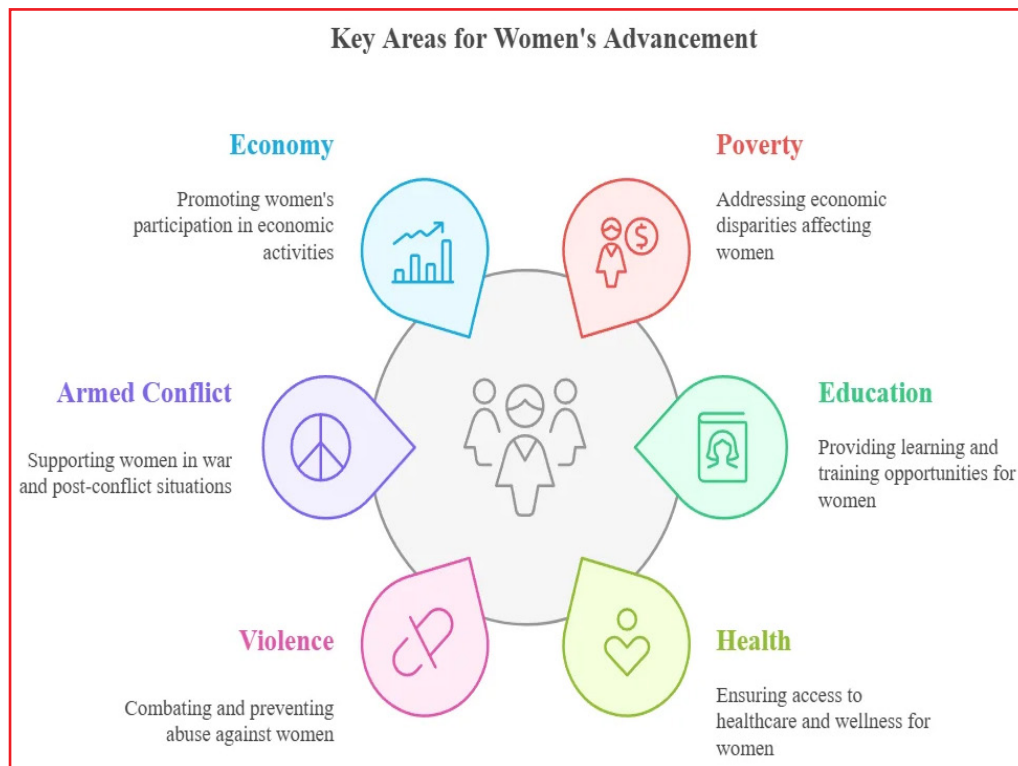


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- **Beijing+30 Action Agenda:** It marks the **30th anniversary (1995-2025)** of the BPfA to review and appraise its implementation. It focuses on **six key areas**:



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UN Women

- **Establishment & Mandate:** UN Women, established by the **UN General Assembly** in **July 2010**, is the **United Nations entity** dedicated to **gender equality** and the **empowerment of women**. Created as part of the **UN reform agenda**, it merged four pre-existing bodies:
 - Division for the Advancement of Women (DAW)
 - International Research and Training Institute for the Advancement of Women (INSTRAW)
 - Office of the Special Adviser on Gender Issues and Advancement of Women (OSAGI)
 - United Nations Development Fund for Women (UNIFEM).
- **Core Mission:**
 - **Governance & Leadership:** Ensuring **women participate equally in decision-making**.
 - **Economic Empowerment:** Securing **equal pay, decent work**, and **financial independence** for women.
 - **Ending Violence Against Women:** Eliminating all forms of **gender-based violence**.
 - **Peace & Humanitarian Action:** Increasing **women's role in conflict resolution, disaster response**, and **peacebuilding**.

UN Security Council Resolution on Women and Peace and Security (2000)

- **About:** Adopted unanimously on **31st October 2000**, the **Resolution** is a **landmark legal framework** that acknowledges the **disproportionate impact of conflict on women and girls** and calls for their **protection from gender-based violence**, including **sexual violence**.

- **Key Pillars of Resolution:** It emphasizes **women's participation** in peacebuilding, **protection** from gender-based violence, **gender-sensitive conflict prevention**, and addressing the **specific needs of women and girls in relief and recovery efforts**.

What Solutions has UN Women Proposed to Address the Challenges Faced by Women?

- **Strengthen Commitment and Leadership:** Urges **renewed political will**, **gender-responsive systems**, elimination of **discriminatory laws**, and promotion of **women's leadership**, including in **climate action**.
- **Gender-Inclusive Peacebuilding:** Calls for greater **investment in conflict prevention**, **women's participation** in peace processes, and improved **reproductive healthcare**, especially in **conflict zones**.
- **Economic Empowerment:** Advocates for **equal pay for equal work**, **anti-discrimination laws**, and investment in **care infrastructure** to ease the **unpaid care burden** and generate **300 million jobs by 2035**.
- **Eradicate Poverty and Food Insecurity:** Stresses **social protection** (cash assistance, maternity leave, pensions) and policies to close **gender gaps in agriculture and wages**.
- **Expand Access to Education & Technology:** Recommends lowering **education costs**, offering **cash incentives**, ensuring **safe learning environments**, **digital access**, and **online safety**, backed by increased **public-private funding** for gender equality.



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Science & Technology

Highlights

- Empowering States Through Science

- Blocking of AI Web Crawler

Empowering States Through Science

Why in News?

National Institution for Transforming India (NITI Aayog), in its report “**A Roadmap for Strengthening State Science and Technology (S&T) Councils**”, has called for reforms in the funding and governance of State S&T Councils.

What is the Role of State S&T Councils in India?

- **About:** Science, Technology, and Innovation (STI) are vital to national development, with both Central and State S&T Departments playing key roles.
 - The Centre-State S&T partnership began in 1971, led by **Bharat Ratna** **Shri C. Subramaniam**, through the creation of **State Science & Technology Councils (SSTCs)**.
 - Initially set up in Karnataka, Kerala, Uttar Pradesh, and West Bengal, SSTCs now exist in almost all States and UTs across India.
- **Support:** SSTCs are supported by the **Department of Science and Technology (DST)**, Ministry of Science and Technology under the **State Science and Technology Programme (SSTP)**.
 - DST provides budgetary assistance to S&T Secretariats of States and UTs. S&T Councils also receive state government funding, though the levels vary significantly.
- **Key Roles:** Councils act as enablers of **grassroots innovations**, often in fields such as agriculture,

renewable energy, disaster management, and biotechnology.

- Promote science-based solutions for resource management, environmental improvement, and better quality of life.
- S&T Councils develop scientific attitude and awareness among all sections of society.

What are the Key Challenges Faced by State S&T Councils?

- **Overdependence on Core Grants:** Many councils rely heavily on **core grants** from the DST, with minimal effort to secure **project-based grants** from other ministries or agencies.
- **Low Central Financial Support:** Despite being intended as key players in decentralised science governance, most councils receive **very little funding from the Centre**.
 - For instance, of the Rs 300 crore annual budget in Gujarat's State Science and Technology Council, only Rs 1.07 crore came from the Centre. In the case of **Kerala's** Rs 150 crore, the **Centre's (DST) contribution was zero**.
 - State contributions to national **R&D are minimal at just 6.7%, compared to the Centre's 44%**. Smaller states like Sikkim and Mizoram are especially impacted by limited budgets, hindering their scientific progress.
- **Lack of Industry and Institutional Linkages:** Minimal collaboration with **state industries**, **Public Sector Enterprises (PSEs)**, and **academic institutions (IITs, IIMs)** limits the councils' impact on applied research and innovation.

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- **Inefficient Use of Resources:** Disparities in fund utilisation across states point to **regional imbalances** and **inefficiencies in execution**.
- **Lagging Research Output:** The bulk of India's S&T output comes from **Centrally funded institutions**, with **State Councils failing to match productivity** or impact.
- **Budget Cuts in Some States:** A comparative analysis of State S&T Council budgets from 2023–24 to 2024–25 shows a **17.65% overall funding increase**, indicating growing state-level investment.
 - However, states like **Sikkim (-16.16%), Tamil Nadu (-4%), and Uttarakhand (-5%)** have seen reductions in their S&T budgets, affecting ongoing and future projects.
- **Lack of Adaptability:** Councils are struggling to keep pace with the **rapidly evolving R&D landscape**, making their programs and models outdated.
- **Weak Leadership:** Many councils are led by bureaucrats rather than experts in science and technology. This lack of scientific leadership has significantly undermined the councils' ability to drive innovation and research.
- **Staffing Issues:** The councils suffer from a shortage of skilled personnel, and many positions remain vacant due to budgetary constraints. Additionally, many councils lack full-time scientific leaders, leading to inefficiency and poor staff morale.

Success Stories of State S&T Councils

- **Kerala:** Kerala's State Science & Technology Council has successfully implemented **fellowship programs that helped women scientists return to research after career breaks**.
 - The state also allocates over Rs **170 crore annually for science and technology** initiatives, showcasing a robust commitment to R&D.

- **Tamil Nadu:** It has emerged as a **national leader in intellectual property filings**, driven by the efforts of its **Patent Information Centre (PIC)**.
 - The state ranked **1st in patent filings and GI registrations and 3rd in industrial design filings** (as per the Indian Patent Office Annual Report 2022–23).
 - For its significant contribution to IP awareness and technology commercialization, Tamil Nadu's PIC received the **National Intellectual Property Award 2023 (Special Citation)** from the Ministry of Commerce and Industry.
- **Punjab:** Punjab's innovative approach to **paddy straw management** has reduced pollution and boosted the local economy by promoting sustainable agricultural practices.
 - This initiative has also created employment opportunities and contributed to environmental conservation.
- **Mizoram:** The **Innovation Facility Centre (IFC)** in Mizoram supports grassroots innovation through technical aid, institutional support, and IP filing.
 - It has developed 82 innovation-related and 93 non-innovative products. The IFC collaborates with institutions like National Innovation Foundation (NIF), NIT Mizoram to promote inclusive growth.
- **Manipur:** Manipur's **aromatic plant cultivation project**, aligned with the **National Mission on Medicinal and Aromatic Plants**, is positioning the state as a potential hub for natural aroma-based products.
 - The initiative has created jobs for local farmers, boosted rural entrepreneurship, and contributed to regional economic growth, showcasing how localized scientific efforts can drive socio-economic development.

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What are the Key Reforms Suggested by NITI Aayog to Strengthen SSTCs?

- **Scientific Leadership:** NITI Aayog recommends appointing full-time scientists, **rather than bureaucrats, to head the councils.** This will ensure that councils are driven by experts who can push for scientific excellence and innovation.
- **Performance-Based Funding:** Instead of flat, non-performance-based grants, NITI Aayog advocates for **funding that is linked to the performance of councils.** This would incentivize states to improve their R&D outcomes and maximize the impact of every rupee spent.
 - States should allocate at least **0.5% of Gross State Domestic Product (GSDP) to S&T for regular and advanced activities.**
 - DST should replace **core grants with performance-based project funding**, except for small NE and UT councils. Councils should explore central ministry schemes beyond DST for additional funding.
- **Secure Jobs and Career Growth:** To improve the morale of scientific staff and retain talent, the roadmap suggests offering secure, long-term jobs with clear career progression for researchers working with SSTCs.
- **Strengthening Industry and Academic Linkages:** Building stronger connections between councils, industries, and academic institutions is critical.
 - This would help bridge the gap between research and commercialization, leading to innovations that benefit both society and the economy.
- **Science Cities and Innovation Hubs:** The roadmap calls for the establishment of **Science Cities planetariums, and innovation hubs in every state.**
 - **Example: Gujarat Science City in Ahmedabad** is a leading hub for scientific learning with state-of-the-art facilities like the Robotics Gallery, showcasing real-world applications in healthcare, industry, and daily life.
 - These would serve as centers of excellence, bringing together research, education, and industry to foster local scientific and technological advancements.
- **STI Information Cell:** Councils should establish Science, Technology & Innovation (STI) Cells to manage state-level STI data and act as nodal points for sharing indicators with government agencies. These cells will support evidence-based policymaking.
- **SSR and CSR Cells:** Councils should lead **Scientific Social Responsibility (SSR) and Corporate Social Responsibility (CSR)** efforts by coordinating resources from institutions and stakeholders to address local challenges and promote scientific awareness.
- **National Monitoring System:** To ensure the effectiveness of these reforms, NITI Aayog proposes the creation of a national monitoring system that tracks the progress of State S&T Councils and holds them accountable for their performance.

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NITI Aayog

(National Institution for Transforming India)

HISTORY- PLANNING COMMISSION

Set up in **1950**
to direct investment
activity

Replaced by **NITI
Aayog** on January
1, 2015

Composition of #NITLaayog

Chairperson

Prime Minister

Governing Council

CMs (States) and Lt Governors (UTs)

Regional Councils

Formed on need-basis, comprising CMs
and Lt Gvs of the region

Members

Full-time basis

Part-time Members

Max 2, rotational, from relevant institutions

Ex-officio Members

Max 4 from Council of Ministers,
nominated by PM

Special Invited

Experts, specialists, practitioners with
domain knowledge

Chief Executive Officer

Appointed by PM for fixed tenure
(Secy rank)

Secretariat

As deemed necessary

OBJECTIVES

- ↳ Foster **cooperative federalism**
- ↳ Develop mechanisms to **formulate credible plans (village level)**
- ↳ Interests of **national security** in economic strategy and policy
- ↳ Special **attention to weaker sections**
- ↳ Provide advice and encouragement to partnerships between **key stakeholders, national-international Think Tanks, research institutions**
- ↳ Create **knowledge, innovation and entrepreneurial support system**
- ↳ **Platform** for inter-sectoral and inter-departmental **issues resolution**
- ↳ Maintain **state-of-the-art Resource Centre**

NITI Aayog vs Planning Commission

NITI Aayog	Planning Commission
Advisory Think Tank	Extra-constitutional body
Wider expertise	Limited expertise
Secretaries (CEO) appointed by PM	Secretaries appointed by usual process
Bottom-up approach	Top-Down approach
No Mandate to impose policies	Imposed policies on states
No power to allocate funds	Allocated funds to ministries/state govts

Major Initiatives

- ↳ SDG India Index
- ↳ Atal Innovation Mission
- ↳ e-AMRIT Portal (electric vehicles)
- ↳ Good Governance Index
- ↳ India Innovation Index
- ↳ Aspirational District Programme
- ↳ 'Methanol Economy' programme

Issues

- ↳ **No powers** in granting **discretionary funds** to states
- ↳ Only an **advisory body**
- ↳ **No role in influencing private or public investment**
- ↳ **Politicisation of the organisation**
- ↳ **Lacks the requisite power** to bring positive change



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Blocking of AI Web Crawler

Why in News?

In a landmark move, major US and UK publishers have started blocking **Artificial Intelligence (AI) web crawlers** to prevent unauthorised use of their content.

- This has renewed calls in **India for consent-based copyright safeguards and fair revenue sharing**, raising key concerns in digital governance, copyright enforcement, and ethical AI use.

What is an AI Web Crawler?

- **About:** An AI web crawler is a type of **automated software or bot** that scans and collects content from the internet specifically to help train AI models like **Large Language Models (LLMs)**, or to provide live information retrieval for AI assistants.
- **Types:**
 - **Model Training Crawler:** Extract website data to train generative AI models.
 - Examples: GPTBot (OpenAI), Amazonbot (Amazon), GoogleOther (Google).
 - **Live Retrieval Crawlers:** These bots pull real-time data from websites to supplement pre-trained models during user queries, ensuring up-to-date and cited responses in AI search tools.
 - It is used by AI platforms like Bing, ChatGPT, etc., to stay updated.
- **Concerns:**
 - **Lack of Regulatory Framework:** Currently, India lacks a regulatory framework to oversee how AI companies access and use web content.
 - This has led to a situation where large tech firms benefit from freely **available Indian content without consent or oversight**, while smaller publishers are left with no tools to monitor or restrict such access.

- **Copyright Enforcement:** News articles, blogs, and educational content are used to train LLMs without permission or compensation.
 - India's **Copyright Act, 1957** is not equipped to address **AI-specific use cases**, such as derivative AI outputs or training data rights.
 - There is no clear interpretation of **"fair use" vs. "unlicensed training" in the Indian context.**
 - India has no data protection law focused on non-personal data, which LLMs mostly rely on for AI training.
- **Ethical Use of AI:** AI developers rarely disclose what data they use, leaving original creators without acknowledgement or reward.
 - Moreover, training AI on **unvetted or outdated material can introduce biases and lead to inaccurate or harmful outputs**, undermining public trust in AI systems.
 - These challenges underscore the urgent need for India to establish a consent-based, rights-respecting digital ecosystem.
- **Global Frameworks and India's Path Forward:** EU's AI Act, 2024 has started addressing AI training on copyrighted data.
 - US publishers are entering licensing deals or legally challenging AI firms.
 - India can study these and develop an Indian model for AI governance, balancing innovation with creators' rights.
 - The Ministry of Electronics and IT (MeitY) and the Ministry of Information & Broadcasting (I&B) must jointly legally define **"unauthorised data scraping"** and establish a **consent-based AI licensing framework** to protect creators' rights.
 - They should also enable technical safeguards by providing AI **bot-blocking tools** to Indian publishers, in collaboration with platforms like **Cloudflare**, to help secure digital content.



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Environment and Ecology

Highlights

- River Pollution in India
- World Bioproduct Day 2025 and BioE3 Policy
- Call for Reforming the UNFCCC
- Great Nicobar Project EIA Downplays Earthquake Risk
- Bonn Climate Change Conference 2025
- Plastic Waste a Public Health Threat
- 50 Years of CITES
- India's Air Pollution Crisis

River Pollution in India

Why in News?

The Delhi government has prioritized **Yamuna** river pollution clean-up, aligning with the **Namami Gange Programme (NGP)**. Its role as a **Ganga** tributary facilitates the alignment of local efforts with national goals for the cleaning of the Ganga River and its tributaries.

What are the Causes of River Pollution in India?

- **Industrial Pollution:** Industries like **textiles**, **tanneries**, and **chemicals** discharge **toxic effluents** (e.g., **lead**, **mercury**, **arsenic**) into rivers such as the **Ganga** (Kanpur), **Yamuna** (Delhi), and **Damodar** (Jharkhand).
 - Many **factories** **bypass** or **misuse** **effluent treatment plants (ETPs)**, often **diluting** waste to falsely meet regulatory norms.
- **Agricultural Runoff:** Runoff from **fertilizers** and **pesticides** leads to **nitrate** and **phosphate** pollution, causing **algal blooms** and harming **aquatic life**, as seen in **Punjab's Sutlej River**.
 - **Stubble burning** in **Punjab-Haryana** releases **ash** that enters rivers through **rainwater runoff**, further degrading water quality.
- **Religious & Cultural Practices:** **Idol immersion** and **cremation rituals** pollute rivers with **Plaster-of-Paris**, **toxic paints**, **plastic**, **polythene**, and **floral waste**, especially at **ghats** like **Varanasi's Ganga**.

- **Solid Waste & Plastic Dumping:** India ranks as the world's largest **plastic emitter**, with significant amounts **clogging** rivers like **Mumbai's Mithi River**.
 - **Toxic runoff** from **landfills** like **Delhi's Ghazipur** pollutes both **groundwater** and **nearby rivers**.
- **Thermal & Radioactive Pollution:** **Thermal plant discharges** (e.g., **Farakka**, **NTPC**) and **uranium mining** in **Jaduguda (Jharkhand)** pollute rivers, harming **aquatic life** with **heat** and **radioactive waste**.
- **Climate-Related Stress:** **Erratic rainfall** and **prolonged low-flow periods** **concentrate** **pollutants**, while **extreme storms** **flush** large **contaminant loads** into rivers.

What is the Namami Gange Programme?

- **About:** It is a **flagship programme** by the **Ministry of Jal Shakti** aimed at **rejuvenating the Ganga River** and its **tributaries** by **reducing pollution**, **improving water quality**, and **restoring the river's ecosystem**.
- **Implementation:** It provides for a **five-tier structure** at the **national**, **state**, and **district levels** to ensure the **effective management** and **rejuvenation** of the **Ganga River**.
 - **National Ganga Council:** Headed by the **Prime Minister**, this is the **apex body** overseeing the **overall efforts** for **Ganga rejuvenation**.
 - **Empowered Task Force (ETF):** Chaired by the **Union Minister of Jal Shakti**, it focuses on **coordinated action** for **cleaning** and **rejuvenating** the **Ganga**.

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- **National Mission for Clean Ganga (NMCG):** Functions as the **implementing agency** for various Ganga-related projects.
- **State Ganga Committees:** Responsible for **state-level implementation** of river conservation measures within their respective jurisdictions.
- **District Ganga Committees:** Set up in each **district along the Ganga and its tributaries**, these committees work at the **grassroots level** to execute local interventions.
- **Main Pillars of NGP:**
 - **Sewerage Treatment Infrastructure:** Aimed at **effectively managing wastewater** to reduce river pollution.
 - **River-Surface Cleaning:** Focused on **removing solid waste and pollutants** from the river's surface.
 - **Afforestation:** Involves **planting trees** and **restoring green cover** along the riverbanks.
 - **Industrial Effluent Monitoring:** Ensures protection of the river from **harmful industrial discharges**.
 - **River-Front Development:** Promotes **community engagement** and **tourism** through the creation of **public spaces** along the river.
 - **Biodiversity:** Aims to **enhance ecological health** and support **diverse biological communities** in and around the river.
 - **Public Awareness:** Focuses on **educating citizens** about the importance of **river conservation**.
 - **Ganga Gram:** Targets the development of villages along the main stem of the Ganga as **model villages** with improved sanitation and sustainability.
- **Key Interventions:**
 - **Pollution Abatement (Nirmal Ganga):** Involves setting up **sewage treatment plants (STPs)** and minimizing **industrial and domestic waste discharge** to ensure cleaner waters.
 - **Improving Ecology and Flow (Aviral Ganga):** Focuses on **restoring natural river flow**, enhancing **biodiversity**, and promoting **water conservation** practices.
- **Strengthening People-River Connect (Jan Ganga):** Aims to **promote community participation**, raise **public awareness**, and involve **local stakeholders** in conservation efforts.
- **Facilitating Research and Policy (Gyan Ganga):** Supports **scientific research**, encourages academic studies, and aids in crafting **evidence-based policies** for river management.
- **Key Achievements:**
 - **Pollution Abatement:** Sewage treatment capacity surpassed the pre-2014 capacity by **over 30 times**.
 - **Improvement in Water Quality:** Water quality improved in **Uttar Pradesh** from **BOD 10-20 mg/l (2015) to 3-6 mg/l (2022)**, in **Bihar** from **20-30 mg/l (2015) to 6-10 mg/l (2022)**.
 - **Biochemical Oxygen Demand (BOD)** indicates the amount of **oxygen required by microorganisms** to decompose **organic matter** in water. A **higher BOD** signifies **greater pollution**, while a **lower BOD** reflects **cleaner water**.
 - **Impact on Biodiversity:** The **Gangetic river dolphin** population has grown, with **new sightings** reported in stretches like **Bithura to Rasula Ghat (Prayagraj)**, and in the **Babai and Bagmati Rivers**.
- **Global Recognition:** In **2022**, the **UN Decade on Ecosystem Restoration (2021-2030)** recognized the **Namami Gange Programme (NGP)** as one of the **Top 10 World Restoration Flagship Initiatives**.

World Bioproduct Day 2025 and BioE3 Policy

Why in News?

The Department of Science & Technology (DST), along with **BIRAC** and **iBRIC+**, organized **World Bioproduct Day 2025**, focusing on **Equity, Environment, and Economy** to highlight the importance of inclusive public participation in biotechnology.

- The event also reiterated the government's **goal of achieving a USD 300 billion bioeconomy by 2030** under the **BioE3** framework.

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World Bioproduct Day

- Launched in **2021** by the **World Bioeconomy Forum**, the day aims to promote awareness about the potential of **bio-based products** in advancing **environmental sustainability**, **climate action**, and **green innovation** by reducing dependence on fossil fuels.

iBRIC+

- **iBRIC+ (Indian Bioeconomy Research and Innovation Consortium Plus)** is a strategic initiative by the **Department of Biotechnology (DBT)** aimed at accelerating India's **bioeconomy** through a **collaborative, multi-stakeholder platform**.
- Building on the iBRIC foundation, it expands focus to strengthen **regional innovation ecosystems** and support a **sustainable, high-performing bioeconomy**.
- It complements **BRIC**, which integrates **13 DBT institutions** under one framework to improve **governance**, ensure **HR parity**, promote **NEP-aligned research**, enable **interdisciplinary collaboration**, and align R&D with **national missions** for enhanced **socio-economic impact**.

What will iBRIC do?

Restructuring for Value and Impact

Enhance & Implement Transformative Power of S&T for benefit of all

Strengthening & aligning science & technology innovation ecosystem



GLOBAL POSITIONING

To define **bold global actions** for driving bioeconomy



CAPACITY-BUILDING

Workforce transitions & **capacity building**:
'The i3c BRIC-RCB Ph.D. Programme in Biosciences'
(Ideate, Immerse, Innovate, Collaborate)



ASSET MANAGEMENT & MONETIZATION

Compelling **incentives** to develop frontier technologies and **nurture start-up ecosystem**



What are Bioproducts?

- **About:** Bioproducts are **fuels, materials, and chemicals** made from **renewable biomass** like **crops, trees, algae, and agricultural waste**.
 - **Eg:** Biofuels (ethanol, biogas), **bioplastics**, **bio-based cosmetics**, and **plant-derived medicines**.
- **Significance:** Bioproducts **reduce reliance on fossil fuels**, thereby addressing **air pollution**, **deforestation**, and **biodiversity loss**.
 - Through **biotechnological innovation**, they promote **climate-resilient development** without compromising product quality or performance.

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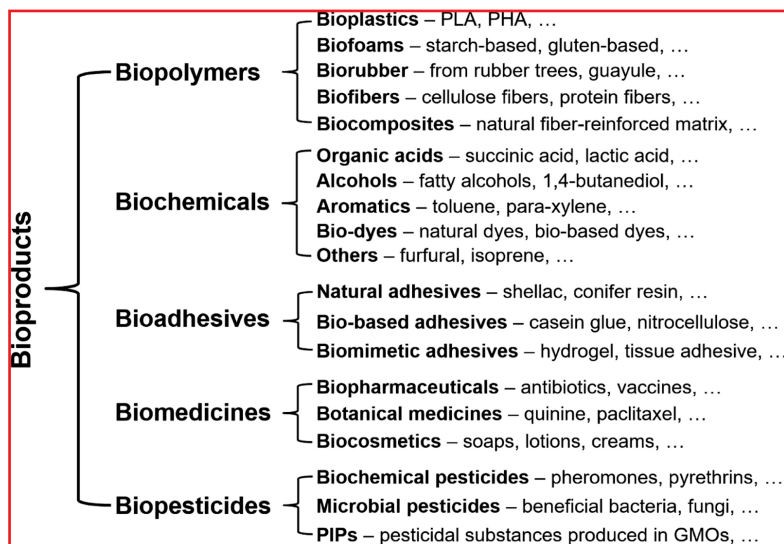
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➤ Categories of Bioproducts:



- **Production Methods:** Bioproducts are produced using methods such as **fermentation, pyrolysis, enzymatic conversion, and chemical synthesis.**
- **Biodegradability:** Not all bioproducts are **biodegradable** and it depends on the intended use (e.g., bio-based paint is not biodegradable).
- **Feedstocks & Sustainability:** Common sources include **soybeans, corn, sugarcane, sunflowers, flax, potatoes, algae, and mycelium.**
 - Many bioproducts use **agricultural or forestry waste**, minimizing pressure on food supply. For example, sunflower residue after seed removal can be converted into **biofuel**.

What is the BioE3 Policy?

- **About:** The **BioE3 Policy (Biotechnology for Economy, Environment, and Employment)**, launched by the **Department of Biotechnology** in 2024 to promote **high-performance biomanufacturing** by integrating **advanced biotechnological processes** across key sectors.
 - It aims to strengthen India's **bioeconomy** through **sustainable practices, innovation, and employment generation.**
 - It supports India's broader goals of achieving a **'Net Zero' carbon economy** and promoting sustainable growth through a **circular bioeconomy.**
- **Key Features:**
 - **Biomanufacturing Infrastructure:** The policy focuses on boosting **research and development (R&D), entrepreneurship,**

and the creation of **Biomanufacturing & Bio-AI hubs and Biofoundries.**

- **Supports Sustainable Biomanufacturing:** Aligned with the **'Lifestyle for Environment' (LiFE)** initiative, the policy supports the development of **regenerative bioeconomy models** that are sustainable and resource-efficient.
 - It also emphasizes **ethical biosafety and global regulatory alignment** to boost India's global competitiveness while ensuring **responsible biotechnology development.**
- **Workforce Expansion:** Focuses on building a **skilled biotechnology workforce**, especially in **Tier-II and Tier-III cities**, to create new jobs and drive **inclusive regional growth** using **local biomass.**
- **Core Themes of BioE3 Policy:**
 - **Bio-Based Chemicals & Enzymes:** Promote eco-friendly alternatives to petrochemicals.
 - **Functional Foods & Smart Proteins:** Develop nutrient-rich, sustainable food sources.
 - **Precision Biotherapeutics:** Advance targeted medical treatments and diagnostics.
 - **Climate-Resilient Agriculture:** Support farming techniques adapted to climate change.
 - **Carbon Capture & Utilization (CCU):** Encourage technologies to capture and reuse carbon.
 - **Futuristic Marine & Space Research:** Explore marine and space biotech for novel solutions in biomanufacturing.

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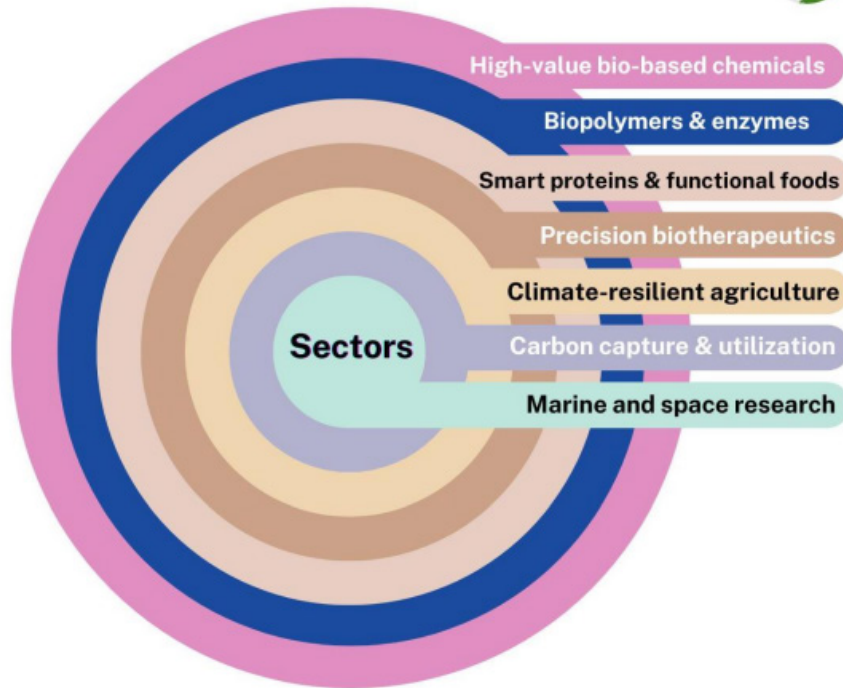


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The policy's scope is broad and ambitious, encompassing several strategic sectors:

BioE3 Policy Targets Strategic Sectors for Sustainable Growth



Government Initiatives Related to Biotechnology

- [National Biotechnology Development Strategy 2020-25](#)
- [National Biopharma Mission](#)
- [Atal Jai Anusandhan Biotech Mission](#)
- [One Health Consortium](#)
- [Biotech Parks](#)
- [Biotechnology Industry Research Assistance Council \(BIRAC\)](#)
- [Genome India Project](#)

Call for Reforming the UNFCCC

Why in News?

A renewed push to reform the [United Nations Framework Convention on Climate Change \(UNFCCC\)](#) process has gained traction ahead of **30th Conference of the Parties (COP) in Brazil (2025)**, amid concerns over its weak implementation, insufficient finance, and procedural inefficiencies.

- Though proposals were discussed at the [2025 Bonn Conference](#), no consensus was reached.

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What is the Need for Reform in the UNFCCC Process?

- **Lack of Effectiveness:** Despite decades of negotiations, global emissions continue to rise, and the process has not delivered the scale of action needed to limit warming to **1.5°C**.
- **Voluntary Commitments:** The Paris Agreement relies on **nationally determined contributions (NDCs)**, which are not legally binding and often fall short of scientific recommendations.
 - As of May 2025, only 21 countries (around 11%) have submitted their 2035 NDCs, raising concerns ahead of COP30 in Brazil.
 - Even among those submitted, many lacked credible implementation plans (meaning they were ambitious on paper but vague or underfunded in practice).
- **Consensus-Based Decision-Making:** Every decision under the UNFCCC must be agreed upon by all parties, giving **each country effective veto power**.
 - This often leads to watered-down agreements to achieve consensus.
 - Civil society groups have called for **majority-based decision-making** when consensus is elusive, but this remains controversial.
- **Inequity and Climate Justice Concerns:** **Small island states and least developed countries** often feel sidelined, with their calls for climate justice and adaptation finance inadequately addressed.
 - The failure of developed countries to meet their climate finance commitments and emission reduction targets has deepened mistrust.
 - Small Island Developing States (SIDS), despite contributing less than 1% of global emissions, face severe climate impacts.
 - Under a 2°C warming scenario, annual losses from extreme weather could reach **USD 75 billion by 2050**.
- **Credibility and Political Will:** The **US withdrawal from the Paris Agreement** has undermined the credibility of the UNFCCC.
- **Implementation Gaps:** The Kyoto Protocol faced major shortcomings as it exempted developing countries like China and India, weakening global emission reduction efforts. It led to a significant rise

in global emissions, **44% increase by 2012 from 1997 levels**.

- The Paris Agreement, though more inclusive, suffers from absence of enforceable timelines.
- The **Loss and Damage Fund**, meant to support vulnerable countries, remains underfunded, with developed nations showing reluctance to accept liability.
- **COP28 (Dubai)** lacked a clear timeline, binding mandates, and enforceable commitments to bridge the climate finance gap.
- **Fossil Fuel Influence:** COP28 marked the first agreement acknowledging the need to **transition away from fossil fuels**. However, hosting COP meetings in countries heavily dependent on fossil fuels such as Dubai and Baku has raised concerns over **conflicts of interest and greenwashing**.
- **Insufficient Enforcement Mechanisms:** Countries face no real consequences for failing to meet their commitments, which weakens accountability and undermines trust in the system.

What is the UNFCCC?

- **About:** The UNFCCC was adopted at the **1992 Rio Earth Summit** and entered into force on 21st March 1994.
 - As of now, the Convention has 198 Parties, making it nearly universal in membership.
 - UNFCCC is one of the three Rio Conventions along with **Convention on Biological Diversity (CBD)**, and the **United Nations convention to combat Desertification (UNCCD)**.
 - These conventions are interconnected and supported by the **Joint Liaison Group** to ensure synergies in addressing global environmental challenges.
- **Objective:** To stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous human interference with the climate system.
- **Core Principles:**
 - **Common but Differentiated Responsibilities (CBDR):** Developed countries, having contributed more historically to emissions, are expected to take the lead in reducing them and supporting developing nations.

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- **Equity:** Recognizes the different capabilities and responsibilities of individual countries.

➤ Institutional Structure

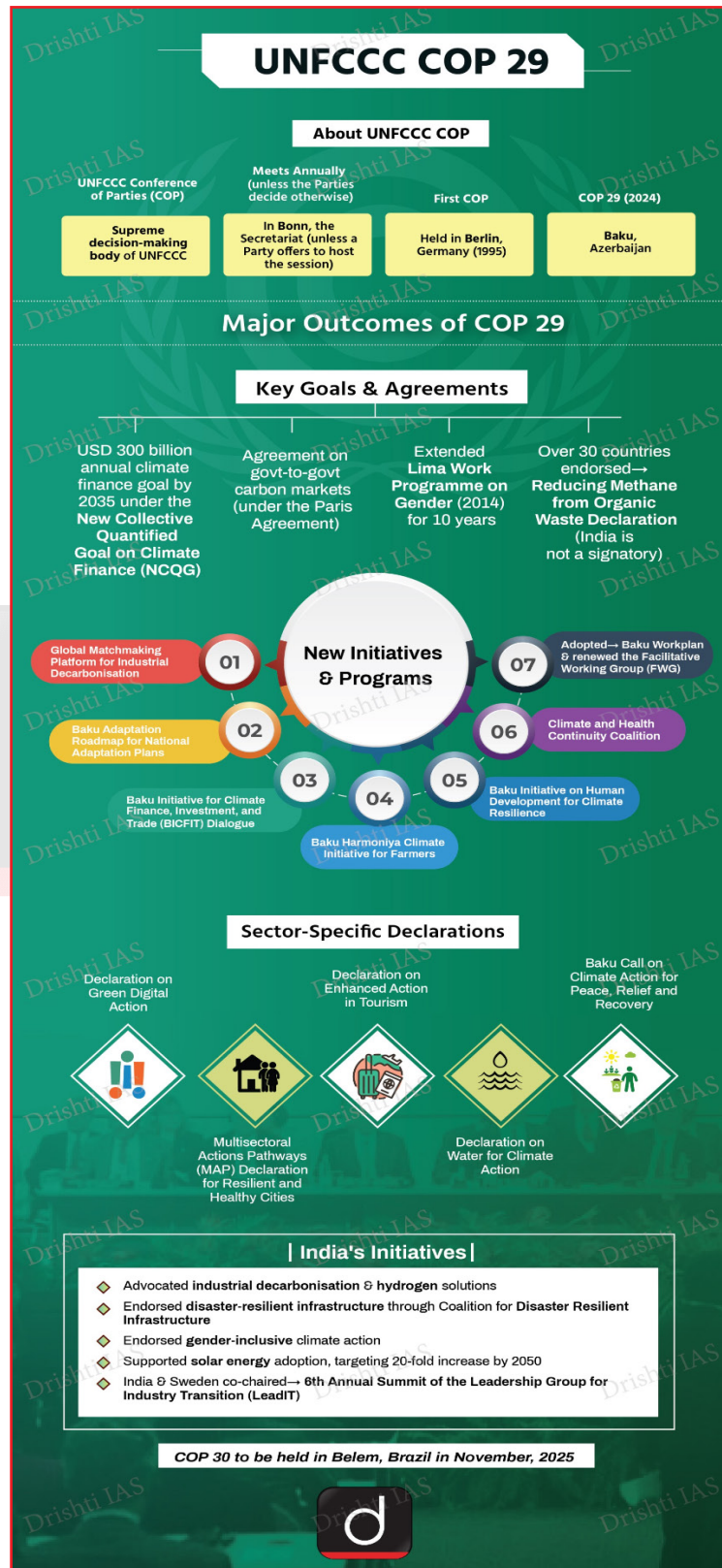
- **COP:** Supreme decision-making body.
- **Subsidiary Bodies:** Includes the **Subsidiary Body for Scientific and Technological Advice (SBSTA)** and the **Subsidiary Body for Implementation (SBI)**.
- **Secretariat:** Based in Bonn, Germany, it supports the implementation of the Convention and its protocols.
- **Global Innovation Hub:** Launched in 2021, aims to promote transformative innovations for a low-emission and climate-resilient future.

➤ Key Functions

- **Negotiation Platform:** Hosts annual **Conferences of the Parties (COPs)**, where countries negotiate climate agreements and review progress.
- **Monitoring and Reporting:** Requires countries to submit regular reports on their emissions and climate actions.
- **Financial and Technical Support:** Facilitates funding and technology transfer to developing countries through mechanisms like the **Green Climate Fund**.

➤ Major Agreements Under the UNFCCC:

- The **Kyoto Protocol**, adopted in 1997, is the only global treaty with legally binding targets for developed countries to cut greenhouse gas emissions. It aimed to reduce emissions by **5% below 1990 levels by 2012**.
 - India ratified it in 2002. It follows the principle of “common but differentiated responsibilities.”
- **Paris Agreement (2015)** countries agreed to submit voluntary climate action plans (NDCs) to limit global warming to well below 2°C, ideally 1.5°C.



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Great Nicobar Project EIA Downplays Earthquake Risk

Why in News?

The proposed Rs 72,000-crore **Great Nicobar Infrastructure Project (GNIP)** has sparked concerns, as an IIT-Kanpur report highlighted **safety risks** associated with the region's status as a **highly seismic zone**, which was hit by a devastating **tsunami** in 2004.

What are the Key Findings of IIT-Kanpur Report that Highlighted the Vulnerabilities of the Great Nicobar Project?

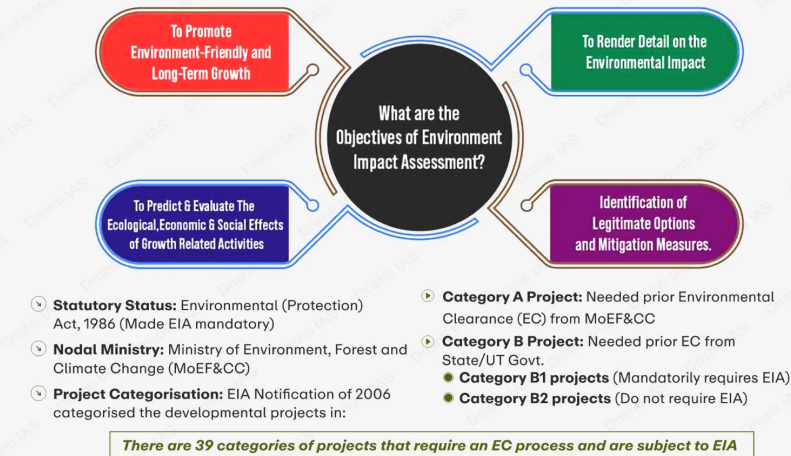
- **Potential for Future Mega Earthquake:** It estimates a 'return period' of 420–750 years for mega-earthquakes (magnitude of 9 or more) and 80–120 years for large-magnitude earthquakes (>7.5), indicating **high seismic vulnerability**.
 - However, the **Environmental Impact Assessment (EIA)** report states that the likelihood of a **mega-earthquake** (similar to the 2004 9.1-magnitude quake) is **low**.
- **Geological Evidence of Past Tsunamis:** Sediment analysis from **Badabalu beach** in **South Andaman** revealed **evidence of at least seven large tsunami**

events over the past 8,000 years, pointing to a long history of major seismic activity in the region.

- **Need for Site-Specific Studies:** Site-specific seismic and tsunami studies must be conducted in **Nicobar Islands**, especially in areas like **Car Nicobar** and **Campbell Bay**, which are lacking such assessments.

ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

EIA is a study conducted in the early stages of development project planning to predict and address potential environmental impacts



EIA Process as per EIA Notification, 2006

Step	Objective	Carried Out By
Screening	Need of EIA	State Expert Appraisal Committee (SEAC) (Category B)
Scoping	Identifies important issues for EIA	Standard Term of Reference (ToR) prepared by MoEF&CC with EAC/SEAC for Category B Projects*
Public Consultation	Addresses concerns of affected people	State Pollution Control Board (SPCB)/ UT Pollution Control Board (UTPCB)
Project Appraisal	Scrutiny of Final EIA Report/ Environmental Management Plan (EMP)	EAC for category A Projects and SEAC for category B1 Projects
Decision Making	Granting EC	Category A: MoEF&CC Category B: State EIA Authority (SEIAA)
Monitoring (Post EC)	Compliance of general and specific conditions	SPCB / UTPCB and Regional Offices

Government Initiatives For EC

- PARIVESH (Proactive and Responsive facilitation by Interactive, Virtuous, and Environmental Single Window Hub): Single Window System for EC
 - Developed by MoEF&CC and National Information Centre (NIC)
- Environmental Information System (ENVIS): Collect, Collate, Storing, Retrieving and Disseminating Information Related to the Environment Sector
- Draft Environmental Impact Assessment Notification 2020: Published by MoEF&CC to replace existing EIA Notification, 2006



What is the Great Nicobar Island Project?

- **About:** Launched in 2021, GNIP is a **mega infrastructure initiative** to be implemented on **Great Nicobar Island (GNI)**, located at the **southern end of the Andaman and Nicobar Islands**.
- **Features:** Spearheaded by **NITI Aayog**, it includes a **transshipment terminal** at **Galathea Bay**, a **greenfield airport**, a **greenfield township**, and a **tourism project** with a **gas-powered plant**.

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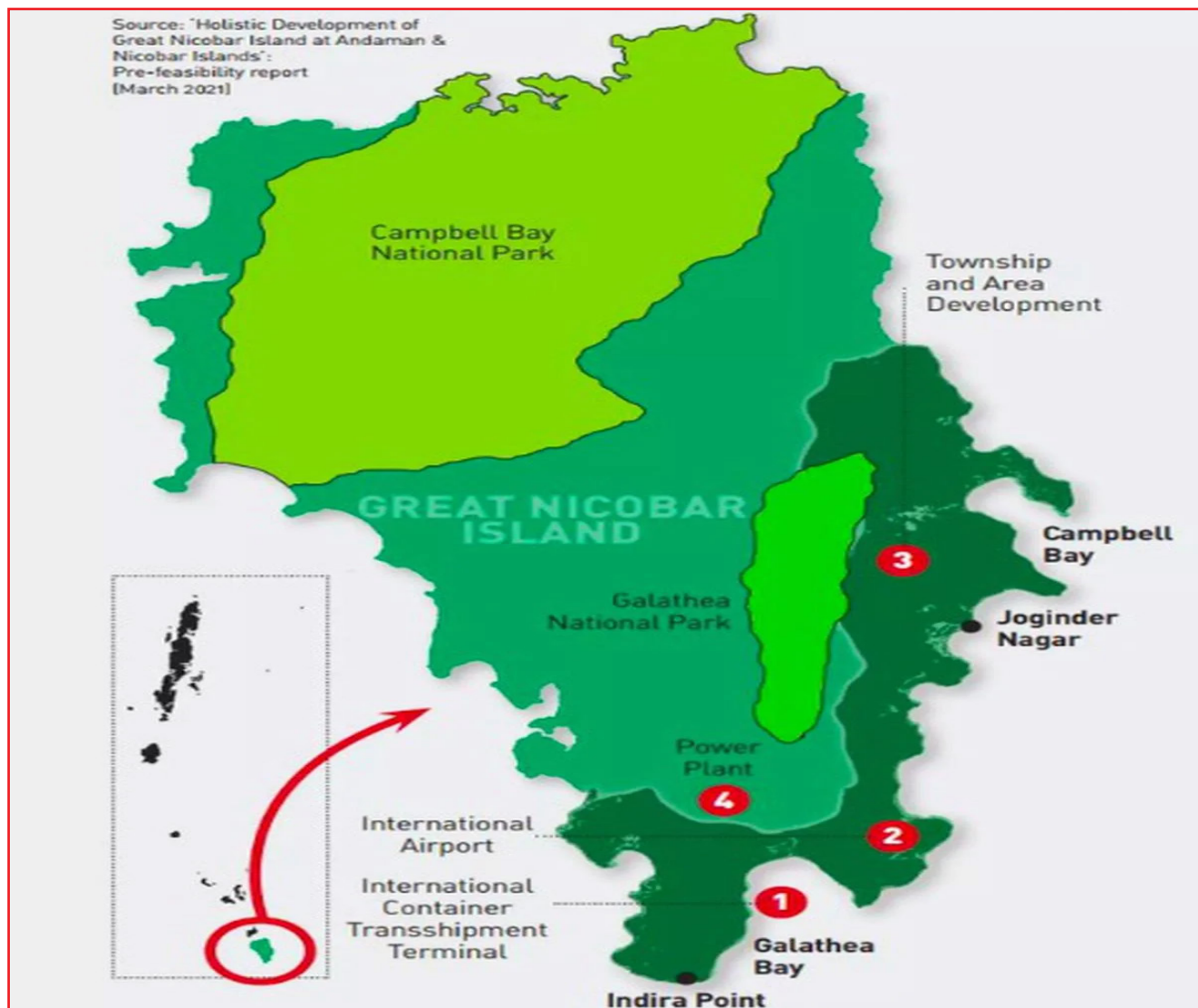
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- It is being executed by the **Andaman and Nicobar Islands Integrated Development Corporation (ANIIDCO)** and is strategically located near the **Malacca Strait**, a key maritime route linking the **Indian Ocean** to the **Pacific Ocean**.

➤ **Significance:**

- **Strategic Importance:** Nicobar's strategic location near the **Malacca**, **Sunda**, and **Lombok Straits** enables India to **monitor crucial sea routes** vital for **global trade and energy supply**, aligning with the **Act East Policy (2014)** and the **QUAD's Indo-Pacific strategy**.
 - The planned **greenfield airport** will enhance **defense deployment**, boosting India's capacity to track **Chinese naval movements** and reinforce **regional security**.
- **Economic Significance:** The **International Container Transshipment Terminal (ICTT)** aims to reduce India's dependence on foreign ports like **Singapore** and **Colombo**.
 - It forms a key part of the **Maritime India Vision 2030** and **Amrit Kaal Vision 2047**, aligning with India's long-term economic strategy.



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Great Nicobar Island

- **About:** Great Nicobar is the **southernmost and largest** island of the Nicobar group in the **southeastern Bay of Bengal**, and is mostly covered in **tropical rainforest**.
 - **Indira Point**, situated on Great Nicobar Island, is the **southernmost point of India**.
- **Geographical Division:** The **Andaman and Nicobar Islands** comprise **836 islands**, divided into **Andaman (north)** and **Nicobar (south)**, separated by the **150-km-wide 10° Channel**.
- **Ecological Importance:** Great Nicobar island is home to **two national parks**—**Campbell Bay National Park** and **Galathea National Park** and a **biosphere reserve**, the **Great Nicobar Biosphere Reserve**.
- **Tribes:** It is inhabited by **small populations of indigenous tribes**, including the **Shompen, Onge, Andamanese, and Nicobarese**.

What Concerns Are Associated with the Great Nicobar Island Project?

- **Environmental Concerns:**
 - **Rampant Deforestation:** The project will clear **130 sq km of primary tropical rainforest**, causing **biodiversity loss**, with actual **tree felling** possibly exceeding **10 million**, far above initial estimates of **8.65–9.64 lakh**.
 - **Wildlife Disruption:** The project threatens **leatherback sea turtles** in the **Galathea Bay Wildlife Sanctuary**, designated in **1997** for their conservation, was **denotified in 2021** for the port—contradicting India's **Marine Turtle Action Plan (2021)**.
 - The coastline is classified as **Coastal Regulation Zone (CRZ 1A)**, where **ship-repair** and other **industrial activities** pose a significant **threat to marine ecosystems**.
 - **Compensatory Afforestation Issues:** The diversion of **pristine Nicobar forests** is being “compensated” with land in **Haryana and Madhya Pradesh**, which **fails to replicate the lost biodiversity**.
- **Geological Concerns:** The island's **tertiary sandstone, limestone, and shale** over **volcanic rocks** amplify **seismic shaking** and are **prone to liquefaction** during earthquakes.

- **Legal Concerns:** The SC appointed **Shekhar Singh Commission 2002** recommended a **total ban on tree felling in tribal reserves and national parks**, along with **afforestation before felling**—a rule currently **not being followed**.
 - The project's **environmental clearance**, justified by **national security**, is contested due to **lack of consultation and transparency**, and its potential to harm the **Shompen tribe** by **endangering their forest-based livelihood**.

Note: CRZ 1A, under the **Coastal Zone Management Plan 2019**, covers **ecologically sensitive coastal areas** like **coral reefs**, crucial for **biodiversity and ecosystem stability**.

Bonn Climate Change Conference 2025

Why in News?

The 62nd annual session of the **Bonn Climate Change Conference** was held in Bonn, Germany. This mid-year meeting sets the stage for key climate negotiations ahead of the **30th Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC)** in Belem, Brazil.

What is the Bonn Climate Change Conference?

- **About:** The Bonn Climate Change Conference is a mid-year summit held under the UNFCCC, the 1992 treaty guiding global climate negotiations.
 - Formally called the **Sessions of the Subsidiary Bodies (SBs)**, it is one of the two regular UNFCCC climate meetings alongside **COP**.
 - It brings together SB members and committees, Indigenous groups, international organisations, scientists, and civil society to review implementation, hold technical discussions, and set the agenda for the upcoming COP summit.
- **Key Players:**
 - **Subsidiary Body for Implementation (SBI) of UNFCCC:** Reviews implementation, facilitates technical and financial support, especially for developing nations.
 - **Subsidiary Body for Scientific and Technological Advice (SBSTA) of UNFCCC:** Provides scientific

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inputs from [UN Intergovernmental Panel on Climate Change \(IPCC\)](#) to negotiators and policymakers.

What are the Key Takeaways from the Bonn Conference 2025?

- **Global Goal on Adaptation (GGA):** Progress was made on refining indicators for the [GGA](#), but disagreements over finance and Means of Implementation (MoI) delayed consensus. A draft list of 100 indicators is expected at COP30.
 - The GGA, first outlined in the [Paris Agreement \(2015\)](#), aims to enhance adaptive capacity and climate resilience. However, it lacked concrete action until COP28 in Dubai, where a framework to define and implement the GGA was finally adopted.
- **Just Transition Work Programme (JTWP):** Bonn saw significant movement on the JTWP, negotiators agreed to establish a **Belém Action Mechanism** to share fair transition strategies.
 - The JTWP is a UNFCCC initiative launched at COP27 (2022) through the Sharm el Sheikh Implementation Plan.
 - It aims to ensure that climate actions under the Paris Agreement are just, equitable, and aligned with national development goals considering social, economic, and workforce impact and is specifically aimed at supporting workers and communities affected by the shift away from fossil fuels.
- **National Climate Plans:** Most countries missed the February 2025 deadline for submitting updated [Nationally Determined Contributions \(NDCs\)](#), slowing efforts to limit global warming to 1.5°C.
 - Brazil urged nations to submit stronger NDCs by September 2025 to align with the 1.5°C target. However, the current submissions remain insufficient, possibly pushing warming closer to 2°C.
- **Climate Finance:** Disputes over [climate finance](#) were intense, with developing nations (India) pressing for the fulfillment of pledges, including the mobilization of **USD 1.3 trillion every year till 2030**

- Wealthier countries suggested private finance as a solution, but critics argued that public grants were essential.
- Developing countries prefer a finance-centric dialogue and emphasize inclusion of **Article 9.1** of the Paris Agreement (obligation of developed countries to provide financial support).
- According to the Climate Policy Initiative (an advisory organization), global climate finance must rise to around **USD 9 trillion annually by 2030** to keep global temperature increases within the targets set by the Paris Agreement.
- **Loss and Damage:** The conference noted that the **Loss and Damage Fund** remains underfunded, with only USD 768 million pledged, far from the USD 1 trillion needed.
 - Despite the pledges, governments have so far signed contribution agreements for USD 495 million and have paid in only USD 321 million.

Nationally Determined Contributions

- **About:** NDCs are country-specific climate action plans to cut emissions and adapt to climate change under the Paris Agreement, updated every five years.
 - The existing NDCs, submitted in 2020, pertain to the 2030 period, with 2035 submissions by February 2025. The 2035 NDC must build on the 2030 targets, but countries set their own progression based on resources.
- **India and NDCs:** India submitted its first NDC in 2015, targeting a **33–35% reduction in emission intensity of GDP and 40% non-fossil fuel-based power capacity by 2030**. Both targets were achieved ahead of schedule—by October 2023, **non-fossil fuel capacity reached 43.81%**, and **emission intensity had reduced by 33% by 2019**.
 - In August 2022, India updated its NDCs, targeting a **45% reduction in emission intensity of GDP, 50% non-fossil fuel power capacity, and an additional 2.5–3 billion tonnes of carbon sink** through forest and tree cover by 2030.
 - According to **India's 4th Biennial Update Report (BUR-4) (2024)**, **emission intensity had reduced by 36%, non-fossil fuel capacity reached 47.10% by December 2024, and 2.29 billion tonnes of carbon sink had been created.**

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UNFCCC

Conference of Parties (COP)

- Supreme decision-making body of UNFCCC
- Meets every year (unless the Parties decide otherwise)

- Meets in **Bonn**, the Secretariat (unless a Party offers to host the session)
- First COP – held in **Berlin**, Germany (1995)

COPs and Their Major Outcomes

COP 3 (1997) Kyoto, Japan

Adopted Kyoto Protocol (legally bind developed countries to reduce emission targets)

COP 7 (2001) Marrakech, Morocco

Marrakech Accords signed (set stage for ratification of Kyoto Protocol)

COP 8 (2002) New Delhi, India

Delhi Declaration (development needs of the poorest countries)

COP 13 (2007) Bali, Indonesia

Bali Road Map and Bali action plan

COP 19 (2013) Warsaw, Poland

- Warsaw Framework for REDD Plus
- Warsaw International Mechanism for Loss and Damage

COP 18 (2012) Doha, Qatar

Doha Amendment to Kyoto Protocol (reducing GHG emissions by 18% compared to 1990 levels)

COP 16 (2010) Cancun, Mexico

- Cancun Agreements (assist developing nations in dealing with Climate Change)
- Estd: Green Climate Fund

COP 15 (2009) Copenhagen, Denmark

Developed countries pledged up to \$30 billion in fast-start finance (for 2010-12)

COP 21 (2015) Paris, France

- Paris Agreement (global temp. well below 2°C above pre-industrial times)
- Climate finance by rich countries (yearly \$100bn funding pledge)

COP 26 (2021) Glasgow, UK

- India announced Net Zero Targets 2070
- India called for "phase-down" of coal-based power
- Glasgow Breakthrough Agenda (by 41 countries + India)

COP 28 (2023) Dubai, UAE

- USD 700 mn pledged by UAE, Germany, UK, EU, & Japan for the **Loss & Damage Fund**
- Phase out fossil fuels to achieve net zero by 2050
- Reach 11,000 GW of RE by 2030
- 66 nations to cut cooling emissions by 68% by 2050
- Triple global nuclear energy capacity by 2050
- **India led Initiatives at COP 28:**
 - **Green Credit Initiative:** Issues credits for eco-friendly actions like planting on degraded lands
 - **LeadIT 2.0:** Supports fair industry transitions & low-carbon technology
 - **Global River Cities Alliance (GRCA):** Promotes sustainable river development & best practice sharing
 - **Quad Climate Working Group (QCWG):** Enhances local & regional sustainability efforts

COP 27 (2022) Sharm-el-Sheikh, Egypt

- Loss & Damage Fund
- USD 3.1bn plan for early warning systems
- G7-led 'Global Shield Financing Facility' for countries suffering climate disasters
- African Carbon Market Initiative
- Action for Water Adaptation and Resilience (AWARe) initiative
- Mangrove Alliance (in partnership with India)
- India's Long-Term Low Emission Development Strategy



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Plastic Waste a Public Health Threat

Why in News?

Studies have found alarming levels of **microplastics** and **endocrine-disrupting chemicals (EDCs)** in human tissues. **India, as the world's top plastic waste generator**, faces a growing public health crisis linked to fertility issues, cancers, and chronic diseases.

How are Microplastics and EDC in Plastics Affecting Human Health?

<h1>THE 7 TYPES OF PLASTICS</h1> <h2>THEIR TOXICITY AND WHAT THEY ARE MOST COMMONLY USED FOR</h2>							
TOXICITY CODE: LOW HIGH							
Polymer Name	POLYETHYLENE TEREPHTHALATE	HIGH-DENSITY POLYETHYLENE	POLYVINYL CHLORIDE	LOW-DENSITY POLYETHYLENE	POLYPROPYLENE	POLYSTYRENE	All other plastics, including acrylic, fiberglass, nylon, polycarbonate, and polylactic acid (a bioplastic)
Resin Identification Code							
Abbreviation	PET or PETE	HDPE	PVC	LDPE	PP	PS	OTHER
Recyclable?	Commonly Recycled	Commonly Recycled	Sometimes Recycled	Sometimes Recycled	Occasionally Recycled	Commonly Recycled (but difficult to do)	Difficult to Recycle
Percentage Recycled Annually	36%	30-35%	<1%	6%	3%	34%	Low
How Long to Decompose Under Perfect Conditions	5-10 Years	100 Years	Never	500-1,000 Years	20-30 Years	50 Years	Majority of these plastics: never Polylactic acid: 6 months
Maximum Temperature	70°C (158°F)	120°C (248°F)	70°C (158°F)	80°C (176°F)	135°C (275°F)	90°C (194°F)	Polycarbonate: 135°C (275°F) Polylactic acid: 150°C (302°F)
Brittleness Temperature	-40°C (-40°F)	-100°C (-148°F)	-30°C (-22°F)	-100°C (-148°F)	0°C (32°F)	-20°C (-4°F)	Polycarbonate: -135°C (-211°F) Polylactic acid: 60°C (140°F)
Toxicity Level							
Most Commonly Leached Toxin(s)	Antimony Oxide, Bromine, Diazomethane, Lead Oxide, Nickel Ethylene Oxide, and Benzene	Chromium Oxide, Benzoyl Peroxide, Hexane, and Cyclohexane	Benzene, Carbon Tetrachloride, 1,2-Dichloroethane, Phthalates, Ethylene Oxide, Lead Chromate, Methyl Acrylate, Methanol, Phthalic Anhydride, Tetrahydrofuran, and Tribasic Lead Sulfate, Mercury, Cadmium, Bisphenol A (BPA)	Benzene, Chromium Oxide, Cumene Hydroperoxide, And Tert-butyl Hydroperoxide	Methanol, 2,6-di-tert-Butyl-4-Methyl Phenol, and Nickel Dibutyl Dithiocarbamate	Styrene, Ethylbenzene, Benzene, Ethylene, Carbon Tetrachloride, Polyvinyl Alcohol, Antimony Oxide, and Tert-butyl Hydroperoxide, Benzoquinone	BPA, BPS, as well as all other toxins mentioned

- **Microplastics:** Microplastics are plastic particles **smaller than 5 mm**, formed either intentionally (primary) or through the breakdown of larger plastics (secondary).
 - **Primary microplastics** include microbeads in **cosmetics** and **fibres from textiles**.

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- **Secondary microplastics** result from the degradation of plastic waste due to sunlight and ocean waves.
- Microplastics are biologically active and have been found in **blood, lungs, heart, placenta, breast milk, ovarian follicular fluid, and semen**.
- **Affect:**
 - **Men:** Linked to lower sperm count, motility, abnormal morphology, and hormonal imbalance.
 - **Women:** Associated with poor egg quality, menstrual issues, miscarriage risk, **Polycystic Ovary Syndrome (PCOS)**, and endometriosis.
- **Endocrine-disrupting Chemicals:** EDCs are **natural or human-made chemicals** that may mimic, block, or interfere with the body's hormones, which are part of the endocrine system.
 - Plastics often carry EDCs like Bisphenol A (BPA) (in water bottles, food containers), phthalates such as DEHP and DBP (in cosmetics, toys, IV tubes), and PFAS (in food packaging, non-stick cookware).
 - **Affect:** These chemicals mimic or block hormones like estrogen and testosterone, disrupting reproductive health and metabolic functions.
 - Plastic additives like DEHP, BPA, and phthalates are classified as **probable carcinogens**.
 - EDCs also contribute to obesity, type 2 diabetes, thyroid disorders, and metabolic syndrome by mimicking cortisol and disrupting insulin response.
- **Plastic debris clogs rivers and drains**, worsening urban flooding and threatening aquatic biodiversity.
- Single-use plastics persist for centuries, polluting land and oceans and harming marine life. Cities like Mumbai see high microplastic exposure, while phthalate levels in drinking water exceed safe limits in Delhi, Jabalpur, and Chennai.
- Children in polluted areas face increased risks of **early puberty, learning issues, and obesity due to EDCs**.
- **Economic and Agricultural Impact:** India could lose **USD 133 billion** in plastic packaging value by 2030 if waste continues to go uncollected.
 - **Microplastics in soil** from plastic use in agriculture and poor wastewater treatment are degrading soil fertility and threatening food safety.
 - The **e-commerce boom** has escalated plastic packaging waste, most of which is non-recyclable.
- **Weak Infrastructure and Regulatory Oversight:** **Insufficient sanitary landfills**, poor segregation at source, and a lack of **advanced recycling technology** hinder effective waste processing.
 - **Informal sector recyclers**, though critical, operate unregulated, leading to gaps in plastic tracking and environmental safety.
 - The enforcement of policies such as the **Plastic Waste Management (Amendment) Rules, 2024** and **Extended Producer Responsibility (EPR)** remains inconsistent and inadequate.
 - Rise in **Single-Use Plastics (SUPs)**, which account for 43% of total plastic waste. Despite regulatory bans, enforcement remains poor due to the low cost and easy availability of such plastics.
- **Data and Policy Gaps:** Official collection rates (95%) are overstated; real rates are closer to 81%, hampering effective planning.
- **Global North-South Divide:** Despite lower per capita plastic use (0.12 kg/day), India's poor disposal systems result in more environmental leakage compared to high-income countries with better infrastructure.

What are the Concerns with Plastic Pollution in India?

- **Massive and Mismanaged Plastic Waste Generation:** India contributes **9.3 million tonnes** of plastic pollution annually (burning 5.8 mt and releasing 3.5 mt into the environment) making it the **world's largest polluter**, surpassing Nigeria, Indonesia, and China, according to a 2024 Nature study.
- **Environmental and Health Hazards:** **Open burning**, a common disposal method, emits toxic pollutants that **degrade air quality** and **harm respiratory health**.

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India's Initiatives Related to Plastic Waste Management

- [Swachh Bharat Mission](#)
- [India Plastics Pact](#)
- [Project REPLAN](#)
- [Un-Plastic Collective](#)
- [GoLitter Partnerships Project](#)

Evolution of Plastic Waste Management in India



50 Years of CITES

Why in News?

The [Convention on International Trade in Endangered Species of Wild Fauna and Flora \(CITES\)](#) completed 50 years on 1st July 2025.

Note: The United Nations General Assembly designated 3rd March as [UN World Wildlife Day](#) in 2013, to coincide with the anniversary of the signing of CITES.

What is CITES?

- **About:** CITES, also known as the Washington Convention, was signed on 3rd March 1973 during the World Wildlife Conference and came into force on 1st July 1975. It was drafted following a 1963 resolution adopted by the [International Union for Conservation of Nature \(IUCN\)](#) to regulate wildlife trade.
 - The Convention now has 185 Parties, including India (a member since 1976) and the European Union.
 - Administered by the [UN Environment Programme \(UNEP\)](#) in Geneva, CITES regulates international trade in over 40,000 species of wild animals and plants, including live specimens and wildlife-derived products.

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- The treaty aims to ensure that such trade is sustainable, legal, and traceable, supporting biodiversity, local livelihoods, and national economies in line with the [UN Sustainable Development Goals](#).
- **Working Procedure:** CITES regulates international trade through permits for export, import, re-export, and sea introduction. Each member country appoints management and scientific authorities to oversee licensing and conservation advice.
- **Appendices System:**
 - **Appendix I:** Species threatened with extinction. Trade is highly restricted.
 - **Appendix II:** Species not endangered but need controlled trade to avoid risk.
 - **Appendix III:** Species protected by at least one country that seeks cooperation to regulate trade.
- Changes to Appendices I and II are decided at the [Conference of the Parties \(CoP\)](#), while Appendix III can be amended unilaterally by individual Parties.
- **Importance:** Wildlife trade is a multi-billion dollar global industry, and unregulated trade alongside habitat loss threatens many species with extinction.
- CITES is recognized as one of the most effective environmental agreements, supported by tools like the [CITES Trade Database](#) (a global reference on legal wildlife trade) and [clear guidelines for enforcement and legal acquisition](#).
 - It has helped save **critically endangered species** such as **African elephants, pangolins, and crocodiles**.
- Initiatives like the [Monitoring the Illegal Killing of Elephants \(MIKE\)](#) Programme have significantly reduced poaching in Africa and Asia.
- All species listed in the [CITES Appendices](#) are now included in [Schedule IV of the Wild Life \(Protection\) Amendment Act, 2022](#), reflecting India's strengthened cooperation with CITES.
- **UN and CITES:** CITES complements the work of other UN entities, such as the [Food and Agriculture](#)

[Organization \(FAO\)](#) to improve fisheries management, capacity building and technical cooperation with the [Economic and Social Commission for Asia and the Pacific \(ESCAP\)](#), and initiatives focusing on the youth with the UN Development Programme.

India's Air Pollution Crisis

Why in News?

A recent **study** revealed that [secondary pollutants](#), particularly [ammonium sulphate \(sulphur dioxide \(SO₂\) + ammonia \(NH₃\)\)](#), contribute to nearly **one-third of India's PM_{2.5} pollution** highlighting the urgent need for air pollution controls.

- Over 60% of **SO₂ emissions** in India come from [coal-fired power plants](#), yet only **8%** have installed [mandatory Flue Gas Desulphurisation \(FGD\) systems](#), key to controlling **secondary PM_{2.5} pollution**.

What are Key Facts Regarding Air Pollution?

- **About:** Air pollution is caused by **chemical, physical, or biological substances** including **noise** that **disturb** the air's natural composition, mainly from **combustion, vehicles, industries, and fires**.
 - Key **pollutants** like **PM, CO, O₃, NO₂, and SO₂** are associated with serious **respiratory diseases** and higher **mortality rates**.
- **Types of Pollutants:** They are divided into **two types** based on how they **exist** in the **environment** after being **released**.
 - **Primary Pollutants:** They remain in the **same form** as they were **released** into the **environment**, such as **DDT, plastic, carbon monoxide (CO), carbon dioxide (CO₂), and oxides of nitrogen and sulphur**.
 - **Secondary Pollutants:** They are **produced** through **reactions** between **primary pollutants**. For instance, **peroxyacetyl nitrate (PAN)** is formed by the interaction of **nitrogen oxides** and **hydrocarbons**.

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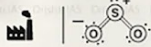


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Air Pollutants

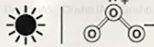
Sulphur Dioxide (SO₂)



It comes from the consumption of fossil fuels (oil, coal and natural gas). Reacts with water to form acid rain.

Impact: Causes respiratory problems.

Ozone (O₃)



Secondary pollutant formed from other pollutants (NO_x and VOC) under the action of the sun.

Impact: Irritation of the eye and respiratory mucous membranes, asthma attacks.

Nitrogen Dioxide (NO₂)



Emissions from road transport, industry and energy production sectors. Contributes to Ozone and PM formation.

Impact: Chronic lung disease.

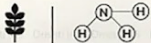
Carbon Monoxide (CO)



It is a product of the incomplete combustion of carbon-containing compounds.

Impact: Fatigue, confusion, and dizziness due to inadequate oxygen delivery to the brain.

Ammonia (NH₃)



Produced by the metabolism of amino acids and other compounds which contain nitrogen.

Impact: Immediate burning of the eyes, nose, throat and respiratory tract and can result in blindness, lung damage.

Lead (Pb)



Released as a waste product from extraction of metals such as silver, platinum, and iron from their respective ores.

Impact: Anemia, weakness, and kidney and brain damage.

Particulate Matter (PM)



PM10: Inhalable particles, with diameters that are generally 10 micrometers and smaller.

PM2.5: Fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller.

Source: Emitted from construction sites, unpaved roads, fields, fires.

Impact: Irregular heartbeat, aggravated asthma, decreased lung function.

Note: These major air pollutants are included in the Air quality index for which short-term National Ambient Air Quality Standards are prescribed.



- **Particulate Pollutants:** Particulate pollutants (also called particulate matter or PM) are tiny solid or liquid particles suspended in the air that can be harmful to human health and the environment.

- **PM10:** Particles with a diameter of 10 micrometers or less. E.g., dust, pollen, mold etc.
- **PM2.5:** Particles with a diameter of 2.5 micrometers or less. E.g., Vehicle emissions, industrial processes, power plants etc.

Measures Taken to Control Air Pollution:

- [National Clean Air Programme](#)
- [Graded Response Action Plan \(for Delhi\)](#)
- [New Commission for Air Quality Management](#)
- [System of Air Quality and Weather Forecasting and Research \(SAFAR\) Portal](#)

What is Flue Gas Desulphurisation (FGD)?

- **About:** Flue Gas Desulphurisation (FGD) is a process that removes sulphur dioxide (SO₂) from flue gas emitted during the combustion of fossil fuels like coal and oil.
 - It is mainly used in coal-fired power plants, using reagents such as limestone (CaCO₃), lime (CaO), and ammonia (NH₃).
- **Purpose:** Coal contains sulphur, and its combustion releases SO₂, causing acid rain. FGD cleans exhaust gases, preventing acid rain and protecting crops, infrastructure, soil, and aquatic ecosystems.
- **Types:** FGD systems are mainly of three main types:
 - **Dry Sorbent Injection:** It involves using limestone to remove SO₂ before it reaches dust control systems and is known for its simplicity and dry operation.

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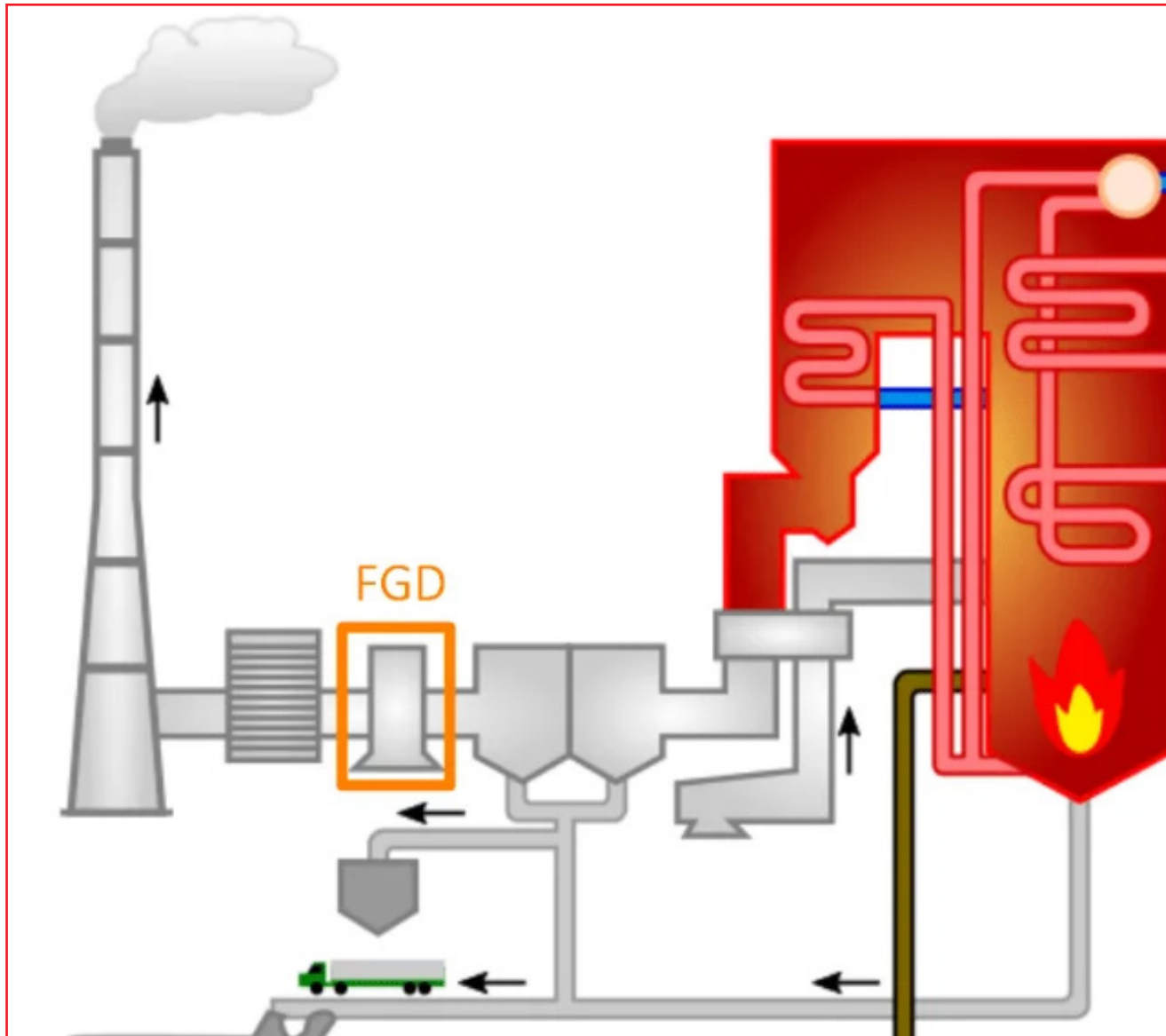
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- **Wet Limestone System:** It is ideal for large-scale applications, offering high SO₂ removal efficiency and producing useful **gypsum** as a byproduct.
- **Seawater-Based System:** It uses **alkaline seawater** to cut SO₂ emissions by 70–95%, suitable where **emission standards** are relaxed and initial costs are low.



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Art and Culture

Highlights

- Maratha Military Landscapes Added to UNESCO World Heritage List

Maratha Military Landscapes Added to UNESCO World Heritage List

Why in News?

At the 47th Session of the World Heritage Committee (WHC), India's official nomination for the 2024-25 cycle, the **Maratha Military Landscapes**, is inscribed on the **United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage List**.

- This makes it India's 44th World Heritage Site, following the 2024 inscription of the **Moidams of Charaideo, Assam**.

What is the Maratha Military Landscape?

- **About:** The Maratha Military Landscapes of India include **12 major forts**, mostly in Maharashtra and one in Tamil Nadu, built or expanded between the late 17th and early 19th centuries.
 - Strategically located in coastal and hilly areas, the forts formed a strong defence system that supported Maratha military power, trade, and territorial control.

12 Major Forts:

- **Maharashtra:** Salher, Shivneri, Lohgad, Khanderi, Raigad, Rajgad, Pratapgad, Suvarnadurg, Panhala, Vijaydurg, Sindhudurg
- **Tamil Nadu:** Gingee Fort
- **Classification by Terrain:**
 - **Hill Forts:** Salher, Shivneri, Lohgad, Raigad, Rajgad, Gingee.
 - **Hill-Forest Fort:** Pratapgad.
 - **Hill-Plateau Fort:** Panhala.
 - **Coastal Fort:** Vijaydurg.
 - **Island Forts:** Khanderi, Suvarnadurg, Sindhudurg.
- **Protection:** 8 forts (Shivneri, Lohgad, Raigad, Suvarnadurg, Panhala, Vijaydurg, Sindhudurg and Gingee) are protected by the **Archaeological Survey of India (ASI)**.
 - 4 forts (Salher, Rajgad, Khanderi and Pratapgad) are under the Directorate of Archaeology and Museums, Government of Maharashtra.
- **World Heritage Site Recognition:** The Maratha Military Landscape was nominated under **UNESCO criteria (iv) and (vi)** for its architectural, technological, and cultural significance, as well as its links to historic events.
 - Such inscriptions aim to protect and promote heritage with **Outstanding Universal Value (OUV)** across 196 countries.



Lohgad fort



Raigad Fort

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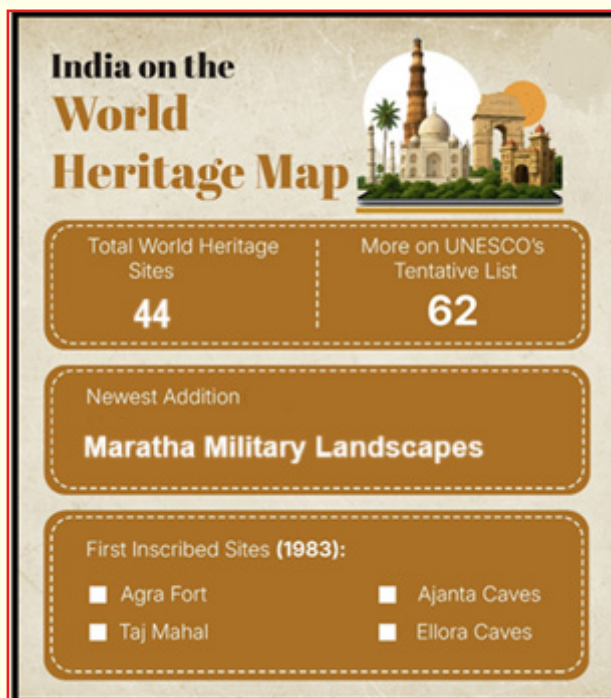


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Note: UNESCO, through the **1972 World Heritage Convention**, helps countries identify and protect cultural and natural heritage sites. India joined the Convention in 1977 (a total of 196 countries have ratified the 1972 World Heritage Convention).

- Every year, each State Party may propose just one site for consideration of the World Heritage Committee for inscription to the World Heritage List.
- India ranks **6th globally and 2nd in the Asia-Pacific for the highest number of World Heritage Sites**. With 62 sites on its **Tentative List of the World Heritage**, which is a mandatory threshold for any site to be considered as a World Heritage property in future.



What are the UNESCO World Heritage Selection Criteria?

- **Criteria for Selection:** To be listed as a UNESCO World Heritage Site, a place must have OUV and meet at least **one of ten selection criteria**. These are outlined in the Operational Guidelines, which serve as the main reference for implementing the World Heritage Convention.
 - Originally, there were **six cultural and four natural criteria**, but since 2005, a single unified set of ten criteria is used. The guidelines are updated regularly to reflect changes in how heritage is understood and protected.
 - After selecting a site from the Tentative List, the State submits a detailed nomination file. The World Heritage Centre reviews it before sending it for evaluation.
- **Evaluation:** A nominated property is independently evaluated by Advisory Bodies mandated by the **World Heritage Convention**: **ICOMOS (International Council on Monuments and Sites)**, **IUCN (International Union for Conservation of Nature)**.
 - ICCROM (International Centre for the Study of the Preservation and Restoration of Cultural Property), an intergovernmental organization that provides the Committee with expert advice on cultural site conservation and training activities.
- **Inscription:** After evaluation, the **World Heritage Committee** meets annually to decide on site inscriptions. It may also defer decisions and seek more information from States Parties.

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- India became a member of the World Heritage Committee from 2021-25.

Selection criteria

(i)

to represent a masterpiece of human creative genius;

(ii)

to exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design;

(iii)

to bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared;

(iv)

to be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history;

(v)

to be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change;

(vi)

to be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance. (The Committee considers that this criterion should preferably be used in conjunction with other criteria);

(vii)

to contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;

(viii)

to be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features;

(ix)

to be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals;

(x)

to contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

Operational Guidelines (year)	Cultural criteria						Natural criteria			
2002	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(i)	(ii)	(iii)	(iv)
2005	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(viii)	(ix)	(vii)	(x)



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Geography

Highlights

- *Melting Glaciers Can Trigger Volcanic Eruptions*

Melting Glaciers Can Trigger Volcanic Eruptions

Why in News?

A study presented at the 2025 Goldschmidt Conference in Prague has highlighted a potential link between **melting glaciers and an increase in volcanic activity**, particularly in regions like West Antarctica.

Note: Goldschmidt is the foremost annual, international conference on geochemistry and related subjects, organized by the European Association of Geochemistry and the Geochemical Society.

What are the Key Findings of the Study on Melting Glaciers and Volcanic Eruptions?

- **Subglaciated Volcanoes:** **Volcanoes** located under **glaciers and ice sheets, known as subglaciated volcanoes**, are found in regions such as Iceland, British Columbia, and Antarctica.
 - These volcanoes are sensitive to glacier retreat, which reduces the pressure that suppresses volcanic activity.
 - The greatest threat is in **West Antarctica**, where around 100 volcanoes lie beneath ice. As ice melts, volcanic activity may increase over decades to centuries.
 - Other regions at risk include North America, New Zealand, and Russia, due to ice melt and climate shifts.

- **Melting Ice and Volcanic Activity:** Ice sheets exert pressure on **magma** chambers beneath volcanoes, suppressing their eruption.
 - As glaciers and ice caps melt, the resulting **reduction in pressure allows underground gases and magma to expand**, increasing the likelihood of explosive eruptions.
 - This phenomenon, known as **glacial unloading**, was first proposed in the 1970s.
 - Precipitation, influenced by climate change, can seep underground and interact with magma systems, potentially triggering eruptions.
 - **Examples:** During Iceland's last major **deglaciation (~15,000 to 10,000 years ago)**, volcanic activity was 30–50 times higher than present rates.
- **Climate Effects of Volcanic Eruptions:**
 - **Short-Term Cooling:** Volcanic eruptions can temporarily cool the Earth by emitting **ash and sulfur dioxide into the atmosphere**, blocking sunlight.
 - Sulfur dioxide reacts with water in the **stratosphere**, forming **sulfuric acid aerosols that reflect solar radiation**, leading to surface cooling.
 - **Example:** Mt. Pinatubo (1991) cooled the Northern Hemisphere by ~0.5°C for over a year.
 - **Long-Term Warming:** Repeated eruptions emit greenhouse gases like CO₂ and methane, fueling global warming and creating a feedback loop of glacier melt triggering eruptions, and eruptions further accelerate warming and glacier retreat.

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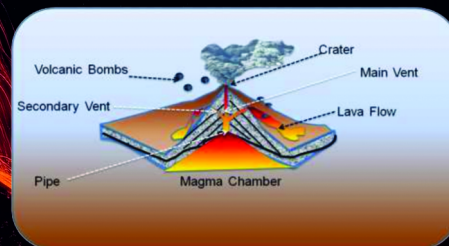


Glaciers

- **Glacier:** A large, slow-moving mass of ice formed from compacted layers of snow.
- **Formation:** Snow accumulates over time, compresses into firn, and then into dense glacial ice, a process that can take over a century.
- **Types:**
 - *Alpine glaciers* flow down mountain valleys.
 - *Ice sheets* (larger than 50,000 sq. km) exist only in Greenland and Antarctica.
 - *Ice caps* (<50,000 sq. km) are dome-shaped and found in high-latitude regions.
 - *Icefields* are smaller than ice caps and influenced by underlying terrain.
- **Glacial Ice Coverage:** ~10% of land surface (15 million+ sq. km).
- **Sea Level Impact:** If all glaciers and ice sheets melted, global sea level would rise by more than 195 feet (60 meters).
- **Largest Glacier by Area:** *Sheller Glacier* (Antarctica)
- **Longest Glacier:** *Bering Glacier* (Alaska).
- **Blue Glacial Ice:** Older glacial ice appears blue or turquoise because it absorbs all other colors of the light spectrum, scattering only blue. Its compact, dense crystalline structure enhances this effect, unlike the loose structure of regular freezer ice.

VOLCANOES

A volcano is a vent or a fissure in the crust from which lava (molten rock), ash, gases, rock fragments erupt from a magma chamber below the surface



● Types: On basis of -

○ Periodicity of Eruption:

- **Active volcano:** Recently Erupted
- **Dormant Volcano:** Potential for eruption, no imminent signs
- **Extinct:** No recent eruptions, low possibility in future

○ Nature of Eruption:

- **Hawaiian:** Calmest types (low gaseous content)
- **Strombolian:** Formation of large gas bubbles in magma
- **Vulcanian:** More explosive
- **Plinian eruptions:** Magma's volatile gases rise via a narrow conduit
- **Icelandic:** Often build lava plateaus

○ Shape of Volcanoes:

- **Shield volcanoes:** Composed of basaltic lava, low slope
- **Cone volcanoes (Cinder Cones):** Most abundant
- **Composite cones (stratovolcanoes):** Formed by layers of diverse materials.

● Volcanic Features:

○ Extrusive :

- **Crater:** Cone-shaped vent for magma
- **Caldera:** Large, crater-like depression
- **Volcanic Plateaus:** Leveled areas from fissure eruptions

○ Intrusive:

- **Batholiths:** Central core of a volcanic mountain.
- **Dyke:** Vertical intrusion cutting across country rock bedding.
- **Sills:** Tabular intrusions along sedimentary bedding.
- **Laccoliths:** Magma injection along horizontal sedimentary bedding.
- **Minor:**
 - **Geysers:** Underground water above 100°C, powered by magma, results in powerful eruptions with steam and diluted minerals.
 - **Hot Springs:** Heated water flows quietly along fault zones.

● Distribution of Volcanoes:

- Subduction zones (Circum Pacific Belt)
- Divergence zones (Mid Atlantic Ridge)
- Intra-plate oceanic volcanism (Hawaiian chain)
- Mid-continental belt and volcanoes in Mediterranean region

● Volcanoes in India:

- No volcanoes in Himalayas
- Barren Island (Only active volcano)

● Products of Volcanic Eruption:

- **Gases:** H, C, O, S, N, CH₄, NH₃
- **Solid:** Pyroclastic materials
- **Liquid:** Lava



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Volcano Facts

The Bad

- **Ash**
 - Causes respiratory problems
 - Triggers **lightning**
- **H₂O (water vapour)**
 - Largest contributor to **greenhouse gas** effect on earth
- **CO₂ (carbon dioxide)**
 - **Toxic** in large amounts >10%
 - Contributes to **global warming**
- **SO₂ (sulfur dioxide)**
 - Dissolves in water vapour to form damaging **acid rain**
- **H₂S (hydrogen sulfide)**
 - **Highly toxic** gas that smells like rotten eggs

The Good

Source of materials

Metals, precious gems, and construction material

Power Generation

Geothermal and hydroelectric opportunities

Rich volcanic soils

Yay coffee! The best coffee grows in volcanic soils

92,000

People killed in the deadliest volcano in **Indonesia** in **1815**

20

Volcanoes are **erupting** right **Now**

Supervolcanoes can plunge the world into an **ice age**

Krakatoa eruption **ruptured eardrums** within **50 KM radius**

2X more **ash** by weight erupted from Mt. St Helens (USA) in 1980 than garbage the entire US produces in 1 year

\$2.2 Billion worth of electrical energy wasted by Krakatoa volcano in **1883, Indonesia**



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Security

Highlights

- Refugee, Deportation and Related Issues in India

Refugee, Deportation and Related Issues in India

Why in News?

India has intensified its action against **illegal migrants**, particularly along the **eastern border**, through measures such as **deportation** and **pushbacks**, in the wake of recent **national security concerns** and **political developments in Bangladesh**.

- However, increasing cases of **wrongful expulsions**, including of **Indian citizens**, have raised serious concerns regarding **citizenship verification**, **due process**, and **constitutional safeguards**.

What is Deportation and Pushbacks?

Deportation

- **About:** Deportation is the **formal, legal process** of removing a foreign national from Indian territory who is staying **illegally or without valid documents**.
- **Procedure:** Detection → Detention → Legal proceedings → Identity verification → Repatriation via **diplomatic channels**.
 - Governed by laws like the **Foreigners Act, 1946**, and the **Immigration and Foreigners Act, 2025**.
- **Involves:** **Ministry of Home Affairs (MHA)**, **Foreigners Regional Registration Office (FRRO)**, and concerned embassy.
- **Safeguards:** Involves **judicial oversight**, compliance with **Article 21 (Right to Life)** and **international norms**.

Pushback

- **About:** Pushback refers to the **informal or extra-legal practice** of **forcibly returning** suspected foreigners,

especially near **international borders**, without due legal procedure.

- **Conducted by:** Primarily **Border Security Force (BSF)**, often at the point of interception.
- **Legal Status:** **Not codified in Indian law**, lacks judicial oversight or nationality verification.
- **Concerns:**
 - **Violation of due process**, risk of **mistaken identity**, and breach of **human rights norms** (e.g., **non-refoulement principle**).
 - Recent cases involve wrongful pushback of **Indian citizens** from **Assam and West Bengal**.

What are the Key Legislations Regulating Immigration and Foreigners in India?

- **Immigration and Foreigners Act, 2025:** It replaced four outdated laws like the **Foreigners Act (1946)**, **Passport (Entry into India) Act (1920)**, **Registration of Foreigners Act (1939)**, and **Immigration (Carriers' Liability) Act (2000)**.
 - It aims to **modernize and streamline the entry, stay, and exit of foreigners** with key provisions.
 - **Stricter Entry & Deportation Norms:** **Valid passport/travel document mandatory**; visa required unless exempted. Entry can be **denied on grounds like national security, sovereignty, public health, or foreign relations**. **Immigration Officers' decisions** are final.
 - **Institutional Framework:** Establishes **Bureau of Immigration (BoI)** as a statutory body for visa issuance, border control, and foreign registration.
 - **Mandatory Reporting:** Foreigners must **register**; **hotels, educational institutions, hospitals, and householders in notified areas** must report foreign nationals.

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- **Movement Restrictions: Special permits required for Protected/Restricted/Prohibited areas** (e.g., border zones, strategic sites). Foreigners cannot change names without permission; movement may be restricted by the government.
- **Penalties: Up to 5 years' imprisonment or Rs 5 lakh fine** for unauthorized entry.
- **Immigrants (Expulsion from Assam) Act, 1950:** Enacted to **manage the post-Partition influx from East Pakistan into Assam**.
 - Though applicable nationwide, it contains **Assam-specific provisions** allowing the **Union Government** to expel individuals or groups who were ordinarily residents outside India if deemed **detrimental to public interest or Scheduled Tribes in Assam**.
 - **Section 2** empowers authorities to order such persons to leave **India or Assam** within a specified time and route.
- **Foreigner Registration: Foreign nationals** (including Persons of Indian Origin) with **long-term visas (over 180 days)** must **register with the FRRO** (Foreigners Regional Registration Officer).
- **Citizenship Act, 1955:** Governs the **acquisition, renunciation, and registration** of citizenship, including provisions for **Overseas Citizens of India (OCI)**.

India's Refugee Policy

- India is **not a signatory** to the **1951 UN Refugee Convention** or its **1967 Protocol** and has **no dedicated domestic refugee law**.
 - India has refrained from signing the Convention due to its **narrow and Eurocentric definition** of refugees, which excludes **economic migrants** and does not align with **South Asian realities**.
 - Additionally, India is concerned that binding obligations may compromise its **sovereignty**, impact **domestic security**, and limit its ability to follow an **ad hoc, humanitarian approach** to refugee protection.

- Refugees from countries like **Myanmar, Afghanistan, and Sri Lanka** are governed under the **Foreigners Act, 1946**, without specific legal protections.
- **States cannot grant refugee status**, reinforcing India's **centralised, ad hoc approach**, offering **humanitarian assistance** without **legal recognition or rights**.

Special Provisions for Border Movement

- **Nepal: India-Nepal Treaty of Peace and Friendship (1950)** allows free movement of citizens without visas.
- **Myanmar: Free Movement Regime (FMR)** permits people within 10 km on either side of the border to cross without a visa.
 - **Post-2023 Manipur violence**, MHA decided to **fence the entire 1,643 km India-Myanmar border** to curb illegal migration.
- **Bangladesh and Pakistan:** Controlled movement governed by passport and visa; no FMR.

What are the Key Issues Associated with Deportation and Pushbacks and Ways to Ensure a Fair and Legal Approach?

Issues Associated with Deportation and Pushbacks

- **Denial of Due Process: Foreigners' Tribunals (FTs)** often **presume foreignness** and **place the burden of proof on the accused**, who may lack means to establish their identity.
 - Pushbacks, as an **extralegal mechanism**, **deny the accused a fair hearing**, resulting in decisions that **violate natural justice**.
- **Impact on Marginalized Groups:** Tribals, migrant workers, and the poor, least likely to retain documentation are **most affected**. Citizenship becomes **conditional on documents** rather than **birth or residence**.
 - **Example:** The **Assam NRC** excluded nearly **2 million people**, affecting **all communities** and revealing that the exercise was **not limited to excluding only foreign nationals**.

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- **Weak Safeguards & Judicial Oversight:** Extra-legal mechanisms like **pushbacks** often **bypass due process** and **reduce the scope of judicial scrutiny**, raising concerns over **accountability and constitutional checks and balances**.
- **Misuse of Legal Interpretations:** Authorities have cited **outdated laws**, such as the **Assam Maintenance of Public Order Act, 1950**, to justify deportations.
 - **Example:** The **authorities in Assam** referenced a **Supreme Court ruling** to support deportation actions. However, deportations without due process violate the **constitutional principles** of **fairness and justice**, stripping individuals of rights like **voting, residence, and return**.



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Rapid Fire Current Affairs

Highlights

- DNA Profiling of Assam Rhino Horn
- 3rd edition of Trade Watch Quarterly for FY 2024-25
- Revival of Machilipatnam Port
- Exercise Talisman Sabre 2025
- Astra Missile
- Software Technology Parks of India
- Grey Seal
- Enumeration of Andaman and Nicobar Tribes
- Sierra Leone's First UNESCO Site Gola-Tiwai Complex
- Reversal on ELV Fuel Ban
- Global HIV/AIDS Fight at Risk
- Himalayas and Kashmir's Climate Shift
- INS Nistar
- International Criminal Court (ICC)
- Revival of Lotus in Wular Lake
- Indigenous MALE Drones
- Sariska Tiger Reserve
- Advancements in Magnetic Field Measurements
- Eklavya Model Residential Schools
- Pethia dibrugarhensis
- Great Hornbill
- Vera C. Rubin Observatory
- Sierra Leone
- Gene-Edited Japonica Rice
- Cooperative Stack: Integrating Rural Schemes Through PACS
- Phenome India National Biobank
- Smart Mosquito Surveillance System
- India's First National Cooperative University
- Operational License for Indigenous 700 MWe PHWRs
- Miniature Coronal Loops
- India's First Equine Disease-Free Compartment
- Helgoland
- SEBI Bans Jane Street
- Ham Radio & Life on the International Space Station
- Birth Anniversary of Dr. Syama Prasad Mookerjee
- Low-Cost Sensor to Detect Toxic Sulfur Dioxide
- High-Efficiency Material for Next-Gen Energy Storage
- Mahabodhi Temple
- SC Upholds Legislative Authority of State
- Chemical Weapons Convention
- Garcinia Kusumae
- BHARAT Study: Mapping Healthy Ageing Biomarkers
- Kariyachalli Island
- DengiAll
- NCB's Operation- MED MAX
- Teak Leaves for Laser Protection
- Electronic Private Automatic Branch Exchange
- Kharai Camel
- Earth's Oldest-Known Rocks
- Hul Diwas
- Digital Fossil-Mining and Evolution of Squids
- India's First Mobile E-Voting in Bihar
- Inauguration of National Turmeric Board in Nizamabad

DNA Profiling of Assam Rhino Horn

The **Assam Forest Department**, in collaboration with the **Wildlife Institute of India (WII)**, has launched a **DNA profiling** initiative for 2,573 rhino horn samples to strengthen **conservation and wildlife crime investigations**.

DNA Profiling of Rhino Horns:

- **About:** As part of **anti-poaching and conservation efforts**, rhino horn samples retained during the public burning of seized and naturally deceased rhino horns in 2021 are being **DNA profiled**.
 - Samples, mainly from **poaching seizures** and **natural deaths**, were verified at **Kaziranga National Park, Assam**.

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- **Genetic Analysis:** Samples have been sent to the **Wildlife Institute of India (WII)**, Dehradun, for DNA analysis under the **RhoDIS (Rhino DNA Index System) India** programme.

RhoDIS India:

- Launched in **2016**, RhoDIS India is a collaborative initiative of the **Ministry of Environment, Forest and Climate Change (MoEFCC)**, **rhino-range States**, the **WII**, and **WWF-India**.
- It aims to **create individual DNA profiles** of **rhino horns** for integration into a **national forensic database**, supporting **wildlife crime investigations** and the **genetic conservation planning** of the **one-horned rhinos**.

One-Horned Rhino (*Rhinoceros unicornis*):

- The **greater one-horned rhino** (or **Indian rhino**) is the **largest rhino species**, identified by a **single 8–25 inch black horn** and **armor-like skin folds**.
- It is mostly **solitary** and has **overlapping, loosely defined home ranges**. It is a **grazer**, feeding mainly on **grasses**, along with **leaves, fruits, and aquatic plants**.
- Assam holds **80% of the global one-horned rhinoceros population**, with **Kaziranga National Park** (1,300 sq km) alone housing **70% of them** (as of 2022).
- Due to sustained **conservation efforts**, **India's rhino population** has grown by **170% since the 1980s**, rising from around **1,500 to over 4,014 in 2024**.

RHINOCEROS

World Rhino Day - 22nd September (declared by WWF in 2010)

5 Main Species of Rhino			
Species	Found in	IUCN Red List Status	Habitat
African White	Africa	NT	Long/short grass Savannah
African Black	Africa	CE	Semi-Desert Savannah
Greater one-horned	Asia	Vu (CITES - Appendix I, WPA - Schedule I)	Tropical grassland
Javan	Asia	CE	Tropical, subtropical forests
Sumatran	Asia	CE	Same as Javan

Ujung Kulon National Park (a UNESCO WHS) is home to the last remaining wild Javan rhinos on Earth

Greater One-Horned Rhino

Only species found in India (aka Indian Rhino)

CHARACTERISTICS

- Largest of the 5 species
- Identified by a single black horn and a grey-brown hide with skin folds

Protected Areas (India)

- **UP**
 - Dudhwa TR
- **West Bengal**
 - Jaldapara NP
- **Assam**
 - Pabitora WLS
 - Orang NP
 - Kaziranga NP (max no. of Rhinos: ~2400)
 - Manas NP

Threats

- Poaching for horns
- Habitat loss
- Decreasing Genetic diversity

Conservation Efforts (India)

- National Rhino Conservation Strategy
- Indian Rhino Vision 2020 (launched in 2005)

New Delhi Declaration on Asian Rhinos 2019

Signed by 5 rhino range nations (India, Bhutan, Nepal, Indonesia and Malaysia)

Read More: [State of the Rhino 2023](#)

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3rd edition of Trade Watch Quarterly for FY 2024-25

NITI Aayog (National Institution for Transforming India) released the 3rd edition of its **Trade Watch Quarterly report** for Q3 of FY 2024–25 (October to December 2024). It offers a comprehensive analysis of India's trade trends.

Key Findings of the Trade Watch Quarterly Report for Q3 of FY 2024–25

- **India's Merchandise and Services Trade Performance:**
 - **Merchandise Exports:** India's merchandise exports grew by **3%** in Q3 FY25, reaching **USD 108.7 billion**.
 - **Merchandise Imports:** Imports rose by **6.5%**, totaling **USD 187.5 billion**.
 - **Services Surplus:** India's services surplus amounted to **USD 52.3 billion**, driven by a **17%** increase in services exports, reflecting the growing strength of India's services sector on the global stage.
 - **Export Composition:** High-tech products like **aircraft, spacecraft, and parts** saw a remarkable **200% growth** year-on-year, further diversifying India's export composition.
 - Exports like **electrical machinery** and **arms/ammunition** are growing rapidly. These have expanded at a **10.6% compound annual growth rate (CAGR)** since 2014
 - **Digital Services:** India ranked 5th globally with USD 269 billion in Digitally Delivered Services (DDS) exports in 2024.
- **Impact of US Trade Policy on India:** The Q3 edition highlights shifts in US trade policies, creating both risks and opportunities. India has a tariff advantage over key competitors in the US, which opens up growth potential in sectors like pharmaceuticals, textiles, and electrical machinery.

Read more: [India's Trade Dynamics](#)

Revival of Machilipatnam Port

Machilipatnam Port, Andhra Pradesh, was once a prominent **ancient port city**. It is now undergoing a major revival with the construction of a **Greenfield port**, expected to become operational by the end of 2026.

- **Ancient Legacy:** Machilipatnam also known as **Masulipatnam or Maisolia**, it flourished as a trading hub as early as the 1st century AD and possibly during **Satavahana rule** (2nd Century BC – 2nd Century AD).
 - Traded with **Rome, China, Persia, and Southeast Asia**; exports included spices, cotton cloth, sugar, and elephants.
 - From the 1570s, under **Ibrahim Quli Qutb Shah**, Masulipatnam's trade flourished and peaked during **Abdullah Qutb Shah's** rule in the late 17th century.
 - Known as **Bandar-i-Mubarak** in Golconda records, it was connected to **Hyderabad** by road and became a profitable port, exporting **chintz** and other goods across Asia, Africa, and Europe.
 - In the 17th century, it was the only eastern port with direct trade links to Pegu, Siam, Bengal, Manila, Cochin, Madagascar, China, and Mecca.
- **Cultural Diversity:** Machilipatnam hosted a mix of **Mongols, Turks, Persians, Jews, Tamils, Dutch, French, and more**.
- **Decline Factors:** Major cyclones (notably in 1867, killing ~30,000) and Mughal neglect led to its fall. The final blow came under the British, who shifted focus to **Madras (Chennai)**.
- **Revival:** The new **Greenfield port** at **Manginapudi**, nearing 50% completion, is expected to commence operations by **end-2026**. It is being developed under a **Special Purpose Vehicle (SPV) Machilipatnam Port Development Corporation Ltd**, using the **Landlord Model**.
- **Economic Impact:** Exports from the port will include **coal, pharma, cement, fertilizers, and container traffic**.
 - **Telangana** is also working on establishing a **dry port facility** and a direct **freight corridor** to Machilipatnam, boosting regional trade.

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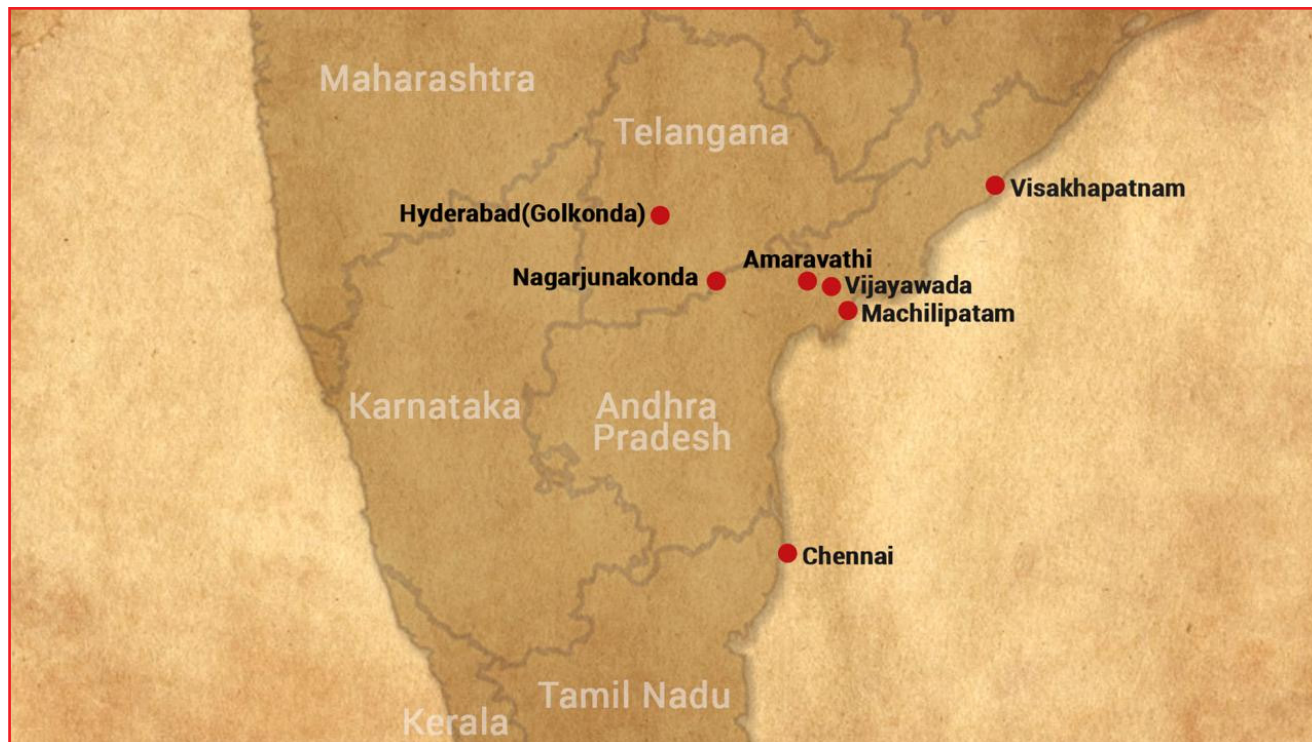
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- **Local communities** are set to benefit from **increased land prices** and **employment opportunities** as the port construction progresses.



Read more: [PM Inaugurates Vizhinjam International Seaport](#)

Exercise Talisman Sabre 2025

India, for the **first time**, is participating in the **11th** edition of Exercise Talisman Sabre 2025, a major **Australia-led** multinational military exercise.

Exercise Talisman Sabre 2025

- **About: Exercise Talisman Sabre**, launched in **2005** and held **biennially**, began as a **bilateral military drill between Australia and the US** and has since evolved into a major **multinational warfighting exercise** involving key **Indo-Pacific** partners apart from European partners.
 - The **11th and largest-ever** edition of this exercise involves **over 35,000 military personnel** from **19 nations**, including **Australia, US, India, Japan, France, UK**, and others, showcasing enhanced **multinational coordination and capability**.
 - Conducted across **Queensland, Northern Territory, Western Australia, New South Wales, and Christmas Island**, with **first-time extension to Papua New Guinea**, marking expanded regional engagement.
- **Objective:** It aims to promote a **free, open, and inclusive Indo-Pacific**, enhance **military readiness, interoperability, joint operational capability** and reinforce the **regional security architecture** among allied nations.
- **Location:** Organised across multiple **Defence and non-Defence training areas in Australia** and **offshore locations**.
- **Key Military Activities:** Includes **live-fire drills, field training, amphibious landings, ground force manoeuvres, air combat, maritime operations**, and **force preparation exercises**, enhancing joint warfighting capabilities.

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Key India-Australia Military Exercises

- **Ausindex** (naval), **Pitch Black** (air), **Austrahind** (military).

Key India-US Military Exercises

- **Yudh Abhyas** (military), **Tiger Triumph**, **Cope India** (air) and **Vajra Prahar**.

Read More: [Major Military Exercises of India](#), [India-Australia Relations](#)

Astra Missile

The **DRDO** and Indian Air Force (IAF) has successfully test-fired the indigenous Beyond Visual Range Air-to-Air Missile (BVRAAM) 'Astra' with an indigenously developed Radio Frequency (RF) Seeker from a **Su-30 Mk-I fighter aircraft** off the coast of Odisha.

BVRAAM Astra:

- **About:** Astra is India's first indigenous BVRAAM, designed to target enemy aircraft **beyond line-of-sight**.
 - It is equipped with a **DRDO-developed indigenous Radio Frequency (RF) Seeker**, which enables the missile to **detect, track, and lock onto targets using radar**, ensuring high accuracy in the terminal phase.
- **Key Features:**
 - Astra is India's first **indigenous BVRAAM**, capable of engaging **supersonic, manoeuvrable targets** beyond **100 km** and up to **20 km** altitude.
 - Uses **inertial navigation**, **mid-course data link updates**, and **active radar homing**, with a **smokeless solid-fuel engine** for enhanced stealth.
 - Equipped with a **DRDO-developed active RF seeker**, enabling **fire-and-forget** and **buddy launch mode**, where one aircraft launches and another guides.

Indigenous Mounted Gun System (MGS):

- DRDO's **Vehicle Research and Development Establishment (VRDE)** has developed a fully indigenous **155mm/52 calibre MGS**, which can be deployed in just **80 seconds**.

- **MGS** is a type of **mobile artillery weapon** where a **large-calibre gun** (like a 155mm howitzer) is mounted on a **wheeled or tracked vehicle** instead of being towed separately.

Su-30MKI:

- The **Su-30MKI** is a **twin-engine multirole fighter** developed by **Russia's Sukhoi** and built by **HAL** for the **IAF**.
 - Inducted in **2002**, it performs **air superiority**, **ground attack**, **electronic warfare**, and **maritime strike** roles, and is a key asset in India's combat fleet.



Read More: [Astra Mk-1 Missile](#)

Software Technology Parks of India

The **Software Technology Parks of India (STPI)** is expanding beyond traditional metro hubs to promote inclusive IT growth, focusing on Tier 2 and 3 cities.

- It aims to encourage **entrepreneurship in software**, **business process management**, and product innovation to build **India's largest tech startup ecosystem** under the **National Policy on Software Products (NPSP) 2019**.
- **STPI:** Established in 1991, the STPI is an autonomous society registered under the Societies Registration Act, 1860.
 - It was set up under the then **Department of Electronics** (now **Ministry of Electronics &**

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Information Technology) to implement the Software Technology Park (STP) and Electronics Hardware Technology Park (EHTP) schemes.

- It provides high-speed data communication, incubation facilities, and supports start-ups across India through initiatives like **Centres of Entrepreneurship (CoEs)** and the **Next Generation Incubation Scheme (NGIS)**.
- **Achievements:** Currently operating 67 centres, with 59 in non-metro locations, STPI created 17 lakh sq. ft. of incubation space to support startups and MSMEs in smaller towns.
 - STPI-registered units contributed USD 110 billion to **India's total software exports** of over USD 200 billion in FY 2024–25. About USD 90 billion came from **special economic zones**-based companies.
 - STPI has created 24 CoEs nationwide to encourage a start-up culture in the product space.
 - Since 2023, STPI has supported 1,500 startups, 800 **Intellectual Property Rights (IPRs)**, and over 2,000 product innovations.

Read more: [National Policy on Software Products 2019](#)

Grey Seal

As climate change, pollution, and overfishing threaten the **Grey seal (*Halichoerus grypus*)** in the **Baltic Sea**, Lithuania has launched a rehabilitation effort to support their survival and restore population balance.

- **Habitat & Range:** Gray seals **live in coastal waters of the North Atlantic**, from the US and Canada to the Baltic Sea and parts of Europe. They haul out on rocky coasts, islands, sandbars, and ice.
- **Appearance:** Males can grow up to **10 feet long**, **females are smaller**. Males have **large, horse-like heads**. Pups are born with white lanugo fur that helps retain warmth.
- **Behavior & Diet:** They gather in large groups for mating and molting, but often live **alone or in small groups otherwise**. Their diet includes fish, squid, and sometimes seabirds.

- The seals, being **apex predators**, absorb high levels of pollutants, making them **indicators of marine ecosystem health**.

- **Breeding & Lifespan:** Gray seals live 25–35 years. Females give birth to a single pup after an 11-month pregnancy.
- **Conservation Status:** The Baltic Sea subpopulation of grey seal is listed as **Least Concern on the IUCN Red List**.
- **Threats:** Grey seals in the Baltic Sea face major threats from receding ice cover, pollution, shrinking fish stocks, and disease.



Read more: [Toxic Bloom Turns Sea Lions Aggressive](#)

Enumeration of Andaman and Nicobar Tribes

The planned **16th Census of India (2026–27)** will include an enumeration of the six major indigenous tribes of the **Andaman and Nicobar (A & N) Islands** namely **Great Andamanese, Onge, Jarawa, Sentinelese, Shompen, and Nicobarese**. Except for the Nicobarese, all others are classified as **Particularly Vulnerable Tribal Groups (PVTGs)**.

- **Great Andamanese:** Once the largest tribe in the Andaman Islands, the Great Andamanese now number just 43 (Census 2001), settled on **Strait Island**. Their decline began with diseases like **influenza** post the establishment of the **Penal Settlement**.

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- Historically, they are known for resisting British intrusion in the Battle of Aberdeen (1859).
- They are no longer nomadic, though occasional hunting and fishing continue.
- **Onges:** One of India's most primitive hunter-gatherer tribes, live in Little Andaman, mainly at Dugong Creek and South Bay.
 - As per Census 2001, the Onges are a semi-nomadic tribe with a population of 96. Traditionally dependent on nature, they now receive government aid and are known for their **canoe-making and crafts**.
- **Jarawa:** They are a **nomadic, hunting-gathering tribe** living along the western coast of Middle and South Andaman. As per Census 2011, their population is 380.
- **Sentinelese:** A hunting and gathering tribe, **inhabit North Sentinel Island and remain hostile to outsiders**. Though brief friendly contact was made

in 1991, they largely avoid interaction. As per Census 2001, their population was 39.

- **Shompens:** Shompen have Mongoloid features, unlike the other Negroid-featured tribes (like Great Andamanese, Onge, Jarawa, and Sentinelese)
 - Shompens inhabit Great Nicobar, They are divided into **Mawa Shompens** (coastal, river valley dwellers) and **hostile Shompens** (interior forest areas).
 - They are highly isolated, semi-nomadic hunter-gatherers. The estimated population of the Shompen tribe was 229 as per the 2011 Census data.
- **Nicobarese:** Nicobarese live across 19 Nicobar Islands. They are of Mongoloid origin, with a population of over 27,000. Society is organized into six territorial groups and follows a **patriarchal joint family system called Tuhet**, which collectively owns land and resources.



Read more: [Reimagining Andaman and Nicobar Islands](#)

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Sierra Leone's First UNESCO Site Gola-Tiwai Complex

Sierra Leone's Gola-Tiwai complex, comprising the Gola Rainforest National Park (GRNP) and the Tiwai Island Wildlife Sanctuary, has been inscribed as its first [United Nations Educational, Scientific and Cultural Organization \(UNESCO\) World Heritage Site](#), due to decades-long conservation efforts by a non-governmental organization Environmental Foundation for Africa (EFA).

- **Tiwai Island**, located on the **Moa River**, spans just **12 sq. km** and hosts **11 species of primates**, including **endangered western chimpanzees** and **king colobus monkeys**.
 - Tiwai now serves as a **biodiversity research hub** and model for **community-based conservation** in West Africa.
- **GRNP** is Sierra Leone's **largest tropical rainforest**, rich in biodiversity, including **pygmy hippopotamuses** and **African forest elephants**.
- **EFA** was established in 1992 and began conservation efforts in **Tiwai** in the early 2000s, especially after damage from Sierra Leone's **1991–2002 civil war**.
 - During the war, **deforestation, poaching, and illegal logging** nearly destroyed Tiwai, but EFA led **reconstruction, community engagement, and biodiversity protection**.
 - Despite the **Ebola outbreak (2014)**, **Covid-19**, and extreme weather, EFA protected Tiwai and surrounding forests from ecological collapse.
- The **UNESCO recognition** is a landmark for Sierra Leone, validating grassroots conservation models rooted in **local empowerment and ecological resilience**.



Read more: [Sierra Leone](#)

Reversal on ELV Fuel Ban

The **Delhi government** has rolled back its fuel ban on **end-of-life vehicles (ELVs)**-Petrol cars over **15 years** and diesel vehicles over **10 years** as directed by the **Commission for Air Quality Management (CAQM)**.

- **CAQM** is a **statutory body** for ensuring **coordinated action, scientific research**, and effective resolution of air pollution issues in the **Delhi NCR and adjoining areas**.

Legal Mandate for Fuel Ban on ELVs:

- **NGT Orders (2015)**: **NGT** banned **diesel vehicles over 10 years** and **petrol vehicles over 15 years** in Delhi-NCR and **barred their re-registration**.
- **Supreme Court (SC) Ruling (2018)**: **SC in MC Mehta vs Union Of India, 2018** case upheld NGT orders and permitted impounding of non-compliant vehicles.
- **Motor Vehicles Act, 1988**: Under the **Motor Vehicles Act, 1988**, private vehicle registration is valid for **15 years**, after which renewal is required.

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- **Central Motor Vehicles Rules, 1989:** Expired registration makes a vehicle legally unfit for road use.
- **Environment Protection (End-of-Life Vehicles) Rules, 2025:** Mandates scrapping of vehicles within 180 days of registration expiry.

State of Air pollution in India:

- Air pollution poses a severe public health challenge in India, contributing to approximately **1.67 million deaths each year**, according to the **WHO**, and is responsible for **17% of all deaths** nationwide, as reported by the **State of Global Air 2023**.
- The **2024 World Air Quality Report (IQAir)** ranks India as the **5th most polluted country**, with an average **PM2.5 level of 50.6 µg/m³**, ten times above the WHO safe limit. **Delhi** remains the world's most polluted capital.

Read More: [India's Air Pollution Crisis](#)

Global HIV/AIDS Fight at Risk

According to the **UNAIDS**, a sudden halt in US funding for the **President's Emergency Plan for AIDS Relief (PEPFAR)** threatens to reverse decades of progress in the fight against **HIV/AIDS**.

- In **January 2025**, the **US** suddenly **withdrew** its **USD 4 billion pledge**, potentially leading to **4 million more AIDS-related deaths** and **6 million new HIV infections** by **2029**.
- A breakthrough injectable drug, **Yeztugo**, shows **100% prevention efficacy** — but the **high price** is keeping it out of reach for most low- and middle-income countries.
- **PEPFAR**, launched in **2003**, aims at **preventing Human Immunodeficiency Virus (HIV) infections**, and saves lives.
- **UNAIDS (Joint United Nations Programme on HIV/AIDS)** is the UN's leading global agency dedicated to:
 - **Ending AIDS** as a public health threat by **2030**
 - **Coordinating HIV response** across **11 UN agencies** (e.g., WHO, UNICEF, World Bank)
 - Advocating for equitable access to **prevention, treatment, and care**.

Read More: [US Agency for International Development](#)

Himalayas and Kashmir's Climate Shift

A recent **palaeobotanical study** conducted by scientists from the **Birbal Sahni Institute of Palaeosciences (BSIP)**, Lucknow, has revealed that the **Kashmir Valley**, currently known for its **cool Mediterranean-type climate**, was **once a warm and humid subtropical region** approximately 4 million years ago.

- **BSIP was founded in 1946** to promote research in palaeobotany, and its **foundation stone was laid by Prime Minister Jawaharlal Nehru** in 1949. It received **UNESCO support (1951–53)** and became an autonomous body in **1969**, funded by the **Department of Science and Technology (DST)**.

Study on Kashmir's Climate Shift

- **About the Study:** The study, based on a **historic fossil leaf collection** at BSIP, was prompted by a **climatic mismatch** between **subtropical fossil specimens** and **Kashmir's present-day temperate flora**, leading to a **fresh investigation** into the valley's ancient climate.
- **Scientific Techniques Used:** To reconstruct Kashmir's palaeoclimate, the study used two key methods—**CLAMP (Climate Leaf Analysis Multivariate Program)**, which analyzed **leaf morphology** (shape, size, margins) to estimate past **temperature and rainfall**, and the **Coexistence Approach**, which compared **fossil taxa** with their **modern relatives** to infer ancient **climate ranges**.
- **Key Findings:** **Fossilized leaves** from the **Karewa sediments from Kashmir** indicate that the valley once supported a **lush subtropical forest**.
 - Many fossils resemble modern species from **warm and humid climates**, contrasting sharply with today's **alpine and coniferous vegetation**.
 - The study attributes this climatic shift to the **tectonic uplift of the Pir Panjal Range**, part of the **sub-Himalayan system**.
 - This uplift acted as a **geological barrier**, blocking the **Indian summer monsoon**, thereby reducing rainfall and transforming the region's climate over geological timescales.

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- **Significance of the Study:** The study enhances **climate modelling** by linking **tectonic activity** with **ecosystem change**, highlights the **sensitivity of Himalayan ecosystems**, and offers analogues for understanding **monsoon dynamics**, **glacial melt**, and **topography interactions**.
 - It underscores the **policy relevance of palaeoclimate research** for **biodiversity conservation**, **disaster preparedness**, and **sustainable development** in fragile mountain regions.

Read More: [Himalayas More Prone to Extreme Weather Events](#)

INS Nistar

The **Indian Navy** has inducted **INS Nistar**, its first **indigenously built Diving Support Vessel (DSV)**, delivered by **Hindustan Shipyard Limited (HSL)**, Visakhapatnam.

- A **DSV** is a **specialized naval ship** designed for **underwater operations**, including **diver deployment**, **rescue missions**, and **submarine crew recovery**.



INS Nistar

- **Technical Specifications:** It measures approximately **120 metres in length** with a **displacement of around 10,000 tonnes**.
 - It has an **endurance of over 60 days at sea**, is **capable of supporting helicopter operations**, and is equipped with a **15-tonne subsea crane** to facilitate deep-sea recovery missions.
- **Operational Capabilities:** **INS Nistar** functions as the **Mother Ship for Deep Submergence Rescue Vessels (DSRV)** for submarine rescue, features a **Dynamic Positioning System (DPS)** for precise station-keeping, **Side-Scan SONAR** for seabed mapping, and supports **search, recovery, diving, and salvage operations**.

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- Upon commissioning, the vessel will be inducted into the **Eastern Naval Command** to enhance capabilities in **deep-sea diving** and **submarine rescue operations**.
- The Indian Navy is organized into **3 major commands**: Western, Eastern, and Southern Naval Commands.
- **Legacy and Significance**: INS Nistar continues the legacy of the original vessel acquired from the **USSR in 1969** (decommissioned in 1989), significantly enhancing **India's submarine rescue capability**, reinforcing **strategic maritime autonomy**, and strengthening India's role as a **net security provider in the Indian Ocean Region (IOR)**, which supports India's **SAGAR (Security and Growth for All in the Region)** initiative.

Read More: [INS Nirdeshak](#)

International Criminal Court (ICC)

The **International Criminal Court (ICC)** has issued arrest warrants against **Taliban** leaders under **Article 7(1) (h) of the Rome Statute** for crimes against humanity, citing systematic **gender and political persecution** in Afghanistan.

International Criminal Court (ICC)

- **About**: ICC is the **world's first permanent international court** established to **prosecute individuals** for the **most serious crimes of global concern**.
 - It is headquartered in **Hague, Netherlands** and governed by the **Rome Statute**, which is the **founding treaty of the ICC**, adopted on **17th July 1998** and entered into force on **1st July 2002**.
- **Crimes Under ICC**: The **Rome Statute** grants the ICC jurisdiction over 4 core international crimes-

Genocide, Crimes against Humanity, War Crimes, Crime of Aggression.

- **Jurisdiction & Mandate**: The ICC prosecutes **individuals**, not states, for grave international crimes and cover **crimes committed after 1st July 2002**, the date the **Rome Statute** came into effect.
 - It acts **only when national jurisdictions are unwilling or unable** to prosecute.
 - The Court has jurisdiction **in countries that are parties to the Rome Statute**, or in **non-member states** if referred by the **UN Security Council (UNSC)**.
- **Parties to ICC**:
 - The **Rome Statute** has been ratified by **125 countries**, including the **UK and most European nations**. Over **30 others** have signed but not yet ratified the treaty.
 - Afghanistan has been a member since 2003, while **India**, along with countries like the **US, Israel, China** are **not parties** to the ICC.
 - India has raised objections due to concerns over **sovereignty** and the **UNSC's referral powers** within the Court's framework.
- **Structure**: The **Presidency, Judicial Divisions, Office of the Prosecutor** and the **Registry** are its 4 main organs.
 - The **Assembly of States Parties (ASP)**, consisting of representatives from **member states**, provides **legislative oversight and ensures proper governance of the ICC**.
- **Enforcement**: The ICC **lacks its own police or enforcement mechanism** and relies on voluntary cooperation of member states for arresting and surrendering accused individuals, freezing assets, and implementing its sentences.

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Differences between the ICJ and the ICC

The International Court of Justice (ICJ) and the International Criminal Court (ICC) are two courts with different functions within the international legal system.

	 ICJ International Court of Justice	 ICC International Criminal Court
Established	1945	2002
UN-relationship	Highest court of the UN	Not part of the UN
Location	The Hague, the Netherlands	The Hague, the Netherlands
Jurisdiction	UN member-states	Individuals
Types of cases	Legal disputes between states and requests for advisory opinions on legal questions	Prosecutes individuals for the most serious crimes as per the Rome Statute
Appeals	No	Yes
Enforcement power	None - relies on the UN Security Council to uphold judgements, with permanent members having veto power	None - relies on cooperation from member states to enforce its decisions

Read More: [International Criminal Court \(ICC\)](#), [ICJ Proceedings: South Africa vs. Israel](#)

Revival of Lotus in Wular Lake

After three decades of ecological dormancy caused by the 1992 flood, lotus flowers have once again begun blooming in Kashmir's Wular Lake due to focused conservation efforts led by **Wular Conservation and Management Authority (WUCMA)**.

- **Lotus stems** (locally called *Nadru*) couldn't grow since **1992** as **seeds were buried under heavy silt**, but the **rhizomes** (*creeping root stalks*) **survived deep below** and **sprouted once the silt was removed**.

Wular Lake

- **About:** It is the **largest freshwater lake in India** and the **second largest in Asia** (after **Lake Baikal** in Siberia, Russia), located between **Bandipora** and **Sopore** in **Jammu & Kashmir**.

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- **Geography:** It is located at the foothills of the Haramuk Mountain and is fed by the **Jhelum River** along with **25 other streams** that feed it.
 - It has a small island in its centre called the **Zaina Lank**, constructed by **Zainul-Abi-Din**, **8th sultan** of Kashmir.
- **Ecological Importance:** In 1990, it was designated as a **Wetland of International Importance** under the **Ramsar Convention**.
- **Geology:** The basin of the lake was formed due to **tectonic activity**. It is also believed to be a **remnant** of the ancient **Satisar Lake**.
- **Avian Fauna:** Wular Lake is home to **56 bird species**, **39 fish species**, and **over 20 types of plants**.
 - Notable **migratory bird species** found here include the **White-bellied Heron**, **Pink-headed Duck**, **Baer's Pochard**, and the **Kashmir Catfish**.

Lotus (*Nelumbo Nucifera*)

- The lotus is a **perennial plant** with **bowl-shaped flowers** that have petals with an 8 to 12 inch diameter.
 - It is an **aquatic plant** that thrives in **nutrient-rich, murky conditions**.
- It comes in shades of **pink hues, yellow or white**.
- It is recognised as the **national flower of India**. The lotus is a recurring motif of **Hindu and Buddhist religions**.



Read More: [Disputes Related to Indus Water Treaty](#)

Indigenous MALE Drones

India is accelerating the procurement of **87 indigenously developed Medium Altitude Long Endurance (MALE) drones**, featuring at least **60% indigenous content**, to reduce dependence on **foreign suppliers** and strengthen **surveillance** along its sea and land borders.

- This is the **first instance** of Indian private manufacturers being tasked to **supply MALE drones** under the **Make in India** initiative replacing earlier imports from **Israel**.
- These drones will offer **over 30 hours of flight endurance** at altitudes of up to **35,000 feet**, providing **ISR (Intelligence, Surveillance & Reconnaissance)** support in varied terrains.

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India's Indigenous Drones

Drone Name	Key Features
Lakshya	Target drone for reconnaissance and target acquisition ; rocket-launched, turbojet-powered .
Nishant	Multi-mission UAV; day/night capable ; used for surveillance, target tracking , and artillery fire correction.
RUSTOM-1	Short Range Remotely Piloted Aircraft System (SR-RPAS, 800 kg class) ; performs ISR, target acquisition, and image exploitation .
TAPAS/ Rustom-2	MALE UAV developed for Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) roles.
Archer	Weaponized short-range UAV ; for reconnaissance, surveillance, and low-intensity conflict .

Note: All the above mentioned drones have been **developed** by **Defence Research and Development Organisation (DRDO)**.

DRONE TECHNOLOGY



Drone is a pilotless flying machine, using aerodynamics for lift, can operate autonomously or remotely, and may carry lethal or nonlethal cargo.

COMPONENTS.

- Unmanned aircraft (UA)
- Control system (ground control station - GCS)
- Control link (specialized datalink)
- Other related support equipment

CLASSIFICATION.

(as per Drone Rules, 2021)

- Nano: <250 gm
- Micro: 250 gm to 2 kg
- Mini: 2 kg to 25 kg
- Small: 25 kg to 150 kg
- Large: >150 kg

APPLICATIONS

- Mapping & Surveying** (asset inspection, roof inspections)
- Agriculture** (bird control, crop spraying & monitoring etc)
- Multispectral/thermal/NIR cameras, **Aerial Photo/videography** and Live streaming events
- Emergency Response** (search and rescue, marine rescue, fire fighting)
- Disaster** (zone mapping, disaster relief etc)
- Mining**
- Monitoring Poachers**
- Meteorology, Aviation, Payload carrying**

ISSUES.

- Increased risk of armed attacks
- Data security
- Cheaper cost** enables a larger population to procure drones
- Use of drones in warfare (**remote warfare**)
- Procurement by non-state actors** can pose serious threats
- Ease in **delivering mass destruction weapons**

DRONES IN DEFENCE

Purpose

- Surveillance and Reconnaissance
- Search and Rescue
- Maritime Surveillance
- Combat Drones
- Offensive (heterogeneous SWARM drones)
- Counter-Terrorism Operations

India's Counter-Drone System


- Indrajaal** (India's inaugural autonomous drone-defense dome)
- Procurement of combat-capable **Heron drones** from Israel
- Acquisition of **MQ-9B Armed Drones** from the US

RELATED REGULATIONS.

- Aircraft (Security) Rules, 2023
- Drones Rules, 2021 and Drone (Amendment) Rules, 2022

INDIA'S INITIATIVES.

- Digital Sky Platform
- No-Permission-No-Takeoff (NPNT) framework
- PLI Scheme for Drones
- Drone Shakti Scheme



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Read More: [UAVs in Modern Warfare](#)

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Sariska Tiger Reserve

The **Standing Committee of the National Board for Wildlife (SC-NBWL)**, chaired by the Union Environment Minister, has approved the proposal to redraw the boundaries of the **Sariska Tiger Reserve's (STR) Critical Tiger Habitat (CTH)**, with the **Supreme Court's** final nod awaited.

- The Supreme Court is suo motu examining several issues related to the STR, including the rationalisation of its boundaries. Its **Central Empowered Committee (CEC)** has recommended changes to address human disturbances such as village relocations and cattle grazing.
- **Proposed Changes:** The rationalisation will result in the CTH expanding from 881.11 sq km to 924.49 sq km, while the buffer zone will reduce from 245.72 sq km to 203.2 sq km, balancing conservation needs with developmental pressures.
- **Ecological and Legal Context:** CTH is protected under the **Wildlife Protection Act, 1972** and must be kept free of human interference.

- The re-demarcation may benefit over 50 mining operations shut down due to proximity to tiger habitat.

➤ **Sariska Tiger Reserve:** The Sariska Tiger Reserve, located in Rajasthan's Alwar district within the **Aravalli hills**, was declared a **wildlife sanctuary in 1955** and became a tiger reserve in 1978 under **Project Tiger**.

- Known for its rich history, it houses the **Kankarwadi Fort**, where Aurangzeb imprisoned Dara Shikoh, and the **Pandupole Hanuman temple** linked to the Pandavas.
- The landscape is marked by rocky terrain, grasslands, scrub-thorn forests, and semi-deciduous woodlands. Vegetation includes **dhok, salar, kadaya, ber, gugal, and bamboo**.
- The reserve supports diverse fauna including **Royal Bengal tigers, leopards, sambhar, nilgai, wild boars, and hyenas**.
- Sariska Tiger Reserve also surrounds the sites like **Jai Samand Lake and the Siliserh Lake**.



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Read more: [Sariska Tiger Reserve](#)

Advancements in Magnetic Field Measurements

Scientists at the [Raman Research Institute \(RRI\)](#) have developed a technique called **Raman-Driven Spin Noise Spectroscopy (RDSNS)** which can be incorporated into an **all-optical quantum magnetometer** to improve magnetic field measurements.

RDSNS (Raman-Driven Spin Noise Spectroscopy):

- **About:** RDSNS is an advanced **all-optical technique** for measuring magnetic fields using **laser light** and **Rubidium atoms**.
 - Atoms naturally exhibit tiny, random **spin movements**, known as **spin noise**.
 - When exposed to a **magnetic field**, the pattern of this noise changes.
 - By detecting these changes with laser light, researchers can measure the magnetic field **without disturbing the atoms**.
- **Key Advantages:**
 - It enables **shield-free, compact/portable, and field-deployable** magnetic sensing with a **wide dynamic range** and **high sensitivity**.
 - It remains effective even in **outdoor or noisy environments** and is **resistant to electrical and mechanical interference**.
- **Applications:** RDSNS is useful in **medical imaging** (MRI alternative), **geological surveys** (mineral detection), **space exploration** (planetary magnetic fields), and **quantum research** (atomic and spin studies).

Magnetometer:

- **About:** A **magnetometer** is a device used to measure the **strength and direction of magnetic fields**, commonly applied in **medical imaging, navigation, and earth/space studies**.

- In **ocean exploration**, it helps detect **shipwrecks, aircraft debris, and geological features** on the seafloor.
- **Working:** The **Earth's magnetic field** is generated by **molten iron and nickel** in its outer core and varies by location.
 - Magnetometers detect this variation by recording **magnetic readings** (typically at **1 Hz**). When encountering **ferrous objects** (like anchors, wreckage, or basalt), the device senses **magnetic anomalies**, sudden, unexpected changes in the field.
- **Modern Magnetometers:** Modern magnetometers such as **Optically Pumped Atomic Magnetometers (OPAMs)** and **Spin-Exchange Relaxation-Free (SERF)** use **laser light and alkali atoms** (e.g., Rubidium) to detect magnetic fields with high sensitivity.
 - However, they require **costly magnetic shielding**, function only in **noise-free lab settings**, and have a **limited detection range**.

Read More: [Aditya-L1: Deployment of Magnetometer Boom in Sun's Orbit](#)

Eklavya Model Residential Schools

Several students from [Eklavya Model Residential Schools \(EMRS\)](#) have cracked **medical & engineering entrance exams**.

Eklavya Model Residential Schools (EMRS)

- **About:** EMRS is a flagship initiative launched by the **Ministry of Tribal Affairs (MoTA)** in **1998** to provide **free, quality residential education** to **Scheduled Tribe (ST)** students from **Class VI to XII** in **remote and tribal-dominated areas**.
- **Objective:** To **bridge the educational gap** between **tribal and non-tribal populations** by offering **CBSE-based instruction** integrated with **holistic development**, including sports, culture, and skill training.
- **Revamp & Expansion:** The scheme was **revamped in 2018–19** to expand coverage. EMRSs are now to be

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established in blocks with more than 50% ST population and with at least 20,000 tribal persons with a target of 728 schools by 2026.

- **Governance:** EMRSs are implemented and managed by the [National Education Society for Tribal Students \(NESTS\)](#), an autonomous body under MoTA.
- **Key Features:**
 - Co-educational, fully residential schools modeled on Navodaya Vidyalayas with a tribal focus.
 - Follow the CBSE curriculum and provide free education along with all basic amenities.
 - Infrastructure includes classrooms, labs, hostels, staff quarters, playgrounds, and cultural activity spaces.
 - Each school has a capacity of 480 students with gender parity.
 - Up to 10% seats may be allotted to non-ST students.
 - 20% reservation under sports quota for meritorious ST students in athletics and games.

Other Initiatives for Tribal Education

- [Rajiv Gandhi National Fellowship \(RGNF\)](#)
- [Vocational Training Centres](#)
- [National Overseas Scholarship Scheme](#)
- [Post-Matric Scholarships](#)

Read More: [Recruitment Concerns in Eklavya Model](#)

Pethia dibrugarhensis

Researchers from ICAR-Central Inland Fisheries Research Institute (ICAR-CIFRI) have discovered a new cyprinid fish species, *Pethia dibrugarhensis*, in the Brahmaputra River.

- It is named after the Dibrugarh district of Assam, where it was first identified.



Pethia dibrugarhensis

- **Taxonomy:** It belongs to the family Cyprinidae, (which also includes carps and minnows) commonly known as barbs, which are small to medium-sized freshwater fishes native to Asia, Europe, and Africa.
 - Though it lacks typical barbels, the species is classified as a barb due to its defining morphological features.
- **Habitat:** Found in moderately fast-flowing waters with muddy-sandy-stony substrate, these coexist with indigenous freshwater species.
- **Key Features:** Characterized by an incomplete lateral line, black blotch near caudal peduncle, and absence of humeral mark and barbels.

ICAR-CIFRI

- It is a premier research institution under the Indian Council of Agricultural Research (ICAR), established in 1947, dedicated to the sustainable management of inland open water fisheries in India.
- It is headquartered at Barrackpore, West Bengal, and plays a key role in promoting fish production, aquatic biodiversity conservation, and livelihood generation.

Brahmaputra River

- **Brahmaputra** originates from the Chemayungdung Glacier near Mansarovar Lake (Tibet), known as Yarlung Tsangpo in Tibet and Siang/Dihang in Arunachal Pradesh.
 - It flows through Tibet (China), India, and Bangladesh.
- Major tributaries include Lohit, Dibang, Subansiri, Jiabharali, Dhansiri, Manas, Torsa, Sankosh, Teesta, Dikhow, Dhansiri and Kopili.
- Majuli in Assam is the world's largest river island.

Read More: [Transforming Fisheries Sector](#)

Great Hornbill

In a rare sighting, the Great Hornbill (*Malamuzhakki Vezhambal* in Malayalam) was spotted in Kannur's (Kerala) coastal region.

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Great Hornbill (*Buceros bicornis*)

- **About:** It is a large bird (length **95–120 cm**, weight **3 kg**) from the *Bucerotidae* family, characterized by a curved yellow bill and a prominent hollow casque. It is mainly **frugivorous** but also hunts **small animals**.
- **Geographic Range:** Native to parts of **South and Southeast Asia** including India, Bhutan, Nepal, China, Thailand, Laos, Cambodia, Vietnam, Malaysia, and Indonesia.
 - In India, it is found in the **Western Ghats, Eastern Himalayas, Northeast**, and parts of **Central India**.
 - It serves as the **official State Bird of both Kerala and Arunachal Pradesh**.
 - The **Hornbill festival** celebrated in **Nagaland** is named after this, which is the most revered and admired bird for the Nagas.
- **Habitat:** Inhabits **tropical and subtropical evergreen and moist deciduous forests**, preferring **old-growth trees with large cavities** for nesting. Coastal sightings are **highly unusual**.
 - Found at elevations of **600–2000 m**, it is **arboreal, diurnal and non-migratory**.
 - It mainly faces threats from human **hunting and habitat loss** due to **deforestation**.
- **Conservation Status:**
 - **IUCN Red List:** **Vulnerable**
 - **CITES:** **Appendix I**
 - **Wildlife (Protection) Act 1972:** **Schedule I**

POPULATION	GEOGRAPHIC RANGE	LIFESPAN	Great Hornbill			
13,000-26,000; declining	Western Ghats, Himalayan foothills, Northeast India, and across many countries in Asia	35-40 years in the wild, 50 years in captivity	BUCEROS BICORNIS			
FEATURES <ul style="list-style-type: none"> • Largest hornbill species in India • Males - red eyes. Females - white eyes, with red skin around. • Heavy casque on top of a yellow beak. • White plumage (head, neck, tail and wings) is often stained yellow with oil from preen gland. Tail has horizontal black band. • Characteristic kok-kok call echoes across the valley, can be heard a kilometre away • Males exhibit aerial casque butting where they clash with their casques while flying 						
THREATS <ul style="list-style-type: none"> • HUNTING – GREAT HORNBILL ARE HEAVILY HUNTED IN THE NORTH-EAST, AS THE UPPER BEAK, CASQUE, AND TAIL FEATHERS ARE USED IN TRADITIONAL HEADGEAR, AND DISPLAYED IN HOUSEHOLDS. MEAT IS EATEN, AND FAT USED FOR PERCEIVED MEDICINAL VALUES. • HABITAT LOSS – TO AGRICULTURE, LOGGING, AND SETTLEMENTS. 			DID YOU KNOW? Great Hornbills disperse seeds of 40 species of trees. That's why they are called 'farmers of the forest'.			
			WHO HELPS PROTECT THEM? WESTERN GHATS HORNBILL FOUNDATION AND NATURE CONSERVATION FOUNDATION HAVE NEST PROTECTION AND NEST ADOPTION PROGRAMMES IN THE WESTERN GHATS AND THE NORTHEAST.			
			FEED ON 90% of their diet is fruits. Figs are a favourite. Diet can include insects, small birds, reptiles, bats, and flying squirrels.			
			FAMILY <ul style="list-style-type: none"> • Monogamous. Live in in pairs or flocks/family groups • Flocks gather in large communal roosts in the evenings • Nest in natural cavities of trees • Produce one chick after an incubation period of about 38-45 days • Female enters nest and seals the entrance with faeces, bits of wood, bark and debris, leaving a slit open through which the male passes food 			
			HABITAT Primarily evergreen and moist deciduous lowland forest			
			PROTECTION STATUS Vulnerable in the IUCN Red List. On Schedule I of the Indian Wildlife Protection Act, 1972			
			AVG WEIGHT 3 kg			

Read More: [Save Hornbills, Save Tropical Forests](#)

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Vera C. Rubin Observatory

The Vera C. Rubin Observatory, an astronomical facility in Chile (8,684 feet above sea level atop Cerro Pachón mountain), released its first test images, utilizing the Simonyi Survey Telescope as its primary instrument.

Vera C. Rubin Observatory

- **About:** It is an astronomical observatory built to conduct the most comprehensive survey of the southern hemisphere's night sky through continuous scanning.
 - It is named in honor of American astronomer Vera C. Rubin, who was the first to provide evidence for the existence of **dark matter** in the 1970s.
- **Uniqueness:** Its Simonyi Survey Telescope features a wide field of view, capable of capturing an area equivalent to 40 full Moons in a single shot—vastly surpassing the **Hubble Space Telescope** (1%) and **James Webb Space Telescope** (75%) in coverage.
 - It houses the world's largest digital camera with 3,200 megapixels, enabling it to detect objects 100 million times dimmer than those visible to the naked eye.
 - Additionally, it is the fastest-slewing telescope, able to adjust its position in just five seconds.
- **Purpose:** It will help explore the nature of **dark energy** (68%) and **dark matter** (27%), which together make up 95% of the universe, while visible matter forms just 5%.
 - It is aimed at addressing key astronomical questions, including the formation of the **Milky Way**, existence of the 9th planet in our solar System and threat of an asteroid to Earth.

Read More: [Dark Matter and Dark Energy](#)

Sierra Leone

Several islands of Sierra Leone are facing imminent submergence due to rising sea levels, marking one of West Africa's most severe cases of climate-induced displacement.

Sierra Leone:

- **Location:** Sierra Leone is a tropical country on the southwest coast of West Africa, bordered by Guinea (north and east), Liberia (south), and the Atlantic Ocean (west).
 - It includes island groups like the Banana and Turtle Islands, known for tourism and cultural significance.
 - Its capital Freetown is home to one of the world's largest natural harbours.



- **History:** Sierra Leone was colonized in 1787 by formerly enslaved people from England, followed by settlers from Nova Scotia in 1792 and Jamaica in 1800.
 - Initially managed by the Sierra Leone Company, it became a British crown colony in 1808 and gained independence in 1961.
- **Geography & Ecology:** It features a coastal belt of mangrove swamps, wooded hill country, an upland plateau, and mountains in the east. It has a tropical climate.
 - The highest mountain peak is Mount Bintumani (Loma Mansa) and major rivers include the Rokel, Taia, Moa, and Sewa.

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- **Economy:** Primarily **agrarian**, with **subsistence farming** being the main livelihood. It is also rich in mineral resources such as **diamonds, gold, bauxite, and rutile (titanium dioxide)**.
- **International Engagement:**
 - Member of the **International Solar Alliance (ISA)**.
 - India was one of the **first contributors** to the **UN Mission in Sierra Leone (UNAMSIL)**, deploying a 4,000-strong military contingent in **2000-2001**.

Read More: [Coup Attempt in Sierra Leone](#)

Gene-Edited Japonica Rice

Indian scientists have successfully used **CRISPR-Cas9 technology** to increase **phosphate** uptake in **japonica rice varieties**, potentially revolutionizing yield and reducing fertilizer use.

- **Phosphate Efficiency:** CRISPR-Cas9 gene editing in **japonica rice varieties** boosted **yield by 40%** using only **10% of the recommended phosphate fertilizer dose**.
 - **CRISPR-Cas9** is a revolutionary tool that enables scientists to **precisely modify the genome** by using the **Cas9 enzyme** as **molecular scissors** to accurately **cut DNA** and **insert, delete, or repair genetic material**.
- **Mechanism:** The key gene edited was **OsPHO1;2**, responsible for **phosphate transfer from root to shoot**, by **removing the repressor's binding site** rather than the repressor itself.
- **Significance:** India imports over **4.5 million tonnes of phosphate fertilizers**, making this gene-editing approach **vital for agricultural sustainability and self-reliance**.

Nutrient Deficiency in Indian Soils

- According to a 2022 study by the **Centre for Science and Environment (CSE)**, approximately **85% of soil samples are deficient** in organic carbon.
- Indian soils are **97% deficient in nitrogen** (crucial for crop growth), **83% in phosphorus** (vital for root and seed development), and **71% in potassium** (regulates water and nutrient flow in plants).
- Indian soils show deficiencies in **Boron (47%), Zinc (39%), Iron (37%), and Sulphur (36%)**, impacting

nutrition security, as **zinc-deficient grains** can worsen **malnutrition**.

Read More: [Genome Editing](#)

Cooperative Stack: Integrating Rural Schemes Through PACS

The Government of India is developing a **comprehensive 'Cooperative Stack'**, centered around **Primary Agricultural Credit Societies (PACS)**, to streamline the delivery of welfare schemes in rural India.

- **About Cooperative Stack:** It is a **technological framework** designed to leverage digital platforms to provide services such as **financial inclusion, credit access, and government subsidies directly** to rural communities.
 - It will adopt **AI-driven technologies**—e.g., **automated weather advisories**—to aid farmers and improve scheme implementation.
 - **Role of PACS:** PACS are the backbone of **rural credit systems in India**, acting as financial intermediaries. By using PACS to distribute and implement schemes, the government ensures that benefits reach rural farmers and communities more efficiently.
- **About PACS:** They are basically **credit societies** that are **registered** under the **Cooperative Societies Act** of the **State concerned**.
 - **PACS** are **grassroots-level cooperative credit institutions** that provide **farmers with affordable loans, banking services, and agricultural support**.
 - They form the **base** of India's **three-tier cooperative credit structure**, along with **District Central Cooperative Banks (DCCBs)** and **State Cooperative Banks (SCBs)**.
 - Out of **1.08 lakh PACS**, around **63,000** are in the **advanced stages of computerisation**, with the government aiming to **fully digitise 80,000** of them.

Read More: [Primary Agricultural Credit Societies](#)

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Phenome India National Biobank

The **National Biobank**, newly inaugurated at **CSIR-Institute of Genomics and Integrative Biology (IGIB)**, marks a key step in creating **India's longitudinal health database**, paving the way for **data-driven healthcare and personalized medicine**.

- A **longitudinal health study** tracks individuals over time to understand **disease trends**, **treatment outcomes**, and support **population-specific health policies**.

National Biobank:

- **About:** A **Biobank** is a repository that collects, stores, and manages **biological samples** (such as **blood**, **tissues**, and **DNA**) and **health-related data** for scientific research.
- **Objective:** Launched under the **Phenome India Project**, its aim is to build a **comprehensive repository** reflecting India's diverse population.
 - To enable **personalized medicine** based on individual **genetic and lifestyle profiles**, support research on **chronic and rare diseases** relevant to the Indian context.
 - Facilitate **early diagnosis** along with more effective, **targeted therapies**.
- **Scope:** Biobank will gather **genomic, lifestyle, and clinical data** from **10,000 diverse Indian participants** across regions, age groups, and socio-economic backgrounds.
- **Significance:** Strengthens India's fight against diseases like **diabetes**, **cancer**, **cardiovascular**, and **rare genetic disorders**.
 - Inspired by the **UK Biobank**, it is tailored to **India's diverse population** for **targeted, population-specific healthcare**.

Phenome India Project:

- The **Phenome India Project**, or **Phenome India-CSIR Health Cohort Knowledgebase (PI-CHeCK)**, is a **pan-India, long-term study** launched by **CSIR** in **2023** to **track individual health over time**.

- It aims to uncover **disease patterns**, **gene-environment interactions**, and develop **India-specific risk models** for **cardio-metabolic diseases**.

Phenome:

- **Phenome** is the full set of **observable traits in an individual**, shaped by the **interaction of their genes and the environment**.
- It includes **physical features**, **behaviors**, and **disease risks**, essentially, the visible outcome of genetic instructions.

Read More: [Phenome India-CSIR Health Cohort Knowledgebase \(PI-CHeCK\)](#), [Precision Medicine and Biobanks](#)

Smart Mosquito Surveillance System

In a tech-driven public health initiative, Andhra Pradesh has launched the **Smart Mosquito Surveillance System (SMoSS)** to monitor and control mosquito populations.

- SMoSS uses **Artificial Intelligence (AI)**-powered sensors, drones, and **IoT (Internet of Things)** devices to detect mosquito species, gender, population density, and weather conditions.
 - Real-time alerts are triggered when mosquito levels exceed safe limits, enabling targeted spraying and fogging instead of ineffective blind spraying.
 - Drones are used for cost-effective **larvicide spraying**, while a central dashboard ensures live monitoring and quick response. The system will be managed by specialised agencies with accountability tracked via mobile apps.
- **Common Mosquito-Borne Disease:**
 - **Zika Virus Disease:** **Zika** is a viral infection primarily spread by the *Aedes aegypti* mosquito.
 - It can lead to Microcephaly and other birth defects in babies born to infected pregnant women.
 - **Dengue:** Caused by the **dengue** virus and spread by *Aedes* mosquitoes, it has four serotypes (DEN-

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1, DEN-2, DEN-3, DEN-4). Symptoms include high fever, severe headaches, pain behind the eyes, and intense joint and muscle pain.

- Diagnosis is through blood tests, but there is no specific treatment for dengue.
- India continues to bear a heavy dengue burden over 2.3 lakh cases and 297 deaths in 2024.
- **Yellow Fever:** A viral hemorrhagic disease caused by the *Aedes aegypti* mosquito.
 - It can lead to jaundice, organ failure, or death in severe cases. Around 30,000 deaths are reported annually.
 - The term "**yellow**" comes from the jaundice (yellowing of skin/eyes) some patients experience.
 - Yellow fever vaccine which is known as 17D and according to the World Health Organization (WHO) also it is safe and affordable.
- **Chikungunya:** A viral disease spread by *Aedes aegypti* mosquitoes, it is characterised by sudden fever and intense joint pain. There is no specific treatment for chikungunya.

<u>Vector</u>		<u>Disease caused</u>	<u>Type of pathogen</u>
Mosquito	<i>Aedes</i>	Chikungunya	Virus
		Dengue	Virus
		Lymphatic filariasis	Parasite
		Rift Valley fever	Virus
		Yellow Fever	Virus
		Zika	Virus
	<i>Anopheles</i>	Lymphatic filariasis	Parasite
		Malaria	Parasite
		O'nyong'nyong virus	Virus
	<i>Culex</i>	Japanese encephalitis	Virus
		Lymphatic filariasis	Parasite
		West Nile fever	Virus

Read more: [Genetically Modified Mosquitoes to Fight Against Malaria](#)

India's First National Cooperative University

Union Home and Cooperation Minister inaugurated **Tribhuvan Sahkari University** in Anand, Gujarat, India's first national cooperative university, aligning with the government's vision of '**Sahkar se Samridhi**' (Prosperity through Cooperation) to strengthen the cooperative sector through education.

Tribhuvan Sahkari University (TSU)

- **About:** TSU is named after **Tribhuvandas Kishibhai Patel**, a key figure in India's cooperative history and founder of **Amul**. His work, alongside **Sardar Vallabhbhai Patel**, helped transform the cooperative movement in Gujarat starting in **1946**.
- The university will be registered under the [Societies Registration Act, 1860](#).

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- **Objective:** It aims to strengthen the **cooperative sector** by offering **degree, diploma, and PhD** courses in **cooperative management, accounting, finance, marketing, cooperative law, and rural development** to build a **skilled workforce**.
 - It aims to **train over 20 lakh professionals** in 5 years, covering key areas like **dairy, fisheries, and agricultural credit cooperatives**.
 - A dedicated **Research and Development (R&D) Council** will be established to drive **innovation**, ensure **transparency**, and promote **best practices** across rural cooperative institutions.

Cooperative Sector in India

- It includes **member-owned organizations** that work together to meet **common social and economic needs** through **mutual help** and **fair sharing of resources**, playing a key role in **rural development** and promoting **financial inclusion**.
- The **right to form cooperative societies** was made a **Fundamental Right** under **Article 19(1)(c)** by the **97th Constitutional Amendment Act, 2011**.
- The sector is primarily governed by the **Cooperative Societies Act, 1912** and the **Multi-State Cooperative Societies (MSCS) Act, 2002**.
 - The **MSCS (Amendment) Act, 2023** seeks to strengthen **governance, accountability, and transparency** in multi-state cooperatives.

DEVELOPMENTAL GROUPS IN INDIA

Self-Help Groups (SHGs)

- ④ Self-governed peer-controlled information group of people with similar socio-economic backgrounds and interests
 - Members allowed: 5-20 | Registration not required
 - SHGs use savings amounts for giving loans to members
- ④ **NABARD's SHG-Bank Linkage Programme (1992)** - To connect SHGs with formal banking institutions
- ④ ~88% of SHGs in India have all-women members
- ④ **Success Stories:**
 - Self-Employed Women's Association (SEWA) since 1972
 - Kudumbashree (1998) in Kerala

Cooperative Societies

- ④ **People-centred** enterprises, owned, controlled, and run by and for their members.
 - Capital raised through shared contributions from members.
- ④ **Regulating Acts:**
 - Multi-State Co-operative Societies Act, 2002
 - State Cooperative Societies Acts
- ④ **97th Constitutional Amendment (2011):**
 - Right to form cooperatives - a fundamental right (Article 19(1)(c))
 - Article 43B (DPSP) - Promotion of Cooperatives
 - Part IX-B titled "The Co-operative Societies" (Articles 243-ZH to 243-ZT).
- ④ **Examples:** AMUL, IFFCO and PACS

Non-Governmental Organisations (NGOs)

- ④ Pursue activities to relieve suffering, promote the interests of the poor, protect the environment, provide basic social services, or undertake community development
- ④ **Registered as:**
 - **Societies:** Societies Registration Act, 1860
 - **Trusts:** Indian Trusts Act, 1882
 - **Companies:** Section 8 Companies Act, 2013
- ④ **Constitutional Provisions:**
 - **Article 19(1)(c)**
 - **Article 43**
 - **Concurrent List mentions** Charities and charitable institutions
- ④ **FCRA mandates registration for all NGOs intending to receive foreign donations.**
- ④ **Prominent NGOs:**
 - **NGO Pratham:** Pioneered the **ASER** report to assess the learning levels of children in rural India.
 - **Akshaya Patra Foundation:** Provided nutritious mid-day meals to school children.
- ④ **NGO-DARPAN Platform - An interface between NGOs and Government Bodies.**



Read More: [India's Cooperative Sector](#)

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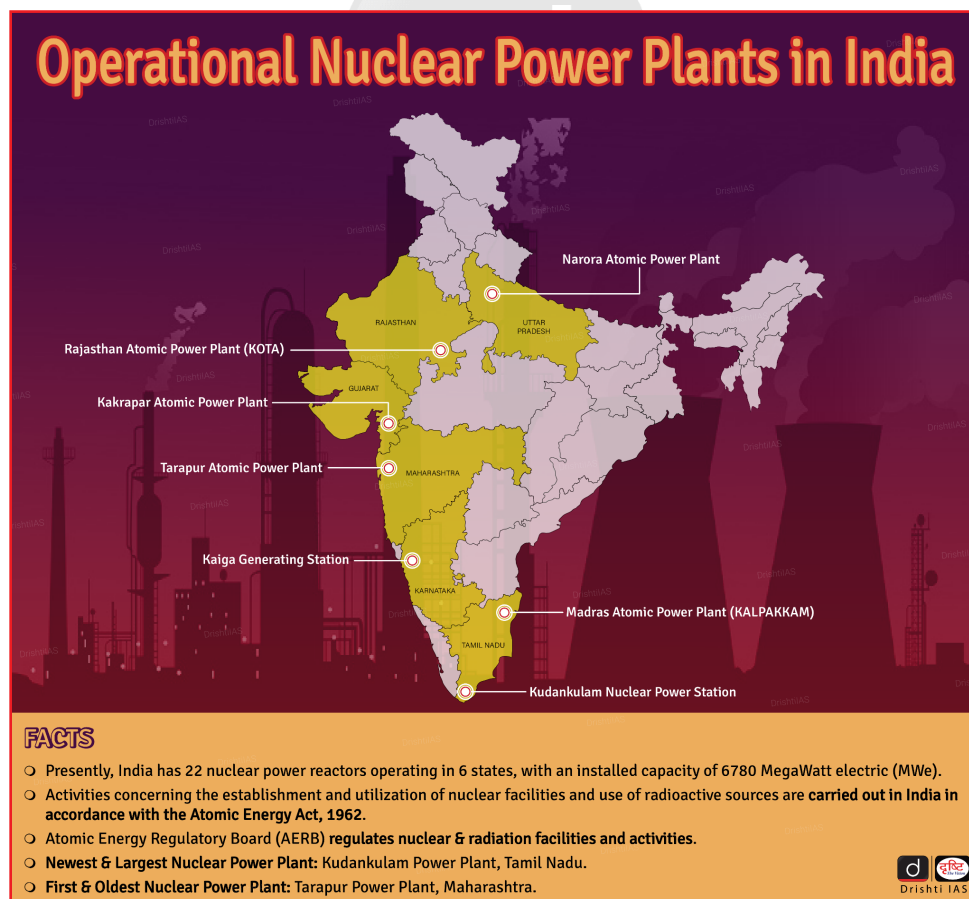


Operational License for Indigenous 700 MWe PHWRs

The **Atomic Energy Regulatory Board (AERB)** granted an operation licence for two indigenously developed (KAPS-3 and KAPS-4) **700 MWe (Megawatts electric) Pressurised Heavy Water Reactors (PHWRs)** at the **Kakrapar Atomic Power Station (KAPS)** in Gujarat.

- **AERB**, after **15 years** of rigorous multi-tiered safety reviews, granted a **5-year Licence for Operation** to the **Nuclear Power Corporation of India Limited (NPCIL)**.
 - This marks a significant boost to NPCIL's plan of building **10 more PHWRs of 700 MWe**.
 - **NPCIL** owns and operates all **nuclear power plants** in India, except **PFBR variants** (owned by The Indira Gandhi Centre for Atomic Research).

- India currently operates **15 PHWRs of 220 MWe**, **2 PHWRs of 540 MWe**, and a **700 MWe reactor** at **Rawatbhata, Rajasthan**.
- **PHWRs** are a type of **nuclear reactor** that use **heavy water (deuterium oxide, D₂O)** as both a **coolant and moderator**, while **natural or slightly enriched uranium** serves as **fuel**.
- **AERB** is India's national regulatory authority responsible for ensuring the **safe use of nuclear energy and radiation technologies** in the country.
 - Established in **1983** under the **Atomic Energy Act, 1962**, AERB functions as an **independent body** under the **Department of Atomic Energy (DAE)**.
- India's **nuclear power capacity** is currently **8.18 GW (2024)**, with targets set at **22.48 GW by 2031–32** and **100 GW by 2047**.



Read More: [India's Nuclear Programme](#)

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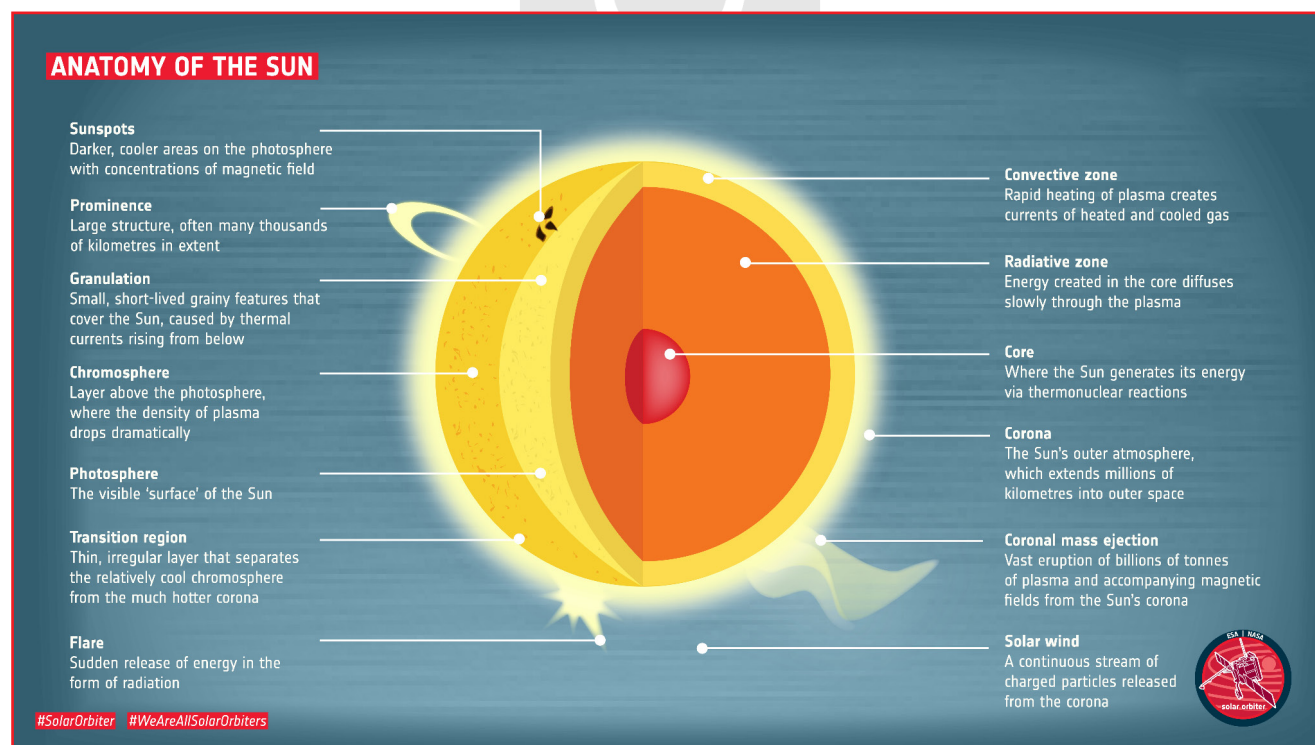
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Miniature Coronal Loops

Astronomers from the **Indian Institute of Astrophysics (IIA)** have unveiled **tiny, short-lived plasma loops** in the **Sun's lower atmosphere** that could hold the key to understanding how the Sun stores and releases magnetic energy.

- These **miniature coronal loops**, only **3,000–4,000 km long** and **<100 km wide**, were previously undetectable due to their size and brief lifespan (lasting just a few minutes).
 - They offer insights into **magnetic reconnection** (a process that releases sudden bursts of energy in the solar atmosphere), and are linked to plasma jets erupting from their tips, mirroring **larger solar coronal events** (like **solar flares** and **coronal mass ejections**).
 - **Differential Emission Measure** (indicates the amount of emission from plasmas at a specific temperature) analysis showed that the plasma temperatures in **miniature coronal loops reach several million degrees**, which is unusually high for the **chromosphere**, where plasma densities are significantly higher than in the corona.
 - This challenges existing solar heating models, which struggle to explain such extreme temperatures in the Sun's lower atmospheric layers.
- Future telescopes like **India's National Large Solar Telescope (NLST)** in Ladakh may help explore these features further.
 - NLST is a proposed ground based **optical and near infra-red (IR) observational facility** in the country. It is designed to address an array of key scientific issues related to **origin and dynamics of solar magnetic fields**.



Read more: [Coronal Mass Ejections](#)

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India's First Equine Disease-Free Compartment

India has set up its **first Equine Disease-Free Compartment (EDFC)** in **Meerut Cantonment, Uttar Pradesh**, which has been **officially recognized** by the **World Organisation for Animal Health (WOAH)**.

- **About EDFC:** It is a **scientifically managed and internationally recognized zone** that guarantees horses are **free from specific equine diseases**, enabling them to engage in global trade and competitions.
 - It has been established under the **Ministry of Fisheries, Animal Husbandry and Dairying**.
- **Certification for Disease-Free Status:** The EDFC is certified free from major equine diseases, including **Equine Infectious Anemia, Equine Influenza, Equine Piroplasmiasis, Glanders, and Surra**.
- **Part of India's Disease-Free Compartment Strategy:** The EDFC is a key element of India's broader strategy to create disease-free compartments, which also includes **Highly Pathogenic Avian Influenza (HPAI)-Free Zones** for safe poultry exports.
 - India has maintained a disease-free status for **African Horse Sickness** since 2014, further strengthening its position in the global equine community.
- **Equine diseases:** These are diseases that impact horses, donkeys, mules, and other members of the equine family (Equidae). They can be infectious in nature, caused by **viruses, bacteria, or parasites**.

Read More: [State of the World's Animal Health Report](#)

Helgoland

Helgoland (or Heligoland), a small 1.7 sq km **red sandstone German archipelago**, 50 km off Germany's coast in the **North Sea**, is renowned as the birthplace of **quantum mechanics**.

- **Helgoland**, initially colonized by **Frisians (ethnic group in Netherland & Germany)**, was controlled by Denmark, then Britain (1814), and finally Germany (1890).

- Post-WWII, it was used as a British bombing range before being returned to West Germany in 1952.



Foundation of Quantum Mechanics:

- In June 1925, physicist **Werner Heisenberg**, suffering from **hay fever (allergic rhinitis)**, retreated to **Helgoland island** for relief.
 - There, he developed **matrix mechanics (how atoms absorb and emit light based on discrete energy levels)**, and laid the foundation of **quantum mechanics** (fundamental physics theory that explains the behavior of matter and energy at **atomic and subatomic levels**).
 - He replaced the **classical idea of electrons orbiting the nucleus** with a system based on measurable quantities like **light absorption**.
 - This led to key concepts such as the **uncertainty principle** and paved the way for modern technologies like **lasers** and **semiconductors**.

Werner Heisenberg:

- He was a **German theoretical physicist and Nobel laureate (1932)**, known for formulating the **Heisenberg Uncertainty Principle** and laying the foundation of **quantum mechanics** at the age of 23.
 - During **World War II**, Heisenberg played a central role in the **German atomic program**, which competed with the **Manhattan Project**.

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QUANTUM MECHANICS VS GENERAL RELATIVITY

 Quantum Mechanics	$E=MC^2$ General Relativity
Quantum Mechanics is the theoretical basis of modern physics that describes the weird behavior of photons, electrons, and other particles that make up the universe.	General Relativity is the geometric theory of gravitation published by Albert Einstein in 1915 and is the cornerstone of modern physics.
Explains the behavior and nature of matter and energy on the atomic and subatomic levels.	The theory of relativity is central to our understanding of many areas of astrophysics and cosmology.
Events are the results of the fundamental interaction between subatomic particles that occur in a very short span of time, at a localized region of space.	Events are continuous and deterministic, meaning what you observe and measure about an event depends on your own point of view as well as the event itself.

Read More: [Quantum Nature of Gravity](#)

SEBI Bans Jane Street

US-based Jane Street, a prominent proprietary trading firm, has been banned by **Securities and Exchange Board of India (SEBI)** for engaging in manipulative trading practices that disrupted market integrity and resulted in massive illegal profits.

- **Manipulative Trading:** Jane Street executed trades in the **derivatives (futures)** segment not to profit from market trends, but to **manipulate prices**.
 - They used a “**marking the close**” strategy, placing large buy orders to inflate prices, then selling them later to maximize gains, employing a **push-pull tactic**.
 - This intra-day manipulation misled small investors and created artificial volatility in the market.
 - Jane Street used its Indian arm, JSI Investments Pvt Ltd, to bypass local regulations because **foreign portfolio investors (FPIs)** are **restricted from engaging in certain cash market activities**, such as **intraday trading** (purchasing and selling

securities listed in a stock exchange on the same day).

- Using a domestic entity allowed the group to execute trades that would otherwise be prohibited under FPI norms.
- **SEBI's Regulatory Actions:** SEBI imposed a Rs 4,843 crore penalty on Jane Street and barred it from accessing the Indian securities market.
- **Impact on Proprietary Trading:** The case has highlighted the need for stronger compliance and market safeguards.
- **SEBI:** SEBI is the statutory regulator of India's securities market under the Ministry of Finance, established under the **SEBI Act, 1992**. It aims to protect investor interests, promote fair practices, and regulate the securities market.
 - Headquartered in Mumbai, it has regional offices in Ahmedabad, Kolkata, Chennai, and Delhi. Initially set up in 1988 as a non-statutory body, it gained statutory powers in 1992.

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- SEBI is a **quasi-legislative and quasi-judicial body** with powers to frame regulations, conduct inquiries, and impose penalties.
- It regulates issuers by prohibiting insider trading and inspecting market entities.

Read more: [Stock Market Regulation](#)

Ham Radio & Life on the International Space Station

Indian astronaut **Shubhanshu Shukla**, aboard the **International Space Station (ISS)** as part of the **Axiom-4 mission**, communicated with Earth using **ham radio** communication, marking a unique instance of **space-to-Earth communication**.

Ham Radio

- Ham radio (amateur radio), is a **licensed, non-commercial radio communication** service used for

education, experimentation, and emergency communication.

- Operators use **radio waves, transceivers and antennas** to establish contact locally, globally, and even from space.
- It was first used in space in **1983** for communication between astronauts and Earth.
 - The ISS features the **ARISS (Amateur Radio on the ISS)** system supported by the **US, Russia, Canada, Japan, and Europe**.
- In India, individuals **above 12 years of age** can obtain a ham radio license from the **Ministry of Electronics and Information Technology**.
- In India, ham radio played a crucial role in facilitating emergency communications during the **Indian Ocean tsunami (2004)**, the **Uttarakhand floods (2013)**, and various other disasters.

WHY AMATEUR RADIO ?

AMATEUR RADIO IS A MAJOR CONTRIBUTOR IN HUMAN RESOURCE DEVELOPMENT IN COMMUNICATION & I.T



Visual Communicator
in
Amateur Radio



HF for local & long distance
Voice / Digital connectivity

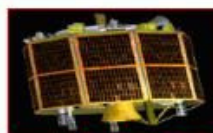
Amateur Radio is a well known **"CATALYST"** & Bringing several **Innovations** in Telecom & I.T as pioneers for Social / Cultural / Scientific **Development** & Far Reaching Economic Benefits



State of the Art
Disaster Relief Vehicle
With HAM RADIO



VHF / UHF can
Link Amateur Radio
Satellite



Amateur Radio Satellites

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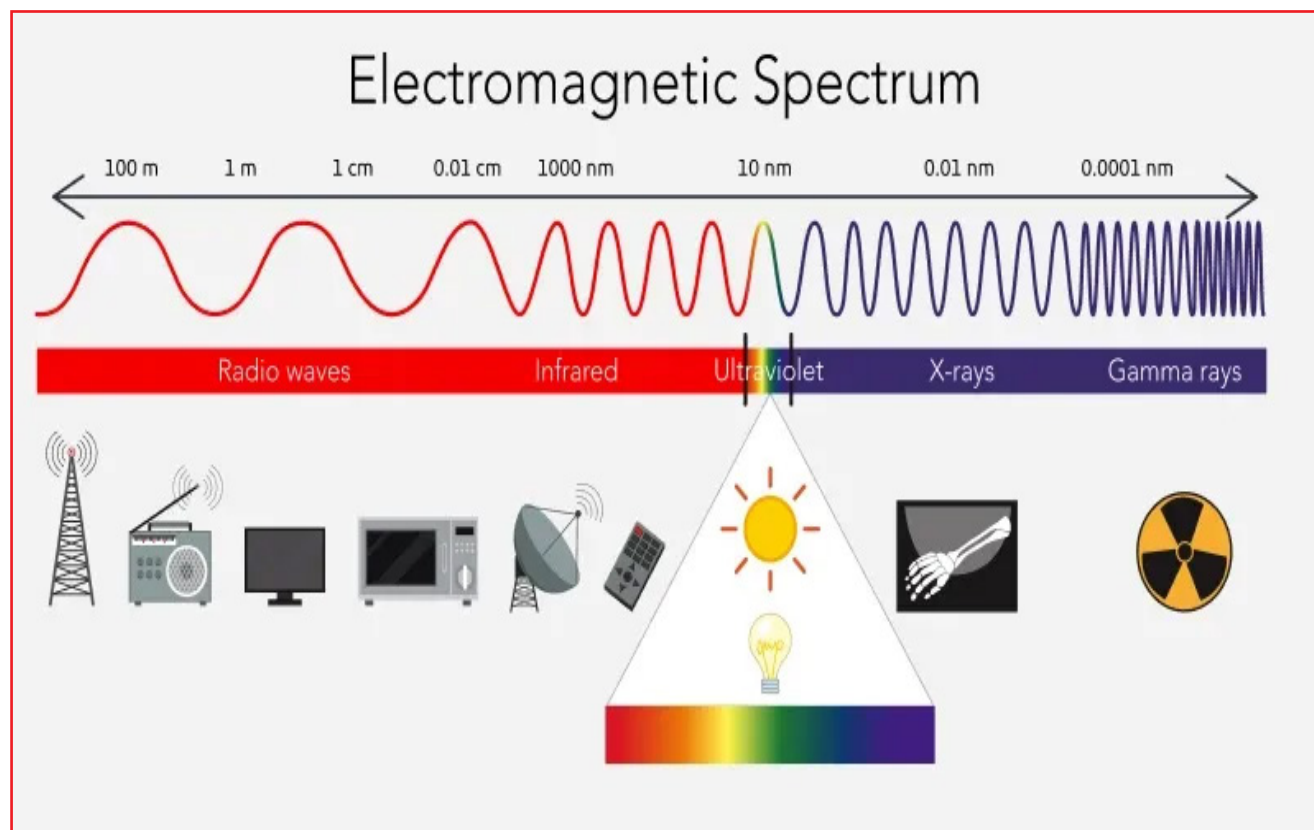


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Radio waves:

- Discovered by **Heinrich Hertz**, they are **long-wavelength electromagnetic waves** used in **communication systems**.
- They propagate via **line-of-sight**, **ionospheric reflection**, or **satellite relay**, enabling **long-distance transmission** and forming a core part of **wireless communication technology**.



Life on the ISS:

- In **microgravity**, astronauts consume **dehydrated, packaged food** rehydrated with **hot water** to avoid floating **crumbs** that may damage equipment.
 - Meals are secured using **Velcro trays**, and **utensils are cleaned without water** using wipes.
 - **High calcium, low sodium**, and **vitamin D** intake is recommended to maintain **bone health** during extended space missions.

Read More: [Cyclone Shelter HAMs Excel in IOTA Expedition](#)

Birth Anniversary of Dr. Syama Prasad Mookerjee

Prime Minister Narendra Modi paid tribute to [Dr. Syama Prasad Mookerjee](#) on his birth anniversary (**6th July**) highlighting his legacy in national unity, industrial policy, and education, and his relevance in India's modern development.

- **Birth and Early Life:** Born in **Calcutta** (now Kolkata). Dr. Mookerjee is the son of **Sir Ashutosh Mookerjee**, a renowned educationist and Vice-Chancellor of **Calcutta University**.

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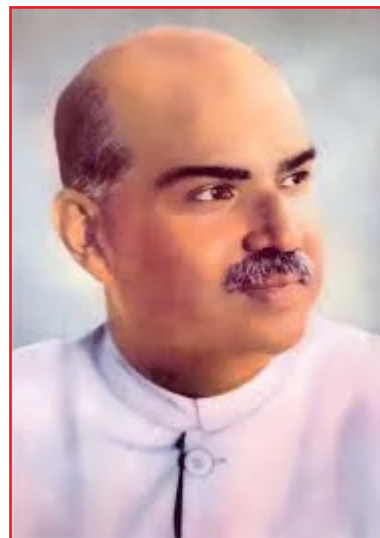
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- **Academic Excellence:** Dr. Mookerjee represented **Calcutta University** at the **Conference of the Universities of the British Empire** in England.
 - Dr. Mookerjee became the **youngest Vice-Chancellor of Calcutta University** at the age of 33 in **1934**.
 - He started "**Bang Wani**", a Bengali journal, in 1922 and **The Nationalist** in the 1940s.
- **Political Career:** In the 1920s, Dr. Mookerjee joined the Indian National Congress but resigned later over ideological differences with the leadership. He later joined the Hindu Mahasabha and played a key role in forming a Progressive Coalition government in Bengal in 1937, where he served as the **Finance Minister**.
 - Became the **acting President** of the **Hindu Mahasabha** in 1940 and advocated for **complete independence** for India.
 - He founded the **All India Bharatiya Jan Sangh** in **1951**, which later evolved into the **Bharatiya Janata Party**.
- **Post-Independence Role:** Dr. Mookerjee served as **Minister for Industry and Supply** in the **Interim Government** after independence.
 - Instrumental in establishing key institutions like the **Chittaranjan Locomotive Factory**, **Sindri Fertilizer Corporation**, and **Hindustan Fertilizer Corporation**.
- **Ideological Stance:** He advocated nationalism, Hindu cultural identity, and a united India. He opposed Article 370, asserting that one nation **cannot have two constitutions, heads, or flags**.
 - **Opposed** the linguistic division of India, advocating for unity based on **administrative efficiency, security, and economic prosperity**.
 - He was arrested during a protest against J&K's special status and died under mysterious circumstances in 1953.
- **Legacy:** He is known as "**The Lion of Parliament**" for his sharp debates on national issues.



Read more: [Dr. Shyama Prasad Mukherjee](#)

Low-Cost Sensor to Detect Toxic Sulfur Dioxide

Scientists at the **Centre for Nano and Soft Matter Sciences (CeNS)**, Bengaluru, have developed a **low-cost, highly sensitive sensor** capable of detecting **sulfur dioxide (SO₂)** at extremely low concentrations.

- Scientists fabricated a sensor combining **nickel oxide (NiO)** and **neodymium nickelate (NdNiO₃)**. NiO acts as a gas receptor, and NdNiO₃ functions as a transducer, transmitting detection signals.
 - It can detect SO₂ concentrations as low as 320 Parts per billion (ppb), surpassing many commercial sensors.
 - The sensor offers real-time SO₂ detection with a user-friendly threshold alert system (**green: safe, yellow: warning**), making it ideal for **public health use in industrial and urban spaces**.
- **Sulfur dioxide (SO₂):** It is a **colorless, water-soluble toxic gas** primarily emitted from vehicles and industrial activities. Even minute exposure can cause respiratory issues, including asthma attacks and long-term lung damage.

Read more: [Particulate Matter & SO₂ Control](#)

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High-Efficiency Material for Next-Gen Energy Storage

Centre for Nano and Soft Matter Sciences (CeNS), Bengaluru & Aligarh Muslim University (AMU) have developed a lanthanum-doped silver niobate-based energy storage material, which has enhanced the performance of **supercapacitors**.

Lanthanum-Doped Silver

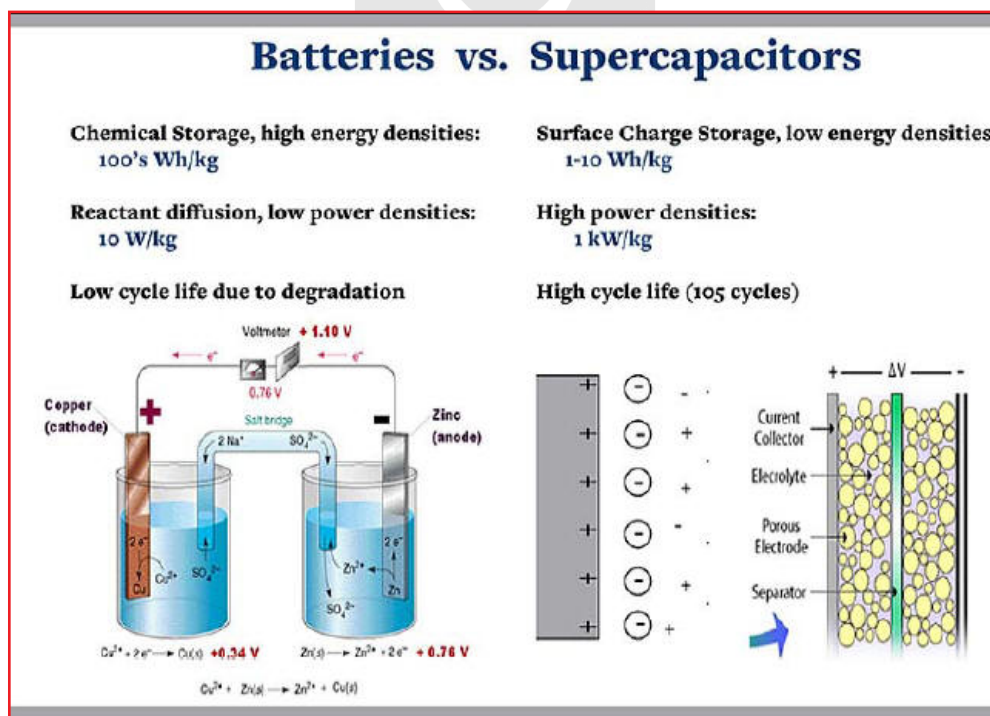
Niobate Energy Storage Material:

- **About:** It is an advanced nanostructured compound made by **doping silver niobate (AgNbO_3)**, a **lead-free and eco-friendly perovskite material**, with **lanthanum**, a **rare-earth element**.
- **Significance:**
 - This doping has **reduced nanoparticle size**, increasing the **surface area** for energy storage, and **improved electrical conductivity** for faster charge-discharge cycles.

- It also ensured **excellent energy retention (118%)** with **no energy loss** during use (**100% coulombic efficiency**).
- It is also **environmentally friendly**, being **lead-free** and suitable for green energy applications.
- **Applications:** Used in **portable electronics**, **electric vehicles (EVs)**, and **renewable energy systems**, demonstrated potential by successfully **powering an LCD display** through a prototype supercapacitor.

Supercapacitors:

- **Supercapacitors**, also known as **ultracapacitors**, are **energy storage devices that bridge the gap between conventional capacitors and batteries**.
- They offer **high power density**, **rapid charge-discharge**, and a **long lifecycle** (millions of cycles).
- Unlike batteries, they store energy through **electrostatic charge separation** rather than chemical reactions, making them **safer and more durable**.
- They have **lower energy density** than batteries, but this can be improved through **material doping**, such as with **lanthanum-doped silver niobate**.



Read More: [Paper-based Supercapacitor for Rapid Device Charging](#)

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Mahabodhi Temple

The **Supreme Court** declined to entertain a **petition under Article 32** challenging the **Bodh Gaya Temple Act, 1949**, which sought **exclusive control of the Mahabodhi Temple** by the **Buddhist community**.

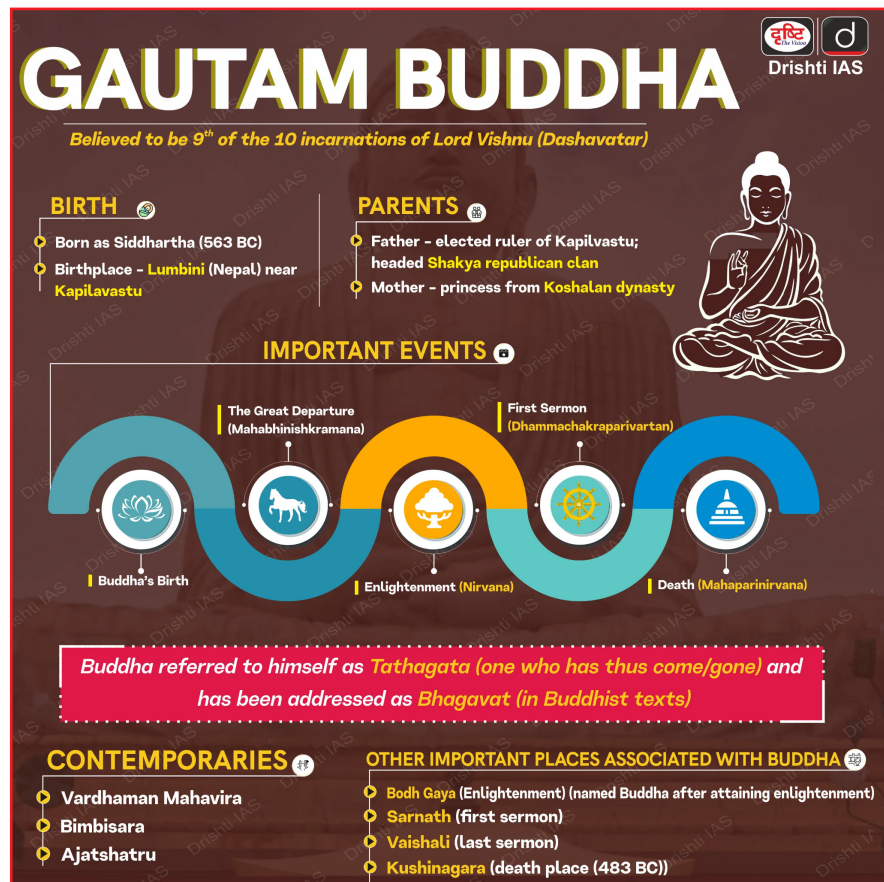
- The **Bodh Gaya Temple Act, 1949** was enacted to ensure the **better management of the Mahabodhi Temple**, one of **Buddhism's holiest sites**.

Mahabodhi Temple

- **About:** It marks the site where **Gautam Buddha** attained **enlightenment** under the **Mahabodhi Tree**. The original temple was built by **Emperor Ashoka** in the **3rd century BC**, while the **present structure** dates to the **5th–6th centuries**.
- **Architectural Features:** It includes the **50 m high grand temple (Vajrasana)**, the **sacred Bodhi Tree**, and **six other sacred sites of Buddha's enlightenment**, surrounded by ancient **Votive stupas**.
 - It is among the **earliest brick temples** from the **Gupta period**, and the **Vajrasana (Diamond Throne)** was originally installed by **Emperor Ashoka** to mark Buddha's meditation spot.
- **Sacred Sites: Bodhi Tree** (direct descendant of the tree under which Buddha attained

enlightenment), **Animesh Lochan Chaitya** (Site of Buddha's meditation after attaining enlightenment), etc.

- **Recognition:** It has been a **UNESCO World Heritage Site** since 2002.



Read More: [Corridor Projects for Vishnupad and Mahabodhi Temples](#)

SC Upholds Legislative Authority of State

The **Supreme Court** ruling in the **Nandini Sundar vs. State of Chhattisgarh 2011 case** sheds light on the role of **state legislatures** in passing laws and their relationship with **judicial orders** in India's democratic framework.

Nandini Sundar vs. State of Chhattisgarh Case, 2011

- **Background:** In **2011**, the **Supreme Court** directed the **Chhattisgarh government** to **cease the use of Special Police Officers (SPOs)** in anti-Maoist operations, citing their **inadequate training** and violations of **Articles 14 and 21** of the Constitution.
 - In response, the state enacted the **Chhattisgarh Auxiliary Armed Police Forces Act**, enabling the formation of an **auxiliary force** resembling the earlier **Salwa Judum** and **Koya Commandos**.

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- The **petitioners filed a contempt plea**, alleging that this new law **contravened the spirit** of the 2011 judgment.
- **Supreme Court Ruling:** The **Supreme Court rejected the contempt plea**, noting that **Chhattisgarh had complied** with its 2011 directions and submitted requisite reports. It held that a **state legislature has the authority to enact laws**, as long as they are **not unconstitutional or ultra vires**.
- Reaffirming the **doctrine of separation of powers**, the Court clarified that **legislative actions** can only be challenged on grounds of **constitutional validity or legislative competence**.
- It emphasized that a legislature may **enact new laws, remove the basis of a judgment, or validate laws struck down**, all within its constitutional domain.
- **Similar Judicial Pronouncements:** SC in *Indian Aluminium Co. vs. State of Kerala (1996)*, upheld the legislature's power to **amend laws or enact retrospective legislation** to remove the basis of a judgment, **without directly overruling it**.

Salwa Judum & Koya Commandos

- **Salwa Judum** is a **state-backed anti-Maoist movement** launched in **2005** in Chhattisgarh, involving the **mobilization of tribal youth** to counter Maoist insurgents.
- **Koya Commandos** were **tribal youths**, primarily from the **Koya tribe**, recruited as **Special Police Officers (SPOs)** in Chhattisgarh under the **Salwa Judum movement** to aid in **anti-Naxalite operations**.

Read More: [SC Verdict on Governors' Powers over State Bills](#)

Chemical Weapons Convention

India hosted the **23rd Regional Meeting of National Authorities of States Parties in Asia** under the **Chemical Weapons Convention (CWC)**.

Chemical Weapons Convention

- **About:** CWC is a **multilateral treaty** banning chemical weapons and requiring their **destruction** within the stipulated time.
 - It came into force in **1997** and its implementation is overseen by the **Organisation for the Prohibition of Chemical Weapons (OPCW)** with **193 member states**.
 - OPCW was awarded the **Nobel Peace Prize** in **2013** for its global efforts in eliminating chemical weapons.
- **India and CWC:** India is an **original signatory** of the CWC and implements it through the **National Authority Chemical Weapons Convention (NACWC)**, established under the **Chemical Weapons Convention Act, 2000**.
 - The **Indian Chemical Council (ICC)**, India's oldest chemical industry association, was **awarded the OPCW-The Hague Award 2024**, becoming the **first industry body globally** to receive this honour.
- **Chemical Weapons:** A **chemical weapon** is any **toxic chemical or device** designed to **cause intentional harm or death**, including munitions and equipment for delivery.
 - It mandates the **destruction of old and abandoned chemical weapons** and requires members to **declare riot-control agents like tear gas**.

Read More: [Chemical Weapons Convention and Biological Weapons Convention](#)

Garcinia Kusumae

Researchers have discovered a new species of tree, *Garcinia kusumae*, in Assam, enriching the region's floral biodiversity.

- *Garcinia kusumae* is a newly identified species in the **genus *Garcinia***, locally known as thoikora in Assamese.
 - The *Garcinia* genus (family: *Clusiaceae*) includes 414 species globally, with 33 species and 7 varieties found in India. Assam alone hosts 12 species and 3 varieties.

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- *Garcinia kusumae* is a **dioecious evergreen tree**, growing up to 18 meters, flowering from February to April, and fruiting from May to June. It differs morphologically from related species such as *G. assamica*, *G. cowa*, and *G. succifolia*, notably in flower structure and fruit resin characteristics.
- **Ethnobotanical Significance:** The fruit pulp is **culturally and medicinally** significant. It is used to make a sherbet to prevent heat stroke, added to curries, eaten raw with condiments, and serves as a traditional remedy for **diabetes and dysentery**.



Read more: [World's First Genetically Modified Rubber: Assam](#)

BHARAT Study: Mapping Healthy Ageing Biomarkers

The Indian Institute of Science, under the Longevity India Programme, has launched the **BHARAT (Biomarkers**

of Healthy Aging, Resilience, Adversity, and Transitions) study to map **ageing biomarkers** and build a baseline for healthy ageing specific to the Indian population.

- **Ageing Complexity:** Ageing varies across individuals and populations, driven by molecular, cellular, environmental, lifestyle, and socioeconomic factors, meaning chronological age may not reflect true biological age.
- **Need for India-Specific Data:** Current **biomarkers and diagnostic standards are often based on Western biomarkers** and cut-offs (like **cholesterol, vitamin D, CRP levels**), which may not be accurate or applicable to Indians, risking misdiagnosis and ineffective treatment.
 - Despite rising life expectancy in India (now 67.3 years), there is a projected surge in **age-related diseases** like **Parkinson's** (168% increase by 2050) and **200% rise in dementia**, underscoring the need for early detection and intervention.
- **Significance of Biomarkers:** BHARAT aims to build a reliable **"Bharat Baseline"** — a reference for what constitutes normal health markers specifically for the Indian population.
 - It covers a broad range of indicators, including **genomic biomarkers** (e.g., disease-linked mutations), **proteomic and metabolic markers** (reflecting biological and metabolic health), and **environmental and lifestyle factors**.
 - The study will use **AI and machine learning** to analyze complex multi-dimensional datasets to predict health outcomes and design effective interventions.

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Tamil Nadu, under the **TNSHORE (Tamil Nadu Sustainably Harnessing Ocean Resources)** project, is working to protect the ecologically vital **Kariyachalli Island** in the **Gulf of Mannar**, which has **shrunk by over 70%** since 1969 and may be **submerged by 2036**.

- **About:** Kariyachalli Island, located within the Gulf of Mannar Marine National Park, is part of one of India's four major coral reef regions (others: **Gulf of Kutch**, **Lakshadweep**, and **Andaman & Nicobar Islands**).
 - It serves as a vital **habitat for endangered species** like dugongs (sea cows, IUCN: **Vulnerable**), which rely on seagrass ecosystems.
- **Threats:** The island has lost **70%** of its **landmass** since **1969**, and due to **climate change**, **30%** of its **coral** has already **bleached**.
- **Conservation:** The **TNSHORE** project plans to install **8,500 artificial reef** modules that are **trapezoidal structures** made of **ferrocement and steel** with **perforations** for **nutrient flow** along with **seagrass plantation** and **coral habitat restoration**, to help **reduce wave energy** and **stabilize the shoreline**.

- **About:** The **Gulf of Mannar**, an extended part of the **Laccadive Sea**, contains **21 islands** and is bordered by **Rameswaram**, **Ram Setu bridge**, and **Mannar Island**.
 - It receives rivers like the **Tambraparni** and **Aruvi**, and hosts the **Tuticorin port**.

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- **Biodiversity:** Home to the **Gulf of Mannar Marine National Park**—South Asia's first **Marine Biosphere Reserve**—it supports **corals, fishes**, and endangered species like **dugongs, whale sharks**, and **sea turtles**.
 - The gulf is noted for its **pearl banks** and **sacred chank** (a gastropod mollusk).
- **Gulf of Mannar Marine National Park:** Established in **1982**, it features **coral reefs, mangroves, mudflats, creeks, seagrass beds, seaweeds, estuaries, sandy shores, saline grasslands, marshes**, and **rocky coastlines**.

Read More: [Coral Breach in Gulf of Mannar](#)

DengiAll

India's efforts to develop a safe and effective **dengue** vaccine have taken a significant leap forward, with its **first indigenous tetravalent dengue vaccine, DengiAll**, reaching 50% enrolment in Phase 3 clinical trials.

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- **DengiAll:** It is developed by **Panacea Biotec** under a licensing agreement with the US National Institutes of Health (NIH), targeting all four dengue virus subtypes.
 - The vaccine has shown a balanced and robust immune response in Phase I and II trials, with no major safety concerns reported.
 - The vaccine is significant as **dengue currently has no specific treatment for everyone**, and severe cases can lead to life-threatening complications like internal bleeding and shock.
- **Dengue:** It is a **mosquito-borne viral disease** caused by the **dengue virus (genus *Flavivirus*)**, primarily transmitted by the **female *Aedes aegypti*** mosquito.
 - This mosquito also spreads **chikungunya, yellow fever, and Zika**. There are **four distinct but related dengue serotypes: DEN-1, DEN-2, DEN-3, and DEN-4**.
 - **Symptoms:** High fever, severe headache, eye pain, muscle and joint pain, rash, and fatigue.
 - **Diagnosis and Treatment:** Diagnosis is done via **blood test**. There is **no specific antiviral treatment**; care is supportive.
 - Dengvaxia is the first dengue vaccine approved by the **US FDA in 2019**; for **ages 9–16 with prior infection** in endemic regions.
- **Burden:** India continues to bear a heavy dengue burden over 2.3 lakh cases and 297 deaths in 2024, making vaccine development crucial.

WHAT IS DENGUE?

- An infection caused by the dengue virus.
- Spread by infected mosquitoes.
- Common in parts of Central and South America, the Caribbean, Africa, the Middle East, Asia, and the Pacific Islands.

WHAT SHOULD I KNOW?

- Anyone who lives or travels to an area with risk of dengue can get infected.
- Before you travel, check to see if the country you are visiting has risk of dengue.

SIGNS AND SYMPTOMS



Fever with any of the following



Aches and pains



Rash



Nausea/vomiting

PREVENTION



Use insect repellent, and treat clothing and gear with permethrin (insecticides).



Wear loose-fitting, long-sleeved shirts and pants.



Choose a hotel or lodging with air conditioning or window and door screens.



Sleep under a mosquito net if you are outside or when screened rooms are not available.

WHEN TO SEE A DOCTOR

Seek immediate medical attention if you or a family member have any of the following symptoms:

- Belly pain or tenderness,
- Vomiting (at least 3 times in 24 hours),
- Bleeding from the nose or gums,
- Vomiting blood, or blood in poop, or
- Feeling extremely tired or restless.

Read more: [Dengue](#)

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NCB's Operation- MED MAX

The **Narcotics Control Bureau (NCB)**, under **Operation MED MAX** and in coordination with international agencies, has **dismantled a transnational drug cartel** operating across **more than 10 countries** in **Asia, North America, Europe, and Oceania**.

- **NCB:** Headquartered in New Delhi, NCB is the apex drug law enforcement and intelligence agency in India, constituted in 1986 under the provisions of the **Narcotic Drugs and Psychotropic Substances (NDPS) Act, 1985**.
 - The **National Policy on Narcotic Drugs and Psychotropic Substances** is based on **Article 47 of the Indian Constitution**, a Directive Principle of State Policy, which mandates the prohibition of the consumption of intoxicating drugs except for medicinal purposes.
- **Functions and Powers of NCB:** Operates under the **Ministry of Home Affairs** and coordinates with various central and state agencies for enforcement and policy implementation.
- **Significance of NCB in Internal Security:** Plays a **key role in national security and public health**, especially in light of increasing international drug syndicates.
 - Leads India's **response to digital and transnational narcotic crimes**.
 - NCB supports **multilateral enforcement actions** involving agencies like the **US DEA and Interpol**.
- **Other Major Legislation Governing Drugs:** Drugs and Cosmetics Act, 1940, and Prevention of Illicit Traffic in NDPS Act, 1988.
 - India is a signatory to key international conventions like Single Convention on Narcotic Drugs, 1961 (as amended by 1972 Protocol), Convention on Psychotropic Substances, 1971, and UN Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances, 1988.

Read more: [Combating Synthetic Drug Trafficking in India](#)

Teak Leaves for Laser Protection

Indian scientists have discovered that **teak leaf extract** could be harnessed as a **natural, eco-friendly optical limiter** to protect eyes and sensitive sensors from **high-intensity laser radiation**.

- **Teak leaves** contain **anthocyanins**, natural pigments with **nonlinear optical (NLO) properties**, making them suitable for **optical power-limiting applications** such as **laser safety goggles, optical shields, and laser-resistant coatings**.

Teak (*Tectona grandis*)

- **About: Teak (Sagwan)** is a **moist deciduous tree** known as the **"King of Timbers"** for its **durability, strength, and resistance to pests, water, and decay**, making it ideal for **shipbuilding, premium furniture, flooring, exterior construction, carving, turnings, and musical instruments**.
 - **India holds 35%** of the world's **planted teak forests**, while **Asia accounts for 95%** of global teak resources.
- **Geographic Distribution:** It is native to **South and Southeast Asia**, including **India, Myanmar, Thailand, Laos, and Indonesia**.
 - In **India**, it grows in **Madhya Pradesh, Maharashtra, Karnataka, Kerala, Tamil Nadu, Assam, and the Northeast**, thriving in **well-drained soils and full sunlight**.
- **Botanical Features:** Teak is a **large deciduous tree** with a **straight cylindrical trunk** (1–1.5 m diameter), **oblong dark green leaves in opposite pairs**, and **small, fragrant white/cream flowers in clusters**.
- **Regulatory Status:** Green felling is **prohibited** in government forests under the **Forest Conservation Act, 1980** and the **National Forest Policy, 1988**, making **private teak plantations** essential to meet domestic and export demands.

Read More: [Types of Forests in India](#)

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Electronic Private Automatic Branch Exchange

In today's fast-paced corporate environment, efficient and integrated communication is essential for productivity, and **Electronic Private Automatic Branch Exchange (EPABX) systems** serve as a critical infrastructure enabling seamless internal and external connectivity in offices.

- **About:** EPABX is a telephone switching system used in businesses to manage both internal and external communication, allowing multiple office telephones to connect through a shared external trunk line without requiring individual lines for each user.
 - The core of EPABX is its switching mechanism, which directs calls accurately across internal and external lines.
- **Evolution of EPABX Technology:**
 - **Electromechanical Relays (1970s–1980s):** Used mechanical switches and electromagnets to connect phone lines.
 - **Digital Electronic Systems:** By the late 1980s, **digital switching** using computers and microprocessors improved call handling and introduced **Pulse Code Modulation (PCM)** and **Time Division Multiplexing (TDM)**.
 - **PCM** converts analog voice into binary data for efficient digital communication.
 - **TDM** enables multiple signals to share one channel by assigning each a time slot, allowing simultaneous data transmission without interference.
 - **Modern Systems:** Integration with **VoIP (Voice over Internet Protocol)** enables voice data to be transmitted over the internet, making communication scalable and cost-effective.

Read more: [The Indian Telecom Revolution](#)

Kharai Camel

Despite repeated interventions by the **National Green Tribunal (NGT)**, Gujarat's **Kachchh region**

continues to witness rampant mangrove destruction, threatening the existence of the rare, swimming Kharai camel.

- **Kharai Camel:** It is indigenous to the **Kachchh region**, the Kharai camel is known for its rare ability to swim long distances and graze on mangroves.
 - The word '**Kharai**' comes from '**Khar**', meaning **saline**, pointing to the camel's ability to live in coastal saline ecosystems. It thrives in brackish water and estuarine ecosystems, not in confined pastures.
 - **Kharai Camels have webbed feet** for swimming and strong digestive systems to tolerate salty vegetation.
 - The Kharai camel is classified as **endangered** by the **International Union for Conservation of Nature (IUCN)**.
- **Ecological and Cultural Significance:** Integral to the **Maldhari community**, traditional camel herders who treat them as part of their pastoral heritage.
 - Kharai Camel is recognised as a **genetically distinct breed** and listed as a **threatened animal** by the **National Bureau of Animal Genetic Resources (NBAGR)**.
- **Threats:** Rapid expansion of salt pans, cement factories, and other industrial activities in **Coastal Regulation Zone- I** areas has led to massive loss of mangrove forests.
 - Populations have declined significantly, with loss of habitat and access to food being the primary reasons.



Read more: [Tourism Working Group in Rann of Kutch](#)

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Earth's Oldest-Known Rocks

A **volcanic rock** belt in Quebec's (Canada) Nuvvuagittuq Greenstone Belt, dated to be **4.16 billion years old**, has been identified as the **oldest-known rock on Earth**, originating from the **Hadean eon** (4.5–4.03 billion years ago), when Earth itself was formed about 4.6 billion years ago.

- The rocks are **metamorphosed** volcanic basalt, formed when magma solidified underground, and provide clues about Earth's early crust, primordial oceans, and the environment where life may have begun.
- Two **radioactive dating methods** (samarium-neodymium decay) confirmed the age, making them the **oldest-known intact rocks**.
- **Zircon crystals** from Australia (4.4 billion years old) remain the **oldest mineral fragments**, but the **Quebec rocks** are the **oldest intact geological formations**.
- The **Hadean eon** (4.5–4.03 billion years ago) was previously thought to be a **molten hellscape** (extremely harsh, hostile, or dangerous to life), but evidence suggests a **cooling crust**, **shallow oceans**, and an **early atmosphere**.

Geologic Time Scale					
Eon	Era	Period	Epoch	MYA	Life Forms
Phanerozoic	Cenozoic (CZ)	Quaternary (Q)	Holocene (H)	0.01	Extinction of large mammals and birds Modern humans
			Pleistocene (PE)	2.6	
		Neogene (N)	Pliocene (PL)	5.3	Spread of grassy ecosystems
			Miocene (MI)	23.0	
			Oligocene (OL)	33.9	
		Paleogene (PG)	Eocene (E)	56.0	Early primates
			Paleocene (EP)	66.0	
					Mass extinction
	Mesozoic (MZ)	Cretaceous (K)		145.0	Placental mammals
					Early flowering plants
		Jurassic (J)		201.3	Dinosaurs diverse and abundant
		Triassic (TR)		251.9	Mass extinction First dinosaurs; first mammals Flying reptiles
	Paleozoic (PZ)	Permian (P)		298.9	Coal-forming swamps Sharks abundant First reptiles
		Pennsylvanian (PN)		323.2	
		Mississippian (M)		358.9	
		Devonian (D)		419.2	Mass extinction First amphibians First forests (evergreens)
		Silurian (S)		443.8	First land plants
		Ordovician (O)		485.4	Mass extinction Primitive fish Trilobite maximum Rise of corals
		Cambrian (C)		541.0	Early shelled organisms
	Proterozoic	Precambrian (PC, W, X, Y, Z)		2500	Complex multicelled organisms
					Simple multicelled organisms
				4000	Early bacteria and algae (stromatolites)
					Origin of life
	Hadean			4600	Formation of the Earth

Read More: [Earth's Mantle and Evolution of Life](#)

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Hul Diwas

The Prime Minister paid a heartfelt tribute on **Hul Diwas (30th June)**, commemorating the start of the **Santhal uprising** and honoring the legacy of **Sido-Kanhu, Chand-Bhairav, Phulo-Jhano**, and other **tribal martyrs** who resisted colonial oppression.

Santhal Uprising

- **About:** Santhal Hul was a **tribal revolt** and **India's first structured war against British oppression**, launched in **1855**, two years before the **1857 Revolt**, aimed at resisting **economic exploitation** and **land alienation**.
- **Leaders & Unity:** Led by **Sidhu and Kanhu**, the **revolt united 32 castes / communities**, showcasing rare **tribal solidarity** against colonial forces.
- **Roots of Rebellion:** It was sparked by the **1832 Damin-i-Koh settlement** in the **Rajmahal hills**, where **Santhals** (displaced from **Bengal**) faced **land-grabbing**, **bonded labour** (*kamioti/harwahi*), and **systemic oppression** by **British-backed zamindars**.
- **Impact:** It led to the passage of **Santhal Parganas Tenancy Act, 1876 (SPT Act)** and later **Chota Nagpur Tenancy Act, 1908 (CNT Act)**.
 - The **SPT Act (1876)** prohibits transfer of **Adivasi land** to non-Adivasis, ensuring **Santhal land rights**, while the **CNT Act (1908)** restricts sale

of **Adivasi and Dalit land**, allowing transfers only within the same caste and area with **Collector's approval**.

Santhal Tribe

- **About:** Originally from **Birbhum** and **Manbhum** (now **West Bengal**), **Santhals** migrated due to the **1770 Bengal famine** and **British policies**, later settling in **Damin-i-Koh (Jharkhand)** under the **Permanent Settlement Act (1790)** for revenue farming.
- **Demographics:** **Santhals** are India's **3rd-largest Scheduled Tribe** (after **Gonds** and **Bhils**), mainly residing in **Jharkhand, Bihar, Odisha**, and **West Bengal**.
- **Culture & Religion:** They celebrate **agriculture-linked festivals** like **Sohrai, Baha**, and **Karam**, speak **Santhali** (8th Schedule language), and use the **Ol Chiki** script.

MAJOR TRIBAL REVOLTS IN INDIA			
TRIBE (REVOLT)	REGION	YEAR	LEADER/S
Pahariya	Rajmahal Hills	1778	Raja Jagannath
Chuar (Jungle Mahal Rebellion)	Jungle Mahal (b/w Chota Nagpur & Bengal plains)	1798	Durjan/Durjol Singh, Madhab Singh, Raja Mohan Singh, Lachman Singh
Oraon and Munda (Tamar Revolt)	Tamar (Chhotanagpur)	1798; 1914-15	Bhulanath Sahay/Singh (1798) Jatra Bhagat, Balram Bhagat (1914-15)
Ho and Munda	Singbhum and Ranchi (Chhotanagpur region)	1820-37; 1890s	Raja of Parahat (Ho) Birsa Munda (1890s)
Ahom	Assam	1828-30	Gomdhar Konwar
Khasi	Hilly region b/w Jaintia and Garo hills	1830s	Nunklow ruler - Tirath Singh
Kol	Chhotanagpur (Ranchi, Singhbhum, Hazaribagh, Palamou)	1831	Buddha Bhagat
Santhals	Rajmahal Hills	1833; 1855-56	Sidhu Murmu and Kanhu Murmu
Khond	Orissa, Andhra Pradesh	1837-56	Chakra Bisnoi
Koya	Eastern Godavari track (Andhra) Rampa (Andhra)	1879-80; 1886 1916; 22-24	Tomma Sora, Raja Anantayyar Alluri Sitarama Raju (Rampa revolt)
Bhil	Western Ghats, Khandesh (MH), south Rajasthan	1817-19; 25; 31; 46 & 1913	Govind Guru (1913 Mangarh Massacre)
Gond	Adilabad (Telangana)	1940	Konrum Bheem

Read More: [Santhal Hul of 1855](#)

Digital Fossil-Mining and Evolution of Squids

Using **digital fossil-mining techniques**, scientists have uncovered that **squids** dominated ancient oceans **30 million years earlier** than previously

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believed, shedding new light on their **deep evolutionary history**.

- Researchers digitally identified at least **40 species** from two modern squid groups—**Oegopsida (deep-sea squids)** and **Myopsida (coastal squids)**—in **110–70 million-year-old Cretaceous concretions** found in **Japan**.
- **Digital fossil-mining** involves using technologies like **3D scanning, CT imaging, AI, and GIS** to extract and analyze fossil data without damaging original fossils.

Squids

- **About:** Squids, belonging to the **Cephalopod class** (with octopuses and cuttlefish), have a **soft mantle**, an **internal shell (gladius)**, a **parrot-like beak**, **two tentacles** for capturing prey, and **eight arms** for holding it.
 - Like all cephalopods, they have **three hearts** and use **jet propulsion** for movement.



- **Habitat Diversity:** Squids are found worldwide, from shallow coasts to **3 miles deep**, and range in size from **tiny pygmy squids** to **giant squids** with the **largest eyes** in the animal kingdom (volleyball-sized).
- **Behavior and Intelligence:** Squids are among the most intelligent invertebrates, using **chromatophores** for **camouflage**, **communication**, and **predator evasion**.
 - They can **ink-spray**, and **detach arm-tips** for **distraction**, and show **social behaviors** like **cooperative hunting** (*Humboldt squid*) and **mate guarding**.
- **Technological Contributions:** They inspired **color-changing materials**, **eco-friendly self-healing packaging**, and **bio-inspired robotics**.

- **Uniqueness:** Some squids can “fly” by **gliding up to 164 feet**, show **parental care** (e.g., *bigfin reef squid*), and **mimic prey** to lure food.

Read More: [Conservation of Cephalopods](#)

India's First Mobile E-Voting in Bihar

Bihar became the first Indian state to pilot mobile phone-based e-voting in municipal elections using the **E-SECBHR app** developed by **C-DAC**. The initiative aimed to improve voting access for senior citizens, pregnant women, and persons with disabilities.

- To ensure **security and transparency**, the system used **blockchain technology**, **facial recognition**, **biometric scanning**, **voter ID verification**, and limited **2 voters per mobile number**.

Recent ECI Electoral Reforms & Privacy Safeguards

- **Restriction on Public Access to Polling Booth CCTV Footage:** The Election Commission of India (ECI) has restricted public access to **CCTV, webcast, and videography footage** of polling stations citing **voter privacy and security**. As per new rules:
 - **Destruction of footage** is mandated **45 days after result declaration**, unless a **petition** is filed.
 - Footage can only be submitted to a **High Court** hearing an **election petition** & **no other authority or individual** may access it as public release may violate **Section 128 of the Representation of People Act, 1951** (secrecy of voting) and **Supreme Court** rulings that uphold **ballot secrecy**.
 - ECI clarified that videography is **not legally mandated**, and is used only as an **internal management tool**.
 - In **December 2024**, **Rule 93(2)(a)** of the **Conduct of Election Rules, 1961** was amended to **exclude CCTV and electronic footage** from public inspection.
- **New Voter-Friendly Measures:** In bye-elections across **5 Assembly Constituencies**, ECI introduced new initiatives to improve **transparency and voter convenience**, including:
 - **Mobile deposit facility** for voters

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- Real-time voter turnout reporting via the ECINET App
- 100% webcasting (except one station)
- Individual mock poll training for all Presiding Officers
- Conducted Special Summary Revision (SSR) to revise the electoral rolls, for the first time in nearly 20 years.

ELECTORAL REFORMS IN INDIA

ELECTORAL REFORMS ARE CHANGES MADE TO IMPROVE THE ELECTION PROCESS AND ENSURE FAIRNESS.

Electoral Reforms Before 1996

- **Model Code of Conduct (1969):** Guidelines to regulate political parties and candidates prior to elections
- **61st Constitutional Amendment Act (1988):** Lowering of the voting age from 21 to 18 years
- **Electronic Voting Machines (EVMs) (1989):** Switched from individual colored ballot boxes to ballot papers, and later to EVMs
- **Booth Capturing (1989):** Provision for adjournment of poll or countermanding of elections in such cases
- **Elector's Photo Identity card (EPIC) (1993):** Electoral roll is the basis to issue EPIC to registered electors
- **ECI- A Multi-member Body (1993):** Election commissioners were appointed in addition to CEC

Electoral Reforms of 1996

- **Time-limit for By-elections:** Elections must occur within 6 months of any vacancy in a legislative house
- **Listing of Names of Candidates:** Contesting candidates categorized into 3 groups for listing
 - Recognised & registered-unrecognised political parties
 - Other (independent)
- **Disqualification for Insulting the National Honour Act, 1971:** Leads to election disqualification for 6 years upon:
 - Insulting the National Flag, Constitution of India or preventing the singing of National Anthem

Electoral Reforms After 1996

- **Vote Through Proxy (2003):** Service voters in Armed Forces & forces under Army Act can vote by proxy
- **Allocation of Time on Electronic Media (2003):** Equitable sharing of time on electronic media during elections to address the public
- **Introduction of Braille Signage Features in EVMs (2004):** To facilitate the visually impaired voters to cast their votes without an attendant

Electoral Reforms Since 2010

- **Voting Rights to Indian Citizens Living Abroad (2010)**
- **Online Enrollment in Electoral Roll (2013)**
- **Introduction of NOTA option (2014)**
- **VVPAT Voter Verified Paper Audit Trail (2013):** Introduction of VVPAT with EVMs to conduct free and fair elections
- **Photos of Candidates on EVMs and Ballot Papers (2015):** To prevent confusion in constituencies with namesake candidates
- **Introduction of Electoral bonds (2017 Budget):** An alternative to cash donations for political parties
 - Declared as unconstitutional by SC (2024)
- **Launch of Electronic EPIC (2021)**
- **Home Voting for People with Disabilities & Those Above 85 years of Age (2024)**

IMPORTANT COMMITTEES/ COMMISSION

Committees/ Commission	Year	Purpose
■ Tarkunde Committee	1974	■ By Jaya Prakash Narayan (JP) during the "Total Revolution" movement.
■ Dinesh Goswami Committee	1990	■ Electoral Reforms
■ Vohra Committee	1993	■ On the Nexus between Crime and Politics
■ Indrajit Gupta Committee	1998	■ State Funding of Elections
■ Second Administrative Reforms Commission of India	2007	■ Report on Ethics in Governance (Headed by Veerappa Moily)
■ Tankha Committee (Core Committee)	2010	■ To look into the whole gamut of the election laws & electoral reforms.



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Read More: [Electoral Reforms in India](#)

Inauguration of National Turmeric Board in Nizamabad

The Union Home Minister inaugurated the National Turmeric Board in Nizamabad, Telangana, to develop a complete value chain for turmeric, including packaging, branding, marketing, and export.

- Operating under the Ministry of Commerce and Industry, the board aims to reduce middlemen, promote GI-tagged organic turmeric, and train farmers in best practices.
- Previously, the Spices Board managed turmeric promotion along with over 50 other spices.

Turmeric

- **About:** **Turmeric** is an underground stem (rhizome) of the *Curcuma longa* plant, which is part of the ginger family (Zingiberaceae).
 - **Curcumin**, the active compound in turmeric, gives it its yellow color and is known for its anti-inflammatory, antioxidant, and antimicrobial benefits.
- **Cultivation:** India cultivates 30+ turmeric varieties across 20+ states, with major producers being Maharashtra, Telangana, Karnataka, and Tamil Nadu.
 - Turmeric requires a tropical climate with 20–30°C temperature, 1500+ mm annual rainfall, and well-drained sandy or clay loam soils for optimal growth.

- **Global Standing:** India is the world's largest producer, consumer, and exporter of turmeric.
 - In 2022–23, it contributed over 75% of global production and held a 62% share in global exports.
- **Export Data:** India exported turmeric and related products worth USD 207.45 million in 2022–23, mainly to Bangladesh, UAE, USA, and Malaysia, and aims to reach USD 1 billion in turmeric exports by 2030.
- **GI Tags:** **GI-certified** varieties include Lakadong turmeric (Meghalaya), **Kandhamal turmeric** (Odisha), **Erode turmeric** (Tamil Nadu).
- **Health Benefits:** Curcumin helps in reducing inflammation, fighting oxidative stress, and aiding digestion by enhancing bile production, making turmeric significant in traditional and modern medicine.



Read More: [National Turmeric Board](#)



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