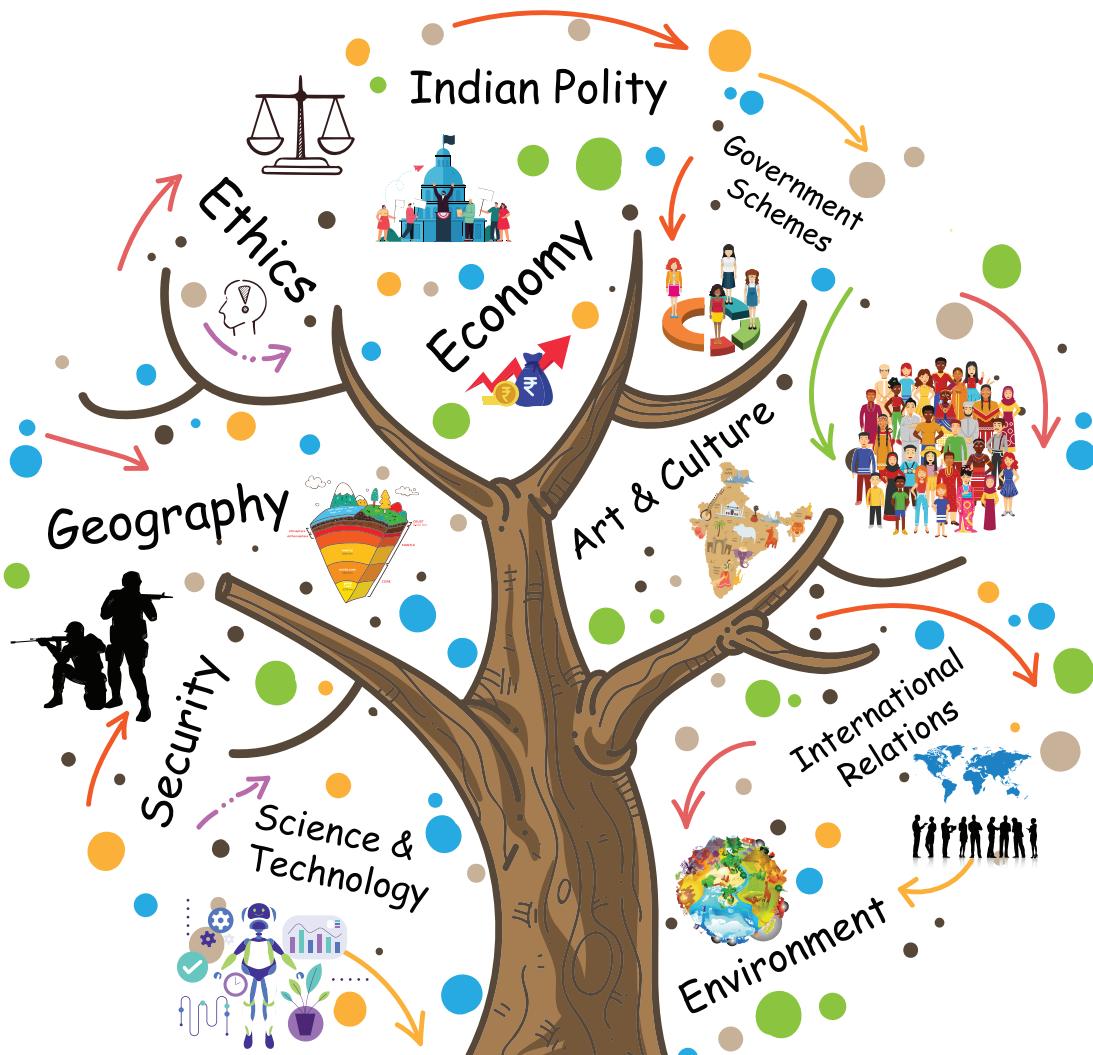


Monthly

# Current Affairs

November 2025



**ZETA**  
**Topicals**

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## November 2025

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## COP 30- Belem Brazil

**In News:** The United Nations Framework for climate change (UNFCCC) summit was held in Belém, Brazil, between 10<sup>th</sup> November 2025- 21<sup>st</sup> November 2025.

### It also included

- The 30th session of the Conference of the Parties (COP 30)
- The 20th meeting of the COP serving as the Meeting of the Parties to the Kyoto Protocol (CMP 20)
- The seventh meeting of the COP serving as the Meeting of the Parties to the Paris Agreement (CMA 7)
- 63rd sessions of the Subsidiary Body for Scientific and Technological Advice (SBSTA 63)
- Subsidiary Body for Implementation (SBI 63)



### Major Outcome of COP30:

COP30 ended with the political agreement called Global Mutirão Agreement.

- ‘Global Mutirão’ which is a Portuguese word meaning ‘collective effort’. At COP30, it refers to the Brazilian presidency’s theme of collective, community-driven effort for climate action.

COP30 made progress across several priority areas, but significantly more ambition and finance will be needed to keep the Paris Agreement goals within reach.

- Presidency’s “Big 4” negotiation issues:** The Presidency undertook consultations on four key issues that were outside the formal negotiations agenda, covering
  - Nationally determined contributions (NDCs) and ambition
  - The treatment of finance (developed country finance to developing countries)
  - Biennial Transparency Reports (BTRs) and transparency
  - Climate-related trade measures, including unilateral trade measures (UTMs)

- **Climate finance:** Climate finance was central to COP30 discussions. Intense discussions occurred on the obligations of developed country parties to deliver finance to developing countries. Adaptation finance was also a prominent issue, with Parties eventually agreeing to triple adaptation finance by 2035 after resistance from developed countries.
- **Carbon markets:** COP30 resolved the administrative uncertainties including funding mechanism and removal of clean development mechanism. Parties affirmed the crediting standards and methodologies developed by the Supervisory Body and reinforced the existing rulebook (which will be reviewed in 2028).
- **Mitigation:** In response to UNFCCC findings that current NDCs fall short of a 1.5°C pathway, Parties decided to develop the Global Implementation Accelerator and the Belém Mission to 1.5°C under the Mutirão Decision.
- **Adaptation:** Adaptation gained prominence at COP30 with agreement on the Belém Adaptation Indicators to track progress towards the Global Goal on Adaptation (GGA). However, these indicators are voluntary and do not create legal obligations.

#### Roadmap to end Deforestation:

- COP30 President announced a dedicated deforestation roadmap, which countries will develop over the coming year.
- This aligns with host country Brazil's emphasis that climate action must prioritise forest protection, biodiversity conservation, and indigenous rights.
- Since COP30 was held in close proximity to the Amazon rainforest, it was a strategic and also a symbolic way of putting emphasis in forest conservation.

#### COP30 and Fossil fuel:

- a. **Phasing out fossil fuels:** Over 80 countries, including the EU and small island nations, pushed for explicit language requiring a phase-out of fossil fuels, the world's largest source of greenhouse gas emissions.
- b. **Opposition from countries:** many countries including EU, India, China and South Africa opposed the phasing-out language which is binding. Their reasons include the following:
  - National energy needs and development priorities,
  - Concerns over inadequate climate finance,
  - Rejection of uniform global timelines that disregard domestic realities.

India and other BRICS member insisted that energy transitions must be nationally determined, not externally imposed.

#### COP30 adopted:

A broad commitment to “transition away from fossil fuels”, but

- No timeline,
- No mandatory reduction pathway

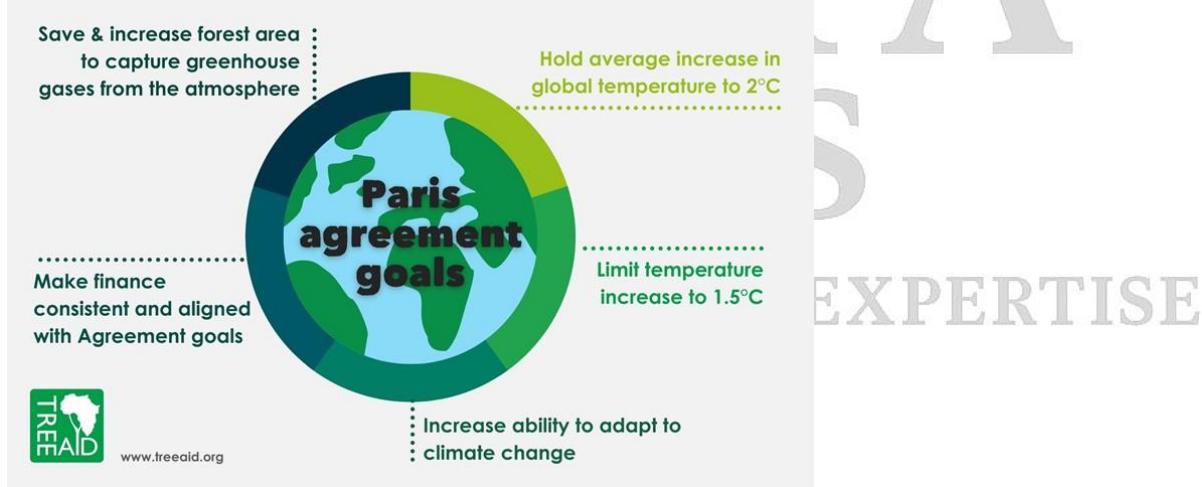
A separate voluntary roadmap, announced by the President, outside the formal COP text.

## USA's boycott and road ahead:

The 195 Parties at COP30 finally managed to adopt a joint declaration at the last minute. This compromise avoided a formal failure, but it has generated major diplomatic frustration for a COP that was meant to mark the 10th anniversary of the Paris Agreement.

- a. **Lack of resources:** lack of resources is currently the biggest obstacle to COP30. Without support, without funding, ambition is impossible in many parts of the world. The absence of US has casted a shadow on these negotiations.
- b. **Lack of effort:** the new Loss and Damage Fund announced on the first day of the conference has only \$250 million, while the annual needs of countries in the Global South reach hundreds of billions. The rich countries including the US make no efforts to fulfil their commitments, rather they have constantly said there is no money.
- c. **Voice of Africa:** COP30 also held Africa Day, which presented Africa's unified stance on sustainable climate finance to international partners, financial institutions, and donors.
- d. **Uncertainties ahead:** Annual inventories from the US Environmental Protection Agency (EPA) show that the country has remained among the world's largest emitters of greenhouse gases for more than three decades, releasing between 5.5 and 6.7 billion tons of CO2 equivalent per year since 1990.
- e. **Historical weight:** historical weight was one of the reasons that led the US to present its first national contribution under the Paris Agreement in 2015, pledging to reduce emissions by 26%-28% by 2025 over 2005. At the time, the commitment was considered central to global ambition as the country alone emitted more than entire continents.

## An Opportunity for other countries: US withdrawal and its repercussions



On January 20<sup>th</sup> 2025, US President Donald Trump signed many Executive Orders, including the withdrawal from the Paris Agreement. The move has raised fears of detrimental implications for climate change, global health, inequalities and multilateralism more widely.

The US is one of the largest emitters of greenhouse gases and plays a key role in international environmental initiatives

As the US is rolling back its ambition, it is allowing other oil producing countries like Saudi Arabia to ignore their own climate pledges and to try and undermine others. **China has stepped into the void and**

**become one of the loudest voices in the room. As the world's largest supplier of green technology, Beijing used Cop30 to promote its solar, wind and electric vehicle industries and court countries looking to invest.**

### Global Mutirão text

**The Global Mutirão text**, a proposed roadmap to “transition away” from fossil fuels. More than 80 countries signed it, from EU members to climate-vulnerable Pacific island states.

But opposition from Saudi Arabia, India and other major fossil fuel producers watered it down.

- The key references to a fossil fuel phase-out were missing.
- There was a backlash from Colombia, due to the lack of inclusion of transition away from fossil fuels, which forced the Cop presidency to offer a six-month review as an olive branch.
- The gulf between oil-producing countries (in particular in the Middle East) and the rest of the world has never been wider. This summit only furthered this gap.

**One positive to come out of the summit was the power of organised people: Indigenous groups and civil society made their voices heard, even if they weren't translated into the final text.**

### Belem Health Action Plan (BHAP):

- Belem health Action Plan was launched by 80 countries and organisations at COP30, building on findings from the Lancet Countdown report.

#### Lancet Report

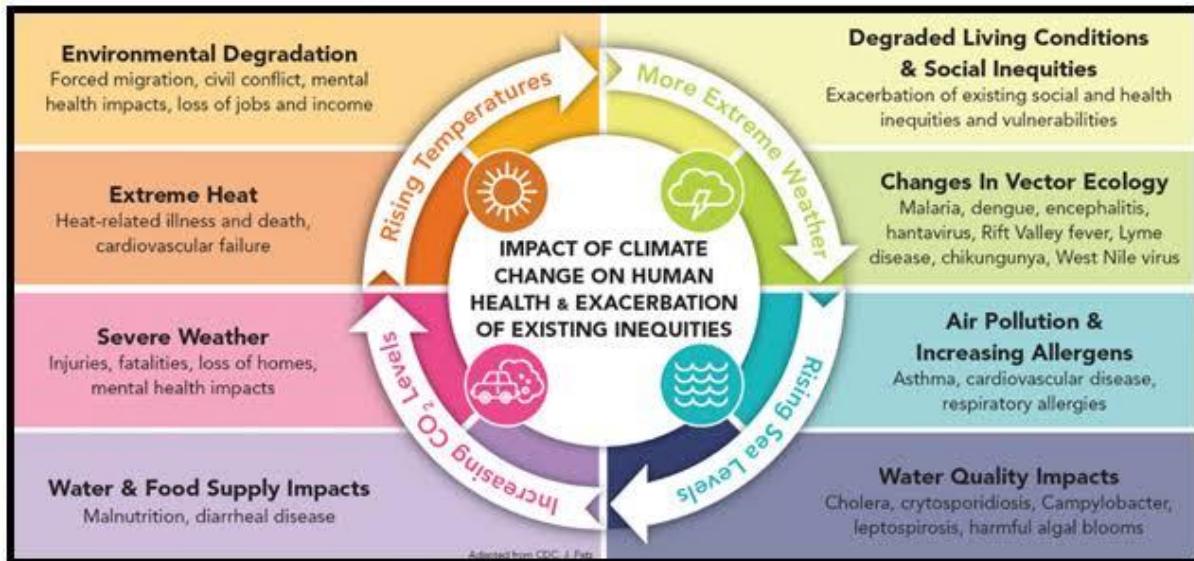
- The 2025 Lancet Countdown Report on Health and Climate Change has become a key reference for the initiative. According to the report:
- Heat-related deaths have surged by 23% since the 1990s, now reaching 546,000 deaths annually.
- Over 154,000 deaths were linked to wildfire smoke exposure in 2024 alone.
- The global dengue transmission potential has risen by 49% since the 1950s

- It builds on international policies and commitments that increasingly recognize the link between health and climate change, including those adopted by the World Health Organization.
- It seeks to integrate climate adaptation with public health strategies, making health systems more resilient, equitable, and climate-ready.
- The Plan aligns with WHO's Global Action Plan on Climate Change and Health, approved by the WHA in May 2025.

The Plan is also coherent with the Global Goal on Adaptation, and the UAE-Belém Work Programme1, building on the progress achieved within the UNFCCC framework, particularly initiatives launched since COP26:

- I. COP26: Health Programme and the subsequent creation of the ATACH (Alliance for Transformative Action on Climate and Health).
- II. COP27: Initiative on Climate Action and Nutrition (I-CAN).

- III. COP28: Declaration on Climate and Health and the Guiding Principles for Financing Climate and Health Solutions.
- IV. COP29: Baku COP Presidencies Continuity Coalition for Climate and Health and the Baku Initiative on Human Development.



## What does South Asia expect from COP30?

A decade after the Paris Agreement, climate change has only intensified. South Asia especially shows the brutal nature of climate change with higher intensity of climate change events affecting the region.

- a. Monsoon floods
- b. Landslides
- c. Heat-waves

These shocks unfold amid fractured global order when multi-lateralism is under strain and trade protectionism is rising. Withdrawal of the US from Paris agreement has further weakened the climate pledges.

### Major concerns: Implementation remains Achilles heels of climate action

- There's a huge gap between what is promised in action and the finance available. Implementation of nationally determined contributions or delivering finance. There is a challenge especially for developing countries, so far only 65 countries have submitted enhanced NDCs.
- A recent study by the council on energy, environment and water (CEEW) revealed that out of 203 initiatives assessed (launched in 2015) approximately 5% of the initiatives have achieved their stated goals.

## What is needed?

- a. Robust governance including clear plan and timeline for reporting progress.
- b. Willing countries should make efforts to strengthen regional forums to build a common stance and advance shared action that be recognized at platforms such as G20, BIMSTEC and BRICS.
- c. Strengthen regional cooperation by sharing knowledge aligning priorities and sealing technology. Focused partnerships can advance both national and regional goals. For example, India's coalition for disaster
- d. Climate adaptation must stand shoulder to shoulder with emission mitigation.
- e. Adequate technical, institutional and financial support to develop and implement plans domestically.

## Governance and Polity

### 1. Right to vote is not the same as freedom of voting

Context: The Centre in response to a petition argued in the Supreme Court that Right to vote is not the same as freedom to vote, amidst the first phase of polling in Bihar.

**'Right to vote' was a statutory right conferred by Section 62 of the Representation of the People Act of 1951, but freedom of voting was a "species of the right to expression under Article 19(1)(a) of the Constitution".**

This means that freedom of voting is considered part of **Article 19(1)(a)** (guarantees all citizens the right to freedom of speech and expression).

- It covers the voter's ability to express preference, including choosing a candidate or selecting NOTA (None of the above), but this expressive freedom exists only when an actual poll occurs.

#### Petitioners' Arguments

- **Violation of voters' freedom of expression:** By declaring a candidate elected without polling, citizens are denied their right to express dissent through None of the Above (NOTA).
- **NOTA as a democratic tool:** NOTA enables voters to register dissatisfaction with all contesting candidates; removing the opportunity to vote suppresses that expression.

Under Section 53(2) of the RPA, 1951, if the number of contesting candidates is equal to the number of seats to be filled, no poll is conducted. Instead, the Returning Officer declares the candidates elected uncontested using Form 21 (for general elections) or Form 21B (for by-elections).

- With no poll, voters cannot exercise freedom of voting or use NOTA. The petitioners argue that this denies voters the opportunity to express dissatisfaction through NOTA, thereby violating their Article 19(1)(a).
- The Union government said that NOTA is not a candidate under Section 79(b) of the RPA, 1951. Therefore, NOTA cannot be used to demand a poll in uncontested elections.

#### Centre and Election Commission of India's response:

Both the government and the Election Commission of India have responded to whether declaration of a sole candidate without taking any poll was a violation of the electors' right to express their unhappiness by voting NOTA.

- The initial right (right to vote) cannot be placed on the pedestal of a fundamental right, but at the stage when the voter goes to the polling booth and casts his vote, his freedom to express arises.
- The casting of vote in favour of one or the other candidate is tantamount to expression of his opinion and preference and that final stage in the exercise of voting right marks the accomplishment of freedom of expression of the voter.
- The freedom of voting (the freedom to choose a candidate through positive vote or a negative vote through NOTA) was dependent on whether or not there was a poll taken.
- The election would be put to vote only if the number of candidates were more than the number of seats to be filled, as provided under Section 53(1) of the 1951 Act. Again, there would be no poll if the number of candidates were fewer than the seats in an election, as mandated under Section 53(3) of the Act.

#### NOTA not a candidate:

- The Centre argued that NOTA did not fit within the definition of a 'candidate' under Section 79(b) of the RP Act, 1951.

- NOTA cannot be given an artificial personality. It is merely an option or an expression. It cannot be termed as a candidate so as to take a poll in terms of Section 53(1) of the RP Act.
- The Election Commission of India also states that with the evolution of democracy, more political parties are contesting and the number of candidates increases automatically. Uncontested elections are a rarity.

### Right to Vote:

- Article 326** of the Constitution grants every citizen the right to vote, without any discrimination.
- The laws enacted by Parliament in this regard are the **Representation of the People Act, 1950 (RP Act, 1950)** and the **Representation of the People Act, 1951 (RP Act, 1951)**.

In India, the right to vote comes from the idea of universal adult franchise mentioned in Article 326 of the Constitution. However, the actual rules for voting are set through laws made by Parliament. Courts have usually said that voting is a legal right, not a fundamental one, though there is ongoing discussion on whether it should get stronger protection under the Constitution in the future.

Zeal      Tenacity

## 2. Why Nomination Process Need Reforms

**Context:** rejection of candidates on technical grounds to ensure unopposed victory, which is lawful by nature has reignited the need for reforms in nomination process. Herein, democracy is being killed by the Rule of law.

### Authority to reject nomination:

- The Representation of the People Act (RPA), 1951, and the Conduct of Elections Rules, 1961, which governs this process has vested extraordinary discretion in the Returning Officer (RO).
- The RO's power under Section 36(2) to conduct a "summary inquiry" and to reject nominations for "defects of a substantial character" is extraordinarily wide, and largely un-reviewable before polling, since Article 329 (b) bars courts from interfering mid-election. The law says no nomination should be rejected for defects not of a substantial character.
- Absence of written rules regarding what qualifies as substantial character leaves no remedy but to file petition after elections. Thereby making the nomination process undemocratic. This absolutism dressed in legal language also has the potential to become a tool of political exclusion.

### Reasons for rejection:

Candidates can be disqualified on minor procedural grounds like missing signatures to delayed certificates, technicalities often override democratic principles.

- The oath trap:** Every candidate must take an oath before a specified authority after filing nomination but before scrutiny. If it's too early, it's invalid, and if too late, the nomination is rejected. Moreover, if it is not before the specified authority, your form is again bound to be rejected.
- The treasury trap:** Security deposits must be made in cash or through treasury challans. A candidate arriving after 3 PM with the correct amount but wrong payment mode can be disqualified.
- The notarisation trap:** Every Form 26 affidavit (an affidavit which needs to be filed by the candidate along with nomination papers) must be notarised by a specified authority. Not having done so can result in rejection of the nomination.

d. **The certificate trap:** Along with nomination papers, the candidate is liable to submit no-dues certificates from municipal bodies, electricity boards, or other government departments; clearance certificates from the Election Commission for government servants; and various other bureaucratic attestations, each of them a veto point when it comes to the time of scrutiny. Thus, each issuing office becomes a potential chokepoint where deliberate delay can eliminate a candidacy.

### Procedural traps:

- Section 36 of the RP Act mandates that only qualified candidates can contest. However, the process of verifying qualification has accumulated complexity over the years.
- Judicial interventions with clear intent have made the procedure more undemocratic.
- Supreme Court directions mandating detailed affidavits on assets, liabilities, and criminal cases were meant to ensure transparency, yet each new disclosure requirement added another opportunity for technical rejection.
- In ***Resurgence India versus Election Commission (2013)***, the Supreme Court held that false declarations lead to prosecution but don't invalidate nominations, only incomplete ones do. This means that a candidate who lies but fills all columns stays on the ballot, and one who makes a good-faith error can be rejected. The system now punishes incomplete declarations more harshly than dishonest ones.

### Way forward:

- **Looking beyond technical paperwork:** The first principle must be that every qualified citizen has a presumptive right to contest. That right can be denied only when the RO establishes, with clear evidence, a substantive constitutional or statutory disqualification. Technical paperwork errors cannot be a reason for disqualification.
- **Digitization of process:** An electronic declaration authenticated by Aadhaar OTP or digital signature would suffice for the mandatory oath which a candidate has to take before a specified authority. Moreover, Security deposit submissions can be made more citizen friendly by including payment modes such as UPI, RTGS, or debit card.
- **Legal standing to checklist:** The RO Handbook instructs ROs to point out defects at the time of filing and record them in a checklist. But this checklist has no legal standing which makes the process opaque.
- **Discretion to duty:** The RO's role must shift from discretion to duty. When a deficiency exists, the RO must issue a detailed written notice specifying the exact error, the legal provision violated, and the correction needed. Candidates must get a guaranteed 48-hour window to fix it after receiving this notice.
- **The law must thus classify deficiencies into three categories:**
  - (1) Technical or paperwork defects such as missing signatures, blank affidavit columns, clerical errors, no-dues certificates etc. These cannot justify rejection.
  - (2) Matters requiring verification of authenticity such as disputed signatures, challenged documents etc. These require investigations before rejection.
  - (3) Constitutional and statutory bars. These should lead to immediate rejection.
- The RO must specify which exact requirement was not met, which provision of law was violated, what evidence supports the finding, and why the defect is substantial enough to justify rejection.

- Paper less nomination: The Election Commission of India (EC) can build a nomination that

#### **Lessons from other countries:**

- In the U.K., ROs help candidates fix errors before deadlines.
- Canada mandates a 48-hour correction period.
- Germany requires written notice of problems, time to remedy them, and multiple appeal layers
- Australia encourages early submission to allow corrections. The common idea being that election officials are facilitators, not sentinels. Their job is to widen participation, not narrow it.
- When a nomination is rejected arbitrarily, two rights are violated: the candidate's right to contest and the voters' right to choose. The world's largest democracy deserves a nomination process that is modern, fair, and inclusive, where the burden of proof is on the state to justify exclusion, not on citizens to prove their right to participate. Fairness must extend to the nomination stage, where the voter's right to choose is determined.

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## **3. New Labour Code**

**In News:** The Government of India has announced the implementation of the four Labour Codes - the Code on Wages, 2019, the Industrial Relations Code, 2020, the Code on Social Security, 2020 and the Occupational Safety, Health and Working Conditions Code, 2020 with effect from 21st November 2025, rationalising 29 existing labour laws.

**Comparison of the labour ecosystem, before and after the implementation of the Labour Codes**

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Formalisation of Employment	No mandatory appointment letters	Mandatory appointment letters for all workers ensuring transparency, job security, and fixed employment.
Social Security Coverage	Limited coverage	Under Code on Social Security, 2020, all workers including gig & platform workers get social security like PF, ESIC, insurance, and other benefits.
Minimum Wages	Applied only to scheduled industries; many uncovered	Code on Wages, 2019 grants all workers statutory right to minimum wage and timely payment for financial security.
Preventive Healthcare	No legal requirement for free health check-ups	Employers must provide free annual health check-ups for workers above 40 years to promote preventive healthcare.
Timely Wages	No mandatory compliance for timely payment	Employers must provide timely wages to ensure financial stability, reduce work stress, and boost worker morale.
Women Workforce Participation	Restrictions on women working night shifts and in certain jobs	Women allowed to work at night and in all jobs with consent and safety, enabling equal opportunities in high-paying roles.
ESIC Coverage	Limited to notified areas and specific industries; mini establishments often excluded	ESIC coverage expanded Pan-India, mandatory for establishments with any hazardous-process workers, voluntary for others with fewer than 10 employees.
Compliance Burden	Multiple registrations, licenses, and returns	Single registration, PAN-India single license, and single return simplify processes and reduce compliance burden.

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## New laws usher in key changes

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### ► Gratuity after a year

Gratuity payments for all fixed-term employees after one year of continuous service, instead of five years earlier.

### ► Mandated minimum wage

A national minimum wage will cover all workers, instead of a few scheduled industries.

### ► Health focus

Free annual medical checkups for workers aged above 40.

### ► New lay-off threshold

Companies with up to 300 workers allowed to fire workers

or shut plants without prior govt approval. The previous threshold was 100 workers.

### ► Relief for fixed-term staff

Fixed-term employees will get the same benefits as permanent staff, including leave, regulated working hours and medical benefits.

### ► Enhancing female labour force participation

Women allowed to work night shifts and enter industries, sectors under the "hazardous" category, such as mining

### ► Laws define gig, platform work

"A person who participates in a work arrangement and earns from such activities outside of a traditional employer-employee relationship"



## What are the changes?

- Fixed-Term Employees gain parity & quicker gratuity:** Fixed-term employees will now get the same benefits as permanent staff, leave, medical cover, and social security. They also qualify for gratuity after just 1 year of continuous service, instead of 5 and must be paid at par with permanent workers, boosting income stability and stronger protection against lack of job security.
- Gig & Platform workers get social security:** For the first time, 'gig work', 'platform work', and 'aggregators' are officially recognised under labour law. Aggregators now must contribute 1-2% of their annual revenue to worker welfare funds, capped at 5% of total pay-outs. Aadhaar-linked Universal Account Number will make welfare benefits easier to access, fully portable, and available across states, regardless of where the worker migrates.
- Contract workers secure healthcare rights:** Contract workers get a big upgrade, free annual health check-ups, plus mandatory health and social security benefits from the principal employer. Fixed-term employees now enjoy the same legal protections as permanent employees and qualify for gratuity after just 1 year of continuous service.
- Women workers achieve equal status:** The new framework outlaws gender-based discrimination and mandates equal pay for equal work. Women can work night shifts and take on any role, including underground mining, operating heavy machinery, with safety measures and consent. Grievance panels must include women, and "family" now covers parents-in-law for female employees, expanding coverage and promoting inclusivity.
- IT & ITES sector gets structured benefits:** Salaries must now be paid by the 7th of every month. Equal pay for equal work is mandatory. Women can work night shifts across all IT and ITES establishments, unlocking higher learning opportunities. Harassment, discrimination, and wage disputes have to be resolved quickly. Social security gets a boost with fixed-term employment provisions and compulsory appointment letters.

- f. **Media workers enter formal employment:** Digital and audio-visual workers, including electronic media journalists, dubbing professionals, and stunt performers, will now get comprehensive benefits. Appointment letters with clear roles, pay and social security rights are mandatory. Wages must be paid on time. Any overtime needs the worker's consent and must be paid at twice the normal rate.
- g. **Youth workers secure minimum standards:** Minimum wages are now mandatory for all workers. Every worker must get an appointment letter, ensuring formal jobs and social protection, helping to maintain an employment record. Exploitation is strictly prohibited, and wages are guaranteed even during leave. The central government's floor wage sets the baseline for fair pay.
- h. **MSME workers covered under social security:** All employees working in micro, small, and medium enterprises are covered by the Social Security Code, 2020, and eligibility depends on the size of the workforce. A minimum wage is assured for every worker, as is access to workplace amenities such as rest areas, drinking water, and canteens. The laws also ensure standard working hours, double wages for overtime, paid leave entitlements, and timely payment.
- i. **Hazardous industry workers get safety net:** Workers in hazardous sectors are entitled to free annual health check-ups. National standards to improve workplace safety will be issued. Women can work in all hazardous environments, including underground mining and heavy machinery operations, ensuring equal employment opportunities. A safety committee will need to be set up to oversee workplace safety and guarantee proper handling of hazardous substances.
- j. **Export sector workers gain security:** Fixed-term workers in the export sector will now get gratuity, provident fund benefits, and other forms of social security. Employees can take annual leave after completing 180 days of work within a year. Timely payments are mandated, with no unauthorized salary deductions or imposing of wage ceilings. If willing, women workers can work in night shifts, throwing open opportunities to earn higher income.

Over the past decade, India has increased social-security coverage from about 19% in 2015 to over 64% in 2025, reaching many more workers with protection and dignity.

The new Labour Codes further expand this coverage and allow workers to carry their benefits across states and sectors. They focus especially on women, youth, gig, migrant, and unorganised workers.

By simplifying rules and supporting flexible work, these Codes promote employment, skill development, and industry growth, showing the Government's commitment to a worker-friendly and inclusive labour system.

## 4. How can State PSC's be reformed?

**In News:** The 2025 national conference of chairpersons of the State Public Service Commissions (PSCs) will be hosted by the Telangana State Public Service Commission on December 19 and 20.

### Issue:

- a. Every year, whenever State PSCs conduct examinations for recruitment, they are mired in one controversy or the other.
- b. Aspirants often have to seek judicial recourse, due to which the entire process is derailed, leading to a 'trust deficit'.

This is an outcome of systemic lapses, both structural and procedural, which exist in almost all State PSCs.

The PSCs in India are a product of India's struggle for Independence. The entry of Indians into the civil services on the sole criterion of merit was embedded in the demand for 'self-rule'. The Montagu Chelmsford report accepted the demand and proposed a permanent office free from political influence to regulate service matters.

1. The first Public Service Commission for the Union was formed in 1926.
2. the Government of India Act, 1935 provided for the establishment of one PSC for each province
3. These provisions were continued by the framers of the Constitution, and so today we have a Union Public Service Commission (UPSC) and PSCs in each State to primarily serve the needs of recruitment.

Article	Description
Article 315	Establishes Public Service Commissions for the Union (UPSC) and States (SPSC), and allows Joint PSCs (JPSC).
Article 316	Details the appointment and term of office for members of these commissions.
Article 317	Covers the removal and suspension of PSC members.
Article 318	Grants power to make regulations regarding conditions of service for members and staff.
Article 319	Prohibits holding certain offices after ceasing to be a member.
Article 320	Outlines the functions of the PSCs, primarily recruitment and consultation on service matters.
Article 321	Allows for the extension of PSC functions by law.
Article 322	Deals with the expenses of the PSCs.
Article 323	Relates to the reports of the PSCs.

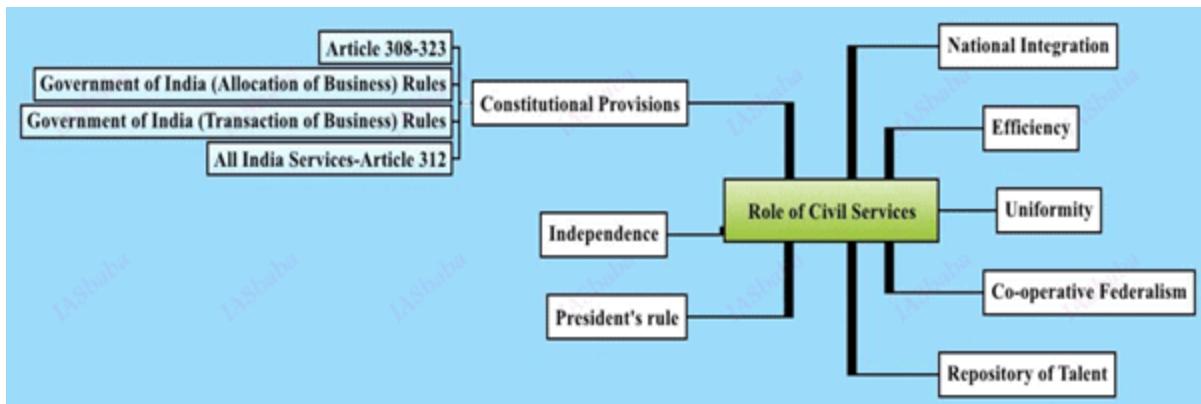
## Structure of UPSC: YOUR ZEAL • OUR EXPERTISE

- a. The members are appointed based on merit and rich prior experience in public affairs
- b. Representation of members from all zones of the country is ensured
- c. While the Constitution does not mention minimum age or qualifications, most of the appointed members are at least above the age of 55, and enjoy a reputation of being apolitical

## State Public Service commission:

- d. State PSCs operate in a politically influenced environment, where the appointment process often reflects the dynamics of the 'spoils system.'

- The usual requirements of minimum age, qualifications, and public experience are often overlooked.



### Difference between UPSC and SPSCs:

- Centre has a dedicated ministry, the Ministry of Personnel, Public Grievances and Pensions in 1985, was created to formulate all policies in the field of personnel management.
- Most State governments do not have a dedicated Ministry of Personnel. And therefore, vacancies are not notified regularly by the government which effectively means that State PSCs are not required to conduct the examinations regularly.
- The UPSC undertakes a periodical exercise of establishing committees comprising not only of academicians but also civil servants, social activists etc. to recommend changes in the syllabi and achieve a balance between academics and contemporary developments. They are able to tap the best talent from across the country to formulate question papers and also evaluate them. A time tested method of 'inter-se' moderation of scores is followed at different levels of the examination to minimise subjectivity.
- The UPSC ably balances conflicting interests of transparency and confidentiality by being quick to respond to any lapses and making systemic changes so that aspirants do not often have to seek judicial recourse for grievances.
- State PSCs do not appoint committees regularly to redraft the syllabus; are constrained to tap academic resources from within the State; and are not able to achieve satisfactory 'inter-se' moderation in evaluation.
- They also have the daunting task of making complex calculations to accurately incorporate not only vertical reservations but also horizontal reservations. Meeting the demands of regional quotas in the form of zonal reservations adds to this complexity. All these lead to continuous litigation in one form or the other delaying the recruitment process.

### What can be done?

- Dedicated ministry should be established:** First, manpower planning should be systematised and a separate ministry should be created for personnel management. This Ministry should clearly layout a five-year road map for recruitment so that State PSCs are able to notify and conduct the examination process.

- h. **Need for new amendment:** the 41st amendment of the Constitution (1976) raised the maximum age limit of the members of State PSCs from 60 to 62 years in order to attract meritorious and experienced civil servants, there is a need for another amendment. The minimum age for appointment as a member should be fixed at 55 and the maximum age at 65. The stipulation of minimum age will enable appointment of experienced individuals while increasing the maximum age will enable State PSCs to benefit from the experience of senior civil servants who have retired at 60 for a longer period than under the existing provisions.
- i. **Qualification:** the new amendment can also add additional qualifications that members need in order to be appointed. For example, in order to be an 'official' member, experience as Secretary to a State government or a post equivalent to this rank should be stipulated while for 'non-official' members 10 years of practice in a recognised profession like law, medicine, or engineering should be stipulated.
- j. **Revision of Syllabus:** the syllabus should be revised periodically, keeping in view the changing academic scenario and the syllabi for examinations as stipulated by the UPSC. Knowledge on State specific areas like regional history, regional economy and regional geography, in which the availability of faculty is limited, should be tested in the objective type format so that there would be no scope for complaint on the grounds of asymmetry of information and value laden correction.
- k. **Competent translation:** The process of translation of the questions from English to the regional language should not only involve technology for secrecy but also the human element so that the right meaning is conveyed. Care should be taken to regularly change the pattern of questions so that the role of AI-chat bots, as a source of information for formulating answers, is effectively countered.
- l. **Secretary of PSC:** The Secretary of the State PSCs should be a senior officer with prior experience as either Commissioner of School Education or Secretary of the Board of Intermediate education to enable effective supervision of the examination branch of the Commission. Transparency and confidentiality should be balanced on the lines of the UPSC.

Time bound structural and procedural reforms are required to restore faith in State PSCs. If these changes are brought into force, one would have vibrant Public Service Commissions at the State level on par with the Union Public Service Commission.

## 5. State of Food and Agriculture report 2025

**Context:** State of Food and Agriculture (SOFA) Report 2025 is published by the Food and Agriculture Organization of the United Nations (FAO).

The report presents new findings on how cropland degradation contributes to the yield gap worldwide against a backdrop of broader degradation processes on other land cover types and even land abandonment.

### About the SOFA Report:

- **Goal:** Aims to help governments design sustainable land management and food security policies.
- **Publication:** Released **annually** by the **Food and Agriculture Organization (FAO)** of the **United Nations** as one of its flagship analytical reports.

- **Focus (2025 Edition):** Examines **human-induced land degradation** and its effects on **agricultural productivity, poverty, and ecosystem stability**.
- **Analytical Scope:** Integrates **soil data, land use patterns, crop yields, and socioeconomic indicators** to identify global vulnerability hotspots.

## Key Highlights of State of Food and Agriculture (SOFA) Report 2025

- It stated that agricultural expansion remained the primary driver of global deforestation, accounting for nearly 90 per cent of forest loss.
- It has reshaped global land use and transformed land-use patterns across the planet over centuries.
- The largest affected populations were concentrated in eastern and southern Asia regions burdened by extensive degradation and high population density.
- India had some of the highest yield gaps due to human-induced land degradation.
- It highlighted that around 3.6 mha of croplands were abandoned annually, with land degradation likely playing a significant role in these losses.

## 6. Rare Earth Permanent magnets (REPM) scheme

**In News:** India launches a ₹7,280-crore REPM scheme to build domestic REPM capacity, cut reliance on China, and strengthen clean energy, EV, and defence manufacturing.

### Why REPM?

To counter China's overwhelming dominance in rare earth magnet manufacturing, the Indian government has approved a ₹7,280-crore scheme to promote domestic production of rare earth permanent magnets (REPMs).

REPMs are critical components for EVs, renewable energy systems, electronics, aerospace, and defence. China currently controls over 90% of global REPM manufacturing and processing.

This gives it significant geopolitical leverage, which it has used during trade disputes.

### What are REPM?

- **About:** REPMs are high-performance magnets made from rare earth elements such as samarium (Sm), neodymium (Nd), praseodymium (Pr), dysprosium (Dy), and cerium (Ce).
- Compared to ferrite or AlNiCo magnets, REPMs offer a much higher maximum energy product, greater coercivity, stronger magnetic output in compact sizes, and superior performance in high-precision or high-power applications. This makes them indispensable for high-efficiency motors and miniaturised devices.
- **Sintered REPMs:** These are produced through a process called sintering, where fine rare-earth alloy powders are compacted under pressure and then heated at high temperatures to form dense, strong magnetic structures.

### Need for diversification?

- India is expanding renewable energy and electric vehicles quickly, which will increase the need for rare earth permanent magnets (REPMs).
- The government expects India's magnet use to double by 2030.
- Currently, India imports almost all REPMs, making it very dependent on other countries.
- In April 2025, China limited magnet exports in reaction to US tariffs, causing worldwide supply worries.
- India has launched a new plan to build its own REPM production and rely less on China.

- Though smaller than China's capacity, this plan is a key step to secure supplies amid ongoing trade issues and supply chain risks.

Driven by the rapidly growing demand from electric vehicles, renewable energy, industrial applications, and consumer electronics, India's consumption of REPMs is expected to double by 2030 from 2025. At present, India's demand for REPMs is met primarily through imports. With this initiative, India will establish its first ever integrated REPM manufacturing facilities, generating employment, strengthening self-reliance and advancing the nation's commitment to achieve Net Zero by 2070.

## 7. Legal Aid in India

**Context:** India is the largest democracy in the world. The Constitution of India guarantees equal rights and the equal protection under the law to every citizen. Yet, many are unable to access legal services due to illiteracy, poverty, natural disasters, crime or the lack of financial means, among other barriers.

**Background:**

- The Prime Minister inaugurated the National Conference on “Strengthening Legal Aid Delivery Mechanisms” at the Supreme Court of India, emphasizing the need for accessible, inclusive, and technology-driven justice for all citizens.
- The conference, organized by the National Legal Services Authority (NALSA), marks 30 years of NALSA's establishment and focuses on improving legal aid systems, mediation, and public legal awareness.
- November 9 is celebrated as the National Legal Services Day to commemorate the Legal Services Authorities Act, 1987, which led to the establishment of organisations providing free legal aid to the needy.
- India's legal aid system has reached 44.22 lakh people (2022-25) and resolved 23.58 crore cases through Lok Adalats.
- From 2022-23 to 2024-25 over 23.58 crore cases were resolved through the state, permanent and national Lok Adalats.
- About 2.10 crore people (as on February 28, 2025) were given pre-litigation advice, pro bono services, and legal representation and awareness through the DISHA scheme.

**Directive Principles of State Policy And Fundamental Rights**

**Article 39A**

**Equal Justice And Free Legal Aid**

The State shall secure that the operation of the legal system promotes justice, on a basis of equal opportunity, and shall, in particular, provide free legal aid, by suitable legislation or schemes or in any other way, to ensure that opportunities for securing justice are not denied to any citizen by reason of economic or other disabilities.

**Article 14**

**Equality Before Law**

The State shall not deny to any person equality before the law or the equal protection of the laws within the territory of India.

**Article 21**

**Protection of Life And Personal Liberty**

No person shall be deprived of his life or personal liberty except according to procedure established by law.

**Article 22**

**Protection Against Arrest And Detention in Certain Cases**

(i) No person who is arrested shall be detained in custody without being informed, as soon as may be, of the grounds for such arrest nor shall he be denied the right to consult, and to be defended by, a legal practitioner of his choice.

Source: Ministry of Law and Justice

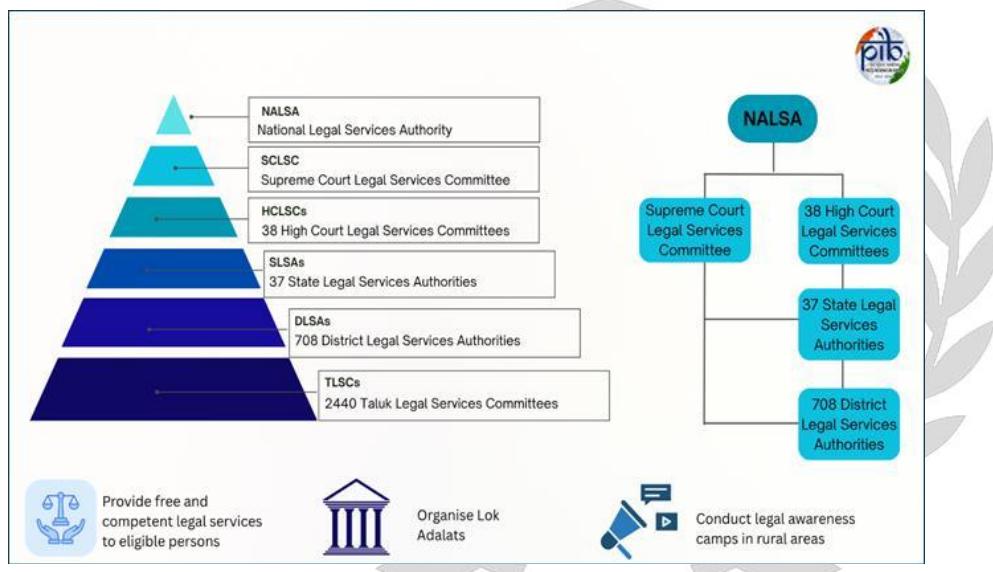
## Legal services Authority:

The **Legal Services Authorities** were established under the Legal Services Authorities Act, 1987, to provide free and competent legal services to marginalised and disadvantaged sections of society.

The Legal Services Authority Act, 1987, established legal aid organisations nationwide to ensure that no citizen suffering from economic or other barriers is denied an equal opportunity for getting justice.

The act established a **three-tier system to provide free and competent legal services**:

- National Legal Services Authority (headed by the Chief Justice of India)
- State Legal Services Authorities (headed by the Chief Justice of High Court)
- District Legal Services Authorities (headed by the District Judge)



Anyone who needs free legal services and is eligible can apply to the concerned Legal Services Authority or Committee.

## Funding of the Legal Services Authority:

Legal aid is funded by the central and state governments and donations through a three-tier funding structure:

- Central funding or donations to the Central Authority through the **National Legal Aid Fund**
- Central or State Government funding or other contributions to the State Authority through the **State Legal Aid Fund**
- State Government funding or other donations to the District Authority through the **District Legal Aid Fund**

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The Act also established Lok Adalats and Permanent Lok Adalats, which are alternate dispute redressal forums organised by the legal authorities above.

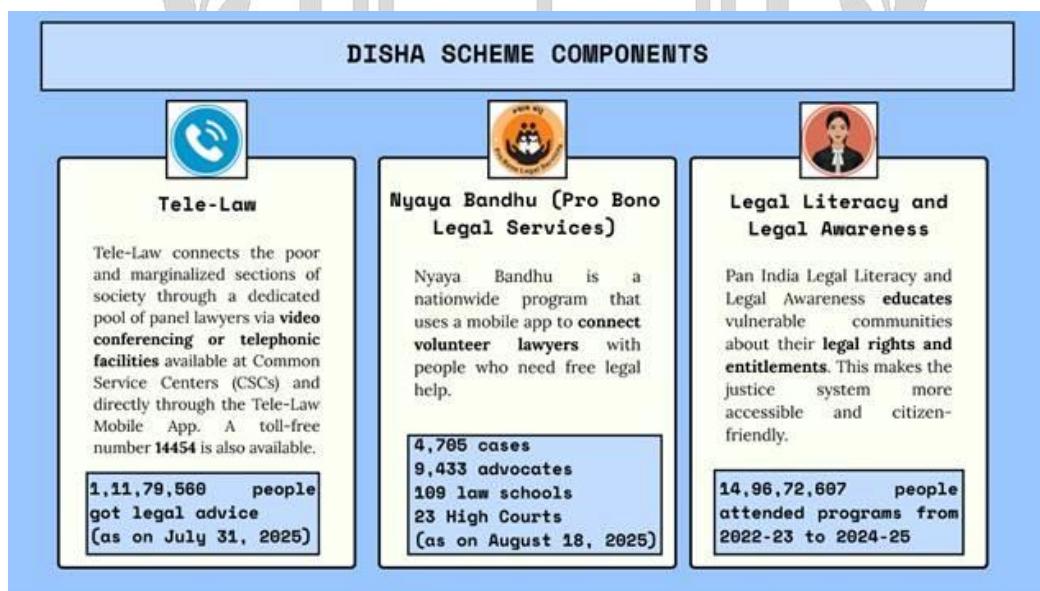
## What is Free Legal Aid?

- Meaning: Free legal aid means providing free legal help to people who are poor or unable to afford a lawyer for their court cases. It applies to both civil and criminal matters.
- Purpose: The goal is to ensure *equal justice for all*, so that no one is denied justice just because they don't have money.

- Right, not charity: Legal aid is not a favour or a gift. It is the *duty of the State* to provide it and the *right of the citizen* to receive it.
- Law governing it: Legal aid is provided under the Legal Services Authorities Act, 1987. It is managed at the national level by NALSA (National Legal Services Authority).

### Services included:

- Representation in court: Free lawyers are provided to represent people in courts, tribunals, or other authorities.
- Legal advice: People can get free legal advice on their legal issues.
- Document preparation: Help is given to prepare legal papers like petitions, affidavits, etc.
- Waiver of court fees: Poor and eligible persons do not have to pay court fees; the State bears these costs.



### Fast Track Courts:

Since October 2019, the Department of Justice is implementing a Centrally Sponsored Scheme, to set up Fast Track Special Courts (FTSCs).

They were established for the speedy trial of heinous crimes and civil cases related to women, children, senior citizens, disabled persons, and property cases pending for more than five years.

Each court comprises of 1 Judicial Officer and 7 Staff Members. Out of 31 States and UTs eligible, 30 have joined this scheme. Puducherry made a special request to join the Scheme and the one exclusive POCSO Court was operationalized in May, 2023.

The Scheme was initially for a period of one year spread over two Financial Years 2019-20 and 2020-21. The Cabinet approved the continuation of the Scheme for two years i.e. up to March, 2023.

### Significance of free Legal Aid in India:

Free Legal Aid is significant for ensuring 'Equal justice to all' as mentioned in Article 14 of the constitution.

### Constitutional aspect

- The Constitution (Article 39A) specifically directs the State to provide free legal aid so that justice is not denied because of poverty or disability.
- Courts have held that free legal aid is part of the right to life and personal liberty under Article 21, and linked to equality before law under Article 14

## Access to justice

- c. Legal aid helps poor, disadvantaged and illiterate people understand their rights and fight their cases in courts, tribunals and authorities.
- d. It reduces the gap between what the law promises and what people can actually enforce, especially for women, children, SC/ST communities, workers and persons in custody.

## Fair trial and protection of rights

- e. By providing lawyers, advice, and help with documents, legal aid supports the right to a fair trial and proper legal representation in both criminal and civil cases.
- f. Failure to provide legal aid in criminal cases to an indigent accused can even make the trial unfair and lead to the conviction being set aside.

## Strengthening rule of law

- g. When people can challenge illegal actions, exploitation and discrimination through free legal aid, it increases trust in courts and the legal system
- h. Legal aid, along with Lok Adalats, legal awareness camps and legal aid clinics, helps resolve many disputes quickly and peacefully, reducing the burden on regular courts.

## Social justice and welfare

- i. Free legal aid is a tool of social justice: it helps fight systemic inequalities, caste and gender-based violence, labour exploitation and denial of welfare benefits.
- j. It supports welfare schemes by helping people claim pensions, compensation, ration, housing and other benefits that they may otherwise lose due to lack of knowledge or resources.

## 8. National Judicial Policy

**Context:** Chief Justice of India Surya Kant called for a national judicial policy to reduce divergence across courts, and also stated that the Supreme Court would consider a plea seeking revival of the National Judicial Appointments Commission (NJAC), which challenges the Collegium system.

### Need for National Judicial Policy:

A national judicial policy is needed to make India's justice system faster, more consistent and more accessible across all courts. It would act as a common roadmap for reforms without harming judicial independence.

- a. **Ensure uniformity and consistency:** Different High Courts and lower courts often follow varying practices, leading to inconsistent procedures and outcomes in similar types of cases. A national policy can set common standards for case management, reasoning, and use of precedent so that courts "speak with clarity and consistency" across the country.
- b. **To tackle huge case pendency and delays:** India has several crores of pending cases, with many taking years or even decades to be decided, which weakens faith in the justice system. A judicial policy can fix timelines, standardise listing and adjournment rules, promote mediation and ADR, and support initiatives like the National Mission for Justice Delivery & Legal Reforms to reduce delay.
- c. **To improve access to justice:** There is a "gap" between the constitutional promise of access to justice and the actual experience of people, especially the poor and those in remote areas. A unified policy can integrate digital courts, translation and language support, legal aid and Lok Adalats so that cost, distance and language do not block people from using the courts.

- d. **To strengthen transparency and public trust:** Predictable, well-reasoned and timely decisions increase people's trust in the judiciary and make the system more citizen-centric. A national policy can lay down principles on judicial conduct, data disclosure (like pendency and disposal rates) and performance standards, making the system more accountable.
- e. **To coordinate reforms while preserving federalism:** At present, reforms are scattered: some High Courts are modernised while others lag, creating inequality in justice delivery. A national judicial policy can give broad national guidelines but still allow High Courts to adapt them to local conditions, balancing uniform standards with federal autonomy.

### Challenges ahead of National Judicial Policy:

- a. **Same rules for all may not work:** Each state has different types and numbers of cases, different levels of court staff, buildings, and technology, so one common rulebook may not fit everyone well.
- b. **Fear of government pressure:** If the government (executive) is involved in making or running the policy, people may worry that judges will lose some independence.
- c. **Difficulty in actual implementation:** Many courts do not have enough staff, money, or computers and software, so they may not be able to follow strict common standards.
- d. **Possible opposition from High Courts:** High Courts have their own powers under the Constitution to decide court procedures and manage work, so they may resist too much central control.
- e. **Lack of good data:** In many places, courts do not have accurate, real-time data on cases and performance, which makes it hard to design and monitor a good policy.

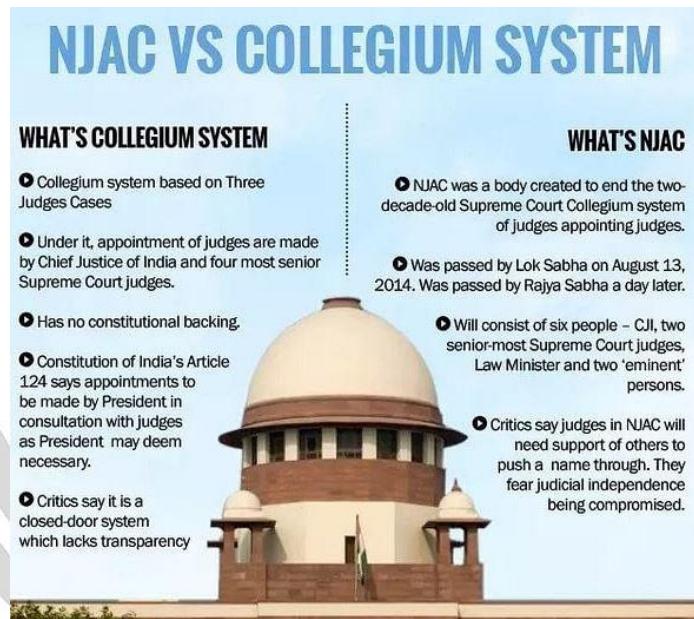
### National Judicial Appointments Commission (NJAC):

- The National Judicial Appointments Commission (NJAC) was introduced as a constitutional body to reform the existing collegium system for appointing judges to the Supreme Court and High Courts. It was set to replace the collegium system.
- It aimed to make the process more transparent, participatory, and accountable.
- The 99th Constitutional Amendment Act, 2014 established the National Judicial Appointments Commission (NJAC) as an independent constitutional body designed to replace the existing collegium system.
- Its purpose was to introduce a more transparent, broad-based, and accountable mechanism for appointing judges to the Supreme Court and High Courts in India.
- Articles 124A, 124B, and 124C were inserted into the Constitution, formally establishing the NJAC as a constitutional body responsible for recommending appointments and transfers of judges to the Supreme Court and High Courts.
- Created a six-member constitutional body called the NJAC to oversee appointments of judges to the Supreme Court and High Courts.
- Provided for the inclusion of two eminent persons, the Law Minister, and senior judges to ensure broader participation.

### Why it was Struck Down

- **Judicial Independence:** Concerns that the inclusion of the executive (Law Minister) and the selection of eminent persons could lead to executive overreach and politicize appointments.

- **Basic Structure:** The Supreme Court ruled that the NJAC's structure compromised the independence of the judiciary, a fundamental aspect of the Constitution.



## 9. Article 240 and Chandigarh

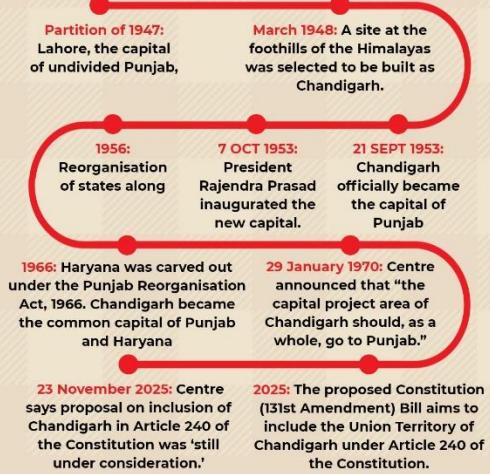
Context: The Ministry of Home Affairs (MHA) has clarified that the government will not introduce the Constitution (131st Amendment) Bill, 2025 in the upcoming Winter Session.

### CENTRE VS STATE BATTLEFRONT

<ul style="list-style-type: none"> <li>Chandigarh is administered by the Punjab governor and, with the new law, it is likely to be administered by an independent administrator</li> <li>The move is being viewed as an attempt to delink Chandigarh from Punjab, as the role of administrator of Chandigarh has been held by the Punjab governor since 1984</li> <li>Earlier this year, central govt</li> </ul>	<ul style="list-style-type: none"> <li>abolished the post of 'advisor to administrator' and redesignated it as 'chief secretary'</li> <li>The move also comes against the backdrop of a Punjab-vs-Delhi skirmish over restructuring of Panjab University senate in which Centre had to make a U-turn</li> <li>Non-BJP parties in Punjab have already banded together to oppose the move</li> </ul>
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#### THE CHANDIGARH TIMELINE



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### 131<sup>st</sup> Amendment Bill

The bill proposed to bring Chandigarh under Article 240 of the Constitution which currently applies to select Union Territories such as Andaman & Nicobar Islands, Lakshadweep, Dadra & Nagar Haveli and Daman & Diu, and Puducherry.

Chandigarh is presently administered as a Union Territory (UT), with the Governor of Punjab serving as its Administrator, since it acts as the joint capital of Punjab and Haryana.

### Article 240:

- Article 240 empowers the President to make regulations for the peace, progress, and good governance of certain UTs that do not have their own legislatures. These regulations have the same effect as an Act of Parliament, giving the Centre direct administrative influence.
- As Chandigarh currently lacks a legislative assembly, bringing it under Article 240 would mainly be a change in the method of governance, allowing the President to rule by regulation instead of Parliament legislating by Act.

#### Government's statement:

- Proposal only aimed at simplifying the Central government's law-making process for Chandigarh.
- However, no decision has been finalized yet. No change intended in the current governance structure. No Bill will be introduced in the 2025 Winter Session.

#### Stakeholder consultation:

Decision will be taken only after adequate consultations with Punjab, Haryana, Chandigarh administration, and other stakeholders.

#### Punjab's opposition

- Punjab is opposing the proposed 131st Constitutional Amendment mainly because it sees it as an attempt to sever its remaining administrative link with Chandigarh and to permanently weaken its claim over the city, which it considers its rightful capital.
- Punjab's political leadership across parties argues that the amendment would remove whatever limited administrative and political control the state still has over Chandigarh, by replacing the Punjab Governor's role with a full-time, centrally appointed Administrator or Lieutenant Governor.
- Critics in Punjab contend that placing Chandigarh under Article 240 turns it into a Union Territory like any other, undermining the special status that arose from its history as a city built on land acquired from Punjabi villages and designated as Punjab's capital after Partition and the 1966 reorganisation.

The Bill was initially listed in the Lok Sabha and Rajya Sabha bulletins for introduction in the Winter Session starting 1 December 2025 but after receiving backlash especially from Punjab, the Home Ministry issued a clarification stating that the government has "no intention" of introducing the Constitution (131st Amendment) Bill, 2025 in the current Winter Session.

## 10. AI's rewriting the rules of Education

Context: India is planning a significant transformation of its educational system by integrating Artificial Intelligence (AI) into the curriculum starting from class three by the academic year 2026-27. This move aligns with the National Education Policy 2020 and aims to prepare students with essential skills for a technology-driven future.

## AI Will Change Education by 2030

AI will provide personalized learning experiences tailored to individual needs and learning styles.

Intelligent tutoring systems offer real-time feedback and support; AI-driven insights help educators make informed decisions and enhance student outcomes.

Are you ready for the future of education?



### HOW DO WE PREPARE LEARNERS FOR a Rapidly Evolving, AI-Driven World?



FUTURE-READY SKILLS



INTEGRATING AI IN EDUCATION



ETHICAL AI AND DIGITAL



GLOBAL

### Significance of AI in education

AI in education is important for India because it can make learning more personal, inclusive, and future-ready. It supports both students and teachers, and can help reduce learning gaps across regions and schools.

- A. Personalisation:** AI can see how fast or slow each student learns and change the lesson speed accordingly. It can give extra practice in topics where a student is weak and harder questions when the student is ready to move ahead. This helps every child learn at their own level instead of “one-size-fits-all” teaching.
- B. Inclusion:** AI tools can work in many Indian languages, so students can learn in the language they are most comfortable with. Features like text-to-speech, speech-to-text, and visual aids can support children with disabilities.
- C. Teacher augmentation:** AI can handle routine tasks such as attendance, grading quizzes, and creating basic worksheets. This saves teachers’ time so they can focus on discussion, doubt-clearing, creativity, and higher-order thinking.
- D. Smarter lessons and real-time feedback:** AI can suggest lesson plans, examples, and questions matched to the class level and syllabus. During class or online learning, AI tools can show which topics students are not understanding.
- E. Early AI literacy:** Introducing simple AI concepts from class three builds comfort with digital tools at a young age. Students learn problem-solving, logical thinking, and how to use AI responsibly and safely.
- F. Workforce readiness:** AI will change many jobs, reducing some roles but also creating new ones by around 2030. If students learn to work with AI early, they can adapt more easily to new types of work. Skills like data handling, critical thinking, and using AI tools become important for future careers.
- G. Momentum in higher education:** Many colleges and universities are already using generative AI for teaching assistance. Chatbots answer student queries, while AI-

based quizzes and personalised notes make learning more engaging. This shows how AI can support large numbers of learners in higher education.

H. System-level scaling: Large-scale teacher training programmes and pilot projects in schools show how AI can be used widely. **With proper planning, rules, and support, AI can help reduce learning gaps between urban and rural schools.**

**This system-level use of AI can improve overall quality and equity in India's education system.**



### Will AI replace human element in Education?

- Despite its transformative potential, AI is designed to augment, not replace, the human element in education. The focus is on enhancing human judgment, creativity and critical thinking through smart tools.
- It acts as a powerful assistant in personalised lesson planning and real-time feedback, amplifying the effectiveness of educators. So, while AI is shaking up the classroom, there is still no substitute for a passionate teacher who drives learning with empathy and insight.
- As AI reshapes education, it also signals seismic workforce changes. According to a recent NITI Aayog report, while AI could displace up to two million jobs in India's tech sector over the next five years, it is also projected to create four million new jobs by 2030, jobs that demand new skills and adaptability.

India's bold initiative to weave AI into early education signals a massive transformation in how knowledge is imparted, how teachers teach, and how students engage with learning. The revolution comes with challenges: teacher training at scale, ensuring equitable access to AI tools, and preparing students for jobs that do not even exist.

## 11. Digital personal data protection Rules 2025

**In News:** The Government of India notified the Digital Personal Data Protection (DPDP) Rules, 2025 on 14<sup>th</sup> November 2025. This marks the full operationalization of the Digital Personal Data Protection Act, 2023 (DPDP Act).

Together, the Act and the Rules form a clear and citizen-centred framework for the responsible use of digital personal data. They place equal weight on individual rights and lawful data processing.

WHAT IT MEANS FOR CONSUMERS			KEY PROVISIONS <b>Indian Digital Personal Data Protection Act 2023</b>
• DATA can be processed or shared by any entity only after consent.	• SAFEGUARDS, including penalties, introduced to prevent misuse of personal data.	• ALL data to be categorized under three heads—general, sensitive and critical.	
THE GOVERNMENT & REGULATORY ROLE			
• GOVT will have the power to obtain any user's non-personal data from companies.	• THE bill mandates that all financial and critical data has to be stored in India.	• SENSITIVE data has to be stored in India but can be processed outside with consent.	Source: Mint research
• SOCIAL media firms to formulate a voluntary verification process for users.	• SHARING data without consent will entail a fine of ₹15 crore or 4% of global turnover.	• DATA breach or inaction will entail a fine of ₹5 crore or 2% of global turnover.	
WHAT COMPANIES HAVE TO DO			

The Ministry of Electronics and Information Technology invited public comments on the draft Rules before finalising them.

With the notification of the Rules, India now has a practical and innovation-friendly system for data protection. It supports ease of understanding, encourages compliance and strengthens trust in the country's growing digital ecosystem.

### Digital Personal Data Protection Act, 2023

- Parliament enacted the Digital Personal Data Protection Act on 11 August 2023
- The law creates a full framework for the protection of digital personal data in India.
- It explains what organisations must do when they collect or use such data.
- The Act follows the SARAL approach. This means it is Simple, Accessible, Rational and Actionable.

### Key Terms under the DPPD Act, 2023

- a. **Data Fiduciary:** An entity that decides why and how personal data is processed, either alone or with others.
- b. **Data Principal:** The individual to whom the personal data relates. In the case of a child, this includes a parent or lawful guardian. For a person with a disability who cannot act independently, this includes the lawful guardian acting on their behalf.
- c. **Data Processor:** Any entity that processes personal data on behalf of a Data Fiduciary.
- d. **Consent Manager:** An entity that provides a single, transparent and interoperable platform through which a Data Principal may give, manage, review or withdraw consent.
- e. **Appellate Tribunal:** The Telecom Disputes Settlement and Appellate Tribunal (TDSAT), which hears appeals against decisions of the Data Protection Board.

### The law rests on seven core principles.

- a. Consent and transparency
- b. Purpose limitation
- c. Data minimisation
- d. Accuracy
- e. Storage limitation
- f. Security safeguards

g. Accountability.

### Details of the rule:

- Empowering individuals:** The rules bring clarity to the rights of data principals, empowering individuals to maintain control over their personal data. From withdrawing consent to requesting corrections or erasure, the regulations provide actionable avenues to ensure data accuracy and address grievances.
- Data protection as a cornerstone:** Privacy and data protection forms the bedrock of the DPDPA Rules, 2025. Mandated measures include the use of encryption, virtual tokens, and robust access controls to protect personal data. Special provisions for safeguarding children's data, such as obtaining verifiable parental consent, underscore the emphasis on vulnerable groups. Furthermore, a well-crafted privacy policy plays a vital role in informing individuals about how their data is processed and protected.
- Operational guidelines for fiduciaries:** Data fiduciaries are tasked with implementing stringent practices, including providing notices with required information, enabling ease of exercising data principal rights.

### Penalties under the DPDP Act, 2023

- The Act imposes strict penalties on Data Fiduciaries, including fines up to Rs 250 crore for failing to maintain security safeguards.
- Not reporting data breaches or violating child-related provisions can lead to penalties up to Rs 200 crore, while other violations may attract fines up to Rs 50 crore.

### Significance

- DPDP increases privacy rights but still keeps the RTI Act working as before. It ensures both privacy and access to information can work together.
- This amendment aligns with established judicial reasoning on reasonable restrictions, codifies existing jurisprudence, and helps avoid potential conflicts between the laws.

The DPDP Rules, 2025, signify a monumental step forward in shaping India's digital future, providing a foundation for secure and transparent data handling practices. However, ambiguities must be addressed to ensure comprehensive compliance and ease of implementation. A collaborative approach among businesses, regulators, and policymakers will be crucial in refining these rules, fostering innovation while safeguarding privacy.

## 12. Important Supreme Court Judgments on Fundamental Duties

Some important judgements of the Supreme Court on Fundamental duties are:

Case	Supreme Court's Pronouncement
Chandra Bhavan Boarding and Lodging vs State of Mysore (1969)	Upheled legislation imposing minimum wages for hotel and restaurant employees, emphasising the importance of social welfare.
Balaji Raghavan vs Union of India (1995)	Upheled the constitutional validity of National Awards, stating that they recognize merit and incentivize citizens to strive for excellence.

Case	Supreme Court's Pronouncement
M.C. Mehta vs Kamal Nath II (2000)	Invalidated a lease in an ecologically sensitive area and imposed fines for harming the environment, highlighting the duty to protect it.
Shri Ranganath Mishra vs Union Of India (2003)	Directed the implementation of recommendations to disseminate information on Fundamental Duties, including the duty to vote in elections.
In Re Ramlila Maidan Incident vs Home Secretary (2012)	Criticised unreasonable eviction from Ramlila Maidan, emphasised the duty to obey lawful orders and safeguard public property.

During the internal emergency (1975-1977), the Congress Party established the Sardar Swaran Singh Committee in 1976. The committee recommended incorporating a separate chapter on Fundamental Duties in the Constitution. It emphasised the importance of citizens recognising their duties alongside their rights.

42nd Constitutional Amendment Act: Accepting the committee's recommendations, the Congress Government enacted the 42nd Constitutional Amendment Act in 1976.

Part IV-A was added to the Constitution, which introduced Article 51A. This article outlined ten Fundamental Duties for citizens, marking their first explicit mention in the Constitution.

### **Article 51A: Fundamental duties - It shall be the duty of every citizen of India**

- (a) To abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem.
- (b) To cherish and follow the noble ideals which inspired our national struggle for freedom.
- (c) To uphold and protect the sovereignty, unity and integrity of India.
- (d) To defend the country and render national service when called upon to do so.
- (e) To promote harmony and the spirit of common brotherhood among all the people of India, transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of women.
- (f) To value and preserve the rich heritage of our composite culture.
- (g) To protect and improve the natural environment, including forests, lakes, rivers and wildlife, and to have compassion for living creatures.
- (h) To develop the scientific temper, humanism and the spirit of inquiry and reform.
- (i) To safeguard public property and to abjure violence.
- (j) To strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement.
- (k) Who is a parent or guardian to provide opportunities for education to his child or, as the case may be, a ward between the age of six and fourteen years.

### **Justice Verma report on fundamental duties:**

The Justice Verma Committee was set up in 1998 to create a practical plan for enforcing Fundamental Duties. It aimed to build responsibility and civic awareness in people from a young age. The committee noted that these duties were not being put into action and suggested ways to make them work.

**It listed these key laws that support some Fundamental Duties:**

- Prevention of Insults to National Honour Act, 1971: Makes it illegal to disrespect the national flag, Constitution, or anthem, protecting national symbols.
- Protection of Civil Rights Act, 1955: Punishes crimes based on caste or religion, promoting equality and civil rights.
- Representation of the People Act, 1951: Holds MPs or MLAs accountable for corrupt election practices like using religion to seek votes.
- Wildlife (Protection) Act, 1972: Safeguards endangered animals and controls their trade to preserve biodiversity.
- Forest (Conservation) Act, 1980: Ensures forests and resources are protected, supporting the duty to care for the environment under Article 51A(g).

### Difference between Fundamental Rights and Fundamental Duties:

Fundamental Rights	Fundamental Duties
Fundamental Rights are constitutionally granted liberties that cannot be taken away from a citizen.	Fundamental Duties are the legal obligations that citizens must fulfil.
Fundamental Rights are regarded as the normative standards of liberty and freedom for all citizens in order to build a peaceful and independent way of life.	Fundamental Duties are the moral responsibilities of all the citizens that must be fulfilled in order for the nation to develop and stay united.
Fundamental Rights are generally available to all citizens, regardless of race, caste, religion, gender, or place of birth, and are justiciable, meaning they may be brought to court.	Fundamental duties are non-justiciable and hence cannot be litigated in a court of law.

### 13. India's mining output: Mineral divide

**In News:** India's mining sector recorded exceptional growth in 2025, with iron ore output reaching 289 mmt and refined copper jumping 43%. Bauxite, manganese, and limestone production also grew, reinforcing India's position as one of the world's top mining and metals producers.

#### Iron ore hits record 289 MMT with 4.3% growth in FY 2025

- India's iron ore production reached a historic high of 289 million metric tonnes in FY 2024-25. This marked a 4.3 per cent increase over the previous year's record of 277 MMT.
- Iron ore accounts for approximately 70 per cent of India's total mineral production by value. India ranks as the world's fourth largest producer of iron ore globally.

#### Bauxite production surges 13.9% reaching 2.13 MMT

- Bauxite production rose sharply by 13.9 per cent to 2.13 million metric tonnes in April 2025 compared with 1.87 MMT in April 2024.
- For the full FY 2024-25, bauxite output increased by 2.9 per cent from 24 MMT to 24.7 MMT. India ranks second globally in aluminium production, which relies heavily on bauxite as raw material.

### Refined copper output jumps 43.5% to 105,000 tonnes

- Refined copper production surged by 43.5 per cent to 105,000 tonnes in April-May FY 2025-26 from 73,000 tonnes in the same period last year.
- In April 2025 alone, refined copper output climbed 15.6 per cent to 52,000 tonnes. India ranks among the world's top 10 producers of refined copper, which serves energy, construction and transport sectors.

### Limestone production rises 1.2% supporting cement and steel industries

- Limestone output increased by 1.2 per cent to 40.5 million metric tonnes in April 2025 from 39.5 MMT in April 2024.
- Annual limestone production for FY 2023-24 stood at 450 MMT. Limestone and iron ore together accounted for 80 per cent of total mineral production by value. India ranks third globally in lime production.

### Manganese ore records 11.8% growth reaching 3.8 MMT annually

- Manganese ore production reached 3.8 million metric tonnes in FY 2024-25, rising 11.8 per cent from 3.4 MMT in the previous year.
- In April-May FY 2025-26, manganese ore output grew by 1.4 per cent to 0.70 MMT. The mineral is essential for steel production and battery technologies used in machinery and electric vehicles.

### Primary aluminium production increases 1.5% to 347,000 tonnes

- Primary aluminium production rose by 1.5 per cent to 347,000 tonnes in April 2025 compared with the same month last year.
- For April-May FY 2025-26, aluminium output was 7.07 lakh tonnes, up 1.3 per cent from 6.98 lakh tonnes. India maintains its position as the world's second largest aluminium producer after China.

### Zinc concentrate and lead ore show steady growth across sectors

- Zinc concentrate output rose by 7.7 per cent to 0.14 million metric tonnes in April 2025. Lead concentrate production increased by 3.1 per cent from 381,000 tonnes to 393,000 tonnes in FY 2024-25.
- In April-May FY 2025-26, zinc concentrate production climbed 3.7 per cent to 0.28 MMT, supporting India's non-ferrous metals sector growth.

### Mineral Distribution in India

The minerals are concentrated in India in three broad belts:

1. **North-Eastern Plateau Region-** It includes the Chotanagpur area, Odisha, West Bengal, and parts of Chhattisgarh.
2. **South-Western Plateau Region-** It includes Karnataka, Goa, and areas contiguous to Tamil Nadu and Kerala.

3. **North-Western Region-** It includes areas of Aravali in Rajasthan and parts of Gujarat and also minerals that are associated with the Dharwar system of rocks.

### North-Eastern Plateau Region

Chhotanagpur in Jharkhand, the plateau regions of Odisha along with West Bengal, including a sliver of Chhattisgarh, make up the north-eastern plateau region. Because of its abundance of raw materials used in the production of steel, including iron ore, coal, manganese, bauxite, as well as Mica, this area is home to numerous steel mills.

### South-Western Plateau Region

The states of Karnataka, Goa, the highlands of Tamil Nadu, and Kerala make up the south-western plateau region. It has an abundance of bauxite and ferrous metals. The region also produces significant quantities of iron ore, manganese, as well as limestone.

### North-Western Plateau Region

The Aravalli Mountains in Rajasthan and the regions that are of Gujarat that are home to the Dharwar rocks make up the northern western plateau. Zinc and copper are two of the region's most valuable metals. Sandstone, Granite, and Marble are all plentiful in Rajasthan, making it an ideal location for construction projects. Copper, Lead, Zinc, Cobalt, as well as Tungsten, are just a few of the minerals that may be found in the Himalayan area of India.

## INDIA ENTERS TOP 10 LIST OF CRITICAL MINERAL PRODUCERS



### Impact of mineral divide in India:

India's mineral divide creates economic concentration in resource-rich states (like Odisha, Jharkhand) but also fuels regional disparities, social unrest (tribal displacement), and severe environmental damage (deforestation, pollution) in mining zones, while mineral-poor areas lag in jobs, highlighting a "resource curse" paradox despite mineral wealth and necessitating better management for inclusive, sustainable growth.

a. **Concentration:** Mineral-rich states see more industrial investment, higher GDP, and job creation in mining/allied sectors (e.g., steel in Jharkhand/Odisha).

- b. **Lagging States:** Mineral-poor states miss out on these benefits, increasing inter-state economic gaps.
- c. **Concentration:** Mineral-rich states see more industrial investment, higher GDP, and job creation in mining/allied sectors (e.g., steel in Jharkhand/Odisha).
- d. **Lagging States:** Mineral-poor states miss out on these benefits, increasing inter-state economic gaps
- e. **Concentration:** Mineral-rich states see more industrial investment, higher GDP, and job creation in mining/allied sectors (e.g., steel in Jharkhand/Odisha).
- f. **Lagging States:** Mineral-poor states miss out on these benefits, increasing inter-state economic gaps
- g. **Concentration:** Mineral-rich states see more industrial investment, higher GDP, and job creation in mining/allied sectors (e.g., steel in Jharkhand/Odisha).
- h. **Lagging States:** Mineral-poor states miss out on these benefits, increasing inter-state economic gaps.

The mineral divide creates pockets of intense economic activity alongside widespread environmental and social distress, hindering India's overall equitable and sustainable development goals.

## International Relations

### 14. A decade of India-Africa Partnership

Context: The 2015 India–Africa Forum Summit, which brought together all 54 African nations, marked a major diplomatic milestone. Since then, India has opened new missions, expanded trade beyond \$100 billion, increased investments, and supported Africa's stronger global role, including its entry into the G20.

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# HOW INDIA CAN TAP THE WEALTH OF 54 NATIONS

NOT FOR NOTHING ARE WORLD POWERS QUEUEING UP FOR THE CONTINENT. HERE'S A LOOK AT AFRICA'S STRENGTHS AND WEAKNESSES, AND INDIA'S WIDENING OUTREACH.

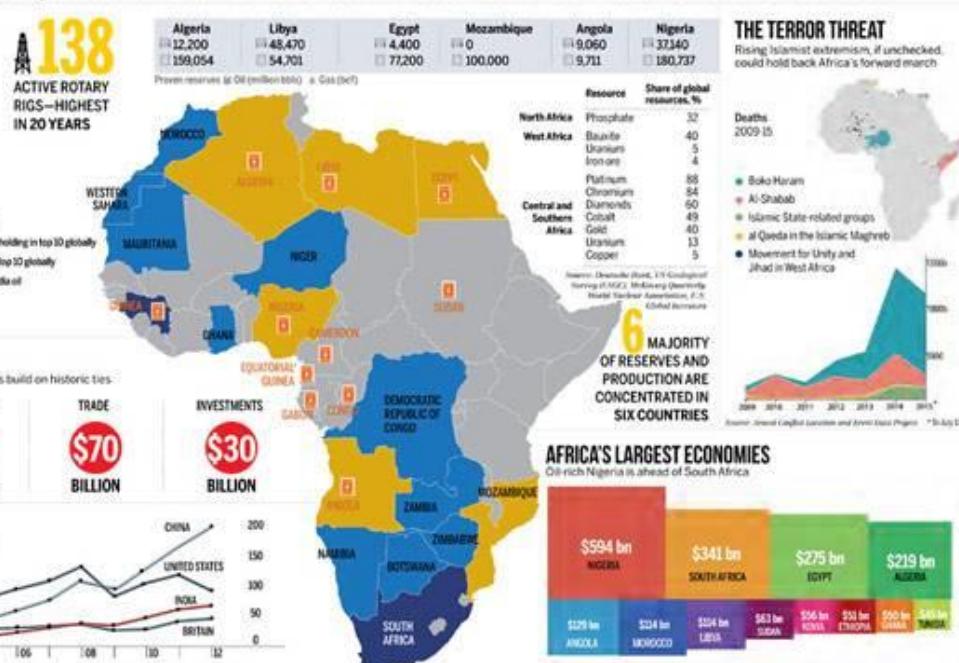
#### MAJOR OIL SUPPLIER

**INDIA'S OIL SUPPLIERS**  
India's major oil suppliers from Africa include Nigeria, Angola, Egypt, Gabon, Libya, Sudan, Algeria, Equatorial Guinea, Cameroon, Guinea and Congo (Brazzaville) with West Africa, North Africa and Central Africa representing India's major partners in the sector. As of 2013-14, the continent accounted for 16.6 per cent of India's total oil import bill, with Sub-Saharan Africa accounting for 91.2 per cent of total oil imports from Africa. The period from 2000-2008 witnessed a steady increase in oil imports from Africa.

ELEVEN AFRICAN COUNTRIES ARE AMONG THE TOP 10 GLOBAL RESOURCE COUNTRIES IN AT LEAST ONE MAJOR MINERAL.

## DEEPENING ENGAGEMENT

INDIA'S RISING TRADE AND INVESTMENT NUMBERS BUILD ON HISTORIC TIES



## Factors driving India-Africa partnership:

- a. **Economic Reasons:** Bilateral trade has grown from USD 56 billion in 2019–20 to over USD 100 billion in 2024–25, reflecting strong economic momentum. India and Africa share remarkable economic complementarity.
- b. **Infrastructure and Industrial Development:** India's growing investments in Africa's industrialisation demonstrate a long-term commitment to shared prosperity.
- c. **Security operations:** India's strategic presence in Africa is expanding through defence diplomacy, counterterrorism training and maritime cooperation. India's strategic presence in Africa is growing through initiatives like the Africa India Key Maritime Engagement (AIKEYME) 2025, jointly conducted with nine African navies to improve anti-piracy and humanitarian operations.
- d. **People to people relations:** The 3 million people comprising Indian-African diaspora living around the world, along with increasing school and cultural connections, create a strong emotional bond for the partnership.
- e. **Together in the Global South:** India and Africa often collaborate in global forums to champion the interests of developing nations.
- f. Both seek reforms in the UN Security Council, WTO, and climate finance frameworks, advocating for fairness, technology transfer and sustainable development. In addition to this the African Union's inclusion in the G20 during India's Presidency reflects India's commitment to promoting a more representative global governance structure.

## Challenges in African-Indian partnership

- a. **Geopolitical factors:** Africa has become a stage for strategic competition among China, the U.S., EU, Russia, Japan, Türkiye, and UAE, which limits India's influence and bargaining power.

- b. **China's growing influence:** China's big investments, diplomatic efforts, and building projects often get more attention than India's work. From 2007 to 2023, China welcomed 251 African leaders, showing its strong influence.
- c. **Diplomatic Engagement Gaps:** A significant hurdle is India's delayed political engagement with Africa. The prolonged gap of nearly a decade since the last India-Africa Forum Summit demonstrates a lack of continuous strategic dialogue, which weakens India's leadership position on the continent. This strategic inertia reduces India's ability to adapt to Africa's rapidly evolving priorities and curtails the momentum of current cooperation efforts.
- d. **Instability in Africa:** Africa's security environment is unstable, marked by multiple military coups and ongoing armed conflicts in countries like Ethiopia, Sudan, and the Central African Republic. The security challenges create an environment unfavourable for long-term investments and strategic partnerships.
- e. **Focus Diversion:** India's strategic focus on the Indo-Pacific and strengthening ties with Western powers sometimes diverts attention from Africa.

Way ahead:

- a. **Establish an annual India-Africa Strategic Partnership Forum:** with governments, businesses, academia, and civil society to discuss key issues like food security, climate change, and digital growth, focusing on clear results and accountability.
- b. **Co-create detailed sector-specific plans:** with African governments and regional groups for infrastructure, agriculture, technology transfer, renewable energy, and skill development aligned with Africa's Agenda 2063.
- c. **Increase financial support:** by offering more low-interest loans, blended finance options, and joining global debt relief efforts. Promote green financing and development impact bonds for climate-friendly infrastructure and social projects.
- d. **Expand training programs, scholarships, and vocational centres:** in African countries, especially in AI, biotechnology, and renewable energy, to enhance skills and employment opportunities.
- e. **Boost bilateral trade:** by reducing costs and shifting away from dollar-based payments using the Special Rupee Vostro Account with key African partners for easier, faster currency settlements.
- f. **Share India's digital public goods expertise:** in mobile payments, digital IDs, and e-governance to support Africa's digital transformation in health, finance, and education sectors.
- g. **Strengthen cultural connections:** through more educational exchanges, Indian cultural centres, scholarships, and festivals to build lasting people-to-people ties.
- h. **Enhance maritime security and defense cooperation:** with joint exercises, anti-piracy operations, military training hubs, and defense production to ensure regional stability and support Africa's security goals.



India-Africa relations are symbolic of a historic partnership built on shared values and mutual aspirations. India should set up regular talks, focus its investments on Africa's needs, improve skills training, and build strong cultural and digital connections. This well-rounded approach will create a lasting, fair partnership that supports sustainable growth and worldwide cooperation.

## 15. Missing Ubuntu

In News: The phrase "missing Ubuntu" refers to the 2025 G20 Leaders' Summit held in Johannesburg, South Africa—the first time the event occurred on African soil—where the African philosophy of "Ubuntu" ("I am because we are," emphasizing collective humanity and interconnectedness) was invoked in the declaration but undermined by key absences and divisions.



## G20 Summit 2025:

- The 2025 G20 Johannesburg Summit, held on 22-23 November 2025 in Johannesburg.
- 20th meeting of the G20 and the first-ever summit hosted on the African continent. South Africa used this opportunity to highlight Africa's development priorities, global equity, and South-South cooperation.
- The summit gained attention due to the absence of top leaders from major economies, including China's Xi Jinping and U.S. President Donald Trump. Despite this, leaders focused on global economic recovery, climate resilience, and digital cooperation.

## G20 2025 Theme:

### G20 Summit 2025 Theme “Solidarity, Equality and Sustainability”

The theme emphasizes collective action, fairness in global development, and long-term environmental responsibility. It aims to strengthen unity among nations while promoting inclusive and sustainable growth worldwide.

## G20 2025 Outcomes:

- a. **Leader's declaration:** It concluded with a consensus declaration from the countries present at the Summit. This **Leaders' Declaration** seeks to advance global climate action amid significant geopolitical and economic pressures. It gave strong emphasis on the principle of common but differentiated responsibilities, reflecting the priorities of emerging markets and developing economies (EMDEs).
- b. **Re-affirmation of multilateral commitment:** Under the theme “**Solidarity, Equality, and Sustainability**,” South Africa’s Presidency reaffirmed multilateral commitment to climate action, equity, and a just transition, closely aligning G20 outcomes with the UNFCCC, the Paris Agreement, and COP30 decisions.
- c. **Coming closer to Belem Package:** A major outcome was progress on climate finance and debt reform, including endorsement of voluntary debt-for-climate and debt-for-development swaps and expanded use of climate-resilient debt clauses. These measures aim to help climate-vulnerable countries manage climate-related shocks without increasing the burden of debt.
- d. **Emphasis on energy transition:** The declaration also places a strong emphasis on a just energy transition, reaffirming commitments to tripling renewable energy capacity and doubling global energy efficiency improvements by 2050.
- e. **Trade-climate nexus:** The G20 also addressed the trade-climate nexus, committing to avoid climate measures that act as disguised trade restrictions, while promoting equitable access to climate technologies.

The key challenge ahead lies in implementation – mobilising finance, translating commitments into policy, and ensuring that just transition principles deliver tangible outcomes.

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### About G20:

The Group of Twenty (G20) is the premier forum for international economic cooperation. It plays an important role in shaping and strengthening global architecture and governance on all major international economic issues.

### Inception:

The G20 was founded in 1999 after the Asian financial crisis as a forum for the Finance Ministers and Central Bank Governors to discuss global economic and financial issues.

The G20 Summit is held annually, under the leadership of a rotating Presidency. The G20 initially focused largely on broad macroeconomic issues, but it has since expanded its agenda to inter-alia include trade, sustainable development, health, agriculture, energy, environment, climate change, and anti-corruption.

The G20 was upgraded to the level of Heads of State/Government in the wake of the global economic and financial crisis of 2007, and, in 2009, was designated the “premier forum for international economic cooperation”.

### India held the Presidency of the G20 from 1 December 2022 to 30 November 2023.

India put forth a proposal for the African Union to attain permanent membership status within the G-20, a proposal that garnered unanimous support from all participating nations. Hence, the African Union was accepted as a permanent member of the G20 in 2023.

## 16. USA-Saudi Arabia

In News: USA-Saudi Arabia summit was held in the USA.

Saudi Arabia-USA relations:

The 80-year-old bilateral alliance remains perhaps the oldest transactional deal still going strong. It was forged on oil-for-security, the strategic partnership was signed in 1945 and was originally intended to last 60 years, and it was renewed in 2005.

**Trajectory of ties:**

- Shale technology:** USA-Saudi Arabia relations have not always been smooth. Mastering shale technology made US the world's largest producer of crude and a significant exporter. This

disrupted the commercial content. While American exports continue to rise thus swaying trade and balance in America's favor.

- b. **Ramadan war of 1973:** When Saudi Arabia joined the Arab oil embargo it sowed seed of discord between the two countries. Additionally, in mid 1980s the Saudis bought intermediate range ballistic missiles from China. American military supplies during Yemen war affected Saudi's offensive and defensive capabilities against Houthis.
- c. **Assassination of Jamal Khashoggi:** who was a prominent Saudi commentator working with the Washington post in the Saudi consulate in Israel in 2019. America's lack of support compelled Saudi Arabia to diversify relations with Russia and China.
- d. **China's growing influence:** Chinese President Xi Jinping visited Riyadh in 2022, he held 3 separate meetings with leaders of Saudi Arabia, Arab and Muslim countries. Beijing also facilitated the resumption of diplomatic ties between Saudi Arabia and Iran.
- e. **Pressure to recognize Israel:** Saudi Arabia has historically resisted the pressure to formally recognize Israel.

#### **USA-Saudi Arabia Summit 2025:**

- a. The United States and Saudi Arabia signed a Joint Declaration on the Completion of Negotiations on Civil Nuclear Energy Cooperation. This builds the legal foundation for a decades-long, multi-billion-dollar nuclear energy partnership with the Kingdom, it also confirms that the United States and American companies will be the Kingdom's civil nuclear cooperation partners of choice.
- b. The United States and Saudi Arabia also signed a Critical Minerals Framework, deepening collaboration and aligning our national strategies to diversify critical mineral supply chains.
- c. The United States and Saudi Arabia signed a landmark AI Memorandum of Understanding that gives the Kingdom access to world-leading American systems while protecting U.S. technology from foreign influence, ensuring that American innovators will shape the future of global AI.
- d. The United States and Saudi Arabia have agreed to intensify their engagement in the coming weeks on trade issues of mutual interest, including in areas related to reducing non-tariff barriers, recognition of standards, and improving the investment environment.

Combined with the critical minerals, nuclear, AI, and defense initiatives announced today, these deals will create high-paying American jobs, boost U.S. technological leadership, and deliver massive returns for American workers and families for decades to come.

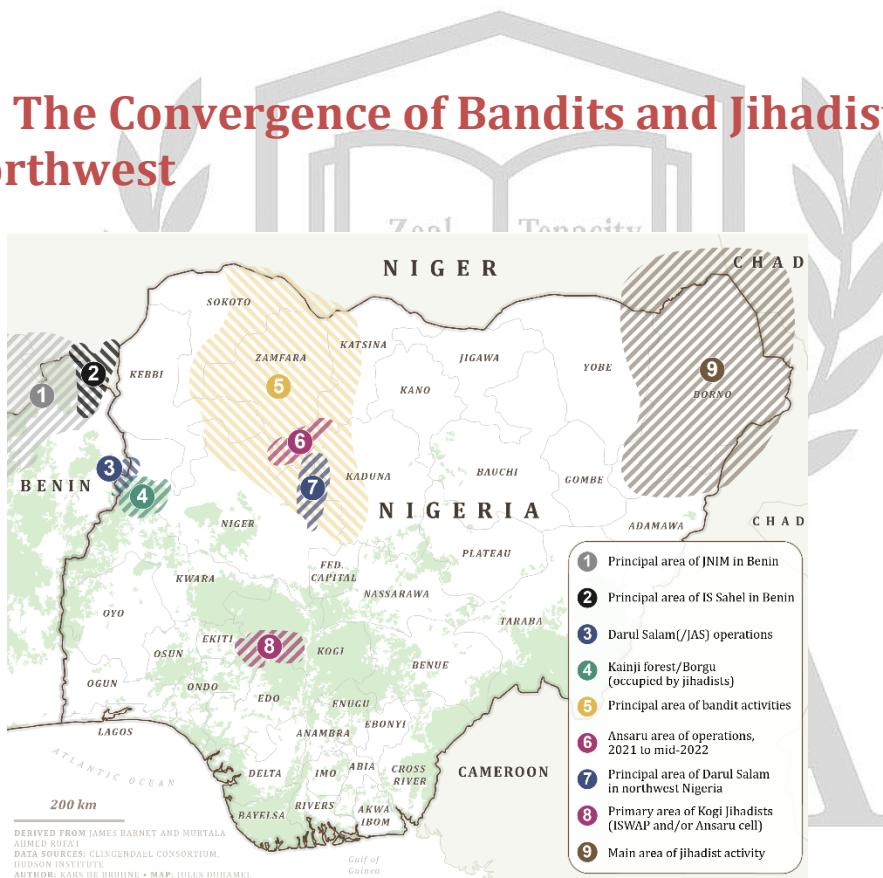
#### **Impact on India:**

The USA- Saudi Arabia deepening of ties has a significant impact on India.

- a. **Pakistan's security gains:** Closer U.S.-Saudi defense ties could help Pakistan indirectly. Saudi Arabia has a defense deal with Pakistan, supported by the U.S. This might make it easier for Pakistan to get U.S. military gear.
- b. **Oil prices and energy:** India wants low oil prices but also needs steady supplies. Moderate prices work well while India looks for other sources besides Russia.
- c. **Saudi Vision 2030 chances:** Saudi Arabia's Vision 2030 plan includes things like AI data centres. This opens doors for India to invest and share technology.

- d. Room to compete with China: If U.S.-Saudi ties block China from Saudi markets, India gets more space. India should push for a full trade deal (CEPA) with Saudi Arabia to secure long-term business and investments.
- e. IMEEC and connections: If Saudi Arabia and Israel get along better, it helps build the India-Middle East-Europe trade route (IMEEC), which goes through Saudi land. Smoother regional ties boost India's trade links.
- f. U.S. practical style helps India: The U.S. now focuses on economic wins with Saudi leader MbS, ignoring past issues like human rights. This means India can build stronger ties with the U.S. through practical business deals, even if values differ.

## 17. The Convergence of Bandits and Jihadists in Nigeria's Northwest



Security in northwestern Nigeria is deteriorating rapidly amid a surge of violent, coordinated attacks by a host of non-state armed groups. The theater of conflict in northwestern Nigeria exhibits a distinct hybrid security landscape where criminal economies, communal grievances, and jihadist insurgency converge, blurring distinctions between organized crime and ideology.

The crisis — characterized by criminal insurgency, warlordism, and intercommunal violence, and commonly subsumed under the broad label of “banditry” — has drastically escalated over the past several months.

- At the heart of this crisis lies Zamfara State: mineral-rich with deposits of gold, copper, and lithium, but also one of Nigeria's most insecure regions. According to Amnesty International, since 2023 more than 273 people have been killed and 467 have been abducted in Zamfara.
- The Nigerian military — also grappling with structural issues such as corruption — remains stretched thin by the simultaneous jihadist insurgency.
- The Nigerian security apparatus is overextended — fighting on multiple fronts across two-thirds of the country — combined with endemic corruption and inadequate troop welfare, which has combined to create structural vulnerabilities that jihadist and bandit actors are actively exploiting.

## Major Social Impacts

- a. Displacement & Humanitarian Crisis: Millions forced from homes into IDP camps or other regions, facing food/water scarcity, poor shelter, and sanitation.
- b. Education Collapse: School abductions, attacks on facilities, and general insecurity have devastated learning, causing academic regression and long-term setbacks, notes the Hudson Institute.
- c. Psychological Trauma: Widespread fear, anxiety, depression, PTSD, and low self-worth, especially among students and children exposed to violence, kidnapping, and murder.
- d. Economic Devastation: Destruction of farmlands, markets, infrastructure (roads, health centers), reduced government revenue, and hampered investment.
- e. Erosion of Social Fabric: Breakdown of community trust, rise of vigilante groups (like Yan Sakai), and increased ethnic/religious tensions.
- f. Forced Recruitment & Sexual Violence: Children and young adults are forcibly conscripted; women and girls face abduction and sexual violence, impacting their mental health and future.

Zeal      Tenacity  
Excellence      Achievement

## 18. APEC Summit

In News: The Asia-Pacific Economic Cooperation (APEC) Summit 2025, held in Gyeongju, South Korea from October 31-Nov 1 2025.

Outcomes of the summit:

- A. Adoption of the Gyeongju Declaration (2025): The declaration reaffirmed APEC leaders' commitment to inclusive economic growth, recognising the transformative impact of Artificial Intelligence (AI) and demographic shifts on labour markets.  
It is based on three priorities:
  - a. Building the world's most dynamic and interconnected regional economy.
  - b. Preparing the region for digital and AI transformation
  - c. Addressing shared challenges and ensuring growth benefits all
- B. APEC Artificial Intelligence (AI) Initiative (2026-2030): The AI initiative seeks to drive inclusive, resilient growth by boosting innovation, cooperation, capacity building, and sustainable, energy-efficient AI development.
- C. Greater cooperation: APEC leaders issued a joint statement pledging greater cooperation to overcome shared challenges in a global economy hit hard by trade tensions between the U.S. and China, the world's two largest economies.
- D. Putrajaya Vision 2040: the APEC members remain committed to the Putrajaya vision 2040 which is a new 20-year growth vision adopted in 2020 that calls for a trade environment that's "free, open, fair, non-discriminatory, transparent and predictable."

### About Asia Pacific economic Cooperation (APEC)

Established in 1989, it is a regional forum of 21 countries. APEC champions free and open trade and investment to promote regional economic integration.



\*Note: Figures from 2016

Source: [www.apec.org](http://www.apec.org)

## Member countries:

It's founding 12 members—Australia, Brunei, Canada, Indonesia, Japan, South Korea, Malaysia, New Zealand, the Philippines, Singapore, Thailand, and the United States—were deeply integrated with the Pacific Rim. It operates on principles of open dialogue, equal say for all economies, consensus-based decision-making, and voluntary commitments without binding treaties or obligations

APEC Member	Date of Joining
Australia	6-7 Nov 1989
Brunei Darussalam	6-7 Nov 1989
Canada	6-7 Nov 1989
Chile	11-12 Nov 1994
People's Republic of China	12-14 Nov 1991
Hong Kong, China	12-14 Nov 1991
Indonesia	6-7 Nov 1989
Japan	6-7 Nov 1989

APEC Member	Date of Joining
Republic of Korea	6-7 Nov 1989
Malaysia	6-7 Nov 1989
Mexico	17-19 Nov 1993
New Zealand	6-7 Nov 1989
Papua New Guinea	17-19 Nov 1993
Peru	14-15 Nov 1998
The Philippines	6-7 Nov 1989
Russia	14-15 Nov 1998
Singapore	6-7 Nov 1989
Chinese Taipei	12-14 Nov 1991
Thailand	6-7 Nov 1989
The United States	6-7 Nov 1989
Viet Nam	14-15 Nov 1998

## India and APEC

India is not a member of APEC. India's exclusion from APEC can be traced to a combination of historical timing, institutional moratoriums, and geopolitical hurdles.

### Reasons for India's Non-Membership:

#### 1. Geographical Criteria:

APEC limits membership to "Asia-Pacific" economies; India is often categorized under the "Indo-Pacific" region.

#### 2. Pace of Economic Liberalization:

India's market reforms in the 1990s were slower than APEC's liberal economies.

#### 3. China's Opposition:

China reportedly resisted India's entry to maintain its influence within APEC.

#### 4. Moratorium Policy:

Since 1997, APEC has maintained a moratorium on new memberships.

## India's potential membership and advantages of the same

- a. The last couple of decades, however, have been different with India beginning to integrate closer with the APEC economies. This has happened with India gradually moving away from its earlier insular external economic policies to a more liberal, outward-oriented vision. Falling tariffs, easier investment rules and friendlier visa practices have facilitated greater movement of goods, services, capital, technology and people between India and APEC economies.
- b. India argues for membership based on geography (western gateway to Asia-Pacific), economic size, trade interactions, and policy convergence. Its 'Act East Policy' aligns with APEC goals in trade, investment, infrastructure, connectivity, and people-to-people ties.
- c. India's request for becoming a formal member of the APEC made in 2007 is yet to be accepted. India is not the only country keen on joining the APEC with several others from South Asia, Northeast Asia and South America also aspiring to do so. Deciding on new members would be difficult and the lack of movement on part of the APEC is understandable.

Zeal

Tenacity

## 19. China-Japan Relations: from partners to rivals

**In News:** Japan and China are in their most dangerous diplomatic crisis in years as escalating tensions over Taiwan. A series of disputes especially over the so-called "Taiwan Question" have severely deteriorated into their lowest point in years.

### What happened?

The Japanese Prime Minister Sanae Takaichi, declared on November 7, 2025 during a cabinet meeting, that a Chinese attack on Taiwan could justify Japan using military force in the area.

China's response: China's U.N. ambassador accused Japan of violating international law warning the country of its self-defense.

### Aftermath:

In mid-November 2025 China's coast guard sailed through waters around the Senkaku/Diaoyu islands (islands which are administered by Japan but claimed by China) on patrol and Japanese Coast Guard vessels sent in response. Japan also sent out fighter jets, and even announced plans to deploy Japanese missiles on Yonaguni island (just 110 km from Taiwan) as a deterring measure.

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China also announced travel advisories urging its citizens to avoid Japan, with large numbers of airlines offering ticket refunds.

### The Roots of Tensions: History, the U.S. and Taiwan

- The island of Taiwan is an indispensably strategic asset for both countries: for China, Taiwan is the core of its national unity; for Japan the security of a separate and democratic Taiwan is now explicitly seen in Tokyo as linked to Japan's own defense.
- Japan's long-standing policy of strategic ambiguity on the Taiwan Question, similar to the one upheld by the United States, has been abandoned by the newly elected Japanese P.M. Takaichi.
- Authorities in Taipei have publicly supported Japan, urging China to show restraint and highlighting how an invasion would draw in allies including Japan and the U.S.

### Memories from the past:

During the World War era (primarily 1937–1945), Japan invaded and waged a brutal, full-scale war against China (Second Sino-Japanese War), which later merged into WWII, involving immense atrocities and heavy casualties before Japan's surrender in 1945. China was on the winning Allied side but suffered devastating destruction.

Invoking Japan's World War II era atrocities, China claims moral high ground or justify its own territorial aims.

### Japan and China: renewing old Rivalry

- Japan's 2025 Defense White Paper says China is its biggest security threat and promises to increase defense spending to 2% of its GDP by 2026.
- New submarine fleets and the potential deployment of medium-range missiles on islands like Yonaguni, have developed into a broader security problem.
- Any Chinese blockade or attack on Taiwan would encircle Japan's supply lines. Therefore, to Japan's leaders, Taiwan's fate is inseparable from their own national survival. China in turn, claims an eventual military approach to Taiwan as inevitable by 2027.

### Economic Dimensions in East Asia

- China and Japan remain among each other's largest economic partners even amid the confrontation. In 2024 China was still Japan's second-biggest export market (after the US)
- After the Fukushima nuclear wastewater release in 2023, China imposed a blanket ban on all Japanese seafood imports. In mid-November 2025 China reinstated these seafood ban.

## India amidst this row:

- Geopolitical shifts:** India and Japan continue to diverge on key foreign policy themes. Japan's alignment with Western sanctions on Russia contrasts sharply with India's continued engagement with Moscow, especially its energy imports and long-standing defense relationship.
- Regional groupings:** India's active role in BRICS and the Shanghai Cooperation Organization (SCO) also stands apart from Japan's deepening coordination with the United States and its increasingly assertive tone on China.
- Improved relations with China:** While Japan is strengthening its defenses against China and working more closely with the United States, India is trying to carefully improve its relationship with China. India has resumed direct flights to China after five years, accelerated economic ties through border trade, and reopened tourism and pilgrimage channels.
- Japanese national policy:** In the economic sphere, Japan's domestic priorities are shifting toward fiscal prudence and industrial revival. This policy may constrain appetite for large-scale overseas financing of the kind that enabled the Delhi Metro, Northeast connectivity projects, or the Mumbai-Ahmedabad High-Speed Rail. India needs to carefully carve its path especially with selective investment linked to areas with clear domestic payoffs for Japan in areas like green hydrogen, advanced batteries, 5G/6G systems, and rare-earth processing rather than megaprojects driven by development diplomacy.

India's engagement with both countries must be grounded in pragmatic alignment. Success will depend on whether the leaderships can manage domestic pressures while maintaining steady, interest-driven foreign-policy coordination.

## 20. IBSA Dialogue forum

**In News:** During the G20 Summit in Johannesburg, India's Prime Minister met with the Presidents of Brazil and South Africa to discuss ways to strengthen the IBSA (India-Brazil-South Africa) forum.

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### About IBSA:

IBSA is a group formed by India, Brazil, and South Africa — three big democracies and major economies from different continents that face similar challenges.

- It was officially created on 6 June 2003 in Brasília through the Brasília Declaration.
- South Africa is the current Chair of IBSA.
- IBSA does not have a headquarters or a permanent secretariat.

### Areas of Cooperation:

**1. Political consultation:** The three countries discuss and coordinate on global and regional political issues.

**2. Trilateral collaboration:** They work together on joint projects through working groups and people-to-people programs.

**3. Support for other developing countries:** They help other developing nations through projects funded by the IBSA Fund.

### Key Outcomes & Proposals (Late 2025 Meetings):

- **Security & Counter-terrorism:** India proposed an institutionalized National Security Advisers (NSA)-level dialogue for regular consultation.
- **Technology & Digital Public Infrastructure (DPI):** An IBSA Digital Innovation Alliance was suggested to share India's digital platforms (UPI, CoWIN) and cybersecurity frameworks.
- **Climate Change & Agriculture:** A new IBSA Fund for Climate-Resilient Agriculture was proposed to assist Global South nations.
- **Global Governance:** Reiteration of the call for swift UNSC reforms and positioning IBSA as a democratic voice for the Global South.
- **Expansion of IBSA Fund:** Continued strengthening of the existing IBSA Fund for development projects in other developing countries.
- **Human-Centric Development:** Emphasis on human-centric development, digital inclusion, and women-led technology initiatives

## IBSA and India: Significance

- South-South cooperation:** Strengthen cooperation among developing countries (South-South cooperation) and deepen democratic partnerships.
- Fair global governance:** Work together to reform global institutions like the UN Security Council and make global governance more fair and representative.
- Digital innovation:** Encourage digital innovation and create global rules for AI that focus on people's well-being.
- Expansion:** Expand IBSA Fund projects in areas such as health, education, women's empowerment, and climate-resilient farming.
- Collaborations:** Collaborate on millets, natural farming, clean energy, disaster management, and health security.
- Digital innovation Alliance:** Create an IBSA Digital Innovation Alliance to boost technology cooperation. This includes building shared digital systems like UPI, health platforms such as CoWIN, cybersecurity systems, and women-led tech programs in all three countries.

## IBSA Fund: for the Alleviation of Poverty and Hunger

The IBSA Fund, established in 2004, finances development projects in least-developed and developing countries, focusing on poverty alleviation, hunger reduction, education, health, and women empowerment.

### IBSA Fund

The India, Brazil and South Africa Facility for Poverty and Hunger Alleviation



**IBSA can become an important voice for the Global South in global governance and sustainable development. Its future goals include:**

- Increasing trade, investment, and economic cooperation among the three countries.
- Strengthening the IBSA Fund and supporting climate-resilient development projects.
- Promoting digital governance, fair AI rules, and sharing of new technologies.
- Taking an active role in UN reforms and improving global decision-making systems.
- Serving as a platform for inclusive growth and unity among Global South nations.
- Working together in areas like renewable energy, health, agriculture, and disaster management.

## 21. Colombo Security Conclave

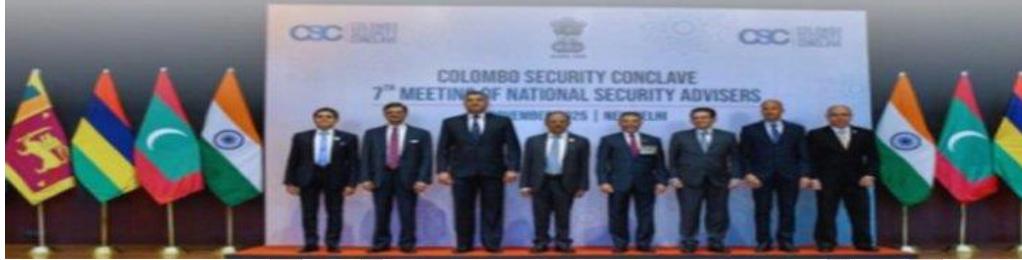
**In News:** The 7th National Security Adviser (NSA) level meeting of the Colombo Security Conclave (CSC) was held in New Delhi, India on 20 November 2025.

**NSA Mr. Ajit Doval** hosted his counterparts from Member States including **Maldives, Mauritius, Sri Lanka and Bangladesh. Seychelles participated as an Observer State, and Malaysia as a Guest.**

## Seychelles Joins Colombo Security Conclave (CSC)

### 7th NSA-level meeting held in New Delhi

- Seychelles becomes 6th full member of the CSC
- Strengthens security cooperation in the Indian Ocean Region



#### About Colombo Security Conclave:

- It was originally known as the NSA Trilateral on Maritime Security and was established between India, Sri Lanka, and the Maldives in 2011.
- It was an initiative of Sri Lanka to enhance maritime security in the Indian Ocean Region.
- The CSC was formed to promote closer cooperation between Member States on vital matters of security and to strengthen partnerships for enhancing regional security in the Indian Ocean Region.
- The signing ceremony for the Founding Documents of the CSC was held in Sri Lanka in August 2024.
- **India, Sri Lanka, and the Maldives** were its founding members.

At the 7th NSA level meeting, the first Secretary General, appointed by India, presented a comprehensive review to the CSC Member States on the decisions taken at the 6th NSA level meeting in Mauritius on 7-8 December 2023 and activities undertaken since then under the five pillars of cooperation.

- Maritime Safety and Security
- Countering Terrorism and Radicalisation
- Combating Trafficking and Transnational Organised Crime
- Cyber Security and Protection of Critical Infrastructure and Technology
- Humanitarian Assistance and Disaster Relief.

Member States also discussed ways of enhancing cooperation under identified pillars, including through training and capacity building.

They reiterated their commitment to the vision and objectives of CSC. The CSC Members welcomed the decision of Republic of Seychelles to accede to the CSC as a full member.

#### Significance of the Indian Ocean to India:

The Indian Ocean is vital for India because it is the main route for India's trade, energy imports, and a key space for its security and influence.

- Economic and trade lifeline:** Most of India's external trade moves by sea through the Indian Ocean, making these waters essential for its economic growth and export-import connectivity. Key ports on the western and eastern coasts link India to markets in West Asia, Africa, Europe, and Southeast Asia through these sea routes.
- Energy security:** A very large share of India's crude oil and gas imports comes by tankers crossing the Indian Ocean from West Asia, Africa, and beyond.

Any disruption in these sea lanes would directly threaten India's fuel supplies, prices, and overall economic stability.

- c. **Strategic and geopolitical influence:** India's central position in the Indian Ocean allows it to watch over important chokepoints like the Strait of Hormuz and the Strait of Malacca that are critical for global shipping.  
Control and presence in this region help India balance other powers, especially China's growing naval and port footprint, and project itself as a leading Indo-Pacific power.
- d. **Security and stability:** The Indian Ocean region faces threats like piracy, maritime terrorism, and illegal trafficking that can endanger ships and coastal areas.  
A strong Indian naval presence here helps protect Indian ships, citizens, and coastal infrastructure and supports regional peace and disaster response.

## Science and technology

### 22. Plastic Rain in Indonesia

**In News:** Plastic rain in Indonesia refers to micro-plastic deposition from the atmosphere via rainfall, particularly documented in Jakarta, where local emissions from dust, industry, and traffic release micro-plastics into the air that fall with rain.



Raindrops were picking up micro-plastics floating in Jakarta's air, Indonesia's National Research and Innovation Agency (BRIN) revealed in its newest study.

#### What's happening?

- Samples of rainwater collected in coastal areas of Jakarta were found to contain about 15 micro plastic particles for every one square metre (11 sq. ft.) per day.
- Researchers found that these microscopic flakes contained synthetic fibres from clothing, polymers from tyres, and smaller pieces of plastics that broke down from combustion and degradation, among others.

- Rain helps trap micro plastics in the air so “the higher the rainfall, the more micro plastics are cleaned from the air we breathe every day. Micro plastics are risky to health as they were a “magnet” for air pollutants and toxic additive chemicals that made up a plastic fibre.
- A collaborative study between BRIN and several universities in Indonesia and China detected micro plastic particles five metres (16 feet) below the surface in the water surrounding the archipelago, from North Java and North Sulawesi to the Maluku Sea.
- Micro plastics have also been found in water collected on Japan’s Mount Fuji and Mount Oyama, as well as in rain from several national parks in the western United States.

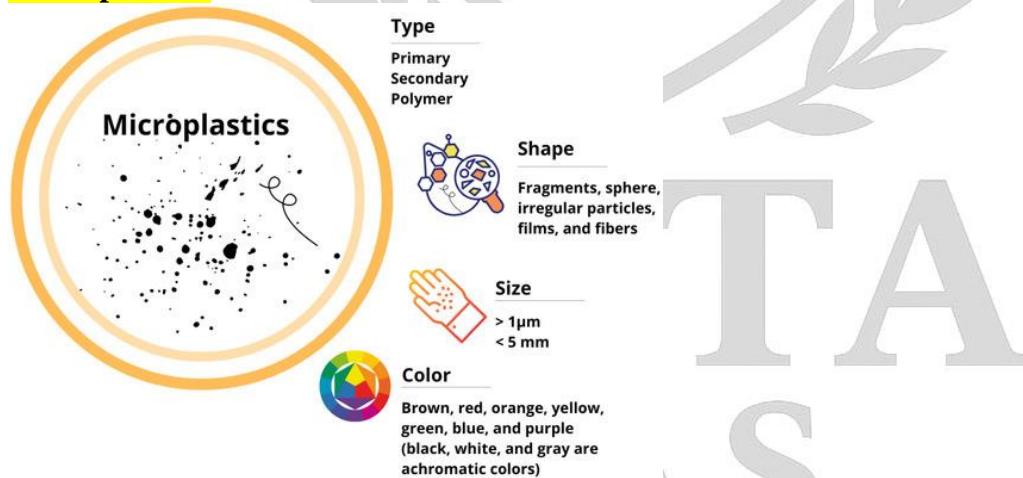
**Source:**

- The source is from open dumping sites, temporary waste storage sites and landfills.
- In Indonesia, the quality of plastic made for consumer products is “poor”, so they cannot be recycled and end up in landfill, while plastic recycling companies prefer to import plastic from abroad because the quality is better.

**Impact of micro plastics on human health:**

- Multiple studies have found that exposure to micro plastics can cause serious health impacts, such as hormonal disruption, damage to organs like lungs and kidneys and cancer development.
- Many Indonesian landfills are not covered or not operated properly, so that when plastics are fragmented, they break into small particles and these become airborne.

**Micro plastics:**



Micro plastics are tiny plastic fragments, less than 5mm in size, coming from broken-down larger plastics (secondary) or manufactured intentionally (primary, like microbeads).

They enter us via water, air, and food (shellfish)

**Types & Sources**

- Primary Micro plastics: Intentionally made small particles, like microbeads in cosmetics/detergents (now often banned) or industrial pellets.
- Secondary Micro plastics: Formed from the breakdown of larger plastic items (bottles, bags, textiles) due to sunlight, waves, and wear.

## 23. Heavy Metals in Cauvery River

**In News:** Researchers from Tamil Nadu have reported that heavy metals are polluting the Cauvery River and its fish. They have also cautioned against consuming “regular” or “excessive” amounts of fish from here.

Accumulation of heavy metals in fish tissues varied significantly across species, with several exceeding the threshold values for non-carcinogenic (non-cancer-causing) and carcinogenic health risks, especially for cadmium and lead.



The study highlights the pressing impacts of urbanisation, industrial effluents, and agricultural runoff on sediment and freshwater fish quality.

The detection of cadmium and lead as primary contaminants of concern, with levels exceeding threshold limits in some fish species, underscores the potential risks to both ecosystem health and human consumers.

### How studies were conducted?

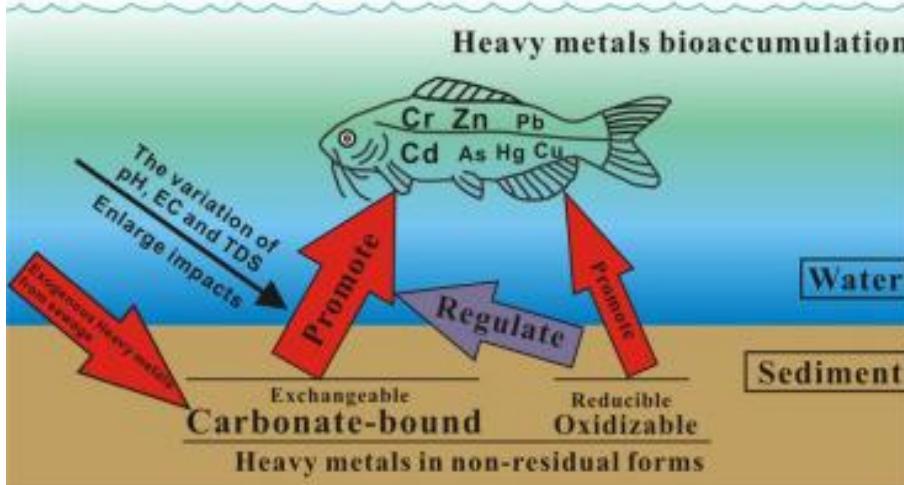
- The scientists used several pollution indices, each index being a number that evaluates the pollution levels of soils and sediments, calculated using the concentration of specific elements relative to their background levels.
- They included  $I_{geo}$ , or the geoaccumulation index, to determine heavy metal pollution in sediments; contamination factor; the contamination degree; the pollution load index; and the potential ecological risk.
- This approach provides valuable insights into the dynamics of metal bioaccumulation and pollution pathways in a tropical river system under rapid industrial and urban development.

### Health impacts by heavy metal

- **Mercury (Hg):** Brain/central nervous system damage (neurotoxicity), especially harmful to foetal development.
- **Cadmium (Cd):** Kidney damage, hypertension, bone issues.
- **Lead (Pb):** Nervous system disorders, kidney damage, high blood pressure.
- **Arsenic (As):** Skin lesions, cancer, cardiovascular diseases, organ dysfunction.
- **Chromium (Cr):** Skin rashes, weakened immunity, stomach ulcers

### Health effects

- Damage to brain, lungs, liver, bones, kidneys, blood.
- Impaired energy levels, muscle disorders (Parkinson's, Muscular Dystrophy).
- Carcinogenic risks and immune system dysfunction.
- Disruption of cellular functions and oxidative stress (ROS generation).



### Bioaccumulation:

Bioaccumulation is the gradual build-up of chemicals (like toxins, pesticides, heavy metals) in a single organism over time.

## 24. Emerging Science, Technology and Innovation Conclave

In News: Emerging Science, Technology and Innovation Conclave was inaugurated by the Prime Minister on November 3, 2025 in New Delhi.



### About the Conclave:

- It is India's **premier Science, technology and innovation platform**, bringing together ministries, innovators, and global visionaries. 2025 is the first edition of the conclave.
- Organized by: It is a flagship annual event organized by the Department of Science and Technology (DST), in collaboration with ARCI, Hyderabad.
- Theme: "Viksit Bharat 2047 – Pioneering Sustainable Innovation, Technological Advancement and Empowerment"
- It is designed to accelerate India's STI (Science, Technology & Innovation) mission in alignment with the vision of "Viksit Bharat 2047".
- It will showcase cutting-edge research, deep-tech breakthroughs, and thought-provoking discussions with Nobel Laureates, global experts, policymakers, and emerging leaders – igniting a new era of scientific leadership.

## EMERGING SCIENCE, TECHNOLOGY, & INNOVATION CONCLAVE (ESTIC) 2025

India's S&T Conclave—Spotlighting Ideas, Breakthroughs & S&T Leadership

### What's in Store

- Plenary talks by Nobel Laureates and global experts
- 11 thematic sessions led by scientists, start-up founders, and policymakers
- 75+ deep-tech exhibition stalls fuelling industry-academia synergy
- Poster presentations by young researchers and technologists



📅 November 3-5, 2025 | 🗺 Bharat Mandapam, New Delhi

Join the movement as India powers its scientific rise towards *Viksit Bharat 2047*

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## 25. Researchers discover new species of spider in a Chikkamagaluru village, name it after 'Malenadu'

**In News:** A team of researchers exploring biodiversity in the Western Ghats has discovered a new species of spider belonging to *pilia*, a genus of jumping spiders, at Madhugundi village in Mudigere taluk of Chikkamagaluru. The researchers named it "*Pilia malenadu*", to give credit to the place it was found.



### What is the significance of this discovery?

This is a historic find as the last *Pilia* species was recorded 123 years ago in 1902 in Kerala. For the first time, researchers found both male and female spiders of this genus.

Interestingly, the researchers noticed that these spiders were found only two plant species — *Memecylon umbellatum* and *Memecylon malabaricum*. In fact, the spiders were found concealed between the leaves of these plants.

Study shows the spiders are habitat specific. If we fail to conserve the habitat, there are chances of losing the species. Spiders are biological controllers and essential to check on insect population. The presence of such species highlights the need for conserving the Western Ghats.

313, 3rd Floor, 4-B Grover Chambers, Pusa Road, Near Karol Bagh Metro Station,  
Old Rajendra Nagar, New Delhi (Ph. 9004928370, 8850452151)

## 26. ISRO launches GSAT-7R

In News: The Indian Space Research Organization (ISRO) successfully launched GSAT-7R (also known as CMS-03), India's heaviest indigenously built advanced communication satellite, marking a major boost to the country's space capabilities and naval communications.

## ISRO launches GSAT-7R, India's heaviest communication satellite

**Saurabh Trivedi**  
**Vasudevan Mukunth**  
NEW DELHI/CHENNAI

The Indian Space Research Organisation on Sunday successfully launched the Indian Navy's advanced communication satellite GSAT-7R (CMS-03) from the Satish Dhawan Space Centre in Sriharikota.

The indigenously designed and developed satellite, weighing approximately 4,400 kg, is India's heaviest communication satellite to date and marks a major milestone in strengthening the Navy's space-based communications and maritime domain awareness.

The ISRO launched the rocket aboard its most powerful launch vehicle, the LVM3, on its M5 mission. The lift-off took place at



The ISRO launching LVM3-M5 carrying a communication satellite from the Satish Dhawan Space Centre in Sriharikota on Sunday. ANI

about 5.26 p.m. from the second launch pad, and mission control soon confirmed that the satellite had been successfully inserted into a geosynchronous transfer orbit (GTO). This is the heaviest In-

dian-built communications satellite launched from Indian soil so far. Because of the high mass of the GSAT-7R, the launch vehicle targeted a standard GTO; once there, the satellite will raise and circular-

ise its orbit using its on-board propulsion systems. The Navy said that equipped with state-of-the-art indigenous components, the GSAT-7R would provide robust and secure telecommunication coverage across the Indian Ocean Region. Its advanced payload features transponders supporting voice, data, and video links over multiple communication bands, ensuring seamless connectivity between the Navy's ships, submarines, aircraft, and Maritime Operations Centres. The launch highlights India's growing self-reliance in space technology and the Navy's commitment to safeguarding national maritime interests, it said.

**CONTINUED ON**  
» PAGE 10

### About GSAT-7R or CMS-03:

- CMS-03 is a multi-band communication satellite that will provide services over a wide oceanic region including the Indian landmass.
- CMS-03, weighing about 4400kg, is the heaviest communication satellite launched to Geosynchronous Transfer Orbit (GTO) from India.
- **GSAT-7R (CMS-03)** was successfully launched aboard the **LVM3 (Launch Vehicle Mark-3)** from the Satish Dhawan Space Centre, Sriharikota.

### Key Features of GSAT-7R Satellite

- It is a part of India's advanced defence communication satellite series GSAT-7.
- Weight: ~4,400 kg
- Orbit: Launched into the Geosynchronous Transfer Orbit (GTO), it will eventually settle into Geostationary Orbit (35,786 kilometers above Earth).
- Coverage: Provides multi-band telecommunication services across the Indian Ocean Region and Indian landmass.
- Purpose: Strengthens space-based communication, maritime domain awareness, and secure links among Navy ships, submarines, aircraft, and Maritime Operations Centers.

### Significance for India:

With **GSAT-7R**, India enhances its ability to monitor, coordinate, and respond swiftly across domains — sea, air, and land.



- It also marks another step in **Atmanirbhar Bharat**, as India strengthens its indigenous capabilities in space-based defence technology.

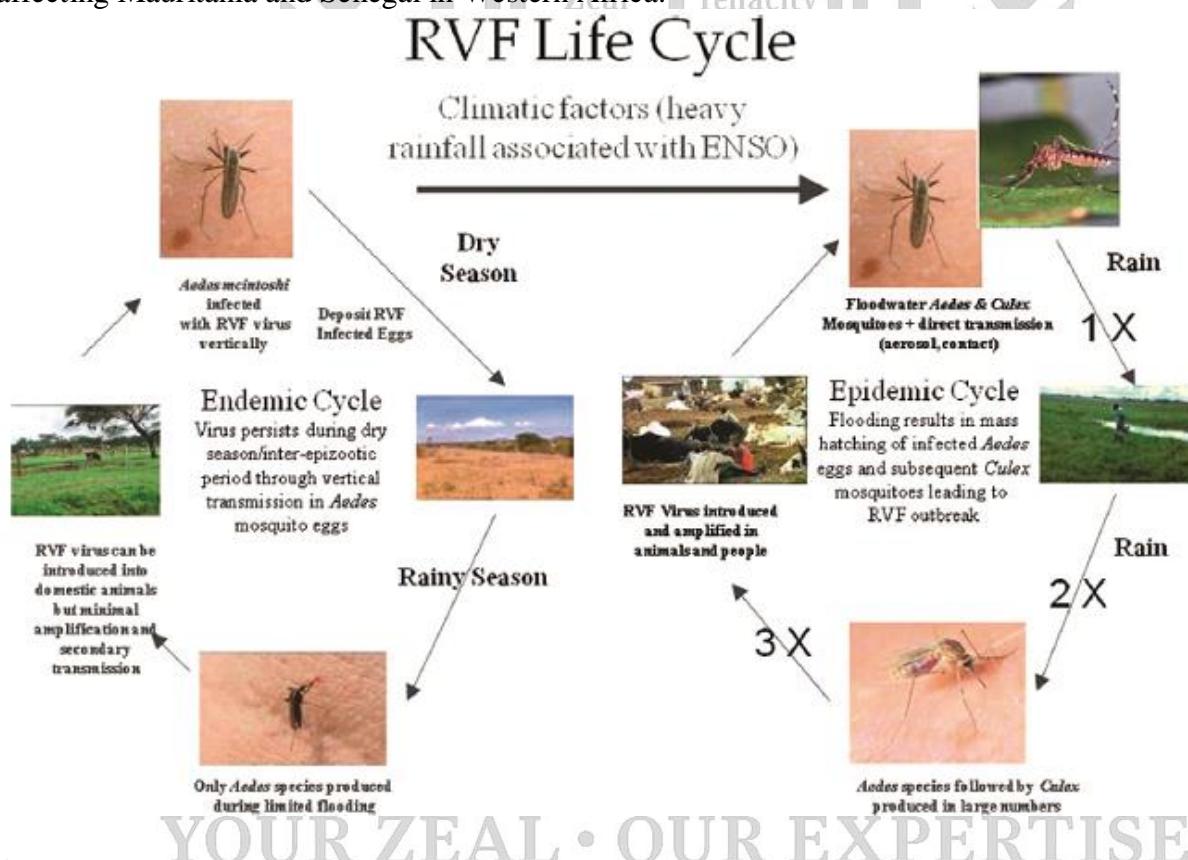
## About Launch Vehicle

LVM3 is **India's heaviest operational rocket** for launching heavy communication satellites and deep-space missions. It is a **three-stage vehicle**, comprising

- Solid Stage:** Two solid strap-on boosters at first stage (use of solid propellant)
- Liquid State:** One liquid core stage (liquid propellant)
- Cryogenic Stage:** One cryogenic upper stage (powered by the indigenous high-thrust CE-20 cryogenic engine, loaded with cryogenic propellant).

## 27. Rift valley fever

**In News:** The World Health Organization (WHO) confirmed an outbreak of Rift Valley Fever (RVF) affecting Mauritania and Senegal in Western Africa.



## About RVF:

- It is caused by a Phlebovirus belonging to the Phenuiviridae family.
- It primarily affects animals such as sheep, goats, cattle, and camels.
- Humans become infected through close contact with infected animals or by the bite of infected mosquitoes.
- The virus has not been shown to spread from person to person.
- Transmission:** Multiple mosquito species can transmit the Rift Valley fever virus, and the predominant vector differs from one region to another.

- The virus persists during the dry season via vertical transmission in *Aedes* mosquito eggs.
- Heavy rainfall and subsequent flooding cause mass hatching of infected *Aedes* eggs, leading to outbreaks.
- During the rainy season, the virus is amplified in animals and people through *Aedes* and *Culex* mosquitoes, as well as direct transmission.
- Female mosquitoes require a blood meal to develop eggs, which is a key part of the transmission cycle.

### **WHO Declaration:**

RVF is recognised by the World Health Organisation for Animal Health as a notifiable animal disease, reflecting its potential for rapid cross-border spread among livestock.

The WHO's R&D Blueprint for Action to Prevent Epidemics also lists it as a priority pathogen with epidemic potential, underscoring the need for urgent research and preparedness. Because of its capacity to cause widespread illness in animals and humans, the virus is also considered to have possible use as a biological weapon, highlighting the importance of global surveillance and coordinated response mechanisms.

## **28. HAMMER- Air-to-Ground weapons**

**In news:** India's state-run Bharat Electronics Limited (BEL) and French firm Safran Electronics and Defence (SED) have signed a joint venture cooperation agreement (JVCA) for the production of **Highly Agile Modular Munition Extended Range (HAMMER)** smart precision-guided air-to-ground weapon system, in India.

- HAMMER is a French-origin medium-range smart munition designed to strike hardened ground targets such as bunkers and reinforced structures.
- The system has a range of over 70 km, enabling fighter jets to launch the weapon from outside the engagement envelope of enemy air defence systems.
- Autonomous and resistant to jamming, HAMMER can be fired from low altitudes and over complex terrain.
- It can be fitted with multiple bomb sizes, including 125kg, 250kg, 500kg and 1000kg.
- The weapon is already in operational use on the Rafale, and is also intended for integration with India's indigenous Tejas fighter aircraft.

### **Previous use of HAMMER:**

- In 2020 amid rising tensions over the clash of Indian and Chinese troops at Galwan along the Line of Actual Control, India made an emergency purchase of the Hammer weapons system from France
- The Hammer weapons system showed its true potential during India's Operation Sindoar when the Armed Forces destroyed terror camps across the border in Pakistan-occupied Kashmir as well as parts of Pakistan.
- Notably, the Hammer weapons system was first used in combat in Afghanistan in 2008 and has since been used in other combat operations in Mali, Libya and Syria.
- It has also been deployed by several Nato-aligned countries.

- Ukraine has received several hundred Hammer systems from France since early 2024 and has used them across multiple aircraft types.

## Why HAMMER? - Reasons

- The Hammer's ability to be fully autonomous and unaffected by jamming was the reason that India chose it for Operation Sindoora.
- Its ability to be launched at low altitude, made it the perfect choice to penetrate fortified structures.

## India-France Joint Venture

- BEL and Safran signed a joint venture cooperation agreement to produce Hammer weapons system in the country. This agreement builds on the memorandum of understanding signed at Aero India in February 2025, strengthening the two sides' intent to establish a Joint Venture Company (JVC) in India with a 50:50 shareholding structure.
- It reinforces the commitment of both partners to incorporate a Joint Venture Company (JVC) in India, which will operate as a private limited firm with equal 50-50 shareholding.
- The indigenisation level is planned to increase gradually up to 60 percent, with key electronics, mechanical components and sub-assemblies produced within India. The deal will see localisation of manufacturing, supply and maintenance of Hammer weapons system in order to meet the operational needs of the Indian Air Force as well as the Indian Navy.

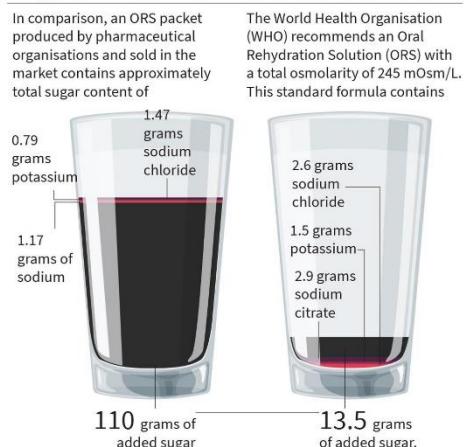
India currently operates 36 Rafale fighter jets and has also ordered 24 carrier-based Rafale-M aircraft for naval deployment.

## 29. Safe processing matters more than zesty flavours

**Context:** Food safety has become a big public health issue in India, especially as informal and street food markets grow without proper checks.

### Risky choice

High-sugar drinks should not be used in place of ORS -- a life-saving therapy that has saved millions of lives



### Problem of Informal Food Contamination

- Rising Concerns:** Indian street food is very popular and part of the culture, but more people are now worried about whether it is safe to eat.
- Hygiene Issues:** In July 2024, a raid on 58 pani puri vendors in Chennai found that most were using contaminated water and handling food with dirty hands, showing very poor hygiene.
- Regulation Challenges:** Millions of people work in the informal food sector, but most are not registered. This makes it hard for authorities to inspect, regulate, or hold anyone accountable for unsafe practices.
- Limitations of FSSAI:** The Food Safety and Standards

Authority of India (FSSAI), set up under the 2006 Act, makes national food safety rules.

However, it cannot directly monitor or test every small or street food vendor across the country.

## *Safe processing matters more than zesty flavours*

**T**here is a shadow – of doubt – over India's food landscape. In the last few years, a string of high-profile food adulterations has shaken consumer confidence. As a result, many are now more cautious about their everyday food choices. Street food, once a beloved symbol of India's rich culinary culture, is facing growing scrutiny that is related to safety and hygiene.

In July 2024, raids on 58 *pani puri* stalls in Chennai revealed alarming practices. Officials found vendors rinsing their hands and dipping their hands into chutneys. These cases are not isolated instances but highlight a troubling gap in food safety across India's informal food sector. While street food brings tradition and community to life, its hygiene standards often remain unchecked.

Food safety and standards for both packaged and unpackaged foods fall under the purview of the Food Safety and Standards Authority of India (FSSAI). However, the vast number of unpackaged food vendors makes it more challenging for the regulator to enforce safety standards consistently. In contrast, packaged foods allow for stricter enforcement of traceability, transparency, and reliability standards, due to clearer labelling and standardised packaging protocols.

**Packaged foods, safety and trust**  
India's packaged food industry is often associated with convenience. But it also reflects a structured system of food production shaped by science, regulation, and evolving consumer expectations. Compared to the informal food sector, the organised packaged food industry operates within a formal regulatory framework. Regulatory guidelines set by the FSSAI span the entire production cycle – from sourcing raw materials to packaging the final product.

Modern processing techniques further reinforce this reliability and shelf-life amidst variable weather conditions. Methods such as pasteurisation, vacuum sealing and aseptic packaging are widely adopted across the industry. These techniques help reduce microbial risks



Arpita Mukherjee  
is Professor, Indian  
Council for Research  
on International  
Economic Relations

while aiming to retain flavour and nutritional value. They also support broader distribution and storage needs, particularly in urban and working populations.

Transparency is another area where packaged foods provide clarity. From listing allergens and ingredients to providing manufacturing and expiry dates, packaged foods offer consumers, especially parents, elderly individuals, and health-conscious individuals, the tools to make informed dietary decisions.

Importantly, the industry is responding to growing consumer priorities around processed foods. Driven by market demand and growing health awareness, companies are evolving their product portfolios by introducing a wider range of offerings that cater to health-conscious consumers, thereby expanding the choices available to them. Similarly, there is a surge in fortification with vital nutrients to combat widespread nutritional deficiencies. These shifts mark a responsible and forward-looking approach that aligns commercial interests with consumer well-being.

**A part of culinary landscape, but with risks**  
Street food remains a vibrant and integral part of India's food culture. It is a source of livelihood, supports millions of livelihoods, and continues to be a popular choice for both locals and tourists. However, beneath this rich and flavourful surface lies a series of systemic risks that cannot be ignored.

A recent analysis by the Observer Research Foundation paints a grim picture, estimating that India records a staggering 100 million cases of food-borne diseases every year, leading to approximately 120,000 deaths. A significant portion of these illnesses is linked to contaminated food from informal sources, including street vendors, small eateries and roadside stalls. These are not just statistics. They represent a significant public health burden that disproportionately affects the most vulnerable sections of society.

The quality of street food often deteriorates due to incorrect cooking practices. The reuse of cooking oil, for instance, is a common practice that not only diminishes the nutritional value of the food but can also lead to the formation of harmful trans fats and other toxic compounds. Similarly, the incentive to use cheaper, adulterated ingredients is high. These practices frequently trigger localised outbreaks of food poisoning and other gastrointestinal illnesses, which often go unreported, further masking the true scale of the problem.

The FSSAI has introduced initiatives to train, certify, and integrate these vendors into the regulatory framework. In collaboration with the Brihanmumbai Municipal Corporation (BMC) it launched a food safety training programme for street food vendors in Mumbai. The training modules include personal hygiene, safe food handling, storage protocols to prevent contamination and proper waste disposal. At the same time, the unorganised nature and sheer scale of the sector make this a gradual and ongoing effort.

### **Foster a commitment to safety**

While packaged foods go beyond convenience and reflect a science-led, structured approach to food safety, street food, despite its importance, requires a more holistic approach. It is important to ensure that street foods are safe and hygienic through training and rating of street vendors under national-level campaigns such as the Eat Right India movement or the Clean Street Food Hub (CSFH).

As India progresses on its path of modernisation and urbanisation, ensuring access to safe and hygienic food must become a top priority. While street food is a part of the romance and tradition of street food remains integral to India's cultural fabric, the associated health risks cannot be overlooked especially when public health is a national priority. The future of food in India must be shaped not by sentiment, but by an unwavering commitment to safety.

*The views expressed are personal*

## **Why Packaged Food Seems Safer**

- Traceability:** Packaged foods can be traced back to the company that made them, forcing manufacturers to follow safety standards or face fines and license loss. Street food, however, has no system of traceability.
- Better Processing:** Packaged foods often use technologies like pasteurisation to kill harmful germs and extend shelf life.
- Clear Labelling:** Labels on packaged foods show ingredients, allergens, and expiry dates, helping people make safer choices.
- Added Nutrients:** Many packaged foods are fortified with vitamins and minerals to reduce hidden hunger and nutritional deficiencies.

## **Health Risks from Informal Food Sources**

- Widespread Illness:** According to an ORF report, about 10 crore Indians suffer from food-borne diseases every year, and around 1 lakh people die — mostly due to unsafe food from informal sources.
- Reused Oil:** To save money, street vendors often reuse cooking oil. This produces harmful trans fats and chemicals that can lead to cancer.
- Ignoring FSSAI Rules:** FSSAI requires that cooking oil be thrown away when Total Polar Compounds exceed 25%, but this rule is rarely followed by vendors.
- Low-Quality Ingredients:** Many vendors use cheap or adulterated ingredients, which cause frequent stomach and digestive problems.
- Under-reporting:** Most cases of food poisoning go unreported because people usually self-medicate and continue working without identifying which food caused the problem.

## **Government Efforts to Improve Food Safety**

- Eat Right India Movement:** A national campaign that encourages people to follow healthy, science-based eating habits.

- b. **Clean Street Food Hub Scheme:** This program identifies major street food areas, improves their hygiene infrastructure, and gives official certification once safety standards are met.

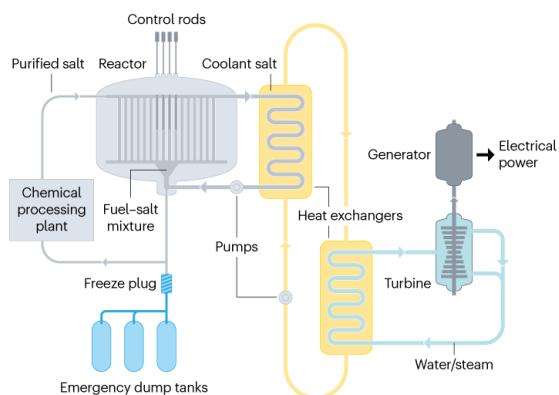
## 30. Thorium Molten Salt Reactor

**Context:** In 2025, China plans to start building a demonstration thorium-based molten-salt reactor in the Gobi Desert.



### MOLTEN-SALT REACTOR

In a molten-salt nuclear reactor the fissile material is dissolved in liquid salt in the reactor core. Liquid salt also acts as a coolant in place of water. Fission occurs in the reactor core, generating heat, which is transmitted by the coolant salt and heat exchangers to water, producing steam. This drives a turbine to generate electricity. A frozen plug of salt melts if the reactor core overheats, allowing the fuel-salt mixture to drain into emergency dump tanks.



Molten salt reactors (MSRs) use molten fluoride salts as primary coolant, at low pressure. They may operate with epithermal or fast neutron spectrums, and with a variety of fuels.

### What is the Project?

- The 10-megawatt reactor project, managed by the Chinese Academy of Sciences' Shanghai Institute of Applied Physics (SINAP), is scheduled to be operational by 2030.
- The project follows a 2-MW experimental version completed in 2021 and operated since then.
- China's efforts put it at the forefront of both thorium-based fuel breeding and molten-salt reactors.

### About Thorium:

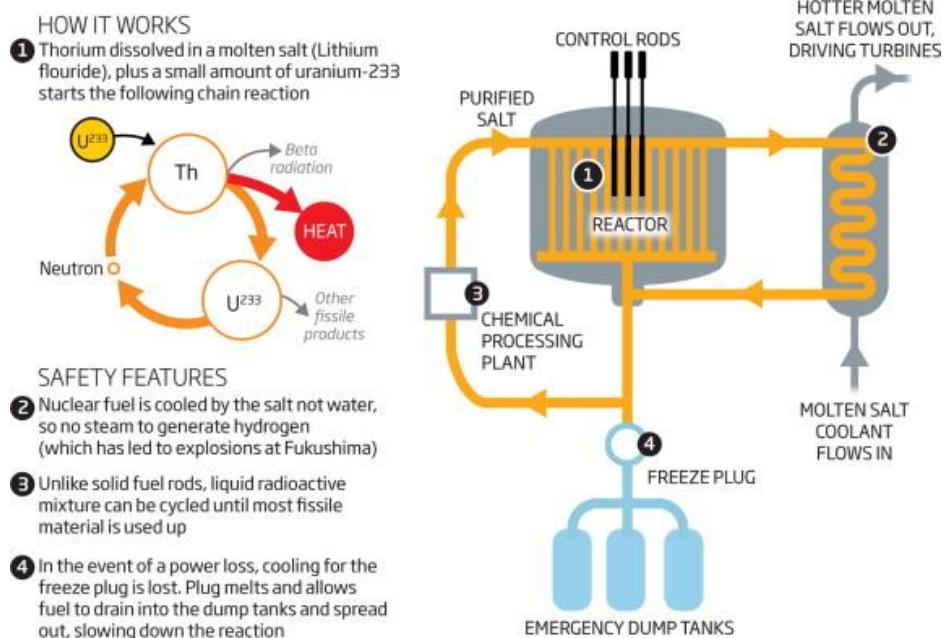
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Old Rajendra Nagar, New Delhi (Ph. 9004928370, 8850452151)

Thorium-232, found in igneous rocks and heavy mineral sands, is more abundant on Earth than the commonly used isotope in nuclear fuel, uranium-235.

- The weak radioactive metal isn't directly fissile—it can't undergo fission, the splitting of atomic nuclei that produces energy. So it must first be transformed into fissile uranium-233. That's technically feasible, but whether it's economical and practical is less clear.
- The attraction of thorium is that it can help achieve energy self-sufficiency by reducing dependence on uranium, particularly for countries such as India with enormous thorium reserves

### Power from thorium

Nuclear reactors based on thorium - a naturally occurring metal - offer several advantages over their uranium and plutonium-based cousins



### How China is sourcing thorium?

- The element is a waste product of China's huge rare earth mining industry. Harnessing it would provide a practically inexhaustible supply of fuel.
- molten-salt reactor core will be 3 meters in height and 2.8 meters in diameter. It will operate at 700 °C and have a thermal output of 60 MW, along with 10 MW of electricity.

### Production of thorium:

- In this kind of reactor, thorium fluoride dissolves in molten salt in the reactor's core. To turn thorium-232 into fuel, it is irradiated to thorium-233, which decays into an intermediate, protactinium-233, and then into uranium-233, which is fissile.
- During this fuel-breeding process, protactinium is removed from the reactor core while it decays, and then it is returned to the core as uranium-233. Fission occurs, generating heat and then steam, which drives a turbine to generate electricity.

### Limitations:

#### Risk of producing nuclear weapons:

A big one is dealing with the risk of proliferation. When thorium is transformed into uranium-233, it becomes directly usable in nuclear weapons.

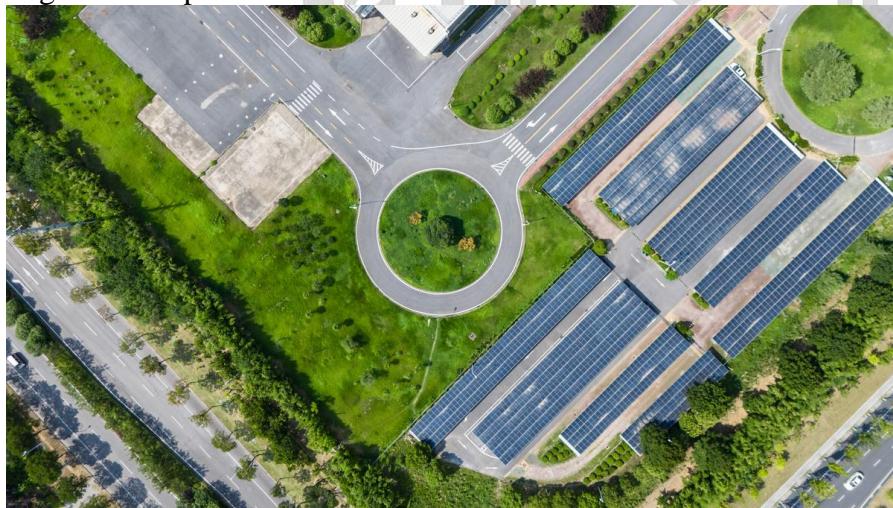
**Uranium-233 theft:** If the fuel is circulating in and out of the reactor core during operation, this movement introduces routes for the theft of uranium-233.

## Environment and Ecology

### 31. Rethinking the symbol of environmental responsibility

Context: The growing trend of reducing green-cover requirements for industrial estates, units within estates, and standalone industries is often celebrated as a step toward “ease of doing business”. However, the rationale for such relaxation frequently based on international examples where minimum plantation norms appear lower often lacks ecological context.

This simply means that just having some trees inside industrial areas is not enough to call it “environment-friendly”, and that India should link industrial growth with real ecological restoration at a larger landscape level.



#### Limits of on-site Green belt

Industrial growth always changes nature because land is cleared and animal habitats are disturbed.

Planting trees inside factory or industrial areas helps, but it mainly reduces some of the harm; it does not fully repair the damage to nature.

- Trees and green belts inside factories can cut dust in the air a lot and also reduce noise to some extent, which gives cleaner air, more comfort, and a cooler local climate.
- But these benefits stay close to the factory area and do not spread very far outside.
- Such green belts cannot do everything that natural forests, wetlands, and other ecosystems do, like storing carbon, managing water, building healthy soil, supporting many species, and allowing animals to move between habitats.
- Factory plantations are usually narrow, often only one or two tree species, and they can get damaged or poorly maintained over time.
- These on-site trees mainly soften the immediate impacts of industry but cannot balance out the bigger loss of natural land and ecosystems.
- So, while planting trees inside industrial areas is still useful, it should not be confused with true ecological restoration of nature.

#### Why International Comparisons Fall Short

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- Policymakers often refer to countries with lower industrial greening ratios to justify local relaxations.
- Yet such comparisons are misleading without considering differences in population density, ecological resilience, industrial intensity, and land availability.
- Nations with extensive open spaces and low population pressure can afford smaller on-site green requirements because surrounding natural landscapes still provide ecological buffering.
- In densely populated, industrially stressed regions, green cover plays a far more critical role in maintaining environmental quality and public health.
- Applying uniform percentages across diverse geographies is akin to prescribing the same diet to people with different health needs.
- Effective policy transfer requires ecological calibration, not numerical imitation.
- Borrowing green-cover norms from elsewhere without considering local environmental stress, climate conditions, and landscape fragmentation undermines evidence-based policymaking.

### What should change

- Instead of only counting on small on-site plantations, policy should demand that industries also support greening outside their boundary: restoring degraded land, creating regional green reserves, and protecting buffer zones around forests and other sensitive areas.
- These efforts can be linked with green credit, carbon markets and other national schemes so that industrial growth and ecological regeneration happen together, not in opposition.

### Role of industry in real responsibility

- The industries must be seen as ecological partners, not just as polluters who put a few trees inside their compound to show they are “green”.
- Real environmental responsibility means industries planning for their total land-use impact on the wider region and investing in nature-based solutions, not relying on token green belts as a symbol of being responsible.
- Green belts within industrial premises function like medicine applied to a wound, immediate and local.
- Expanding natural green cover around industrial clusters, however, strengthens the entire ecological system, preventive, long-term, and indispensable.

The future of sustainable industrial development will depend not on the number of trees inside factory gates, but on how deeply industries root themselves in the health of surrounding landscapes.

## 32. India's grappling with Dust Pollution

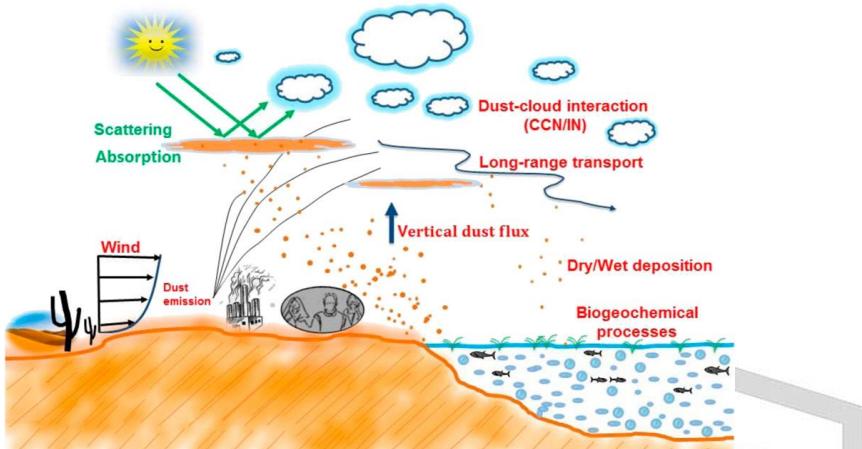
**Context:** Road dust is now recognised as a major source of air pollution in many Indian cities, but policy and spending on it are often poorly targeted and only partly effective.

Road dust mainly comprises PM<sub>10</sub> and coarse particles and forms a large share of the air we breathe. With the National Clean Air Programme (NCAP) aiming for a 40% reduction in PM<sub>10</sub> by 2025-2026, reducing road dust is an urgent priority.

### How big the road dust problem is?

Source apportionment studies in 17 non-attainment cities show that road dust contributes roughly 20–52% of PM10 and 8–25% of PM2.5, making it one of the dominant local pollution sources. Measurements by IIT-Delhi across 32 cities found very wide variation in how much loose silt lies on roads, with Delhi averaging about 14.5 g/m<sup>2</sup> and northern cities generally dustier than those in the south.

## The Dust Cycle



### Where the money is going?

Under the National Clean Air Programme, about ₹19,711 crores was given to 131 cities between 2019 and 2025 to improve air quality, with nearly 64% of funds spent on road dust control alone by late 2023. This is far more than what cities spent on cutting biomass burning, vehicular emissions, or building institutional capacity, raising questions about balance in clean-air strategies.

### Chronology of efforts made by the Government:

- Efforts to control road dust have been underway for several years. In January 2018, the Union Environment Ministry issued a notification to mitigate dust at construction sites, mandating paving and blacktopping of roads leading up to such sites.
- In 2021, the Commission for Air Quality Management in the National Capital Region and Adjoining Areas (CAQM) recommended the establishment of 'Dust Control and Management Cells.'
- The CAQM periodically reviews these activities. However, dust from roads and open areas remains a major driver of poor air quality in Delhi-NCR. To strengthen its approach, the CAQM initiated a study called 'Addressing vehicular traffic-induced road dust resuspension for air quality action plans' in 2025.

### Missing parts:

- The Environment (Protection) Act 1986 and the Air (Prevention and Control of Pollution) Act 1981 make broad references to road dust management. The Construction and Demolition Waste Management Rules 2025 don't outline specific regulations addressing road dust control at the national scale, however.
- There are also no standard operating procedures to scientifically dispose of the dust collected by manual and mechanised sweeping to prevent resuspension.
- One major challenge is fragmented jurisdiction. Under the NCAP, municipal corporations and State Pollution Control Boards are required to curb road dust. In practice, however, the responsibility is split across multiple agencies. For example, in Delhi 12 agencies maintain roads.
- Operational constraints add to the problem. Of Delhi's total road length of 19,000 km, only 8,000 km has been identified for mechanised sweeping. Around 200 mechanised road-sweeping machines (each operating at 40 km/hr) are required to clean this stretch every day. Yet the number of such machines in Delhi is only 85.

### Way forward:

- Road dust management guidelines should also be established to define the appropriate type of cleaning and maintenance machinery based on road width, surface type, traffic conditions, debris characteristics, water availability, and seasonal variations.
- A GIS-based platform should be created to allow them to monitor and resolve complaints in real-time, thus improving accountability. Such a system can be integrated with existing applications, such as the Green Delhi App and Swachhata App, to improve coordination and response.

### Practical measures:

- Dust pollution is mainly caused by unscientific practices during road development and maintenance. The collected dust is typically discarded in landfills or on roadsides, wherefrom the wind easily carries it back into cities, rendering the entire sweeping process ineffective.
- Dust suppressant chemicals such as calcium chloride, magnesium chloride, and natural polymer-based agents (e.g. lignosulphate and bitumen-based emulsions) are widely available. However, their effectiveness and impact on soil and road health aren't well documented.

India needs a clear, long-term plan to reduce dust from roads and open spaces, built into how cities are planned and developed. This plan must treat clean roadsides and good air quality as important parts of all road and infrastructure projects.

Dust control should be based on scientific evidence and strict rules for how roads are built and maintained, including how open areas along roads are managed.

If dust control measures are well planned and followed regularly, they can greatly improve air quality, protect people's health, and make cities more comfortable and resilient places to live.

## 33. UNEP Adaptation Gap Report 2025

**In News:** The UNEP Adaptation Gap Report 2025, titled "Running on Empty" was released in Belem, Brazil ahead of COP30. According to the report, the world is critically underprepared to protect vulnerable populations from worsening climate impacts.

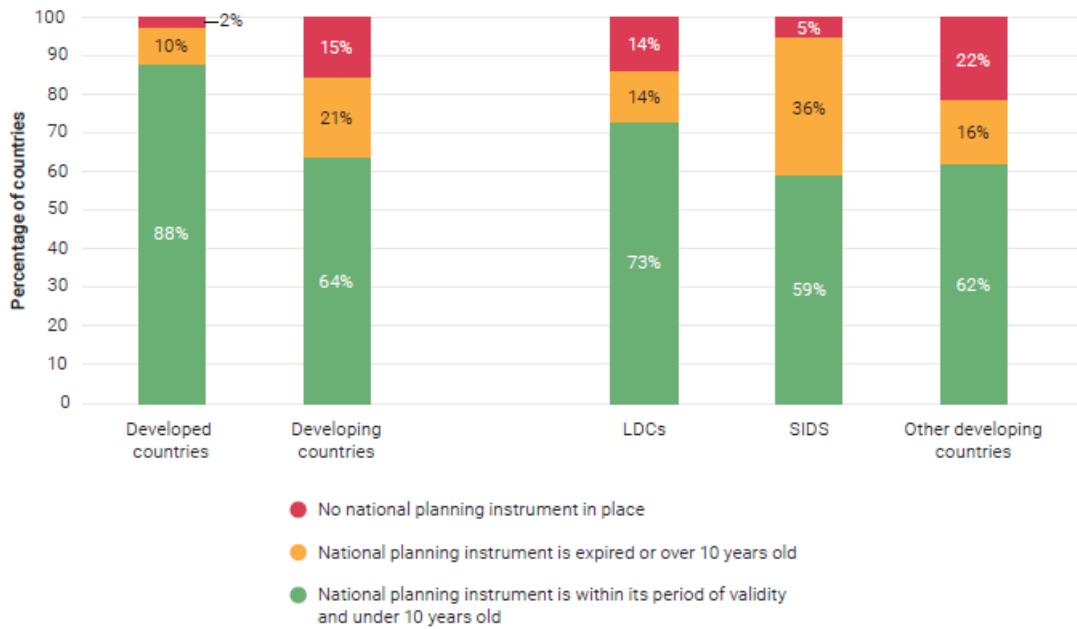
### Findings of the Report:

- a. It finds that developing countries will require between \$310 billion and \$365 billion annually by 2035 to adapt to climate change. Current international public adaptation finance flows stand at \$26 billion, leaving a gap that is 12 to 14 times wider than existing support.
- b. The report warns that the Glasgow Climate Pact goal to double adaptation finance to \$40 billion by 2025 will not be met unless there is an urgent turnaround in funding commitments.
- c. The report highlights that 172 countries now have at least one national adaptation policy, strategy or plan, but 36 of these are outdated, raising the risk of maladaptation.
- d. Countries reported more than 1,600 adaptation actions in sectors such as biodiversity, agriculture, water and infrastructure, but few are tracking or reporting their outcomes.
- e. Money from climate funds like the Adaptation Fund, the Global Environment Facility and the Green Climate Fund went up to 920 million dollars in 2024, which is 86% more than the average of the previous five years. But UNEP warns this jump may not last, because new money problems could reduce future funding.
- f. The report also examines the New Collective Quantified Goal (NCQG) set at COP29 in Baku, which calls for \$300 billion per year by 2035 for climate action in developing

countries. UNEP notes that these funds are largely inadequate, especially when adjusted for inflation.

- g. The report also estimates that private sector investment in national adaptation priorities could realistically reach \$50 billion per year with supportive policy and blended finance mechanisms, up from the current \$5 billion.

**Figure 2.2 Status of national adaptation planning instruments across different country classifications commonly used under the UNFCCC**



### India facing Risks:

India is among the countries facing rising health risks due to climate change.

- Increasing heat stress, water scarcity, wet bulb temperatures and air pollution amid climate change, which are adding to the health challenges in our regions.
- These threats are not only increasing coping pressure on local governance, hospitals and the health infrastructure but also require adequate finance for the scale of the problem.
- Real adaptation finance for health systems remains abysmally inadequate and in a post-pandemic world, this is not just an economic issue but a serious public health emergency

## Takeaways from the deal

A look at what was achieved, and what wasn't, in Glasgow

### CURBING EMISSIONS

**TARGET 1.5°C**

Nations agreed to focus on the Paris goal of keeping global warming from going beyond 1.5°C. Experts have long advocated this, but some nations had been pressing onto the option of aiming for 'well below 2°C'.

### COAL, FOSSIL FUEL

Nations also agreed to explicitly target coal use and fossil fuel subsidies, though the original proposals were greatly watered down.

### NEW TARGETS IN 2022

Major emitters will present new targets at the 2022 UN climate conference in Egypt.

### ALL IN FOR 1.5°C

Now can also visit our business pavilion in Hall 4

### AID TO POOR NATIONS

There was bad blood going into COP26 as rich nations have failed to meet a pledge of providing \$100bn/year to poor nations to expedite a clean tech shift. The final agreement expressed 'deep regret' about this and urged the west to pay 'as soon as possible'.

### NO REPARATIONS

Wealthy nations rejected demands to compensate poor countries for the climate destruction, which the former are responsible for because of past emissions. The latter were angered, but nevertheless backed the deal in the hope of making progress on this issue next year.

### 'CARBON TRADING'

The rules regarding carbon trading, for achieving 'net zero' by 2050, was one of the hardest-fought issues. While a compromise was found that may add trillions of dollars to fight climate crisis, many say the Glasgow Climate Pact left big loopholes which may get exploited.

- **Climate impacts are accelerating.** Yet adaptation finance is not keeping pace, leaving the world's most vulnerable exposed to rising seas, deadly storms, and searing heat. Closing the adaptation gap is how we protect lives, deliver climate justice, and build a safer, more sustainable world.
- **The impacts of climate change:** wildfires, heat-waves, desertification, floods, rising costs and more are affecting every person inhabiting the planet. As action to cut greenhouse gas emissions continues to lag, these impacts will only get worse, harming more people and causing significant economic damage.

The report has also made clear how developed countries are evading responsibilities by abandoning developing countries to climate change risks and eventualities, without being at fault.

## 34. Global cooling watch Report 2025

**In News:** The Global Cooling watch report 2025 was launched by UNEP at Belem, Brazil ahead of COP30 meeting.



The Global Cooling Watch 2025 is UNEP's second global assessment on the environmental, economic, and equity dimensions of cooling, providing the scientific foundation for the Global Cooling Pledge. The main objective of the report is to analyse global cooling trends, project future emissions, and propose a "Sustainable Cooling Pathway" to achieve near-zero emissions while ensuring equitable access to cooling worldwide.

### Key Findings of the Report

- Cooling demand:** Installed global cooling capacity may rise from 22 TW (2022) to 68 TW (2050) under Business-As-Usual (BAU) driven by population growth, rising incomes, urbanisation, and more frequent extreme heat events.
- Cooling emissions:** Cooling-related emissions could double from 4.1 Gt CO<sub>2</sub>e in 2022 to 7.2 Gt CO<sub>2</sub>e by 2050, despite efficiency improvements.
- Extreme heat:** Heat-waves now the deadliest climate-related hazard; Urban heat islands add 5–10°C, amplifying cooling needs.
- Equity Challenge:** Over one billion people currently lack access to cooling, a figure projected to triple by 2050 if sustainable measures are not implemented.
- The most vulnerable groups include women, elderly populations, and smallholder farmers, particularly in Africa and South Asia.

## A sustainable cooling pathway

- The report outlines a Sustainable Cooling Pathway that could cut emissions by 64 per cent and save \$43 trillion in avoided electricity and grid investments through 2050. When paired with rapid power-sector decarbonisation, cooling-related emissions could fall by 97 per cent, nearing net-zero by mid-century.

## The pathway combines

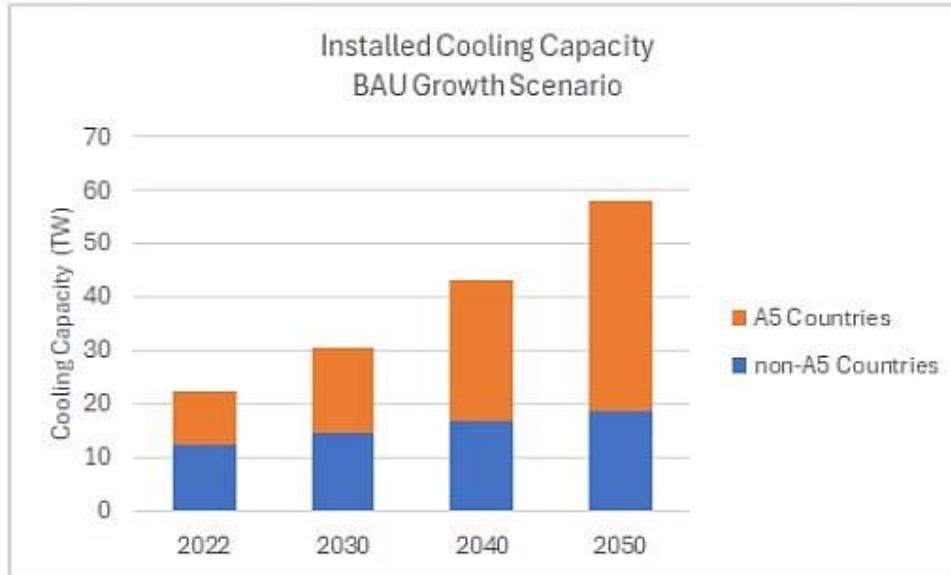
- Passive cooling measures such as shading, ventilation, reflective surfaces, and green urban spaces.
- Low-energy and hybrid systems that pair fans with efficient air conditioners.
- High-efficiency equipment and a faster phase-down of HFC refrigerants under the Kigali Amendment.

Together, these measures could extend safe cooling access to three billion additional people, particularly in the Global South, while easing pressure on overstressed electricity grids.

## Equity and access at the core

- Over one billion people currently lack adequate access to cooling, a figure that could triple by 2050 without intervention.
- Vulnerability is highest among women, smallholder farmers, and elderly populations, especially in Africa and South Asia.
- The report finds that passive and low-energy cooling solutions deliver the biggest and fastest comfort gains at the lowest cost, reducing indoor temperatures by up to 8°C and cutting household energy use by 30 per cent or more.

Figure 4-1 Installed cooling capacity under the BAU Growth scenario, global



## Cities lead the ‘Beat the Heat’ movement

At COP30, UNEP and the Brazil Presidency launched the ‘Beat the Heat’ implementation drive, a global coalition of 187 cities — from Rio de Janeiro to Jakarta to Nairobi — working to localise the Global Cooling Pledge and bridge gaps in finance, governance, and delivery of heat resilience.

So far, 72 countries have signed the Global Cooling Pledge to cut sectoral emissions by 68 per cent by 2050, though only 54 have comprehensive policies aligned with the Sustainable Cooling Pathway.

## Way ahead

The report calls for governments to treat heat protection and cooling as public goods, integrated into

urban planning, housing, health, and education infrastructure.

It urges countries to embed cooling in Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs), and building codes, and to empower local authorities to drive passive urban design — trees, water bodies, and reflective materials — that can lower city temperatures by up to 25 per cent.

## 35. Bharat TREM (Tractor Emission Norms)

**In News:** Farmers' organisations have opposed the Union government's proposal to implement **Tractor Emission Norms (TREM) Stage V** for tractors from 1st October 2026, urging that the rules would **force farmers to buy new tractors**, increasing debt and economic hardship.

- The Farmers said that stricter emission norms should apply only to tractors above 70 horsepower (HP), which are often used for non-agricultural purposes.
- Farmers expressed concern that most of the tractor brands they used may not fall within the TREM Stage V norms, and urged the Centre for the relaxation of the norms.

The industries had also earlier requested that tractors below 50 HP could be exempted from following the proposed norms.

### TREM

These are pollution-control standards set by the government to regulate and reduce harmful exhaust emissions from **agricultural tractors and farm machinery**.

They are similar to Bharat Stage (BS) norms for other vehicles but are specifically designed for agricultural equipment to limit pollutants like NOx, particulate matter (PM), hydrocarbons, and carbon monoxide.

### TREM Stages:

India introduced tractor emission norms in 1999, followed by Bharat (Trem) Stage II in 2003 based on the Expert Committee on Auto Fuel Policy (Mashelkar Committee, 2002), and Bharat (Trem) Stage -III in 2005.

TREM-IIIA (2010–11) brought horsepower (HP)-based limits, and TREM-IV was implemented in 2023 for tractors above 50 HP to further curb emissions.

### Significance of TREM:

Tractor emission norms are important because they cut pollution and push the industry to use cleaner, better technology. Here is a simple version of each point.

- Environment and health:** These rules reduce harmful gases like nitrogen oxides and tiny dust particles from tractor engines. This helps keep the air cleaner and lowers health problems caused by air pollution.
- Global standards and technology:** Newer norms like TREM IV and V bring Indian tractor standards closer to those in Europe and the US. This pushes companies to use cleaner technology, such as better exhaust systems and improved engine designs.
- Better efficiency and performance:** To meet these rules, engine technology has to improve. This often leads to tractors that use less fuel, work better, and need better-quality lubricants.
- Support for exports:** Because Indian tractors follow similar rules as rich countries, manufacturers can sell more easily in markets like Europe and the US. This helps the export potential of Indian tractors.
- Costs and farmer concerns:** Stricter rules, especially Stage V, make tractors more expensive to design and build. This can increase the price of tractors, worrying farmers about higher loans and financial stress.

f. **Change in the industry:** Tougher norms favour big companies that have money and R&D strength to upgrade engines and systems. Smaller local manufacturers may struggle, leading to consolidation in the tractor market.

## 36. Global Methane report 2025

**In News:** The Global Methane report 2025 was released by the UNEP (United Nation Environment program). According to the report, crop residue burning is turning India into a global methane hotspot.

### About Global methane report:

It is produced by the UN Environment Programme and the Climate and Clean Air Coalition (CCAC). It provides updates on global progress on methane mitigation and the remaining work needed to achieve the Global Methane Pledge.

### Key Highlights from the Global Methane Status Report 2025

- Atmospheric methane levels have now doubled compared to pre-industrial eras.
- Without action, escalating global methane emissions could lead to nearly 24,000 extra premature deaths each year and crop losses totalling 2.5 million metric tons by 2030.
- India ranks as the third-biggest source of methane worldwide.
- The country's agriculture sector accounts for 12% of global methane emissions from farming—one of the largest national contributions.
- Full implementation of Nationally Determined Contributions (NDCs) and Methane Action Plans by all countries could reduce emissions by 8% by 2030.
- The report emphasizes that 72% of the world's potential for cutting methane comes from G20+ nations, which are responsible for 65% of human-caused methane releases.

### Global Methane Pledge:

The Global Methane Pledge is an international initiative launched at COP26 in 2021 by the European Union and the United States to accelerate methane emission reductions.

### Core commitments:

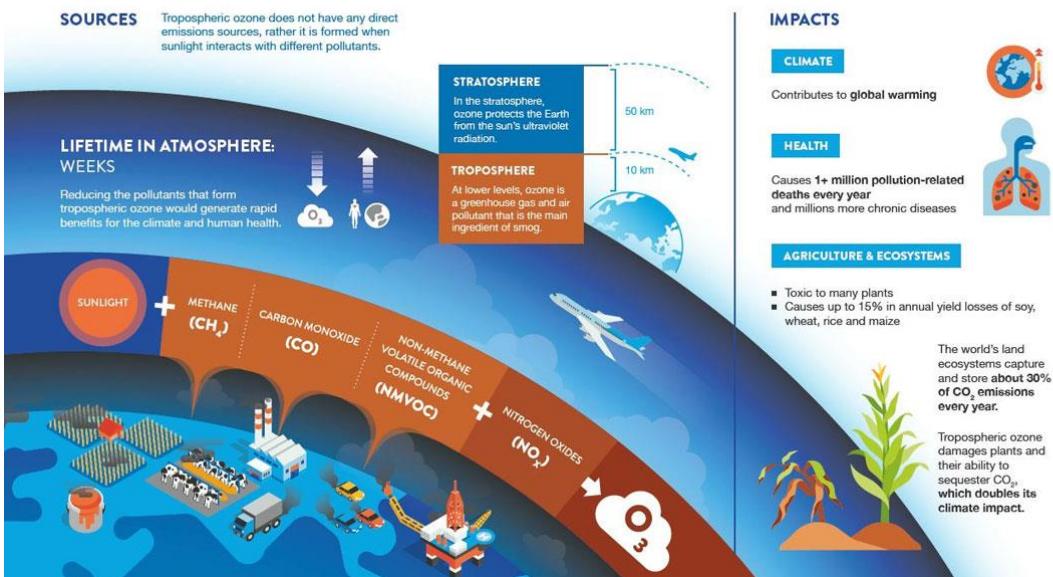
Participants voluntarily commit to a collective global target of cutting methane emissions by at least 30% from 2020 levels by 2030, which could limit warming by over 0.2°C by 2050.

Countries also pledge to improve methane inventory reporting using top-tier IPCC methodologies and enhance transparency in key sectors like energy, waste, and agriculture.

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## TROPOSPHERIC OZONE ( $O_3$ )

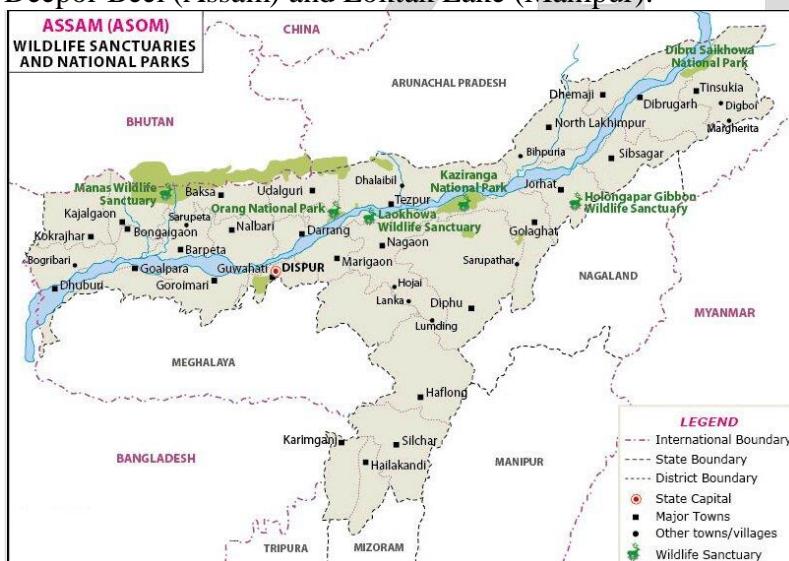


## 37. Rowmari-Donduw: Wetland

**Context:** Conservationists in Assam are pushing Ramsar recognition for the Rowmari–Donduwa wetlands after very high water bird counts.

### Rowmari–Donduwa Wetland Complex

It is located within the Laokhowa Wildlife Sanctuary (WLS), a part of the Kaziranga Tiger Reserve in Assam. It is an interconnected floodplain–marsh system spanning about 2.5 to 3 square kilometres. It hosts a higher diversity of bird species compared to the two existing Ramsar sites in Northeast India — Deepor Beel (Assam) and Loktak Lake (Manipur).



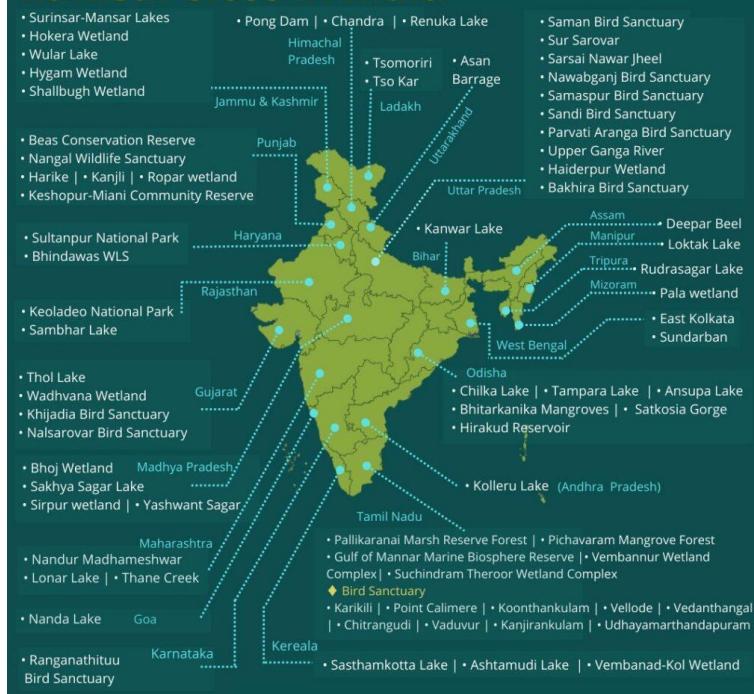
### Ramsar Sites

Ramsar Sites are wetlands of global importance designated under the Ramsar Convention (Convention on Wetlands), an international treaty for conserving wetlands crucial for biodiversity, water management, and climate regulation.

Ramsar Sites are wetlands recognized for their ecological value, supporting unique species, serving as critical habitats, or representing specific wetland types.

Named after the city of Ramsar, Iran, where the treaty was signed in 1971, this convention promotes wetland conservation and wise use.

## Ramsar sites in India



## Significance of Ramsar sites

- Biodiversity conservation:** These wetlands are special homes for many rare and unique plants, fish and animals. They are especially important for protecting more than 180 kinds of waterbirds.
- Ecosystem services:** Ramsar wetlands help control floods, refill groundwater and clean water naturally. These functions keep the environment stable and healthy.
- Climate change role:** They store large amounts of carbon, so they act as carbon sinks. This helps regulate local climate and makes the area more resilient to climate change.
- International recognition:** When a wetland becomes a Ramsar site, it gets global recognition and support. This can bring cooperation, expertise and funds to protect and manage the site better.
- Socio-economic benefits:** These areas help local communities with fishing, farming and eco-tourism. This provides jobs and income while encouraging conservation.

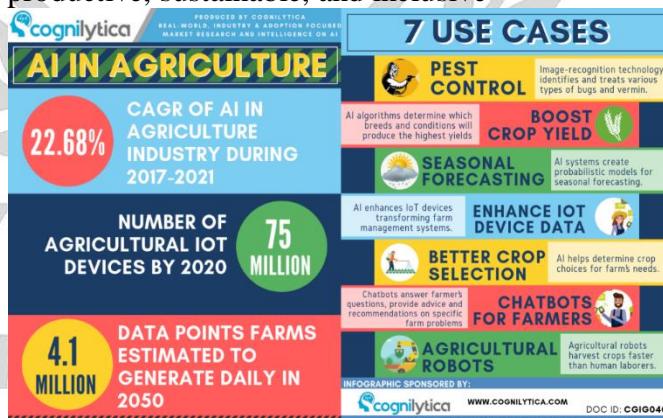
## Agriculture

### 38. How Artificial Intelligence is transforming Agricultural production

**In News:** The World Bank report "Harnessing Artificial Intelligence for Agricultural Transformation," released in late 2025, outlines how AI boosts productivity, resilience, and sustainability in global agrifood systems, especially for small-scale producers in low- and middle-income countries.

#### Need for AI in current scenario:

The global agrifood system stands at a critical inflection point. Climate shocks, rising input costs, fragile supply chains, and widening inequality are placing unprecedented pressure on food production and distribution. Small-scale producers (SSPs), who produce one-third of the world's food, are especially vulnerable. Artificial Intelligence (AI) presents a timely and powerful tool to help reimagine agricultural transformation in ways that are more productive, sustainable, and inclusive.



#### What's different about AI now?

AI is not new—but its capabilities, accessibility, and societal relevance have changed dramatically due to two key developments:

- The Rise of Generative AI (GenAI):** GenAI models can synthesize insights from massive unstructured datasets—text, satellite imagery, and audio—to support natural language advisories, local language interfaces, and synthetic data generation. This opens new possibilities for non-literate or low-connectivity user groups.
- Multimodal Integration:** Agriculture is uniquely suited for AI because it generates diverse data types—images, climate records, sensor outputs, and more. AI models can now fuse this data to generate granular, predictive insights for input optimization, climate resilience, and market linkages.

#### What's in the report?

The report identifies high-impact AI use cases spanning the entire agrifood value chain, illustrating the strategic relevance and practical adaptability of AI across diverse LMIC contexts. These include:

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- a. **Crop & Livestock Discovery** – accelerating research and development (R&D) through the identification of climate-resilient gene varieties and optimized breeding strategies.
- b. **Advisory & Farm Management** – enabling data-driven decisions via AI-powered pest diagnostics, precision farming tools, and real-time soil monitoring.
- c. **Markets, Distribution & Logistics** – improving market transparency and reducing spoilage with AI-enabled traceability, price forecasting, and smart contracts.
- d. **Inclusive Finance & Risk Mitigation** – expanding financial access through alternative credit scoring and climate-indexed insurance models.
- e. **Cross-cutting Applications** – supporting adaptive planning through synthetic data, agro ecological zoning, and granular weather prediction.

Together, these innovations offer transformational potential—accelerating scientific discovery, optimizing the use of scarce inputs, boosting productivity, improving food quality and market access, and strengthening environmental and climate resilience across agricultural system.

## Implications for Policy and the Future

As AI reshapes agriculture, policymakers must address five pivotal areas:

- **Data Sovereignty and Ethics:** Create legal frameworks that recognize farmers' ownership of agricultural data and mandate transparent AI algorithms with localized training datasets.
- **Energy and Connectivity Infrastructure:** Incentivize renewable-powered data centers and 5G or edge computing solutions in rural areas to bridge the digital divide.
- **Digital Literacy and Human Capital:** Invest in context-specific digital training for both farmers and local tech intermediaries. Human-centered design is critical for adoption.
- **Public-Private Governance:** Build PPPs that ensure AI solutions reflect local priorities, avoid vendor lock-in (where dependence on a specific company's technology makes it difficult or costly to switch providers), and balance commercial viability with public interest.
- **Environmental Sustainability:** Evaluate and manage the environmental footprint of AI compute and promote AI models that support regenerative agriculture.

## Limitations of AI in Agriculture:

- a. **One size doesn't fit all:** AI offers transformative potential, but it is not a universal solution. Not every problem in agriculture requires AI, and not all AI investments will deliver equitable returns. Strategic deployment requires clear-eyed cost-benefit analysis, identifying where AI adds distinctive value—such as in processing unstructured data at scale, enabling predictive insights, or personalizing services in low-connectivity environments.
- b. **Simpler tools are better:** In many contexts, simpler digital tools, better data governance, or improved institutions may yield more immediate and sustainable impact.
- c. **AI and risk management:** Equally important is the need to manage risks. AI systems, if poorly designed or unaccountably deployed, can reinforce inequalities, replicate biases, undermine privacy, and impose environmental burdens.

## Recommendations

### For Policymakers:

- Adopt National AI Strategies inclusive of agriculture, with clear implementation pathways and budgets.
- Embed AI in AgriFood System Policy by linking it to resilience, climate adaptation, and nutrition security goals.
- Foster Open and Interoperable Data Ecosystems by supporting Agricultural Data Exchange Nodes

(ADENs) and FAIR data principles.

### For International Development Institutions:

- Integrate DPI and AI Investments in agriculture projects, ensuring that identity, payments, and data infrastructures are AI-ready.
- Support AI Readiness Assessments and policy diagnostics for LMIC governments, especially in fragile or climate-vulnerable regions.
- Channel Research Funding to co-develop LMIC-relevant AI models with local institutions, focusing on crops, languages, and supply chains underrepresented in global models.

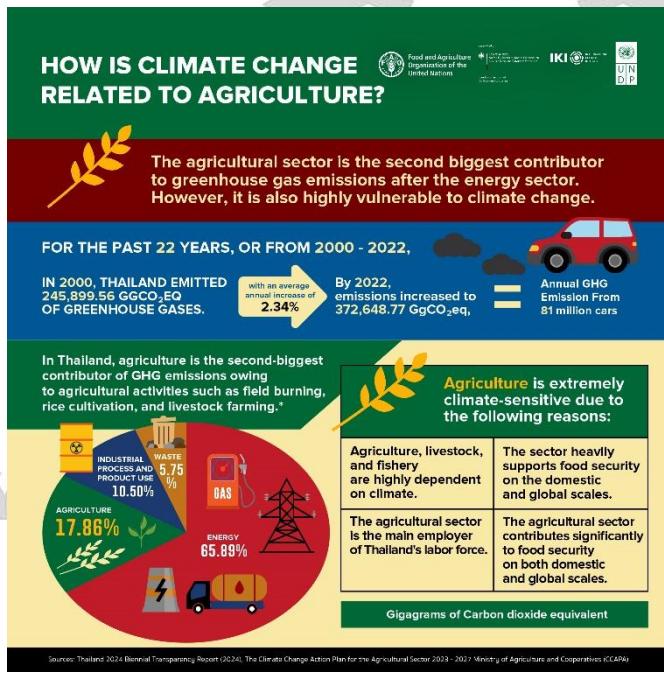
### For Operational Teams:

- Pilot AI Solutions in Anchor Use Cases such as pest diagnosis, micro insurance underwriting, and advisory services, with embedded monitoring and learning frameworks.
- Prioritize Interoperability and Modularity in tech choices to avoid future fragmentation.
- Engage Farmers and Extension Workers Early to ensure solutions are user-centered and culturally grounded.

AI can be the engine of a new agricultural revolution - one that is digital, inclusive, and sustainable. But realizing this vision will require discernment: deploying AI where it offers true strategic value, and resisting hype where simpler, more appropriate solutions suffice.

With the right investments in infrastructure, governance, and capacity, and a commitment to inclusion and ethics, AI can help reshape agri-food systems for the better.

## 39. Horticultural Revolution- Changing India's landscape for farmers



**Context:** The Third Advance Estimates of the area and production of horticultural crops for the year 2024–25 was released.

### Third Estimates report:

- According to it, the area under horticultural crops is estimated to have increased by 0.4 million hectares, from 29.086 million hectares in the previous year to 29.488 million hectares. The total

production is estimated to have increased by 14.311 million tonnes — from 354.744 million tonnes in the previous year to 369.055 million tonnes.

- Fruit production is expected to grow by 5.12%, reaching 118.76 million tonnes, with banana, mango, watermelon, jackfruit, mandarin, papaya, and guava contributing significantly.
- Vegetable production is estimated to increase by 4.09% to 215.684 million tonnes. Onion production is projected to rise sharply by 26.88%, from 24.267 million tonnes to 30.789 million tonnes, while potato production is expected to grow to 58.108 million tonnes, an increase of 1.85%.
- The estimates also indicate that production of aromatic and medicinal plants may reach 0.781 million tonnes, up from 0.726 million tonnes last year.
- Total spice output is projected at 12.503 million tonnes, slightly higher than last year's 12.484 million tonnes, with increases reported in garlic, ginger, and turmeric. Tomato production is expected to touch 19.468 million tonnes.

## Horticulture in India:

- The horticultural revolution, often termed the Golden Revolution, has transformed India's agriculture by shifting focus from staple grains to high-value fruits, vegetables, flowers, and spices, boosting farmer incomes and rural employment.
- Horticulture offers higher returns per hectare than cereals, with one hectare of horticultural crops potentially increasing annual income by Rs 80,000 compared to staples, benefiting small and marginal farmers.
- It enhances nutritional security through diverse micronutrients and generates jobs via labor-intensive practices and secondary industries like processing. Production has surged, with advanced technologies like drip irrigation and hybrids driving yields over 10 times the average in some cases.
- The government is introducing new technologies for farmers, aimed at simultaneously enhancing agricultural productivity and farmers' income. Through the widespread dissemination of innovative technologies in horticulture, advancements in high-quality seed production, and improved market management, India is steadily moving toward becoming a global leader in agriculture.

## Government Initiatives:

- a. The National Horticulture Mission, launched post-2005, provides technical aid, infrastructure like cold storage, and subsidies for modern practices, fostering public-private partnerships.
- b. **Har Khet ko Pani**- PM Krishi Sinchayee Yojana subsidize micro-irrigation for over 1.2 million farmers. It reinforces, improving water use efficiency '**More crop per drop**' in a focused manner with end to end solution on source creation, distribution, management, field application and extension activities
- c. APEDA boosts exports by 20% in recent years. These efforts promote area expansion, high-density planting, and hybrid seeds for tomatoes, chilies, and more.

The Agricultural and Processed Food Products Export Development Authority (APEDA) is an apex body established under the Ministry of Commerce and Industry, Government of India, to promote the export of agricultural and processed food products. It plays a pivotal role in enhancing India's global trade presence by ensuring quality standards and fostering growth in export-oriented industries.

### Key Initiatives Under Mission for Integrated Development of Horticulture (MIDH)

- Under MIDH, a total of **58 Centres** of Excellence have been approved across various States in the country.
- MoA&FW has identified **55 Clusters** under Horticulture Cluster Development Programme (HCDP).
- The government is setting up **9 Centres** for Clean Plant Programme (CPP) and **4 Post-Entry Quarantine (PEQ)** facilities.
- In the past five years, a total of **55,748 Post-harvest management** facilities have been established under the MIDH scheme. These include cold storages, controlled atmosphere storages, pack houses, ripening chambers, refrigerated vehicles, processing units, preservation units, and food processing facilities.
- During the same period, **11,140 marketing infrastructures** have also been set up. These comprise static and mobile vending carts, retail outlets, rural and primary markets, Apni Mandis, direct markets, as well as wholesale and terminal markets.

As of July 2025

Source: Ministry of Agriculture and Farmers Welfare

The National Horticulture Board was established by the Government of India in 1984 as an autonomous organisation under the administrative control of the Ministry of Agriculture and Farmers Welfare.

The Board aims to develop production clusters or hubs for integrated high-tech commercial horticulture, create post-harvest and cold chain infrastructure, ensure the availability of quality planting material, and promote the adoption of advanced technologies for high-tech commercial horticulture.

#### Central Institute for Horticulture (CIH)

The Central Institute of Horticulture was established at Medziphema, Nagaland, in 2006-07 to provide technical support through capacity building and training for farmers and field functionaries in the North Eastern Region. It now functions as one of the sub-schemes under MIDH. However, the institute does not directly implement any schemes.

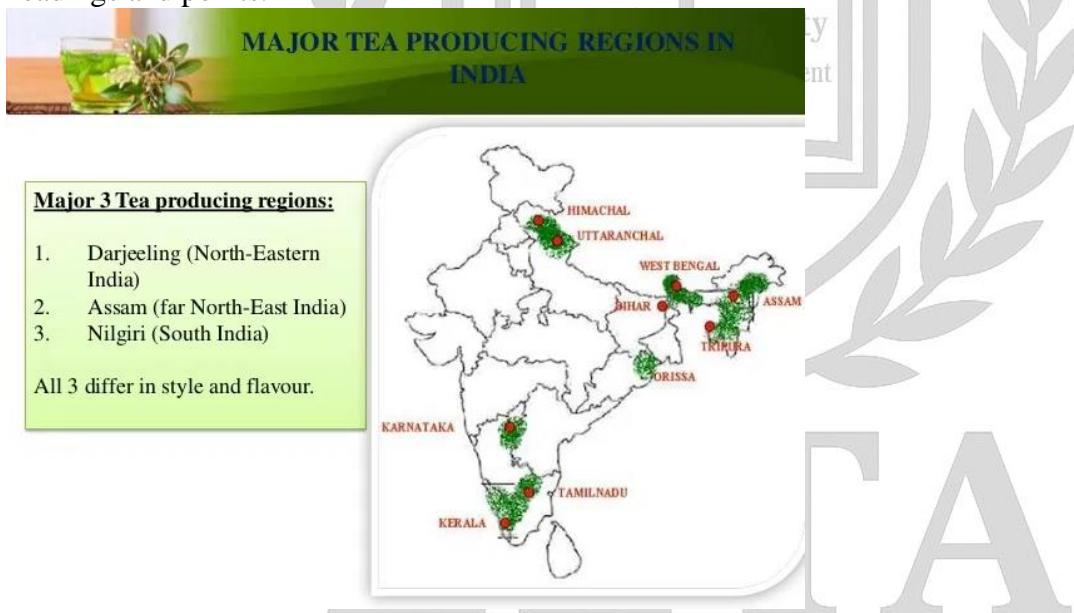
#### Research and Quality Improvement

**National Agricultural Research System (NARS)** including **ICAR** Institutes and **State/Central Agricultural Universities (CAU/SAU)** under the aegis of Indian Council of Agricultural Research (ICAR) provide improved horticultural varieties.

Horticulture plays a vital role in strengthening India's agricultural growth and ensuring nutritional security. The wide variety of crops, ranging from fruits and vegetables to spices, flowers and plantation crops, reflects the rich diversity of the sector. Continuous research, improved varieties and better post-harvest management are helping farmers increase productivity and incomes.

## 40. Climate change and stagnant prices- Threat to tea industry in India

In News: India's tea industry faces big threats from climate change, especially in Assam's tea areas. Heat, odd rains, and high humidity hurt tea plants and over 12 lakh workers' jobs. Here's a simple rewrite with headings and points.



### Climate Change Threats to Tea

- Rising Heat: Hot weather stresses tea bushes, causing black leaves, wilting, and poor nutrient uptake. Flush cycles (new leaf growth) become irregular.
- Erratic Rain: Dry spells cut soil moisture; heavy rains cause erosion and flooding, not good soaking.
- Shifting Areas: Prime spots like South Bank and Upper Assam may no longer suit tea. Cultivation moves to higher places like Karbi Anglong and Dima Hasao.
- Economic Issues: Tea prices rise slowly (4.8% yearly) vs. costs and inflation. Farmers can't afford new bushes or climate fixes.
- No Strong Policies: Tea growers get little government help for droughts or heat, unlike other crop farmers.

### Key Facts on India's Tea

What It Is: Tea comes from *Camellia sinensis* plant; world's #2 drink after water.

Growth Needs:

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- Temperature: 13-28°C, best at 23-25°C.
- Rainfall: 1,500-2,500 mm yearly, even spread for moist soil.
- Seasons: Clear ones for flush periods and flavor.
- Soil: Deep, crumbly, organic-rich.

Tea Board: Set up in 1953 under Commerce Ministry; helps with money, tech, and sales. Offices in Kolkata, London, Dubai, Moscow.



### Market Stats:

- India: #2 producer/consumer, #3 exporter (Kenya #1 export, China #2).
- Regions: 96% from Assam, West Bengal (Dooars, Terai, Darjeeling), Tamil Nadu, Kerala.
- Consumption: 80% stays in India; 840g per person yearly.
- Exports: To 25+ countries like Russia, UAE; mostly black tea.

### Ways to Build Resilience

- Farm Changes:
  - Use tough varieties with deep roots.
  - Better soil/water: Mulch, cover crops, drip irrigation, rainwater harvest.
  - Agroforestry: Shade trees and other plants cut heat and pests.
- Money & Market Fixes:
  - Sustainable labels for better sales.
  - Direct sales online to skip auctions and earn more.
- Policies & Training:
  - Equal govt aid like subsidies, disaster help.

- Fund research for climate-proof methods.
- Train small farmers on new tech.
- Learn from Kenya: Their KTDA uses field schools for planting, picking, and certification skills.

Assam's tea industry faces unprecedented threats from **climate change, pest attacks, and stagnant prices**, jeopardising livelihoods of over 12 lakh workers. Strengthening **resilient cultivation, sustainable practices, and policy support** is essential to safeguard tea production, global competitiveness, and the economic backbone of Assam, ensuring a sustainable future for India's \$10 billion tea economy.

## 41. Justice for food- food and climate change

**In News:** EAT-Lancet Commission on healthy, sustainable, and just food systems' report shows how food systems are at the centre of the overlapping climate, biodiversity, water, and pollution crises.

### Report Findings:

Food alone drives five of the six breached planetary boundaries and about 30% of greenhouse-gas emissions worldwide. Thus food systems are at the centre of climate change.

- Foods from animals account for most agricultural emissions whereas the grains dominate nitrogen, phosphorus, and water use. Only combined action, including cuts to food loss, enhanced and durable productivity gains, and dietary changes, can reverse these trends.
- Current agriculture leaves a global nitrogen surplus more than twice in excess of the safe limit. Efficiency gains left uncorrected by good policy can also spur more output that then erases environmental savings.
- India's current diet is heavy on cereals, but meeting 2050 benchmarks requires adding more vegetables, fruits, nuts, and legumes, which could increase average consumer prices.

### Justice in Food:

In regions relying on imported foods, prices are already unstable, making people vulnerable to sudden hikes. True justice, therefore means shifting to healthier, varied diets without letting costs spiral out of control.

### Can diet change alone guarantee climate justice?

Changing diets may not always be desirable: preferences are anchored in religion, caste, and convenience, and on necessity vis-à-vis midday meals and procurement commitments.

- The supply-side reform is also essential to overcome water stress, degraded soils, and fossil fuel dependence in cold chains and processing.
- India also needs to move away from implicit, open-ended incentives to extract groundwater.
- the Commission identifies market concentration, weak incentives for preventing labour and ecological harm, and undue corporate influence as factors that could stall change.

Justice on the other hand demands stronger collective bargaining by workers and small producers and consumer representation in regulatory processes. These safeguards are partial at best today and need to become guaranteed in practice.

### Greenhouse Gas Emissions Intensity in Food

Climate impact of food measures greenhouse gas emissions intensity in kg CO<sub>2</sub> equivalents (including all GHGs) per kg food, per gram protein, or per calorie.

Metric	Key Points
Measurement	kg CO <sub>2</sub> e per kg food, per g protein, or per 1000 kcal. Compares efficiency for weight, protein, or energy.
High-Impact Foods	Red meat, dairy, farmed shrimp: Highest emissions due to deforestation (grasslands/mangroves release stored CO <sub>2</sub> ), methane from cow/sheep digestion, nitrous oxide from waste/fertilizers.
Low-Impact Foods	Plant-based (fruits, vegetables, grains, beans, peas, nuts, lentils): Lower use of energy, land, water; reduced GHG intensity vs. animal foods.

### Comparison Factors

Factor	Animal-Based Foods	Plant-Based Foods
Land Use	Extensive grasslands from deforestation; mangroves for shrimp.	Less land required.
GHGs	Methane (digestion), N <sub>2</sub> O (waste/fertilizers), CO <sub>2</sub> (deforestation).	Generally lower across all.
Resources	High energy, water, land.	Lower energy, water, land.

## Economy

### 42. How is BRICS challenging the SWIFT?

**Context:** BRICS nations want to cut Western control over global money systems. They are creating BRICS Pay, a new way for cross-border payments that avoids depending on the US-led SWIFT network.

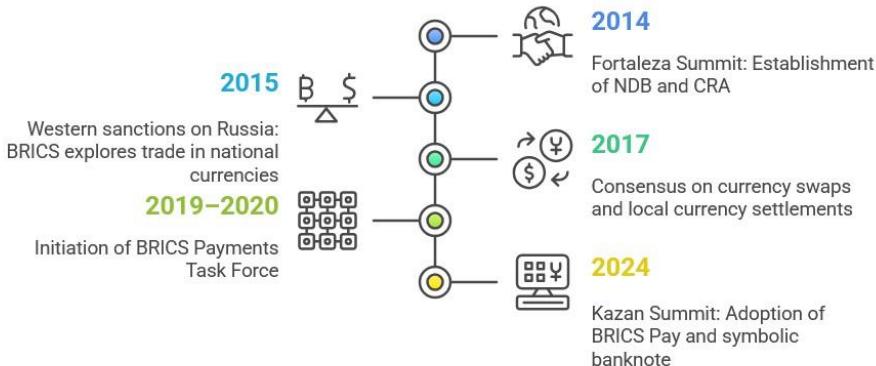
#### Background

- For over a decade, the BRICS have taken a series of steps showing their increasing determination to reduce dependence on the dollar-dominated international financial system.
- The Fortaleza Summit in 2014 marked the beginning of this process with the grouping taking the initiative of setting up financial institutions to meet not only their needs but also of other developing countries.
- The New Development Bank (NDB), BRICS's development bank, and the Contingent Reserve Arrangement (CRA- BRICS lender of last resort), marked the first time developing countries created their own major financial institutions. Before this, such bodies were only run by rich, advanced nations.
- In late 2014, after the imposition of Western sanctions on Russia for deployment of its troops in Crimea, the BRICS grouping decided to explore the potential of expanding the use of their national currencies in inter se transactions.

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- In 2017, the grouping agreed to communicate closely to enhance currency cooperation, including through currency swap, local currency settlement, and local currency direct investment.

## BRICS' Journey to Financial Independence



### BRICS Payments Task Force

The BRICS Payments Task Force (BPTF) is a collaborative initiative aimed at developing an independent, secure cross-border payment system ("BRICS Pay") to reduce reliance on the Western-dominated SWIFT network.

#### Why is BRICS challenging SWIFT?

- Wanting financial independence:** SWIFT relies heavily on the US dollar and is run by G10 rich countries, giving BRICS nations little say in how world money flows. A BRICS alternative would let members set their own rules for international payments.
- Avoiding US sanctions:** The US and allies have used SWIFT to block countries like Russia and Iran from global banking. This cuts off BRICS access to markets, so they want their own system to stay safe.
- Geopolitical reasons and diversification:** Tensions with the West, especially for Russia and China, make BRICS reduce risks from Western financial tools. They also plan to strengthen trade with developing nations in Africa, Latin America, and Asia using independent payment options. This builds a less Western-dependent financial network.

#### Challenges ahead of BRICS:

- National payment rivalries:** BRICS countries push their own systems—like China's CIPS and India's UPI—which clash over which one should dominate. China's bigger economy and CIPS's wide use (in over 120 countries) worry others that BRICS Pay might just become a China-controlled tool.
- Political tensions:** Rivalries, especially between India and China, slow things down. India prefers its UPI over CIPS, so these geopolitical fights must be sorted out for real teamwork.
- Technical mismatches:** The systems don't work together easily. Matching up tech like data formats, security, and payment settlements takes a lot of effort and money.
- No unified money policies:** A shared payment system needs agreement on exchange rates, money flows, and cash handling, but BRICS nations have different goals here.
- Outside threats:** The US might hit back with tariffs or other penalties, scaring some members from fully joining.

- f. **Lack of trust from others:** Non-BRICS countries hesitate due to West-related fears, payback risks, or not knowing the system. For global success, BRICS Pay must win over partners outside the group by proving it's safe and useful.

## Way forward

- a. **Clear step-by-step plan:** Create a gradual roadmap: begin with two-country deals using local currencies, then build a digital network, and grow it via partnerships in Africa, Latin America, and Central Asia.
- b. **Rewards for joining:** Give perks like lower fees and quicker transfers than SWIFT to attract countries and banks.
- c. **Better system matching:** Make national platforms (like China's CIPS, India's UPI, Brazil's Pix, Russia's SPFS) work seamlessly together for easy cross-border payments.
- d. **Fixing political issues:** Sort out rivalries, such as India-China tensions, and unite on shared goals for stronger cooperation.

BRICS challenges SWIFT to gain financial freedom, avoid sanctions, and build a fairer global money system. With tools like BRICS Pay and better links between their national payment systems, BRICS aims for a more equal financial setup.

## 43. Rupee is Asia's worst performing currency

**Context:** At a sharp depreciation of 4.3% against the U.S. Dollar (USD) in this calendar year (January–December 2025), the Indian Rupee (INR) has become the worst performing currency in Asia, forex analysts said.

Though the INR's performance has been weaker compared with peers like the Chinese Yuan and the Indonesian Rupiah, it is still faring better than structurally weak currencies like the Japanese Yen and Korean Won, which continue to battle domestic policy challenges.

- Commentators note that the rupee is among Asia's worst performers this year and that India's weak macro data (trade deficits, slower nominal GDP growth, soft FDI, foreign selling in equities) make currency weakness more likely.
- Some analysts warn that if the rupee settles above 90, it may trigger more speculative bets and further depreciation.

### Reasons:

- a. **Capital outflows:** INR has been facing depreciation pressure for many months, not so much because of the current account but because of capital outflows. Despite steady inflation and GDP growth, investors pulled out \$17 billion equities in 2025.
- b. **Uncertainty over India-USA deal:** uncertainty around the pending India-US trade deal and the broader trade-war environment is weighing on markets.
- c. **FII's selling:** FIIs' selling is the major reason for the sharp fall in the Indian Rupee. They have been selling in the Indian market since July 2025, when Trump's tariffs began to impact Indian businesses in the US market.
- d. **Central bank policy:** Big-ticket imports like smartphones, laptops, cars, and appliances become costlier, directly impacting household budgets.
- e.

## Policy interventions:

The RBI's relatively limited intervention so far appears deliberate. With India's growth strong and inflation contained, policymakers may be comfortable allowing some currency depreciation, especially in a global trade-war environment where a weaker currency can support export competitiveness.

## What's new?

- Unlike earlier episodes, this time the dollar is not particularly strong; the rupee is weakening even without a global dollar surge.
- India now has large foreign exchange reserves (about 690 billion dollars), giving the RBI room to be patient rather than firefight every move.
- The RBI's strategy has shifted from aggressively defending specific levels to allowing gradual depreciation based on fundamentals like inflation and trade trends.

## Impacts:

- Export and import:** A somewhat weaker rupee can help exports become more competitive, partly offsetting the impact of higher US tariffs. Micro meets macro: Imports = inflation: India imports 90% of its oil and also depends on overseas suppliers for electronics, fertilizers and edible oil. A weak rupee inflates these bills.
- Consumers:** For households, the impact is concrete: higher prices for fuel, cooking oil, LPG, and many imported everyday items. Lower- and middle-income families feel the squeeze most, as a larger share of their income goes towards essentials.
- Foreign education:** Students studying abroad face a sharp jump in costs: the same dollar tuition now requires significantly more rupees, adding several lakh rupees per year. Education loans taken when the rupee was stronger now feel heavier, because repayments in rupees increase as the currency weakens.
- Expensive travel:** Foreign travel becomes more expensive, with the same dollar budget translating into a much bigger rupee outlay.
- Impact on business:** Small businesses dependent on imported inputs or foreign travel for work face higher costs and pressure on profit margins. Exporters gain in theory from a weaker rupee, but the benefits vary by sector and are partly offset by other pressures. IT and business services firms that earn in dollars but pay costs in rupees can see better margins, although hedging often limits the upside. Pharma exporters earn from the exchange rate but face global price pressures and higher costs of imported raw materials.

Sectors like textiles and light manufacturing could gain, but higher US tariffs erode much of the advantage from currency depreciation.

- More incentive:** One clear positive is for families receiving remittances from abroad: each dollar sent home converts into more rupees. This extra rupee income can meaningfully support education, healthcare, savings, or property purchases for low- and middle-income households.

## Way ahead:

- Households are advised to avoid dollar loans if their income is in rupees, to prevent currency risk. For predictable foreign expenses like tuition, using tools such as hedging or staggered payments can reduce exchange rate shocks.

- b. Families receiving remittances can use higher rupee inflows to build savings through deposits or suitable debt funds, and investors can consider exposure to export-oriented sectors or global funds.

Overall, the rupee's slide past 90 signals a deliberate policy choice to prioritise long-term adjustment over short-term defense.

While this may support macroeconomic resilience and competitiveness over time, it is already reshaping daily life, monthly budgets, and long-term financial plans for India.

## 44. IMF gives India a 'C' on its GDP and other national accounts data, the second-lowest grade

**In News:** The International Monetary Fund's (IMF) annual review has given India's national accounts statistics, which includes key figures such as Gross Domestic Product (GDP) and Gross Value Added (GVA), a grade of 'C', the second-lowest grade there is.

HOME / BUSINESS / ECONOMY

### IMF gives India a 'C' on its GDP and other national accounts data, the second-lowest grade

The IMF noted that India's national accounts and inflation data do not adequately capture key aspects such as the informal sector and people's spending patterns.

Updated – November 27, 2025 07:48 pm IST



T.C.A. SHARAD RAGHAVAN



#### Why did IMF accord C-grade to India's GDP data?

##### a. Old base year (2011-12)

India still calculates major economic numbers like GDP, CPI (Consumer Price Index), and IIP (Index of Industrial Production) using the 2011-12 base year. Since then, how people spend money, what industries produce, technology use, and price levels have all changed a lot. This outdated starting point twists the true picture of economic growth, inflation rates, and the importance of different sectors.

##### b. Poor measurement of inflation

The CPI, which tracks everyday price changes, got a low rating ('B' instead of top 'A') from global reviewers. Reasons include the old base year and too much emphasis on food prices, which don't reflect modern spending habits well. This inaccuracy affects the RBI's decisions on interest rates and money supply, as they rely on CPI to fight inflation.

##### c. Missing the informal sector:

India's huge informal economy—think street vendors, small shops, and unregistered

workers—gets underestimated because it's mostly cash-based and not tracked in official records. This leads to wrong estimates of total GDP size, job trends, and how well people are doing economically, since informal work is a big part of daily life for millions.

- d. **Slow updates to data:** World standards say countries should update the base year every 5 years to match real changes. India hasn't done this for over 10 years, so its data lags behind the actual economy and misses important shifts in time.
- e. **Not using new data tools fully:** While company data is now collected easily through MCA-21 (Ministry of Corporate Affairs portal), big gaps remain in other areas. For example, GSTN (Goods and Services Tax Network) data, which could help calculate business value added more accurately, is not yet fully linked into GDP estimates. Modern sources like digital payments and apps could fill these holes but aren't integrated well.

## Implications of IMF's grade:

- a. **Weaker policy decisions:** Flawed or old data messes up government planning for budgets, fighting inflation, setting interest rates, and targeting help to specific industries. Leaders end up making choices based on incomplete or wrong pictures of the economy.
- b. **Loss of trust in numbers:** Global investors, credit rating companies, and banks start doubting India's official stats. This makes it harder to attract foreign money and can raise borrowing costs for the country.
- c. **Wrong view of growth and well-being:** Underestimating informal jobs hides true economic progress, job struggles, and problems faced by everyday families. This leads to poor judgments on how fast the economy is growing and whether people are better off.
- d. **Problems for interest rate policy:** If inflation numbers are off, the RBI might set wrong interest rates that don't match real price rises. This can mess up money availability, loans for people and businesses, and overall economic speed.
- e. **Push for big changes:** The low IMF score ramps up calls for India to fix its systems—update old base years, use modern surveys and tech, and give stats agencies more independence from politics.

## IMF's grading:

The IMF grades countries' economic data using its Data Quality Assessment Framework (DQAF), a structured tool that checks how well national statistics match global best practices.

DQAF evaluates data across prerequisites (like agency independence) and five key quality dimensions: assurances of integrity (objectivity and ethics), methodological soundness (following international standards), accuracy and reliability (data sources and validation), serviceability (timeliness, consistency, revisions), and accessibility (ease of getting data and metadata).

## Grading scale

- Grade A: High compliance—data fully meets international standards with few issues.
- Grade B: Acceptable—meets basics but has clear weaknesses or gaps.
- Grade C: Significant problems—weaknesses seriously limit reliable economic analysis and surveillance.
- Grade D: Poor quality—data flaws make it hard to use for informed decisions

## 45. Poverty free Kerala

**In News: Kerala is set to become India's first state to eradicate extreme poverty by November 1, 2025**

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What the Data says:

The state government identified 64,006 families as being in "extreme poverty" based on criteria of food security, health, housing and income. By September 2025, the government reported that 53,699 families (≈84%) have exited extreme poverty.

By excluding factors such as deaths, migration, and duplication, the rehabilitated number of families is raised to 59,277 families (≈93%).

In the Thiruvananthapuram district, out of 6,250 families identified, 5,929 families are reported as freed from extreme poverty by late-September 2025 (≈94.9%). Also, Kottayam district was indicated as the state's first district to have no homes that are extremely poor in a June 2025 report.

This milestone showcases Kerala's consistent focus on inclusive growth and welfare-oriented governance, making it a model for other Indian states.

### Eradication Initiatives:

Kudambashree Network:

Athi Daridrya Nirmarjanam Project:

The project was launched in 2021 by the Government of Kerala with the goal of completely eradicating extreme poverty in the state by November 2025.

As part of the identification phase, 64,006 families (covering about 1,03,099 individuals) were recognised as living in extreme deprivation.

The identification used four core deprivation indicators:

- 1) Lack of adequate food,
- 2) Poor housing /landlessness,
- 3) Inadequate basic income or livelihood,
- 4) Poor health status / lack of access to healthcare.

### The initiative focused on:

- Identifying families in severe economic distress
- Integrating state and local resources for housing, health, and food
- Promoting long-term rehabilitation through employment and education

Through this approach, the state ensured that assistance reached those who needed it most while building a sustainable path out of poverty.

For each identified family, a micro-plan was prepared by local self-government institutions (LSGIs) and the women's network Kudumbashree.

### These plans included:

- Provision of missing documentation (Aadhaar, ration card, voter ID, UDID for differently-abled) and access to basic services like health insurance and social security pensions.
- Educational support for children in these families: study materials, financial aid, meals to ensure uninterrupted schooling. (While specific numbers in article form may vary, this support is part of the holistic plan.)
- Infrastructure/institutional support: housing construction, land allotment, house renovation, livelihood initiatives through Kudumbashree's Ujjeevanam scheme and other departmental programmes.

- A digital Management Information System (MIS) was used to track each family's progress, ensuring that the micro-plan actions were monitored.

## Why Kerala Leads in Social Development

Kerala's success stems from its people-centric governance and decentralised planning model. Strong panchayati raj institutions, active civil society participation, and consistent investments in education and healthcare have built a solid foundation for human development.

Its efficient Public Distribution System (PDS), universal access to healthcare, and emphasis on gender equality have reduced the gap between rural and urban poverty levels.

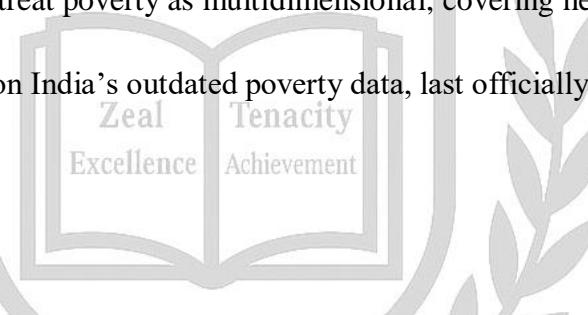
## National and Policy Significance

Kerala's achievement carries national-level implications:

- Serves as a benchmark for other states to design targeted anti-poverty programmes.
- Strengthens India's performance toward Sustainable Development Goal (SDG) 1 – No Poverty.
- Encourages policymakers to treat poverty as multidimensional, covering health, dignity, and opportunity, not just income.
- This also revives the debate on India's outdated poverty data, last officially released in 2011.

## Understanding Extreme Poverty

POVERTY
 <p>People who earn less than \$4.20 per day but more than \$3 per day.</p> <p>→ They are poor but can meet some basic needs.</p>
EXTREME POVERTY
 <p>People who earn less than \$3 per day (World Bank, 2025)</p> <p>→ They struggle to meet even basic needs like food, shelter, health, and education</p>
In short:
<p>→ Poverty = lack of comfort and opportunities</p> <p>→ Extreme poverty = lack of basic survival needs</p>



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India does not have a recent official definition of extreme poverty, but it broadly includes families lacking basic needs like income, shelter, and healthcare. These households are often excluded from welfare programmes due to lack of documents or isolation.

Kerala's identification process involved panchayat-level data, local body surveys, and NGO partnerships, ensuring accurate targeting of the most vulnerable families.

India has made major progress in fighting extreme poverty, though challenges remain for jobs and well-being. Here is a clearer breakdown of India's position globally.

### Global poverty picture

About 838 million people worldwide lived in extreme poverty in 2022, measured at less than 3 dollars per day. India has done better than many nations in reducing this burden.

### India's poverty decline

Extreme poverty in India dropped sharply from 16.2% in 2011-12 to just 2.3% in 2022-23. This means roughly 171 million Indians escaped extreme poverty in about a decade. The main drivers were more jobs and people moving to cities for work and opportunity.

## Recent employment gains

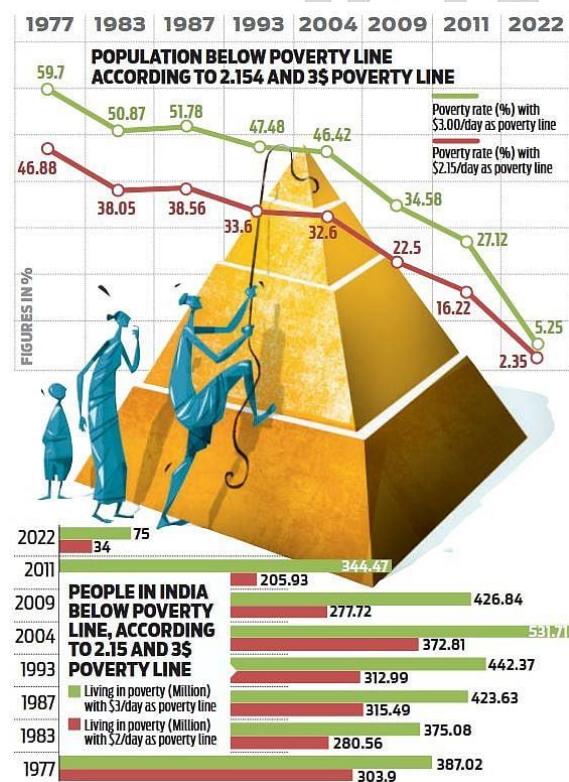
Urban joblessness fell to 6.6% in the first quarter of 2024-25, the lowest level since 2017-18. This shows the economy is creating more chances for urban workers.

## Stubborn job problems

Despite progress, young people face steep challenges: unemployment among all youth sits at 13.3%, but jumps to 29% for those with a degree. Many jobs also remain informal—77% of non-farm work and most farm jobs lack formal contracts, benefits, or security.

## Gender gap in work

Female employment lags far behind: only 31% of working-age women have jobs, compared to much higher rates for men. This shows women still face barriers to earning and independence.



Critics point out that official poverty counts may hide deeper struggles. People might earn slightly more than the poverty line but still lack access to healthcare, education, clean water, or stable housing—what experts call "multidimensional deprivation."

## Way forward for India:

India needs a stronger approach to keep people out of poverty and track their progress. Here is a clearer breakdown of key steps forward.

- Better micro-level planning:** Link local data systems to bigger state and national frameworks like NITI Aayog's Multidimensional Poverty Index (MPI). This means collecting detailed neighborhood-level information and using it to guide help more precisely where it's needed.
- Include tribes and marginal groups:** Create special plans focused on tribal and marginalized communities to ensure they get fair representation, secure land rights, and equal access to opportunities. Too often, these groups are overlooked in general programs.
- Secure livelihoods:** Move beyond just giving cash—build real job security through job creation, training for new skills, and easy access to small business loans. This prevents people from sliding back into poverty when temporary aid ends.
- Monitor and measure results:** Track rehabilitated families regularly to see if they stay out of poverty and improve their lives. Use this feedback to fix programs that aren't working.
- Learn from success stories:** Kerala has shown that combining local decision-making, smart data-driven targeting, and community involvement works well. Other states should study and adapt Kerala's model to fit their own contexts and needs.

Kerala's Extreme Poverty Eradication Programme (EPEP) is a major step forward in India's battle against poverty, proving that local control, focus on people's needs, and community involvement actually work to change lives. Though critics point out some gaps and political disputes, the model shows other states how to fight poverty in a lasting and fair way. By combining government support with respect for people's dignity and power to shape their own futures, Kerala has again shown itself as a leader in social progress.

## 46. Digital initiatives to modernise PDS (public Distribution System)

**In News:** The Ministry of Consumer Affairs, Food & Public Distribution has launched a series of digital initiatives aimed at modernizing the Public Distribution System (PDS), improving supply chain efficiency, and enhancing transparency in food storage and logistics.

### Digital Initiatives:

India is using modern technology to upgrade the Public Distribution System (PDS) for food grain delivery. Here are the key digital initiatives.

- Bhandaran 360:** This new computer system for the Central Warehousing Corporation links to 35 other systems like customs, FCI, and NAFED. It allows safe logins, encrypted data, live dashboards, and smart forecasting to make operations smoother and faster.
- Smart EXIM Warehouse System:** Uses AI, IoT sensors, and FASTag technology to track shipping containers in real time and move cargo quicker. This reduces delays and losses.
- ANNA DARPA:** FCI's unified platform merges buying, storing, moving, selling, quality checks, and contract tracking into one system. This centralizes information and reduces gaps.
- ASHA (AI Solution):** An automated AI system that calls ration shoppers to ask about grain quality, shop problems, and entitlements. It collects feedback fast and helps fix issues and track performance.
- Modern Steel Silos:** A new storage hub in Malout, Punjab, with 1.5 lakh metric ton capacity uses steel instead of older methods. This cuts grain waste and spoilage from moisture and pests.

**The Public Distribution System (PDS) is India's food safety net managed by the Ministry of Consumer Affairs that gives poor families cheap grain and other items.**

### Who gets help?

Under the National Food Security Act, 2013, Priority Households can buy 5 kg of grain per person monthly at very low prices: Rs 3 per kg for rice, Rs 2 per kg for wheat, and Rs 1 per kg for coarse grains.

### Extra help for the poorest

The Antyodaya Anna Yojana targets the most vulnerable families, giving them 35 kg of grain per month. This ensures even the poorest have access to food at minimal cost.

Under PDS, wheat, rice, sugar, and kerosene are allocated to States/UTs, with some also distributing additional items like pulses, edible oils, iodized salt, and spices.

### Challenges in Public Distribution System:

- Leakage and diversion:** About 28% of food grains meant for PDS never reach the intended beneficiaries—roughly 20 million metric tons annually. This causes a loss of nearly Rs 69,108 crore per year. Grains are diverted to the open market for profit, stolen, or lost in transit. High leakage rates vary by state, with some north-eastern states like Arunachal Pradesh and Nagaland reporting especially bad losses.

- b. **Corruption:** Fair Price Shop operators often under-weigh grain, overcharge customers, or refuse service to eligible beneficiaries. Data is also manipulated to hide irregularities and hide black-market sales.
- c. **Targeting errors:** The system includes ineligible people and excludes eligible ones, especially migrants and those with faulty identity records. Using outdated census data and Aadhaar-based systems alone cannot fix this problem perfectly.
- d. **Storage and transport losses:** Poor warehouse capacity, bad roads, and weak coordination lead to grain rot and spoilage. About 4-5% of grains are lost during storage and transport. Remote areas often face delays and shortages.
- e. **Fiscal unsustainability:** The government spends over Rs 2 lakh crore on PDS annually, but for every Rs 3.65 spent, only Rs 1 actually benefits the poor—showing massive inefficiency and high operational costs.
- f. **Limited nutrition diversity:** MSP-driven procurement focuses only on rice and wheat, ignoring diverse crops. This creates mono-cropping in Punjab and Haryana, exhausts groundwater, and fails to address hidden hunger and nutritional gaps.
- g. **Digital exclusion:** In remote areas, poor internet connectivity makes PoS machines non-functional. Biometric systems fail for elderly people and manual workers with worn fingerprints, locking them out of rations.

#### Reforms needed:

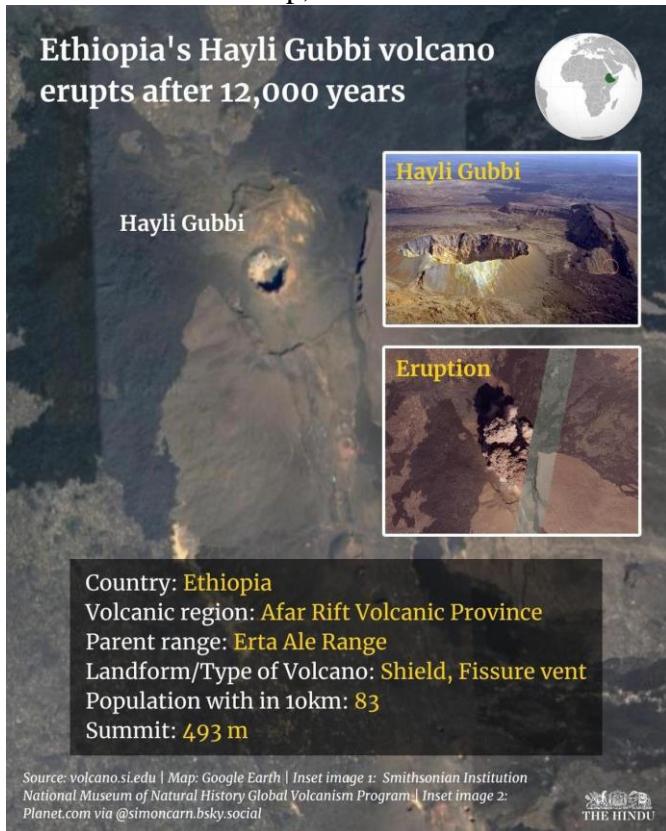
- a. **Digital systems:** Use block chain and AI to track grain, reduce theft, and increase transparency with real-time monitoring.
- b. **Better targeting:** Update beneficiary lists regularly and include options for elderly and manual workers who struggle with biometrics.
- c. **Cut leakage:** Deploy cameras, increase inspections, use GPS on trucks, and punish officials involved in grain diversion.
- d. **Diversify food:** Add pulses, oils, and millets beyond rice and wheat to improve nutrition and support crop diversity.
- e. **Improve storage:** Build modern silos and improve rural roads so grain reaches shops faster without spoiling.
- f. **Lower costs:** Streamline procurement, reduce intermediaries, and shift some spending from subsidies to nutrition programs.
- g. **Empower users:** Train shopkeepers better, let beneficiaries buy from any shop, and set up complaint systems with community oversight.
- h. **Local buying:** Let states buy locally grown food instead of only central procurement to cut costs and support farmers.

The recent digital reforms in PDS mark a significant shift towards a modern, data-driven system. Sustained focus on last-mile delivery and nutritional diversification is crucial for ensuring genuine food security.

## Geography

### 47. Hayli Gubbi Volcano

**In News:** The Hayli Gubbi volcano in Ethiopia has erupted explosively, sending high-altitude ash plumes thousands of metres up, some of which have drifted into Indian airspace, triggering aviation advisories.



**About Hayli Gubbi Volcano:**

- Hayli Gubbi is a shield volcano in Afar, Ethiopia, and a member of the Erta Ale Range.
- It's located at the edge of the East African Rift where the African and Arabian plates are slowly pulling apart.
- Geological studies have shown that Hayli Gubbi is built mainly from dark basaltic lavas but also contains more silica-rich rocks like trachytes and rhyolites.
- These lighter magmas can trap more dissolved gases, so when they rise, they're more likely to erupt explosively and throw ash high into the atmosphere.
- 

### Shield Volcano:

A shield volcano is a broad, gently sloping volcano that consists of many thin, fluid lava flows. Its eruptions are typically less explosive so the lava spreads out wide like a warrior's shield.

Why did it erupt now after at least 12,000 years of quiet?

As the tectonic plates move apart, hot mantle rock rises and partially melts, feeding magma into shallow chambers beneath the volcano. Over millennia, this magma can slowly build up and pressurise the rocks above it.

At some point, faulting or cracking of the crust will open a path to the surface, allowing the pressurised, gas-rich magma to rise quickly and the dissolved gases to expand into bubbles.

## Types of Volcanoes

SHIELD VOLCANOES	COMPOSITE VOLCANOES	LAVA DOMES	CINDER CONES
Large broad slopes, fluid lava flow	Steep and symmetrical, explosive eruptions	Small with steep sides, oozes viscous lava	Smallest, single vent, erupts cinders, ash, and rocks
			
			
Mauna Loa, Hawaii	Mayon, Philippines	Showa Shinjan, Japan	Sunset Crater, Arizona

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## 48. Mount Semeru



**In News:** Mount Semeru, Indonesia's tallest and most active volcano on Java Island, erupted violently, spewing ash up to 13 km into the sky and triggering dangerous.

### About Semeru

Mount Semeru is an active stratovolcano and the third-tallest volcano in Indonesia, known for continuous low-level eruptions since 1967.

**Located in:** Eastern Java, Indonesia—at the southern end of the Tengger Volcanic Complex in a major subduction zone where the Indo-Australian Plate sinks beneath the Eurasian Plate.

Indonesia sits on the Pacific Ring of Fire, where the meeting of continental plates causes high volcanic and seismic activity.

### Key points about Pacific Ring of Fire

It also known as the Circum-Pacific Belt is a path along the Pacific Ocean characterized by active volcanoes and frequent earthquakes.

Its length is approximately 40,000 kilometres.

It traces boundaries between several tectonic plates—including the Pacific, Juan de Fuca, Cocos, Indian-Australian, Nazca, North American, and Philippine Plates.

## 49. National Geospatial Platform

**In News:** The Survey of India is developing a National Geospatial Platform. This will further the vision of the National Geospatial Policy, 2022.

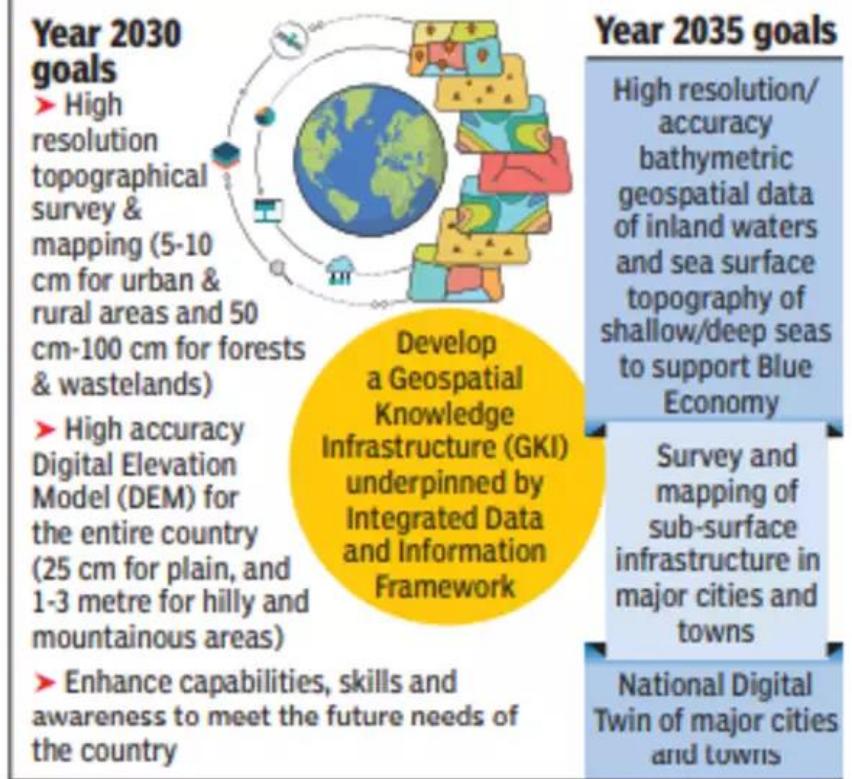
### About the National Geo-Spatial Platform (NGP)

- Objective: To serve as a robust and scalable system for standardizing, sharing, and managing foundational geospatial datasets, and
- It will facilitate seamless access to accurate and authoritative spatial data through web services, APIs, and mobile applications.

### Geospatial Policy 2022

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## NATIONAL POLICY 2022 NOTIFIED



### National Geospatial Policy, 2022

- It outlines a strategic roadmap for the development of geospatial infrastructure, services, and platforms at both national and sub-national levels.
- It provided for constituting Geospatial Data Promotion and Development Committee (GDPDC) at the national level.
- Operation Dronagiri has been launched under it
- Operation Dronagiri is a pilot initiative aiming to demonstrate the real-world applications of geospatial technologies.

Other key Initiatives taken to promote Geospatial sector: National Geospatial Mission, National Geospatial Data Repository, etc.

### What is Geospatial data?

- Geospatial data, or geodata, is data that includes information related to locations on the Earth's surface. You can map objects, events, and other real-world phenomena to a specific geographical area identified by latitude and longitude coordinates.
- Geospatial data combines location information with characteristics or attributes of other business datasets over a given period.
- For example, geospatial data can represent where a car is parked and also track its location when it starts moving.

### Applications:

Urban planning, disaster response (satellite data after hurricanes), traffic management, tracking vehicles, environmental monitoring, and location-based services.

### 50. Gold coins from Vijayanagara era unearthed

In News: Over 100 gold coins dating back to the Vijayanagara era have been discovered during restoration work at a Later Chola-era Shiva temple in Kovilur hamlet atop the in Tiruvannamalai district, Tamil Nadu.



A total of 103 punch-marked gold coins of varying sizes and shapes were discovered during excavation near the sanctum sanctorum of the Kovilur Shiva temple atop the Jawadhu Hills.

#### Discovery:

Officials from the Tamil Nadu State Archaeology Department and Revenue Department protected the discovery site and moved the coins to the district treasury, following the Indian Treasure Trove Act of 1878.

#### Coin Characteristics

These coins feature the boar emblem, emblematic of Vijayanagara royal power, and are thought to represent devotional offerings struck under kings like Harihara II or Krishnadevaraya from the 14th to 16th centuries CE.

#### Estimated Details

- Experts assess the coins as roughly 5 mm in diameter, crafted from pure gold, and likely produced as temple endowments or charitable donations.
- Purpose of Deposition: According to archaeologists, coins were deposited under temple sanctums for two main reasons:
- Religious Offering: Gold coins were buried beneath sanctums as offerings to deities to invoke prosperity and divine protection for the region.

**Economic Usage:** Metal coins (especially copper and silver) were also used for economic transactions due to durability and resistance to melting.

#### Vijayanagara Empire:

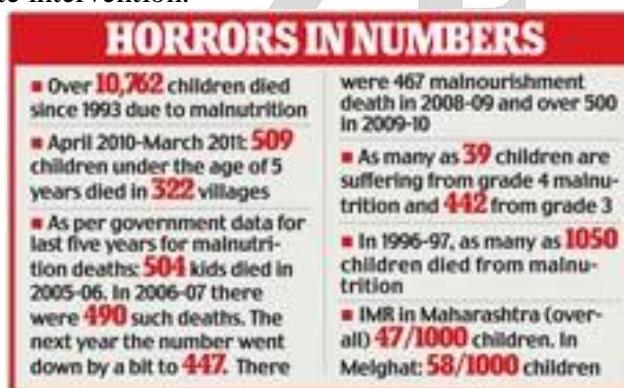
The Vijayanagara Empire (1336-1646 CE) was a powerful Hindu kingdom in South India, founded by Harihara and Bukka Raya I to counter Islamic expansion in the Deccan, with its capital at Vijayanagara (modern-day Hampi).

Aspect	Details
Founding & Purpose	Established by the Sangama brothers to defend South India against northern Islamic sultanates, symbolizing Hindu resistance and cultural revival.
Capital	Vijayanagara, now Hampi (UNESCO World Heritage Site in Karnataka), famed for its stunning ruins.
Golden Age	Krishna Deva Raya's reign (early 16th century) marked peak prosperity, cultural growth, and architectural brilliance with iconic temples.
Administration	Robust system featuring the Nayakar system (land grants to officials for military upkeep) and autonomous village governance.
Economy	Thrived on agriculture (rice, sugarcane) and trade; imported horses and silks, exported spices, textiles, and minerals via bustling ports.
Decline	Internal instability and external pressures culminated in defeat by Deccan Sultanates in 1565, leading to gradual fade.

## 51. Infant deaths in tribal dominated Melghat- Tribal issues

**In News:** The Bombay High Court sharply criticised the Maharashtra and Union governments for their extremely casual handling of the alarming rise in malnutrition-related infant deaths in Melghat, a tribal-dominated region in Amravati district.

65 infants (0–6 months) had died due to malnutrition between June 2025 and now, and over 220 children were currently classified as Severe Acute Malnutrition (SAM) — with half at risk of dying without immediate intervention.



**Melghat faces a long-standing malnutrition crisis affecting its Korku tribal communities.**

## **Key Issues**

- Chronic infant and maternal deaths over 30+ years from malnutrition and limited healthcare.
- Persistent challenges despite government programs:
  - Food insecurity.
  - High infection rates.
  - Poor healthcare access.
  - Severe anaemia.

Melghat comprises Dharni and Chikhaldara talukas with 324 villages. Infant deaths remain worryingly high.

Officials argue deaths stem not only from malnutrition but also:

- Anaemia
- Sickle cell disease
- Pneumonia
- Delayed treatment due to poor connectivity.

However, deaths due to malnutrition remains high.

## **Challenges faced by Melghat:**

Melghat grapples with critical infrastructure gaps that hinder timely medical interventions.

## **Major Deficits**

- Poor road conditions impede rapid access to hospitals during emergencies.
- Unreliable electricity disrupts households and healthcare facilities alike.
- Scarce fully operational Primary Health Centres (PHCs) force reliance on far-off hospitals.
- These shortcomings directly fuel preventable infant and maternal mortality.

## **Poor governance**

- Irregular supply of nutrition supplements
- Weak monitoring of malnutrition cases
- Poor coordination in implementing policies

**Lack of medical staff:** High absenteeism among doctors despite improved salaries and incentives, difficult working conditions deter medical staff.

**Preference for traditional methods:** A large section of the tribal community still depends on bhoomkas (traditional healers). Methods like damma (burning skin with hot iron tongs) delay scientific treatment and worsen conditions, particularly in sick infants.

## **Intergenerational cycle:**

- Many tribal women enter pregnancy underweight and anaemic
- They give birth to low-birth-weight babies with weak immunity
- Limited healthcare access means infections go untreated, raising mortality risks
- This perpetuates a cycle of malnutrition across generations

## **Way ahead:**

- a. **Strengthen Healthcare:** Build robust maternal-child systems, treat infections/anaemia promptly, and upgrade infrastructure.

- b. **Empower ASHA Workers:** Train for early malnutrition detection, referrals, and follow-ups.
- c. **Integrate Interventions:** Link nutrition with illness treatment via unified health-nutrition programs.
- d. **Promote Behaviour Change:** Engage communities on maternal health, child feeding, hygiene, and trust-building.
- e. **Ensure Convergence:** Coordinate across Health, WCD, Rural Dev, Tribal Welfare, Social Welfare, PWD departments.
- f. **Fix Doctor Issues:** Rigorous recruitment, full tenures, better conditions, and monitoring.

Melghat's malnutrition crisis stems from intertwined issues like poor infrastructure, healthcare shortages, cultural practices, and administrative lapses, beyond just food scarcity.

Systemic, multi-sector reforms are essential—bolstering healthcare, empowering frontline workers, integrating programs, engaging communities, and enforcing staffing accountability—to end persistent infant deaths.

## 52. Tribal Wisdom for a modern world

**Context:** November 15 is celebrated as Janjatiya Gaurav Divas (Tribal Pride Day) to commemorate the birth anniversary of tribal freedom fighter Birsa Munda.

- The Ministry of Tribal Affairs is establishing 11 museums to commemorate various tribal movements and uprisings against the British rule and promote their cultures and histories.
- The Ministry of Tribal Affairs promotes tribal art, language, and traditions through other digital initiatives such as Adi Sanskriti and Adi Vaani.

### Tribal wisdom in Modern world: lessons on sustainability

- a. **Enough is enough:** the Bishnois live by 29 commandments that guide them to use only what they need, even firewood and water.
- b. **Seasonal eating:** The Kurumba and Kadar tribes of South India eat what grows naturally each season, wild roots, greens, mushrooms and honey.
- c. **Water wisdom:** The Rabaris of Gujarat practice traditional rainwater harvesting techniques suited to arid regions.
- d. **Nature connection:** Gondas and Bairags (Madhya Pradesh) worship forests, rivers and wild animals as sacred.
- e. **Community value:** Khasis (Meghalaya) have strong traditions of community resource sharing and collective decision-making.
- f. **Zero waste living:** Santhal communities recycle almost everything by composting organic waste and using plant or animal by-products.
- g. **Gratitude as habit:** Todas (Tamil Nadu) express gratitude before milking or grazing, while Gonds offer daily prayers and small rituals to forest in thanks.
- h. **Rhythm of Life:** Banjaras migration aligns with summer/winter cycles, agricultural schedules and lunar events.
- i. **Balance over speed:** Apatani (Arunachal Pradesh) use a slow, careful farming method growing rice and fish together in terraced fields.
- j. **Harmony with wildlife:** Soliga (Karnataka) coexist with tigers and elephants in the BRT forest, peacefully sharing the land with wildfire.

## Tribal Preservation Projects

Initiative	Description or Objective	Key Features or Outputs
Adi Sanskriti Project	Digital learning platform for tribal artforms.	~100 immersive courses; ~5,000 curated documents on tribal socio-cultural heritage.
Adi Vaani	AI-powered tool to preserve/promote tribal languages.	Real-time text/speech translation (Hindi/English to Mundari, Bhili, Gondi, Santhali, Garo, Kui); digitizes folklore/oral traditions.
Tribal Digital Document Repository	Digital archive of tribal research/resources.	Zeal Excellence Tenacity Achievement
Varnamala and Oral Literature Initiative	Preservation of tribal linguistic/oral heritage.	Publishes rhymes/stories; documents oral literature, folklore, folktales.
Research and Documentation of Indigenous Knowledge	Promotion/protection of tribal knowledge systems.	Studies on healing, plants, languages, agriculture, dance, paintings; supports festivals, translations, publications.
Aadi Mahotsav	National festival of tribal culture.	Showcases crafts, cuisine, commerce, art; platform for tribal talent/entrepreneurship.
Tribal Craft Mela & Cultural Events	Events promoting tribal arts.	Craft melas, dance festivals, art competitions, workshops; state-level fairs with funding

## Other News

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### 53. Jal Sanchay Jan Bhagidari Awards 2025

**In News:** The Jal Shakti Ministry announced the 1st Jal Sanchay Jan Bhagidari (JSJB) Awards under the JSJB initiative, with Telangana topping the list for 5.2 lakh water conservation structures.

Jal Sanchay Jan Bhagidari (JSJB), launched in September 2024 in Surat, is a community-driven program under Jal Shakti Abhiyan: Catch the Rain (JSA: CTR), integrating whole-of-government and society approaches.

#### Key Aspects

- Promotes rooftop rainwater harvesting and reviving traditional water bodies like lakes, ponds, stepwells.

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- Encourages artificial recharge/storage structures via 3Cs mantra: Community, CSR, Cost for long-term water security.
- States divided into five zones: Northern, Eastern, Southern, Western, North-Eastern/Hilly.
- Nodal: Ministry of Jal Shakti; partners with Housing & Urban Affairs for urban efforts.
- Targets: 10,000 structures/district (general), 3,000 (hilly/NE), 10,000 (municipal corps).
- Achievement: 27.6 lakh structures vs. 10 lakh target, showing strong participation.

President Droupadi Murmu conferred the 6th National Water Awards on November 18, 2025, recognizing 46 winners (including joint winners) across 10 categories for water conservation efforts.

### Best State

Rank	Winner	State
1st	Maharashtra	Maharashtra
2nd	Gujarat	Gujarat
3rd	Haryana	Haryana

### Best District

Zone	Winner	State	Rank
East	Rajnandgaon	Chhattisgarh	1st
West	Khargone	Madhya Pradesh	1st
North	Mirzapur	Uttar Pradesh	1st
South	Tirunelveli	Tamil Nadu	1st
North East	Sepahijala	Tripura	1st

### Best Urban Local Body

Rank	Winner	State
1st	Navi Mumbai	Maharashtra
2nd	Bhavnagar	Gujarat
3rd (Joint)	Nabadiganta Industrial Township	West Bengal

Rank	Winner	State
3rd (Joint)	Agra	Uttar Pradesh

### Best Institution (Other than School/College)

#### Inside-Campus

Rank	Winner	State
1st (Joint)	Indian Institute of Technology, Gandhinagar	Gujarat
1st (Joint)	ICAR – Central Coastal Agricultural Research Institute, Goa	Goa
2nd (Joint)	Birla Institute of Technology & Science, Pilani	Rajasthan
2nd (Joint)	Islamic University of Science & Technology, Awantipora	Jammu & Kashmir
Special Mention	Assam Rifles, Manipur	Manipur

#### Outside-Campus

Rank	Winner	State
1st (Joint)	Chaudhary Charan Singh Haryana Agricultural University, Hisar	Haryana
1st (Joint)	Regional Chief Conservator of Forests, Berhampur Circle	Odisha

### Best Water User Association

Rank	Winner	State
1st	Vettaikaranpudur Canal Odayakulam Village WUA, Coimbatore	Tamil Nadu
2nd	Kanifnath WUA, Nashik	Maharashtra
3rd	Kharlan WUA, Sri Ganganagar	Rajasthan

### Best Civil Society

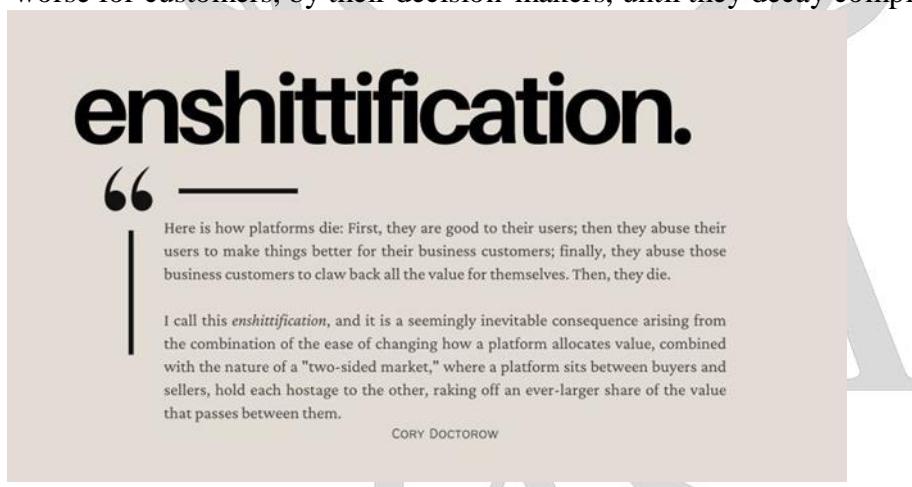
Rank	Winner	State
1st	Banaskantha District Co-operative milk producers union limited, Banaskantha	Gujarat
2nd	Ambuja Foundation, Jaipur	Rajasthan
3rd	Art of Living, Bengaluru	Karnataka

### Best Village Panchayat

Rank	Winner	State
1st (Joint)	Dubbiganipalli, Annamayya	Andhra Pradesh
1st (Joint)	Payam, Kannur	Kerala
2nd (Joint)	Kaweshwar, Khandwa	Madhya Pradesh
2nd (Joint)	Murugummi, Prakasam	Andhra Pradesh
3rd (Joint)	Balapuram, Tiruvallur	Tamil Nadu
3rd (Joint)	Dumarpani, Kanker	Chhattisgarh

## 54. ENSHITTIFICATION

Enshittification is a way of naming the process through which internet platforms are being made deliberately worse for customers, by their decision-makers, until they decay completely.



- In 2022, Cory Doctorow—a writer from Canada who covers tech and fights for user rights—created the word "enshittification."



- It describes how online platforms slowly get worse on purpose. Company bosses make changes that hurt users until the sites or apps fall apart completely.

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- The term also covers everyday annoyances for internet users, like ads popping up everywhere, companies pushing their own stuff first, skewed search results, free features turning into paid ones, and real products swapped for cheap knockoffs.



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