Monthly

Current Affairs

October 2025

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October 2025

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OCTOBER FOCUS

1.1 NOBEL PRIZE 2025

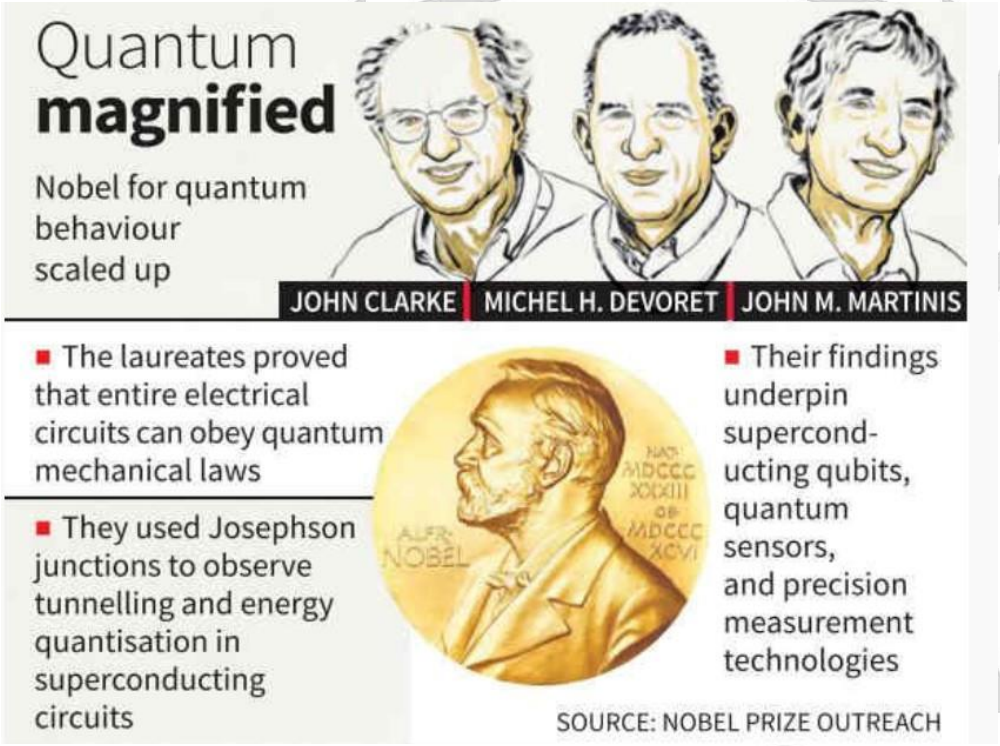
Category	Laureates	Reason / Area of Work
➢ Physiology or Medicine	➢ Mary E. Brunkow; Fred Ramsdell; Shimon Sakaguchi	➢ For discoveries concerning peripheral immune tolerance.
➢ Physics	➢ John Clarke; Michel H. Devoret; John M. Martinis	➢ For the discovery of macroscopic quantum mechanical tunnelling and energy quantisation in an electric circuit.
➢ Chemistry	➢ Susumu Kitagawa; Richard Robson; Omar M. Yaghi	➢ For the development of metal–organic frameworks (MOFs).
➢ Literature	➢ László Krasznahorkai	➢ For his visionary works exploring apocalyptic themes and the power of art.
➢ Peace	➢ María Corina Machado	➢ For her tireless work promoting democratic rights for the people of Venezuela and for her struggle to achieve a just and peaceful transition from dictatorship to democracy.
➢ Economic Sciences	➢ Joel Mokyr; Philippe Aghion; Peter Howitt	➢ For their contributions in explaining innovation-driven economic growth.

1.2 2025 PHYSICS NOBEL PRIZE: THE MAGIC OF QUANTUM PERVADES ALL SCALES

John Clarke (University of California, Berkeley), Michel H. Devoret (Yale University and University of California, Santa Barbara), and John M. Martinis (University of California, Santa Barbara) won the 2025 Nobel Prize in Physics.

They won the prize for showing that quantum effects usually seen only in tiny particles can also happen in larger systems. Their work proved that quantum theory works for both small and big things.

Significance of their work: Their work has helped create superconducting circuits that could power practical quantum computers and sensors, marking a big step forward in quantum technology.



1.3 NOBEL PRIZE IN CHEMISTRY

The Nobel Prize in Chemistry 2025 is awarded to Susumu Kitagawa (Japan), Richard Robson (Australia), and Omar Yaghi (US) for their ground-breaking work in creating Metal-Organic Frameworks (MOFs).

Metal–Organic Frameworks (MOFs): are special materials made by combining metal atoms with organic (carbon-based) molecules. Together, they form solid structures full of tiny, evenly spaced holes, like a sponge at the microscopic level. These holes can hold, separate, or filter gases and other small molecules, making MOFs useful for things like storing clean energy, capturing carbon, or purifying air and water.

1.4 Nobel Prize in Physiology or Medicine

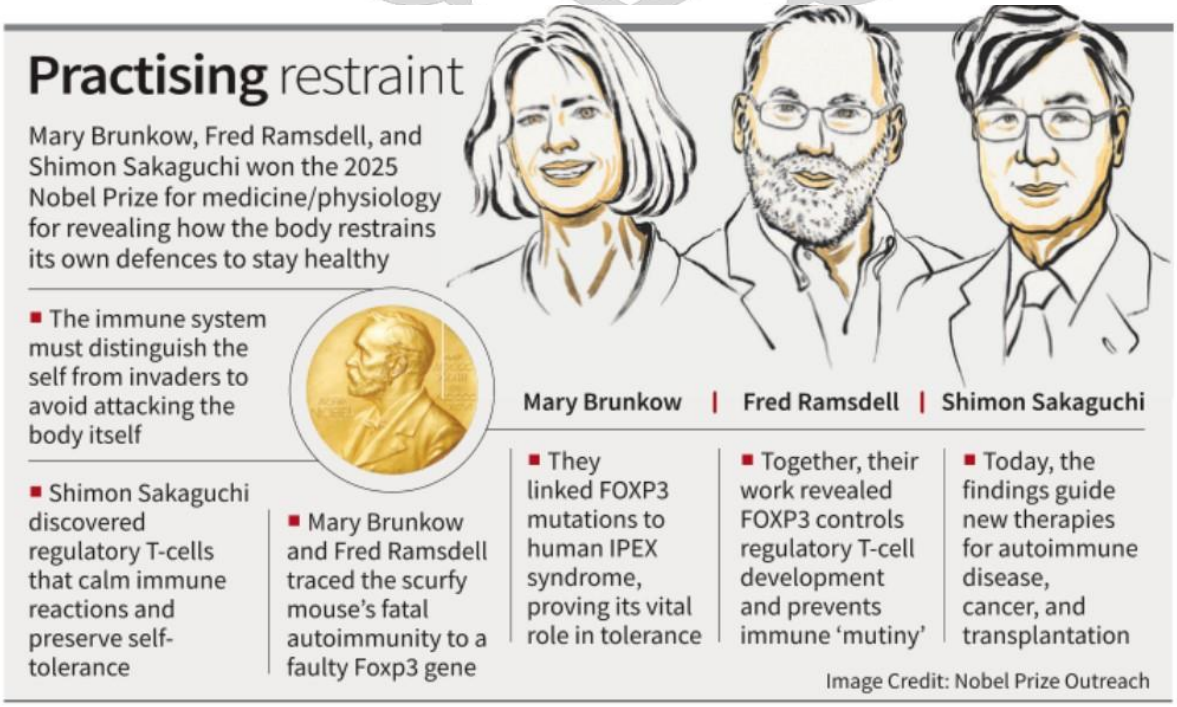
2025 Nobel Prize in Physiology or Medicine is given to Mary E. Brunkow (US), Fred Ramsdell (US), and Shimon Sakaguchi (Japan).

FOXP3 gene: They were recognized for their discoveries on peripheral immune tolerance, particularly regarding regulatory T cells (Tregs) and the FOXP3 (Forkhead Box Protein P3) gene.

Immune system:

The immune system defends the body against harmful invaders such as viruses, bacteria, and abnormal cells. It has two main parts: **innate immunity** and **adaptive immunity**. The **innate immune system** provides a quick, general defense using barriers like the skin, immune cells (macrophages, neutrophils), and inflammation to destroy pathogens. The **adaptive immune system** offers a slower but highly specific response and "remembers" pathogens for faster protection in the future. **T-cells** attack infected cells, while **B-cells** produce antibodies that neutralize specific invaders.

The immune system must also avoid attacking the body's own tissues, a process called **immune tolerance**. This occurs through **central tolerance** (removing self-reactive cells in the thymus and bone marrow) and **peripheral tolerance** (controlling any that remain). **Regulatory T cells (Tregs)** play a key role by suppressing unnecessary immune responses and maintaining balance, preventing autoimmune diseases such as type 1 diabetes and rheumatoid arthritis.



1.5 Nobel Peace Prize 2025

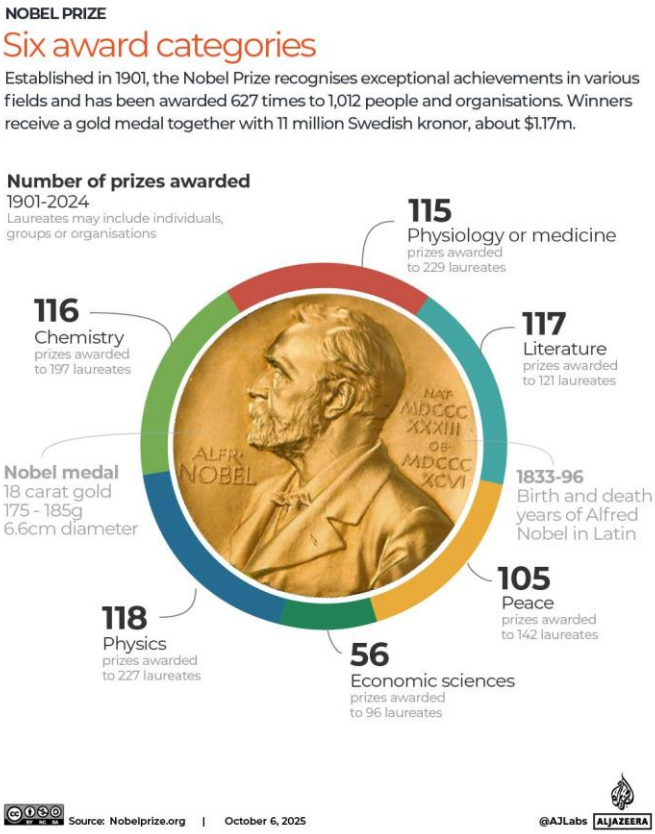
Nobel Peace Prize 2025 to Maria Corina Machado in recognition of her tireless efforts to promote democratic rights in Venezuela and her unwavering struggle for a just and peaceful transition from dictatorship to democracy.

Since 1999, Venezuela has shifted from a relatively stable democracy to a deeply entrenched authoritarian state. With citizens facing poverty and limited freedoms, while the opposition struggles under constant threats.

1.6 Nobel Prize for Literature

The Nobel Prize in Literature for 2025 is awarded to the Hungarian author László Krasznahorkai, for his compelling and visionary oeuvre that, in the midst of apocalyptic terror, reaffirms the power of art.

1.7 About Nobel Prize

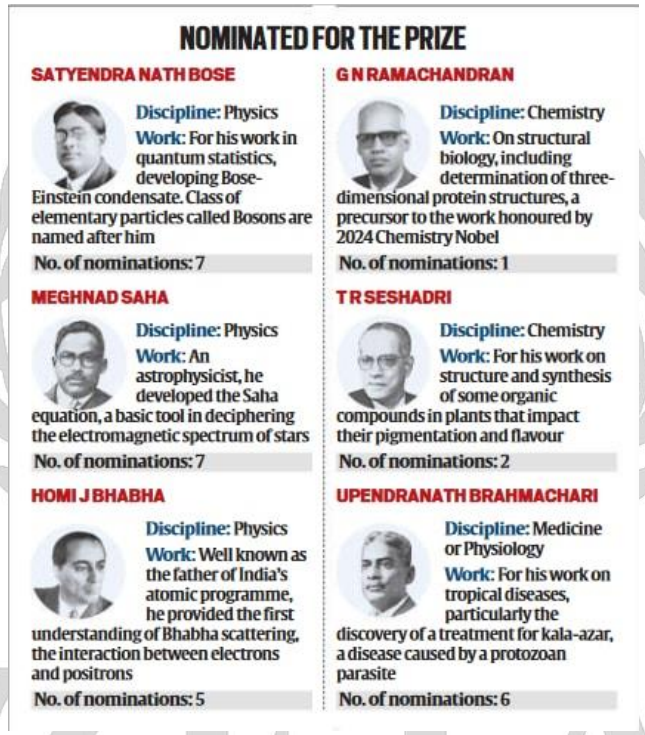


- The Nobel Prize was established by Alfred Nobel, the inventor of dynamite, and was first awarded in 1901.
- The prizes are awarded in six categories: Physics, Chemistry, Physiology or Medicine, Literature, Peace, and Economic Sciences.
- The prize ceremony is held in Stockholm, Sweden, in December, except for the Peace Prize, which is presented in Oslo, Norway.

INDIAN WINNERS:

- **Rabindranath Tagore:** He was the first Indian Nobel Laureate, winning the prize for Literature in 1913.
- **Mother Teresa:** She was the first Indian woman to win a Nobel Prize, receiving the Peace Prize in 1979 for her humanitarian work
- C. V. Raman (Physics, 1930)
- Har Gobind Khorana (Physiology or Medicine, 1968)
- Subrahmanyan Chandrasekhar (Physics, 1983)

- Amartya Sen (Economic Sciences, 1998)
- Venkatraman Ramakrishnan (Chemistry, 2009)
- Kailash Satyarthi (Peace, 2014)
- Abhijit Banerjee (Economic Sciences, 2019)



Significance of the Nobel Prize: The importance of the Nobel Prize lies in its global recognition of exceptional contributions to humanity, its role in encouraging research and innovation, and its function as a symbol of humanism and progress.

2 GOVERNANCE AND POLITY

1. CALLING OUT THE CRITICISM OF THE INDIAN JUDICIARY

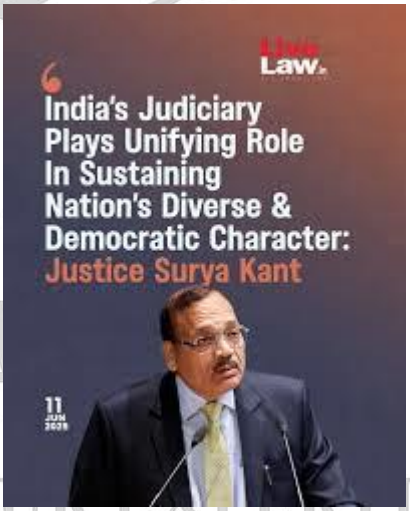
Context: Sanjeev Sanyal, Member of Prime Minister's economic advisory council has highlighted that Indian Judiciary often becomes the scapegoat in stalling economic growth thus judiciary in India is becoming the greatest obstacle for India to become Viksit Bharat or developed nation.

Criticism of the Judiciary: How is it hindering the goal of Viksit Bharat?

a. Judges work short hours and take long vacations: Critics argue that Judges work for short hours, approximately 8 hours a day and take long vacations. In truth, Judges hear about 50-100 cases per day and every case requires detailed study and pre-preparation. Therefore, this criticism stands invalid.

b. The rule that requires mediation before filing commercial suits (under Section 12A of the Commercial Courts Act, 2015): mandatory pre-suit mediation as ineffective. However, the courts are simply implementing laws which are made by the Parliament.

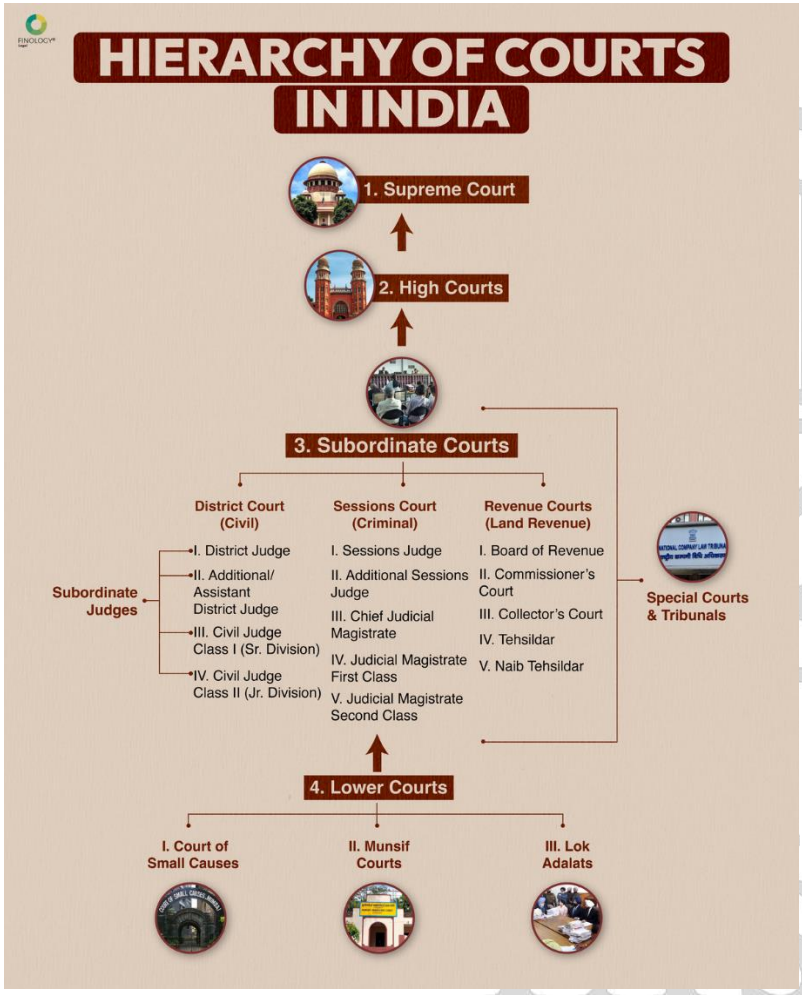
c. Law making issue: Laws in India are often written to stop misuse by a small group (1%), but this makes things harder for the remaining 99% who follow the rules. This is a flaw in legislation, not the judiciary's fault. Judges cannot on behalf of legislators and fix a confusing law.



d. Contract and Tender Issues: the courts are criticised for delays and pending cases but Government contracts are often not written clearly or have confusing rules. The government takes many matters to court or keeps appealing decisions even when it's not needed. This burdens the courts with unnecessary work.

Indian Judiciary: Structure and Functions

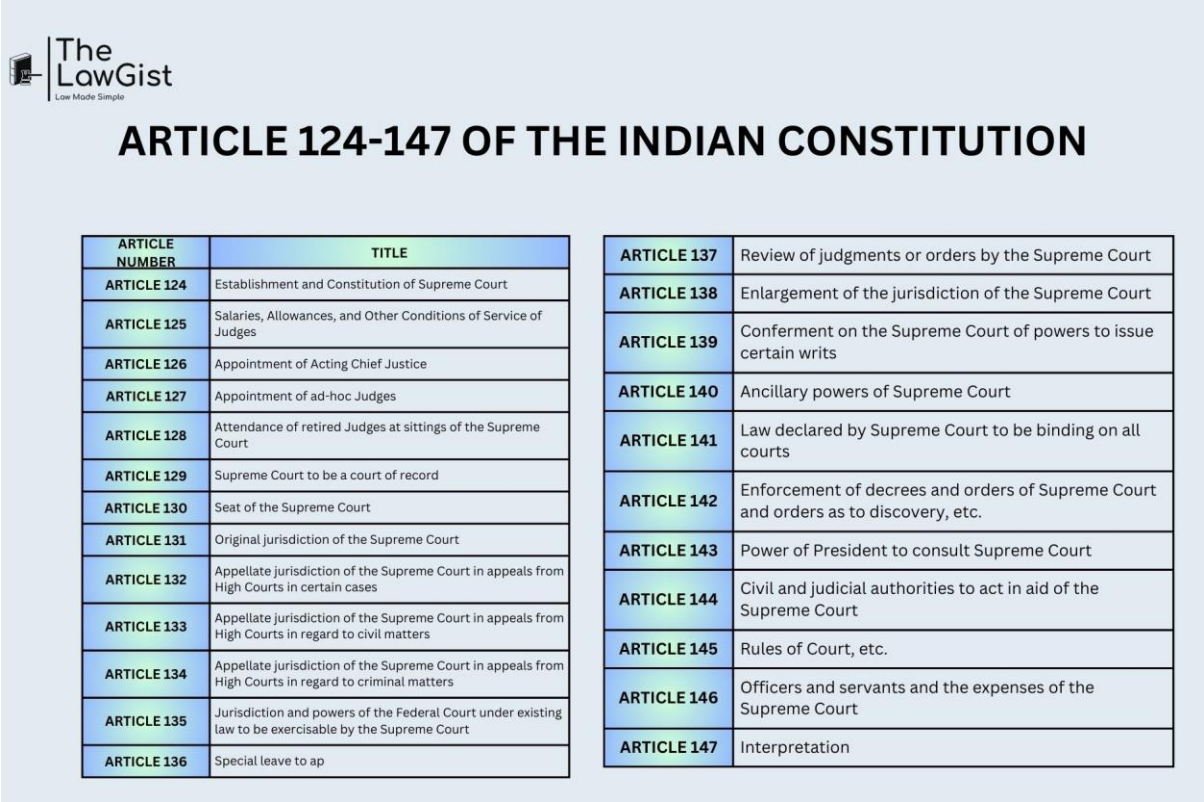
Judiciary is one of the three pillars of Democracy in India, the other two being legislature and Executive. It is in charge of resolving all conflicts and applying the law to particular situations. As judges render their decisions in various situations, they determine the true "meaning of law." Because it protects citizens against potential abuses by the legislative and executive branches, the judiciary is viewed by the public as the most significant branch of government. The autonomy of judiciary is more respected than the other two branches because of its role as the defender and protector of the constitution and the people's fundamental rights.



The judiciary is regarded by the public as the most significant branch of government because it acts as:

- The arbiter of center-state issues
- The defender of justice and the rule of law
- People's rights are protected
- The state constitution is guarded
- Legislative and executive abuses are prevented and

- The arbitrary use of power by those in positions of authority is restrained



ARTICLE NUMBER	TITLE
ARTICLE 124	Establishment and Constitution of Supreme Court
ARTICLE 125	Salaries, Allowances, and Other Conditions of Service of Judges
ARTICLE 126	Appointment of Acting Chief Justice
ARTICLE 127	Appointment of ad-hoc Judges
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ARTICLE 141	Law declared by Supreme Court to be binding on all courts
ARTICLE 142	Enforcement of decrees and orders of Supreme Court and orders as to discovery, etc.
ARTICLE 143	Power of President to consult Supreme Court
ARTICLE 144	Civil and judicial authorities to act in aid of the Supreme Court
ARTICLE 145	Rules of Court, etc.
ARTICLE 146	Officers and servants and the expenses of the Supreme Court
ARTICLE 147	Interpretation

Reasons for delays in Judiciary:

a. **Shortage of judges**: India has a low judge-to-population ratio. There are at present about 21 judges per million people (as per recent data), far below the Law Commission's recommendation of 50 judges per million.

b. **Poor physical infrastructure:** Many district and subordinate courts lack sufficient courtrooms, basic amenities, and digitized record systems.

c. **E-courts**: Although e-courts and online case tracking have been introduced, implementation is uneven across states and court levels. Lack of trained technical staff, inconsistent internet connectivity, and reluctance among court personnel to adapt to digital systems.

d. **Pending cases:** Over 4 crore cases are pending across all courts in India (as per National Judicial Data Grid, 2024).

e. **Lack of Judicial Accountability:** The absence of a robust mechanism for ensuring judicial accountability has been a point of concern, potentially affecting public trust in the judiciary.

f. **Judicial Activism and Potential Overreach**: The fine line between judicial activism and overreach continues to be a subject of debate. While judicial activism has helped in resolving cases or giving law a new direction but it continues to be a debatable subject which hinders working of the legislature.

Judicial Reforms needed:

a. **Streamlining Case Management through Technology**: Full implementation of the e-Courts Project for digitized records, online filing, and AI-based case management. Expanding this to every court and training of judges and advocates to make reforms more efficient.

b. **Promoting Alternative Dispute Resolution (ADR)**: Strengthen mediation, arbitration, and Lok Adalats to reduce court burden. The Mediation Act, 2023 seeks to promote mediation, particularly institutional mediation, and provide a mechanism for enforcing mediated settlement agreements.

c. **Reforming Judicial Appointments and Vacancies**: Simplify and make the appointment process transparent and time-bound. Raise judges' retirement age to retain experience and reduce vacancies.

d. **Strengthening Legal Aid and Access to Justice**: Expand legal aid coverage through the National Legal Services Authority (NALSA).

e. **Specialized Courts and Tribunals**: Expand specialized courts for environment, cybercrime, and IPR. Appointment of experts since specialized judges will ensure expert and faster resolution.

Judicial reforms in India must focus on technology, capacity building, inclusiveness, and transparency to ensure speedy, affordable, and accessible justice for all. The reforms must align with ideals of Article 39A of the Constitution.

2. TRANSFORMING INDIA'S DEMOGRAPHIC DIVIDEND INTO PRODUCTIVE EMPLOYMENT

Context: India is at an important stage in its population journey. As the world's fastest-growing major economy and the fifth largest overall, it has a big advantage. About 63% of its people are in the working-age group, and the median age is just 28 years. This means India has a young and energetic population, which gives it a great opportunity to boost economic growth and development in the coming years.

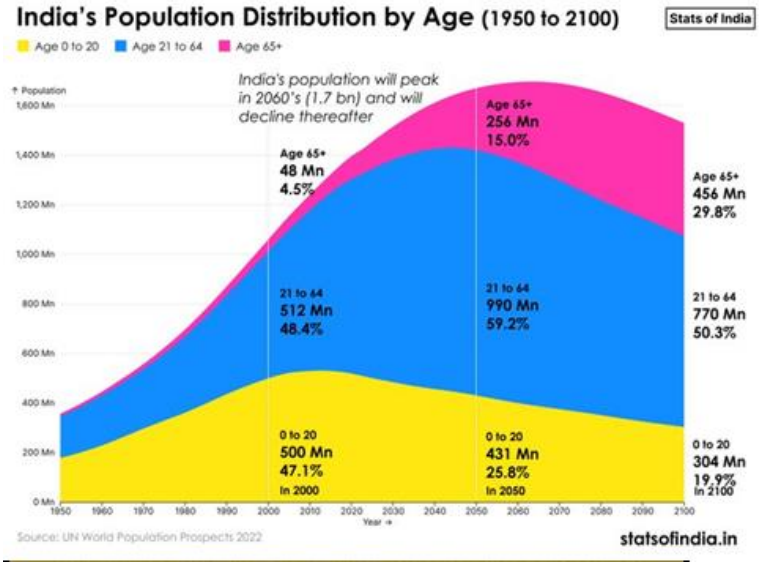
Issue: However, this potential can be realized only if enough jobs are created to match the growing workforce.

According to the International Labour Organization (ILO, 2022), India's labour force participation rate is only about 2%, showing a serious gap between population strength and employment generation. This highlights the urgent need to turn India's demographic advantage into productive and meaningful jobs.

India's Demographic Dividend

India's demographic advantage comes from having more people of working age compared to dependents. However, economic growth has not created enough jobs, especially in labour-intensive sectors like manufacturing.

While the services sector contributes most to the GDP, it is capital-intensive and does not employ enough people. This makes it difficult for India to provide sufficient livelihoods for its growing workforce



India's Demographic Transition and Dividend

India has moved from a stage of **high birth and death rates** to one of **low fertility and mortality**, changing the structure of its population. This shift has increased the share of people in the **working-age group**, creating an opportunity for faster economic growth — known as the **demographic dividend**.

According to the **2011 Census**:

- About **48%** of Indians were in the **working-age group (15–59 years)**.
- Around **31%** were **children under 14 years**.
- Nearly **9%** were **elderly (60 years and above)**.

The **dependency ratio** — the ratio of dependents (children and elderly) to the working-age population — **fell from 64% in 2001 to 55% in 2011**, showing fewer dependents per worker.

The **Economic Survey 2018–19** projected that India's **demographic dividend will peak around 2041**, when the **20–59 age group** will make up about **59% of the total population**.

Currently, over **two-thirds of Indians** are of **working age**, while the elderly form **less than 7%**. With a **median age of 28 years**, India remains **one of the youngest countries in the world**, offering a strong potential workforce for the coming decades.

What does it imply? Why is rate of employment low?

a. **India's economic structure shows some worrying signs:**

- The capital-to-output ratio is falling, but the capital-to-labour ratio is rising, meaning growth is becoming more technology-driven and less job-friendly.
- Around 45% of India's workforce still works in agriculture, which contributes only 18% to the GDP — showing an urgent need to shift workers to more productive sectors like manufacturing and services.
- The informal and non-agricultural sectors, which employ about one-fifth of workers, suffer from low productivity and poor job quality.
- New technologies like Artificial Intelligence (AI) and Machine Learning (ML) — expected to be worth $826 billion globally by 2030 — can create new job opportunities, but only if India invests in upskilling and reskilling its workforce.

b. Skill development: India faces a skill paradox, which means that there are plenty of workers, but not enough with the right skills.

- Only 4% of youth (aged 15–29) have formal vocational training, showing a big gap between what education provides and what the job market needs.
- In fast-growing fields like AI and Machine Learning, there is already a 51% skill shortage, which could worsen if not addressed soon.

- To tackle this, the skill development system must become more flexible, industry-linked, and technology-driven so that workers are ready for the changing job market.

What needs to be done?

To create more jobs, India needs to focus on **labour-intensive and fast-growing sectors**:

a. The **manufacturing sector** is key for large-scale employment. Areas like **toys, textiles, tourism, and logistics** can provide jobs for surplus rural workers.

b. India should move **up the value chain** by improving both **technical and soft skills** to meet global standards.

c. **Micro, Small, and Medium Enterprises (MSMEs)** — the main job creators — need **financial support, digital tools, and easier regulations** to grow and create more employment.

3. Reforming Passive Euthanasia in India

Context: The UK's Terminally Ill Adults (End of Life) Bill, recently passed by the House of Commons, legalises assisted dying for terminally ill adults with less than six months to live, under strict safeguards and multiple medical approvals. The law seeks to ensure choice, dignity, and protection against coercion.

In contrast, India permits only passive euthanasia, reflecting a more cautious stance shaped by ethical concerns and limited accessibility.

Euthanasia:

Euthanasia comes from the Greek words "eu" (good) and "thanatos" (death), meaning "good death." It refers to intentionally ending a person's life to relieve unbearable suffering from a terminal or incurable illness. It aims to ensure a painless and dignified death.

Types of Euthanasia

Based on Consent:

- **Voluntary:** At the patient's informed request.
- **Non-voluntary:** When the patient cannot consent (e.g., coma, mental incapacity), and a legal guardian decides.
- **Involuntary:** Against the patient's will — illegal and unethical.

Based on Method:

- **Active:** Directly causing death (e.g., lethal injection).
- **Passive:** Withholding or withdrawing life support to allow natural death.

Global Legal Status

Countries such as the Netherlands, Belgium, Canada, and some U.S. states allow voluntary active euthanasia or physician-assisted dying under strict safeguards.

In most countries, however, active euthanasia is illegal and treated as homicide.

Assisted suicide is different from Euthanasia: the patient self-administers the lethal dose, unlike euthanasia where another person acts.

Legal Status in India

a. **Active Euthanasia**: Still illegal and punishable under the Bharatiya Nyaya Sanhita (BNS), 2023.

b. **Passive Euthanasia**: Legally allowed after Supreme Court rulings in

- Aruna Shanbaug v. Union of India (2011)
- Common Cause v. Union of India (2018): It permits withdrawal of life support under strict medical and legal procedures.

Arguments Against Legalisation

a. **Moral and Religio**us Concerns: Many believe life is sacred and only nature or God should decide death.

b. **Risk of Misuse**: Vulnerable patients may be pressured into euthanasia due to family, financial, or emotional factors.

c. **Mental Capacity Challenges**: Doctors may find it hard to judge if a patient is mentally fit or coerced, especially in cases of depression or severe illness.

d. **Legal Ambiguity**: Active euthanasia remains a crime under BNS, and no dedicated law defines clear procedures, leaving doctors at legal risk.

e. **Complex Procedure**: Even for passive euthanasia, Supreme Court guidelines require multiple medical boards and approvals, making the process slow.

f. **Public Opinion and Awareness:** Surveys (e.g., in Kerala) show mixed attitudes — less than 40% support euthanasia — making policy acceptance difficult.

g. **Impact on Palliative Care**: Critics fear euthanasia may reduce focus on developing pain management and end-of-life care.

WHO: Only 14% of those needing palliative care globally receive it.

India: Just 4% of 7–10 million people needing palliative care get it.

How can India reform Passive Euthanasia?

a. **Simplify Passive Euthanasia Process**: In 2023, the Supreme Court made living wills easier by allowing notarisation instead of judicial attestation and enabling digital access to doctors.

b. **Clear Legislation**: Parliament should enact a law clearly distinguishing active and passive euthanasia and defining procedures for advance directives.

c. **Strengthen Palliative and Hospice Care**: Build a nationwide network to reduce suffering and dependence on euthanasia.

d. **Hospital Ethics Committees:** Create multi-disciplinary teams (doctors, lawyers, social workers) to assess requests and ensure ethical compliance.

e. **Training for Professionals**: Train doctors and legal experts in evaluating mental competence and ethical end-of-life decisions.

f. **Public Awareness**: Promote education on living wills, palliative care, and rights related to end-of-life choices.

Conclusion

Article 21 of the Indian constitution guarantees Right to life with dignity which also includes Right to dignified death, however, it should not mean Right to be killed. Therefore India needs to reform the law on passive euthanasia while also considering India's cultural values and religious sentiments.

4. Preventive Detention and National Security Act

In News: Sonam Wangchuk, a climate activist, has been detained under the stringent National Security Act (NSA) by the police in Leh. He is accused of instigating violence during protest for separate statehood for Ladakh and inclusion of it in sixth schedule.

National Security Act 1980 (NSA):

National Security Act, 1980 (NSA) is a significant Indian law aimed at preventive detention concerning matters of national security and public order. This act permits limitations on individual freedom and preventive detention for the sake of public safety and order.

Significance of NSA 1980:

a. Preventive Detention: Empowers the government to detain individuals to prevent actions that could harm national security, foreign relations, or public order.

b. Deterrence: Can deter individuals from engaging in activities that threaten the state, such as terrorism, smuggling, or disruption of essential services.

c. Swift Action: Allows authorities to act quickly in sensitive regions to maintain peace and order.

d. Balancing Act: Represents a key legal tool that seeks to strike a balance between safeguarding national security and protecting civil liberties.

Repercussions

a. **Curtailment of Civil Liberties**: Allows for detention without formal charges, potentially bypassing the constitutional right to be informed of the grounds of arrest and to be produced before a magistrate within 24 hours.

b. **Potential for Arbitrary Use:** Critics and various reports suggest the act can be used arbitrarily, for reasons such as social or political dissent, rather than solely for national security concerns.

c. **Long Periods of Detention**: A person can be detained for a significant period (initially up to 12 months, extendable thereafter), which can be used coercively.

d. **Weakening of Legal Safeguards**: In some instances, the act may lead to the circumvention of safeguards provided under the Criminal Procedure Code (CrPC) and Article 22 of the Constitution.

Preventive detention:

Preventive Detention means detention of a person without a trial or conviction by a Court. The primary objective of preventive detention is not to punish an individual for a past offence but to prevent him from committing an offence in future.

Pre-independence (British India)

- **East India Company Act, 1793**: This act allowed the Governor to detain individuals suspected of "illicit correspondence" that was dangerous to the British settlements.
- **Bengal Regulation III of 1818**: This regulation provided a legal basis for the government to detain individuals on mere suspicion of intending to threaten public peace, though it was frequently used against political opponents.
- **Defence of India Act, 1915:** Introduced during World War I, this act allowed for the arrest and detention of anyone suspected of being anti-British.
- **Emergency regulations during World War II**: The powers for preventive detention were strengthened and utilized further during wartime, as seen with the Defence of India Act, 1939.

Post-independence (India)

- **Constitutional provision**: The Constitution of India includes Article 22, which provides for preventive detention while also imposing safeguards, though these are considered weaker than typical due process rights.

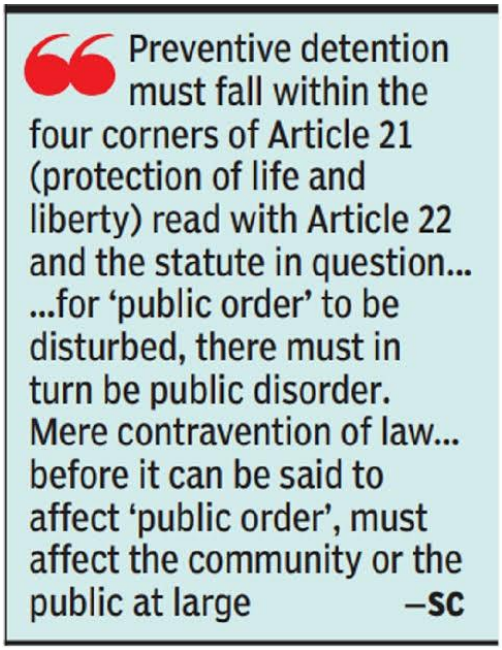
- **Preventive Detention Act, 1950**: The first post-independence law, it was enacted shortly after the Constitution came into effect. Its constitutionality was upheld by the Supreme Court in the landmark case of A. K. Gopalan v. State of Madras.
- **Maintenance of Internal Security Act (MISA), 1971**: This act replaced the 1950 Act and was in place until it was repealed by the Janta government in 1977.

Implications of Preventive Detention:

- **Lack of due process**: The process is controlled by the executive and bypasses the standard criminal justice system, which requires evidence and a trial.
- **Potential for misuse**: There are concerns about the misuse of these laws, leading to the detention of individuals based on flimsy grounds and raising fears of abuse of power.
- **Challenges to fairness**: While the law requires the detainee to be informed of the grounds for detention (unless it is against public interest), the process can still be challenged on grounds of vagueness, irrelevance, or malafide intent by the detaining authority.
- **No protection under certain articles:** The constitutional protections against arbitrary arrest and detention (like Articles 22(1) and 22(2) in India) do not apply to individuals held under preventive detention laws, according to Article 22(3).
- **Right to counsel:** The right to legal representation is limited in preventive detention cases, although courts have sought to ensure the process remains fair and reasonable as far as possible.

Important facts about Preventive Detention:

- Parliament has exclusive power to make laws on preventive detention for defence, foreign affairs, or security of India.
- Both Parliament and State Legislatures can make laws for preventive detention related to public order or essential supplies/services.
- Major preventive detention laws include the National Security Act (NSA), Unlawful Activities (Prevention) Act (UAPA), and various state Public Safety Acts.
- Detention can occur without trial or formal charges and may last up to 12 months.
- Orders for detention are issued by designated authorities, with review by an Advisory Board.
- The Advisory Board must consist of or be headed by a High Court judge and reviews detentions exceeding three months.
- Safeguards include the right to know the grounds for detention and the opportunity to make representations against it.
- Judicial review for preventive detention is limited because IC prioritises the state's "subjective satisfaction" when ordering a detention.
- A judicial review is limited to whether the Advisory Board applied its mind, considered all material facts and whether the state showed obvious malafide in ordering detention.



Preventive detention is an exceptional law and should be used cautiously. It shouldn't be used to avoid bail and keep someone in jail longer.

The SC, on many occasions, said that:

- **Preventive detention cannot be invoked to circumvent the granting of bail.**
- **The state cannot detain an accused when he is likely to be released on bail for the same offence.**

Misuse of preventive Detention:

Preventive detention is a form of extraordinary power with the Government which is susceptible to misuse. It has been seen in the past how people have been detained on vague grounds for long periods of time without trial or on mere suspicion of a criminal activity.

a. **Suppression of Dissent**: Governments may use preventive detention laws to target and silence political opponents, activists, journalists, and human rights defenders, branding their legitimate activities as threats to national security or public order.

b. **Arbitrary and Prolonged Detention**: Detainees are often held for extended periods without formal charges or a fair trial, sometimes without being informed of the specific reasons for their detention in a timely or detailed manner.

c. **Circumvention of Normal Legal Procedures**: Preventive detention is frequently used to bypass the ordinary criminal justice system and its associated safeguards, such as the right to be produced before a magistrate within 24 hours.

d. **Vague Grounds**: Detention orders are often based on broad and imprecise definitions of "public order" or "national security," allowing for wide executive discretion and minimal accountability.

e. **Disproportionate Impact**: Evidence suggests these laws disproportionately affect marginalized communities, including caste and religious minorities.

Ways to protect people against misuse of preventive detention:

Protecting individuals from the misuse of preventive detention requires a multi-faceted approach involving strong legal frameworks, judicial vigilance, and institutional reforms

A. **Prompt Communication of Grounds**: Authorities must inform the detainee of the specific, factual grounds for their detention as soon as possible, in a language they understand, to enable them to prepare a defense.

B. **Right to Legal Representation**: Detainees must have access to legal counsel of their choice from the moment of arrest, and the state should provide legal aid if needed.

C. **Independent Judicial Review**: All detention orders should be subject to mandatory and prompt review by an independent judicial authority (such as a High Court) to determine their lawfulness and necessity.

D. **Advisory Board Review**: Detention beyond a short initial period (e.g., three months) should only be permitted with the approval of an independent advisory board comprising qualified judicial members.

E. **Fixed Maximum Duration**: The law should specify a clear, reasonable maximum period for detention that cannot be extended indefinitely, and laws must have mandatory sunset clauses requiring periodic renewal by the legislature based on necessity.

Preventive detention laws in India are designed to guard public order and national security by discouraging individuals from taking actions that may pose a threat to society or the state. The laws that safeguard fundamental rights in Articles 21 and 22 of the Indian Constitution are often in conflict with these rights, which may be required.

In a country with a diverse and geopolitical sensitiveness, such as India, preventive detention is an essential tool to safeguard national security. The implementation must consider the fundamental rights of the Constitution. In order to safeguard democracy and prevent abuse, it is imperative to connect the legal framework for preventive detention with the guiding principles of justice, fairness, and due process of law.

5. TAMIL NADU EMERGED AS A DYNAMIC HUB FOR INNOVATION AND ENTREPRENEURSHIP

Context: Tamil Nadu has emerged as a compelling case study in building inclusive start-up ecosystems through strategic state intervention.

How did Tamil Nadu emerge as a hub for innovation and entrepreneurship?

In recent years, Tamil Nadu has transformed from a traditional manufacturing base into a vibrant hub for innovation and entrepreneurship.

A key example is Torus Robotics, which started in a government-backed incubation program and later signed a ₹100-crore investment MoU with the Tamil Nadu government.

Such success stories highlight the State's systematic and strategic approach to nurture, scale, and integrate start-ups into its overall economic growth plan.

Catalytic factors behind such transformation:

a. **State capital as a driving force**: The Tamil Nadu Start-up Seed Grant Fund (TANSEED) shows how smart support can boost start-ups. It offers ₹10 lakh to regular start-ups and ₹15 lakh to women-led, green-tech, and rural ventures, creating a 28-fold rise in private investment.

Tamil Nadu has also expanded this model to new areas through the Tamil Nadu Space Tech Fund, which provides up to ₹50 lakh for projects in satellite technology and AI-based geospatial solutions.

b. **Inclusive approach**: To include marginalised class and remove challenges faced by them, Tamil Nadu launched the SC/ST Startup Fund, which has provided over ₹60 crore in equity support. The State also strongly supports women entrepreneurs through programs like Thozhili bootcamps, offering training and incubation.

c. **Digital Public infrastructure**: UPI and Aadhaar has greatly lowered costs and made digital access easier, creating a strong base for Fintech and E-commerce startups. Startups like Zepto grew quickly using UPI-based microtransactions, proving how digital payments are driving new business models like Quick Commerce.

d. **Connected but decentralised ecosystem**: Tamil Nadu has set up 10 regional startup hubs in cities like Madurai, Coimbatore, Tiruchi, and Salem to provide infrastructure, mentorship, and market access across the State.This approach ensures startups get not just money but also guidance, visibility, and market opportunities.

e. **Shift to Artificial Intelligence**: India's startup ecosystem is shifting towards Deep-Tech fields like Generative AI, CleanTech, and Spacetech, supported by policies such as the National Deep-Tech Startup Policy.

Issues with start-ups in India:

1. **Funding and Financial Issues:** Early-stage startups struggle to attract venture capital or angel investors, worsened by economic slowdowns. Moreover, few Indian investors are willing to fund high-risk, long-term ventures, preferring quick returns. Additionally many start-ups fail due to weak financial planning and cash flow issues.

2. **Regulatory and Compliance Hurdles:** Complicated tax rules and compliance requirements slow growth and waste time. Further, the process of registration is slow and often tainted with policy uncertainty

3. **Innovation and R&D Gaps:** Most start-ups work in service-based sectors, with fewer in deep-tech areas like AI or robotics. India's spending on R&D is also low as compared to global standards.

4. **Talent and Infrastructure Gaps:** A mismatch between academic training and industry needs leads to a lack of skilled workers in areas like AI. Many skilled professionals move abroad for better opportunities. Moreover, Tier-2 and tier-3 cities lack strong start-up hubs, mentorship, and networks.
5. **Operational and Scaling Challenges:** Startups often fail to expand due to poor processes and operational inefficiencies. They are also unable to adapt to consumer needs which leads to business failures. Further, cases of financial mismanagement have raised doubts about ethics and transparency.

Measures to Strengthen India's Start-up Ecosystem

1. **Simplified Regulations and Single-Window Clearance: there should be a** single digital platform for all approvals, registrations, and compliance. Along with it, the government must Introduce graded compliance based on business size and stage to reduce burdens on early start-ups.
2. **Deep-Tech and R&D Innovation Hubs**: incubation clusters in AI, biotech, clean energy, defense should be developed. For this, the government must ensure collaboration between university and industry.
3. **Decentralized Access to Capital:** Setting up regional start-up funds combining government seed capital, private equity, and CSR contributions. Tiered financing for micro, early-stage, and growth-stage start-ups should be introduced.
4. **Global Market Access Platforms:** Provide soft-landing programs, trade missions, and India Start-up Embassies abroad. Efforts should also be made to build cross-border e-commerce frameworks to help start-ups reach global customers.
5. **Talent Mobility and Entrepreneurial Skilling: Encourage people to move easily between universities, companies, and start-ups to share skills and ideas.** Introduce entrepreneurial sabbaticals, gig-friendly laws, and academic credits for startup work.
6. **Public Procurement as a Catalyst:** Integrate start-ups into government procurement through platforms like GeM and allocate quotas in sectors like smart cities, green mobility, and defense tech.
7. **Sustainable and Inclusive Policies**: incentives for circular economy, women led start-ups and aligning start-up with sustainable development goals will ensure inclusivity, equity and protection of the environment.

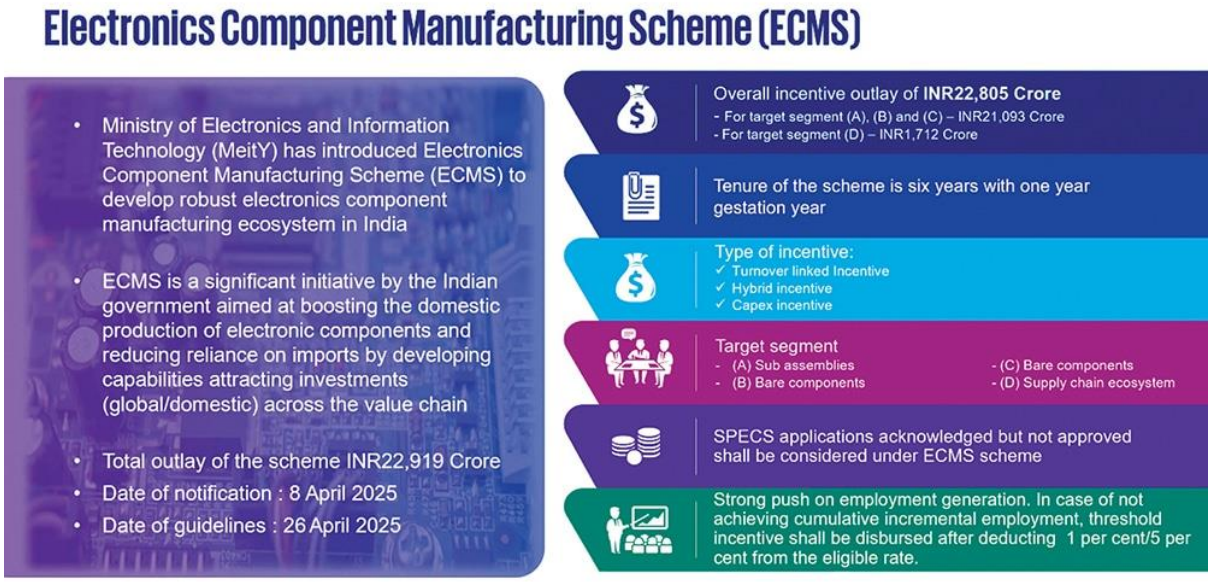
Conclusion

India's start-up ecosystem is witnessing growth beyond big cities and spreading across the country. This growth is powered by new technologies, digital tools, and more inclusion but India still needs to help the start-up become stronger, for this India needs better laws, easier access to funding, skilled people, global connections, and a focus on sustainability. These steps will help Indian start-ups create new ideas and products, not just run businesses.

6. ELECTRONICS COMPONENTS MANUFACTURING SCHEME

In News: Government has received unprecedented response from domestic as well as international industry on Electronics Component Manufacturing Scheme.

This reflects India's growing stature on the global stage and the increasing confidence of the domestic industry, including MSMEs, which have shown strong interest in making the country self-reliant in electronics manufacturing.



ECMS:

- The ECMS was launched in April 2025 as a complement to the India Semiconductor Mission.
- It seeks to strengthen India's electronics value chain beyond finished goods and chip fabrication by boosting Domestic Value Addition (DVA) and linking Indian firms with Global Value Chains (GVCs).
- ECMS supports horizontal linkages with automobile, power, and industrial sectors

Scheme Tenure: 6 years (1 year of gestation period) i.e. from FY2025-26 to FY2031-32.

Aim: The scheme is projected to create 1,42,000 direct jobs well above the target of 91,600 and a manifold number of indirect jobs, demonstrating its potential to drive large-scale employment.

Objectives: The estimated production of Electronics Components under the scheme in the next six years will be about Rs. 10,34,700 Crores. The response is 2.2 times of the targeted Rs. 4,56,000 crore worth of production under the scheme.

The successful launch of ECMS scheme would propel the nation to achieve the vision of Hon'ble Prime Minister to establish a $500 billion domestic electronics manufacturing ecosystem by 2030-31.

Significance: Electronics is India's third-largest export, with the country being the 2nd-largest mobile manufacturer globally. The ECMS, along with Production Linked Incentive (PLI) and semiconductor initiatives, is crucial for establishing a USD 500 billion electronics manufacturing ecosystem by 2030-31.

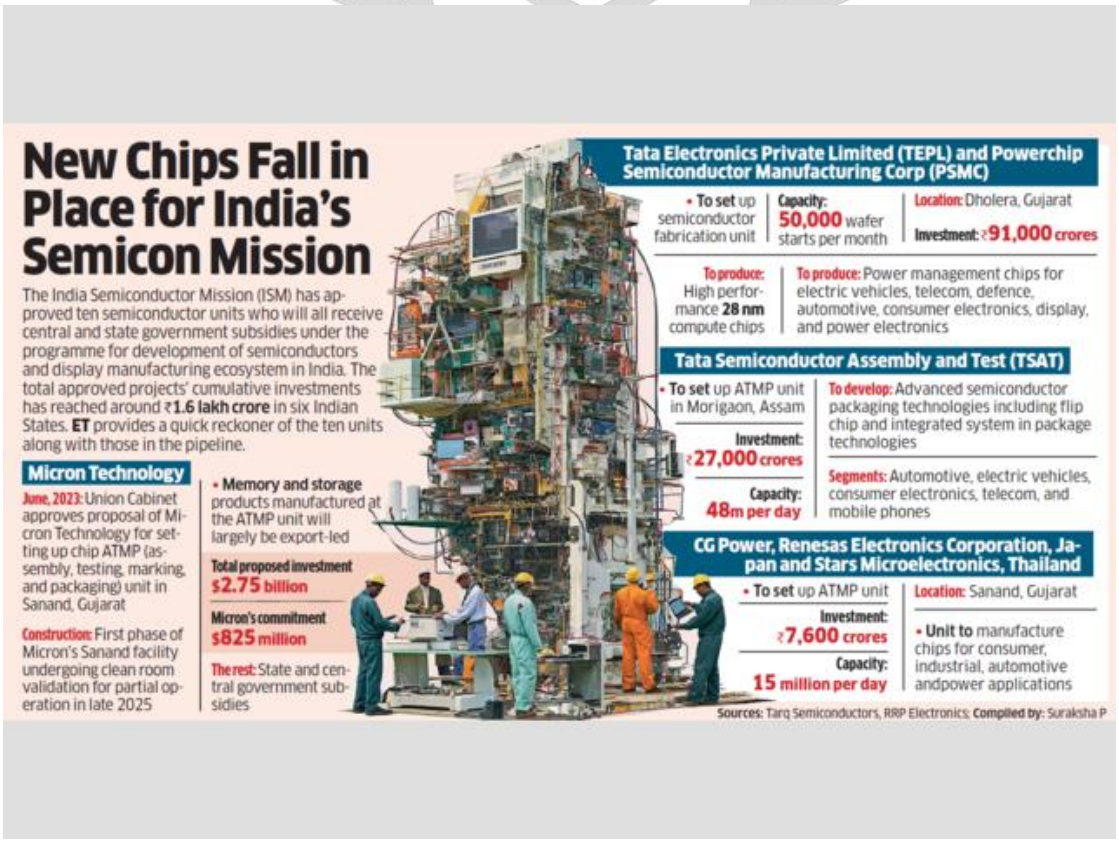
About India Semi-Conductor Mission:

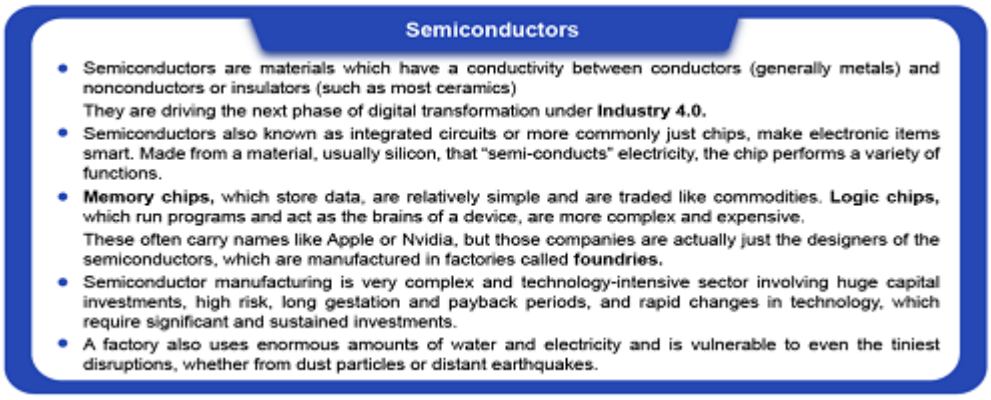
India Semi-Conductor Mission: approved in 2021, aims to boost India's global electronics value chain presence and establish it as a global manufacturing hub.

It operates under the Ministry of Electronics and Information Technology (MeitY).

Objective: To support chip design startups, promoting indigenous IP and technology transfer, fostering research, innovation, and industry-academia collaboration.

It aims to reduce import dependence to strengthen India's global semiconductor presence.





7. COMBATING COUNTERFEIT MEDICINES IN INDIA

In News: at least 16 children, mostly under five years of age died after consuming adulterated cough syrup (Coldrif) in Madhya Pradesh.

Implication of the incident:

- Laboratory testing revealed the contaminated batch contained 48.6% diethylene glycol (DEG), 480 times the permissible limit of 0.1%. This crisis highlights the need for drug quality control and regulatory reform in India's pharmaceutical sector.
- India emerged as a leading pharmaceutical hub during the pandemic, it is also a major drugs exporter in African continent. This incident has jeopardised India's position as the pharmacy of the world.
- It has also raised serious concerns in India about drug regulation in India, especially the adequacy of national safety oversight, quality standards, and enforcement.

Drug regulation system in India:

India's drug regulation functions under the Drugs and Cosmetics Act, 1940 and Rules, 1945, through a dual control structure.

a. The Central Drugs Standard Control Organisation (CDSCO), led by the Drugs Controller General of India (DCGI), manages central licensing, new drug approvals, and policy formulation.

Drugs and Cosmetics Act (1940): Originally designed for regulatory compliance, it's outdated for tackling modern organised crimes like pharmaceutical counterfeiting and drug falsification.

b. State Drug Controllers is the implementing body. It oversees manufacturing and sales licenses, inspections, and enforcement.

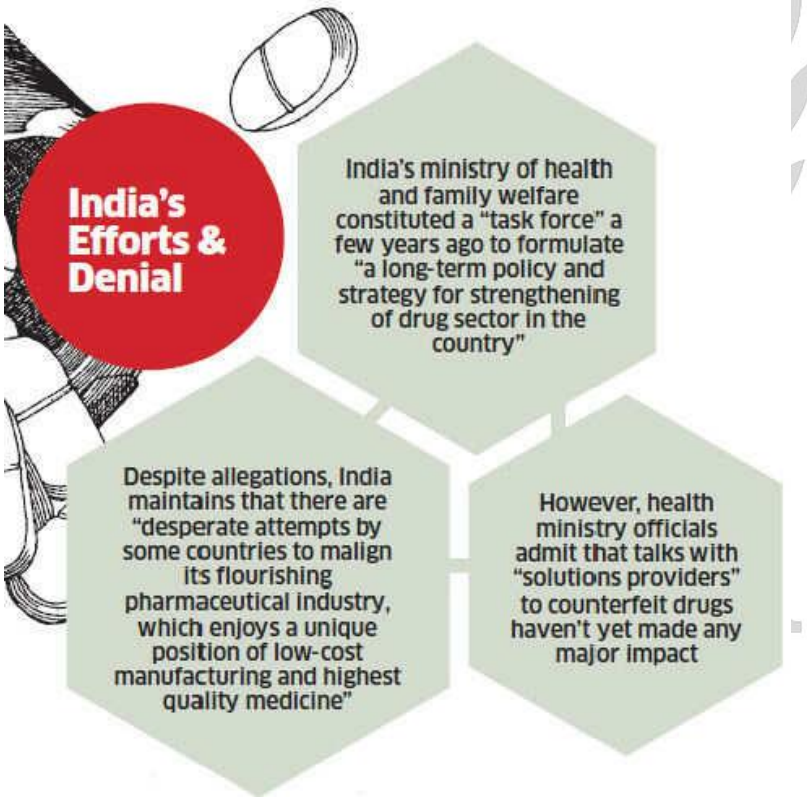
Issues with drug regulation in India:

a. **Fragmented system:** The dual control system results in inconsistency in formulation and implementation of drug policy.

b. **Infrastructure gaps**: A 2023 parliamentary review revealed that nearly half of India's state drug testing laboratories lack proper equipment or qualified analysts for effective surveillance.

c. **Weak accountability**: The detection of 48.6% DEG content in Coldrif suggests deliberate substitution rather than accidental contamination. This points out that those responsible for wrongdoing in India's pharmaceutical sector are rarely held criminally liable. The regulators at fault are subjected to administrative actions like suspending or cancelling company licenses.

d. **Limited jurisdiction**: Drug inspectors focus on regulatory compliance, lacking expertise in criminal investigations or forensic validation of falsified medicines.



Government response:

- In response to the Coldrif crisis, the Union Health Ministry has ordered strict compliance with revised Schedule M norms, updated GMP standards under the Drugs and Cosmetics Act, 1940. The Rajasthan government also banned cough syrups containing Dextromethorphan for children under five years of age.
- The new norms, effective by December 31, 2025, mandate Quality Risk Management, supply chain traceability, DEG/EG testing, data integrity, and pharmacovigilance systems.

Way forward:

a. **Re-visiting laws**: Parliament should revise the Drugs and Cosmetics (D&C) Act to give both police and Drug Control Officers the authority to jointly file cases and carry out investigations. Investigators ought to apply appropriate criminal provisions from the Bharatiya Nyaya Sanhita (BNS), such as Section 318 for cheating and Sections 336–338 for forgery, in addition to the D&C Act, and should invoke Section 111 in cases involving organized crime.

b. **Special investigation committee**: National and state governments should set up Special Investigation Teams comprised of police, Drug Control authorities, the Enforcement Directorate (ED), and forensic experts to conduct comprehensive investigations from start to finish.

c. **Forensic mandate**: The rules and guidelines should be updated so that all major investigations into fake drugs must use detailed forensic techniques like drug testing, packaging checks, digital analysis, and phone record tracking. Forensic labs and the National Forensic Sciences University should standardize these methods, give quick certified reports, and help in court with expert opinions.

d. **Collaboration with International Bodies**: India should collaborate with international bodies like the World Health Organization (WHO) to adopt best practices in drug regulation. This will help ensure that Indian pharmaceutical companies are following global safety and quality standards. The authorities should also work closely with international bodies to monitor the safety of drugs that are exported from India to other countries.

e. **Creating a National Drug Database for Transparency:** A centralized, publicly accessible database listing approved drugs, manufacturers, and regulatory statuses can enhance transparency. This will allow healthcare providers and consumers to verify drug authenticity and prevent the sale of unapproved or counterfeit products

India's counterfeit drug problem stems from weak laws and poor enforcement. To fix this, regulatory and criminal investigation teams must work together. A coordinated system with clear laws, shared intelligence, and forensic support can shift focus from just catching fake drugs to breaking the networks behind them. Using science in investigations and strict laws for accountability will help protect patients and restore trust in India's pharma sector.

8. PM-SETU

In News: In a landmark initiative for youth development, Prime Minister Shri Narendra Modi unveiled various youth-focused initiatives worth more than Rs.62,000 crore in New Delhi. This also includes Pradhan Mantri Skilling and Employability Transformation through Upgraded ITIs- PM – SETU.

The scheme envisages:

- The upgradation of 1,000 Government ITIs across the country in a hub-and-spoke model comprising 200 hub ITIs and 800 spoke ITIs.
- Each hub will be connected to four spokes on average, creating clusters equipped with advanced infrastructure, modern trades, digital learning systems and incubation facilities.
- Anchor Industry Partners will manage these clusters, ensuring outcome-based skilling aligned with market demand.
- Hubs will also house innovation centres, training-of-trainers facilities, production units and placement services, while spokes will focus on expanding access.

PM-SETU will redefine India's ITI ecosystem, making it government-owned but industry-managed, with global co-financing support from the World Bank and Asian Development Bank. In the first phase of the scheme implementation there will be special focus on ITIs in Patna and Darbhanga.

A special emphasis of the programme will be on transformative projects in Bihar, reflecting the state's rich legacy and youthful demographic.

Aims and objectives:

- Introduce new, demand-driven courses and revamp existing ones in collaboration with industry;
- Set up Special Purpose Vehicles (SPVs) with credible Anchor Industry Partners to manage clusters and ensure outcome-based training.
- Create pathways for long-term diplomas, short-term courses, and executive programs
- Strengthen 5 National Skill Training Institutes in – Bhubaneswar (Odisha), Chennai (Tamil Nadu), Hyderabad (Telangana), Kanpur (Uttar Pradesh), Ludhiana (Punjab), as Centres of Excellence with global partnerships.

9. PRATIBHA SETU

In News: Prime Minister Narendra Modi announced the launch of the Pratibha Setu Portal, a fresh initiative aimed at effectively utilising the talent of UPSC aspirants who reached the final selection stages but were not appointed. This platform seeks to connect these skilled individuals with opportunities in both government and private sectors.

What is UPSC PRATIBHA SETU?

- UPSC Pratibha Setu was earlier known as Public Disclosure Scheme (PDS) of the Commission.
- The Scheme is in operation since 20.08.2018. It publicly shares the biodata of UPSC candidates who cleared written exams and appeared for the personality test but were not recommended in the final selection process.
- Originally started by the Department of Personnel and Training (DoPT), the scheme has expanded over time to include candidates from various UPSC exams including Civil Services, Indian Forest Service, Engineering Services, Central Armed Police Forces, Combined Geo-Scientist, CDS, IES/ISS, and Combined Medical Services.

Who will benefit from the scheme?

- The portal focuses on nearly 33,950 candidates out of 52,910 aspirants who were not appointed after final interviews in UPSC exams. By digitally connecting these talented individuals with prospective employers across government and private sectors, it aims to ensure their abilities are recognised and utilised effectively.
- This initiative supports and complements larger schemes like the Skill India Mission, which provides vocational training, and the National Career Service, which has made over 7 crore job vacancies accessible.

The launch of the Pratibha Setu Portal marks a positive step towards inclusive employment policies by recognising the vast pool of skilled aspirants whose potential may otherwise remain untapped.

8. MODEL YOUTH GRAM SABHA SCHEME

Context: The Model Youth Gram Sabha (MYGS) is an Indian initiative launched in 2025 by the Ministry of Panchayati Raj, in collaboration with other ministries, to simulate real Gram Sabha (village assembly) processes for students.

Aims and objectives:

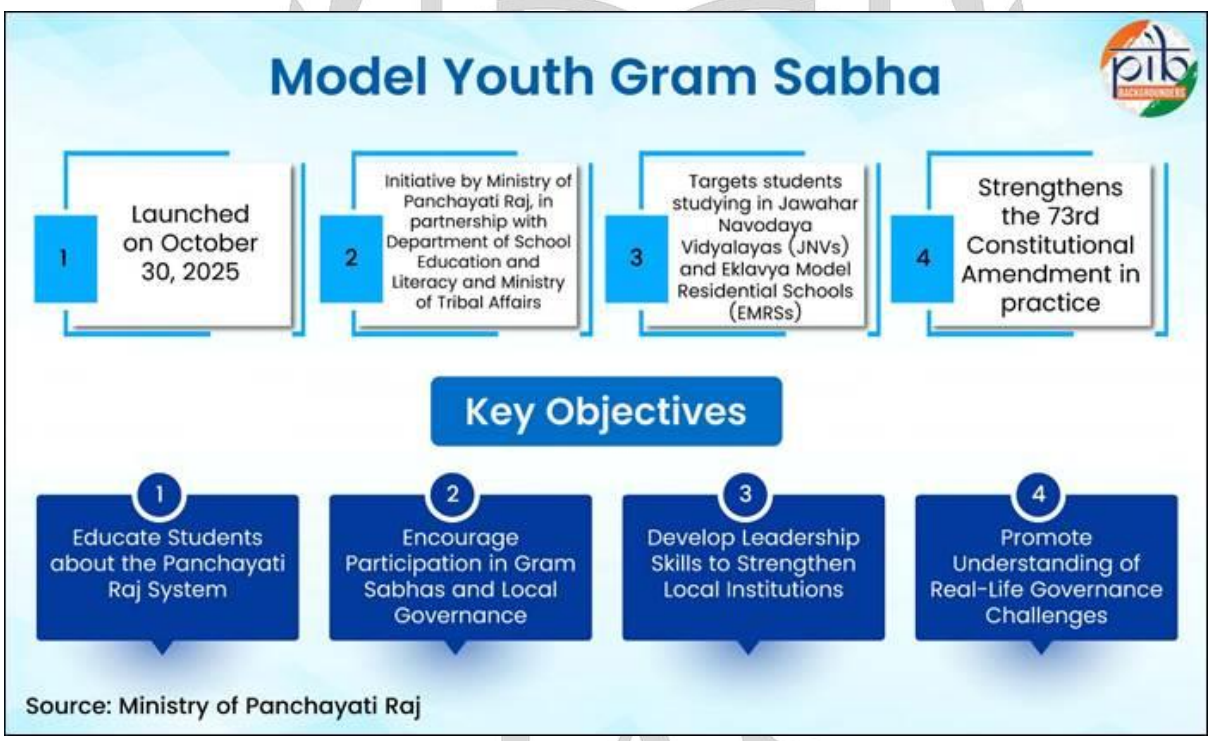
a. The Model Youth Gram Sabha (MYGS) equips students with hands-on experience in grassroots democracy, simulating real gram sabha processes to build leadership and civic engagement.

b. It strengthens youth understanding of the Panchayati Raj System and promotes transparency, inclusion, and accountability in local governance.

c. The initiative aligns closely with the National Education Policy (NEP) 2020 by nurturing constitutional values, social responsibility, and civic consciousness among students, preparing them for active citizenship.

d. Structured facilitation through trained educators and standardized modules ensures high-quality implementation and measurable learning outcomes.

e. The programme fosters youth participation in governance while developing essential life skills such as communication, critical thinking, teamwork, and consensus-building and decision-making for democratic engagement.



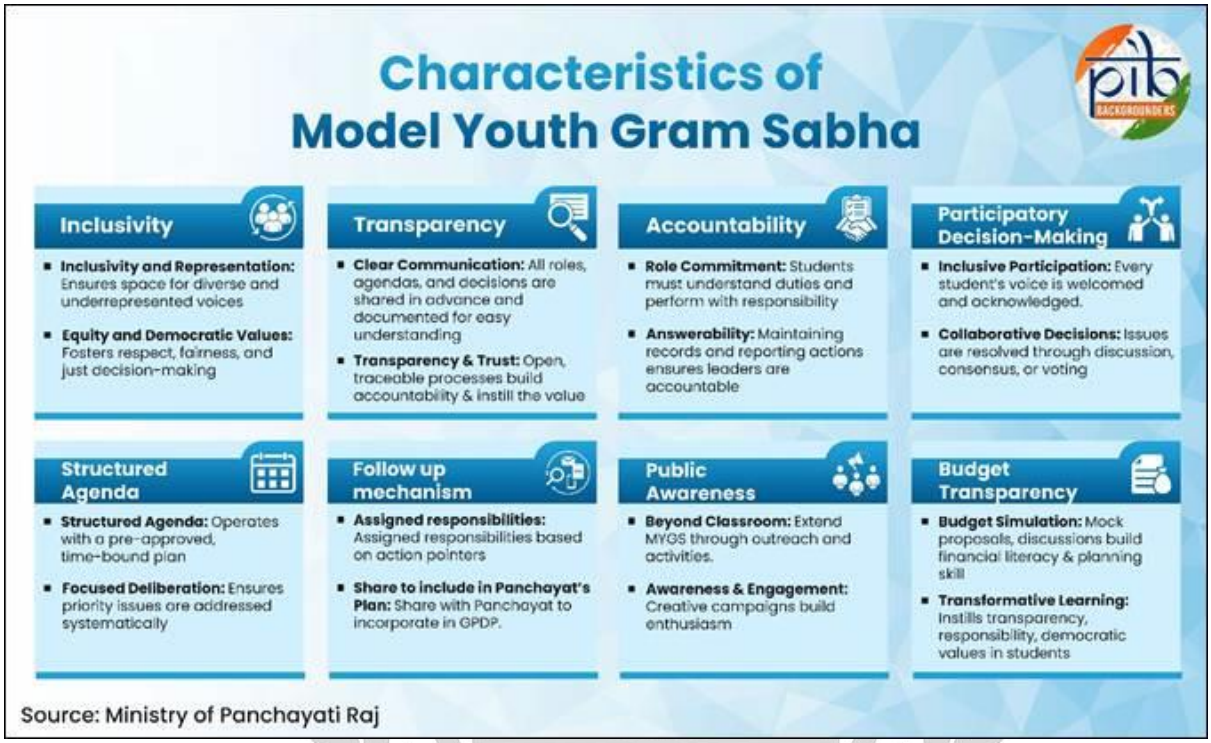
Aspects of the model:

a. The Model Youth Gram Sabha initiative is strongly aligned closely with the vision of the **National Education Policy (NEP) 2020,** which underscores the need for educational curriculum and pedagogy to instill in students a deep respect for the Fundamental Duties and Constitutional values, along with a strong sense of national belonging.

b. The Policy envisions fostering in young people a profound pride in being Indian, reflected in their thoughts, actions, and intellect, while equipping them with the knowledge, skills, values, and attitudes that promote human rights, sustainable development, and global well-being, ultimately shaping them into responsible and compassionate global citizens.

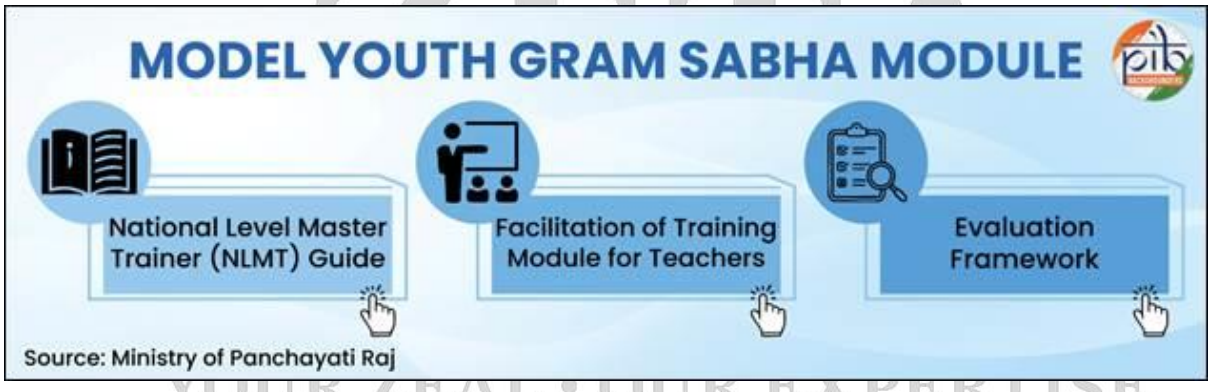
Vision:

The vision of the Model Youth Gram Sabha is "to nurture empowered, responsible, and empathetic young citizens who actively participate in democratic processes and contribute to sustainable and inclusive national development."



Model Youth Gram Sabha module:

The Model Youth Gram Sabha Module serves as a comprehensive framework designed to translate the vision of participatory democracy into practice within schools. It ensures effective, engaging, and high-quality implementation of youth-led Gram Sabhas by equipping educators and students with structured guidance, facilitation tools, and evaluation mechanisms.



Funding and Recognition of Participating Students and Schools

- An amount of Rs. 20,000 per school will be provided to each participating school as a one-time financial assistance for conducting each mock Gram Sabha. The fund may be utilized in the arrangement of a Sabha, including logistic support and refreshment.
- Participating students will be provided certificates of appreciation from the Ministry of Panchayati Raj, motivating them to take an active interest in democratic governance. Best-performing schools will be recognized at the national level, encouraging wider participation.

- There is a token cash award for the winning team at the regional level. The fund may be used for school development.
- Huge cash prizes will be offered to the 3 winning teams at the central level. The fund may be used for school development.
- The ministry would also support the logistics for teams selected for the national-level competition.

The Model Gram Sabha will play a vital role in shaping the vision and responsibilities of young minds toward participatory governance. By fostering awareness, leadership, and engagement, this initiative aims to bridge the gap between youth and local governance, ensuring that the next generation is well-equipped to contribute to India's democratic and developmental journey.

9. Shram Shakti Niti 2025

Context: The Ministry of Labour and Employment has released the draft National Labour & Employment Policy — Shram Shakti Niti 2025 for public consultation, aligning with India's Viksit Bharat @2047 vision.

Shram Shakti Niti 2025:

- Shram Shakti Niti 2025 articulates India's renewed vision for a fair, inclusive, and future-ready labour ecosystem that upholds the dignity of every worker while fostering productivity, innovation, and social justice.

- The Policy aligns constitutional guarantees of equality and welfare with the imperatives of a rapidly transforming world of work.

Why does India need a Shram Shakti Niti and how will it work?

a. India's labour market is experiencing structural shifts driven by digitalisation, green transitions, and new employment forms such as gig and platform work.

b. Shram Shakti Niti 2025 responds through a unified framework integrating social protection, skilling, occupational safety, and technology-led governance.

c. It also repositions the Ministry of Labour & Employment (MoLE) as an Employment Facilitator, enabling convergence among workers, employers, and training institutions through trusted, AI-driven system.

d. The National Career Service (NCS) will evolve as India's Digital Public Infrastructure for Employment, serving as the technological backbone for inclusive job matching, credential verification, and skill.

Mission and Objectives:

To translate this vision into action through seven interlinked strategic objectives:

1. Universal Social Security
2. Occupational Safety and Health
3. Employment and Future Readiness
4. Women and Youth Empowerment
5. Ease of Compliance and Formalisation
6. Technology and Green Transitions
7. Convergence and Good Governance

Guiding principles:

a. **The Policy rests on four pillars**: Dignity and Equality of Labour: Recognising work as a foundation of national prosperity and social harmony.

b. **Universal Inclusion**: Ensuring no worker - formal, informal, migrant, or gig - is left behind.

c. **Cooperative Federalism**: Fostering coordination among Centre, States, and Local Bodies.

d. **Data-Driven Governance**: Harnessing technology for transparency, accountability, and efficiency.

The National Career Service (NCS) will function as India's Digital Public Infrastructure (DPI) for Employment, offering a secure, interoperable platform linking workers, employers, start-ups, and skilling institutions through open APIs and AI-driven tools.

Expected Outcomes by 2047

• Universal worker registration and social-security portability.

• Near-zero workplace fatalities.

• Increased Female labour-force participation.

• Sharp reduction in informality through digital compliance.

• AI-driven labour-governance capacity in all States.

• Creation of millions of green and decent jobs.

• A fully converged One Nation Integrated Workforce ecosystem

Shram Shakti Niti 2025 brings a major change in how India manages labour. It shifts the focus from strict rules and inspections to support and empowerment. The policy helps the Ministry of Labour & Employment act as a National Employment Facilitator, using the National Career Service (NCS) as a digital platform to connect people with jobs. Thus the aim is to create a fair, open, and caring system for workers that reflects India's belief that the value of work is the foundation of inclusive national progress.

10. SOAR- SKILLING FOR AI READINESS PROGRAM

In News: Skilling for AI Readiness (SOAR) Programme, launched by MSDE, aims to equip individuals with AI skills for future-ready careers and digital transformation.

About SOAR:

- It was launched by the Ministry of Skill Development and Entrepreneurship (MSDE).
- It aims to integrate artificial intelligence learning into India's school education and training ecosystem, preparing both students and teachers for a rapidly evolving digital world.
- SOAR's long-term vision is to position India as a global leader in AI by preparing its youth for AI-driven careers and entrepreneurial ventures.

Features of SOAR:

a. **Foster AI awareness**: The SOAR initiative prioritises cultivating AI literacy among school students and educators. For educators, SOAR provides specialised training to incorporate AI modules into existing curricula, ensuring effective delivery and alignment with industry needs.

b. **Support Economic Self-reliance**: SOAR strategically supports India's vision of economic self-reliance (Atmanirbhar Bharat) by equipping youth with skills for high-demand sectors like IT, digital innovation, and AI-driven industries.

c. **Build a Tech-driven India**: SOAR's long-term vision is to position India as a global leader in AI by preparing its youth for AI-driven careers and entrepreneurial ventures. By fostering a robust ecosystem of AI-literate students and educators, the initiative aims to create a pipeline of skilled professionals for roles in AI development, data analytics, and tech innovation.

Artificial Intelligence is revolutionising India's education sector by fostering innovation, enhancing digital literacy, and preparing students for a technology-driven future. In line with the recommendations of the National Education Policy (NEP) 2020, AI is being seamlessly integrated into classrooms and skill development frameworks.

3. INTERNATIONAL RELATIONS

11. INTERNATIONAL CIVIL AVIATION ORGANISATION COUNCIL- INDIA GETS RE-ELECTED

In News: India has been re-elected to the Part II of the Council of International Civil Aviation Organization (ICAO) for the 2025–2028 term.

About ICAO:

ICAO: The ICAO, a specialized United Nations agency established in 1944 through the signing of the Convention on International Civil Aviation in Chicago.

Objective: It sets global standards for safe and peaceful air navigation. ICAO also promotes the orderly growth of international air transport.

Brief Overview:

- Established: 1944 under the Chicago Convention
- Type: Specialized agency of the United Nations
- Headquarters: Montreal, Canada
- Members: 193 countries (including India)

The structure of the International Civil Aviation Organization (ICAO) consists of three main bodies

a. ICAO Assembly
b. ICAO Council
c. ICAO Secretariat

ICAO Assembly:

The ICAO Assembly, convened every three years, is the organization's sovereign body, comprising all 193 signatory States to the Chicago Convention. The 36-member ICAO Council, elected by the 193 Member States during the Assembly, serves as the governing body for a three-year term.

ICAO Council:

- 36 members, elected by the Assembly for a three-year term
- Divided into three parts:
  - Part I: Major air transport states (e.g., US, UK, China, Japan)
  - Part II: States with the largest contribution to civil air navigation (e.g., India, Germany, Brazil)
  - Part III: States ensuring geographical balance (e.g., Bolivia, Malaysia, Ethiopia)

ICAO Secretariat:

The Secretariat is headed by the Secretary General.

Functions: manages daily operations, technical assistance, and standardization

The Secretariat is further divided into five bureaus: Air Navigation, Air Transport, Technical Cooperation, Legal Affairs and External Relations, and Administration and Services.

India and ICAO: Re-election

India is a founding ICAO member, it played a key role in promoting safe, secure, sustainable, and inclusive international civil aviation.

For the 2025–2028 term, India reaffirms its commitment to:

a. Strengthening international aviation safety, security, and sustainability
b. Promoting equitable growth in air connectivity
c. Advancing technology and innovation
d. Supporting ICAO's, No Country Left Behind initiative

Significance of India's re-election to ICAO:

a. **Influence on policy**: India can now contribute to developing global aviation standards and regulations, influencing policies on key issues like carbon emissions and sustainable fuels.

b. **Continued voice in governance:** The re-election ensures India's continued participation in global aviation governance, allowing it to contribute to decision-making on behalf of its national interests and the broader community.

c. **Diplomatic standing:** This re-election, achieved with a stronger mandate, underscores global confidence in India's leadership and its ability to serve as a bridge between advanced economies and the Global South.

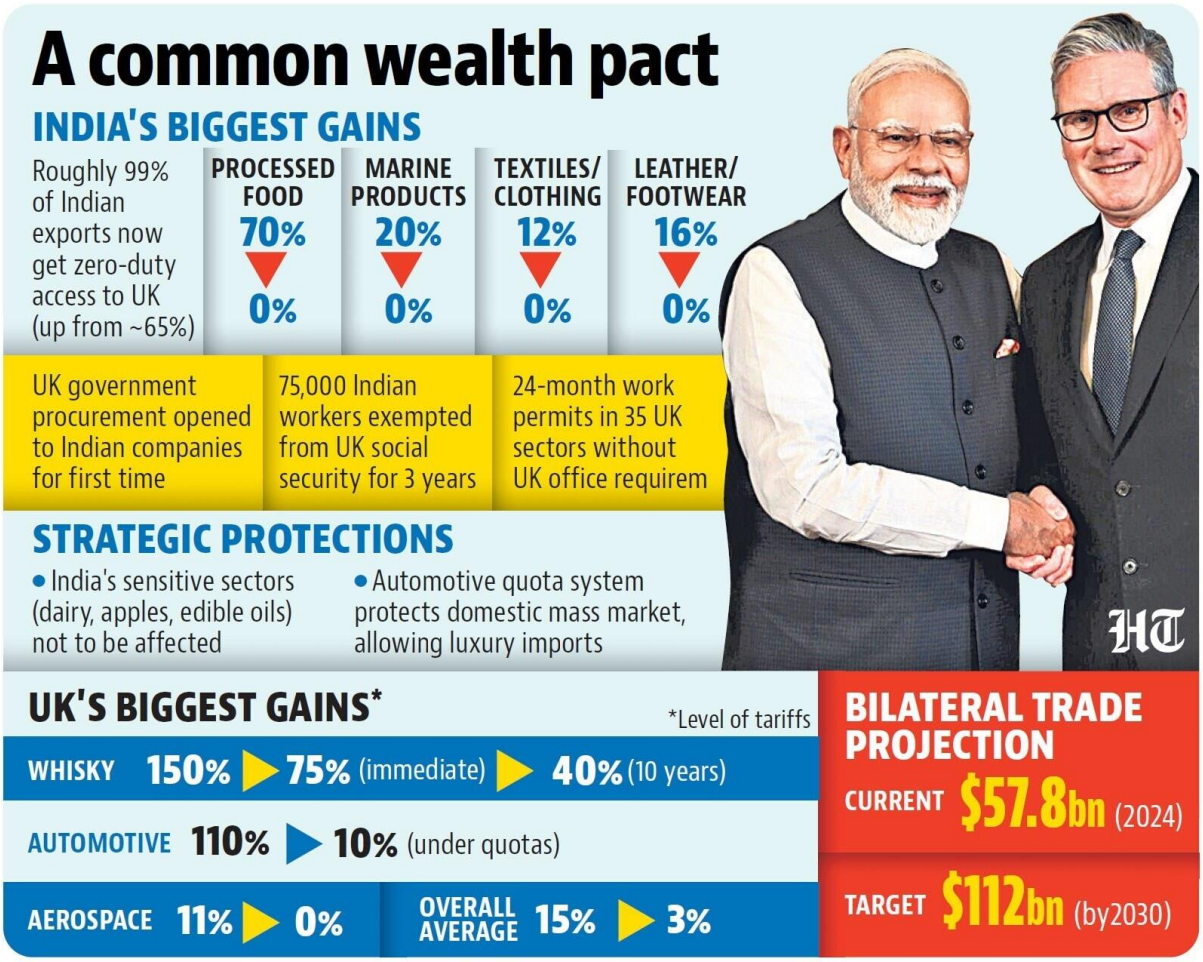
d. **Advancement of safety and sustainability**: India can actively promote ICAO's goals for safe, secure, and sustainable international air transport, including initiatives like the "No Country Left Behind" program.

e. **Economic interests:** A strong presence in the ICAO Council allows India to align its own national connectivity strategies with global developments and influence the future of international air transport in ways that benefit its growing aviation market.

India has maintained an uninterrupted presence on the Council for 81 years. It continues to play a pivotal role in advancing ICAO's mission to promote safe, secure, sustainable, harmonized, and gender-inclusive international civil aviation. India is actively engaged in policy development, regulatory frameworks, and international aviation standards.

12. INDIA-UK ENTER A NEW PHASE OF GROWTH

Context: British Prime Minister Keir Starmer was on a two-day visit to India (October 8-9, 2025).



Background of India-UK trade agreement:

- The visit is reciprocal, following Modi's trip to the UK in July when the two nations signed the India–UK Free Trade Agreement (FTA)
- After three years of intensive negotiations, India and the United Kingdom (UK) successfully concluded a landmark Free Trade Agreement (FTA) on 6 May 2025.
- The agreement is poised to deepen trade and investment ties, promote innovation, and support job creation across both economies, therefore it is hailed as a historic milestone in strategic partnership between the countries.
- It is projected to boost bilateral trade by approximately £25–34 billion by 20401 and enhance the overall well-being of citizens. The FTA also opens avenues for India and the UK to jointly develop products and services for global markets.

- This marks India's first major FTA outside Asia, granting 99% of its exports significant benefits through duty-free access to the UK market. Key sectors expected to gain include textiles, leather, agriculture, seafood, gems, and automotive components.

India-UK dependency partners in an uncertain scenario:

The world is unstable because of US President Donald Trump's unpredictable actions. In this uncertain time, India and the UK are seen as dependable and steady partners.

Free Trade Agreement (FTA) between them is just the first step toward a much closer relationship.

India-UK strengthened relationship:

a. The Indian diaspora, making up 2.6% of the UK's population, plays a vital role in academia, business, politics, and innovation, owning over 65,000 UK-based companies that drive jobs and economic growth.

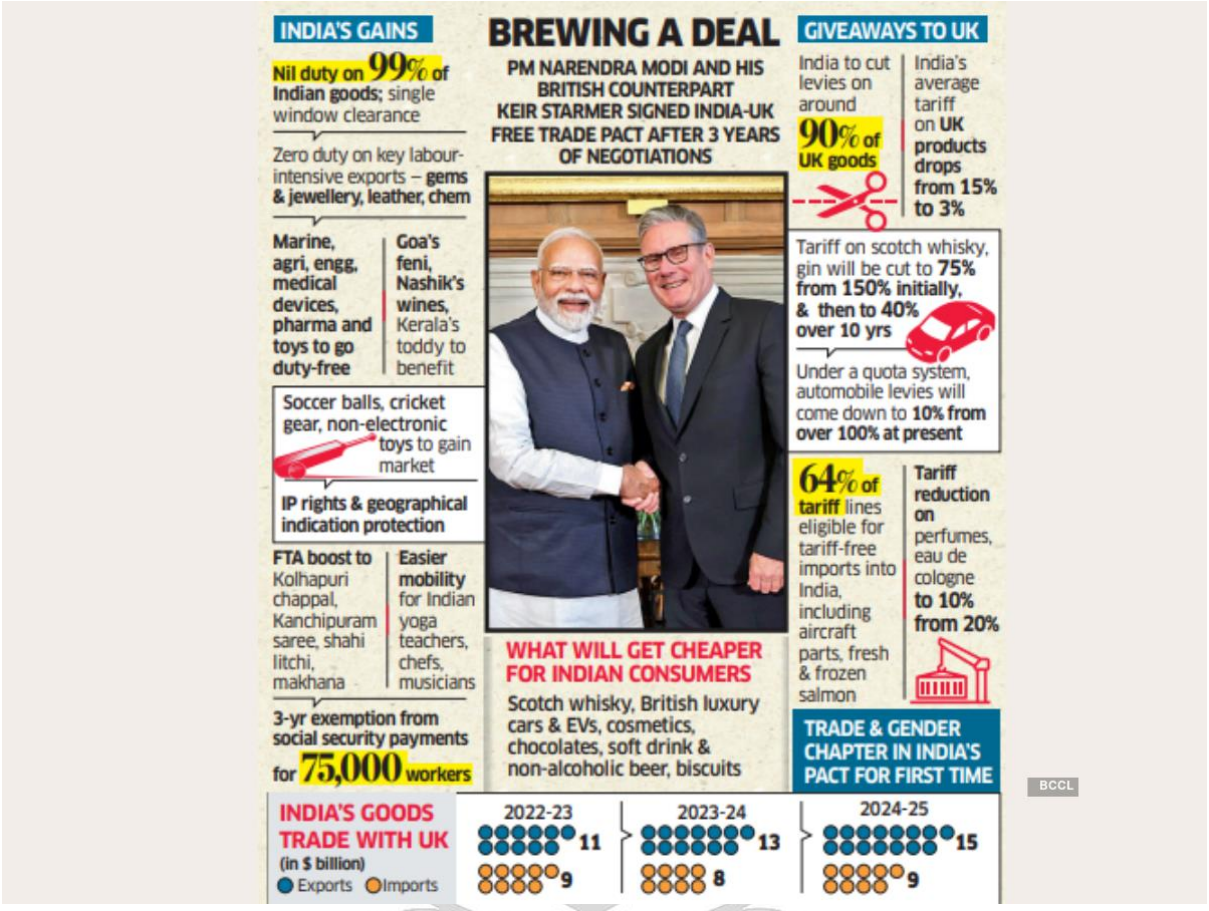
b. This dynamic community serves as a "living bridge" connecting the two nations.

c. The India-UK relationship was recently elevated to a new level through two major diplomatic milestones.

d. In May 2025, the two Prime Ministers announced the conclusion of the India-UK FTA (Free Trade Agreement) and the Double Contribution Convention, a pact aimed at simplifying social security contributions for professionals.

e. This momentum was solidified in July 2025 during PM Modi's visit to the UK with the formal signing of the Comprehensive Economic and Trade Agreement (CETA), the long-term strategic blueprint Vision 2035 document, and a new Defence Industrial Roadmap.

f. The Vision 2035 plan focuses on economic growth, education and skill development, technological innovation, and defence cooperation, charting a comprehensive path for the future of India–UK relations



Both nations are committed to global stability, with India's growing partnership with the UK seen as an important pillar of global stability and economic progress.

13. INDIA-AFGHANISTAN WAY FORWARD

In News: The recent visit of the Afghan Taliban government's Foreign Minister in India has been described as unprecedented & ground-breaking by several geopolitics experts. It is the Taliban's highest-level visit to India since seizing power in 2021.

Recent developments:

a. **Diplomatic relations with Taliban led development**: The visit of Afghan Acting Foreign Minister Amir Khan Muttaqi marked the first direct diplomatic engagement with the Taliban-led government since 2021, signalling thawing ties and enhanced dialogue.

b. **Diplomatic communication**: India and Afghanistan agreed on mutual exchanges of diplomats, facilitating continuous diplomatic communication.

c. **Sovereignty and territorial integrity**: Both nations affirmed respect for sovereignty and territorial integrity, with Afghanistan pledging not to permit use of its soil against India, a crucial security reassurance.

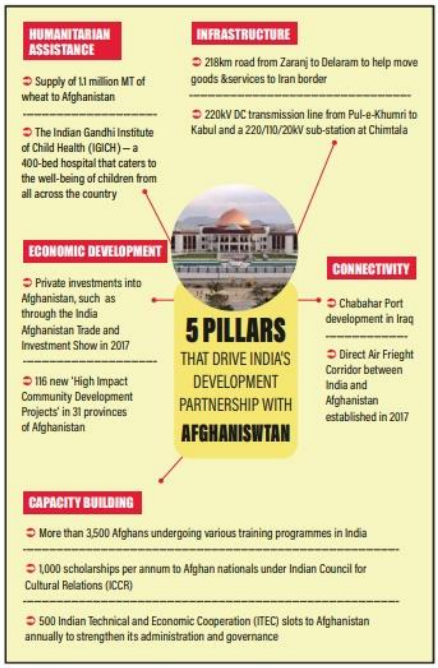
d. **Better trade relations**: Both governments are committed to boosting bilateral trade, aiming to rejuvenate economic ties despite political uncertainties.

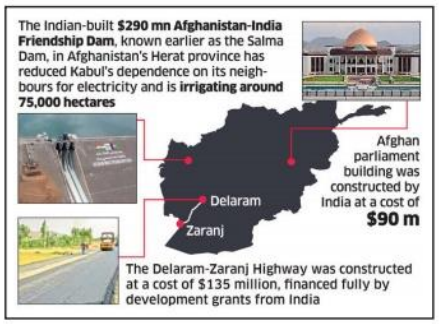
e. **India's assistance to Afghanistan**: India announced infrastructure projects, including hospital construction and extended humanitarian aid, reflecting soft power and developmental diplomacy.

India-Afghanistan relations:

- In the Vedic Age, Gandhara, which forms parts of modern-day Afghanistan, was considered as one of the 16 Mahajanapadas of Vedic India.
- The contact between the people of modern-day India and Afghanistan has existed since the days of the Indus Valley Civilization.
- During the Soviet intervention (1979-89), India was the only South Asian nation to recognise the Soviet-backed Democratic Republic of Afghanistan.
- In 2005, India proposed Afghanistan's membership in the South Asian Association for Regional Cooperation (SAARC).
- Indo-Afghan relations have been strengthened by the Strategic Partnership Agreement signed between the two countries in 2011.

After the takeover of Afghanistan by Taliban, Indian Armed Forces started Operation Devi Shakti to evacuate Indian citizens and foreign nationals from Afghanistan after the collapse of Afghanistan and the fall of Kabul to the Taliban





India-Afghanistan: relationship significance

a. **Regional influence**: Afghanistan's location makes it a crucial partner in India's regional strategy to counterbalance Pakistan's influence.

b. **Connectivity**: Afghanistan is a critical link for India's access to Central Asia through projects like the Turkmenistan-Afghanistan-Pakistan-India (TAPI) gas pipeline and the Chabahar Port corridor.

c. **Terrorism concerns**: India is concerned about Afghanistan being used as a base for anti-India terrorist groups and seeks assurances from the Taliban to prevent this.

d. **Intelligence and capacity building**: India has supported capacity-building for Afghan forces and intelligence coordination to counter transnational terrorism.

e. **Economic opportunities**: Afghanistan's mineral wealth is a major attraction for India, which seeks to gain access to its natural resources, such as lithium, copper, and rare earths.

f. **Bilateral trade**: India-Afghanistan trade relations were supported by air corridors and can be boosted further via regional connectivity projects.

India-Afghanistan relations have been shaped by geography, history, and strategic interests. Afghanistan has historically served as a bridge between South Asia and Central Asia, fostering trade, cultural exchanges, and political alliances.

Since Taliban's takeover in 2021, India has maintained a limited diplomatic presence while focusing primarily on humanitarian and people-to-people assistance.

Areas of concern

- India has not formally recognized the Taliban government, citing concerns over human rights and women's rights.
- The long-standing issue of drug trafficking remains a concern, as the trade could be used to finance terrorism.

Engagement does not equate to endorsement:

The path forward demands patient, principled engagement, robust humanitarian aid, and multilateral collaboration to safeguard India's interests while supporting Afghanistan's peace and progress.

14. INDIA-NEPAL ECONOMIC TIES

In News: RBI Governor (Sanjay Malhotra) highlighted that internationalising Indian Rupee has had a positive impact on India-Nepal relations.

RBI reforms (October 2025)

B. **INR Lending to Non-Residents:** Authorised Dealer (AD) Banks in India are now permitted to lend Indian Rupees (INR) to non-resident entities in Nepal, Bhutan, and Sri Lanka for legitimate cross-border transactions.

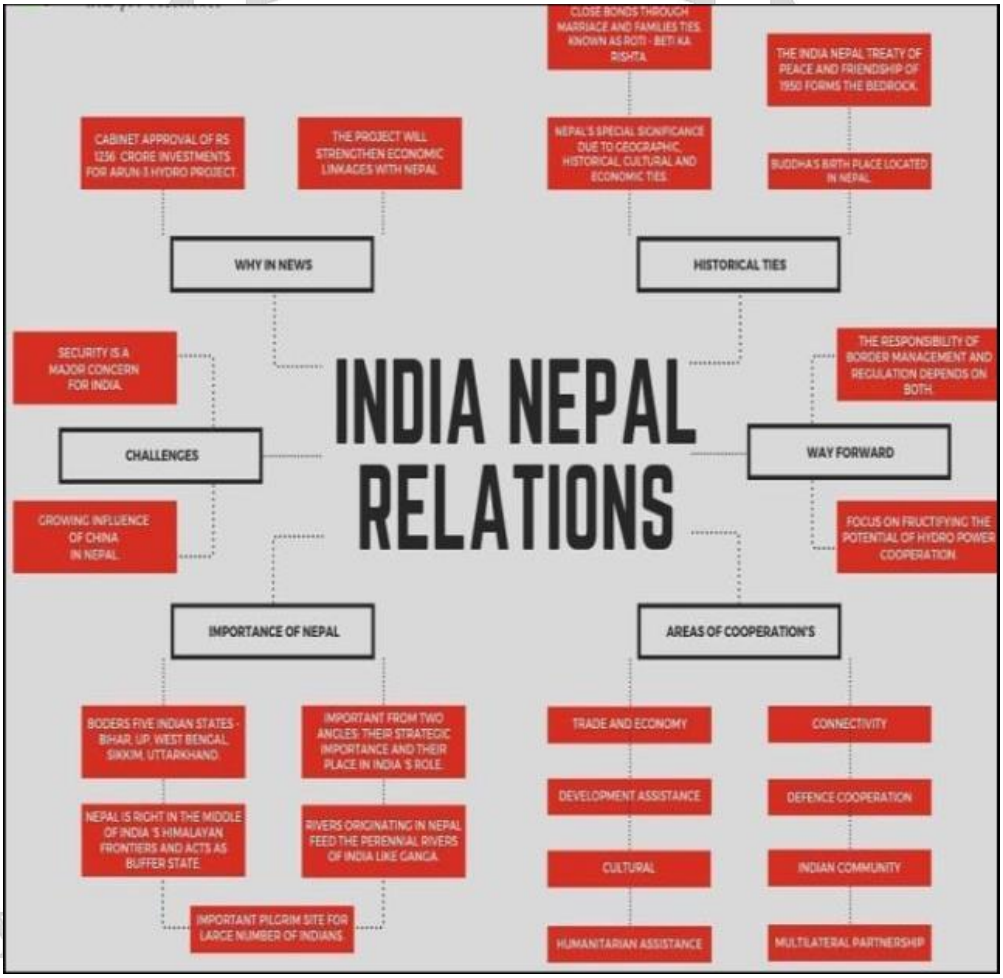
- This measure is expected to ease trade financing, reduce dependency on foreign currencies, and improve liquidity for Nepalese businesses engaged in trade with Indian firms.
- It also strengthens the use of INR as a regional trade currency, enhancing monetary cooperation in South Asia.

C. Special Rupee Vostro Accounts: The RBI has allowed Special Rupee Vostro Accounts to be used for investments in corporate bonds and commercial papers, in addition to

central government securities. This provides foreign banks and financial institutions in Nepal with broader investment options within India.

It promotes capital market linkages and enhances financial interdependence between the two countries.

D. **Transparent Currency Reference Rates**: RBI will now publish reference rates for currencies of India's major trading partners, including the Nepalese Rupee. This aims to make INR-based trade more transparent, reliable, and predictable, reducing currency volatility in bilateral transactions.



India-Nepal relations:

India and Nepal share strong economic ties, with India being Nepal's largest trade and investment partner, accounting for approximately two-thirds of Nepal's trade with other countries and a significant portion of its foreign direct investment.

a. **Trade partner**: India is Nepal's largest trade partner, accounting for about two-thirds of its international trade, while Nepal is India's 17th largest export destination.

b. **Bilateral trade**: The bilateral trade has grown significantly, increasing from approximately $512 million in 2002 to 10.5 billion in 2021.

c. I**nvestment**: India is the largest source of foreign direct investment (FDI) in Nepal, with Indian firms accounting for over one-third of Nepal's total FDI stock, valued at around $670million.

d. **The India-Nepal Treaty of Peace and Friendship (1950):** completing 75 years in 2025, has been the cornerstone of bilateral relations, shaping cultural, economic, and strategic cooperation between the Two Nations.

e. **Energy and infrastructure**: Nepal possesses an estimated hydropower potential of 40,000 MW, while India faces rising electricity demand. India and Nepal have signed a long-term power trade agreement to export 10,000 MW of electricity from Nepal to India over the next decade, marking a major step in energy cooperation and regional integration.

f. **Connectivity and Infrastructure**: India's investments in cross-border connectivity—including railways (Jayanagar–Kurtha, Jogbani–Biratnagar), highways, Integrated Check Posts (Birgunj, Bhairahawa), and petroleum pipelines—have enhanced Nepal's access to sea routes and global trade.

India-Nepal economic ties: challenges

a. **Rupee dominance**: Nepal's over-reliance on the Indian Rupee (INR) exposes its economy to India's monetary shocks and can lead to political opposition within Nepal, which perceives this as a form of dominance.

b. **Currency and credit risks**: Maintaining the INR-NPR exchange rate peg requires careful monetary coordination. The expansion of cross-border credit without oversight could lead to debt vulnerabilities in Nepal.

c. **Institutional and regulatory gaps**: There are challenges in aligning regulatory processes, such as the Nepal Rastra Bank (NRB) needing to reform its processes to align with updated Reserve Bank of India (RBI) norms.

d. **Political Instability and Governance Deficits**: Nepal's political landscape experienced intense unrest in 2025, catalysed by youth-led protests against corruption,

unemployment, and suppression of dissent. Such instability disrupts policy continuity, affecting India–Nepal bilateral projects and cooperation.

e. **Territorial dispute and Anti-India Sentiments**: The rise of nationalist narratives in Nepal has introduced diplomatic strains. Particularly, the 2020 territorial dispute over Kalapani, Lipulekh, and Limpiyadhura has magnified perceptions of Indian territorial encroachment.

f. **Economic and Trade Imbalance**: Nepal's persistent trade deficit with India remains a pressing challenge. While India supplies over 64% of Nepal's imports, Nepal's exports to India constitute less than 10% of bilateral trade, making Nepal economically dependent.

China's influence in Nepal

g. **Belt and Road Initiative (BRI):** China's BRI has led to a surge in Chinese investment and projects, providing Nepal with alternative development and connectivity options to those historically dominated by India.

h. **Economic dominance**: China's trade with Nepal has grown significantly, and it has become a major source of investment, with Chinese firms becoming dominant players in infrastructure projects.

i. **Increased tourism:** A rise in Chinese tourism strengthens China's economic and cultural footprint in Nepal.

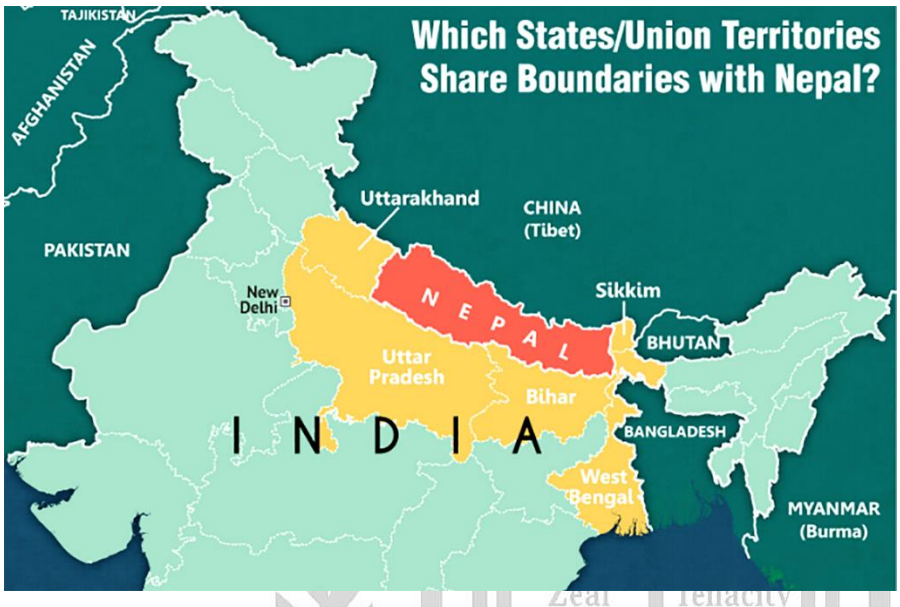
j. **Strategic implications**: India views China's expanding economic and strategic presence in Nepal as a challenge to its regional influence and security, especially along the sensitive Himalayan border, making it more vulnerable.

Balancing act for Nepal and India

a. **Nepal's balancing act:** The Nepali government states its engagement with China is primarily economic and not a threat to India. However, its increased ties with China complicate its relationship with India.

b. **India's recalibration**: To maintain its influence, India needs to adapt its policies to ensure its investments in infrastructure and energy are competitive with China's offerings.

c. **The need for cooperation**: Despite the challenges, both nations must find ways to manage their relationship, acknowledging the deep historical, cultural, and economic ties, while also addressing newer strategic concerns.



15. INDIA- ASEAN SUMMIT 2025

Context: The 22nd ASEAN-India Summit was held on 26 October 2025 in Kuala Lumpur. It was attended by the Indian Prime Minister virtually.

PM's virtual Address:

a. In his address, Prime Minister congratulated Timor Leste on becoming the 11th Member of ASEAN, welcomed the delegation at its first ASEAN-India Summit as a full member of ASEAN, and conveyed India's continued support for its human development.

b. Reiterating India's support for ASEAN Unity, ASEAN Centrality, and the ASEAN Outlook on the Indo-Pacific, Prime Minister complimented ASEAN on adoption of the ASEAN Community Vision 2045.

c. Prime Minister emphasised that early review of the ASEAN-India FTA (AITIGA) can unleash the full economic potential of our relationship for the benefit of our peoples and further strengthen regional cooperation.

d. Prime Minister stated that terrorism is a serious challenge to global peace and security, and stressed the importance of unity in the fight against terrorism.

e. In support of the Malaysian Chair's theme of "Inclusivity and Sustainability", PM announced:

Extended support for implementation of the ASEAN-India Plan of Action to implement the ASEAN-India Comprehensive Strategic Partnership (2026-2030)

- Adoption of the ASEAN-India Joint Leaders' Statement on Sustainable Tourism to strengthen tourism cooperation, as part of celebrating the ASEAN-India Year of Tourism
- Designation of the year 2026 as the "ASEAN-India Year of Maritime Cooperation" to forge partnerships in blue economy
- Proposing to organise the Second ASEAN-India Defence Ministers' Meeting and the Second ASEAN-India Maritime Exercise for a secure maritime environment
- India will continue its role as a First Responder in times of crisis in the neighbourhood, and further strengthen cooperation in Disaster Preparedness and HADR
- Training of 400 professionals in renewable energy, for supporting the ASEAN Power Grid initiative
- Extending Quick Impact Projects (QIPs) to Timor Leste
- The proposed establishment of a Centre for Southeast Asian Studies at Nalanda University, to develop regional expertis
- Supporting ongoing cooperation in education, energy, science and technology, fintech and cultural preservation, and emphasised the need for increasing cooperation in infrastructure, semiconductor, emerging technologies, rare earths and critical minerals
- Holding the East Asia Summit Maritime Heritage Festival at Lothal, Gujarat, and a conference on Maritime Security Cooperation

The summit also designated 2026 as the "ASEAN–India Year of Maritime Cooperation" and endorsed the ASEAN-India Plan of Action for 2026–2030.

Key outcomes from the summit

a. **Strengthened partnership:** Leaders reviewed progress in the ASEAN-India Comprehensive Strategic Partnership and discussed initiatives to strengthen it further.

b. **Maritime cooperation** : 2026 was designated as the "ASEAN–India Year of Maritime Cooperation" to enhance collaboration in the Blue Economy and maritime security.

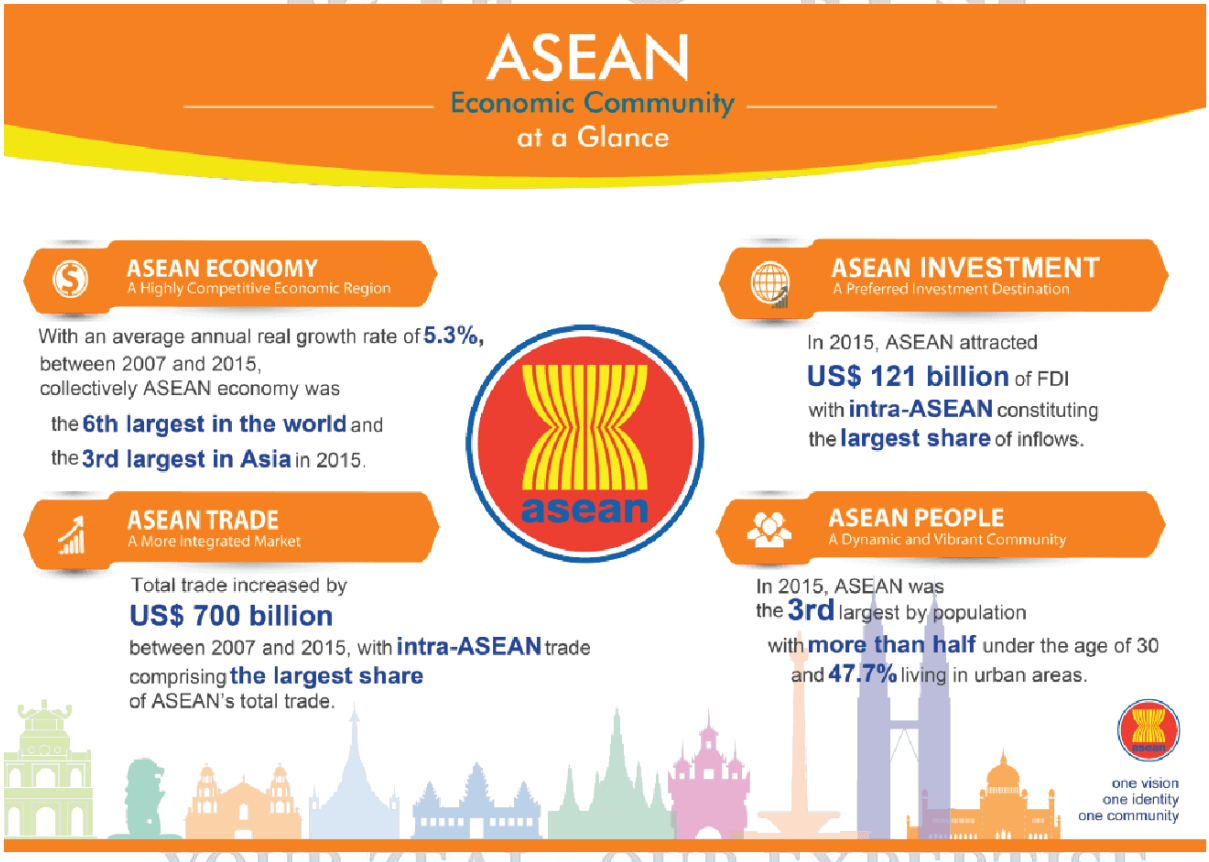
c. **Connectivity:** The summit focused on enhancing connectivity and sustainable development.

d. **ASEAN Outlook on the Indo-Pacific**: India reaffirmed its commitment to ASEAN Unity, Centrality, and the ASEAN Outlook on the Indo-Pacific (AOIP).

e. **Economic and technological collaboration**: Discussions included deepening cooperation in areas like infrastructure, technology, energy, and semiconductors.

About ASEAN:

ASEAN, the Association of Southeast Asian Nations, is a regional organization established in 1967 to promote economic, political, and social cooperation among its 11 member states. Its members are Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Vietnam, and Timor-Leste.



How is ASEAN significant for India?

a. **Large Market**: ASEAN is a market of over 650 million people with a combined GDP of $3.2 trillion, offering significant opportunities for Indian businesses.

b. **Trade Partner**: It is India's fourth-largest trading partner, with bilateral trade exceeding $123 billion in 2024-2025.

c. **Supply Chain Resilience**: The partnership is vital for creating more resilient and diversified supply chains, reducing over-dependence on single countries.

d. **Geopolitical Counterbalance**: Strengthening ties with ASEAN helps India counterbalance China's growing influence in the Indo-Pacific region.

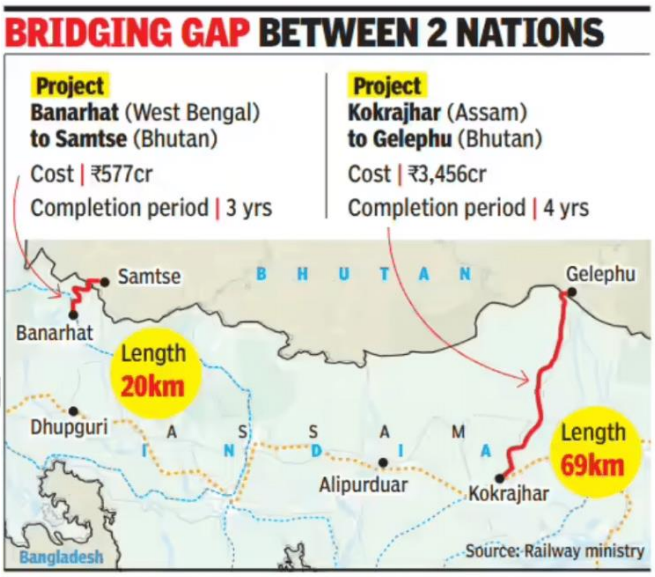
e. **Maritime Security:** ASEAN is critical for ensuring maritime security, addressing piracy, and upholding freedom of navigation in the South China Sea and other critical waters.

f. **Regional Stability**: The partnership contributes to a rules-based security framework and overall regional peace and stability.

16. INDIA-BHUTAN RECONNECT

Context: The Prime Minister of India was on a two-day state visit to Bhutan. To mark his presence at the 70th birthday celebrations of the Fourth King, Jigme Singye Wangchuck (K4), father of the current monarch King Jigme Khesar Namgyel Wangchuck.

Significance of the Visit: The visit reaffirms the India-Bhutan special partnership, rooted in mutual trust, shared spiritual heritage, and developmental cooperation under India's Neighbourhood First Policy.



India and Bhutan are significantly boosting their connectivity and economic ties through major infrastructure projects, especially new cross-border railways (Kokrajhar-Gelephu, Banarhat-Samtse), enhanced road links, multimodal logistics access, and major hydropower deals like Punatsangchhu-II, all reinforced by frequent high-level visits and India's substantial development aid, strengthening their already robust partnership.

Key Highlights of the recent visit:

a. **Economic assistance**: India reaffirmed its support for Bhutan's 13th Five Year Plan and Economic Stimulus Programme, and announced backing for the Gelephu Mindfulness City project and an Immigration Check Post at Hatisar, Assam.

b. **Strengthening Hydropower infrastructure**: India and Bhutan inaugurated the 1020 MW Punatsangchhu-II Project and resumed work on the 1200 MW Punatsangchhu-I Project, strengthening their hydroelectric partnership.

c. **Cross-border connectivity**: Both sides reaffirmed commitment to strengthen cross-border connectivity and infrastructure, building on initiatives like the Darranga Check Post and Jogigopha Multimodal Terminal.

d. **Trade and Agriculture Cooperation**: India institutionalised the supply of essential commodities and fertilisers to Bhutan, with the first consignment ensuring uninterrupted agricultural inputs.

e. **Cultural ties**: India has announced land for the construction of a Buddhist temple in Varanasi. This is in addition to the previously inaugurated Bhutanese temple in Nalanda.

Issues faced by Bhutan today:

f. **Youth unemployment**: Decades of unaddressed economic and social problems and little economic diversification have contributed to youth unemployment (17.8%).

g. **Migration:** over 9% of its population has migrated elsewhere, hollowing out the country's working population and bureaucracy.

h. **Population ageing**: By 2027, the country will also transition into an ageing society.

i. **Chinese Intrusion**: China has continued intrusions into Bhutanese territories, pressuring the country to demarcate borders and enhance diplomatic relations.

How is Bhutan dealing with these issues?

j. **Investment**: It is investing significantly in technology to improve its economy, governance, and efficiency.

k. **Governance**: the State has introduced Gyalsung — a policy of mandatory national service for Bhutanese attaining 18 years of age — to promote a new form of civic nationalism.

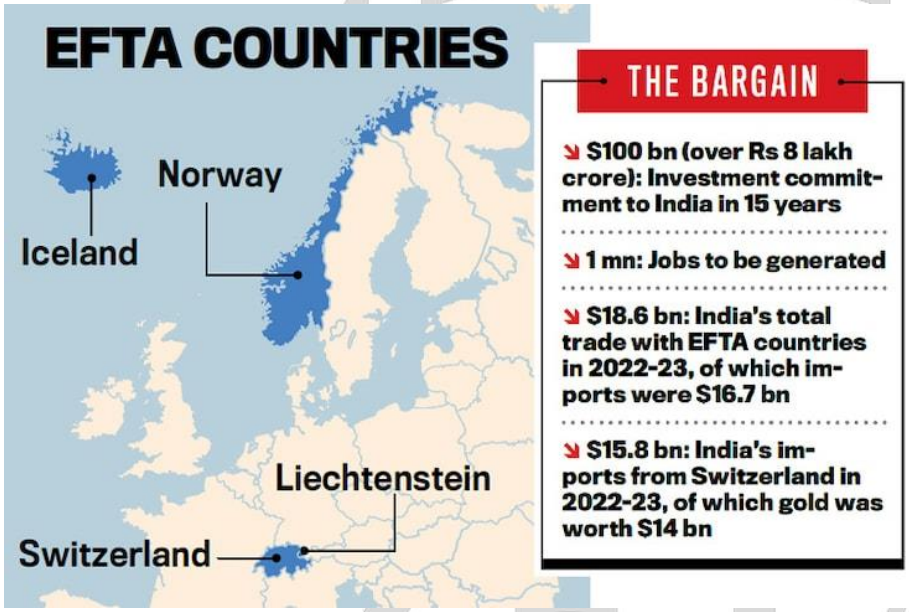
**This is also being supplemented by the flagship project of Gelephu Mindfulness City (GMC), a special administrative region bordering Assam, intended to draw investments, promote innovation, and economic growth.

l. **Help from India**: India is assisting Bhutan with Gyalsung and is also helping with the GMC's success by enhancing connectivity. India also offered Bhutan its first-ever Line of Credit worth ₹4,000 crore in the energy sector. This is in addition to the ₹10,000-crore assistance for Bhutan's current Five-Year Plan and economic stimulus package.

The visit was both symbolic and substantive. By touching upon several issues like connectivity, development cooperation, culture, energy, and defence and security, India has demonstrated that it will remain a steadfast partner to the country even as it faces a new set of domestic changes.

17. INDIA-EFTA DEAL

In News: The India-EFTA Trade and Economic Partnership Agreement (TEPA), effective Oct 1, 2025, is a major FTA with Iceland, Liechtenstein, Norway, and Switzerland.



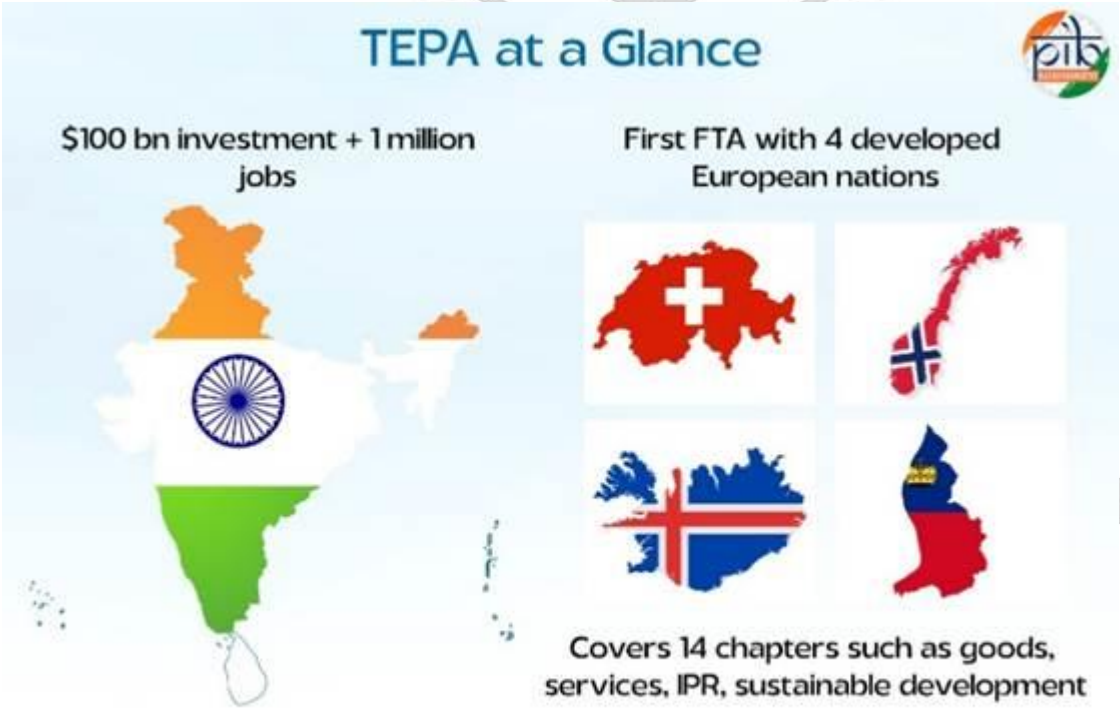
India-EFTA Deal:

- The India-EFTA FTA (Trade and Economic Partnership Agreement (TEPA) was finalized in March 2024, and came into effect on 1st October 2025.
- TEPA commits USD 100 billion in investments and 1 million direct jobs over 15 years, the first binding pledge of its kind in any Indian FTA.

What is TEPA?
TEPA (Trade and Economic Partnership Agreement) is a modern and ambitious agreement which, for the first time in any Free Trade Agreement (FTA) signed by India, includes binding commitments on investment and job creation.

- It strengthens India's global trade ties, complementing recent FTAs with UAE, Australia, and the UK.

- EFTA covers 92.2% of tariff lines (99.6% of India's exports), while India covers 82.7% (95.3% of EFTA's exports), protecting key sectors like dairy, soya, coal, and agriculture.
- The pact expands market access, drives manufacturing and innovation, and strengthens cooperation in technology and sustainability.
- Services exports gain through digital delivery, commercial presence, professional mobility, and Mutual Recognition Agreements (MRAs) in fields such as nursing, accountancy, and architecture.
- This is India's first Free Trade Agreement with four developed European nations, Switzerland, Norway, Iceland, and Liechtenstein, and one of the most ambitious in scale and intent. It represents a strategic convergence between India's Atmanirbhar Bharat vision and EFTA's search for resilient, diversified partnerships.
- The agreement consists of 14 chapters, focusing on key areas such as market access for goods, rules of origin, trade facilitation, trade remedies, sanitary and phytosanitary measures, technical barriers to trade, investment promotion, services, intellectual property rights, trade and sustainable development, and other legal and horizontal provisions.
- At its core, the agreement envisions unlocking $100 billion in investments and creating one million direct jobs in India over the next fifteen years, marking it as one of the most forward-looking trade partnerships in the country's economic history.



Key objectives:

a. **Investment & Jobs**: A binding commitment of $100 billion in FDI over 15 years, expected to create 1 million jobs, aligning with 'Make in India'.

b. **Market Access**: Near-zero tariffs for India's industrial goods (machinery, chemicals, textiles) and processed foods, improving competitiveness.

c. **Services & Mobility**: First Indian FTA with MRAs for professions (nursing, CA, architecture), easing work for Indian professionals in EFTA.

d. **IPR Protection**: Ensures TRIPS-level IPR commitments, safeguarding India's generic medicines sector.

e. **Technology & R&D:** Access to EFTA's tech in precision engineering, renewables, R&D.

f. **Trade Facilitation**: EFTA Desk in India acts as a single-window for investors, streamlining processes.

g. **Sustainable Development**: Commit to core ILO labor standards, implement multilateral environmental agreements (UNFCCC, Paris Agreement), and encourage sustainable practices.

h. **Supply Chain Resilience**: Build more resilient and integrated supply chains between India and EFTA through cooperation and reduced trade barriers.

EFTA Nations	Products / HS Codes	Tariff Concessions / Opportunities
Switzerland	Food Preparations	Tariffs up to 127.5 CHF/100 kg eliminated; scope for Indian exports
	Confectionery, Biscuits	Duty cuts create opportunities in processed foods
	Fresh Grapes	Tariffs up to 272 CHF/100 kg eliminated
	Nuts & Seeds, Fresh Vegetables	Zero tariffs post FTA, boosting competitiveness
Norway	Food Preparations, Condiments	Duty-free access on several tariff lines
	Rice	Tariff reductions (non-feed purposes) open new markets
	Processed Vegetables & Fruits	Duty-free access on selected lines
	Biscuits, Malt Extracts, Beverages	Tariff relief improves access for Indian brands
Iceland	Processed Foods	High MFN tariffs (up to 97 ISK/kg) cut to zero
	Chocolate & Confectionery	Duties eliminated; strong potential for processed food exports
	Fresh/Chilled Vegetables	Tariff elimination

India's way forward with TEPA

- For India, TEPA is more than a trade pact, it is an instrument of strategic trust with like-minded economies that value transparency, rule-based trade, and innovation.
- It also demonstrates a mature approach to trade liberalisation, one that protects domestic interests while projecting India as a reliable partner in global supply chains.
- By opening doors to investment, employment, technology and sustainability, TEPA captures the essence of a modern economic partnership, ambitious, balanced, and forward-looking.

The India–EFTA Trade and Economic Partnership Agreement (TEPA) represents a historic milestone, establishing India's first FTA with four developed European nations. It brings with it commitments of

USD 100 billion in investments and the creation of 1 million direct jobs over the next 15 years. The agreement enhances market access for goods and services, strengthens intellectual property rights, and promotes sustainable and inclusive development, while advancing the objectives of Make in India and Atmanirbhar Bharat.

18. NAVIGATING GLOBAL ECONOMIC TRANSFORMATION- HOW GLOBAL ORDER IS BEING RE-SHAPED BY INDIA-CHINA RELATIONS

Context: as USA and China are engaging in great-power conflict, a new global ecosystem has emerged which is based on maximising self-interest. In this scenario it will be interesting to see how India-China relations will re-shape the global order.

New Economic paradigms:

a. Populist autocracy- state- capital Gordian knot

Populist-autocracy means power-centric governance that prioritises big business. States place loyal oligopolies above competitive markets and public interest. Policy favours private gain, public assets are pledged and citizen welfare is side-lined. This results in tightening of the state-capital Gordian knot.

> **Gordian Knot:** The "Gordian knot" refers to a legend about Alexander the Great and a complex knot he famously "cut" with his sword to solve a problem, and the phrase is now used to describe a difficult or intractable problem that requires a bold and decisive solution.

b. Myopic notion of states having spheres of influence:

When state policies are formulated to favour corporates, the governance becomes primordial. This is evident from America's recent policies where it is trying to force Taiwan to shift chip manufacturing to USA, fortifying supply lines for rare earth minerals which is monopolised by China and fusing digital currency ecosystem with foreign policy as seen in Pakistan. These are trivial ways in which USA is going back to dividing regions as spheres of control. Thereby igniting regional conflicts and genocides.

c. **Digital colonialism**: Digital colonialism means that global tech companies and cloud service providers gain power and profit by controlling data and online platforms in other countries. Their algorithms and data systems influence what people think and often support governments that restrict digital freedoms. This problem is growing because of new AI policies, laws like the CLOUD Act, the political use of systems like SWIFT, and state-run digital currencies being tested by around 100 central banks.

d. **Sanctions and tariffs:** USA's tariffs (on 70 nations) and sanctions (on 30 plus nations) has impacted free flow of trade, capital, people and ideas. This also shows how America is unwilling to absorb goods from surplus producing countries like Japan, Europe, China and penalising these countries.

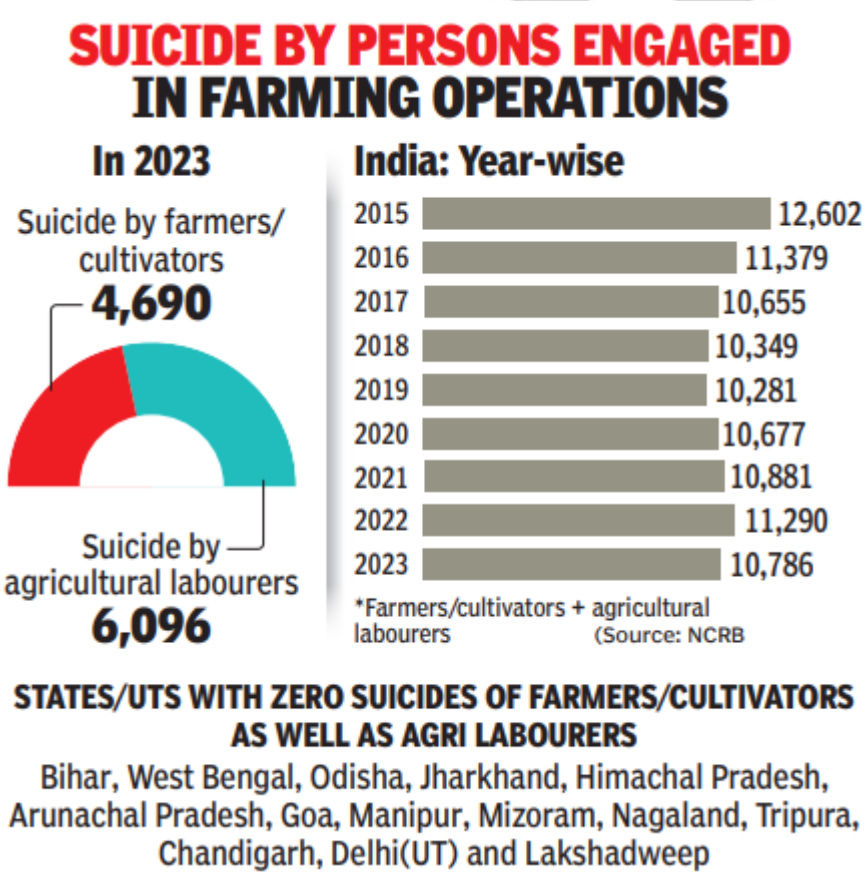
Amidst these concerns Global South is seeking alternatives through bilateral treaties, localising production, securing supply chains. Though the Western countries are also charting independent path. This also provides opportunities for India-china.

4. ECONOMY

19. FARMER SUICIDES IN INDIA

In News: according to the NCRB (National Crime Records Bureau) report of the ministry of home affairs over 10,700 farmers and agricultural workers died by suicide, with Maharashtra and Karnataka recording the highest numbers.

The number of such suicides, however, declined by more than 4% in 2023 compared to 2022 when 11,290 persons involved in farming committed suicide.



Key highlights of the report:

- **Maharashtra**: Reported the highest share at 38.5% of farmer suicides, with Marathwada and Vidarbha remaining epicentres.
- **Karnataka:** Accounted for 22.5%, reflecting widespread distress across drought-prone regions.
- **Andhra Pradesh, Madhya Pradesh, and Tamil Nadu**: Reported 8.6%, 7.2%, and 5.9% respectively.

- **Zero Reports**: States like West Bengal, Bihar, Odisha, and several north-eastern states officially reported no farmer suicides, though experts question the accuracy of this data
- **Cultivators (Farmers):** 4,690 suicides (mostly male).
- **Agricultural Workers**: 6,096 suicides, indicating that landless labourers also face severe economic stress.
- The NCRB data highlights that more than 10,000 suicides annually have been consistently reported from the farming sector in 2021, 2022, and 2023.
- Experts and farmer organisations argue that the figures may be underreported due to discrepancies in state-level data recording.

Crisis of Farmers suicide: Reasons

a. **Dependence on cash crops**: dependence on cash crops like cotton and sugarcane is the main reason for distress among farmers as these crops require huge investments in terms of farm inputs. This pushes farmers into the clutches of moneylenders.

b. **Limited reach of farmer income support:** though there are farm income support and easy loan facility, the reach of such programs is limited. Many farmers continue to face the brunt of high input costs and disasters.

c. **Regional Concentration**: Farmer suicides are often concentrated in cotton and soybean belts like Vidarbha and Marathwada in Maharashtra, highlighting the vulnerability of monocrop-dependent regions.

d. **Market Volatility**: Price fluctuations in key crops like cotton, soybean, onion, and pulses reduce profitability.

Farmer organisations such as the All India Kisan Sabha (AIKS) argue that the government's policies have aggravated rural distress rather than alleviating it.

Key criticisms include:

- **Trade Liberalisation**: Removal of the 11% import duty on cotton has sparked fears that cheaper American cotton will further undercut Indian farmers.
- **Impact of Free Trade Agreements (FTAs):** Concerns that upcoming FTAs could threaten domestic agriculture, dairy, and edible oil sectors.
- **Policy Indifference**: Critics argue that successive governments have failed to draw lessons from the crisis, remaining focused on corporate-driven models of growth.

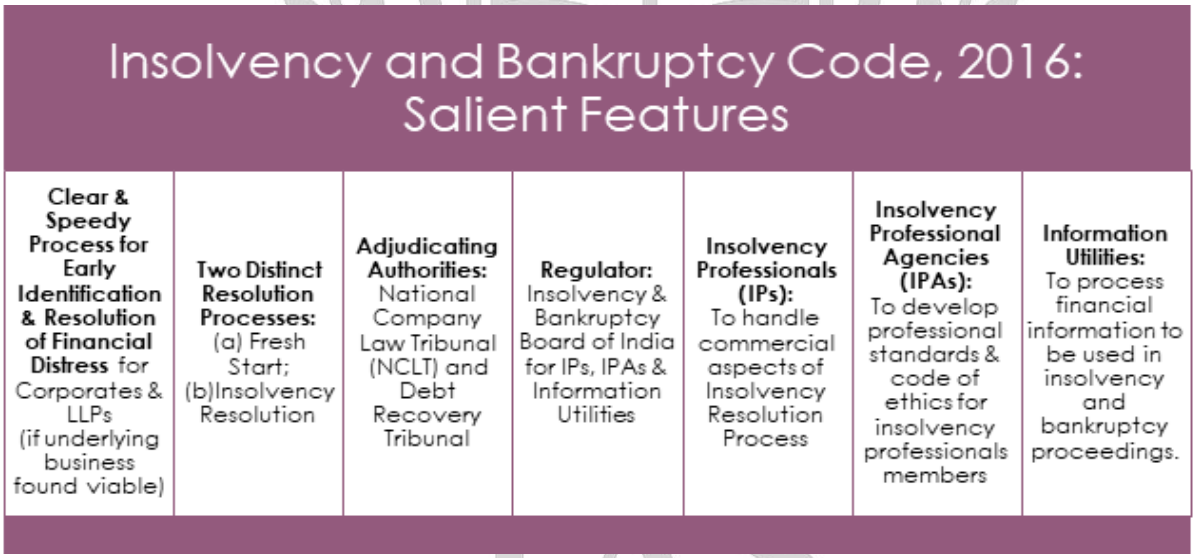
The data shows that farmers growing cotton and soybeans are facing serious problems, and many suicides are happening in these areas. This clearly means that agricultural changes should not be done in parts but should aim to improve the overall security of rural livelihoods.

20. CLEAN SLATE DOCTRINE UNDER INSOLVENCY AND BANKRUPTCY CODE

Context: The Insolvency and Bankruptcy Code, 2016 ("IBC") has reshaped insolvency framework in India by prioritising time-bound resolution and certainty for stakeholders. At the heart of this framework lies the clean slate doctrine, which ensures that once a resolution plan is approved, the successful resolution applicant ("SRA") takes over the corporate debtor free from historical liabilities.

About Clean Slate Doctrine:

- The Clean Slate Doctrine is a key legal principle embedded in the Insolvency and Bankruptcy Code, 2016 ("IBC"), which plays a pivotal role in the corporate insolvency process in India.
- The doctrine suggests that once a company successfully undergoes the insolvency resolution process and is taken over by a new buyer, the new owner should not be held accountable for any of the company's pre-existing debts, penalties, or liabilities.
- This principle is designed to give the company a fresh start, essentially, a "clean slate" free from the baggage of its prior financial.



The Insolvency and Bankruptcy Code (Amendment) Act, 2021 amended the Insolvency and Bankruptcy Code, 2016 . It introduced an alternate insolvency resolution process for Micro, Small and Medium Enterprises (MSMEs) with defaults up to Rs 1 crore called the Pre-packaged Insolvency Resolution Process (PIRP).

Major objectives of the Insolvency and Bankruptcy Code are as follows:

- To consolidate and amend all insolvency laws that are existing in India.
- To simplify and expedite the process of resolution of Insolvency and Bankruptcy in India.

- To protect the interest of creditors, including stakeholders in a company.
- To revive the company in a time-bound manner.
- To promote entrepreneurship.
- To get the necessary relief to the creditors and consequently increase the credit supply in the economy.
- To work out a new and timely recovery procedure to be adopted by the banks, financial institutions or individuals.
- To set up an Insolvency and Bankruptcy Board of India.
- Maximization of the value of assets of corporate persons.

The need for a new Insolvency and Bankruptcy Code can be seen as follows:

- Previously, India had several overlapping laws and adjudicating forums aimed to address financial failure and insolvency of companies and individuals.
- This led to undue delays in the recovery of the NPAs by the Banks.
- The Insolvency and Bankruptcy Code (IBC Code) was needed to consolidate all the laws related to Insolvency and Bankruptcy resolution and to simplify the process of insolvency resolution.

21. INDIA'S PRIVATE INVESTMENT SLOWDOWN

Context: Despite strong GDP growth and policy incentives, India's private sector investment remains weak, raising concerns over sustainable growth and job creation.

Private Capex

- Private capex is basically the engine that powers long-term economic growth. When businesses build new factories, set up plants, or invest in new technology, they're not just spending money for themselves.
- They're also creating jobs, boosting demand for raw materials, and setting up future production capacity.
- Government spending can certainly give the economy a push, but it's private companies that usually make that growth broad-based and self-sustaining.
- When private investment is weak, the economy starts leaning too heavily on the government, and that's not sustainable forever.

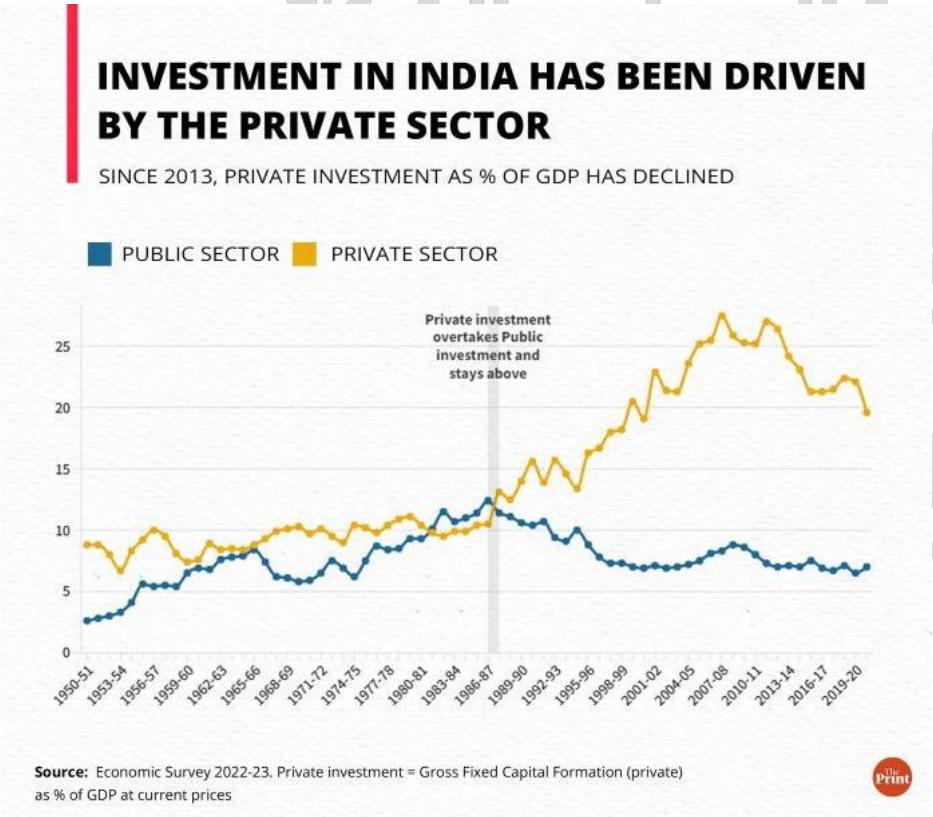
What is the concern?

In absolute terms, private investment is touching new highs, yet as a share of GDP it remains historically low.

Private investments as a share of GDP rose from around ~13% during the reforms to 21% in the early 2000s, reaching its highest-ever peak at ~27.5% in 2007–08. Even the Global Financial Crisis of 2008 caused only a temporary dip; private capex recovered to ~27% of GDP by 2011–12.

Since about 2012, however, private capex as a share of GDP has been on a downward trajectory. It slid to ~21% of GDP by 2015–16

By the mid-2020s, private capex has improved from its CoVID-era lows, but is still relatively subdued in a historical context. The total Gross Capital Formation — which includes investments from the government, households and private sector — was ~30% of GDP at the end of 2024, well below the peak of ~41% in 2011.



Significance of Private Investment for Sustained Growth

a. While the government has been working to boost private consumption through tax reliefs, direct cash transfers, and GST cuts, this is only a means to an end — the real goal is to trigger private investment.

b. Higher consumer demand is expected to encourage businesses to expand, build new factories, and invest in capacity creation.

c. To support this, the government has increased public spending on infrastructure — roads, ports, and power — hoping to "crowd in" private investment.

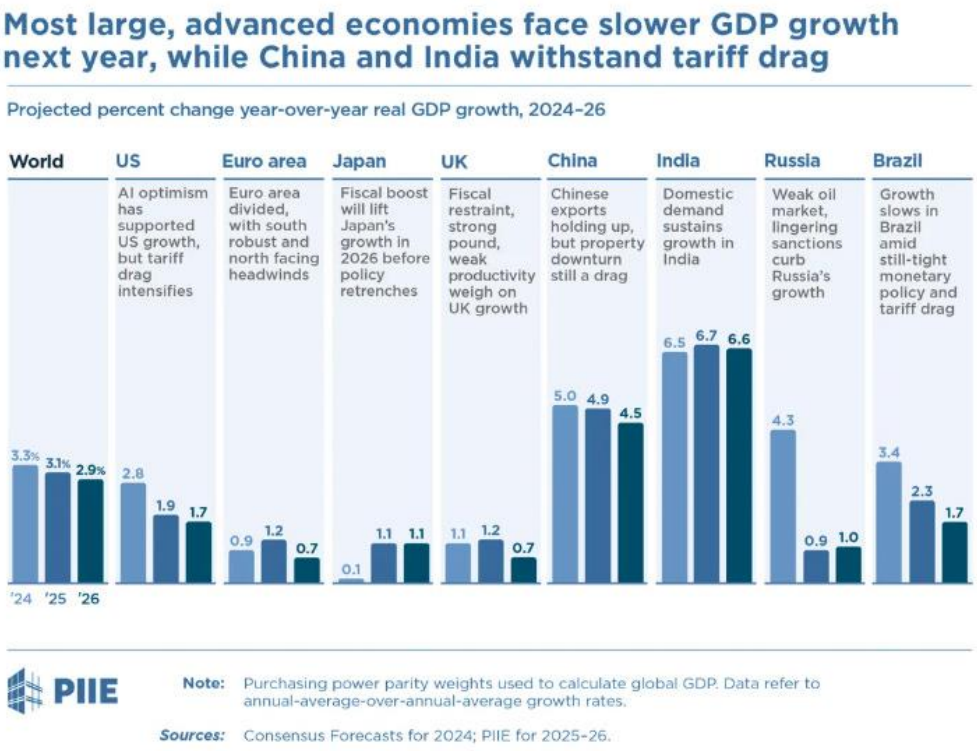
d. A thriving private investment environment reduces the burden on government spending. It aligns with the vision of "Minimum Government, Maximum Governance."

Reasons for low private investment:

a. **Drop in domestic consumption**: In recent years, domestic consumption has been on the softer side, which reduces the incentive for companies to expand capacity. Both urban and rural consumption have shown signs of weakness.

b. **Uncertainty in Global economy**: export demand has also been uncertain. Global trade frictions (e.g. U.S.–China trade issues) and slowing world economy mean Indian firms cannot bank on surging exports. Lingering trade uncertainties and only limited tariff protections have made companies cautious about investing for export-oriented growth.

c. **Low or mistrust among private investment**: there is an intangible trust deficit or confidence issue affecting private investment. Unpredictability in economic policies or regulatory overreach can make companies hesitant. Sudden tax or regulatory changes, demonetization and other such policies have seriously dented private sector's confidence.



Government efforts and outcomes of the same:

a. **Fixing the banking system**: after the NPA crisis peaked in 2018, the Government made desperate attempts to fixing the banking system. Bad loans were written off, a bankruptcy

code was put in place, and public sector banks were recapitalised. Yet, the private investment did not grow.

b. **Corporate income tax cut**: The Corporate income tax cut in 2019 was the steepest. The move was simple lower taxes should boost corporate profits, and higher profits should lead to more investments. But the private sector was burdened by high taxes not weak demand.

c. **Production linked incentive scheme**: it provided directly subsidised private investment in targeted sectors. More than 800 projects and about ₹1.76 lakh crore worth of intended investments were cleared. Yet, strip away the subsidy-led projects, and the overall private investment numbers stayed underwhelming.

d. **GST simplifications and income tax cuts**: aimed at putting more money in consumers' hands and stimulating demand. Because ultimately, companies invest when they see customers. If consumer spending remains weak, incentives alone can't force a capex cycle to take off.

Government capex can build the stage, but the private sector still has to step up and perform. Without private sector investment India's growth will be lethargic.

22. SAFEGUARDING INDIA'S DIGITAL ECONOMY

Context: India's digital transformation — powered by affordable Internet, digital banking, and e-commerce — while enhancing convenience and inclusion has also created a fertile ground for cybercrime.

Cybercrime status and report in India:

- Over 13.9 lakh cybercrime cases were reported in India in 2023 (NCRB), but experts estimate many go unreported due to stigma or distrust in institutions.
- Social engineering is at the core—fear, greed, urgency—exploited via phishing, OTP/UPI frauds, loan/job scams, remote access malware, and fake government impersonations.
- Elderly and rural citizens: digitally illiterate yet financially vulnerable.
- Banks: often issue generic advisories, fail to detect abnormal transactions, and allow mule accounts with weak KYC.
- Cyber police: lack manpower, training, and AI-driven tools, reducing their effectiveness.

> Social engineering is the tactic of manipulating, influencing, or deceiving a victim in order to gain control over a computer system, or to steal personal and financial information .

Constitutional and Institutional Dimensions

- Right to Privacy (Justice K.S. Puttaswamy vs Union of India, 2017) – protection of personal and financial data is a fundamental right under Article 21.
- Article 300A – guarantees the right to property; digital fraud undermines this protection.
- RBI Regulations – mandate zero liability protection to customers in specific cases of fraud.
- CERT-In – nodal agency for cybersecurity incidents under the IT Act, but lacks retail-level fraud prevention capacity.

Potential threats to cybersecurity

a. Social Engineering Fraud – phishing, OTP/UPI frauds, job/loan scams, and impersonation frauds.

b. Identity Theft & Data Breaches – misuse of Aadhaar, PAN, and bank details due to leaks and weak encryption.

c. Mule Accounts & Money Laundering – enabled by weak KYC, making fund recovery difficult.

d. Institutional Negligence – banks often fail to flag abnormal high-value transactions; cyber police remain under-equipped.

e. Cross-Border Scams – fraud networks exploit jurisdictional loopholes and limited international cooperation.

Legal & Regulatory Frameworks

- Digital Personal Data Protection (DPDP) Act : Establishes data protection, consent rights, and responsibilities for data fiduciaries, with a Digital Data Protection Board for grievance redressal.
- Telecommunications Act, 2023 : Imposes penalties for tampering with telecom identifiers (like IMEI) to secure networks.
- IT Act, 2000 Modernization: Needs updates for AI, blockchain, and cross-border cybercrimes.

Way forward:

- **Empower Cyber Police**: Provide better tools, training, and 24/7 rapid response units.
- **Cross-Border Cooperation**: Strengthen international partnerships (INTERPOL, Budapest Convention) for intelligence sharing.
- **Financial Sector Reforms**: Tighten KYC, audit mule accounts, and mandate swift victim compensation.
- **Mandatory Audits**: Conduct regular cybersecurity audits for financial institutions and government departments.

23. PRESUMPTIVE TAXATION: PROPOSED BY THE NITI AYOG

In news: the NITI Ayog in its working paper titled "Enhancing Tax Certainty in Permanent Establishment and Profit Attribution for Foreign Investors in India.' Has proposed introduction of presumptive tax to attract more foreign investment and facilitate ease of doing business in India and ease dispute resolution to realize the objective of Viksit Bharat by 2047.

Need for presumptive Tax:

a. India is now a top choice for foreign investment, with over USD 1 trillion in FDI coming in since 2000.

b. But global companies often face long-running tax disputes in India, especially about what profits should be taxed and where their main business is really located (called Permanent Establishment, or PE rules).

c. To solve this, NITI Aayog suggests a new, simpler tax option for foreign firms

d. Foreign companies could pick "presumptive taxation"—they pay tax on a set percentage of their India-based income, instead of calculating exact profits and fighting over rules.

e. If a company thinks it's being charged too much, it can choose normal detailed tax filing instead.

f. This method makes tax rules clearer, cuts down arguments and paperwork, and could encourage more foreign investment in India

What is Presumptive tax?

- Presumptive taxation is a simplified tax regime where taxable income is calculated as a fixed percentage of gross revenue, rather than through detailed accounting.

- This mechanism reduces the compliance burden, avoids prolonged disputes, and provides certainty to businesses.

India already uses presumptive taxation in limited sectors such as:

- Electronics manufacturing services: 25% of gross payments are deemed as profit.
- Non-resident cruise operators: 20% of gross receipts deemed as profit.

NITI Aayog's proposal seeks to extend this principle across sectors, particularly those involving digital services, technology, and offshore supply, where disputes are more common.

Features of proposed presumptive tax:

a. **Choose Your Tax Plan:** Foreign companies can pick either the new simple tax method or keep using India's regular tax rules.

b. **Different Sectors, Different Rates**: The amount considered as profit will change based on the type of industry, usually between 5% and 30%. For example, tech companies might pay tax on 5% of revenue from offshore supply and 20% from work done in India.

c. **No Arguments Over 'Permanent Establishment'**: If a company uses the presumptive tax system, the government won't argue about whether it has a 'Permanent Establishment' in India for those activities—removing a major cause of disputes.

d. **Much Easier Paperwork**: Companies using this method don't need to keep lots of detailed Indian records or go through long audits.

e. **Switch Back Anytime**: If a company finds its real profit is less than the fixed rate, it can change back to the regular tax system.

How will India benefit from it?

a. **Less Tax Disputes**: The new system makes tax rules clearer for global companies, reducing fights over how much profit should be taxed and where their main business happens

b. **Easier for Businesses**: Foreign companies spend less time and money on paperwork, audits, and complex tax filings, making it simpler to operate in India.

c. **More Foreign Investment**: With clear, predictable rules, international companies are more likely to invest, helping India attract higher-quality FDI.

d. **Faster Tax Collection**: The government gets a steady stream of tax revenue without waiting for long court cases or investigations.

e. **Boosts the Economy**: Easier tax rules encourage more companies to set up and hire in India, supporting growth and jobs.

Challenges:

a. **Double Taxation Risk**: There's a risk that foreign companies could be taxed in both India and their home country if other countries don't recognize the presumptive regime, especially when international tax treaties are involved.

b. **Conflict with Tax Treaties**: The new system might not align with existing tax treaty principles, which use detailed analysis of a company's activities and profits (called the "FAR" method), potentially leading to disputes and uncertainties.

c. **Setting Fair Profit Rates**: It is difficult to decide fair, industry-specific profit percentages for different sectors. If the rates are too high, companies may be discouraged from using the regime and might even avoid investing in India.

d. **Updating and Monitoring**: The government must regularly review and update these rates to reflect real business trends, which adds complexity to administration.

e. **Preventing Tax Revenue Loss**: Authorities need to make sure the new regime does not cause significant loss in tax revenue for India.

f. **Administrative and Data Issues**: Ensuring coordination between central and state tax bodies and protecting corporate data privacy under the simplified scheme pose operational challenges.

g. **Legal Uncertainty**: There may still be legal debates about who can use the scheme, how to switch in and out, and what part of income qualifies, causing some confusion and litigation risk.

The presumptive tax regime is a promising reform that makes tax filing much simpler for foreign companies and supports India's push to attract global business. At the same time, successful implementation depends on careful rule design, updating profit rates, and managing concerns around double taxation and treaty conflicts. If challenges are addressed, presumptive taxation can boost investor confidence, ease compliance, and help grow India's economy and tax base.

5. SCIENCE AND TECHNOLOGY

24. INDIA'S FIRST FULL-STACK 4G NETWORK

In news: India has marked a historic milestone with the launch of its first fully indigenous 4G (5G-ready) network and the commissioning of nearly 98,000 Swadeshi 4G towers, all powered by homegrown technology. The core network, developed by C-DOT, with Tejas Networks' Radio Access Network and integration by TCS, exemplifies a major technological breakthrough and the realization of the Government's commitment to Aatmanirbhar Bharat.

With this development, India joins a small group of countries, including China, Denmark, Sweden, and South Korea that manufacture their own telecom equipment.

About 4G:

- 4G (fourth-generation wireless) represents the broadband mobile communication standard that succeeded 3G and paved the way for 5G.
- It delivers high-speed internet, enabling HD video streaming and wireless broadband connectivity without wired ISP networks.
- Technologies such as LTE, MIMO, and OFDM power 4G networks, offering higher bandwidth, lower latency, and improved efficiency.

Features of the 4G Stack

a. **End-to-end indigenous stack**: Radio Access Network (Tejas), Core Network (C-DoT) and domestic integration, therefore reducing dependency on foreign vendors and building local capability.

b. **Software-first/ cloud native**: Enables rapid upgrades, scalability and easier future migration path to 5G.

c. **Future proofing**: Sites and architecture described as "5G ready," facilitating an upgrade path without replacing large parts of the deployed infrastructure.

Benefits:

BSNL's indigenous 4G services are expected to benefit tribal regions, remote villages, and hilly areas by providing access to quality digital services. This will enable children in rural areas to attend online classes, farmers in distant locations to check crop prices, and patients to consult doctors through telemedicine. Additionally, the initiative will greatly support armed forces personnel by enhancing secure communication through improved connectivity.

Benefits & Impact of the Indigenous 4G Stack

a. **Strategic Autonomy and Digital Sovereignty**: The fully indigenous 4G stack empowers India to control its telecom infrastructure, reducing reliance on foreign technologies and enhancing national security, thereby strengthening the country's strategic autonomy and digital sovereignty in critical communication networks.

b. **Employment generation and supply-chain development**: Localised manufacturing and deployment are creating employment, strengthening supplier ecosystems, and nurturing a skilled domestic workforce capable of designing, testing, and maintaining advanced telecom systems. This adds both human capital and supply-chain autonomy to India's telecom sector.

c. **Catering to domestic demand with global potential**: The fully indigenous 4G stack is not only meeting India's internal requirements but is also designed with export potential, with several countries having already expressed interest.

d. **Rapid development through indigenous capability**: The entire 4G architecture was indigenously built in just 22 months, a pace significantly faster than comparable nations.

e. **Expanding scale and reach**: More than 92,000 4G sites have been commissioned across the country, connecting over 22 million citizens. For two million users, this marks their first entry into the digital era. The network is managing nearly four petabytes of data traffic every day with efficiency and security.

f. **Realisation of the Swadeshi principle**: The deployment reflects the Swadeshi ethos, transforming an idea into a growth engine that promotes domestic production, cultivates indigenous skills, inspire community enterprise, and embeds economic dignity into everyday life.

g. **Financial turnaround and citizen trust:** Confidence in homegrown technology has enabled BSNL to record consecutive profitable quarters after 17 years of financial strain. This turnaround underlines the trust citizens place in institutions aligned with the vision of Aatmanirbhar Bharat.

The successful deployment of indigenous 4G technology and expansion of 5G is accelerating digital connectivity and strengthening India's telecom ecosystem for future advancements. these efforts pave the way towards Viksit Bharat 2047, where India not only builds for itself but also empowers the world in the era of 5G, 6G, and beyond.

25. BHARAT DRONE POLICY

In News: The Ministry of Civil Aviation recently made public the Draft Civil Drone (Promotion and Regulation) Bill, 2025, and invited feedback from stakeholders and citizens.

Main Features:

a. The Draft Civil Drone (Promotion and Regulation Bill) 2025 proposed provisions such as mandatory registration, safety and security features, as well as insurance, amongst other requirements for unmanned aircraft systems' (UASs) operations in the country.

b. The law covers individuals and entities engaged in drone ownership, operation, design, manufacture, import, export, leasing, training or maintenance, but excludes unmanned aircraft used by the armed forces or those weighing over 500 kilograms, which will be governed under the Bharatiya Vayuyan Adhiniyam, 2024.

c. Directorate General of Civil Aviation (DGCA) will be the primary regulatory authority.

d. Scope: The bill applies to various entities involved in drones but exempts military/security drones and those over 500 kg, which fall under the Bharatiya Vayuyan Adhiniyam, 2024.

e. Pilot Certification: Remote pilots need a valid Remote Pilot Certificate.

f. Digital Sky Zones: The existing system for classifying airspace will continue, using Digital Sky zones.

g. Penalties: The bill includes provisions for penalties, including jail terms, fines, and confiscation of devices for non-compliance.

Need for a Drone Policy:

The applications of drones are numerous and in fields as diverse as agriculture, mapping, defence, and emergency response. This makes them indispensable in a country like India which has vast rural, forested, and hilly areas that cannot be easily accessed. As an emerging new technology that can be leveraged by different sectors, drones should be promoted so that their unique advantages are widely used.

a. **Paradigm Shift**: For civil transport, drones present the opportunity to create new means of moving people from one place to another. The new rules appear to directly address this opportunity for Indian players, with drone corridors being created across the country for cargo deliveries. These will provide supply-chain opportunities aside from conventional surface and air transport.

b. **Boost to manufacturing**: the stage is set for manufacturers, both start-ups and older companies, to study and develop both the technology and the different applications of drones. The Indian drone industry already has over 100 manufacturers and 200 service providers and provides employment to nearly 25,000 people. Accordingly, the new rules facilitate the development of drone manufacturing in the country.

c. **Strategic importance**: The policy acknowledges the strategic importance of drones for national security, economic development, and governance, aligning with the "Make in India" and "Atmanirbhar Bharat" initiatives.

d. **Potential for balanced growth**: The success of the policy will depend on its ability to balance national security with economic goals, ensuring that regulations promote rather than stifle innovation and growth.

The Bharat Drone Policy 2025 (Civil Drone Bill 2025) signifies a comprehensive, though stricter, legal framework for India's drone sector, aiming to boost adoption through clearer rules and lower costs via a unified 5% GST on drones. Its significance lies in streamlining operations via a unified GST and color-coded airspace zones, while also increasing compliance burdens like mandatory UIN registration and insurance for all operators.

If implemented effectively then it will surely boost India’s manufacturing application especially in the agricultural sector.

26. AI AND ARMED FORCES IN INDIA

Context: AI has become a force multiplier for the Army with enhanced surveillance, intelligence, and precision targeting. Operation Sindoor (May 2025) was India’s first AI enabled operation.

Background:

As per a senior Army officer, Operation Sindoor is the first cross-border operation in a conflict that India had undertaken with heavy use of Artificial Intelligence (AI) that cut the “kill chain” for the Army, and provided exact coordinates of threat to carry out pinpointed strikes with “human in the loop”.

How did AI work?

- AI was fed with 26 years of historical data, which provided the Indian Army with information on Pakistan military movement, enabling pinpoint targeting.
- With this modelling and live feed, 94 percent accuracy was achieved, allowing the army to pinpoint where a particular machine, such as a gun or missile unit, would be located on the border.
- These capabilities are being upgraded with a military-specific large language model (LLM), which is expected to become operational in about six months.
- A total of 23 applications were brought together to provide a full battlefield picture and post-strike assessment.
- AI-based tools enhanced surveillance, intelligence, and precision targeting. Key systems include the Electronic Intelligence Collation and Analysis System (ECAS), TRINETRA (integrated with Project SANJAY), and predictive modelling and weather forecasting tools—all of which improved coordination and situational awareness.
- An in-house app was able to provide exact weather conditions for 48 hours ahead, including the wind speed, which enabled the Army to plan and fire extended range artillery with pinpointed precision.
- The Army has seen a 1,200 percent increase in users and a 620 percent rise in data storage capacity. These advances have made the Army's digital backbone more interconnected and efficient, supporting decision-making across all levels.

Ongoing AI Initiatives

- "AI as a service" is being introduced across the Army, ensuring military personnel have access to tools equivalent to civilian smart device applications.
- The "Jigyasa" military Generative AI ensures independence from commercial AI models within the Army.

AI Development and National Alignment

The Indian Army is focused on building AI capabilities without targeting specific countries, aligning with the IndiaAI mission approved by the Union Cabinet in March 2024, with a budget of ₹10,371.92 crore.

27. ATMA-NIRBHARTA IN SPACE

Context: India's space programme, spearheaded by the Indian Space Research Organisation (ISRO), has transformed the nation into a prominent power in global space exploration. From the historic launch of Aryabhata, India's first satellite in 1975, the country has progressed to pioneering cost-effective satellite launches with the PSLV, delivering over 400 foreign satellites into orbit.

The turning point for India's space program came in 2014 with the introduction of major space reforms. The government has initiated a series of policy changes aimed at opening up the space sector to private participation and international collaboration. These reforms have been a game-changer, unlocking India's space potential and setting the stage for a quantum leap forward.

The global space economy is currently valued at about USD 360 billion. Despite being among a few spacefaring nations in the world, India accounts for only about 2% of the space economy.

Key achievements:

The Indian Space Research Organisation (ISRO), the principal space agency, has been at the forefront of this transformation. The success story of India's self-reliance in space technology extends beyond ISRO.

a. NISAR (2025)

- NISAR is the first of its kind mission, jointly developed by ISRO and NASA. The satellite was launched on July 30, 2025 from Satish Dhawan Space Centre, Sriharikota.
- NISAR mission's primary objectives are to study land & ice deformation, land ecosystems, and oceanic regions in areas of common interest to the US and Indian science communities.
- This mission marks the first joint Earth observation collaboration between NASA and ISRO, set to launch aboard GSLV-F16, which will provide all-weather, day-night imaging of the Earth's land and ice-covered surfaces.

c. The Axiom-4 Mission (2025)

- The Axiom Mission 4 has enabled human spaceflight for India, Poland, and Hungary, with each nation's first government-sponsored flight in more than 40 years. While Ax-4 marks these countries' second human spaceflight mission in history, it is the first time all three nations executed a mission on board the International Space Station.
- Experiments conducted aboard the ISS on microalgae, seed sprouting, tardigrades, muscle cell regeneration, cyanobacteria growth, human–device interaction, and crop seed exposure to microgravity have progressed or concluded, with samples returned for post-mission analysis.

d. Space Docking and Servicing (SpaDeX)- 2025

- SpaDeX demonstrated India's capability in docking, undocking, refuelling, and payload transfer, which are essential for a self-sustained space station.
- On January 16th, 2025, India became the fourth country to successfully carry out a satellite docking process in Low Earth Orbit (LEO).
- Approval has been granted for the development of a five-module space station, with the first module slated for launch in 2028.

e. Chandrayaan-3 (2023)

- Launched on July 14, 2023, Chandrayaan-3 marked a historic achievement for India as it successfully landed near the Moon's South Pole.

- This mission made India **the first country** to achieve a soft landing in this region, which is of great scientific interest due to its permanently shadowed craters that may contain water ice.
- Chandrayaan-3 made India the first country to land on the lunar south pole and furthered scientific knowledge of lunar soil and the environment.

f. Aditya L-1: India's first solar mission (2023)

- It is aimed at studying the Sun from an orbit around the Sun-Earth Lagrangian point 1 (L1) which is about 1.5 million kilometres from the Earth.
- In February 2025, The Solar Ultraviolet Imaging Telescope (SUIT) onboard Aditya-L1 captured an unprecedented view of a powerful solar flare 'kernel' in the lower solar atmosphere, namely the photosphere and the chromosphere.

Towards Atmanirbharta in Space:

a. **Reduced dependence on foreign technology:** Public-private collaboration is being emphasized, with over 300 Indian start-ups now active in satellite and exploration technologies, enabling rapid innovation and reducing dependence on foreign technology. India is prioritizing the development of indigenous rockets, satellites, and infrastructure, with flagship missions like Bharatiya Antariksh Station targeted for 2035 and an Indian Moon landing by 2040.

b. **Expanding Space Policy Reforms**: Recent reforms, such as opening the space sector to private firms and increasing the FDI threshold to 100%, have invigorated entrepreneurship and investment, boosting both technical capabilities and global competitiveness. Initiatives under the Indian Space Policy 2023 and the establishment of IN-SPACe foster a robust regulatory support for non-governmental actors, allowing for more efficient satellite launches and development of launch vehicle.

c. **Strategic Projects and Missions**: Upcoming milestones include the Gaganyaan human spaceflight program, indigenous experiments aboard international missions, and global collaborations like NISAR with the US and Chandrayaan-5 with Japan. The planned space station will support international research and interplanetary exploration, increasing India's autonomy and technological stature.

d. **Promoting Cost-Efficient Innovation**: India's continued focus on low-cost, high-efficiency missions has made it an attractive player in the global launch market, facilitating Make in India for the World approaches.

e. **Investment in Education and R&D**: Increasing budget allocation and establishment of venture funds for space research are accelerating indigenous innovation and advanced skill development, ensuring India stays at the forefront of space

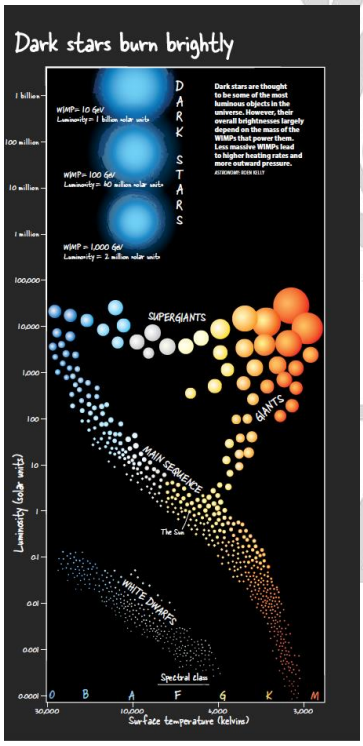
technology. Programs aimed at promoting space education and awareness strengthen the domestic talent base

The global space economy is currently valued at about USD 360 billion. Despite being among a few spacefaring nations in the world, India accounts for only about 2% of the space economy. Over the last two decades, the private sector has played an increasingly important role in other spacefaring countries within the global space economy.

India's path to Atma Nirbharta in space is defined by a blend of indigenous innovation, supportive policy, vibrant private participation, and impactful international cooperation.

28. DARK STARS

Context: Astronomers recently unearthed evidence that some of the earliest luminous objects in the universe may be "dark stars", stars powered not by nuclear fusion but by dark matter annihilation.



What are dark Stars?

Dark stars are a hypothetical type of massive, ancient star theorized to be powered not by nuclear fusion, but by the annihilation of dark matter particles.

Formation and Properties

Scientists propose that dark stars may have been the first stars to emerge about 200 million years after the Big Bang, forming within dense regions of dark matter called "minihalos".

These stars would be composed of normal matter like hydrogen and helium, but their immense size and brightness are sustained by the energy released from dark matter annihilation rather than fusion.

Despite the name, dark stars are actually extremely luminous and can grow to sizes a million times greater than the Sun, yet maintain relatively cool surface temperatures (about 10,000 K).

Importance in Cosmic Evolution

Dark stars are of interest because they may solve the mystery of how supermassive black holes formed so rapidly in the early universe. Their large mass and brightness could act as seeds for these black holes and influence cosmic evolution.

Detection Efforts and Current Status

Efforts to detect dark stars involve searching for giant, cool, and extremely luminous objects in the early universe, often using advanced telescopes like the James Webb Space Telescope. Some scientists theorize that remnants or "WIMP burners" powered by dark matter might still exist in galactic center.Dark stars are theoretical objects representing the earliest, most massive and brightest phase of stellar evolution, powered by dark matter rather than nuclear reactions, and

potentially central to understanding the formation of supermassive black holes.

6. Environment and Ecology

29. India to mandate Acoustic Vehicle alerting system (AVAs) in EVs from 2026 for safer roads.

In News: The Ministry of Road Transport and Highways (MoRTH) has proposed making Acoustic Vehicle Alerting Systems (AVAS) mandatory for all new electric cars, buses, and trucks starting October 2026.

AVAs:

AVAS aims to enhance pedestrian safety by generating sound alerts at low speeds, addressing the silent-movement risk of EVs.

While global markets have already adopted similar standards, India's regulation marks a major step in aligning with international EV safety norms.

How it works?

- AVAS produces artificial sound when an EV moves at speeds below 20 kilometres per hour, alerting pedestrians, cyclists, and other vulnerable road users to the vehicle's presence.
- At higher speeds, natural tyre and aerodynamic noise is sufficient to signal the approach of an EV.

- According to the US Department of Transportation, electric vehicles have a 20 percent higher risk of pedestrian accidents than petrol or diesel vehicles, with the risk rising to 50 percent at low speeds. Recognising this, the US, Japan, and the EU already mandate AVAS in certain categories of EVs.
- The draft notification also suggests removing the requirement for vehicle manufacturers to provide spare tyres in models equipped with tubeless tyres. This provision will affect cars, three-wheelers, and quadri-cycles.

Other perspective:

- While the industry is equivocally welcoming the move, stating its potential to tackle road safety risks for pedestrians and cyclists, especially for people with visual impairments, in the scenario where the roads are dominated by silent electric vehicles, there are contrasting views on whether the regulations should apply to all electric vehicles, including e2w, e3w, etc., or should it be limited to heavy vehicles like electric buses and electric trucks only.
- The development of AVAS systems can be designed to be highly effective, with energy performance also optimised for the electric vehicle's battery operation. This will also lead to new opportunities for manufacturing some EV components as a part of India's clean mobility ecosystem

A sound profile that is either similar to conventional ICE vehicles or one that distinctly differentiates EVs can create a balance between safety, comfort, and awareness. With the right implementation, AVAS can strengthen both road safety and user confidence in EV adoption.

30. STRICTER CAFÉ-III REGULATION TO TIGHTEN FUEL EFFICIENCY TARGETS

Context: The central government has been planning to update the Corporate Average Fuel Efficiency (CAFE) norms, which are aimed at regulating the average carbon dioxide (CO_2) output of an automaker's entire fleet.

What is Corporate Average Fuel Efficiency (CAFÉ) norms?

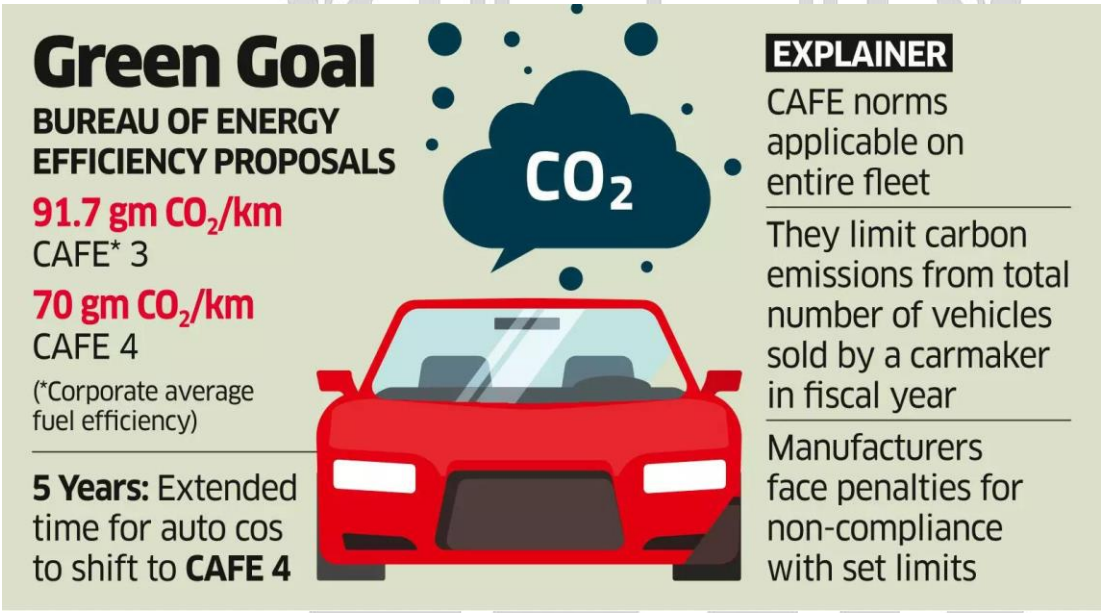
- Introduced in 2017 by BEE, Ministry of Power, to regulate fuel consumption and carbon emissions from passenger vehicles.
- These norms apply to vehicles running on petrol, diesel, liquefied petroleum gas (LPG), compressed natural gas (CNG), hybrids, and electric vehicles (EVs) weighing less than 3,500 kg.
- Designed to reduce oil dependency and curb air pollution, pushing automakers to lower carbon dioxide emissions while incentivising the production of EVs, hybrids, and CNG vehicles.
- CAFE 2: In 2022-23, the norms were tightened (fuel consumption capped at 4.78 litres/100 km, and CO_2 emissions capped at 113 g/km) with increased penalties for non-compliance.

- CAFE III (Corporate Average Fuel Efficiency) regulationsare India's upcoming stricter norms, planned from 2027-2032, requiring automakers to reduce their fleet-wide average CO2 emissions to 91.7 g/km , based on the World Harmonized Light Vehicles Testing Procedure (WLTP).
- These rules aim to curb pollution and meet climate goals by pushing for cleaner tech, offering "super credits" for EVs/hybrids, and providing some relief (deregulation) for small cars, but also increasing costs for ICE vehicles.

Need for CAFÉ-III regulation?

In the USA, EU, China, Japan, smaller lightweight cars receive relaxed CO_2 norms.

However, India's current framework is inverted, giving SUVs more relaxed limits and burdening small cars. So, CAFE 3 seeks to align with global best practices



The CAFE norms are designed by the Bureau of Energy Efficiency (BEE) and officially issued through the Ministry of Power. The government checks compliance together with the Ministry of Road Transport and Highways (MoRTH).

Calculation of CAFÉ:

Emissions are measured in grams of CO_2 produced per kilometre. Instead of checking one car alone, the government looks at the average of all the cars a company sells in a year. First, it calculates the company's average car weight based on how many units of each model are sold. Then a CO_2 target is set for that weight.

India's weight-based formula means the heavier the car, the more pollution it is allowed to produce. Lighter cars get a much stricter limit, even though they naturally emit less. This creates imbalance, thereby burdening the small cars.

CAFÉ-III Regulation: Key Features

- Stricter Targets: Aims to reduce fleet-wide CO_2 emissions significantly for manufacturers.
- Weight-Based System: Manufacturers' targets adjust based on their fleet's average weight, with heavier vehicles having more lenient per-unit targets.
- Super-Credits: EVs get a 3x multiplier, strong hybrids 2x, incentivizing cleaner tech.
- Small Car Relief: Petrol cars under 4m, 909kg, 1200cc get an extra 3 g/km CO_2 deduction to keep entry-level models affordable.
- Fleet Pooling: Allows manufacturers (up to 3) to group for compliance

Challenges faced by small cars manufacturers:

a. The linear CAFE formula is tougher on lighter cars, even if they naturally emit less carbon dioxide.

b. Small car sales have been steadily shrinking in recent years.

c. Carmakers may stop selling small models and instead shift to bigger models.

d. Meeting stricter targets requires new technology, like dual injectors, better combustion systems, or mild hybrid tech, which increases costs.

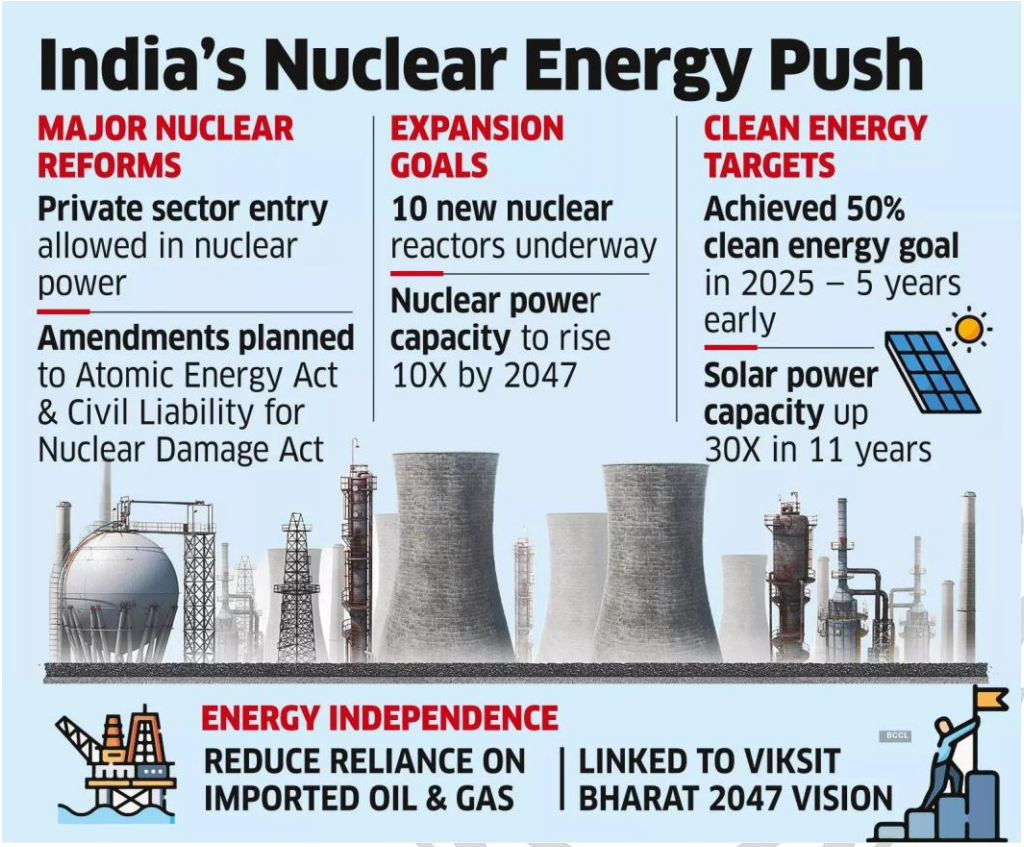
The new CAFE 3 rules are an important change in how India plans to cut pollution from cars.

They try to bring back demand for small cars, encourage more electric and cleaner-fuel vehicles, and slowly make fuel-efficiency rules stricter over the coming year. If these rules work well, India can use less imported oil, push more people and companies towards green mobility, and match its climate promises under the Paris Agreement. However, challenges still persist, car companies need time and money to adjust, buyers must accept new technologies, and India must build enough charging and fuel infrastructure for EVs and other alternative fuel vehicles.

31. PRIVATE INVESTMENT IN INDIA'S NUCLEAR ENERGY

Context: In the Union Budget FY 2024 the Indian government announced plans to expand the nuclear energy sector by private sector participation.

India is actively opening its nuclear energy sector to private investment, a major policy shift to meet ambitious clean energy goals (500 GW non-fossil by 2030, 100 GW nuclear by 2047).



Why does India need Private investment in Nuclear Energy?

a. **Meeting Growing Energy Demand**: India's energy demand is expected to rise significantly by 2040. Private investment can help expand nuclear power capacity faster to meet this increasing demand reliably.

b. **Financial Support**: Nuclear power projects require huge investments. The government alone cannot fund such capital-intensive projects, so private investment is critical to bridge this financial gap and accelerate development.

c. **Speed and Efficiency**: Private sector participation can reduce delays and cost overruns commonly seen in nuclear projects, helping to complete plants faster and more efficiently.

d. **Technological Innovation**: The private sector can drive development of advanced nuclear technologies like small modular reactors (SMRs), which promise quicker setup, scalability, and better cost efficiency.

e. **Energy Security and Climate Goals**: Nuclear power is a key low-carbon energy source that can provide stable, large-scale electricity while reducing dependence on fossil fuels — vital for India's climate commitments and energy independence.

f. **Policy Reforms Encourage Investment**: The government is reforming laws to make nuclear energy investment-friendly, easing liability norms, and allowing more private and foreign participation.

g. **More Funds for Projects**: Large private capital can boost available funding, enabling faster construction and commissioning of nuclear plants beyond what government budgets alone allow.

h. **Innovation and Technology Adoption**: Private firms bring advanced technologies, such as small modular reactors (SMRs), which are quicker to build and scalable, helping India rapidly increase nuclear capacity.

Challenges ahead of private investments:

a. **High Capital Costs**: Nuclear plants require very large upfront investments with long payback periods, which can deter private investors looking for quicker returns.

b. **Regulatory Complexity**: The nuclear sector is heavily regulated for safety and security. Navigating complex licensing, environmental clearances, and liability rules can be time-consuming and challenging for private firms.

c. **Liability and Risk Concerns**: India's nuclear liability law places significant financial risk on operators for accidents, which can discourage private and foreign investment due to potential legal and financial exposure.

d. **Technology and Expertise Gaps**: The private sector may lack the specialized nuclear technology and skilled manpower initially, requiring partnerships or technology transfers from established players.

e. **Long Project Timelines**: Nuclear plants take many years to build, making private investors wary due to prolonged commitment and uncertain policy or market changes over time.

f. **Public Perception and Opposition**: Nuclear energy faces public concerns related to safety and environmental impact, potentially causing delays or opposition to new projects involving private firms.

g. **Infrastructure Challenges**: Adequate infrastructure for nuclear fuel supply, waste disposal, and grid integration needs strengthening to support faster private sector deployment.

India's legislative framework for nuclear energy is designed to ensure safety, security, and proper regulation of nuclear activities. The key laws and agencies involved are:

a. **Atomic Energy Act, 1962**: This is the main law governing nuclear energy. It grants the government exclusive rights to develop, control, and regulate nuclear energy, including nuclear reactors, fuel, and materials.

b. **Atomic Energy Regulatory Board (AERB):** Established in 1983 under the Atomic Energy Act, AERB is the independent authority responsible for regulating nuclear safety, radiological safety, and radiation protection in India.

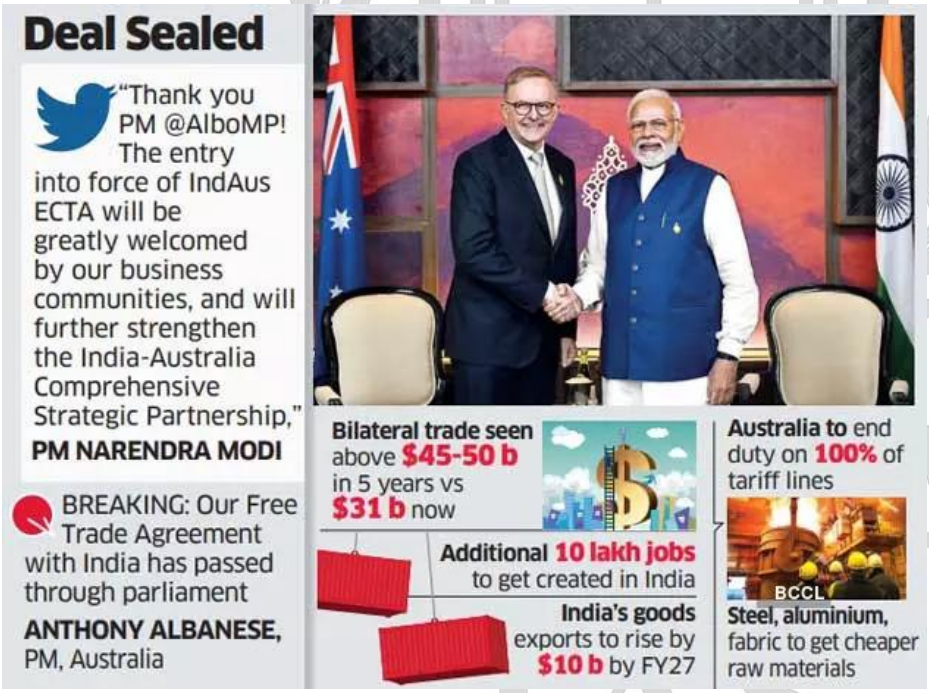
c. **Environmental Laws:** Nuclear projects must also comply with environmental regulations such as those under the Environment Protection Act, which include environmental impact assessments and public consultations.

India's nuclear energy capacity is projected to grow by 32 GWe, which requires substantial capital investment and a skilled workforce. PPP is one way to meet the demand and another is to skill development in this sector. To attract private investment, the legal framework governing nuclear liability must be robust to ensure adequate compensation to victims and there should be robust safety protocols.

32. INDIA-AUSTRALIA CLEAN ENERGY PARTNERSHIP

Context: India and Australia are both pursuing ambitious clean energy targets to address climate change and ensure energy security.

The Australia-India clean energy partnership, launched in 2024 under the Comprehensive Strategic Partnership (CSP), is a strategic framework to deepen bilateral cooperation in the clean energy sector.



Australia-India Clean Energy Partnership: need and importnace

a. **Climate Change in the Indo-Pacific Region**: The Indo-Pacific faces grave climate risks, averaging 10 climate disasters per month (1970–2022), with up to 89 million displaced and 80% of the population affected by 2050.

b. **Overdependence on China**: China dominates critical materials, refining over 90% of rare earth elements and producing 80% of global solar modules.

c. **Renewable Energy Partnership (REP):** Launched in 2024, REP outlines cooperation across eight areas—solar PV technology, green hydrogen, energy storage, solar supply chains, circular economy in renewables, two-way investment, capacity building, and other shared priorities.

d. **Shared Climate Ambitions**: India targets 500 GW of non-fossil capacity by 2030, including 280 GW from solar, while Australia aims for a 62–70% emission reduction by 2035, aligned with its net-zero goals.

Why does India need to partner with Australia?

a. **India's ambitious goals**: India aims to increase its renewable energy capacity rapidly to meet climate goals and ensure energy security while reducing pollution from coal, which still generates about 75% of its electricity. Partnering with Australia, a countr rich in critical minerals like lithium and rare earths, helps India secure key resources needed for technologies like solar panels, batteries, and green hydrogen production.

b. **Joint partnership**: India benefits from Australia's stable investment environment and technical expertise, while India offers a large skilled workforce and growing clean energy market, supported by government incentives. This partnership supports joint projects, technology sharing, and capacity building, which collectively help both countries build a resilient, diversified clean energy supply chain independent of over-reliance on any single country.

c. **India's climate leadership**: his cooperation fits into India's broader ambitions of climate leadership and economic growth by creating green jobs, strengthening manufacturing, and promoting clean technology innovation. In essence, a clean energy partnership allows India to scale up its renewable energy goals more effectively and sustainably with international collaboration and resource integration.

33. INDIA'S CLEAN ENERGY AMBITIONS AND CRITICAL MINERALS

Context: A key factor in India's clean energy ambitions is securing a sustainable supply of critical minerals like lithium, cobalt, copper, and nickel, essential for solar panels, wind turbines, EVs, and energy storage. India faces domestic shortages and import reliance, prompting efforts to develop resilient supply chains through domestic mining, recycling, R&D, and international partnerships to achieve 500 GW renewable targets by 2030.

What are critical minerals?

- Critical minerals are those minerals which are essential for economic development and national security of a country.
- The lack of availability of these minerals or even concentration of existence, extraction or processing of these minerals in few geographical locations may lead to supply chain vulnerability and disruption.

Why Critical Minerals are Important for India?

a. **Foundation of Modern Technology**: Critical minerals are the foundation on which modern technology is built. They are used in a wide range of essential products, from mobile phones to solar panels to electric vehicle batteries to medical applications.

b. **Energy Transition**: They are vital to renewable energy technologies that will be required to meet the "Net Zero" commitments of many countries around the world.

The world needs critical minerals to build products like solar panels, semiconductors, wind turbines and advanced batteries for storage and transportation.

c. **Futuristic Economy**: The future global economy will be powered by technologies that depend on minerals such as lithium, graphite, cobalt, titanium and rare earth elements. Critical minerals are the building blocks for the green and digital economy.

d. **Self-Reliance**: Identification of critical minerals will help India to plan for the acquisition and preservation of such mineral assets taking into account the long term need of the country. This will also in turn reduce the import dependency as India is 100% import dependent for certain elements.

Critical minerals like lithium and cobalt are vital for India's clean energy transition, especially for EV batteries. Supported by schemes such as the Electric Mobility Promotion Scheme 2024, India's EV market is expected to grow at a 49% CAGR from 2023 to 2030. The battery storage market, valued at $2.8 billion in 2023, will expand rapidly with rising renewable energy adoption.

Challenges:

a. **Heavy reliance on Imports**: India currently relies heavily on imports for these critical minerals. This dependency exposes the country to global supply chain disruptions, price volatility, and geopolitical risks. Any disruption could affect the cost-effectiveness and stability of India's renewable energy projects, slowing progress toward its clean energy targets.

b. **Untapped resources**: India has vast untapped mineral potential, with lithium in Jammu and Kashmir (J&K) and Rajasthan, and REEs in Odisha and Andhra Pradesh.

In 2023, the Geological Survey of India (GSI) identified 5.9 million tonnes of inferred lithium resources in J&K.

c. **Domestic mining**: Investment in domestic mining is central to India's critical mineral strategy. The Mines and Minerals (Development and Regulation) Amendment Act, 2023 opened up private exploration, but the sector still faces high costs, regulatory hurdles and environmental concerns.

Way forward:

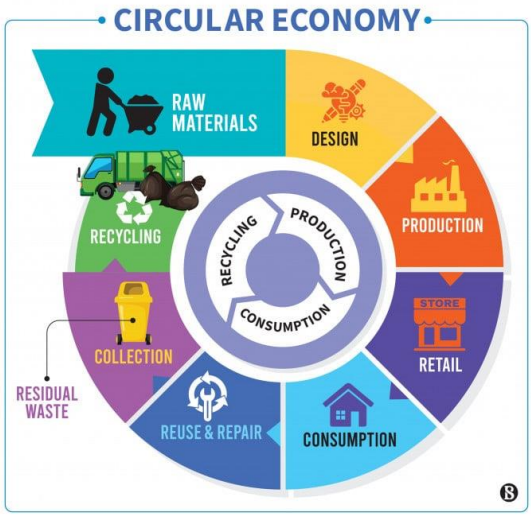
a. **National Critical Mineral mission**: The Government of India launched the National Critical Mineral Mission (NCMM) in 2025 to establish a robust framework for self-reliance in the critical mineral sector. Under this mission, the Geological Survey of India (GSI) has been tasked with conducting 1,200 exploration projects from 2024-25 to 2030-31.

b. **KABIL:** KABIL (Khanij Bidesh India Ltd) signed an agreement with CAMYEN SE, a state-owned enterprise in Catamarca, Argentina, on 15th January 2024 for lithium exploration covering 15,703 hectares. KABIL also signed an MoU with the Critical Mineral Office (CMO), Department of Industry, Science and Resources (DISER), Government of Australia, in March 2022.

India's clean energy ambitions:

a. Clean energy ambition: India's renewable energy goals underline the importance of critical minerals. The country aims to achieve 500 GW of non-fossil fuel-based power by 2030, with solar and wind energy as key contributors.

Towards Circular economy



a. **Infrastructure upgrade and recycling**: Upgrading India's mining and processing infrastructure is equally critical. Modernising infrastructure requires significant investment in mechanised mining equipment, automated processing plants and waste management systems. Infrastructure upgrades also extend to recycling.

b. **Recycling critical minerals**: India generates close to four million metric tonnes of e-waste annually, yet only 10% is formally recycled. Advanced recycling facilities could recover critical minerals, strengthening the circular economy.

c. **Better recycling technologies**: The Battery Waste Management Rules, 2022 set recycling targets, but weak implementation and limited infrastructure pose challenges. Public-private hubs could boost recycling technologies, cut costs and reduce environmental impact.

India's clean energy transition and industrial growth depend on securing critical minerals through mine development and a circular economy. Priority should be given to operationalising mining leases, investing in mines, upgrading recycling, fast-tracking exploration in Chhattisgarh, promoting urban mining, and boosting research and development to cut import dependence, create jobs and drive innovation.

34. ENSURE SAFEGUARDS FOR INDIA'S CARBON MARKET

Context: the growth model perpetuated by the Industrial revolution has resulted in profound environmental alterations, while some experts suggest' de-growth' to restore the health of the planet, it must be considered that there are still countries that are facing extreme poverty and hunger and therefore countries must find a way to balance poverty and growth.

How to strike a balance?

a. Cleaner technologies

b. Renewable energy

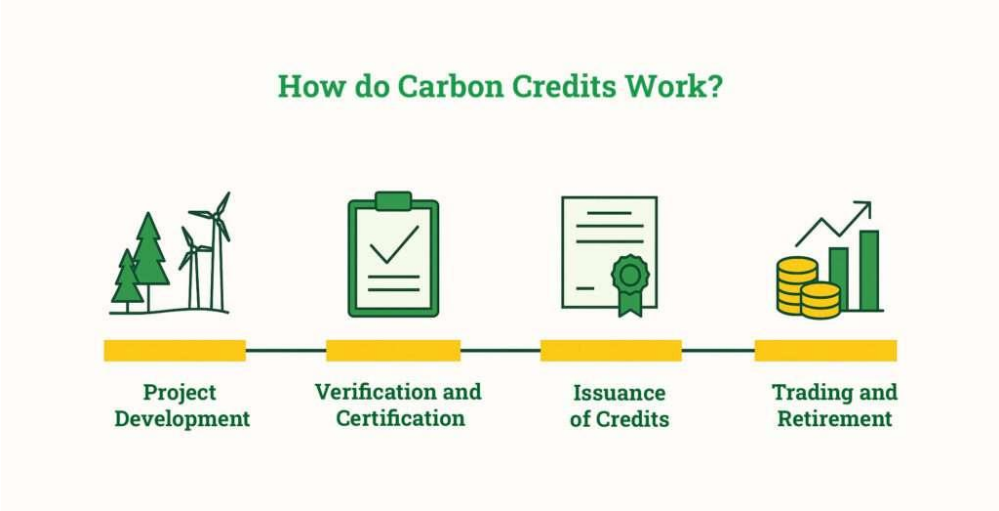
c. Sustainable farming practices

Carbon credit:

- Carbon crediting is one such tool. A carbon credit represents a certified reduction or removal of greenhouse gases, expressed in carbon dioxide (CO_2) -equivalents. These can be generated through mitigation activities such as renewable energy or sequestration efforts such as reforestation, agroforestry and biochar.
- Firms buy them to offset emissions while transitioning to cleaner processes, ideally rewarding developing countries for adopting low-carbon practices.

Carbon credit trading scheme:

- India is also building its own carbon market through the Carbon Credit Trading Scheme (CCTS). The scheme will set emission-intensity benchmarks for energy-intensive sectors and include voluntary offsets.
- A national registry and trading platform will manage transactions, with draft methods for biomass, compressed biogas, and low-emission rice cultivation.



Risks and challenges associated with Carbon Market:

a. Carbon projects are meant to reward communities at the frontlines of climate action. But without safeguards, they risk replicating extractive power structures, echoing the logic of colonial plantations.

b. Rising carbon prices only heighten this risk. **The Northern Kenya Rangelands Carbon Project offers a cautionary tale. Launched in 2012, it spanned 1.9 million hectares and sought to remove 50 million tonnes of CO2 over 30 years**. Though framed as community-led, the project has drawn scrutiny for bypassing consent and weakening local land rights, raising critical questions about who truly controls and benefits from carbon projects.

c. In 2023, Verra suspended credit issuance after advocacy groups highlighted flaws in soil carbon measurement and a lack of free, prior, and informed consent (FPIC) from indigenous communities. Petitioners alleged that the conservancies were created without public consultation, on unregistered community land, and enforced through armed rangers.

d. Carbon projects in afforestation, reforestation and agriculture often extend into areas with customary land use. Plantations on village commons or forest fringes could disrupt access to grazing, fuelwood and forest produce without community consent.

Vulnerability of carbon projects in India:

a. Carbon projects can slip into "modern plantations" when powerful companies dominate and local communities are sidelined. In India, farmers and tribal communities often face information and power asymmetries that enable opaque deals and unfair benefit-sharing.

b. India's Carbon Credit Trading Scheme, while ambitious, focuses mainly on procedures and compliance, with scant attention to land rights, FPIC, and equitable revenue distribution. These blind spots may expose vulnerable groups to exclusion and exploitation as the market expands.

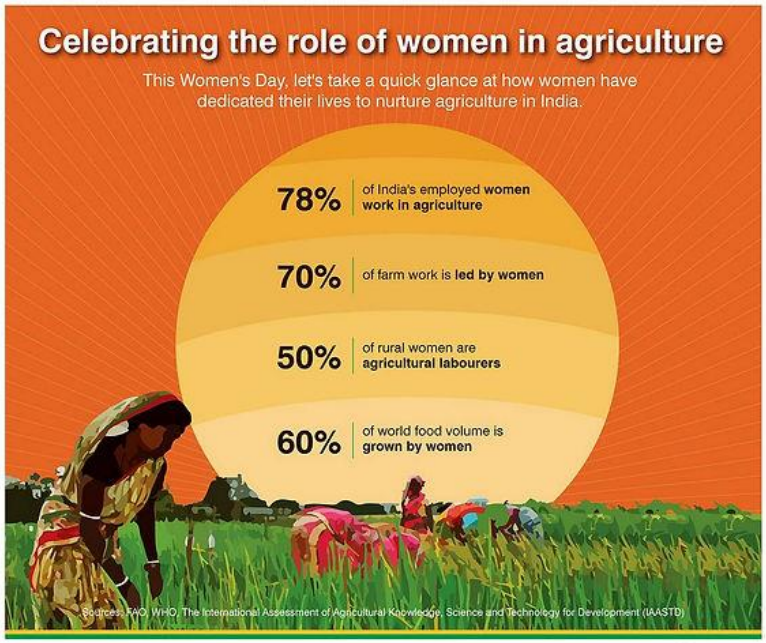
c. Overregulation is not the solution, as burdensome legal frameworks could discourage even well-intentioned actors. What India needs is a balanced, lightweight regulatory architecture that guarantees transparency, formalises benefit-sharing, and protects community rights, without creating bureaucratic choke points.

Stakeholder consultation, adaptive regulation and a clear-eyed recognition of risks can help India build trust and integrity in its carbon market while ensuring that climate action does not come at the cost of justice.

7. AGRICULTURE AND SOCIETY

35. FEMINIZATION OF AGRICULTURE

Context: As per the 2023-24 Periodic Labour Force Survey, 76.95% of rural women in India are now engaged in agriculture, and women's representation among self-employed farmers and agricultural workers has sharply increased. Despite making up over 42% of the workforce, women still own only about 12.8% of operational land holdings.



Factors aiding feminization of Agriculture:

a. **Male Out-Migration**: Men are migrating to cities or shifting to more lucrative rural jobs (construction, services, transport, government), leaving women to manage and work on family farms.

b. **Growth of the Contract Farming**: Sectors like floriculture, horticulture, and tea/coffee plantations prefer women for labor-intensive tasks, viewing them as reliable, skilled, and willing to accept lower wages.

c. **Patriarchal Norms**: Society expects women to handle home and light farm work, treating their farm labor as part of household duties or assisting men.

d. **Limited Alternative Opportunities**: Lower literacy, restricted mobility, and social norms limit women's non-farm employment, making agriculture one of the few acceptable and accessible livelihoods in rural areas.

Opportunities and Challenges

The feminization of agriculture offers opportunities for women's empowerment, increased participation in decision-making, and improved productivity through their knowledge of sustainable farming. However, persistent gender inequalities remain, notably in land rights, wage gaps, and limited autonomy over resources and agricultural decisions.

Policy Directions and Solutions

Recent recommendations include strengthening land and property rights for women, expanding access to microfinance and crop insurance, providing tailored agricultural extension services, and supporting women-led cooperatives to increase bargaining power and market access.

Social security nets and targeted technology integration are also being suggested to reduce the burden of unpaid care work and boost capacity.

Schemes specifically for women farmers

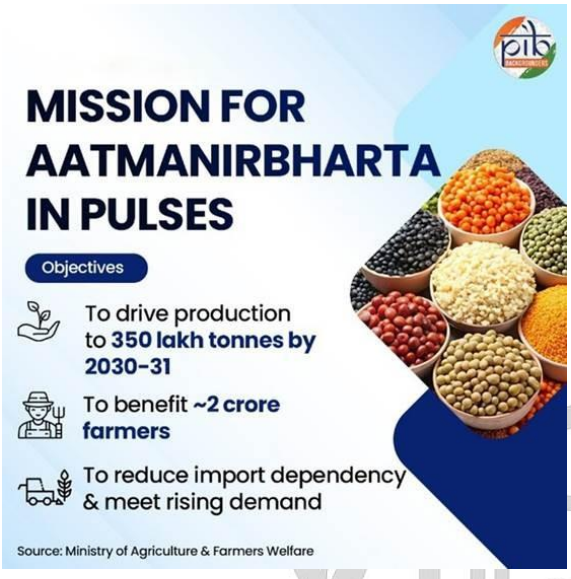
- **Mahila Kisan Sashaktikaran Pariyojana (MKSP):** A sub-component of the Deendayal Antyodaya Yojana-National Rural Livelihoods Mission (DAY-NRLM), it aims to enhance women's participation and productivity in agriculture through training, skill development, and promoting sustainable livelihoods.
- **Rashtriya Mahila Kisan Yojana:** Encourages women to take on leadership roles and provides skills training to improve their productivity.

Feminization of agriculture is now a widely recognized structural shift, shaping both rural livelihoods and national development agendas in 2025.

36. INDIA'S MISSION FOR ATMANIRBHARTA IN PULSES

Context:

Prime Minister launched the Mission for Aatmanirbharta in Pulses (2025–26 to 2030–31) with a budgetary allocation of ₹11,440 crore on October 11, 2025.



Significance of pulses in India:

- Pulses are more than just an agricultural commodity; they are a keystone of India's nutritional security, soil health, and rural livelihoods.
- India is the largest producer, consumer as well as importer of pulses in India.
- India's policies have consistently focused on enhancing productivity and sustainability in this vital sector.
- Pulses serve as a nutritional powerhouse. As per the National Institute of Nutrition, they contribute nearly 20-25 percent of total protein intake in Indian diets.
- However, the per capita consumption of pulses continues to fall short of the recommended 85 grams per day, contributing to protein-energy malnutrition across the country.
- Therefore, enhancing domestic production is not only an economic necessity but also a vital step toward improving public health.

Dalhan Atmanirbharta mission:

- This mission represents a major step toward achieving nutritional security and self-sufficiency.
- The Mission for Aatmanirbharta in Pulses was announced in the Union Budget 2025–26 and was approved by the Union Cabinet on 1st Oct 2025.
- It will be implemented during 2025–26 to 2030–31. It seeks to boost domestic production, reduce import dependence, and pave the way for an "Aatmanirbhar Bharat" in pulses.

Objectives of the mission:

a. Self-sufficiency in Pulses production

b. Reduce dependency on imports

c. Improve farmers income

Need to boost Pulses production:

Consistent government efforts under the National Food Security and Nutrition Mission (NFSNM) have driven production up from 192.6 lakh tonnes in 2013–14 to 252.38 lakh tonnes in 2024-25(3rd Advance Estimates), reflecting an impressive growth over 31 percent.

While this progress is commendable, considerable potential remains to further enhance production and meet the country's increasing consumption requirements. In 2023–24, India imported 47.38 lakh tonnes of pulses, even as it exported 5.94 lakh tonnes, highlighting opportunities for structural improvement.

- Despite being among the world's largest pulses producers, India's domestic production has significant scope to grow to fully meet demand, making imports a necessary supplement. With pulses imports reaching 47.38 lakh tonnes in 2023–24, the government has prioritized achieving self-sufficiency in pulses as a key national objective.
- Prime Minister Shri Narendra Modi has set the ambitious goal of making India fully aatmanirbhar (self-reliant) in pulses by December 2027, with particular focus on Tur (Arhar), Urad, and Masoor. The new Mission strengthens this vision by aiming to meet India's future pulses demand entirely through domestic production.
- The Mission is aligned with Vision 2047, emphasizing sustainable growth, diversified cropping patterns, and the empowerment of farmers through assured income, adoption of advanced technologies, and climate-resilient agricultural practices.

The Mission adopts a holistic approach, integrating soil health management, mechanization, balanced fertilizer application, plant protection, and large-scale demonstrations facilitated by ICAR, Krishi Vigyan Kendras (KVKs), and state agricultural departments. Through these measures, the Mission envisions a resilient, self-reliant pulses production system that meets India's growing domestic demand.

37. AGRICULTURE IN THE AGE OF INEQUALITY

Context: A recent article from the World Inequality Lab (2025) finds that agricultural inequality is rising within countries, even as the average productivity gap between agriculture and other sectors narrows globally.

Correlated to the above trend, there is a systemic erosion of India's farm economy due to corporate capture, predatory commercialization, and decades of neoliberal policies.

Key highlights: brief overview

a. **Farmer Suicides**: Over 4,00,000 farmers have died by suicide since 1995; NCRB (2022) reported 11,290 deaths, indicating that over one farmer dies every hour due to indebtedness and market distress.

b. **Income Decline**: The NSS 77th Round (2018–19) reveals that average farm household income is ₹10,218/month, marking a 10% decline from 2012–13, reflecting stagnation amid rising costs.

c. **Employment Exodus**: Between 1991 and 2011, India lost nearly 15 million full-time cultivators, with 2,000 farmers quitting agriculture every day, signalling a collapse in rural viability.

d. Inequality Ratio: The 217 Indian billionaires' wealth (US$1.04 trillion) equals 58× the agriculture budget, exposing a stark contrast between rural poverty and elite d. accumulation.

e. **Falling Terms of Trade:** Cotton's purchasing power plunged—farmers who once bought 12 gm of gold per quintal in the 1970s can't buy 1 gm today, showing the widening gap between input inflation and stagnant output prices.

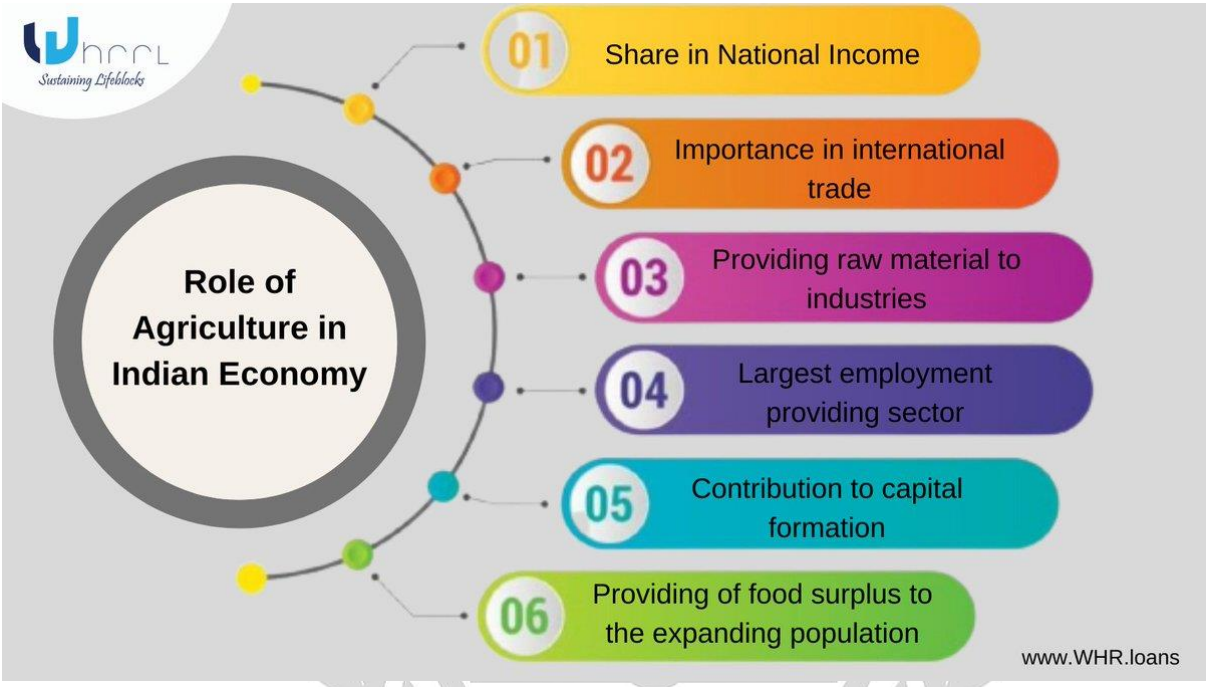
Inequality in agriculture:

a. Average productivity in agriculture is converging with other sectors, but income gaps among farmers are widening.

b. The shift toward commercial and corporate farming has increased capital income and profit concentration among a small fraction of agricultural producers, exacerbating inequality.

Challenges

- Small and marginal farmers face persistent disadvantages in technology adoption, credit access, and market connection, while large agribusinesses can leverage capital for higher profits.
- Rural infrastructure gaps and fragmented landholdings further widen disparities, with the poorest often forced out of agriculture or stuck in subsistence roles.



38. MONUMENT CONSERVATION BEYOND ASI: POLICY SHIFT

Context: The government has introduced a major heritage policy shift by allowing private players, alongside ASI, to participate in monument conservation through the National Culture Fund.

Monument conservation in India has historically been the responsibility of the ASI, established in 1861 during British rule and restructured post-independence to safeguard India's civilizational heritage.

The Archaeological Survey of India (ASI) was established in 1861 under the Ministry of Culture, responsible for archaeological research and the protection of India's cultural heritage.

It enforces the Ancient Monuments and Archaeological Sites and Remains Act, 1958 and the Antiquities and Art Treasures Act, 1972.

Structure of ASI:

Organizational Structure of ASI: ASI operates through 37 regional Circles across India, each responsible for fieldwork, conservation, and research in its jurisdiction. Specialized branches include:

- Science Branch: Focuses on conservation science and material analysis;
- Horticulture Branch: Maintains gardens around heritage sites;
- Underwater Archaeology Wing: Explores submerged cultural heritage;
- Temple Survey Projects: Documents temple architecture and iconography

The ASI has so far been solely responsible for the conservation of around 3,700 protected monuments across India. It often led to delays and limited capacity to manage the vast number of heritage structures requiring attention.

Policy Shift:

The new heritage conservation policy now allows private companies, public sector units, and private groups to take part directly in the core conservation work of important monuments for the first time. These private players can hire outside agencies to carry out the conservation work at chosen monuments.

Key points of the policy include:

a. **Public-Private Partnership Model**: Corporations and donors can fund conservation projects through the National Culture Fund (NCF), which offers 100% tax exemption benefits.

b. **Empanelled Conservation Architects**: The Ministry of Culture will create a list of trusted conservation architects. Donors can select architects from this list to guide their projects.

c. **Checks and Balances:** While private entities can execute the work, the Archaeological Survey of India (ASI) will oversee and supervise all projects to ensure quality and adherence to conservation rules. All Detailed Project Reports (DPRs) must follow the National Policy for Conservation, 2014.

d. **Pilot List of Monuments**: Initially, conservation work by private players will be allowed at 250 selected monuments.

National Culture Fund

- The NCF, set up in 1996, will play a central role in this new framework. Since its inception, the NCF has received Rs. 140 crore in corporate and PSU donations, funding nearly 100 projects.
- Of these, 70 have been completed, including conservation of Bhuleshwar Temple (Pune), Hyderabad's British Residency, and Mandu monuments (Madhya Pradesh).
- Previously, corporates contributed only financially, while ASI handled the work. Under the revised policy, donors will have greater control, being able to directly hire implementing agencies under ASI's oversight.

Core Implication:

- **Capacity Building**: With more players, conservation efforts will speed up, especially for lesser-known sites.
- **Sustainability**: Private funding will reduce the financial burden on the government.

- **Public Engagement**: Corporate branding and involvement may lead to increased public awareness of heritage conservation.
- **Global Standards**: Involving reputed conservation architects can help India align with global practices in heritage management.

This approach opens up conservation beyond ASI's sole control, encouraging faster, better-funded preservation while maintaining necessary oversight.

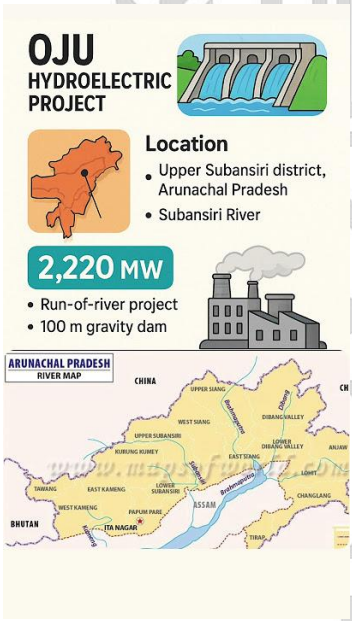
8. PRELIMS FOCUS

39. OJU HYDEL POWER PROJECT IN NORTH EAST

In News: The central government has granted environmental clearance to the Oju Hydroelectric Project in Arunachal Pradesh's Upper Subansiri district, paving the way for the construction of one of India's largest hydroelectric projects, near the China border.

Oju Hydel Power Project:

- Oju Hydroelectric Project is a 2,220 MW run-of-river hydro project.
- It is a 2,220 MW run-of-the-river hydropower project planned for the Subansiri River in Arunachal Pradesh's Upper Subansiri district, near the China border.



About Subansiri River:

The Subansiri River, also known as the Gold River, is a Trans-Himalayan river.

It originates from the western part of Mount Porom (5059 m) in the Tibetan Himalayas.

It enters India through the Miri Hills in Arunachal Pradesh.

As the longest tributary on the right northern bank of the Brahmaputra, the Subansiri merges with the Brahmaputra at Majuli Island in Assam, which is the largest river island in Asia.

Significance of the project:

- This is part of the infrastructure push in the North-East for hydropower development.
- The project is largest in the Subansiri basin, upstream of projects like Niare, Naba, Nalo, Dengser, Upper & Lower Subansiri, making it vital for basin-wide energy planning.
- Its proximity to the international border also enhances its significance in terms of energy security.

40. ARATTAI MESSENGER

In News: Indian messaging app Arattai, developed by Zoho Corporation, has experienced a sudden and dramatic surge in usage. This highlights the rising interest in domestic digital platforms.

About Arattai:

"Arattai" in Tamil translates to "casual conversation" or "chat."

Arattai was originally launched in 2021 as a side project, but it has now gained mainstream traction. The app provides a full suite of messaging tools including one-to-one and group chats, sharing of text, images, and videos, as well as audio and video calls.

Reason behind the surge:

The surge in downloads has been bolstered by public endorsements from government officials, which appear to have amplified awareness and adoption.

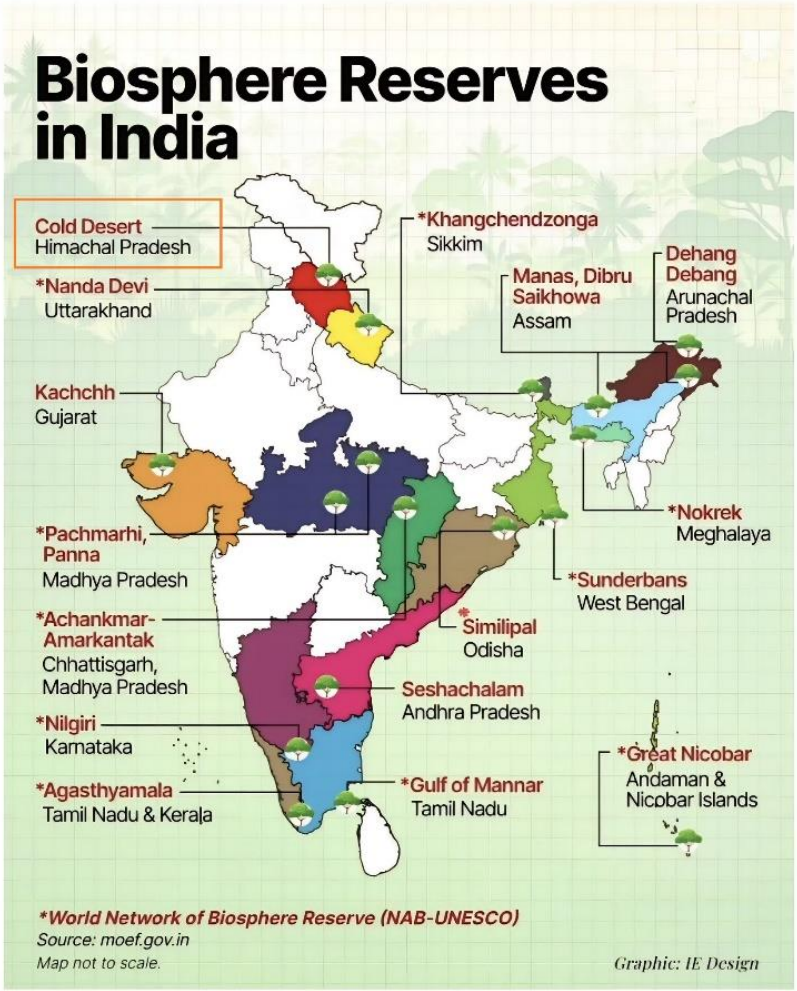
The citizens are being encouraged to use Zoho's Swadeshi platform for documents, spreadsheets, and presentations, citing broader support for homegrown digital solutions under the Aatmanirbhar Bharat initiative.

Social media discussions further fueled the app's viral growth, with users comparing it to WhatsApp and other established messaging platforms.

41. INDIA'S NATURAL HERITAGE WINS GLOBAL HERITAGE

In News: the trans-Himalayan landscape of Lahaul and Spiti was officially inscribed in UNESCO's World Network of Biosphere reserves as India's first Cold Desert Biosphere Reserve under UNESCO's Man and the Biosphere (MAB) Programme, a move that puts the trans-Himalayan landscape on the global conservation map.

**São Tomé and Príncipe (island country of Central Africa) becomes the first state to have its entire territory designated as a biosphere reserve.



- The Cold Desert Biosphere Reserve includes the Spiti Wildlife Division (7,591 sq. km) and adjoining parts of the Lahaul Forest Division, covering Baralacha Pass, Bharatpur and Sarchu..
- It was declared a biosphere reserve in 2009, becoming India's 16th and first high-altitude cold desert biosphere reserve.
- The recognition also highlights the role of local communities, who have maintained traditional agro-pastoral practices and lived in close harmony with their environment for generations.
- It integrates Pin Valley National Park, Kibber Wildlife Sanctuary, Chandratal Wetland, featuring windswept plateaus, glacial valleys, alpine lakes, and high-altitude desert, making it one of the coldest and driest ecosystems in WNBR.

World network of biosphere:

- The World Network of Biosphere Reserves (WNBR) consists of a dynamic and interactive network of sites of excellence.

- It promotes North-South, South-South and South-North-South collaboration and represents a unique tool for international cooperation through the exchange of experiences and know-how, capacity-building and the promotion of best practices among Biosphere Reserves.
- It operates under the United Nations Educational, Scientific and Cultural Organization's (UNESCO) Man and the Biosphere Programme.

42. INS SUTLEJ

In News: INS Sutlej arrived at Port Louis to conduct the 18th Joint Hydrographic Survey in Mauritius.

INS Sutlej is a specialized hydrographic survey vessel of the Indian Navy, built by Goa Shipyard Limited and commissioned in 1993. Currently based in Kochi under the Southern Naval Command.

It is a specialized hydrographic survey vessel for charting, mapping, and oceanographic research.

Its advanced systems including:

Multi-beam swath echo sounder and side-scan sonars – for high-precision seabed mapping.

Differential GPS and motion sensors – for navigational accuracy.

Sea gravimeter, magnetometer, and oceanographic sensors – for geophysical and environmental data.

Automated data logging system – for real-time digital survey processing

The ship also carries a Chetak helicopter and four survey motorboats.

43. CASSINI SPACECRAFT

In News: data collected by NASA's Cassini spacecraft has revealed more evidence that Saturn's moon Enceladus may be able to support life.

About Cassini:

It is a joint project of NASA, the European Space Agency and the Italian space agency (ASI).

Cassini was a sophisticated robotic spacecraft sent to study Saturn and its complex system of rings and moons in unprecedented detail.

It was launched on October 15, 1997. It was one of the largest interplanetary spacecraft.

The mission consisted of NASA's Cassini orbiter, which was the first space probe to orbit Saturn, and the ESA's Huygens probe, which landed on Titan, Saturn's largest moon

Objectives of Cassini Spacecraft

Saturn—Study cloud properties and atmospheric composition, winds and temperatures, internal structure and rotation, ionosphere, origin, and evolution

Rings—Observe their structure and composition, dynamical processes, interrelation of rings and satellites, dust and micrometeoroid environment.

Titan—Study abundances of atmospheric constituents, distribution of trace gases and aerosols, winds and temperatures, composition and state of the surface, and upper atmosphere

Saturn's Magnetosphere—Study its structure and electric currents; composition, sources, and sinks of particles within it; dynamics; interaction with the solar wind, satellites, and rings; Titan's interaction with solar wind and magnetosphere.

44. MONOETHYLENE GLYCOL

In News: The textile industry has appealed to the government to not levy anti-dumping duty on Mono Ethylene Glycol (MEG), which is one of the main raw materials used in the production of polyester fibre and filament.

About Mono Ethylene Glycol

- It is an organic compound with the formula $C_2H_6O_2$.
- It is also called ethylene glycol or just glycol.
- It is a slightly viscous liquid with a clear, colourless appearance and a sweet taste that emits virtually no odour.
- It's miscible with water, alcohols, and many other organic compounds.
- It is produced from the reaction between water and ethylene oxide.
- It is hygroscopic, meaning it can absorb water from its surroundings, and this property makes it useful as a dehydrating agent in various applications.
- MEG has a relatively low toxicity and is considered safe for many industrial and commercial uses.

Uses:

- MEG is most commonly used in the manufacture of polyester fibre, fabrics, and polyethylene tereph-thalate (PET) resin used for the production of plastic bottles.
- Other industrial uses are as a coolant, heat transfer agent, antifreeze, and hydrate inhibitor in gas pipelines.

45. EXERCISE KONKAN 2025

In News: Indian Navy and Royal Navy bilateral Exercise KONKAN-25 commenced on 05 Oct 2025, off the western coast of India.

Exercise KONKAN:

- First held in 2004, Exercise Konkan is an annual bilateral maritime exercise.

- The 2025 edition is the first-ever exercise to feature both nations' Carrier Strike Groups (the UK's HMS Prince of Wales and India's INS Vikrant)
- The exercise includes a Harbour Phase with professional exchanges and visits, and a Sea Phase featuring anti-air, anti-surface, and anti-submarine drills with flying operations.

Objective: Reinforces the Comprehensive Strategic Partnership under the India–UK Vision 2035, and commitment to a free, open, and secure Indo-Pacific.

46. CENTRAL ASIAN MAMMALS INITIATIVE

News: Central Asian nations, including India, have endorsed a six-year trans-boundary conservation plan under the Central Asian Mammals Initiative (CAMI) to protect 17 migratory mammal species.

About Central Asian Mammals Initiative (CAMI)

The Central Asian Mammals Initiative (CAMI) is a collaborative conservation framework under the Convention on the Conservation of Migratory Species of Wild Animals (CMS), aimed at protecting migratory and nomadic mammals across Central Asia's vast steppe, desert, and mountain ecosystems.

- Launched in 2014 during COP11 of CMS held in Quito, Ecuador, and later revised at COP13 (Gandhinagar, India, 2020).
- To preserve migratory connectivity, combat threats such as habitat fragmentation, poaching, and climate change, and enhance cross-border cooperation among Central Asian nations for shared species conservation.
- Covers 17 flagship species, including Saiga antelope, Snow leopard, Wild camel, Urial, Argali sheep, Bukhara deer, and Persian leopard.
- Encourages regional coordination through national action plans, data sharing, and removal of physical migration barriers.
- Promotes ecosystem-level management rather than isolated species protection.
- Engages governments, NGOs, IUCN, and local communities in a multi-stakeholder approach.

Significance:

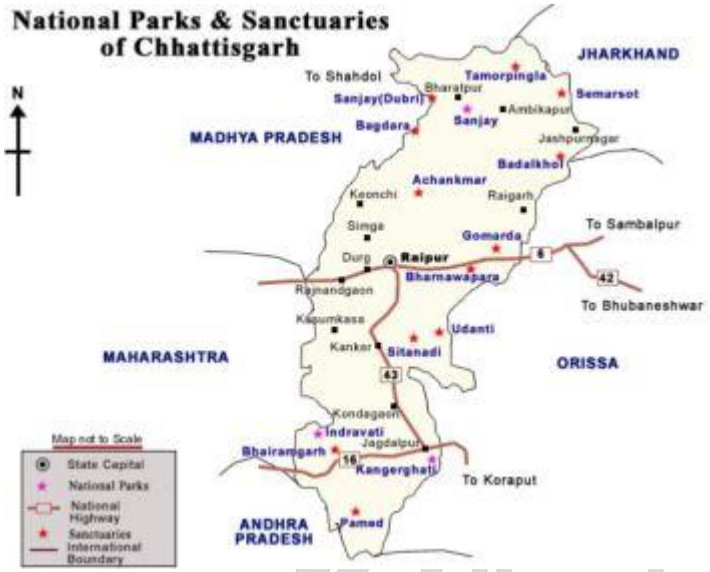
Preserves the "Serengeti of the North", one of the world's largest remaining landscapes for long-distance ungulate migrations.

Enhances transboundary ecological connectivity vital for species adapting to climate change.

47. BARNAWAPARA WILDLIFE SANCTUARY

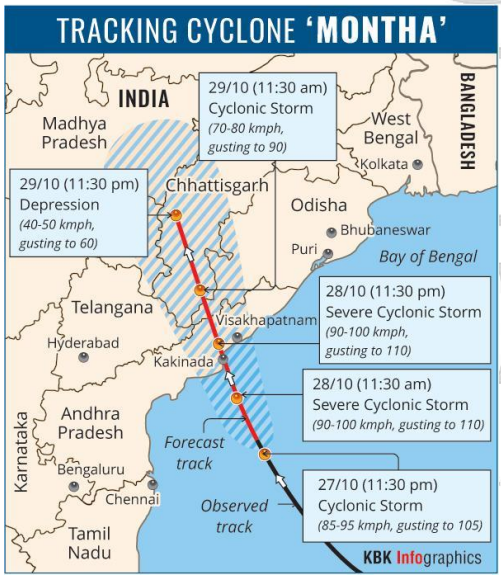
In News: After being declared locally extinct for about 50 years, the blackbuck has made a remarkable comeback at Barnawapara Wildlife Sanctuary in Chhattisgarh.

- Barnawapara Wildlife Sanctuary is located in the district of Raipur of Chhattisgarh.
- The Balmedhi, Jonk, and Mahanadi rivers flow beside the sanctuary.
- Teak, Sal, and mixed forests make up the majority of the sanctuary's vegetation. Rich and dense understorey bamboo forms are seen throughout. There are sporadic presence of white Kulu (Sterculia ureus) trees.
- In order to preserve the ecosystem, it has a healthy density of predators and prey.
- Common sightings include Chital, Sambhar, Nilgai, and Wild Boar.
- The bison is a noticeable and often spotted feature in Sanctuary. There are also Sloth Bears, Wild Dogs, Porcupines, Foxes, Striped Henas, and Barking Deer.



48. CYCLONE MONTHA

In News: Cyclone Montha, a severe cyclonic storm, made landfall in Andhra Pradesh, bringing heavy rains, strong winds, and widespread damage across coastal Andhra Pradesh and Odisha, and parts of Tamil Nadu.



Formation: formed over the west-central Bay of Bengal (BoB) as a low-pressure system and quickly intensified into a Severe Cyclonic Storm (SCS) (wind speed the range of 89 to 117 kmph).

Cyclones in Bay of Bengal: Cyclones in the Bay of Bengal are driven westward by easterly trade winds between 5°–20° latitudes, pushing them toward the Indian east coast, similar to Atlantic storms moving toward the Americas.

Naming:

The cyclone is named “Montha,” a Thai word meaning beautiful or fragrant flower.

The name was contributed by Thailand under the World Meteorological Organization (WMO) and the Economic and Social Commission for Asia and the Pacific (ESCAP) Panel on Tropical Cyclones(PTC), which oversees the naming of cyclones in the North Indian Ocean region.

49. CYCLONE SHAKTHI

In news: Cyclone Shakti 2025 formed over the Arabian Sea as a Severe Cyclonic Storm.

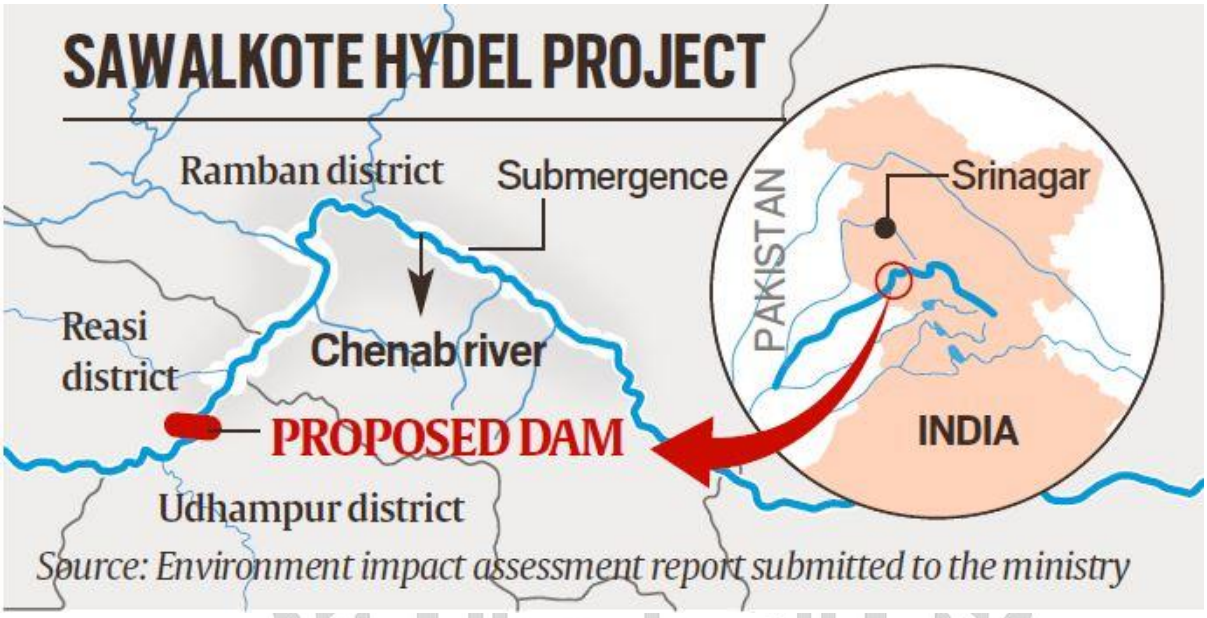
Cyclone Shakti is a recent example of a tropical cyclone that formed over the Arabian Sea in 2025.

Cyclone Shakti was classified as a Severe Cyclonic Storm (SCS) by the IMD. It formed over the east-central Arabian Sea with wind speeds expected reaching 130-145 km/h.

The name “Shakti,” proposed by Sri Lanka, symbolizes power and resilience.

50. SAWALKOTE HYDEL PROJECT

In News: The Union Environment Ministry’s Expert Appraisal Committee (EAC) has granted a fresh environmental clearance to the Sawalkote Hydroelectric Project on the Chenab River in Jammu & Kashmir.

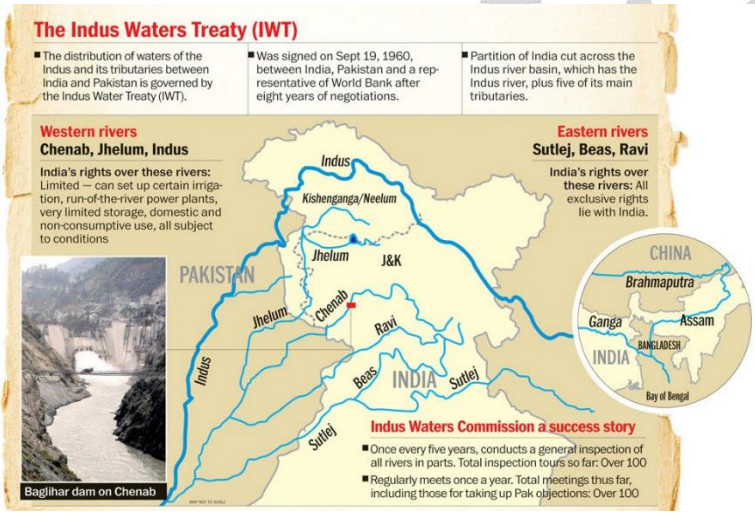


About Sawalkote Hydel Project

The Sawalkote Hydroelectric Project is a run-of-the-river hydropower project designed to harness the flow of the Chenab River for clean energy generation.

It is being developed by the National Hydroelectric Power Corporation (NHPC) Ltd. and will be among India's largest hydroelectric projects in the Indus basin.

- Installed Capacity: 1,856 MW (Stage I – 1,406 MW; Stage II – 450 MW).
- Structure: 192.5-metre-high concrete gravity dam with a reservoir capacity of 530 million cubic metres.
- Energy Generation: Approx. 8,000 million units (MUs) annually.



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