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A. Polity & Governance

1. Reservation Cannot Be on the Basis of Religion

1. In **December 2024,** the Supreme Court of India has emphasised that **reservations must not be granted solely on religion.**
2. This observation was made during a hearing regarding a challenge to the Calcutta High Court's ruling in May 2024, which struck down OBC reservations for 77 classes, predominantly from the Muslim community, under the OBC quota.
3. The court found that the reservations were based solely on religion, without using **objective criteria** to determine **backwardness**.

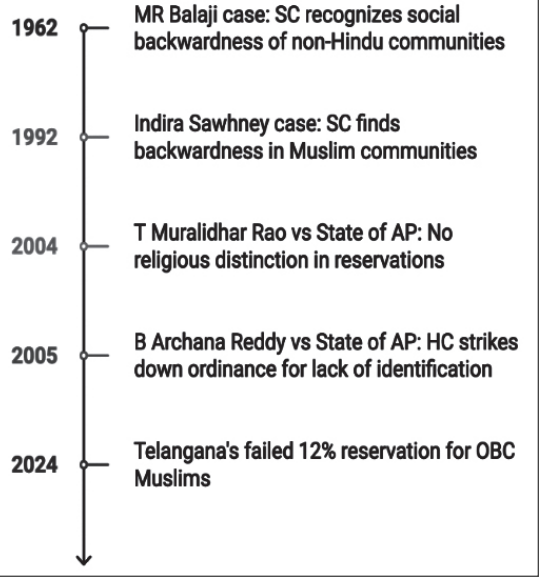
Present Constitutional and Legal Framework for OBC Reservations:

1. **Article 15(4):** Enables the State to make special provisions for the advancement of any socially and educationally backward classes or for the **Scheduled Castes (SCs)** and the **Scheduled Tribes (STs).**
2. **Article 16(4):** Provides that the State can enact legislation for the reservation of posts in the government sector or jobs in favour of the backward classes of citizens, which the State considers to have not been adequately represented in the services of the State.
3. **Indira Sawhney Judgment (1992):** The Supreme Court in **Indira Sawhney v. The Union of India** upheld the constitutionality of reservations for **Other Backward Classes (OBScs)** in public employment, capping the **reservation at 50%.** The court emphasised that identification of backwardness should be based on social and educational criteria rather than religion.

Previous rulings in this Context:

1. **MR Balaji case (1962):** The SC held that Muslims/ Christians/Sikhs are not excluded for the purpose of conferring reservations under Article 15(4) or 16(4).
   a. The court further held that it is **not unlikely** that these communities can be socially backward, so even though caste is considered to be the relevant criteria for determining backwardness in Hindu community, it cannot be made the sole criteria.
2. **Indira Sawhney case:** The SC held that in certain states, Muslim communities as a whole can be identified as backwards (based on their social and educational conditions). (**E.g.,** Karnataka, Kerala)
3. **T Muralidhar Rao vs State of AP, 2004**: The State while discharging its constitutional obligation cannot make any distinction between one group of citizens and others on the ground of religion, faith or belief.
4. **B Archana Reddy vs State of AP (2005)**: HC struck down the ordinance for extending the benefits of reservation on the ground that the benefit could not be extended to the **whole community without proper identification** of social backwardness of Muslims by the Commission.
5. **Telangana** tried to pass 12% reservation for OBC Muslims based on **G Sudhir Commission report.** However, this was struck down, since it breached the 50% limit set by Indra Sawhney judgement (1992) and the Central Government denied its inclusion in the Ninth schedule.

Evolution of Reservation Policies for Muslim Communities in India



Various Committees recommendations in this context:

1. **Justice Rajinder Sachar Committee, 2006:** The Muslim community was **almost as backward as** SCs and STs and **more backward than** non-Muslim OBCs.

2. **Justice Ranganath Misra Committee, 2007:** It suggested a **15% reservation** for minorities, with **10% specifically for Muslims**.
3. **Executive Order, 2012:** The GOI issued an order providing a **4.5% reservation** for minorities within the existing **27% OBC quota**.

The relationship between **religion** and **reservation policies** in India remains **complex** and **controversial**. While the **Constitution** provides for **reservations** based on **socio-economic backwardness**, the role of **religion** in determining eligibility for these benefits has led to multiple **legal challenges**. The **Supreme Court** and **government** continue to navigate these challenges, aiming to balance **affirmative action** with the **need for social justice**, while ensuring that reservations are provided based on **objective criteria** that address **historical inequalities**.

2. Why Government Ends No-Detention Policy?

1. **In December 2024, Union Ministry of Education** amended ended the **no-detention policy** for students in **Kendriya Vidyalayas (KVs)**, **Jawahar Navodaya Vidyalayas (JNVs)**, and other schools governed by the central government.
2. It was done through a **gazette notification** titled **"Right of Children to Free and Compulsory Education (Amendment) Rules, 2024"**.
3. This move allows for students in **Classes 5** and **8 to be held back if they do not meet the required promotion criteria** after their regular and re-exam assessments.
   - This decision aligns with changes made to the **Right to Education Act (RTE)** in **2019, allowing states and central schools to implement retention policies for these grades.**

What was the 'no-detention' policy and why was it introduced?

1. The Right of Children to Free and Compulsory Education (RTE) Act of 2009 was meant to provide free and compulsory education to all children aged 6 to 14.
2. **Section 16 of the Act** prohibited holding back or expelling a child. It said: "No child admitted in a school shall be held back in any class or expelled from school till the completion of elementary education," meaning till Class 8.
3. **The rationale was that** repeating a class could be demotivating for a child and result in her dropping out. The **'no-detention' aspect** was meant to ensure that a student completes at least elementary education without abandoning school. It also factored in the possibility that a student may have failed an exam because of inadequacies in the education system.
4. Key to this concept was the **'Continuous and Comprehensive Evaluation' (CCE)** at the elementary level. It meant a student's understanding and application of knowledge would be assessed through continuous evaluation. The Act also added that no child shall be required to pass any board examination until completion of elementary education.

What is Right of Children to Free and Compulsory Education (Amendment) Rules, 2024?

The **Right to Education (RTE) Act, 2009, was amended in 2019 to eliminate the no-detention policy.** The Rules to implement the amended Act were delayed and passed in 2024 to keep them in sync with the National Curriculum Framework (NCF) following the introduction of the National Education Policy (NEP) 2020.

a. Following the **RTE amendment Act, 2019**, 18 states and UTs, including Assam, Bihar, Gujarat, and Tamil Nadu, have abolished the policy.
   i. Haryana and Puducherry are yet to decide, while states like Andhra Pradesh, Maharashtra, and Uttar Pradesh continue to implement it.

Key Provisions Under Amended Rules:

1. **Revised Promotion Criteria:** Exams and re-exams will assess holistic development, focusing on learning rather than rote memorization.
   a. Students failing in annual exams will receive 2 months of additional instruction and a **re-exam opportunity** to address learning gaps.
2. **Retention in Case of Non-Promotion:** Students failing after re-exams will be retained in the same class.
3. **Specialized Interventions for Detained Students:** Class teachers must guide detained students and their parents, **providing targeted interventions.**
   a. School heads are responsible for monitoring progress and ensuring remedial effectiveness.
   b. Under the NEP, students who are weak in studies should be paid special attention.
4. **Inclusive Learning Approach and Safeguards:** The rules prioritize holistic development, ensuring no student is expelled before completing elementary education, in line with the RTE Act.

What were the arguments for and against no-detention?

Here's the revised comparative table with more detailed data and figures, as per your request:

Aspect	Arguments For No-Detention	Arguments Against No-Detention
Goal of Policy	Aimed to ensure inclusiveness, reduce dropout rates, and eliminate fear of failure among students.	Critics argue that it diminishes the seriousness of academic performance, leading to reduced motivation.
Effect on Dropout Rates	The policy led to a **rise in the Gross Enrollment Ratio (GER)** at the elementary level, especially for marginalized groups such as Scheduled Castes, Scheduled Tribes, and girls.	Critics argue that no detention **adversely impacts academic performance**, causing students to not take their studies seriously.
Learning Levels	According to **Pratham's Annual Status of Education Report**, the policy did not lead to a significant fall in enrollment and **reduced dropout rates.**	**Declining learning outcomes**: From 2010 to 2013, there was **a 10 percentage point drop** in standard 5 students' ability to read a standard 2 text in government schools in rural areas.
Impact on Students' Motivation	**No fear of failure:** The policy is aimed at minimizing fear among students, which ideally fosters a **growth mindset.**	Critics argue it leads to **low student motivation** and the general message is that "performance does not matter."
Teacher Accountability	Encourages holistic education, but **teacher accountability** is often seen as low due to the focus on inclusiveness over assessment.	Low teacher accountability due to lack of meaningful **assessments.** The absence of detentions can lead to teachers not addressing gaps in students' learning.
Social and Economic Impact	**Marginalized groups** (e.g., poor, rural students) benefit the most, as they stay in school for **eight years.**	Many students from marginalized groups still fail to make up learning gaps, and the policy may **ignore deeper systemic issues.**
Empirical Evidence	The **TSR Subramanian Committee (2016)** concluded that there was an **increase in pass percentages** for Class 10 and Class 12 in most states.	Critics argue that **there is no clear evidence** to show that no-detention improved learning. For example, the **Pratham report** highlighted poor **learning outcomes** in government schools.
Support from States	**18 states/UTs favored** modifying the policy. **Karnataka and Andhra Pradesh** supported it, emphasizing that **dropout rates** would increase if the policy is scrapped.	**Madhya Pradesh and Punjab** recommended introducing board exams for Classes 5 and 8, arguing that no detention has had a **negative impact** on academic performance.
Flexibility in Policy	The **CABE sub-committee** called for **"more flexibility,"** suggesting that **detention** could be allowed for students significantly lagging behind in their studies.	Some argue that this **increases ambiguity** in the policy. They fear that a rigid system of detention may adversely affect marginalized students.
Long-Term Effects	The **no-detention policy has kept children in the learning** cycle for at least 8 years, leading to **improved enrollment rates.**	Critics argue that **poor infrastructure** and lack of **quality teaching** are contributing to poor learning outcomes, not just the no-detention policy.
Specific Data from Reports	**CABE 2016:** Suggested no detention led to **increased pass percentages** in Class 10 and 12 across many states.	**Pratham's 2013 report:** Showed a **10 percentage point drop** in standard 5 students' ability to read a standard 2 text in rural government schools from 2010 to 2013.

Rationale Behind Scrapping the Policy

1. The central government argued that the **no-detention policy** led to a lack of **accountability** in the education system.
2. With students no longer facing the consequences of poor performance, there was a growing concern about the **deterioration of academic standards**.
3. The aim of the new policy is to ensure that children meet certain **academic standards** before progressing, promoting a more **serious approach** to learning and **accountability** among students.
4. Since the 2019 amendment, **18 states and Union Territories** (UTs) have already scrapped the no-detention policy, citing similar concerns about **student performance** and the **quality of education**.

States and UTs' Implementation Status

1. **States That Have Scrapped the Policy**: Assam, Bihar, Gujarat, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Madhya Pradesh, Meghalaya, Nagaland, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttarakhand, West Bengal, Delhi, and Dadra & Nagar Haveli have already implemented the policy change.
2. **States Still Implementing No-Detention Policy**: Andhra Pradesh, Arunachal Pradesh, Goa, Chhattisgarh, Karnataka, Kerala, Maharashtra, Manipur, Mizoram, Odisha, Telangana, Uttar Pradesh, Ladakh, Lakshadweep, Chandigarh, and Andaman & Nicobar Islands are still following the no-detention policy.
3. **Haryana & Puducherry**: These states are yet to make a final decision regarding the implementation of the **detention policy**.

Right to Education

1. **Education** was originally a state subject in India under the **Government of India Act 1935**. However, during the **42nd Amendment Constitutional Amendment 1976,** education was moved to the **Concurrent List.**
   a. Thus, now **both the central and state governments** can legislate on matters concerning education.
2. The **86th Amendment Constitution Act, 2002** made the **Right to Education a fundamental right under Article 21A** for children aged 6-14 years.
   a. It added **Article 21A under Fundamental Rights**, making education a fundamental right for children aged six to fourteen, mandating free and compulsory education.
   b. In the **Directive Principles of State Policy (DPSP), Article 45** was substituted to emphasize the state's responsibility to provide early childhood care and education until the age of 6.
   c. Additionally, Article 51A was amended to include a duty for parents or guardians to ensure educational opportunities for their children or wards between 6 and 14 years.
3. Later, **Parliament passed the Right to Education Act, 2009,** enforcing RTE as a fundamental right under Article 21-A.

Government Initiatives Related to Educational Reforms

National Education Policy, 2020, National Programme on Technology Enhanced Learning, Sarva Shiksha Abhiyan, PRAGYATA, Mid-Day Meal Scheme, PM SHRI Schools and Samagra Shiksha Scheme 2.0

Conclusion

The government's decision to end the **no-detention policy** for students in **KVs**, **JNVs**, and other central schools marks a significant shift in India's education policy. The policy is expected to raise academic **accountability**, **improve learning outcomes**, and address concerns about **deteriorating educational standards**. While the move will affect thousands of schools and students, it aligns with the broader goals of **competency-based learning** and **holistic development** as outlined in the **National Education Policy (NEP)** and the **Right to Education Act**. This change will require schools, teachers, and parents to work more closely to ensure that students are equipped with the necessary skills to succeed academically.

3. Bharatiya Vayuyan Vidheyak Bill, 2024

Recently, the President granted assent to the ***Bharatiya Vayuyan Vidheyak (BVV), 2024***, which aims **to replace the 90 years-old *Aircraft Act, 1934*** and modernize India's aviation sector. The new legislation seeks to enhance safety measures, align with global standards, and promote the growth of civil aviation in India.

Key Features of *Bharatiya Vayuyan Vidheyak (BVV), 2024*

Parameters	Retained from Aircraft Act, 1934	Addition/ Changes in Bharatiya Vayuyan Vidheyak, 2024
Regulatory Structure	The Act sets up **three** key authorities: ● Directorate General of Civil Aviation (DGCA) ● Bureau of Civil Aviation Security (BCAS) and ● Aircraft Accident Investigation Bureau (AAIB) The **central government** exercises overall **superintendence** over these bodies.	● The power to issue the **Radio Telephone Operator (Restricted) Certificate** and **license** has been transferred from the **Department of Telecommunication** to the **DGCA**. ● Simplification of the licensing process by consolidating it under one authority, the **DGCA**.
Regulation of aircraft-related activities	The Act regulates activities related to aircrafts including **manufacturing, use, operation, and trade.**	The Act now includes powers to regulate aircraft design.
Power to make Rules	The Act empowers the **central government to make Rules** on matters including: ● **regulation** of specified activities related to **aircrafts** and matters on **licencing, certification, and inspection**, ● regulation of **air transport services** ● implementation of the **Convention on International Civil Aviation,1944**.	The central government may now also make rules concerning **Radio Telephone Operator certificates and licenses** under the **International Telecommunication Convention**.
Offences and Penalties	Offences are punishable by: ● Imprisonment up to 2 years ● A fine up to ₹1 crore, or both ● Violations include: o Carrying prohibited goods o Flying in a manner that causes danger to life or property o Failure to comply with the directions of DGCA or BCAS	**Discretionary Penalties**: The **Central Government** has the **discretion to specify civil or criminal penalties** for violation of certain Rules. E.g., **implementation of international convention**, **protection of public health** etc.
Adjudication of penalties	● **Adjudication**: Penalties are adjudicated by an officer of the central government (at least a Deputy Secretary level). ● **First Appeal**: Appeals go to an Appellate Officer who must be of a higher rank than the Adjudicating Officer.	**Second Appeal:** A second appeal can be made to an officer of a higher rank than the First Appellate Officer.

Aviation Governance in India

1. The aviation industry in India is governed by the **Ministry of Civil Aviation (MoCA)**.
2. Its primary **responsibility** is **formulation of policy, rules, and regulations** related to civil aviation operations in the country or related to **international civil aviation operations** from the country.

Aviation Sector in India – Key Facts

1. India is the **9th largest** civil aviation market globally.
2. India is the **3rd largest domestic air passenger market**.
3. There are **157 operational airports** in India in 2024.
4. The **CAGR** in the number of domestic passengers during FY14 and FY20 is **14.5%**.
5. India has **15% women pilots**, almost **three times the global average**.

Concerns related to Bharatiya Vayuyan Vidheyak (BVV) 2024

1. **Lack of independence of DGCA**: The central **government** exercises **superintendence** over DGCA unlike other regulatory bodies of telecom, insurance and electricity sector.
2. **Appellate System**: Appeals against decisions of bodies like DGCA are **limited to the Union Government**, potentially affecting their efficacy.
3. **Arbitration**: The unilateral appointment of an arbitrator by the government in compensation-related cases is seen as potentially violative of the **Right to Equality** under **Article 14** of the Constitution.

Key Organizations under Ministry of Civil Aviation (MoCA)

1. **Directorate General of Civil Aviation (DGCA)** – Regulates aviation safety.
2. **Bureau of Civil Aviation Security (BCAS)** – Sets standards for the security of civil flights at airports.
3. **Airport Authority of India (AAI)** – Oversees airport development and modernization.
4. **Aircraft Accident Investigation Bureau (AAIB)** – Investigates aircraft accidents.
5. **Airport Economic Regulatory Authority of India (AERA)** – Regulates tariffs and monitors airport performance.

Key legislations Governing Aviation in India:

1. **Aircraft Act, 1934** (and **Aircraft Rules, 1937**) – Regulates civil aviation activities and airport licensing.
2. **AERA Act, 2008** – Regulates tariffs for aeronautical services and monitors airport performance.
3. **FDI Policy** –
   - 100% Foreign Direct Investment (FDI) is permitted in scheduled air transport services and domestic airlines (49% automatic route, beyond 49% with government approval).
   - **100% FDI** is permitted for **NRIs** under the automatic route and in **Greenfield and Brownfield airport projects**.

Key Initiatives for India's Aviation Sector

1. **Policies:**
   a. **National Civil Aviation Policy, 2016**: Aims to make regional air connectivity affordable and convenient, promoting civil aviation and tourism.
   b. **Vision 2040 for Civil Aviation Industry**: A roadmap outlining long-term strategies for the development of India's civil aviation sector.
2. **Schemes/ Initiatives:**
   a. **RCS-UDAN Scheme**: Target to operationalize **1,000 UDAN routes** and **revive/develop 100 unserved** & underserved airports/heliports/water aerodromes by 2024.
   b. **Privatization of Airports**: 25 airports are being privatized under the **National Monetization Pipeline (NMP).**
   c. **Technological interventions:**
      i. **NABH Nirman** (for airport capacity augmentation),
      ii. **Digi Yatra** (for paperless travel)
      iii. **AirSewa** (for online grievance redressal),
      iv. **GPS Aided GEO Augmented Navigation (GAGAN) (**developed by **AAI and ISRO** for **Air Traffic Management).**
3. **International Cooperation:**
   a. **Delhi Declaration on Civil Aviation (2024):** Adopted at the **2nd Asia Pacific Ministerial Conference on Civil Aviation (APMC)**, it sets a framework for enhancing **regional cooperation in civil aviation.**
   b. **Carbon neutrality initiatives:** Standardization of **Carbon Accounting and Reporting framework** of Airports.
   - Since 2014, **73 airports** like **Delhi and Bengaluru** have switched to **100% green energy usage.**

India's aviation sector is on a **transformative path**, with significant strides in **infrastructure development, regional connectivity, and sustainability efforts. Bharatiya Vayuyan Vidheyak (BVV)**, 2024 can promote growth of the sector by removing ambiguity and confusion in the **legal framework.**

4. Not Every Private Property can be Acquire by State: Supreme Court

1. In November 2024, the Supreme Court of India ruled that the government cannot automatically take over private properties by calling them **"material resources of the community"** for redistribution under Article 39(b).
2. A **9-judge Constitution Bench** delivered a landmark ruling in Property Owners Association v State of

Maharashtra**,** restricting the powers of the state to acquire private property.

3. This decision **overturned earlier rulings** in State of Karnataka v. Ranganatha Reddy (1978) and Sanjeev Coke Manufacturing Company v. Bharat Coking Coal Ltd. (1983), which had suggested that private properties could be considered community resources.

Material Resources of The Community

1. It refers to both public and private resources that are used to generate goods, services, or wealth for the benefit of the community.
2. **Private Ownership of Resources:**
   - Certain material resources, like forests, ponds, fragile areas, wetlands, and resource-bearing lands, may be privately owned.
   - Such resources fall under Article 39(b), which focuses on the equitable distribution of resources for the welfare of the people.
3. **Scarcity of Resources:**
   - Some material resources are scarce and finite, such as spectrum, airwaves, natural gas, mines, and minerals.
   - These resources may sometimes fall under private control.
4. **Converting Private Resources to Community Resources:** Private resources can be transformed into material resources for the community through the following means:
   - Nationalization, Acquisition, Operation of law, Purchase by the state and Owner's donation

Evolution of the Right to Property in India

1. **Initially a Fundamental Right**
   - **a.** The right to property was originally enshrined as a Fundamental Right in the Indian Constitution under Article 19(1)(f) and Article 31.
   - **b.** **Article 19(1)(f)** guaranteed citizens the right to own property, while Article 31 provided protection against the arbitrary deprivation of property, ensuring compensation in the event of property acquisition by the government.
2. **Curtailment through the 25th Amendment (1971)**
   - **a.** The **25th Constitutional Amendment (1971)** made a significant change by introducing Article 31C, which granted immunity to laws enacted to implement the Directive Principles of State Policy under Article 39(b) and Article 39(c) from being challenged on the grounds of violation of Fundamental Rights, including the right to property.
   - **b.** The **Kesavananda Bharati case (1973)** upheld the validity of Article 31C, but the Supreme Court clarified that laws under this provision would still be subject to judicial review, particularly in cases where they violated the Basic Structure of the Constitution.
3. **Making it a Constitutional Right**
   - **a.** **In 1978,** the 44th Constitutional Amendment significantly altered the status of the right to property. It was removed as a Fundamental Right and reclassified as a Constitutional Right under Article 300A.
   - **b.** The reclassification under Article 300A allowed the government to acquire private property for public purposes, provided that fair compensation was offered. However, it no longer enjoyed the same constitutional protection as a Fundamental Right.

Key Highlights of the Judgment in *Property Owners Association v. State of Maharashtra*:

The Supreme Court addressed two important questions:

- **The validity of Article 31C:** The Court examined whether Article 31C, which deals with property rights, continues to hold validity in light of amendments and judicial decisions that have influenced its scope.
- **Interpretation of Article 39(b):** The Supreme Court considered whether the government can classify privately owned property as "material resources of the community" and acquire it for redistribution purposes.

1. **On Article 31C:**
   - The Supreme Court reaffirmed the principles laid out in **the** Kesavananda Bharati **case**, confirming that Article 31C provides protection only to laws that implement the directive principles of State Policy, specifically **Articles 39(b) and 39(c).**
   - The Court emphasized that laws under **Article 31C must align** with the objective of fulfilling social and economic justice as mandated by these specific provisions.
2. **On Article 39(b):**
   - The Court clarified that the government's authority is limited when it comes to acquiring private

property under Article 39(b). It rejected the broad interpretation that was previously proposed by **Justice Krishna Iyer.**

- The Court further ruled that not all privately owned property qualifies as a "material resource of the community" under Article 39(b). Hence, such property cannot be automatically acquired by the state.

3. **Factors for Classifying Material Resources:**
   - The Court emphasized that for a resource to be considered a "material resource of the community," several factors need to be assessed:
     - The public trust doctrine.
     - The resource's intrinsic qualities and impact on the community.
     - The scarcity of the resource.
     - The potential harm if the resource is monopolized by private hands.
   - These factors must be carefully evaluated to determine whether a resource is critical for the public good.
4. **Clarification on the Term "Distribute":**
   - The Court clarified that the term "distribute" in Article 39(b) does not just refer to government ownership. It can also involve redistributing resources to private entities, as long as it is done for the common good.
5. **Flexibility in Economic Policies:**
   - The Court reaffirmed that the framers of the Constitution intended for economic policies to be flexible, allowing governments to adapt to the changing needs of society, rather than being bound by rigid economic doctrines.

Difference Between Fundamental Rights And Community Rights

Aspect	Fundamental Rights	Community Rights
Definition	Rights guaranteed to individuals, focusing on personal freedoms and equality.	Rights granted to groups or communities to protect their cultural, religious, or collective interests.
Focus	**Individual-centric:** ensures personal liberty and dignity.	**Group-centric:** safeguards the interests of specific communities.
Legal Basis	Typically enshrined in a country's constitution and universally applicable.	Recognized through specific laws, policies, or constitutional provisions in some cases.
Enforcement	Legally enforceable in courts by individuals for violation.	Enforcement depends on national laws and policies, often requiring collective action.
Applicability	Applies equally to all individuals regardless of background.	Specific to certain groups, such as indigenous peoples or minorities.
Examples	Right to Equality, Right to Freedom, Right to Education (e.g., Articles 14–32 in India's Constitution).	Rights of Indigenous communities, minority language rights, and cultural preservation rights.
Purpose	Protects individual liberty and creates a just and equitable society.	Preserves the heritage, identity, and autonomy of communities or groups.

Implications of the Ruling

1. **For Future Government Policies**:
   - **a.** The ruling will influence **future government policies** regarding **wealth distribution**, **land acquisition**, and **social welfare**. The government will now have to be more **careful** when creating laws that involve **private property**.
   - **b.** It restricts the government's ability to **arbitrarily define** private property as **"community resources"** that can be taken over without clear guidelines.
2. **For Property Owners**:
   - **a.** The ruling is a **major victory for property owners**, providing them with a **stronger legal basis** to protect their property against **unjust state actions**.
   - **b.** Owners can now challenge any **government acquisition** of their property by **questioning its "public good"** justification, making it harder for the state to take over property without meeting clear legal standards.

3. **For Investors and Private Sector**:
   a. The ruling will **increase investor confidence** because it guarantees **greater protection of private property rights**.
   b. Investors are less likely to fear that their property or resources will be **arbitrarily taken** by the government under the guise of serving the "common good".

Conclusion

The **Supreme Court's 2024 ruling** significantly strengthens the protection of **private property rights** in India and clarifies the state's limited powers in acquiring and redistributing private property. This judgment ensures that government policies related to wealth redistribution or public welfare cannot **disregard private ownership** without clear justification. It also marks a shift towards a more **liberalized economic model**, where **state control** over private property is not seen as the **default solution** for addressing wealth inequalities.

5. A.P became 5th state to Scrap the 2-Child Rule for Local Body Elections

1. In November 2024, Andhra Pradesh decided to remove **2-child rule** for contesting local body elections by passing the AP Panchayat Raj (Amendment) Bill, 2024 and the AP Municipal Laws (Amendment) Bill, 2024.
2. This rule, **introduced in 1994** by the then Andhra Pradesh government **(when the state was undivided), by amending the AP Panchayat Raj Act, the AP Municipal Corporations Act, 1955 and the Municipalities Act, 1965,** was initially part of efforts to control population growth.
3. Under this policy, individuals with **more than two children were restricted from standing for elections** at various local levels, including panchayats (villages), municipalities, and other local bodies.
4. The **decision to abolish the rule** marks a significant shift in the state's approach to governance and electoral participation.

Why Was the Two-Child Rule Introduced?

1. The rule was introduced after it was found that the population control measures between the **1981 and 1991 censuses** were not producing the expected results.
2. At the time, India was struggling to manage its **rapid population growth**.
3. In response to growing population concerns, the **National Development Council** (NDC) set up a committee in the early 1990s, chaired by then **Kerala CM K Karunakaran**, which recommended that people with more than two children should be excluded from government positions.
4. This recommendation was adopted by several states, including Andhra Pradesh.

Which States Adopted the Two-Child Rule?

1. **Rajasthan** became the first state to adopt "2-child policy" for **panchayat elections** in **1992**, followed by **Andhra Pradesh (them undivided)**, **Haryana** in **1994**.
2. **Odisha** introduced the policy for local bodies in **1993 and extended it to the block panchayat level in 1994.**
3. While Chhattisgarh, Himachal Pradesh, and Madhya Pradesh introduced the policy in 2000, Maharashtra, Gujarat, Bihar, and Assam enforced it in 2003, 2005, 2007 and 2017, respectively.
4. The policy came into force in Uttarakhand in 2019 while the Union Territories (UTs) of Dadra and Nagar Haveli and Daman and Diu adopted the policy in 2020.

Why have some states Revoked this Policy?

1. Of the 13 states and UTs that adopted the policy, **Chhattisgarh, Haryana, Himachal Pradesh, and Madhya Pradesh rolled it back in 2005.**
2. A key reason for going back on the policy was the **worsening Sex Ratio** at Birth (SRB), which **declined to 880:1000 between 2003 and 2005.**
3. Steep decline in the SRB was due to the strict 2-child policy and widespread access to pre-natal diagnostic technology for sex detection.
4. Another reason for rolling back the **"two-child policy"** was the National Population Policy that came into force in 2000 and deviated from the previous target-driven approach of population control.
   - National Population Policy in 2000 advocated target free approach and protection of reproductive rights.

Why Did Andhra Pradesh Scrap the Two-Child Rule?

1. Andhra Pradesh government, claiming that the **ageing population** could adversely affect the state.
2. He believes that a **low fertility rate** could eventually hurt the state's **economic productivity** and workforce.
3. **State government said, Total Fertility Rate (TFR)** had fallen to **1.5**, which is lower than the **national average** of **2.11**.
   - A low TFR means fewer children are being born, which could lead to a **shrinking younger population** over time.
4. The government has expressed concern that an **ageing population** with fewer young people would eventually affect the state's **economic growth**, as there would be fewer workers to drive development.

How Does This Connect to Delimitation?

1. **Delimitation** refers to the process of **re-drawing boundaries** of constituencies based on population data.
2. In India, the **delimitation exercise** is important for deciding the number of seats each state gets in Parliament and state legislatures.
3. The **delimitation exercise** in 2026 is expected to be based on **population data**.
4. Since **southern states** like Andhra Pradesh and Tamil Nadu have successfully implemented **family planning measures**, they have seen lower population growth rates compared to other states.
5. Naidu and other southern leaders are concerned that the **Centre might reduce their seats in Parliament** because of their lower population.
6. This has led to calls for a system that adjusts seats based on **economic performance**, not just population.

Challenges and Criticism of the Move

1. While the **Andhra Pradesh government** has called for **incentives** to encourage families to have more children, **demographers** warn that **such incentives** rarely work in reversing the trends of an **ageing population**.
2. **Many countries with similar policies**, such as **Japan** and **Italy**, have seen limited success in increasing birth rates through financial or social incentives.
3. Some people have argued that forcing people with more than two children out of elections was a violation of **constitutional rights**.

Telangana likely to scrap two-child policy

1. **A part of undivided Andhra Pradesh till 2014**, Telangana, like Andhra Pradesh, will have to amend its Panchayat Raj Act, 2018, for the policy to be scrapped.
2. If scrapped, Telangana will become the 6th state in the country to rescind the policy. While Andhra Pradesh recently rolled it back, Chhattisgarh, Haryana, Himachal Pradesh, and Madhya Pradesh scrapped it in 2005.

6. National Panchayat Awards 2024

In December 2024, **45 Panchayats were awarded with National Panchayat Awards 2024** for their contributions to sustainable and inclusive development in rural India.

About National Panchayat Awards 2024

1. **Launched by the Ministry of Panchayati Raj** in alignment **with 9 Localization of Sustainable Development Goals (LSDGs)** themes aggregating 17 SDGs.
   a. **9 LSDGs themes include** Poverty-Free and Enhanced Livelihoods, Healthy Panchayat, Child-Friendly Panchayat, Water-Sufficient Panchayat, Clean and Green Panchayat, Self-Sufficient Infrastructure, Socially Just and Secured Panchayat, Panchayat with Good Governance, and Women-Friendly Panchayat.
2. **Objectives:** To assess the performance of Panchayats in attainment of SDGs, Promotion of competitive spirit among them etc.
3. This award has been conferred under the **following categories:**
   a. **Deen Dayal Upadhyay Panchayat Satat Vikas Puraskar (DDUPSVP):** This award is for top-3 ranking GPs/Equivalent bodies for their outstanding performance under each of the above mentioned 9 award themes.
   b. **Nanaji Deshmukh Sarvottam Panchayat Satat Vikas Puraskar:** This award is for top 3 Gram, Block and District Panchayats each for their aggregate performance under all the 9 award themes of DDUPSVP.
   c. **Special categories of Awards:**
      - **Gram Urja Swaraj Vishesh Panchayat**

Puraskar is for top 3 GPs/Equivalent Bodies for their performance in adoption and usage of renewable sources of energy.

- **Carbon Neutral Vishesh Panchayat Puraskar** is for top 3 GPs/Equivalent Bodies for their performance in adoption and **usage of renewable sources of energy.** This year, a total 3 awards have been conferred under this category.
- **Panchayat Kshamta Nirmaan Sarvottam Sansthan Puraskar** is for 3 Institutions across the country who have provided institutional support to GPs in achieving LSDGs.

National Panchayati Raj Day

- The **National Panchayat Awards** are usually celebrated on **April 24th** every year, in conjunction with **National Panchayati Raj Day** (due to the General Elections to the Lok Sabha held earlier in 2024, the award ceremony was rescheduled to 11th December this year.).
- This day commemorates the enactment of the **73rd Constitutional Amendment Act, 1992**, which came into effect in 1993 and granted Panchayats constitutional status as institutions of local self-governance.

7. Pardoning Powers of the President in India

1. Recently, U.S. President Joe Biden issued a **'full and unconditional pardon'** for his son, Hunter Biden, who faced sentencing for illegally owning a firearm while using drugs and for tax-related offenses.
2. The **'royal prerogative of mercy'** is a historic prerogative of the British monarch, originally used to withdraw or provide alternatives to death sentences.

Comparison between Pardoning Powers of the President of India and the USA

Attributes	Indian President	U.S. President
Source of Power	Article 72 of the Constitution	Article II, Section 2 of the Constitution
Scope	Power extends to not only federal/union but also state crimes.	Power extends to federal crimes only and not state crimes.
Death Penalty	The President can pardon death sentences, including those by states.	The President can pardon only federal death sentences, not those for state crimes.
Role of Executive Branch	• ***Maru Ram vs Union of India*, 1980**: The Supreme Court held that the power to grant pardons must be exercised fairly, reasonably, and without arbitrariness, ensuring justice and balance. • ***Kehar Singh v. Union of India*, 1988**: The Supreme Court held that the President's pardoning power is independent of the judiciary, but it can be reviewed to ensure procedural fairness. The review focuses on adherence to constitutional principles and procedural requirements, not the merits of the decision.	The President can act at his own discretion.
Judicial Review	Limited judicial review; courts can examine the process but generally not the decision itself.	Courts can review pardons in cases of suspected corruption or abuse of power.
Limitations	The President cannot pardon someone impeached by Parliament.	The President cannot pardon someone impeached and convicted by Congress.

What are the Different Types of Clemency?

Clemency Type	Definition
Pardon	Removes both the sentence and the conviction, absolving the convict from all punishments and disqualifications.
Commutation	Substitutes one form of punishment for a lighter one.
Remission	Reduces the period of a sentence without changing its nature.
Respite	Awards a lesser sentence due to special circumstances like physical disability or pregnancy.
Reprieve	Temporarily stays the execution of a sentence to allow time to seek pardon or commutation.

Pardoning Power of the Governor

The Governor of a state exercises pardoning powers **under Article 161**, though with limitations compared to the President's power.

- The Governor can pardon, **reprieve, respite, remit, suspend, or commute** the punishment or sentence of anyone convicted of an offense under state law.
- The Governor **can suspend, remit, or commute a death sentence, but cannot pardon** it.

8. The Boilers Bill, 2024

1. In December 2024, the **Boilers Bill, 2024** passed in the **Rajya Sabha**.
2. This Bill replaces the **Boilers Act, 1923** and aligns with the provisions of the **Jan Vishwas (Amendment of Provisions) Act, 2023**.
3. The **primary objective** of the Bill is to enhance the safety of life and property by preventing explosions and accidents involving steam boilers.

Key provisions of the Bill

1. **Regulation:** Centre will constitute **Central Boilers Board** to regulate the design, manufacture, erection and use of boiler and boiler components.
2. **Inspection:** Inspections can be carried out by **State-appointed Inspectors or authorized third parties.**
3. **Ease of Doing Business (EoDB):**
   - In the **Boilers Act, 1923**, there were 7 offences, but the new Bill retains only **4 serious offences** that involve loss of life or property. These offences are subject to **criminal penalties**.
   - For **non-criminal offences**, penalties will be in the form of **fines**, but these will now be levied through an **executive mechanism** rather than going through courts, which simplifies the process and improves **Ease of Doing Business**.

Issues associated with Bill

1. **Safety Concerns:** The Bill allows **state governments** to **exempt certain areas** from its provisions. This raises concerns about whether safety measures will be effectively implemented in these exempted zones.
2. **Limited Judicial Recourse:**
   - **Decisions** made by the **central government** and **state-appointed inspectors** cannot be challenged in **regular courts**.
   - Aggrieved individuals must file **writ petitions** in the **High Courts** under **Article 226** of the **Constitution**.
3. **Hindrance to Ease of Doing Business (EoDB):**
   - **No specific timelines** have been set for:
     - Inspections
     - Approvals for alterations, repairs, or erection of boilers
   - This lack of clarity could delay business operations.

About Boilers

- A **boiler** is a vessel in which steam is generated under **pressure**.
- As of **2024**, India has approximately **40 lakh steam boilers** in operation.
- **Boilers** fall under the **Concurrent List** of the Indian Constitution, meaning both the **Central Government** and **State Governments** can legislate on the subject.

9. Social Dialogue Report 2024

1. In December 2024, the **International Labour Organisation (ILO)** published its **Social Dialogue Report**.
2. It emphasizes the importance of governments protecting fundamental workers' rights, particularly the freedom of association and the right to collective bargaining (negotiating work conditions collectively with employers).

Key Findings and Recommendations

1. **Decline in Labor Rights (2015-2022):** Between 2015 and 2022, countries saw a **7% drop in compliance** with the freedom of association and right to collective bargaining.
   a. This decline has been driven by **increased violations of fundamental rights**, affecting employers, workers, and their representative bodies.
2. **Importance of Peak-Level Social Dialogue (PLSD):** The report emphasized the need for **Peak-Level Social Dialogue (PLSD)**, which involves governments, employers, and workers coming together to discuss labor and social policies.
   a. PLSD includes two forms of dialogue:
      - **Bipartite Dialogue**: Between employers and workers.
      - **Tripartite Dialogue**: Involving the government as well.
   b. PLSD enables countries to pursue economic development together with social progress, aligning with the goals of the **United Nations 2030 Agenda for Sustainable Development** for a more inclusive and sustainable future.
3. **Improvement of National Social Dialogue Institutions (NSDIs):** The ILO encouraged countries to strengthen their social dialogue institutions by providing better resources and technical support, ensuring more effective participation in labor discussions.
4. **Role of Social Dialogue in Economic Development:** Social dialogue is seen as a key tool for **balancing economic development with social progress**.
   a. The ILO emphasizes that social dialogue plays a crucial role in ensuring fair transitions during the economic shifts caused by technological advancements, climate change, and demographic changes.
   b. This dialogue helps manage the low-carbon and digital transformations of economies effectively.
5. **Impact on Civil Liberties and Bargaining Rights:** The report attributes the deterioration to rising violations of basic civil liberties and the bargaining rights of both employers and workers.
6. **Social Dialogue as a Catalyst for Development:** The ILO argues that social dialogue can play a crucial role in achieving economic growth while ensuring social justice.
   a. It also highlights the **importance of dialogue in promoting inclusive transitions** toward low-carbon and digital economies.

Role of Trade Unions in Emerging Sectors

1. Unlike traditional industries such as manufacturing, public utilities, and conventional financial sectors like banking and insurance, establishing trade unions in modern and emerging sectors is significantly more challenging.
2. IT employees are often perceived as not requiring unions due to: competitive salaries, favourable work environments, mechanisms to address grievances
3. These factors encourage loyalty to their employers and the industry. If these conditions are violated, employees leave (exit) because they possess in-demand skills, resulting in high labor turnover.
4. Employees typically avoid collective bargaining, strikes, or legal action due to societal stigma and instead either remain silent (loyalty) or resign.

Framework Governing Labour in India

Constitutional Framework

1. **Concurrent List:** Labour laws fall under the **Concurrent List**, empowering both Central and State governments to enact laws, with some matters reserved for the Centre.
2. **Judicial Interpretation:** In Randhir Singh vs Union of India, the Supreme Court emphasized that **"Equal pay for equal work"** is not explicitly defined in the Constitution but is a goal supported by the following articles:
   a. **Article 14:** Ensures equality before the law and equal protection under the law within India.
   b. **Article 16:** Guarantees equal opportunities in public employment.
   c. **Article 39(c):** Advocates for an economic system that prevents wealth concentration and promotes societal welfare.

Legislative Framework

1. The government has introduced several legislative measures to improve work conditions and streamline labor laws.
2. **Labour Codes:** The latest initiative is the consolidation of labor laws into four comprehensive labor codes, pending implementation:
   a. **Code of Wages, 2019**
   b. **Industrial Relations Code, 2020**
   c. **Social Security Code, 2020**
   d. **Occupational Safety, Health, and Working Conditions Code, 2020**

What is Freedom of Association?

1. Freedom of association is a **fundamental right** that supports all other efforts towards improving living and working conditions.
2. **Right to Peaceful Assembly and Association:** The right to peaceful assembly includes organizing events, meetings, sit-ins, strikes, rallies, protests, and demonstrations, both offline and online.
   a. It grants individuals the ability to come together to express, promote, defend, and pursue common interests.
   b. This right also covers the ability to form trade unions, allowing collective bargaining for workers' rights.
3. **Legal Framework:** The **Universal Declaration of Human Rights (Article 20)** guarantees the right to freedom of peaceful assembly and association.
   a. These rights are further protected by **International Labour Organisation (ILO)** conventions, which also safeguard the right to form and join trade unions.

Case Study: Rajasthan

1. A case study from **Rajasthan, India** highlighted the introduction of the **Platform-Based Gig Workers (Registration and Welfare) Bill**.
2. This bill led to the creation of the **Rajasthan Platform-Based Gig Workers Welfare Board**, tasked with overseeing the welfare of gig workers such as drivers and delivery personnel.
3. The board is composed of 12 members: 6 from the government and 6 representing gig workers, aggregators, and civil society.

10. E-Courts Mission Mode Project Phase III

The Union Cabinet has approved Phase III of the e-Courts Mission Mode Project. This phase aims to enhance the judicial system by transitioning towards a digital, online, and paperless environment, primarily by digitizing all court records. The project has been under implementation since 2007, with previous phases (I & II) being executed between 2011-15 and 2015-23.

Objective:

The main goal of e-Courts Phase III is to create a unified technology platform for the judiciary, enabling a seamless and paperless interface between courts, litigants, and other stakeholders.

Key Features of e-Courts Phase III:

1. **S3WAAS Platform:** Provides secure and efficient data storage and access for court records.
2. **e-Seva Kendra:** Offers electronic services and assistance to users of the court system.
3. **CLASS System:** Facilitates live audio-visual streaming of court proceedings in courtrooms.
4. **Scanning and Digitization:** Involves converting physical records into digital format to streamline access.
5. **Cloud Infrastructure:** Ensures scalable storage and computing resources to support the digital transition.
6. **Virtual Courts:** Enables remote court proceedings through digital platforms, allowing proceedings to be conducted virtually.

Project Details:

1. **Duration:** The project will be implemented over 4 years (2023-2027).
2. **Financial Outlay:** ₹7,210 Crore.
3. **Scheme Type:** Central Sector Scheme.

Implementation & Governance:

1. **Jurisdiction:** The project will primarily be implemented in High Courts (HCs).
2. **Funding:** Funds are released to High Courts by the Department of Justice (Ministry of Law) based on recommendations from the e-Committee (Supreme Court of India).

3. **e-Committee Role:**
   - The e-Committee is responsible for providing policy planning, strategic direction, and guidance for the implementation of the e-Courts project.

Significance of Digitalization of Courts:

1. **Judicial Modernization:** Transitioning to a digital system allows data-driven decisions and fully digitizes the justice delivery system, making it more efficient.
2. **Reducing Case Pendency:** Integrating emerging technologies such as AI, Optical Character Recognition (OCR), and others can enhance court efficiency and reduce the backlog of cases.

This project represents a monumental shift towards modernizing the Indian judiciary, ensuring faster, more efficient, and accessible justice.

11. What is the SC directive on Sacred groves?

1. In December 2024, the Supreme Court ordered the Rajasthan Forest Department to map and **classify sacred groves** as **'forests'** and **'community reserves'** under the **Wildlife Protection Act, 1972.**
2. This order shifts control of sacred groves from **community-based management to the Forest Department.**
3. The Court also recommended the Union Environment Ministry to **identify sacred groves** across the country and formulate a policy for their protection.

What is the background of the case?

1. **SC's definition of 'forest land':**
   a. In T.N. Godavarman v. Union of India, 1996, it was held that **'forest land'** in Section 2 of the **Forest (Conservation) Act, 1980**:
      i. Will not only include 'forest' as understood in the **dictionary sense**,
      ii. But also, **any area recorded as forest** in the government record **irrespective of the ownership** of the land.
   b. State governments were directed to form **expert committees** to identify such areas.
2. **Expert committee report of the Rajasthan government (2004):**
   a. Identified only those sacred groves as 'forests' that fulfilled the criteria of **'deemed forests',** while the remainder was not.
      i. **Criteria of 'deemed forests'**: Trees covering 5 hectares of land with at least 200 trees per hectare
3. **Disagreement of Supreme Court's Central Empowered Committee (CEC):** Because the report of the expert committee was not in line with SC's definition of 'forest land'.
4. **SC's direction:** In 2018, the Rajasthan government was directed to implement the recommendations immediately.
5. Since 2018, the Rajasthan government has **only notified** around 5,000 out of 25,000 orans (sacred groves) as deemed forests.

What are sacred groves?

1. **Sacred groves** are forests that are **protected by local communities** due to their **religious and cultural significance.**
2. They are often associated with temples, monasteries, shrines, pilgrim sites, and/or burial grounds.
3. **How are they called in different regions of India?**

Region	Names
Karnataka	'devara kadu'
Kerala	'kavu' and 'sarpa kavu'
Gujarat	'sabarkantha', 'dahod' or 'banaskantha'
Rajasthan	'orans', 'malvan', 'deo ghat', and 'baugh'
Chota Nagpur Plateau region	'sarna'
Chhattisgarh	'devbani'
Odisha	'jahera' or 'thakuramma'
Maharashtra and Chhattisgarh – by the Muria, the Madia, and the Gond adivasis	'devgudi'
Himachal Pradesh	'devban'
Meghalaya	'ki law lyngdoh', 'ki law kyntang' or 'ki law niam'

4. India has the **highest number of sacred groves** in the world, ranging up to 10 lakh groves. Rajasthan has around 25,000 and they cover about six lakh hectares of the State.

What is the significance of sacred groves?

1. **Part of cultural identity**:
   a. The myths, legends and beliefs surrounding a sacred grove is closely tied with how the community identifies itself.
   b. It thus has a strong **emotional and psychological connection** with the community.
   c. According to anthropologists, they are closely related with the concept the **Nature-Man-Spirit Complex (NMS Complex)** which highlights the relationship between people, nature, and the spiritual world.
   d. For instance, in the **Mawphlang Sacred Forest of Meghalaya**, rituals are conducted to appease the spirits of the forest for their blessings.
2. **Biodiversity hotspots**:
   a. They are sites that support the growth of **unique and endemic** flora and fauna.
   b. For instance, the **sacred groves of Kerala** help in the preservation of rare species such as Malabar civet, Lion-tailed macaque etc.
3. **Water Conservation:**
   a. They are frequently sources of perennial streams, ponds, or sacred springs, helping maintain local hydrology.
4. **Disaster mitigation:** They have helped communities **mitigate the effects** of floods, landslides, and droughts on their lives while stabilising the soil and preventing erosion.
5. **Traditional knowledge**: They act as repositories of indigenous knowledge of herbal medicines, sustainable forest management etc.
6. **Livelihood source:** They provide a variety of resources like medicinal plants, fruits, fuelwood, fodder, and even water for communities.

What are community reserves?

1. **Community reserves** are **community-owned lands** where local communities actively **participate in wildlife conservation** while continuing their traditional land-use practices.
2. They are a category of **protected areas** introduced through the Wildlife Protection (Amendment) Act, 2002 under the **Wildlife Protection Act, 1972 (WLPA).**
3. **Volunteering by the locals:** To conserve habitats to protect "fauna, flora, and traditional or cultural conservation values and practises".
4. **Responsibilities of the locals:**
   a. Prevent any offences specified in the WLPA
   b. Assist the authorities in arresting any offenders
   c. Report the "death of any wild animal,"
   d. Prevent or extinguish any fires

Some of Offences include
• Damaging the boundary marks
• Teasing or molesting wild animals
• Littering in the community reserve
• Setting fires or allowing a fire to burn
• Using any chemical substances that endanger wildlife

5. **Control:** The Chief Wildlife Warden, under whose jurisdiction community reserves fall, effectively has overall control of the reserve and its management plan.
6. **Community Reserve Management Committee:**
   a. Must be constituted by the **State Government** to conserve, maintain, and manage the reserve and to protect wildlife and habitats.
   b. **Consists of**:
      i. At least five members nominated by the gram panchayat (or members of the gram sabha if there is no gram panchayat)
      ii. A representative of the Forest or Wildlife Department in whose jurisdiction the community reserve is located.
   c. If the reserve is on **private land**, the committee will consist of:
      i. The landowner
      ii. A representative of the Forest or Wildlife Department
      iii. A representative of the concerned Panchayat or tribal community
   d. The elected chairperson of the committee will be designated the reserve's **'Honorary Wildlife Warden'.**
   e. **Land-use pattern** within a community reserve cannot be changed without the approval of the reserve management committee and the State government.

What are the other protected areas under WLPA, 1972?

1. **National Parks:** Areas designated for the protection of wildlife and biodiversity, with **strict regulations against human activities.**
2. **Wildlife Sanctuaries:** Areas where certain species of flora and fauna are protected, with **some regulated human activities allowed**.
3. **Conservation Reserve:** They are reserves that are created on **government-owned land** that is not part of a National Park or Wildlife Sanctuary.

Conservation Reserve vs Community Reserve

Criteria	Conservation Reserve	Community Reserve
Ownership	Government-owned land	Typically, private land
Management	Managed by the government	Managed by the community with a committee
Purpose	To protect wildlife and biodiversity	To conserve biodiversity through community involvement

How will the directive clash with the FRA's provisions?

1. The directive which would lead to the **takeover of the control of sacred groves by the Forest department** defies the **Forest Rights Act (FRA) 2006**.
2. **FRA 2006** sought to **recognise traditional and customary rights** over all forest lands under the control of **the Gram Sabhas** (took away the control of the Forest Department).
3. **Currently**,
   a. **All sacred groves in forest areas** come under **'community forest resources'** as per the FRA 2006.
      i. **Community forest resource:** As per FRA 2006, it is the "customary common forest land within the traditional or customary boundaries of the village… including reserved forests, protected forests and protected areas to which the community had traditional access".
      ii. **Authority of the Gram Sabha:** To protect, regenerate, conserve or manage community forest resources, along with the wildlife, flora, and biodiversity within.
   b. **All sacred groves outside forest land**, if any, also come under the FRA's purview if a proposal to notify them as 'forest land' comes into being
4. **With the directive, if sacred groves are notified as community reserves**:
   a. The sacred groves would be controlled by the forest department. Thus, **undermining the traditional governance** in such areas.
   b. It could lead to **conflict with the customs** of communities threatening their cultural identities.
   c. The **traditional and customary rights** of the communities could be lost.

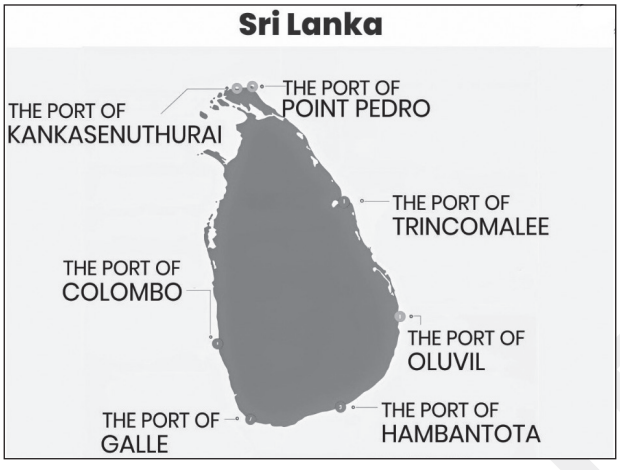
Forest Rights Act, 2006

1. **Aim:**
   a. To recognize the rights of forest-dwelling communities over forest land and resources.
   b. Seeks to address historical injustices faced by these communities regarding their traditional land use and forest rights.
2. **Key Provisions**
   a. **Recognises 4 types of rights:**
      i. **Title rights:** Ownership rights to Forest Dwelling Scheduled Tribes and Other Traditional Forest Dwellers of land used for farming up to 4 hectares.
      ii. **Use rights:** Use for grazing, collecting Minor Forest Produce etc.
      iii. **Relief and development rights:** Right to rehabilitation in case of illegal or forced displacement.
      iv. **Forest management rights:** The right to protect, regenerate, conserve or manage any community forest resource.
   b. **Central role of Gram Sabha**
      i. Gram Sabha initiates the **process of verification** of claims.
      ii. **No eviction** of forest dwellers is allowed unless Gram Sabha consents and scientific alternatives are explored.
      iii. Role in protection of **community forest resources**

B. International Relations

1. Sri Lankan President Visited India

After sweeping Presidential and Parliamentary elections, Sri Lankan President Dissanayake is on his maiden visit to India in December 2024. He met the Indian Prime Minister and has requested to continue its grants assistance to Sri Lanka and help it tide over its economic problems.



Key Announcements of the Meet

1. Continuation of discussions on the **Economic & Technological Cooperation Agreement (ETCA)**.
   a. It would build on the free trade agreement (FTA) that was **implemented in 2000.**
2. **Explore the possibility of jointly working on rehabilitation of Kankesanthurai port** in Sri Lanka with grant assistance from the Government of India.
3. Expedite implementation of **India-funded grant project of Sri Lanka Unique Digital Identity**.
4. **MOU on a protocol to amend the Double Taxation Avoidance Agreement (DTA)** to bring the DTA in line with international standards on prevention of tax treaty abuse.
5. **Other announcements:**
   a. Support the development of **Trincomalee as a regional energy and industrial hub.**
   b. Early finalization of the proposed **bilateral Social Security Agreement.**
   c. **Assistance of USD 14.9 million by India** to undertake a Signaling System in the **Maho Anuradhapura segment of Sri Lankan railways**.
   d. **Comprehensive scholarship program** for 100 economically disadvantaged students.
   e. **MOU to train 1500 Sri Lankan civil service officers**.

Significance of India- Sri Lanka bilateral Relations

For both Nations

1. **Mutual Support at international forums:**
   a. India's support for Sri Lanka's application to become a **member of BRICS.**
   b. Sri Lanka has extended its support to **India's candidature for a non-permanent seat on the UN Security Council** for 2028-29.
2. **Shared maritime security interests in the Indian Ocean Region:** Both are committed to countering traditional and non-traditional threats as well as to ensure a free, open, safe and secure Indian Ocean Region.
3. **Energy cooperation:** Several projects are at different stages of discussions, for instance, plans for inter-grid connectivity, a multi-product petroleum pipeline between the two countries, supply of LNG, and the under-preparation Sampur Power Project.
4. **Regional and multilateral cooperation:** Both are part of **SAARC,** Indian Ocean Rim Association (IORA), and BIMSTEC.
5. **Military Collaboration:** Joint exercises like **SLINEX (Naval**) and **MITRA SHAKTI (Army**) are held annually.
   a. Sri Lanka also participates in **MILAN** the multilateral naval exercise hosted by the Indian Navy.

For Sri Lanka

1. **Role of India in Debt Restructuring**:
   a. **Financial aid:** Nearly **USD 4 billion** was provided by India in various kinds of aid **in 2022 and 2023** to help the country navigate its economic crisis. (see infographic)

b. **Co-chair of Official Creditors' Committee (OCC)**: OCC was formed in **2023 by 17 countries**, co-chaired by **India, Japan, France**, to discuss Sri Lankan debt treatment
   i. Includes **Paris Club creditors** and official bilateral creditors.

c. **International Monetary Fund (IMF) bailout**: India was among the **first countries** to provide financing **assurances to IMF**, a prerequisite for the **IMF's $2.9 billion** bailout package approved **in 2023.**

d. **Conversion of line-of-credit to grant assistance:** India extended USD 20.66 million as grant assistance to settle the payments related to seven completed line-of-credit projects in Sri Lanka.
   i. Further project that for the **rehabilitation of Kankesanthurai Port** in the northern province will now be executed through a grant.

2. **Economic importance**: India has been Sri Lanka's largest trade partner, **top FDI contributor**, and **largest source of tourists**.
3. **Other key areas of support from India:**
   a. **India acts as a 'first responder' for Sri Lanka** in the field of Humanitarian Assistance and Disaster Relief.
   b. India supports **Colombo Security Conclave,** backing Sri Lanka's regional security initiatives.
   c. **Capacity Building** including installation of the Maritime Rescue Coordination Centre (MRCC) under an Indian grant.
   d. **Cultural support** like **restoration of the Thiruketheeswaram Temple in Mannar and exposition of sacred Kapilavastu Relics** in 2012.

India's Financial Support to Sri Lanka

Support granted by India	Strategic Motivations Behind India's Support
• **Currency Swaps and Trade Credit**: o A **USD 400 million currency swap** through the Reserve Bank of India (RBI). o Deferral of **USD 500 million in trade liabilities** under the Asian Clearing Union (ACU), helping Sri Lanka avoid immediate default. • **Fuel and Food Imports**: **USD 500 million in fuel import credit** and a **USD 1 billion import credit facility** to ensure essential imports like fuel and food etc. • **Humanitarian Aid**: Supply of essential items such as **food, medicines, and medical equipment.**	• **Countering China's Influence**: China's **Belt and Road Initiative (BRI)** had expanded its presence in Sri Lanka through projects like **Hambantota Port** and **Colombo Port City**. • **Protecting Economic Interests**: The **Colombo Port** is vital for India's trade, handling transshipment of container traffic to and from Indian ports. • **Strengthening Bilateral Ties**: India sought to improve relations with Sri Lanka, which have been strained by **historical grievances** and **anti-India sentiment**.

For India

1. **Security of Indian Ocean**: Sri Lanka **is India's closest maritime neighbour** and plays crucial role in preventing territorial actions inimical to India's security/stability.
2. **Alignment with India's policy**: Central place in India's **'Neighbourhood First' policy** and **Security and growth for all in the region (S.A.G.A.R) vision.**
3. **Indian Origin Tamils (IOTs):** Around 1.6 million IOTs, primarily employed in tea and rubber plantations, with a significant presence in Colombo's business sector.

Challenges in India-Sri Lanka Relations

1. **Chinese Strategic Presence in Sri Lanka**: Several developments may have security implications for India.
   a. **China's growing influence** through financial aid and projects **like Hambantota Port increases** its leverage over Sri Lanka, impacting India's interests.
   b. **Chinese vessels (Shi Yan-6, Yuan Wang-5)** conduct data collection activities may potentially aid future military operations against India.
2. **Fishermen Disputes**: Sri Lanks opposes use of **bottom trawlers by Indian fishermen** and frequent

entry into Sri Lankan waters citing concerns regarding environmental damage and overfishing.

   a. Also, territorial dispute over this **Katchatheevu Island**, ceded to Sri Lanka in 1974, remains a contentious issue, with Indian fishermen claiming traditional fishing rights.

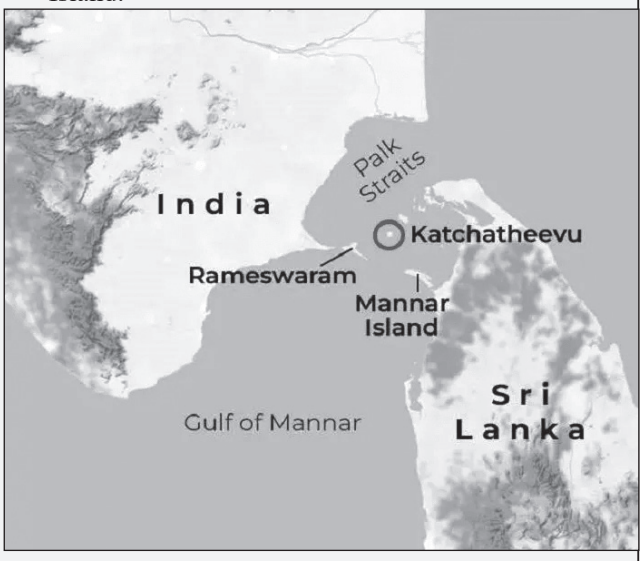
3. **Delayed Implementation of the 13th Amendment:** The amendment was a result of Indo-Lanka Accord (1987), aimed at resolving ethnic conflict through devolution of power.
   a. **Contentiousness:** Sinhala nationalists oppose it as an imposition; Tamil groups seek broader powers.
   b. **India's Role:** India pushed for devolution, but Sri Lanka's reluctance, especially on land and police powers, remains.

Way Forward

1. **India's Five "S" approach to the world**: Samman (Respect), Samvad (Dialogue), Sahyog (Cooperation), and Shanti (Peace); to create conditions for universal Samriddhi (Prosperity).
   a. India's **'Neighbourhood First Policy' and SAGAR policy** should be the guiding force in tackling inimical Chinese attitude in and around the Indian Ocean.
2. **Proposed solution towards resolving Fishing Issue:**
   a. **Shared Fishing Zones**: Allow Indian fishermen to fish within 5 nautical miles of the International Maritime Boundary Line in exchange for Sri Lankan access to India's Exclusive Economic Zone.
   b. **Regulated Trawling**: Limit trawling to twice a week, reduce fishing hours, and enforce a 3-nautical-mile distance from the Sri Lankan coast & ultimately enforce a strict ban on bottom trawling.
   c. **Leasing Kachchatheevu**: Sri Lanka could lease the island to India, maintaining ownership while allowing Indian fishermen to fish in its waters.
3. **13th Amendment:** Present Sri Lankan government could use this opportunity to devolve powers to the provinces.

Katchatheevu Island Issue

1. **Geographical Location:** A 285-acre island located within the maritime boundary line of Sri Lanka. Proximity to India and Sri Lanka: Situated 33 km off the Indian coast to the northeast of Rameswaram in Tamil Nadu and southwest of Sri Lanka's Delft Island.



2. **Historical Control and Ownership**:
   - **Ramanad Kingdom**: The island was historically under the control of Ramanad Raja, a zamindari in Ramanathapuram in the Madras Presidency during British rule (1795 to 1803).
3. **Disputed Claims**
   - **India and Sri Lanka's Claims:** Both countries have been claiming Katchatheevu since at least 1921, following a survey that placed the island within Sri Lanka's boundaries.
   - **Contestation by British Indian Delegation:** The British Indian delegation contested Sri Lanka's claim, citing the historical ownership of the Ramanad kingdom.
4. **1974 Agreement**
   - **Indira Gandhi's Tenure:** In 1974, during Indira Gandhi's tenure as Prime Minister, India and Sri Lanka signed an agreement that transferred Katchatheevu to Sri Lanka.
   - **Fishermen's Rights:** The agreement allowed Indian fishermen "access to Katchatheevu for rest, drying of nets, and participation in the annual St. Anthony's festival."
   - **Lack of Clarity on Fishing Rights:** The agreement did not specify the fishing rights of Indian fishermen, leaving a critical issue unresolved.

2. King and the Queen of Bhutan Visited India

In December 2024, the Bhutan's King Jigme Khesar Namgyel Wangchuck and the Queen Jetsun Pema Wangchuck were on an official visit to India.

Key Highlights of the Visit

1. **Gelephu Mindfulness City Project:**
   a. The Prime Minister of India reassured the King of Bhutan regarding India's continued support for the **Gelephu Mindfulness City** project, which aims to enhance Bhutan's prosperity.
   b. The city is a **2500 km zero-carbon** co-operative initiative focusing on several sectors such as finance, tourism, green energy, healthcare, agriculture, and more.
2. **Infrastructural Developments:**
   a. The **Integrated Check Post (ICP)** was inaugurated at **Darranga**, Assam, along the India-Bhutan border, marking a significant step in improving border connectivity and trade.
   b. The **1020 MW Punatshangchhu-II hydro power project** is nearing completion, which will boost Bhutan's energy capacity.

Significance of India- Bhutan Bilateral Relations

India and Bhutan share a deeply rooted and multifaceted relationship that encompasses political, economic, cultural, and strategic aspects. Their cooperation spans various domains, including trade, security, hydropower, and wildlife conservation, contributing to mutual growth and stability.

For Both countries

1. **Robust political relationship:** Highlighted by **Treaty of Friendship,** which was **first signed in 1949** and **renegotiated in 2007.**
   a. Formal diplomatic relations **were established in 1968**.
2. **Mutually beneficial hydro-power cooperation**: The 2006 bilateral agreement and its 2009 Protocol govern hydropower cooperation with benefits for both countries.
   a. **For Bhutan:** India provides Bhutan **access to Indian financing and energy markets** to support hydro-power development, which is a vital catalyst for the country's socio-economic development.
      i. E.g., India facilitated the access of **Basochhu hydropower and Nikachhu hydropower plants** for trading on Day Ahead and Real Time Markets in the Indian Power Exchanges.
   b. **For India**: Clean energy imported from Bhutan alleviates power deficiency sustainably.
3. **India-Bhutan Buddhist Connect:** Both countries promote pilgrimage at important Buddhist sites.
   - Kolkata's Asiatic Society **also loaned statue** of 16th-century monk Zhabdrung Ngawang Namgyal, regarded as the founder of the modern nation state of Bhutan**, to Bhutan.**
4. **Transboundary wildlife conservation**: E.g., Both countries collaborate through **Transboundary Manas Conservation Area (TraMCA)** to protect the wildlife in Manas National Park in India and Royal Manas National Park in Bhutan.
1. **Space Cooperation:** In 2022, India and Bhutan jointly developed the India-Bhutan SAT, a satellite to boost communication and space cooperation.
2. **Fin-Tech Collaboration:**
   a. **RuPay Card (2019-2020):** The launch of RuPay in Bhutan allowed for seamless cross-border payments.
   b. **BHIM App (2021):** The BHIM App was introduced to promote cashless transactions and financial inclusion.
3. **E-Learning and Digital Connectivity:** Integration of Bhutan's Druk Research Network with India's National Knowledge Network has enhanced educational connectivity, fostering learning and collaboration.

For Bhutan

1. **Free trade regime**: The **India-Bhutan Agreement on Trade, Commerce, and Transit** (first signed in **1972**, revised in **2016**), establishes a Free Trade Regime between the two countries.
   a. It **allows duty-free transit of Bhutanese exports** to third countries.
2. **Developmental assistance**: India has significantly ramped up its support for Bhutan's **13th Five-Year Plan (2024-29)** and the **Economic Stimulus Programme.**
3. **India as a net security provider:**
   a. **Doklam Standoff (2017)**: India invoked the **India-Bhutan Treaty of Perpetual Friendship 2007** to intervene on Bhutanese territory (which China claims) to prevent the China from constructing a road to **Gipmochi In 2017.**
   b. **IMTRAT**: The Indian Military Training Team **(IMTRAT),** established in **1961-62**, provides training to Bhutanese forces.
4. **Infrastructure Development**: India's **Border Road Organisation (BRO**) has constructed the majority of roads in Bhutan under **Project 'DANTAK'.**
5. **Other Areas of support from India:**
   a. **Scholarships for Bhutanese students** to study in India;
   b. India contributes to **50% of the Bhutan's total foreign direct investment (FDI);**
   c. Financial support for Bhutan's **'Digital Drukyul'** project to establish optical fiber connectivity.

For India

1. **Trade:** India is Bhutan's largest trade partner with **balance of trade favouring India.**
2. **Strategic location:** Bhutan acts as a strategic buffer between India and China, particularly along the sensitive **Chumbi Valley**, which has implications for India's national security.

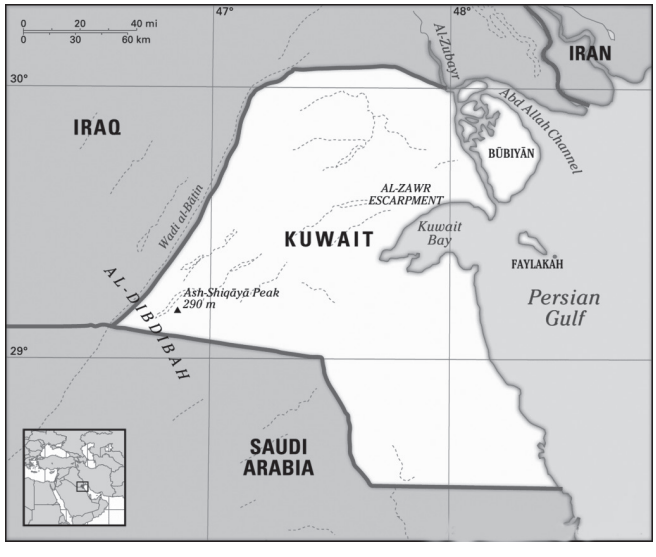
Growing Concerns in India-Bhutan Relations

1. **Increasing Proximity Between China and Bhutan**
   a. In **2023**, Bhutan's Foreign Minister visited China for the first time, signaling a potential shift toward diplomatic relations.
   b. China now accounts for over **25% of Bhutan's trade**, highlighting the growing economic influence.
   c. Bhutanese sentiment is inclined toward establishing relations with China to resolve the long-standing border dispute.
2. **Chinese Territorial Assertiveness:** China considers Bhutan as part of its "**five-finger policy**," which views **Tibet as the palm** and **Ladakh, Nepal, Sikkim, Bhutan, and Arunachal Pradesh** as the fingers.
3. **Bhutan-China border disputes**: Bhutan and China signed a **"three-step roadmap**" in **October 2021** to expedite boundary dispute resolution.
   a. **India fears** China may pressure Bhutan to cede access or control over **the Doklam plateau**, threatening **India's strategic Siliguri Corridor.**
4. **Other challenges**:
   a. **Militant groups:** India's North-East militant groups, such as **United Liberation Front of Assam (ULFA) & National Democratic Front of Bodos (NDFB)**, use Bhutan as a hideout.
   b. **Stalled projects**: Bhutan has stalled the **BBIN Motor Vehicle Agreement** (Bangladesh, Bhutan, India, Nepal) over environmental concerns.

India-Bhutan bilateral relations are deeply significant for both countries, with strong political, economic, cultural, and security cooperation. While the ties remain largely positive and mutually beneficial, emerging challenges—especially Bhutan's increasing proximity to China—could shape future dynamics. Nevertheless, their strategic, economic, and cultural connections remain robust, offering promising opportunities for continued collaboration.

3. PM Modi in Kuwait: First Visit by an Indian PM in 43 Years

In December 2024, Prime Minister Narendra Modi visited Kuwait, marking the **first visit** by an Indian **Prime Minister to the country** in **43 years**.



Key Outcomes of the visit

1. PM Modi received Kuwait's highest honor, 'The Order of Mubarak Al Kabeer.'
2. Kuwait joined **International Solar Alliance (ISA)** for sustainable energy cooperation.
3. **Asian Cooperation Dialogue (ACD):** The significance of ACD was highlighted for regional cooperation.
   - ACD was inaugurated in 2002 and promotes cooperation among 35 Asian countries, with India as a founding member.
4. **India-GCC Cooperation**: Kuwait, as Gulf Cooperation Council (GCC) President, pledged stronger India-GCC ties.
5. **Defence Pact Signed**: Key areas of cooperation include training, exchange of personnel and experts, joint exercises, cooperation in defense industry, supply of defense equipment, etc.
6. **Other Developments**
   a. Renewed **Cultural Exchange Program (2025–2029**) for arts, literature, etc.
   b. India praised Kuwait for hosting the **4th Dushanbe Process on counter-terrorism and border security**.

Convergence in India-Kuwait Relations:

1. **Kuwait's Strategic Location and India's Interests:**
   - Mutual interest in securing key sea lanes in the region, such as the **Red Sea, Gulf of Aden, Gulf of Oman, and Arabian Sea,** all of which are some of the busiest shipping routes globally.
   - Kuwait's strategic position supports India's connectivity projects, such as the India-Middle East-Europe Economic Corridor (IMEEC).
2. **Kuwait's Petroleum Economy and India's Energy Security:**
   - Kuwait holds **6% of global oil reserves** and substantial gas reserves. Oil revenues constitute 94% of the state's income.
   - Kuwait meets **3.5% of India's total energy needs** and has expressed interest in India's Strategic Petroleum Reserve Program.
   - The petrochemical sector presents a potential avenue for collaboration as India's rapidly growing petrochemical industry is expected to **reach $300 billion by 2025.**
3. **India as a Key Investment Destination:** Kuwait Investment Authority (KIA) manages one of the largest sovereign wealth funds (~$1 billion), ranking fourth globally.
4. **India's Interest in Strengthening Ties with GCC:** Kuwait holds the presidency of the Gulf Cooperation Council (GCC), which influences regional geopolitical dynamics.
5. **Geopolitical Alignment:** The growing political ties between India and Kuwait reflect broader India-Gulf relations. India's strategic reorientation in the Gulf region enhances its geopolitical influence as a Net Security Provider.

Divergences in India-Kuwait Relations

1. **Expatriate Welfare and Labor Issues:** India's large expatriate community in Kuwait faces challenges such as labor rights violations and mistreatment. The 2024 fire in Mangaf, which killed 40 Indians, highlighted poor working conditions.
2. **Limited Economic Diversification:** While energy trade is the foundation of India-Kuwait relations, economic engagement is limited in other sectors. India also faces a trade deficit with Kuwait.
3. **Geopolitical Tensions in the Gulf:** Kuwait's diplomatic stance on regional crises, such as the Gulf War, and ongoing tensions in Yemen and Syria, sometimes differ from India's non-interventionist policy.

India and Gulf Cooperation Council (GCC)

GCC Established: 1981

GCC Members: Comprises six member states. Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the UAE.

India and GCC Relations

1. **Economic and Trade Relations**: The GCC is also one of the largest trading blocs of India's foreign trade.
   a. **E.g., in 2023-24**, the bilateral trade between India and GCC comprised ~**14% of India's total foreign trade.**
   b. **Trade balance** is in the **GCC's favour** mainly because of the **large volumes of oil and gas India imports from the GCC countries.**
   c. **Investment:** Between 2000 and 2024, India received a collective FDI of ~US$25 billion from the GCC countries, excluding significant portfolio investments.
2. **Energy Security:** The GCC supplies over **50% of India's crude oil** and **70% of its natural gas**. E.g., **Qatar is India's largest supplier of liquefied natural gas (LNG).**
3. **Indian Diaspora and Remittances:** The GCC hosts over 8 million Indian expatriates, making it the largest expatriate community in the region. GCC countries are the **second largest** source of remittances to India, after the US.

Challenges in India-GCC Relations

1. **Geopolitical Rivalries in the Region:** The Saudi Arabia-Iran rivalry has impacted India's relations with both nations, complicating diplomatic and economic ties.
2. **Labour Migration and Social Issues:** India has raised concerns over the Kafala system migrant worker's employment and immigration status control) in GCC countries, highlighting issues like exploitation, human rights violations, and abuse of migrant workers.
   - **Example**: A 2021 report by The Guardian revealed that around 6,500 migrant workers from India, Pakistan, Nepal, Bangladesh, and Sri Lanka died in Qatar since it won the FIFA World Cup host.
3. **Slow Progress in Free Trade Agreement (FTA) Negotiations** Despite ongoing discussions, the India-GCC FTA remains unresolved, hindering deeper economic integration.
4. **Discriminatory "Asian Premium" on Crude Oil Pricing:** The "Asian Premium" imposed by OPEC countries results in higher crude oil prices for Asian nations, including India, compared to Western buyers.

India-Kuwait Relations: An Overview

1. **1990 Kuwait Airlift:** India played a crucial role during Iraq's invasion of Kuwait in 1990 by airlifting over 1,70,000 Indians from Kuwait between August and October. This operation set a Guinness World Record as one of the largest civilian airlifts in history.
2. **Diplomatic Connect:** India was one of the first countries to establish diplomatic relations with Kuwait after its independence from the British Protectorate in 1961, marking the beginning of a long-standing bilateral relationship.
3. **Indian Community Engagement**
   - **Expatriate Community**: Over 1 million Indians reside in Kuwait, making them the largest expatriate group in the country.
   - **Educational Contributions**: There are 26 CBSE-affiliated schools in Kuwait, educating around 60,000 students from Indian families.
4. **Energy Trade**
   - **Crude Oil Supply**: Kuwait is the 6th largest crude oil supplier to India.
   - **Petroleum Gas**: It is also the 4th largest supplier of petroleum gas to India, reinforcing the energy trade between the two nations.
5. **Historical Ties:** India has historically been one of Kuwait's top trading partners. Notably, until 1961, the Indian Rupee was the legal tender in Kuwait, showcasing the depth of the historical economic relationship.
6. **Investment:** The Kuwait Investment Authority (KIA) has made significant indirect investments in India, estimated at over US$10 billion, further strengthening economic ties.
7. **Bilateral Investment Promotion Agreement (BIPA):** India and Kuwait signed a Bilateral Investment Promotion Agreement in 2003, with a tenure of 15 years. However, the agreement expired in 2018.

4. Nepal and China Signed BRI Cooperation Framework

Nepal and China have signed a **Belt and Road Initiative (BRI) Cooperation Framework**. This agreement is expected to lay the foundation for implementing BRI projects in Nepal, which joined the initiative in 2017.

Key Aspects of the Framework:

1. **Trans-Himalayan Connectivity Network (THMDCN):** Both countries have committed to developing this network to improve connectivity between Nepal and China.
2. **Infrastructure Development:** The framework focuses on enhancing infrastructure, including: Roads, Railways, Aviation and Power grids.

BRI's Regional Reach:

- **Other Countries Involved:** Pakistan and Sri Lanka are also part of the BRI, benefiting from infrastructure and trade links fostered by China.

About Belt and Road Initiative (BRI)

1. **Genesis:**
   a. The **Belt and Road Initiative (BRI)** was initiated by the People's Republic of China in **2013** under the name "One Belt One Road".
   b. The BRI aims to connect **Asia, Africa**, and **Europe** through a vast network of **land and maritime routes**.
2. **Objectives:**
   a. Improving regional integration
   b. Increasing trade
   c. Stimulating economic growth
3. **Key Components:**
   a. Silk Road Economic Belt: A trans-continental land passage.
   b. Maritime Silk Road: A sea route for international trade.

Key Concerns for India

1. **Security Threats:**
   - **Geopolitical Vulnerability:** Nepal shares a long land border with India (about 1,700 km) and serves as a buffer zone.
   - China's infrastructure projects in Nepal, like the **Chinese-funded airport in Pokhara**, could make border areas more vulnerable in case of conflict.
2. **Regional Influence:**
   - **China's Influence:** As China expands its economic footprint in Nepal, there is concern that Nepal may politically align with China, undermining India's influence in the region.
     o This is seen as part of **China's "String of Pearls"** strategy, aiming to encircle India with China-friendly nations.
   - **Debt Trap Diplomacy:** Nepal may become increasingly reliant on China's financial support, leading to concerns over debt dependency.
3. **Impact on Trade Relations:** India is Nepal's **largest trade partner**, and growing Chinese influence could disrupt existing **cross-border energy trade** and other commercial ties between the two countries.

Phewa Dialogue

Recently, Nepal and China launched the **"Phewa Dialogue"** series.

About Phewa Dialogue

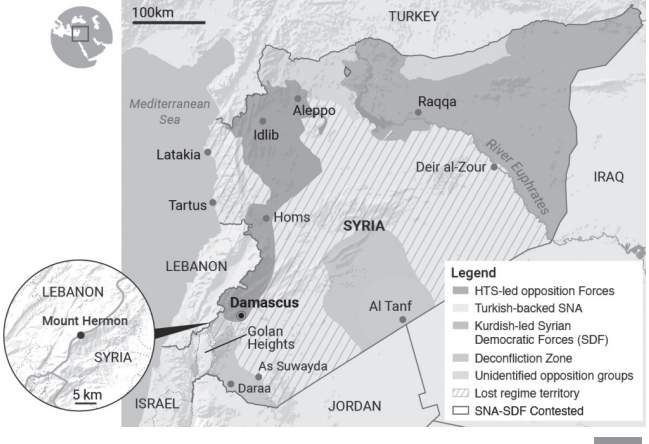
- It derives its name from the famous **Phewa Lake** situated in **Pokhara Valley** of Nepal**.**
- This will be Nepal's first official think tank forum **dedicated to South Asia Regional Economic Integration.**

5. Turmoil in Syria: Collapse of Assad regime

Turkish backed rebels in Syria have overthrown President Bashar Al Assad, ending the Assad family's 5 decades rule in the country. The offensive is led by **Hayat Tahrir al-Sham (HTS)** formerly known as **the Nusra Front** (It is the Syrian branch of al-Qaeda).

What are the likely outcomes?

1. It will **limit Iran's ability** to spread weapons to its allies like Hezbollah which have already been weakened by Israel.
2. It could cost Russia its **Mediterranean naval base Tartus.**
3. It also paves the way for millions of refugees scattered for more than a decade in camps across Turkey, Lebanon and Jordan **to finally return home.**



Background: The Assad Family and Bashar al-Assad's Rise to Power

1. **Hafez al-Assad's Rule (1970-2000)**
   a. **1970**: **Hafez al-Assad, Bashar's father, took power in Syria after a military coup.** Syria at the time was unstable, with many changes in leadership.
   b. **Sectarian Politics**: **Hafez was from the Alawite sect, a small group within Shia Islam**, while **most Syrians were Sunni Muslims**.
   c. **Despite being a minority, the Alawites gained power in the military and government**, which helped Hafez stay in control.
   d. Hafez ruled Syria with **complete power, not allowing much freedom.** He focused on controlling the **economy, the military, and keeping himself in power.**
   e. **Syria became a one-party state**, ruled by the Ba'ath Party, which supported Arab nationalism and socialism.
   f. Hafez crushed any opposition to his rule. The most **famous example is the 1982 Hama Massacre**, when thousands of people were killed after an Islamist group rebelled in the city of Hama.
   g. **Foreign Policy**: Hafez made Syria a key player in the **Middle East by supporting Palestinian groups and opposing Israel**.
   h. He also built **strong ties with the Soviet Union (which collapsed in 1991) and later with Iran.**
2. **Bashar al-Assad Becomes President (2000-Present)**
   a. **2000**: After his father died, **Bashar al-Assad, a trained eye doctor, became president**. Many hoped he **would bring change to Syria, but he quickly continued his father's policies.**
   b. At first, **Bashar promised reforms and a more open government**.
   c. However, **it soon became clear that he was unwilling to give up the strong control his family** had over the country.
   d. He kept political opposition down, and Syria remained an authoritarian state.
   e. Bashar **tried to modernize Syria's economy but faced many challenges**, including **widespread corruption**, **high unemployment,** and **poor living conditions** for many Syrians.
   f. These problems worsened as the country faced economic struggles.
   g. **Political Repression**: **Bashar continued his father's strict control, s**ilencing any critics and imprisoning many political opponents.
   h. While Syria faced many issues, Bashar remained in power by keeping loyal supporters in key positions of the military and government.

Brief history of Syrian Civil War:

1. The **Syrian Civil War** began in March 2011, rooted in widespread discontent with President **Bashar al-Assad's** regime, and was part of the broader **Arab Spring movement**.
2. The conflict escalated from peaceful protests demanding democratic reforms to a full-scale civil war as government forces violently suppressed dissent.

Key Events in Syrian Civil War

1. **March 2011:** Syrian Civil War begins with Protests
2. **July 2011:** Formation of the Free Syrian Army
3. **2012-13:** Escalation to full-scale civil war
4. **2014:** Rise of ISIS
5. **September 2015:** Russian intervention
6. **Late 2016:** Assad regains control of Aleppo
7. **Mid-2018:** Consolidation of government control
8. **December 2024:** Overthrow of Bashar al-Assad

Key Phases of the Conflict:

1. **Initial Protests and Uprising (2011)**: Large-scale protests erupted across Syria, calling for political reform and the release of political prisoners. The government's brutal crackdown on demonstrators led to the formation of armed opposition groups, notably the **Free Syrian Army (FSA)**, in July 2011.
2. **Escalation to Civil War (2012-2013)**: By mid-2012, the situation deteriorated into civil war, with significant territorial gains by rebel groups. The conflict drew international attention, with various countries providing support to different factions.
3. **Rise of Extremist Groups (2014)**: The emergence of the **Islamic State (ISIS)** marked a new phase, as it captured large territories and declared a caliphate, complicating the conflict further. This prompted U.S. military intervention aimed at combating ISIS which continues till now.

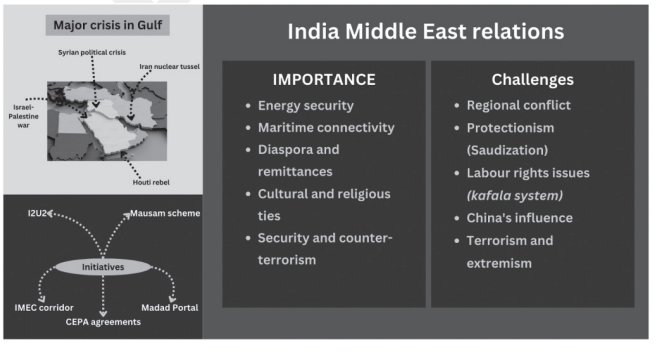
4. **Russian Intervention (2015)**: Russia intervened militarily in **September 2015** to support Assad's regime, significantly altering the balance of power. Russian airstrikes targeted both ISIS and moderate rebel groups.
5. **Government Consolidation (2016-2018)**: The Assad regime gradually regained control over major cities and strategic areas, including Aleppo in late 2016 and parts of southern Syria by mid-2018.
6. **Stalemate and Ongoing Conflict (2019-Present)**: Despite the regime's territorial gains, fighting continued in various regions, particularly in Idlib.
7. **Current Situation (December 2024):** Turkish backed rebels **HTS** have overthrown **Bashar Al Assad**, ending the family's 5 decades rule. He has flown to Russia seeking asylum.

6. Houthi Rebels becoming keystone of Iran's 'Axis of Resistance'

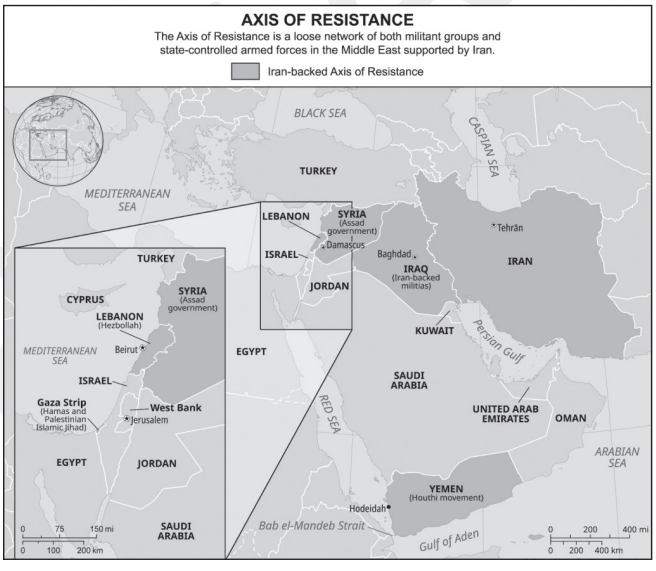
With the end of Bashar-al-Assad's regime in Syria, the Houthi rebels have gained importance in **Iran's axis of resistance** against the US and Israel.

What is the Axis of Resistance?

1. The 'Axis of the Resistance' refers to the political and military alliances led by **Iran** and is composed of state and non-state actors in the Middle-East. It is formed in opposition to U.S. and Israeli influence in the region.
2. **Key Components of the Axis of Resistance:**
   i. **Iran**: Led by the Islamic Revolutionary Guard Corps (IRGC).
   ii. **Hezbollah:** A militant group based in Lebanon.
   iii. **Syria:** Governed by Bashar-al-Assad's regime.
   iv. **Palestinian Groups**: Hamas and the Palestinian Islamic Jihad (PIJ).
   v. **Iraqi Militias**: Groups like Popular Mobilisation Forces (PMF).
   vi. **Houthi Rebels:** Based in Yemen, the Houthis are a significant part of the Axis.



3. **Key Objectives of the Axis of Resistance**:
   a. **Opposing Israel:** The alliance seeks to counter Israel's actions in Gaza and support Palestine in regaining control over its territory.
   b. **Anti-Americanism:** The Axis opposes U.S. military presence and cultural influence in the region, reflecting Iran's legacy of anti-American sentiment.
   c. **Regional Dominance:** It aims to promote Shia Islam across the region, creating a 'Shia Crescent' that includes Lebanon, Iraq, and Syria.
   d. **Resistance to Sunni Powers:** The Axis also stands against Sunni-majority countries like Saudi Arabia and the UAE, who are aligned with the U.S.



4. **Means and modes used to sustain Ideology:**
   a. **Military campaigns** as members are actively involved in several conflicts like Syrian civil war, Iraq fight against ISIS and Yemen's civil war.
   b. **Proxy warfare** by helping non-state actors like Hezbollah in Lebanon and Popular Mobilisation Forces (PMF).
   c. **Diplomatic alliance-** Axis is focused to counter USA by hand holding alliance with Russia and China for weapons and logistical support.

The Role of the Houthi Rebels in the Axis of Resistance:

1. Houthi Rebels, originally known as Ansar Allah (Supporters of God) are **predominantly Shia Muslims** and a political military group of **Yemen.**

2. The group is focused on opposing the USA and Israel. Also, they oppose Saudi Arabia and UAE to favour Sunni sects of Islam.

Role of Houthis in Axis of Resistance

1. **Opposing US allies:** The Houthis attack Saudi Arabia from the Yemen border as it is a US ally in the region.
2. **Block trade:** Location of Houthi is at a crucial choke point i.e., **Bal el-Mandeb strait** allows them to attack the vessels with short range rockets leading to damage or rise in vessel insurance premium, disrupting trade.
3. **Symbol of resistance:** Houthis continue terrorist attacks on Saudi Arabia and US supported Yemen government to show resistance.

India Middle East Relations

Importance	Challenges
1. Energy Security	1. Regional Conflicts
2. Maritime connectivity	2. Protectionism (Saudization)
3. Diaspora and remittances	3. Labour rights issues (Kafala system)
4. Cultural and religious ties	4. China's influence
5. Security and counter-terrorism	5. Terrorism and extremism

Impact on India due to these regional dynamics:

1. **Impacting energy security:** Houthi attack on vessels can destabilise the Indian supply of crude oil via **Bab el-Mandeb** and **Red Sea**.
2. **Expensive Maritime trade:** Indian vessels due to attack by Houthis either take the route of Cape of Good Hope or need to pay heavy premium on vessel insurances. Both make maritime trade expensive for India.
3. **Safety of India Diaspora:** Any escalation in the situation leading to war like situation can risk the safety of 2.5 million Indians in Saudi Arabia.
4. **Geopolitical Challenge:** Violence and continuous proxy-war will demean India efforts to balance relations with the US and Iran.
5. **Spillover effect:** In case of escalation the tensions may spill to the **Horn of Africa** making a new challenge to balance relations with Djibouti and Somalia.

What should be India's course of action in these complicated situations?

1. India should follow a pragmatic approach with a balance of Idealism containing values like humanity, peace and growth of the region.
2. India needs to strengthen trade ties with the Middle East, continuously engage with Iran, ensure diaspora security, build a strong naval presence in the Indian Ocean and diversify the energy basket to sail over the tides of challenges in the region.

7. India Re-elected to the U.N. Peacebuilding Commission

India has been **re-elected** to the **United Nations Peacebuilding Commission** for the term **2025–2026**.

About the U.N. Peacebuilding Commission

1. **Genesis:**
   a. The **U.N. Peacebuilding Commission** was established in **2005**.
   b. It is an **intergovernmental advisory body** that provides support for peace efforts in **conflict-affected countries**.
2. **Composition:**
   a. The Commission consists of **31 Member States**, elected from:
      i. The **General Assembly**
      ii. The **Security Council**
      iii. The **Economic and Social Council**
   b. The membership includes **top financial contributors** and **troop-contributing countries** to the United Nations system.
3. **Mandate:** The U.N. Peacebuilding Commission works to:
   a. **Bring together relevant actors** from various sectors to promote peace.
   b. **Marshal resources** for peacebuilding efforts.
   c. **Advise on strategies** to help countries recover from conflict.
   d. **Ensure long-term recovery** in post-conflict countries.
4. **India's Role:**
   a. India is one of the **largest contributors** of **uniformed personnel** to U.N. Peacekeeping operations.
   b. India currently has **more than 6,000 personnel** deployed in peacekeeping missions worldwide.

C. SECURITY

1. United Nations Convention on Cybercrime

1. The United Nations General Assembly has recently adopted the landmark United Nations Convention on Cybercrime**,** the **first-ever legally binding** UN instrument on cybercrime.
2. This treaty is **designed to combat** the growing threat of cybercrime, strengthen international cooperation, and provide the legal framework necessary to address the challenges posed by cybercriminals.
3. The convention has been **adopted by 193 UN Member States by consensus.**
4. The convention will **open for signature in Hanoi, Vietnam in 2025,** with the United Nations Office on Drugs and Crime (**UNODC**) serving as **secretariat**.
5. It will take effect after **40 states become parties to the agreement.**
6. **Scope of Application**
   a. Focuses on preventing, investigating, and prosecuting cybercrimes, including **freezing, confiscating and returning crime proceeds**.
   b. Involves **collecting and sharing electronic evidence** for criminal investigations.

Objectives of the UN Cybercrime Convention

The Convention is intended to:

1. **Technical Assistance and Capacity-Building**: Promote, facilitate, and support technical assistance and capacity-building to prevent and combat cybercrime, particularly in developing countries.
2. **Measures to Combat Cybercrime**: Strengthen measures to prevent and combat cybercrime more effectively.
3. **International Cooperation**: Facilitate and strengthen international cooperation in preventing and combating cybercrime.

Key Provisions of the Convention

The Convention outlines several key provisions:

1. **International Cooperation & Data Sharing**: Establishes mutual legal assistance, extradition, and a 24/7 network for immediate assistance, as well as cooperation for confiscation purposes.
2. **Procedural Measures**: Provides guidelines for law enforcement agencies to preserve, search, and seize electronic data.
3. **Protection of Personal Data**: Requires compliance with domestic privacy laws during data transfer, with safeguards in place. The Convention also encourages bilateral or multilateral agreements for easier data sharing.
4. **Protection of Human Rights**: Ensures that human rights and freedoms are upheld during the implementation of the Convention.
5. **Other Provisions**: Includes guidelines for extradition, the transfer of sentenced persons, criminal proceedings, and joint investigations.

Cybercrime Offenses Criminalized

The Convention criminalizes the following key offenses:

1. **Illegal Access to Information Systems**: Unauthorized access to networks, data, and information systems.
2. **Child Sexual Abuse**: Production, distribution, and possession of child sexual abuse material.
3. **Laundering of Proceeds from Cybercrime**: Involvement in laundering money obtained through cybercrime activities.
4. **Non-consensual Dissemination of Initiatives**: Sharing private information without consent, particularly in harmful ways.

Why the Convention against Cybercrime matters?

1. **Increased Connectivity and associated Vulnerability**: With over 67% of the global population now online (World Bank), cybercrime risks are widespread.
   a. Southeast Asia has emerged as a **"ground zero"** for **organized cybercrime**, with sophisticated operations threatening economies and infrastructure.
   b. The **threat is escalating, undermining economies, disrupting critical infrastructure, and eroding trust in digital systems.**
2. **Around-the-Clock Cooperation:** Transnational crime investigations rely on **electronic evidence**, which is often decentralized and spread across jurisdictions.

   a. **Quick access is crucial to prevent tampering or deletion.** The Convention establishes frameworks for accessing and sharing electronic evidence to support investigations and prosecutions.
3. **Transnational Nature of Cybercrime:** Cybercrimes often involves **cross- border transactions and targeting** wherein criminals operate from one country while targeting victims in another.
   a. Thus, handling transnational and organised crimes **requires a coordinated global law enforcement response** to dismantle their networks and prevent the spread of their activities.
4. **Adapting to Rapid Technological Advancements:** Technologies like AI and 3D printing pose dual-use risks, outpacing policymakers' ability to adapt (UNIDIR).
   a. **Example**: While the 1880s electric grid took 50 years to reach 100 million homes, ChatGPT achieved this in just two months (2022).
5. **Protecting children:** Online platforms such as social media, chat apps and games offer anonymity that predators can exploit to **groom, manipulate, or harm children.**
   a. By criminalising these offenses, the **Convention equips governments with stronger tools** to protect children and bring perpetrators to justice.
6. **Rehabilitation and Justice for Victims:** Treaty acknowledges the growing number of cybercrime victims and emphasizes securing justice while addressing the needs of vulnerable individuals in prevention and response measures.

The adoption of the United Nations Convention on Cybercrime marks a significant milestone in the global fight against cybercrime. It highlights the success of multilateralism during challenging times and reflects the collective will of member states to enhance international cooperation in the prevention and prosecution of cybercrimes. This treaty, the first international criminal justice agreement in over 20 years, will play a crucial role in combating cybercrime and securing a safer digital future for the world.

2. Smuggling in India Report 2023-24

The Directorate of Revenue Intelligence (DRI) recently released the ***Smuggling in India Report 2023-24***. This report provides critical insights into the trends, challenges, and measures taken to combat smuggling activities in India.

Key Highlights of the Report

1. **Trends and Challenges**: The report highlights a rise in smuggling activities, including illegal drugs, wildlife products (such as elephant tusks), foreign currencies, and insecticides.
2. **Interception**: DRI's recent seizures showcase an increase in the volume of smuggling operations across the country.

Directorate of Revenue Intelligence (DRI)

1. **Role**: The DRI is India's premier agency focused on intelligence and enforcement related to anti-smuggling efforts.
2. **Working under**: Central Board of Indirect Taxes & Customs (CBIC), Ministry of Finance.
3. **Objective**:
   a. To detect and curb the smuggling of contraband, including drug trafficking and illicit international trade in wildlife and environmentally sensitive items.
   b. To combat commercial frauds related to international trade and evasion of customs duty.

Reasons Behind Increased Smuggling in India

1. **Geography and Borders**:
   a. India's vast coastline and porous borders with countries like Bangladesh, Myanmar, and Nepal present multiple entry points for smugglers.
   b. The proximity to regions like the Death Crescent (Afghanistan, Iran, Pakistan) and the Death Triangle (Myanmar, Laos, Thailand) further exacerbates smuggling activities.
2. **Market Demand**: The high demand for items like gold, particularly from Gulf countries (e.g., UAE and Saudi Arabia), drives illegal trade across borders.
3. **Sophisticated Techniques**:
   a. Smugglers use advanced concealment methods such as hiding contraband in machinery parts or having 'mules' ingest drugs.
   b. Technology such as the Darknet and cryptocurrencies enables anonymity and complicates enforcement.
   c. Smuggling also involves drones for transporting arms and narcotics across borders, particularly in states like Punjab.
4. **Misuse of Legal Loopholes**: Smugglers exploit Free Trade Agreements (FTAs) and manipulate certificates of origin to evade taxes and customs duties.

5. **Transnational Networks**: The intricate and global nature of smuggling networks makes detection and dismantling of operations difficult.

Nexus of Smuggling and India's Security Risks

Smuggling is not just an economic issue—it also threatens national security and social stability.

1. **Narco-Terrorism**: India's location between the Death Crescent and Death Triangle makes it vulnerable to narco-terrorism. Drug smuggling directly funds insurgent activities, with terrorist organizations relying on illicit trade to finance operations.
2. **Financial Instability**: Smuggling of foreign currencies undermines India's financial system, while activities like money laundering and tax evasion destabilize markets and deprive the government of revenue.
3. **Commercial Fraud**: The misuse of FTAs, misclassification of goods, and undervaluation of imports lead to significant losses in government revenue.
4. **Wildlife and Environmental Crimes**: Smuggling operations often involve the illegal trade of endangered species, hazardous materials, and valuable timber, which endanger India's biodiversity.
5. **Human Trafficking**: Smuggling often overlaps with human trafficking. Smuggling routes and document forgery networks are used for multiple illegal activities, complicating law enforcement efforts.

Steps Taken to Prevent Smuggling and Associated Crimes

- ***Global Level:***
  1. **United Nations Office on Drugs and Crime (UNODC)**: Works globally to tackle the production and trafficking of illicit drugs.
  2. **United Nations Convention against Transnational Organized Crime**: Promotes international cooperation to combat organized crime.
  3. **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)**: Ensures that international trade in wildlife does not threaten the survival of species.
- ***By India:***
  1. **Strengthening Enforcement**: Increased surveillance and intelligence-gathering efforts have led to significant contraband seizures.
  2. **Amendment to Wildlife Protection Act (2023)**: Customs officers now have more power to seize illegally traded wildlife items.
  3. **Directorate General of Foreign Trade (DGFT)**: The DGFT is responsible for outlining procedures for exporters, importers, and licensing authorities to follow.
  4. **Narcotic Drugs and Psychotropic Substances (NDPS) Act, 1985**: This law prohibits the trade and use of narcotic drugs and psychotropic substances, except for medical and scientific purposes.
  5. **Use of Technology**: Advanced data analytics, such as using Advance Passenger Information systems, allows for targeted controls to intercept contraband.
  6. **Customs Mutual Assistance Agreements (CMAAs)**: India has signed CMAAs with over 65 countries to enhance international cooperation and information sharing.
  7. **International Collaborations**:
     - India works with organizations like the *World Customs Organization (WCO)* and *Interpol* to combat transnational smuggling.
     - India also participates in global operations like *Operation SESHA*, targeting illegal timber trade.

As smuggling activities become increasingly sophisticated, enforcement agencies need a multi-faceted approach. The use of advanced detection technologies, such as Artificial Intelligence, Machine Learning, advanced data analytics, and open-source intelligence, should complement traditional intelligence-gathering methods. Only through a combination of these strategies can smuggling be effectively countered.

UN Commission On Narcotic Drugs (UNCND)

Recently, India has been chosen to chair the **68th Session of the UNCND** for the 1st time.

About UNCND

- **Origin**: Established by **UN Economic and Social Council** (ECOSOC) resolution in **1946** to **assist in supervising the international drug control treaties**.
- **Members**: **53 member states** elected by ECOSOC.
- **Functions:** Act as the **governing body** of the **United Nations Office on Drugs and Crime** (UNODC).
- **Mandate**: Reviews and analyses the global drug situation, considering supply and demand reduction.

3. Search and Rescue Aid Tool (SARAT)

The **Indian National Centre for Ocean Information Services (INCOIS)** has developed an advanced version of the ***Search and Rescue Aid Tool (SARAT)***. This **upgraded version** is aimed at enhancing the accuracy and efficiency of sea-based **search and rescue (SAR)** operations, particularly for agencies like the Indian Coast Guard.

About Search and Rescue Aid Tool (SARAT)

1. **Development and Purpose**:
   - **a. Launched**: SARAT was originally developed in 2016 under the Make in India initiative.
   - **b. Objective**: The tool's primary purpose is to aid in the quick identification of individuals or vessels in distress during sea operations, facilitating faster search and rescue actions.
   - **c. Availability**: SARAT is also available as a mobile application, making it accessible for wider use.
2. **Key Features**: The tool improves the accuracy of search and rescue missions by providing real-time information about the location of vessels or individuals in distress.

About Indian National Centre for Ocean Information Services (INCOIS)

1. **Genesis**: INCOIS was established in 1999 as an autonomous body under the Ministry of Earth Sciences (MoES).
2. **Mandate**: INCOIS aims to provide high-quality ocean information and advisory services to society, particularly in areas that involve ocean-related risks and opportunities.
3. **Key Activities**:
   - **a.** INCOIS operates 24/7, providing essential services to coastal populations, including:
     - **i. Monitoring**: Real-time monitoring of ocean conditions.
     - **ii. Advisory Services**: Issuing warnings for tsunamis, storm surges, high waves, and other ocean-related hazards.

4. Indian Navy commissioned INS Tushil

1. In December 2024, The Indian Navy commissioned its latest multi-role stealth guided missile frigate, INS Tushil (F 70), in Kaliningrad, Russia.
   - A **frigate is a** versatile warship used for escorting, patrolling, and combat operations, crucial in modern navies.
2. The ship will traverse **the Baltic Sea, the North Sea, the Atlantic Ocean, and finally, the Indian Ocean,** making port calls at several friendly foreign countries along the way.

Background

1. In October 2016, India and Russia signed a deal for four stealth frigates, two to be built in Russia and two to be constructed at Goa Shipyard Limited under technology transfer.
2. INS Tushil, is the **first of the two ships** to be constructed in Russia.
3. The **second frigate Tamal** is expected to be delivered to the Indian Navy in Russia in the first quarter of 2025.

Key Facts about INS Tushil:

1. INS Tushil is an upgraded Krivak III class frigate (warship) under Project 1135.6.
2. **Specification:** 125-metre-long, 3,900-tonne ship.
3. All Krivak frigates are powered by engines from Zorya Nashproekt of Ukraine.
4. **Operational capabilities:** Designed for blue water operations across the spectrum of naval warfare in all four dimensions air, surface, underwater and electromagnetic.
5. **Armament and Technology:** It is armed with a range of advanced weapons, including:
   - **a.** Brahmos supersonic cruise missiles (jointly developed by India-Russia)
   - **b.** Vertically-launched Shtil Surface-to-Air missiles with enhanced ranges
   - **c.** Medium-range anti-air and surface gun with advanced stealth features
   - **d.** Optically-controlled close-range rapid fire gun system
   - **e.** Anti-submarine torpedoes and rockets
   - **f.** Advanced electronic warfare and communication suite.
6. The ship is also capable of embarking the upgraded anti-submarine and airborne early warning helicopters, the Kamov 28 and Kamov 31.
7. **Speed:** Powered by an advanced gas turbine propulsion plant with state-of-the-art controls, it is capable of achieving speeds in exceeding 30 knots.

Significance:

- INS Tushil reinforces the Indian Navy's role as a net security provider in the Indian Ocean Region.
- Reflects collaborative prowess of Russian and Indian industries and technological excellence through joint Manship.

Motto and Symbolism:

1. **Name**: The ship is named **Tushil**, meaning **"the protector shield,"** reflecting its primary function as a **defensive** force in India's naval fleet.
2. **Crest**: The frigate's crest features the symbol of an **Abhedya Kavacham** (impenetrable shield), representing its protective role.
3. **Motto**: The ship's motto, **"Nirbhay, Abhedya aur Balsheel" (Fearless, Indomitable, Resolute),** reflects the **Indian Navy's commitment** to safeguarding India's maritime borders.

India - Russia Defense Cooperation:

1. Agreement on Military Technical Cooperation (2021-2031)
2. India-Russia 2+2 Dialogue.
3. **Bilateral Projects**: T-90 tanks, Su-30-MKI aircraft, MiG-29-K aircraft.
4. **Military Exercises**: INDRA (Tri-Services), Avia Indra (Air Force), and Ex Vostok (Army)

5. India's 1st long-Range Hypersonic Missile

1. Recently, India's **Defence Research and Development Organisation (DRDO)** successfully conducted a **flight test** of India's first **long-range hypersonic missile** from Dr APJ Abdul Kalam Island off the coast of Odisha.
2. This hypersonic missile is designed to carry various payloads for **ranges greater than 1,500 kms** for the Armed Forces.
   - Only US, Russia and China had this technology earlier.
   - Several other nations are also pursuing hypersonic missile programs, including **France, Germany, Australia, Japan, Iran**, and **Israel**.
3. This missile was developed by multiple DRDO laboratories and industry partners, centered around the **Dr APJ Abdul Kalam Missile Complex** in **Hyderabad**.

Technologies demonstrated during test

1. **Aerodynamic configuration** for hypersonic manoeuvres for stability and control.
2. **Use of scramjet propulsion** for ignition and sustained combustion at hypersonic flow.
   - A scramjet is a form of air-breathing jet engine that uses the vehicle's forward motion to compress incoming air for combustion and operates at hypersonic speeds.
3. **Thermo-structural characterisation** to withstand extreme aerothermal environments during flights.
4. **Separation mechanism** at hypersonic velocities.

What is a Hypersonic Missile?

1. A **hypersonic missile** is one that travels at speeds of at least **Mach 5**, which is **five times the speed of sound** or about **1 mile per second**.
   - The speed of sound is Mach 1, and speeds between Mach 1 and Mach 5 are supersonic and speeds above Mach 5 are hypersonic.
2. Hypersonic missiles are **faster** than traditional ballistic missiles and are also **maneuverable**, unlike **ballistic missiles that follow a fixed trajectory.**

There are two main types of hypersonic weapons:

1. **Hypersonic Glide Vehicles (HGV)**: These are **launched from a rocket and glide to the target.**
2. **Hypersonic Cruise Missiles (HCM)**: These are powered by **scramjets** (**air-breathing engines**), **which keep the missile moving at high speeds after the initial launch.**

Advantages of Hypersonic Missiles

1. **Long-Range Strike Options**: Hypersonic missiles can hit **distant targets**, even those that are defended or time-sensitive, such as **moving missiles** or **time-critical facilities**.
2. **Difficult to Track**: Due to their speed and low flight path compared to ballistic missiles, **hypersonic missiles are harder to detect with surface-based sensors** like **traditional radar systems.**
3. **Kinetic Energy**: These missiles rely on **kinetic energy** (energy from motion) to destroy targets, including **underground facilities** or structures that are harder to penetrate using conventional weapons.

Other Missile Systems of India

- **Inducted:** AKASH (Surface to Air Missile Systems), BRAHMOS (Long Range Supersonic Cruise Missile), etc.
- **Advanced stage of induction:** NAG (Anti-Tank Guided Missiles), ASTRA (Air-to-Air Missiles), Agni (Long Range Ballistic Missile) etc.

6. Exercises/Operations in News

NAME	TYPE	PARTICIPANTS	BRIEF DESCRIPTION
SAREX	National Maritime Search and Rescue (SAR) Exercise & Workshop	Indian Coast Guard	• **Edition**-11th • **Conducted** under the aegis of National Maritime Search and Rescue (NMSAR)Board in Kochi, Kerala. • **Theme** : *'Enhancing Search and Rescue capabilities through Regional collaboration'*
SLINEX	Naval exercise	India - Sri Lanka	• **Held at** Visakhapatnam under the aegis of the Eastern Naval Command in two phases (harbour and Sea Phase). • **INS *Sumitra* of the Eastern Fleet, along with Special Forces team** participated from Indian side. • *SLINEX* series of bilateral exercises were **initiated in 2005**
HARIMAU SHAKTI	Military Exercise	India - Malaysia	• An **annual training event** conducted alternatively in India and Malaysia. • **Edition** - 4th • **Held at** – Malaysia • Indian contingent comprising of 78 personnel is being represented by a **Battalion of MAHAR** Regiment. • **Last edition** was conducted in Nov 2023 at Umroi Cantonment in Meghalaya, India.
AGNI WARRIOR (XAW)	Military Exercise	India - Singapore	• **Edition**-13th • **Held at**- Devlali (Maharashtra) • Indian Army contingent comprising 114 personnel from the Regiment of Artillery.
CINBAX	Army	India - Cambodia	• **Edition**-1st • **Held at**- Pune • Indian Army contingent was comprising 20 personnel from an Infantry Brigade. • A **planning exercise** aimed to wargame conduct of **joint Counter Terrorism** (CT) operations under Chapter VII of the United Nations Charter. • **Conducted in three phases**- o **Phase-I** will focus on preparations and orientation of participants for CT operations during UN peace keeping missions. o **Phase-II** will involve conduct of the Table Top exercises and o **Phase-III** will involve finalisation of plans and summing up.

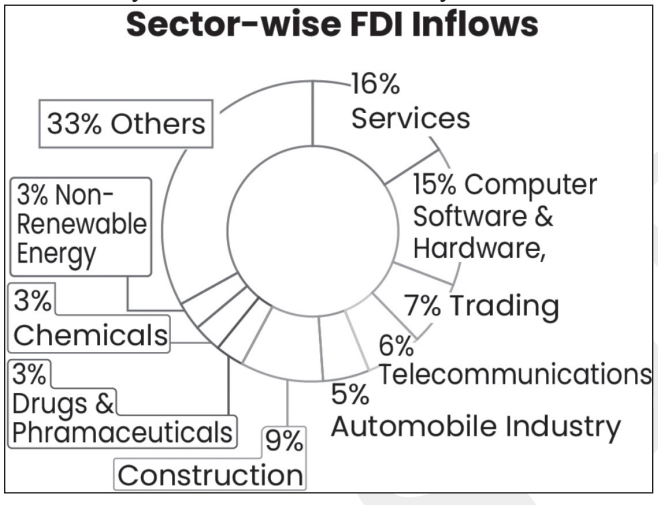
D. Economy

1. India's FDI Journey Hits $1 Trillion

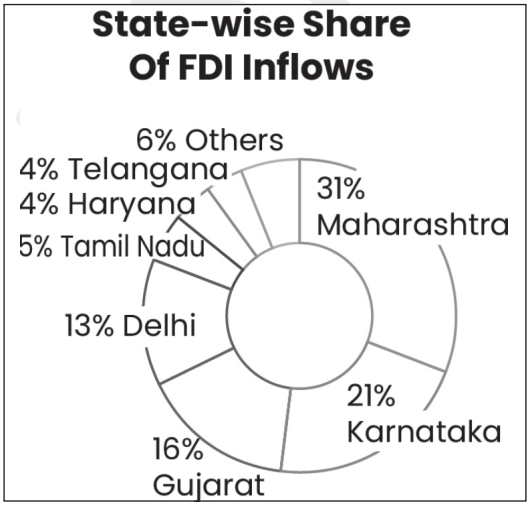
According to data from the **Department for Promotion of Industry and Internal Trade (DPIIT)**, the **cumulative amount of FDI inflows** into **India** has crossed the **$1 trillion milestone** ($1,033.40 billion) in the **April 2000-September 2024 period**.

Key Highlights

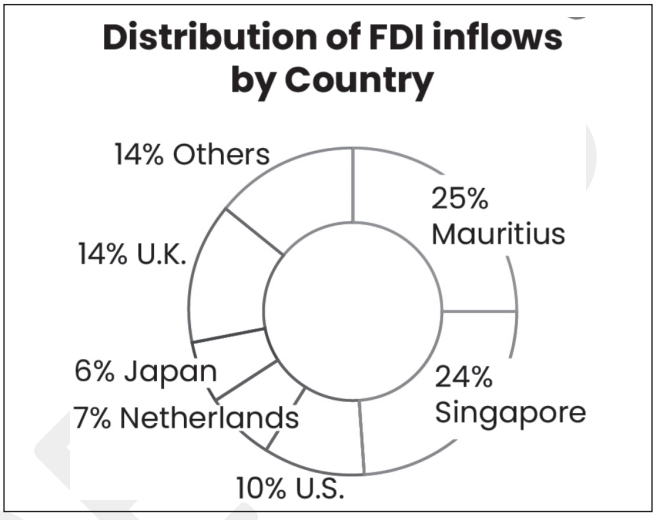
1. **Growth in FDI**: The decade from 2014-2024 saw an increase of **119%** in FDI inflows compared to the preceding decade (2004-2014) according to the Union Ministry of Commerce and Industry.



2. **FDI Increase Over Two Decades**: India's FDI inflows have increased approximately **20 times** from 2000-01 to 2023-24.



3. **Sector-wise FDI**: Over the period from 2000-2024, the service sector attracted the highest equity inflow, amounting to **$115.18 billion**.



What is Foreign Direct Investment (FDI)?

FDI refers to **investments made by a foreign entity in an Indian business** with the intention of long-term operation, through capital instruments, in unlisted companies or in **10% or more** of the paid-up equity capital of listed Indian companies.

Typically, FDI is a **long-term** investment and is considered a **non-debt creating capital flow**.

1. **Routes of FDI**
   a. **Automatic Route**: The foreign investor needs to inform the Reserve Bank of India (RBI) after the investment has been made, without requiring prior approval.
   b. **Government Approval Route**: Foreign investors are required to obtain approval from the concerned Ministry or Department before making an investment.
2. **Regulations Governing FDI in India**
   a. **FDI Policy 2020** and **FEMA (Non-debt Instrument) Rules, 2019** govern FDI in India.
   b. **Primary Regulators**: The Department for Promotion of Industry and Internal Trade (DPIIT) and the Reserve Bank of India (RBI) oversee FDI policies and rules.

Sectors where FDI is Prohibited

1. Lottery Business
2. Gambling and Betting
3. Real Estate Business except development of townships, REITS etc.
4. Nidhi Companies
5. Trading in Transfer-able Development Rights (TDRs)
6. Chit Funds
7. Cigarette and Tobacco Manufacturing
8. Sectors not open to Private sector (Atomic Energy and Railway Operations)

Foreign Direct Investment (FDI) vs. Foreign Portfolio Investment (FPI)

Parameters	Foreign Direct Investment (FDI)	Foreign Portfolio Investment (FPI)
Form of Investment	Long-term investment in business enterprises	Investment in financial assets like stocks and bonds
Type of Investment	Includes financial and non-financial assets, including resources, technology, and securities	Focused on financial assets such as stocks and bonds
Volatility	Low volatility due to extended investment periods	High volatility due to quick investor sentiment changes
Investor Control	Higher control over business decisions	Limited control, passive investors
Liquidity	Low liquidity due to long-term investments	Highly liquid, easily tradable assets

Challenges for FDI in India

1. **Complex Regulations and Policy Uncertainty**: The intricate regulatory framework, including issues with tax laws and transfer pricing, leads to compliance challenges for foreign investors.
   - **Example**: Vodafone's dispute over retrospective taxation.
2. **Institutional Deficiencies**: Bodies like the Competition Commission of India (CCI) have been less effective in curbing anti-competitive practices.
   - **Example**: The Flipkart controversy, which resulted in India losing its preferential treatment under the U.S. Generalized System of Preferences (GSP).
3. **Concentration of FDI**: FDI is disproportionately concentrated in a few sectors like services and in urban regions, leading to developmental inequalities.
   - **Example**: The lack of infrastructure in rural areas deters FDI.
4. **Impact on Local Businesses**: The extensive operations of foreign companies often threaten local businesses that struggle to compete.
   - **Example**: The opposition to Walmart's entry into India.
5. **Impact on the Labor Market**: FDI may raise concerns over job security and the displacement of local workers.
   - **Example**: Legal action against companies like Amazon and Uber for poor working conditions in India.

Challenges Faced by the Indian Economy Due to FDI

1. **Dependency on Foreign Capital**: Relying on foreign investment can lead to economic fluctuations due to external factors.
   - **Example**: The global recession, protectionist measures, and the Russia-Ukraine war led to a drop in FDI inflows in 2023.
2. **Development vs. Environment**: Poorly managed FDI projects can harm ecosystems and communities.
   - **Example**: Vedanta Resources' mining activities in Niyamgiri Hills faced opposition due to environmental concerns.
3. **Intellectual Property Concerns**: Inadequate management of technology and intellectual property can prevent India from fully utilizing the expertise brought by international companies.
   - **Example**: Bio-piracy in India's pharmaceutical sector.

Steps Taken to Promote FDI Inflows

1. **Schemes for FDI Promotion**: Initiatives like **Make in India**, **Start-up India**, **PM Gati Shakti**, **National**

Industrial Corridor Programme, and the **Production Linked Incentive (PLI) Scheme** have boosted FDI inflows in alignment with **Atmanirbhar Bharat**.

2. **Promoting Ease of Doing Business (EoDB)**: Steps to reduce compliance burdens include the **Jan Vishwas (Amendment of Provisions) Act, 2023**, which has led to the reduction of over **42,000 compliances** and decriminalized more than **3,800 provisions**.
3. **Project Development Cells (PDCs)**: Each Ministry/ Department has established PDCs to fast-track investment processes.
4. **Technological Interventions**:
   - The **National Single Window System (NSWS)** simplifies FDI approvals.
   - The **Foreign Investment Facilitation Portal (FIFP)** serves as a single point for facilitating FDI.
5. **State Investment Summits**: States like Gujarat and Uttar Pradesh have hosted Global Investment Summits to attract FDI.
   - **Example**: The **Vibrant Gujarat Global Summit** attracted FDI worth **USD 55 billion** between 2002-2022.

Way Forward

1. **Infrastructure and Skill Enhancement**: Strengthening infrastructure (e.g., high-speed rail, expressways) and upskilling the workforce in emerging sectors like **renewable energy**, **semiconductors**, and **electric vehicles (EVs)** can further attract FDI.
2. **Policy Reforms for Balanced FDI Inflows**: Specific policies and separate rules for manufacturing and service sectors within Special Economic Zones (SEZs) will encourage more balanced FDI distribution.
   - **Recommendation**: The **Baba Kalyani Committee** has suggested creating policies to attract FDI in manufacturing.
3. **Dispute Resolution and Contract Enforcement**: Streamlining dispute resolution and strengthening contract enforcement through dedicated arbitration and commercial courts can provide legal certainty and enhance investor confidence.
4. **Promote Tier-II and Tier-III Cities**: Encouraging FDI in smaller cities through cluster-based development initiatives like **Bulk Drug Parks** and **Mega Food Parks** can help spread investment across regions.
5. **Bilateral Investment Treaties (BITs)**: Strengthening and updating BITs with key nations can further ensure investor confidence by clearly defining terms and conditions for foreign investments.

2. Is Coconut Oil A Haircare Product?

1. The **question of whether coconut oil should be classified as an edible oil or a hair care product** for **taxation purposes** has been a subject of legal and tax debates for over **15 years** in India.
2. In December 2024, Supreme Court ruled that **coconut oil should be classified as an edible oil** and taxed at a lower **GST rate of 5%** instead of 18% for haircare products.

Timeline of the Case

1. **Pre-GST Era (Before 2017)**
   a. **Amendment of the CET Act (Post-2005):**
      - Coconut oil was classified under the Central Excise Tariff Act, 1985 (CET Act).
      - **Section III:** Coconut oil was included under the heading "Animal or Vegetable Fats and Oils and their Cleavage Products; Prepared Edible Fats; Animal or Vegetable Waxes", attracting 8% excise duty (as an edible oil).
      - **Section VI**: Coconut oil was also included under **"Preparations for use on the hair",** attracting a 16% excise duty (as a hair oil).
      - This classification was in line with the **Harmonised System of Nomenclature (HSN),** the international standards established by the World Customs Organization (1988).

   b. **2009 – CBEC Circular:** The Central Board of Excise and Customs (CBEC) issued a circular classifying **coconut oil in small containers (less than 200 ml)** as **hair oil**. This meant that smaller quantities would be taxed at the higher rate of 16% excise duty.

   c. **2015 – Withdrawal of Circular:** The CBEC circular was withdrawn after tribunals and courts ruled that size alone could not determine whether coconut oil was an edible oil or a hair care product.
2. **Goods and Service Tax (GST) Regime (Post-2017)**

a. **Introduction of GST:**
   - Coconut oil was classified under GST at a rate of 5%, as it was considered an edible oil.
   - Hair care products like hair oils were taxed at a higher rate of 18% under the GST regime.

3. **Legal Dispute and Case Development**
   a. **2007 – Show-Cause Notices:** The **Central Excise authorities** issued show-cause notices to **Madhan Agro Industries Pvt. Ltd.**, a company selling coconut oil in various sizes (from 5 ml to 2 liters), proposing to classify it as a hair care product and impose a higher excise duty (16%).
   b. **CESTAT Ruling (2007):**
      a. The **Customs Excise and Service Tax Appellate Tribunal (CESTAT)** in Chennai ruled that **coconut oil was an edible oil** under the **2005 amendment to the CET Act**, and should **not be classified as a hair care** product.
      b. Similar rulings were passed for several companies in Puducherry selling coconut oil in small containers.
   c. **Appeal by the Commissioner of Central Excise, Salem:** The Commissioner of Central Excise, Salem appealed the CESTAT ruling before the Supreme Court (SC).

4. **Supreme Court Rulings**
   a. **2018 – Split Verdict:**
      - Justice Ranjan Gogoi held that coconut oil should be classified as an edible oil irrespective of packaging size.
      - Justice R. Banumathi applied the "Common Parlance Test" and ruled that small packages of coconut oil are perceived as hair oil by consumers and should be taxed at the higher 16% rate.
   b. **2023 – Final Supreme Court Ruling:**
      - A Bench comprising Chief Justice of India Sanjiv Khanna and Justices Sanjay Kumar and R. Mahadevan delivered the final judgment, holding that:
        i. **HSN International Standards:** The international HSN norms must take precedence in classification, and cannot be ignored.
        ii. **Common Parlance Test Not Applicable:** The Common Parlance Test is only applicable when a product is not clearly defined or specifically dealt with under the law. Since coconut oil is specifically dealt with under the law, this test was deemed unnecessary.
        iii. **Dual Uses of Coconut Oil:** The mere fact that coconut oil is used as a cosmetic or hair oil does not exclude it from being classified as an edible oil.
        iv. **Packaging Size:** Both edible oils and hair oils can be sold in small-sized containers (e.g., 50 ml, 100 ml, 200 ml), and the **size of the packaging alone is not sufficient for classification.**
        v. **Final Classification:** Coconut oil should be classified as an edible oil for GST purposes, taxed at the 5% GST rate, irrespective of its potential use in hair care.

5. **Common Parlance Test:** The Common Parlance Test is used when a product can be reasonably classified under two different taxing categories. The court looks at how the public or market generally perceives the product**:**

Examples: -

- **Homeopathic hair oil:** In May 2023, the SC used this test to classify **homeopathic hair oil** as a medicament, subject to a lower tax.
- **Anardana:** In 2022, the SC applied the test to classify anardana (dried pomegranate seeds) as a seed, even though it can also be consumed as fruit.

What is HSN?

HSN (Harmonized System Nomenclature) is an international system for classifying goods, developed by the World Customs Organization (WCO) in 1988. It is used for customs and tax purposes across 200+ countries.

How HSN Works:

1. **HSN Code:** A 6-digit code classifies over 5000 products.
2. **Structure:** Organized into 21 sections, 99 chapters, 1244 headings, and 5224 subheadings.
3. **Purpose:** Helps determine tax rates, duties, and ensures global uniformity in product classification.

HSN in India:

1. **8-digit HSN Codes** are used for GST and Customs classification.
2. **GST Invoices** require HSN codes to calculate taxes.
3. **Small taxpayers** (turnover < ₹1.5 crore) don't need to mention HSN codes.
4. Taxpayers with turnover:
   - **₹1.5 crore to ₹5 crore**: Mention 2 digits.
   - **> ₹5 crore**: Mention 5 digits.

HSN Code Structure:

1. **First 2 digits:** Chapter (broad category).
2. **Next 2 digits:** Heading (specific product type).
3. **Next 2 digits:** Sub-heading (further details).
4. **Last 2 digits:** Tariff item (specific classification).

Example: For cotton T-shirts:

- **HSN Code:** 6109
  - **61:** Chapter (Apparel, knitted).
  - **09:** Heading (T-shirts).

3. State Finances: A Study of Budgets 2024-25

1. The **Reserve Bank of India (RBI)** released the **State Finances: A Study of Budgets of 2024-25** report, with the theme "Fiscal Reforms by States".
2. This report highlights the fiscal position of state governments and outlines fiscal reforms undertaken by them.

Fiscal Position of the State Governments (2021-22 to 2023-24)

1. **Decline in Gross Fiscal Deficit (GFD)**:
   a. State governments have successfully contained their gross fiscal deficit within **3% of Gross Domestic Product (GDP)** from 2021-22 to 2023-24.
   b. The GFD has fallen from an average of **4.3% of GDP** (1998-99 to 2003-04) to **2.7% of GDP** (2004-05 to 2023-24).
2. **Revenue Deficit**: States have maintained a **revenue deficit** at **0.2% of GDP** during 2021-22 to 2023-24.
3. **Improved Expenditure Quality**: Capital outlay (expenditure leading to physical/financial asset creation) increased to **2.6% of GDP** in 2023-24, compared to **2.2% in 2022-23**.
4. **Declining State Debt**:
   a. The debt of states has decreased from **31.8% of GDP** (March 2004) to **28.5% of GDP** (March 2024).
   b. However, it remains well above the **20%** recommended by the **Fiscal Responsibility and Budget Management (FRBM) Act** and the **FRBM Review Committee** (2017).

About the FRBM Act, 2003

1. **Objective**: The FRBM Act was enforced in **July 2004** to ensure **inter-generational equity** in fiscal management and **long-term macroeconomic stability**.
2. **Key Provisions**:
   - Limits Fiscal Deficit (FD) to **3% of GDP**.
   - Containing **General Government Debt** to **60% of GDP** by **2024-25** (Central: **40%** and State: **20%**).
3. **Amendments**: The Act has been amended **four times** in 2004, 2012, 2015, and 2018.

Why Fiscal Deficit is still high in some States?

1. **Reduction in Transfer of Money from Centre to state:** There has been a decline in grants from the Centre attributed to the cessation of GST compensation and the tapering of Finance Commission grants.
   - E.g., Finance Commission Grants under proviso to **Article 275(1)** have reduced by more than 18% in 2022-23 to 2023-24. (Budget 2024-25)
2. **Power Sector Losses**: Electricity distribution companies (DISCOMs) continue to remain a drag on State finances with total accumulated losses at ₹6.5lakh crore by 2022-23 (2.4% of GDP). (Power Finance Corporation, 2024).
3. **Rising subsidy burden**: Driven by farm loan waivers, free/subsidised services (like electricity to agriculture and households, transport), cash transfers to farmers, youth, women etc.
4. **Unreliable fiscal data and reporting:** States reporting standards are often inconsistent with those of the Finance Commissions, the Union Ministry of Finance, and the Reserve Bank.
   - This leads to ambiguities in reporting, differential treatments of public account items, non-uniform nomenclature, and underreporting of debt liabilities.

5. **Other issues in fiscal management in states**:
   a. **Absence of Fiscal Data:** Delays in quarterly data release from some states/UTs.
   b. **Delays in the setting up of State Finance Commissions (SFCs):** It hampers **fund transfer to Local government bodies** which remain heavily reliant on transfers from the State governments.
   c. **Too many Central government schemes**: They reduce flexibility of State government spending and dilute the spirit of cooperative fiscal federalism.
   d. **Economic, climatic and geopolitical uncertainties: They** exacerbate the fiscal risks, leading to large divergences of actual revenues and expenditures from the budgeted estimates.

Fiscal Reforms Undertaken by States

1. **Fiscal Responsibility Legislations (FRLs)**: States have enacted their own **FRBM Acts/FRLs** that incentivize fiscal policy strategies, improve transparency, and lead to the creation of **Medium-Term Fiscal Plans (MTFPs)**.
2. **Institutional Reforms**: Many states, with the help of **NITI Aayog**, have established **State Institutions of Transformation** (e.g., Assam, Gujarat).
3. **Expenditure Reforms**:
   a. **Direct Benefit Transfer (DBT)**: To reduce duplicate and fake beneficiaries.
   b. **National Pension System (NPS)**: Replacing the old pension scheme.
   c. **Single Nodal Agency (SNA)** for centrally sponsored schemes.
4. **Tax Reforms**:
   a. **Goods and Services Tax (GST)** adoption.
   b. **Tax Administration Modernisation** through **e-governance** (e-registration, e-filing, e-payment) to reduce leakages and streamline compliance.
5. **Market-based Financing**: Increased reliance on **market borrowings** for financing GFD, growing from **17%** in 2005-06 to **79%** in 2024-25.
6. **Power Sector Reforms**: **UDAY scheme** and additional borrowing space for power sector reforms as per the **Fifteenth Finance Commission**.

Best practices for Enhancing Transparency and Compliance

1. **GST Seva Kendras** (Gujarat): Simplifying registration and preventing documentation misuse.
2. **Facilitation Cells** (Haryana): Assisting startups and MSMEs with GST compliance.
3. **e-Tendering** (Assam): Ensuring transparency in the issuance of wine licenses.
4. **Leveraging Technology to Boost Revenue**:
   a. **QR code-based track-and-trace system** (Haryana) to prevent alcohol diversion.
   b. **Faceless GST tax administration** (Delhi) using data analytics and automation.
   c. **Drone surveys and satellite imaging** (Odisha) to monitor mining operations.

Recommendations of the report

1. **Next-Generation Fiscal Rules**: Introduce **counter-cyclical fiscal policies** to address large exogenous shocks.
2. **Switzerland's Example of Decentralized Fiscal Governance**: Allow states to create their own fiscal rules based on **state-level fundamentals** (debt levels, growth rates).
3. **Medium-Term Expenditure Framework (MTEF)**: Linking **policymaking to budgeting** for better forward planning and accountability.
4. **Data-Driven Fiscal Policymaking**: Utilizing **data analytics, machine learning**, and **artificial intelligence** for improved taxation systems.
5. **Improving Fiscal Data Generation and Dissemination**: Provide uniform formats for data on **outstanding liabilities**.
6. **Contain DISCOM Losses**: Through enhanced **productivity, transmission and distribution loss reduction**, **rationalization of tariffs**, and privatization efforts.
7. **Other Recommended Measures**:
   a. **Rationalisation of subsidies** and **centrally sponsored schemes**.
   b. Implementing the **'golden rule'**: Finance current expenditures with current revenue, and capital expenditures with borrowings.

c. **Refining the process** of **SFC appointments** to ensure timely resource availability.
d. **Outcome budgeting**: Linking spending to measurable outcomes.
e. **Adoption of climate budgeting**.

State governments in India have demonstrated **fiscal prudence** over the years. However, with rising **developmental expenditures** and **liabilities**, continued reforms are necessary. The recommended fiscal reforms aim to strengthen public finances, ensure **fiscal sustainability**, and enhance fiscal management for the long term.

4. 55th GST Council meeting

1. The 55th Goods and Services Tax (GST) Council meeting was held in Jaisalmer, Rajasthan, in December 2025.
2. This meeting brought forward several key decisions aimed at simplifying trade, improving compliance, and revising GST rates.

About Goods and Services Tax (GST)

GST is a unified indirect tax system introduced in India in 2017 through the **101st Constitutional Amendment Act, 2016**. It replaced multiple indirect taxes levied by both the Centre and States, bringing about a single tax structure across the nation.

- **Nature**: GST is a destination-based tax. This means it is levied on the consumption of goods and services rather than production.
- **Taxation Process**: GST is applied at each stage of the production and distribution chain.

About the GST Council

The GST Council is a constitutional authority tasked with overseeing and making recommendations on matters related to GST. It ensures a uniform approach to GST implementation across the country.

Key Features of the GST Council:

1. **Constitutional Basis**: The GST Council is established under **Article 279A** of the Indian Constitution.
2. **Composition**:
   a. The Union Finance Minister is the Chairman of the GST Council.
   b. The **Finance Ministers of all States** are members of the Council.
3. **Decision-Making Process**:
   a. Decisions in the GST Council are made through a **simple majority**.
   b. A **three-fourths majority of weighted votes** is required for decisions to pass.
   - The **Central Government** holds **one-third** of the total votes.
   - The **State Governments** collectively hold **two-thirds** of the voting power.
4. **Objective**:
   a. The primary objective of the GST Council is to serve as a platform for cooperation between the **Central Government** and **State Governments**.
   b. It helps address disputes and promotes consistency and uniformity in the implementation of GST across the nation.

Key Recommendations by the GST Council:

1. **Exemption on Gene Therapy**: The GST Council announced a full exemption of GST on gene therapy.
2. **GST Exemption for Contributions to Motor Vehicle Accident Fund**: Contributions made by general insurance companies from third-party motor vehicle premiums towards the Motor Vehicle Accident Fund will be exempted from GST.
3. **Reduction in GST Rate on Fortified Rice Kernel (FRK)**: The GST rate on Fortified Rice Kernel (FRK) has been reduced to 5%.
4. **Other Key Decisions**:
   a. **Pepper and Raisins**: Fresh green or dried pepper, as well as raisins supplied by an agriculturist, will not be subject to GST.
   b. **Popcorn with Sugar**: Popcorn mixed with sugar (such as caramel popcorn) will attract an 18% GST.

5. Investment Facilitation for Development Agreement (IFDA)

India along with South Africa, Namibia, and Turkey, opposed the China-led IFDA proposal at the **World Trade Organization (WTO)**.

About IFDA

1. **Genesis**:
   a. The IFDA was **first proposed in 2017 by China** and other developing and least-developed countries (LDCs) within the WTO.

   b. The key aim was to recognize trade and investment as twin engines of economic growth and sustainable development.

2. **Objective**:
   a. The primary objective of IFDA is to create **legally binding provisions** to **increase global flows of Foreign Direct Investment (FDI)**, particularly to developing economies and LDCs.
   b. The ultimate goal is to foster **sustainable development**.
3. **Nature of the Agreement**:
   a. The IFDA is a **plurilateral agreement**, meaning it is **binding only on those members** who accept it, but it remains **open to all WTO members** to join.
   b. Provisions for plurilateral agreements are outlined in **Annex 4** of the WTO Rule Book.
4. **Based on the Most-Favored-Nation (MFN) Principle**:
   a. The **MFN Principle** requires WTO members to accord the **most favorable tariff and regulatory treatment** given to any one member's products, to all other members, at the time of import or export of "like products."
   b. The MFN Principle is a **founding principle** of the WTO.

Four Pillars of IFDA

1. Improving transparency of investment measures
2. Streamlining administrative processes
3. Fostering cooperation between governments and investors
4. Promoting sustainable investments

Reasons for India's Opposition to IFDA

1. **Jurisdictional and Structural Issues**:
   a. **India's stand**: Investment matters are **not a trade issue**, and India believes that the **WTO lacks the mandate** to regulate investment-related matters.
   b. Existing WTO agreements, such as **GATS (General Agreement on Trade in Services)** and **TRIMs (Trade-Related Investment Measures)**, already address trade-related investment aspects.
2. **Opposition to Plurilateralism**:
   a. India is opposed to the **plurilateral approach**, viewing it as a threat to the **multilateral foundation** of the WTO.
   b. The **Doha Development Round** of the WTO specifically requires **explicit consensus** for major agreements, which India feels is contradicted by plurilateral arrangements.
3. **Concerns Regarding Chinese Leadership**:
   a. India expresses concerns about **China's leadership role** in the IFDA, particularly in light of **China's history of debt-trap diplomacy** and strategic investments through the **Belt and Road Initiative (BRI)**.
   b. India perceives **potential risks** in formalizing investment frameworks that could increase China's influence over weaker economies.
4. **Sovereignty Concerns**:
   a. India argues that the IFDA could boost **foreign corporate lobbying**, putting **diplomatic pressure** on weaker economies and thereby limiting their **national regulatory powers**.
   b. The agreement might **prioritize foreign investors** over domestic interests, which could undermine national policy-making autonomy.

Potential Benefits of IFDA

1. **Investment Reforms:** Anchors domestic reforms in international commitments, improving investment climate.
2. **Global Standards**: Establishes clear benchmarks to reduce regulatory uncertainty
3. **Capacity Building**: Provides technical support to LDCs for implementation and benefits.
4. **Economic Impact**: Global welfare gain may rise by 0.63% to 1.73% depending on the agreement's depth (WTO).

6. Programme of Action for LLDCs for the Decade 2024-2034

1. The **UN General Assembly** has adopted the **Programme of Action for Landlocked Developing Countries (LLDCs)** for the **Decade 2024-2034**, building on the foundations laid by the **Vienna Programme of Action (2014-2024)** and the **Almaty Programme of Action (2003)**.
2. This new programme aims to address the unique challenges faced by LLDCs and promote their sustainable development.

Five Priority Areas for Action:

The **Programme of Action** identifies **five key priority areas** to support the sustainable growth and development of LLDCs:

1. **Promoting Sustainable Economic Growth**
2. **Enhancing Regional Trade Integration**:
3. **Improving Transport Connectivity**:
4. **Building Climate Resilience**:
5. **Ensuring Effective Implementation Strategies**:

Key Targets for LLDCs by 2034:

To achieve the objectives of the Programme of Action, several **key targets** have been set:

1. **Boost Labour Productivity & Job Opportunities**: **Increase labour productivity** and create job opportunities across all sectors by **50%** by 2034.
2. **Develop Special Economic Zones**: Provide **support for the development** of **special economic zones**, **industrial parks**, and other industrial hubs.
3. **Reduce Non-Tariff Barriers**: **Eliminate unjustified non-tariff barriers** to trade and **double global merchandise exports** from LLDCs by 2034.
4. **WTO Agreement on Trade Facilitation**: **Effectively implement** the **WTO Agreement on Trade Facilitation** in all LLDCs to streamline international trade processes.
5. **Reduce Disaster Risk**: **Implement the Sendai Framework for Disaster Risk Reduction (2015–2030)** fully to reduce disaster risk in LLDCs.

About Landlocked Developing Countries (LLDCs):

- **Landlocked countries** are nations that **do not have direct access to the sea**.
- There are currently **32 LLDCs**, with a combined population of about **570 million** people.
- Notably, **Liechtenstein** and **Uzbekistan** are **doubly landlocked**, meaning they are **surrounded by other landlocked countries**.

Challenges Faced by LLDCs:

LLDCs face several significant challenges that hinder their economic and developmental progress:

1. **Hurdles in Trade**:
   - **Dependence on transit countries** leads to:
     - Higher **trade costs**
     - **Delays in shipments**
     - Reduced **global market competitiveness**.
2. **Slower Economic Growth**:
   - Limited **trade** and **export opportunities**, as well as reduced **Foreign Direct Investment (FDI)**, slow down economic progress.
   - **Global merchandise exports** from LLDCs accounted for just **1.1%** of total global exports in 2022.

The **Programme of Action for LLDCs (2024-2034)** is a comprehensive framework designed to address the unique challenges faced by landlocked countries. By focusing on **sustainable economic growth**, **trade integration**, **transport connectivity**, **climate resilience**, and **effective implementation**, this programme aims to unlock the potential of LLDCs and drive their inclusive development. The targets set for the decade ahead are pivotal in reducing economic disparities and promoting global integration for these nations.

7. Global Wage Report (2024-25) by ILO

The **Global Wage Report (2024-25)**, published by the **International Labour Organization (ILO)**, provides an in-depth analysis of wage trends worldwide. It highlights important changes in **wage inequality** and **real wage growth** across different regions.

Key Findings from the Global Wage Report (2024-25)

1. **Trends in Wage Growth:**
   a. **Global Overview**: After a decline in 2022, **global real wage growth** showed a **recovery in 2023**.
   b. **Regional Trends**: **Asia and the Pacific**, **Central and Western Asia**, and **Eastern Europe** are seeing **faster wage increases** compared to other parts of the world.
   c. **Low-paid Workers in India**: Around **9.5% of Indian workers** are considered **low-paid wage workers**.

Do you know?

The Palma ratio is a measurement of inequality calculated by dividing the total hourly wages of top 10% of wage distribution by total hourly wages of the bottom 40% of wage distribution.

3. **Trends in Labour Income Inequality:**
   a. **Global Wage Inequality**: Overall, **wage inequality** has shown a **declining trend** globally. However, inequality remains **highest in low-income countries** and **lowest in high-income countries**.
   b. **Informal Economy**:
      - **Women** and **workers** are overrepresented at the **low end of the wage distribution**.
      - The **informal economy** has seen an **increase** in **absolute terms** due to **insufficient formal job creation**.
   c. **Labour Productivity vs. Real Wages (1999-2024)**: **Labour productivity** has increased **more rapidly** in **high-income countries** than **real wages** during this period.

Addressing Wage Inequality and Promoting Fair Wages

1. **Increased Research: Robust data and statistics** are essential for measuring and estimating **changes in inequality** to better understand and address wage disparity.
2. **National Strategies to Reduce Wage Inequality:**
   a. **Wages** should be set considering **economic factors** as well as the **needs of workers** and their families.
   b. There should be a focus on promoting **gender equality**, **equity**, and **non-discrimination** in wage policies.
3. **Redistribution of Income:**
   a. Income should be redistributed through systems of **taxation** and **social transfers**.
   b. Alongside, policies should focus on promoting **productivity**, **decent work**, and the **formalization of the informal economy**.

8. First-Ever Auction of Minerals in Offshore Areas

The **Ministry of Mines** has launched the **first-ever tranche of the auction** for **mineral blocks in offshore areas**. This marks a significant step forward in **exploring India's extensive offshore mineral resources** within its **Exclusive Economic Zone (EEZ)**.

Key Details of the Offshore Mining Auction:

1. **Mineral Blocks**: The auction includes **13 mineral blocks** spread across the **Arabian Sea** and the **Andaman Sea**.
2. **Types of Minerals and Their Regions**:
   a. **Construction Sand**: Off the coast of **Kerala** (Arabian Sea)
   b. **Lime-Mud**: Off the coast of **Gujarat** (Arabian Sea)
   c. **Polymetallic Nodules and Crusts**: Off **Great Nicobar Islands** (Andaman Sea)

Offshore Mining (or Deep Sea Mining)

1. **Definition**: Offshore mining refers to the process of retrieving mineral deposits from the **deep seabed**, typically at depths of more than **200 meters**.
2. **Potential Area**: The **Geological Survey of India (GSI)** has identified about **six lakh sq. kms** of offshore areas that have potential for offshore mining.

Significance of Offshore Mining for India

1. **Rich Offshore Mineral Reserves**: India's offshore mineral reserves include essential minerals such as **gold**, **diamond**, **copper**, **nickel**, **cobalt**, **manganese**, and **rare earth elements**.
2. **Strategic Benefits**:
   a. **Increased Mineral Availability**: Offshore mining will boost the availability of critical minerals, contributing to **Atmanirbharta (self-reliance)** in minerals.
   b. **Unlocking India's Blue Economy**: By tapping into offshore resources, India can better harness its **blue economy**, which refers to the economic potential of the oceans.
   c. **Reduced Dependence on Imports**: Offshore mining can help **reduce dependence on imports** of crucial minerals, strengthening India's position in global mineral markets.
3. **Key Areas of Application**: The minerals retrieved through offshore mining are vital for:
   a. **Infrastructure development**
   b. **High-tech manufacturing**

c. **Green energy transition**, including clean energy technologies.

Challenges in Offshore Mining

1. **Lack of Private Participation**: The offshore mining sector has historically seen limited **private sector involvement**, which has hindered growth.
2. **Skilled Labor and Capital**: Offshore mining requires **highly skilled labor** and significant capital investment for technology, equipment, and operations.
3. **Environmental Concerns**:
   - **Habitat Destruction**: Mining activities can lead to the destruction of marine habitats.
   - **Marine Ecosystem Disruption**: The extraction of minerals can disrupt delicate marine ecosystems, affecting biodiversity.

Step Taken for Offshore Mining

1. **National Geological Data Repository (NGDR) portal**: by GSI covering exploration data.
2. **Deep Ocean Mission**: To explore and extract polymetallic nodules.
3. **Offshore Areas (Existence of Mineral Resources) Rules, 2024**: defines the stages of exploration, classification of mineral resources and reserves etc

9. mBridge Project

According to Bank for International Settlements (BIS), Project mBridge reached the **minimum viable product (MVP) stage in mid-2024**.

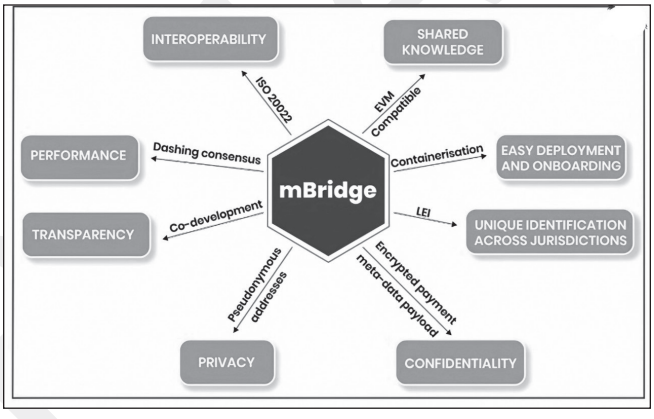
About Project mBridge

1. **Launched in 2021**, mBridge is a **cross-border**, **decentralised**, **multiple central bank digital currency (mCBDC)** platform.
2. **Key Features**:
   a. A new blockchain called **the mBridge Ledger** supports **real-time, peer-to-peer cross-border payments** and **foreign exchange transactions**.
   b. Built on **Distributed Ledger Technology (DLT)**, it utilizes a decentralized ledger network that draws resources from multiple nodes to ensure **data security** and **transparency**.

Central Bank Digital Currency (CBDC): A legal tender and **a central bank liability** in digital form denominated in sovereign currency and appearing on central bank balance sheet. (RBI)

Legal tender: Money issued by monetary authority and cannot be refused by any citizen of the country for settlement of any kind of transaction.

3. **Participants**:
   a. Initially led by the **BIS Innovation Hub**.
   b. **Collaborating central banks**: China, Thailand, UAE, and Hong Kong.
   c. **Saudi Central Bank** joined in **2024**.
   d. **More than 31 observing members**, including the **Reserve Bank of India.**



Significance of mCBDC

The project has several potential benefits for global trade and finance, including:

1. **Lower Transaction Costs**: By utilizing digital currencies and blockchain technology, mBridge can reduce the cost of cross-border transactions.
2. **Increased Efficiency and Speed**: Real-time payments and foreign exchange transactions enhance the efficiency and speed of cross-border financial exchanges.
3. **Enhanced Security and Transparency**: Leveraging blockchain and AI technologies improves the security and transparency of transactions.
4. **Monetary Sovereignty**: mBridge helps ensure that countries can maintain control over their own currencies, enhancing trust and credibility in their financial systems.
5. **Prevention of Monopoly and Digital Dollarization**: Reduces the risk of one dominant currency taking over international trade, allowing for more diversified financial systems.

Bank for International Settlements (BIS)

1. **Headquarters:** Basel, Switzerland
2. **Genesis:** Created in 1930 at the Hague Conference.
3. **Mandate:**
   a. To support central banks in their pursuit of monetary and financial stability through international cooperation.
   b. Act as a bank for central banks.
4. **Ownership:** Owned by 63 central banks, including the Reserve Bank of India.

Challenges associated with mCBDC

While the project has great potential, there are several challenges that could hinder its widespread adoption:

1. **Global Acceptance and credibility** as BIS has announced backing out from project after involvement for about four years.
2. **Regulatory Uncertainty** due to lack of a **coherent regulatory framework** across jurisdictions.
3. **Volatility and Macroeconomic Stability** associated with digital currencies.
4. **Security Concerns** regarding data breaches, Illegal uses such as money laundering, tax evasion or financing illegal activities, etc.
5. **Risks of creating Parallel and unregulated structures** of transactions.

Similar Global Initiatives

- **BRICS Bridge**: Proposed payment system by BRICS nations.
- **Project Nexus**: Bank for International Settlements (BIS) initiative that aims to connect multiple domestic instant payment systems (IPS) globally.

Project mBridge represents a significant shift toward a **multipolar global financial system**, where **digital currencies** backed by local economies could play a crucial role in **international trade**. It promises to give countries greater control over their financial transactions, reducing the impact of sanctions or economic pressures from foreign nations. However, the initiative faces challenges, particularly in terms of **global acceptance**, **regulatory frameworks**, and **security concerns**. Nonetheless, mBridge could reshape the future of cross-border finance, but its long-term success will depend on overcoming these obstacles.

10. RBI Allows SFBs to Extend Credit Lines via UPI

1. The **Reserve Bank of India (RBI)** has recently permitted **Small Finance Banks (SFBs)** to offer **pre-sanctioned credit lines** through the **Unified Payment Interface (UPI)**.
2. This decision marks an important step in deepening **financial inclusion** and improving access to formal credit, especially for individuals who are "new to credit."

Key Features of Credit Line Through UPI by SFBs:

1. **Pre-Sanctioned Credit Lines via UPI**:
   - Small Finance Banks can now issue **pre-sanctioned credit lines** to individuals.
   - With the **prior consent** of the individual customer, these credit lines can be used for **transactions through the UPI system**.
2. **Earlier RBI Decision**: In **September 2023**, the RBI had already allowed **Scheduled Commercial Banks (SCBs)** to extend pre-sanctioned credit limits via UPI to individuals.
3. **Significance**: The facility aims to **deepen financial inclusion** and provide **formal credit access**, particularly to those who are new to the credit system.

About Small Finance Banks (SFBs)

Small Finance Banks (SFBs) were introduced to promote **financial inclusion** and provide essential banking services to underserved sections of society. Here are some key details about them:

1. **Origin**: SFBs were **announced in the Union Budget 2014-15** as part of the government's initiative to improve financial inclusion.
2. **Objectives**:
   a. To provide **savings vehicles** to **unserved and underserved populations**.
   b. To offer **credit** to:
      - **Small business units**
      - **Small and marginal farmers**
      - **Micro and small industries**
      - Other entities in similar sectors.

   c. SFBs operate through **high technology** and **low-cost models**, making banking services more accessible to these sectors.
3. **Registration**: SFBs are **registered as public limited companies** under the **Companies Act, 2013**.
4. **Licensing**: SFBs are licensed under **Section 22 of the Banking Regulation Act, 1949**.
5. **Regulation**: The **RBI** regulates SFBs, ensuring their compliance with banking norms and policies.
6. **Capital Requirements**: SFBs are required to have a **minimum paid-up voting equity capital** of ₹200 crore (except those converted from **Urban Cooperative Banks**).
7. **CRR and SLR Requirements**: SFBs are subject to **Cash Reserve Ratio (CRR)** and **Statutory Liquidity Ratio (SLR)** requirements similar to **Scheduled Commercial Banks (SCBs)**.
8. **Priority Sector Lending (PSL)**: SFBs are required to extend **75% of their Adjusted Net Bank Credit (ANBC)** to **priority sectors** as defined by the RBI.

Impact and Importance of the RBI's Decision

1. **Financial Inclusion**: By allowing SFBs to offer credit through UPI, the RBI aims to increase access to credit for individuals who have limited or no exposure to formal credit systems.
2. **New-to-Credit Customers**: This move is particularly focused on **'new-to-credit' customers**, providing them with an opportunity to build a credit history and improve their financial standing.
3. **Enhanced Credit Access**: The integration of **UPI with credit facilities** offers a seamless and convenient method for individuals to access and use their pre-sanctioned credit lines, thereby promoting a digital and cashless economy.

11. Network Readiness Index (NRI) 2024

The **2024 edition** of the **Network Readiness Index (NRI)** has officially launched, bringing forward the theme:

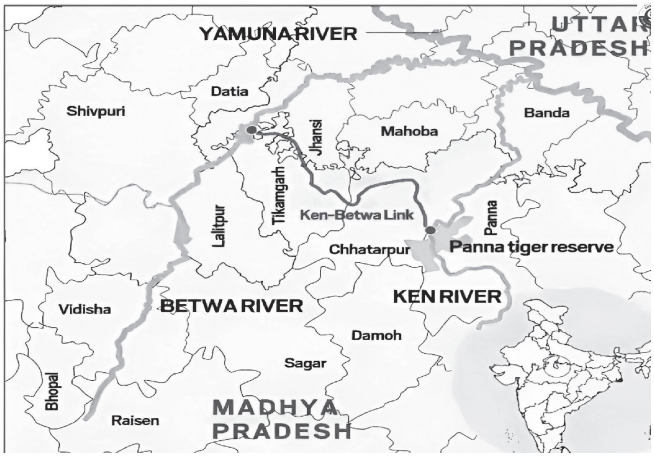
"Building a Digital Tomorrow: Public-Private Investments and Global Collaboration for Digital Readiness."

Key Points:

1. **India's Performance**: India has made significant progress by **climbing 11 ranks**, securing the **49th position** in the NRI 2024.
2. **Scope of the Report**: The NRI 2024 maps the **network-based readiness landscape** of **133 economies** around the world. It evaluates countries based on their performances in four key pillars:
   a. **Technology**
   b. **People**
   c. **Governance**
   d. **Impact**
3. **Co-Publishing**: The NRI 2024 report is co-published by the **Portulans Institute** and the **Saïd Business School, University of Oxford**.

12. India's first River Interlinking Project: Ken-Betwa River Linking Project

1. In December 2024, Prime Minister Narendra Modi laid the foundation stone of the **Ken- Betwa River Linking National Project** on the 100th birth anniversary of former Prime Minister Atal Bihari Vajpayee.
2. Alongside the KBLP, PM laid the foundation stone for the **Daudhan Dam irrigation project,** which will serve **11 lakh hectares of land** in the region.
   - The PM also inaugurated **Madhya Pradesh's first floating solar energy project** at **Omkareshwar,** marking a significant step toward **renewable energy adoption.**



What is the Ken-Betwa Link Project (KBLP)?

The KBLP is the 1st project under the **National Perspective Plan (NPP)** for interlinking rivers, which was introduced in 1980. The NPP includes 16 projects under its peninsular component, of which KBLP is one.

1. The **Ken-Betwa Link Project (KBLP)** focuses on **interlinking rivers** to **transfer excess water from the Ken River in Madhya Pradesh to the Betwa River in Uttar Pradesh,** both of which are **tributaries of the Yamuna**.
2. This initiative aims to **address water scarcity in the drought-prone Bundelkhand region**.
3. The project involves constructing the **221-km Ken-Betwa Link Canal**, which includes a 2-km tunnel. It also includes the construction of a 77-meter tall and 2-km wide **Dhaudhan dam**, located within the **Panna Tiger Reserve**.
4. According to the **Jal Shakti Ministry**, the project will:
   a. Provide **annual irrigation to 10.62 lakh hectares** (around 8 lakh hectares in Madhya Pradesh and 2.5 lakh hectares in Uttar Pradesh).
   b. **Supply drinking water** to approximately 62 lakh people.
   c. Generate **103 MW of hydropower** and **27 MW of solar power**.
5. **Approval and Funding:** The Union Cabinet approved a budget of around ₹44,6050 crore for the KBLP in 2021.
   a. Central Government will contribute 60% of the cost. 30% will come as a central loan. Madhya Pradesh will provide the remaining 10%.
6. **Regions Benefiting from the Project:** The KBLP is located in the **Bundelkhand region**, which spans 13 districts across Uttar Pradesh and Madhya Pradesh. Key beneficiaries include:
   a. **Districts in Madhya Pradesh:** Panna, Tikamgarh, Chhatarpur, Sagar, Damoh, Datia, Vidisha, Shivpuri, and Raisen.
   b. **Districts in Uttar Pradesh:** Banda, Mahoba, Jhansi, and Lalitpur.
7. According to the Jal Shakti Ministry, the Ken-Betwa Link Project (KBLP) is expected to be completed in eight years.

What is the National Perspective Plan for Interlinking of Rivers?

1. The **National River Linking Project (NRLP)**, also known as the **National Perspective Plan (NPP)**, was prepared by then **Union Ministry of Irrigation (now Ministry of Jal Shakti)** in August 1980.
2. **Aims**:- to redistribute water from surplus basins, prone to flooding, to deficit basins, suffering from drought and scarcity, through inter-basin water transfer projects.
3. Under NPP, The **National Water Development Agency (NWDA)** has identified 30 potential links under the plan: **16** under the Peninsular Component and **14** under the Himalayan Component.

What are the Environmental and Social Impacts of the project?

1. **Environmental Concerns:** Significant deforestation is anticipated in the **Panna National Park and Tiger Reserve**.
   a. **Wildlife Impact:** Approximately 98 sq. km of **Panna National Park** will be submerged. **Tiger reintroduction** efforts may be adversely affected. **Gharial populations** in the **Ken Gharial Sanctuary** and **vulture nesting sites** may face risks.
   b. **Hydrological Changes:** River interlinking **may reduce rainfall by up to 12%** in September, altering land-atmosphere interactions.
2. **Social Impacts:** Around 5,200 families in Chhatarpur district and 1,400 families in Panna district will be displaced. Protests have erupted over claims of insufficient compensation and minimal benefits for local communities.
3. **Regulatory Concerns:** The Supreme Court's **Central Empowered Committee (CEC)** raised questions on the economic viability of the project, advocating for first exhausting other irrigation options in the upper Ken basin.

Origin of River-Linking Projects in India

1. **Sir Arthur Cotton (19th Century):** The idea of linking rivers was first proposed by Sir Arthur Cotton, a British engineer, to connect the **Ganga and Cauvery** for navigation and irrigation.
   - The Periyar Project, constructed in 1895, is a major irrigation project that diverts water from the **Periyar River basin in Kerala** to the **Vaigai River basin in Tamil Nadu.**
2. **National Water Grid:** Dr. K.L. Rao, the then Union Irrigation Minister, proposed the construction of a **National Water Grid in the 1970s.**
   - It aims to transfer water from water-surplus regions to water-deficit areas.
3. **Garland Canal:** Captain **Dinshaw J Dastoor** proposed a Garland Canal to redistribute the water from one area to another.
4. **National Perspective Plan (1980):** Prepared in 1980, aimed at inter-basin water transfer.
   - In 1982, the **National Water Development Agency (NWDA)** was established to conduct water balance and feasibility studies for the linking of rivers.

"Background and Evolution of the idea of river interlinking"

1. **1972**: Dr. K.L. Rao, then Minister of Irrigation, proposed interlinking rivers by connecting the **Ganga** and **Cauvery** rivers.
2. **1977**: Capt. Dastur introduced the concept of a **Garland Canal** to encircle Himalayan, Central, and Peninsular India.
3. Both proposals were considered innovative but deemed **technologically and economically unfeasible** at the time.

National Perspective Plan (NPP)

In **1980**, the Ministry of Irrigation (now the **Ministry of Jal Shakti**) and the **Central Water Commission (CWC)** launched the NPP, aiming to address water imbalances by transferring surplus water to deficit regions.

- The NPP has **two major components**:
  1. **Himalayan Rivers Development**
  2. **Peninsular Rivers Developmen**

Components of NPP

1. **Himalayan Rivers Development**
   - Involves building **storage reservoirs** on the main tributaries of the Ganga and Brahmaputra in **India, Nepal, and Bhutan**.
   - Proposed interlinking includes:
     - Transfer of surplus flows from **eastern tributaries of the Ganga** to the west.
     - Linking the **Brahmaputra** with the Ganga and further with the **Mahanadi**.
2. **Peninsular Rivers Development**

This component is divided into **four sub-projects**:

1. **Mahanadi-Godavari-Krishna-Cauvery Link**
   - Transfers surplus water from Mahanadi and Godavari rivers to southern regions via Krishna and Cauvery.
   - Envisions the creation of **storage reservoirs** at potential sites.
2. **West-Flowing Rivers (North of Mumbai to Tapi)**
   - Plans to store and interlink west-flowing rivers for:
     - **Water supply to Mumbai**.
     - Irrigation of Maharashtra's coastal areas.
3. **Ken-Chambal Interlinking**
   - Establishes a **water grid** for Madhya Pradesh, Rajasthan, and Uttar Pradesh.
   - Supported by reservoirs and canals for storage and distribution.
4. **Diversion of Other West-Flowing Rivers**
   - Targets the high-rainfall streams of the **Western Ghats**, directing water eastwards to drought-prone regions and ensuring Kerala's water needs.

Salient Features of NPP Proposals

- Most transfers rely on **gravity-based systems** to minimize energy costs.
- **Lifting mechanisms** are limited to around **120 meters** for economic viability.
- Focuses on utilizing **surplus floodwater** while safeguarding **in-basin requirements**.

Progress on Himalayan Rivers Development Component

Key Links/Details	Status	Impact	Location
Kosi-Mechi Link Project	PFR (prefeasibility report completed) completed	Annual irrigation: 4.74 lakh ha (2.99 lakh ha in Bihar).	Nepal
		Domestic & industrial water supply: 24 MCM for Bihar and Nepal.	
Kosi-Ghaghra Link Project	Draft FR (Draft feasibility report) completed	Annual irrigation: 10.58 lakh ha (8.17 lakh ha in Bihar).	Bihar, UP, Nepal
		Domestic & industrial water supply: 48 MCM for Bihar, UP, and Nepal.	
Chunar-Sone Barrage Link Project	Draft FR completed	Annual irrigation: 0.67 lakh ha (0.13 lakh ha in Bihar).	Bihar
		Supports existing commands of Western Sone Low and High-Level Canals.	
		Additional irrigation: 2.99 lakh ha in Bihar via Sone Dam–Southern Tributaries of Ganga Link.	
Intra-State Kosi-Mechi Link Project	DPR prepared in March 2014	Cleared for environmental and investment purposes in 2019 and 2020, respectively.	Bihar
	MoU signed in December 2022	Working DPR preparation in collaboration with NWDA and Government of Bihar.	

13. 13th National Seed Congress (NSC)

In November 2024, **13th National Seed Congress (NSC) 2024**, organized by the Ministry of Agriculture & Farmers' Welfare, held in Varanasi, Uttar Pradesh.

Theme of NSC 2024 is *'Innovating for a Sustainable Seed Ecosystem'.*

- **Sustainable Seed Ecosystem:** Ensures timely access to affordable, quality seeds of suitable crop varieties for farmers (FAO).

Significance of quality seeds:

1. Ensures **genetic and physical purity of the crops** & capacity to withstand the **adverse conditions.**
2. Seedlings produced **will be more vigourous, fast growing and can resist pest**.
3. Development of **root system will be more efficient** that aids **absorption of nutrients** efficiently and result in **higher yield.**
   - Good quality seeds of improved varieties ensure **higher yield at least 10 – 12 %**

Challenges in India's seed ecosystem

1. **Seed Replacement Rate (SRR):** In India SRR is **around 15 – 20%** which may vary with crop varieties. However, it's **100% for hybrid seeds.**
   a. **SRR:** It's the percentage of a crop area sown with certified seeds instead of farm-saved seeds.
2. **Monoculture Farming**: Widespread use of Bt cotton reduces biodiversity and increases pest vulnerability.
3. **Seed Market Monopoly**: Multinational companies (e.g., Bayer) dominate seed markets, limiting access to local seeds.
4. **Other issues**: Pending Seed Bill, lack of seed entrepreneurship, etc.

Steps taken by the government

1. **National Seed Corporation (NSC):** Established in 1963, it produces foundation and certified seeds for 600+ varieties across 60 crops.
2. **Seeds Act, 1966**: Regulates seed quality and establishes State Seed Certification Agencies.
3. **National Seed Policy, 2002**: Focuses on varietal development, seed quality, and intellectual property protection.
4. **Seed Village Programme (Beej Gram Yojana)**: Improve farmers' saved seed quality.
5. **National Seed Reserve**: Maintains reserves to ensure seed availability during climatic disruptions.

14. National Legal Metrology Portal (eMaap)

Department of Consumer Affairs, Government of India, is developing the National Legal Metrology Portal (eMaap) to integrate State Legal Metrology Departments and their portals into a unified National System.

- Presently, State Governments are using their own portals for registration of packaged commodities, issue of licenses and verification/stamping of weighing & measuring instruments

About eMaap

- **Aim:** Streamline processes for issuing licenses, conducting verifications and managing enforcement and compliance.
- **Benefits**:
- **Foster ease of doing business and Transparency in trade practices** by minimizing compliance burdens, reducing paperwork under Legal Metrology Act, 2009.
- **Enables data-driven decision-making**, streamlines enforcement activities, and facilitates policy formation, ensuring a robust and efficient regulatory framework.

15. SEBI announced Tighter IPO Rules for SMEs

1. **Recently** The **Securities and Exchange Board of India (SEBI)** introduced reforms to the **SME (Small and Medium Enterprises) Initial Public Offering (IPO) process.**
2. These changes aim to make the **market safer for investors** and improve the **framework** for **equity derivatives**.

What Is an IPO?

1. An **Initial Public Offering (IPO)** is the process through which a **private company** offers its shares to the **public** for the first time on a **stock exchange**.
2. This process marks the company's transition from **private** to **public ownership**, commonly referred to as **"going public"**.

How Does an IPO Work?

1. **Before the IPO**: The company is privately owned, with a small number of investors, such as the **founders**, **family members**, and **venture capitalists**.
2. **During the IPO**:
   a. The company **sells shares** to the public to raise **capital** for growth, expansion, or **debt repayment**.
   b. Early investors in the company can also sell their stakes for **profit**.
3. **Role of Investment Banks**: Investment banks help manage the IPO process by:
   a. Evaluating the company's value.
   b. Preparing documents.
   c. Marketing the offering to potential investors.

Why Is SEBI Proposing These Changes?

1. **Increase in Retail Investors**: Over the past few years, **retail investors** (small individual investors) have become more involved in SME IPOs.
2. **However, these IPOs are riskier and can lead to losses if market conditions change after the shares are listed.**
3. **Protecting Smaller Investors**: SEBI wants to make sure that only investors who can **handle higher risks take part in SME IPOs, to protect smaller investors who may not fully understand the risks.**

Key Proposals from SEBI:

Increase in Minimum SME IPO Size:

1. **Proposed Change**: SEBI suggests increasing the **minimum IPO size** for SMEs from **Rs 1 crore** to **Rs 10 crore**.

2. **Reason**: Many small SME IPOs have been raising funds at **inflated valuations**, leading to **losses** for investors. A larger IPO size will ensure that the company has a more substantial base before going public, making it more reliable.

Doubling the Minimum Subscription Amount:

1. **Proposed Change**: SEBI plans to **double the minimum amount** needed to apply for an SME IPO from **₹1 lakh** to **₹2 lakh**, and in some cases, up to **₹4 lakh**.
2. **Reason**: This will limit participation to investors who can handle more risk. It will also help keep smaller investors out, which is better for them because it reduces the chance of them losing money in risky investments.

Using the 'Draw of Lot' System:

1. **Proposed Change**: SEBI wants to use the **'draw of lot'** system for SME IPOs, just like it is used in regular (mainboard) IPOs for retail investors.
2. **Reason**: This system will give all investors a **fair chance** to get shares, especially when the IPO is oversubscribed **(when there are more applications than shares available).**

Splitting the Non-Institutional Investor Category:

1. **Proposed Change**: SEBI proposes to split the **non-institutional investor** category into two groups based on the application size.
2. **Reason**: This will give smaller investors a **better chance** of getting shares in case the IPO is oversubscribed.

Introducing a Monitoring Agency for Large IPOs:

1. **Proposed Change**: If an SME IPO raises more than **₹20 crore**, SEBI suggests a **monitoring agency** should track how the raised funds are used.
2. **Reason**: This agency will make sure that the funds are used properly, as mentioned in the IPO documents. For smaller IPOs, a **statutory auditor** will confirm the proper use of funds.

Stricter Financial Requirements Before IPO:

1. **Proposed Change**: SEBI suggests that companies should have a minimum **operating profit** of **₹3 crore** in two of the last three years before they can file for an IPO.
2. **Reason**: This will make sure that only financially stable companies are able to raise money from the public.

Share Face Value Requirement:

1. **Proposed Change**: SEBI recommends that shares issued in an IPO should have a **face value of ₹10** for both the company's issued capital and new shares.
2. **Reason**: This will standardize the value of shares and ensure better **pricing transparency** for investors.

Related-Party Transaction Rules:

1. **Proposed Change**: SEBI wants to apply the **Related-Party Transaction (RPT)** rules to SME-listed companies, just like it applies to bigger companies.
2. **Exception**: Companies with **less than ₹10 crore** in paid-up capital or **less than ₹25 crore** in net worth will be exempt from this rule.
3. **Reason**: This will help reduce any conflicts of interest and improve **corporate governance**.

No Use of IPO Funds for Loan Repayments:

1. **Proposed Change**: SEBI suggests that companies should not be allowed to use the funds raised from an IPO to **repay loans** taken by the promoters (owners) or their relatives.
2. **Reason**: This will make sure that the money raised is used to help the company grow, not to pay off personal debts.

Periodic Fund Use Reports:

1. **Proposed Change**: Companies raising large amounts for **working capital** will need to submit **periodic reports** from auditors to show that the funds are being used as planned.
2. **Reason**: This will ensure that IPO funds are being used properly and not wasted or misused.

What is the Securities and Exchange Board of India (SEBI) ?

1. **Before SEBI**: The Indian securities market was regulated by the **Controller of Capital Issues** under the **Capital Issues (Control) Act of 1947**.
2. **Establishment**: SEBI was first created in **1988** as a **non-statutory body** with no legal powers. It later became an **autonomous statutory body** under the **Securities and Exchange Board of India Act of 1992**.
3. **Role of SEBI**: SEBI is responsible for regulating the securities market in India, ensuring that it operates in a **fair**, **transparent**, and **efficient** manner. It aims to protect the interests of **investors** and promote **market development**.

key differences between IPO (Initial Public Offering) and FPO (Follow-on Public Offering):

Feature	IPO (Initial Public Offering)	FPO (Follow-on Public Offering)
Definition	The **first sale of shares** by a company to the public, marking the company's transition from private to public.	An offering of **additional shares** by a company that is already publicly listed.
Purpose	To raise capital for the company by going public and offering shares to the general public for the **first time**.	To raise additional capital, often for **expansion, debt repayment**, or to meet regulatory requirements, after the company is already listed.
Who Can Issue?	Any **private company** that is going public for the first time.	A company that is already **publicly listed** and wants to issue more shares.
Number of Shares	The company issues **new shares** to the public. It can also include the sale of existing shares by shareholders.	The company issues **additional new shares** or may allow existing shareholders to sell their shares.
Stage of Company	IPOs occur when the company is in its **early or growth stages**, seeking to raise capital for future development.	FPOs occur when the company is already listed and may have been operational for some time, often seeking additional funds for expansion or debt management.
Pricing	The price of shares in an IPO is generally decided based on **underwriting and market demand**, often through a book-building process.	The pricing of shares in an FPO can sometimes be **lower than market price** to attract investors. This happens when the company is trying to raise funds quickly.
Type of Shares	IPO shares are typically **newly issued shares** (except in cases where existing shareholders are selling).	FPO can involve **new shares issued** by the company or **sale of existing shares** by promoters or large shareholders.
Regulatory Process	IPOs are subject to **extensive regulatory scrutiny** and require approval from bodies like the **SEBI** in India.	FPOs also require approval from regulatory bodies like **SEBI**, but the process is typically faster than an IPO since the company is already listed.
Risk	IPOs tend to be riskier for investors as the company is **new to the market** and may not have a long track record.	FPOs generally carry **lower risk** compared to IPOs, as the company is already publicly listed with a track record.
Examples	A company like **Zomato** or **Paytm** going public for the first time.	A company like **Reliance Industries** or **HDFC Bank** issuing additional shares after already being publicly listed.

Key Differences:

1. **IPO** is the first time a company offers shares to the public, while an **FPO** is a subsequent offering of more shares after a company is already listed.
2. **IPO** helps a private company go public, whereas **FPO** allows an already public company to raise more capital by issuing additional shares.
3. In an **IPO**, the company is new to the public market and has little to no trading history, while an **FPO** typically involves a company with an established market presence.

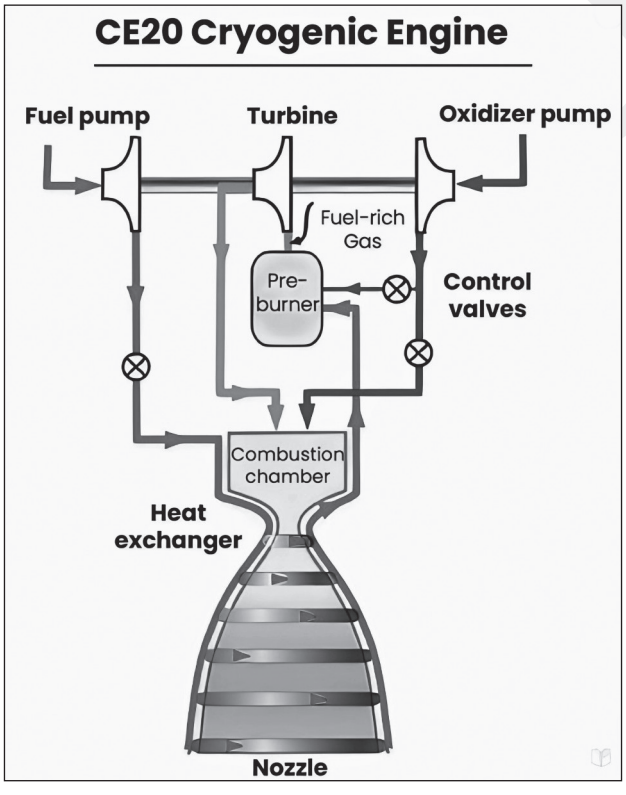
E. Science & Technology

1. CE20 Cryogenic Engine: ISRO's Propulsion Technology

1. The Indian Space Research Organisation's (ISRO) CE20 cryogenic engine has **passed a critical sea-level test,** marking a significant breakthrough in its propulsion technology.
2. This advancement is crucial as ISRO prepares for its Gaganyaan mission, India's first manned spaceflight.

Key Highlights of the Test:

1. The test was conducted at the ISRO Propulsion Complex in Mahendragiri, Tamil Nadu.
2. A key innovation introduced in the sea-level test was the "Nozzle Protection System."
3. This system is designed to manage issues such as flow separation within the nozzle, which can cause vibrations, thermal problems, and potential damage.
4. The engine's design **also addressed challenges** related to engine restart capability.



5. In 2023, Hindustan Aeronautics Limited (HAL) set up the Integrated Cryogenic Engine Manufacturing Facility in Bengaluru.

How Does a Cryogenic Engine Work?

A cryogenic engine generates thrust through an internal combustion process, relying on the principle of Newton's Third Law of Motion: *"Every action has an equal and opposite reaction."* This is achieved by using cryogenic propellants (fuel and oxidizer) that are stored at extremely low temperatures.

- **Cryogenic Propellants:** These engines use liquefied gases that are kept at very low temperatures. The common cryogenic fuels are:
  - **Fuel:** Liquid hydrogen (LH2) is used, which is liquefied at a temperature of -253°C.
  - **Oxidizer:** Liquid oxygen (LOX) is used, liquefied at -183°C.

Note: A semi-cryogenic engine uses refined kerosene instead of liquid hydrogen. This offers advantages such as lighter weight and storage at normal temperatures.

Advantages of Cryogenic Engines:

1. **Efficiency and Thrust:**
   - **a.** Cryogenic propulsion **offers superior thrust** compared to solid and earth-storable liquid propellants.
   - **b.** The **combination of LOX and LH2 produces maximum energy** and light water vapor, resulting in higher performance.
2. **Fuel Efficiency:**
   - **a.** Cryogenic engines **use less fuel than other systems**.
   - **b.** For instance, ISRO's PSLV Vikas engine burns 3.4 kg of fuel per second, while a cryogenic engine needs only 2 kg/sec for the same thrust.
   - **c.** The specific impulse (efficiency) of cryogenic engines is about 450 seconds, compared to 260 seconds for solid propellants.

3. **Eco-Friendly Technology:** The combustion of hydrogen and oxygen **produces only water vapor**, making cryogenic propulsion a clean, **carbon-free solution.**
4. **Capability for Heavy Payloads and Long Missions:** The high efficiency of cryogenic engines makes them ideal for heavy payloads and long-duration space missions, such as ISRO's **Gaganyaan and Chandrayaan missions.**

Challenges in Cryogenic Engine Technology:

1. **Complex Technology:** Cryogenic engines **are more complex** than solid or liquid propellant systems due to the use of extremely low-temperature propellants and the thermal and structural challenges they present.
2. **Thermal Issues: High thermal gradients and stresses can lead to issues** such as cracks in the divergent outer shell, nozzle distortions, and blockages in coolant channels.
3. **High Operational Pressures:** The **high pressures in the thrust chamber** require superalloys for structural integrity, which can add significant weight to the engine.
4. **Maintaining Low Temperatures:** Balancing system performance with the thermal capabilities of the coolant liners at very low temperatures is a significant challenge.
5. **High Development Cost:** The development of cryogenic engines is **costly**, as seen in ISRO's Cryogenic Upper Stage (CUS) project, which had a budget of Rs 300 crore in 1994.

About CE20 Engine:

1. **Developed by:** The Liquid Propulsion Systems Centre (LPSC), Valiamala, Kerala.
2. **Thrust Output:** The CE20 engine has been upgraded to produce a thrust of 20 tonnes, with the capability to generate up to 22 tonnes of thrust for the C32 stage in the future.
3. **C32 Stage:** A heavier variant of the C20 engine, which will replace the lesser-capacity C25 stage.
4. **Successful Missions:** The CE20 engine has successfully operated in six successive LVM3 missions, including the Chandrayaan-2 and Chandrayaan-3 missions, along with two commercial OneWeb missions.
   - **LVM3 (Geosynchronous Satellite Launch Vehicle Mk III):** A three-stage vehicle capable of lifting payloads up to 4000 kg.

Cryogenic Engine Comparison with Other Engines:

Characteristic	Cryogenic Engine	Jet Engine	Solid Propellant Engine	Liquid Propellant Engine
Air Intake	No intake required	Air intake required	Air intake required as oxidizer	Air intake required as oxidizer
Fuels	Supercooled Hydrogen and Oxygen	Jet A-1, kerosene, aviation gasoline	Composite propellants with metallic powders	Hydrazine, MMH, UDMH
Fuel Temperature	Very low	No low-temperature requirement	No low-temperature requirement	No low-temperature requirement
Efficient Working	Efficient when low-temperature fuel transforms and mixes correctly	Efficient at supersonic speeds	Efficient with sufficient oxidizer	Efficient with sufficient oxidizer
Purpose	Third/Last stage of rocket	Used in airplanes	Used as boosters in liftoff	Main stage after booster separation

ISRO is exploring the use of start fuel ampules like **Tri-ethyl-aluminum (TEA)** and **Tri-ethyl-boron (TEB)** to improve ignition reliability and engine efficiency, taking cryogenic propulsion technology to the next level.

The CE20 cryogenic engine is a vital step forward in ISRO's propulsion capabilities and is crucial for the success of future space missions, including the ambitious Gaganyaan mission.

2. MACE in Ladakh Opens a Unique Eye to Cosmic Gamma Rays

1. Recently, the **Major Atmospheric Cherenkov Experiment (MACE)** telescope was inaugurated in **Hanle, Ladakh**, marking a significant milestone in India's scientific and technological progress.
2. This advanced facility, developed by several Indian research institutions, is set to make groundbreaking contributions to the field of **gamma-ray astronomy**.

What is the MACE Telescope?

1. MACE is a **ground-based gamma-ray telescope** designed to detect and study **extremely high-energy gamma rays from cosmic sources.**
2. Its unique design and location will allow it to observe phenomena that are otherwise difficult to study from the ground.

Key Points:

1. **Development:** Indigenously built by Bhabha Atomic Research Centre (BARC) with support from ECIL and other Indian partners.
2. **Size**: MACE features a **21-meter-wide dish**, making it the largest Cherenkov telescope in Asia.
3. **Purpose**: To study **high-energy gamma rays** emitted from energetic cosmic objects like **black holes, pulsars, and gamma-ray bursts.**

What Are Gamma Rays and Why Are They Important?

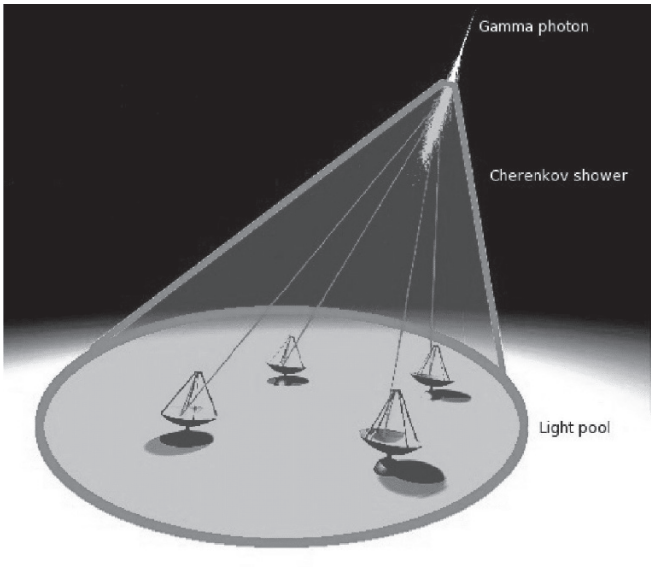
1. **Gamma rays** are the most energetic form of light in the **electromagnetic spectrum**. They have the **shortest wavelength** and the **highest energy**.
2. While visible light has energy levels in the range of **1.63-3.26 electron volts (eV)**, gamma rays carry **over 100,000 eV** per particle.
3. Gamma rays are **produced by some of the most energetic and exotic phenomena in the universe:**
   a. **Pulsars** (rotating neutron stars)
   b. **Supernova explosions**
   c. **Black holes** and their accretion disks
   d. **Gamma-ray bursts** (intense bursts of gamma radiation)
4. Despite their **high energy, gamma rays are blocked by Earth's atmosphere,** which prevents them from reaching the surface.
5. To study these rays, scientists use **indirect methods** from the ground, such as **Cherenkov radiation**.

What is Cherenkov Radiation?

1. When a **gamma ray enters the Earth's atmosphere, it interacts with air molecules**, creating a **shower of particles** (electron-positron pairs).
2. These particles travel faster than the speed of light in air, which causes them to emit a faint **blue light** called **Cherenkov radiation**.
3. This light is **visible in the violet and blue range** and is **produced almost instantaneously.**
4. Cherenkov radiation spreads out over a large area, and special instruments, called **Imaging Atmospheric Cherenkov Telescopes (IACTs)**, are used to detect and analyze this light.
5. **MACE** is **one of the most advanced IACTs in the world, designed to capture these faint signals** and convert them into valuable scientific data.

The Technology Behind MACE

1. MACE's **light collector** consists of **356 mirror panels**, each made up of 4 smaller mirrors arranged in a **honeycomb structure**.
2. This design makes the mirrors **lighter and more stable**, improving their ability to capture and reflect Cherenkov radiation efficiently.



3. The mirrors focus the light onto a **high-resolution camera**, which contains **1,088 photomultiplier tubes**.
4. These tubes amplify the **faint Cherenkov light and convert it into electronic signals for analysis.**

Key Features:

1. **High-Energy Detection**: MACE is designed to detect **gamma rays** with energies over **20 billion eV**.
2. **Moving Telescope**: The telescope is **mounted on a base with six wheels and can rotate both vertically and horizontally** to observe the sky in all directions.
3. **Altitude Advantage**: The high-altitude location of **4.3 km above sea level allows MACE to avoid interference** from **atmospheric disturbances, ensuring clearer observations.**

The Search for Dark Matter: MACE's Role

1. One of the most exciting scientific goals of the MACE telescope is to search for evidence of **dark matter**, which is thought to make up over **85% of the mass of the universe**.
2. While dark matter has been theorized, **scientists do not yet know what particles it is made of.**
3. A leading candidate for dark matter particles are **WIMPs (Weakly Interacting Massive Particles)**.
4. When **WIMPs collide and destroy each other**, they are believed to release high-energy **gamma rays**.
5. MACE will help detect these gamma rays, particularly from regions like **galaxy clusters** or the **center of galaxies**, which might be rich in dark matter.
6. MACE will help answer two key questions:
   a. **Are WIMPs real?**
   b. **Do WIMPs make up dark matter?**

Why is MACE Important for India and the World?

1. India has been involved in **gamma-ray astronomy** for over 50 years.
2. The launch of MACE represents a major leap forward, with most of its **subsystems built and designed** in India.

Scientific Impact:

1. **Understanding High-Energy Astrophysics**: MACE will provide valuable insights into some of the most extreme and energetic processes in the universe.
2. **Advancing Particle Physics**: The telescope will also help scientists study particle physics at the highest energy levels, including the search for dark matter and other cosmic mysteries.

Technological Achievements:

1. MACE is India's **first** such high-energy telescope.
2. The project strengthens India's role in **international space and astronomy research**.

Looking Ahead: MACE's Potential for Future Discoveries

1. MACE is still in its early stages, but it has already shown the potential to detect **high-energy gamma rays** that could be linked to **dark matter** and other fundamental phenomena in the universe.
2. In addition to its dark matter research, MACE will help improve our understanding of the most energetic objects in space, including **black holes**, **supernovae**, and **pulsars**.
3. As MACE continues to collect data and make discoveries, it could provide critical information that will shape the future of **astrophysics** and **particle physics**.

The **MACE telescope** in Ladakh is an incredible scientific advancement, offering a unique window into the study of high-energy gamma rays from cosmic sources. With its cutting-edge technology and strategic location, MACE will not only help explore the mysteries of the universe but also contribute to India's growing role in **global scientific research**. By studying cosmic phenomena such as **dark matter** and **gamma-ray bursts**, MACE will provide crucial insights into the fundamental workings of the universe.

3. Google's Latest Quantum Chip: Willow

1. Google has recently unveiled **Willow**, its latest quantum chip, marking an important advancement in the field of **quantum computing.**
2. Willow represents a significant step forward in solving some of the challenges that have plagued quantum computers, particularly around error reduction and quantum coherence.

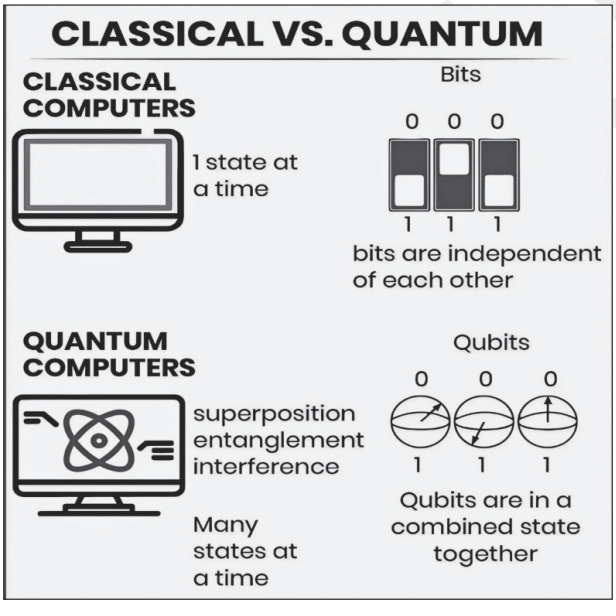
Key Achievements of Willow

1. **Improved Performance on RCS Benchmark**: Willow has demonstrated exceptional performance in the **Random Circuit Sampling (RCS)** benchmark, a key test used in quantum computing.

   a. **Exponential Error Reduction**: As quantum systems scale up with more qubits, Willow can reduce errors exponentially, an important factor for building larger and more reliable quantum computers.
   b. **Speed Advantage**: Willow performed a benchmark computation in **under five minutes**, a task that would take **10 septillion (10^25) years** on today's fastest supercomputers.
2. **Improved Coherence Time**: Willow has also shown better **coherence time**, which refers to the amount of time a qubit can maintain its quantum state before it collapses.

Understanding Quantum Chips and Qubits

1. **Qubits vs. Classical Bits**:
   a. **Classical Bits**: Traditional computer chips use bits that represent information as either a **0** or a **1**.
   b. **Quantum Bits (Qubits)**: Quantum chips, however, use **qubits** which can exist not only in a 0 or 1 state but also in a superposition of states, where they can represent multiple states simultaneously. This enables quantum computers to perform computations much faster and more efficiently than classical computers.



2. **Superposition and Entanglement**:
   a. **Superposition**: A qubit can represent not just 0 or 1, but a combination of both states, expanding its potential for calculation.
   b. **Entanglement**: Qubits can also be entangled, meaning the state of one qubit can depend on the state of another, even if they are far apart. This phenomenon allows quantum computers to process information in ways classical computers cannot.
3. **Quantum Gates**: Just like classical computers perform operations on bits through logical gates (AND, OR, NOT), quantum computers use **quantum gates** to manipulate qubits and perform calculations. These operations are crucial to quantum computation, but they behave differently from classical gates.

Impact of Quantum Computing on Emerging Technologies

1. **Quantum AI**:
   a. Quantum computers can process data much faster than classical systems, making them a great asset in the development of **Quantum AI**.
   b. This technology can revolutionize how AI algorithms are trained, especially when dealing with large datasets, leading to more advanced AI models.
2. **Encryption and Cybersecurity**:
   a. **RSA Encryption**: One of the biggest concerns with quantum computing is its potential to break current encryption systems.
   b. For example, quantum computers could break **RSA encryption**, which is widely used for securing online communications.
   c. **Shor's Algorithm**: In 1994, Peter Shor showed that a sufficiently powerful quantum computer could solve the **discrete logarithm problem**, breaking RSA encryption. This poses a challenge to cybersecurity and could change the landscape of digital security.
3. **Cryptocurrency**:
   a. **Impact on Cryptocurrencies**: The ability of quantum computers to break encryption algorithms threatens the security of cryptocurrencies like **Bitcoin**, which rely on cryptography to secure transactions and protect user data.

Challenges Facing Quantum Computing

1. **Fragile Quantum States**:
   a. Qubits are highly sensitive to their environment, and even slight disturbances can cause them to lose their quantum state.

   b. This fragility limits how long qubits can store information, which in turn limits the scalability of quantum systems.
2. **Noise and Interference**:
   a. Qubits are vulnerable to noise and interference, which can cause them to lose information.
   b. Even with large numbers of qubits, many might end up being redundant due to these issues, making quantum systems inefficient.
3. **Temperature Control**: Quantum systems need to be kept at near absolute zero temperatures to maintain stability and prevent disturbances. This requires complex and costly cooling systems.
4. **High Costs**: Building and maintaining quantum systems requires expensive equipment, including **coaxial cables**, **CMOS control systems**, and sophisticated cooling mechanisms, making it challenging to scale quantum computing for practical business needs.
5. **Supply Chain Issues**: Quantum chip production relies on highly specialized materials and equipment, and global disruptions (like pandemics or trade wars) can lead to delays or shortages in the supply chain.

Way Ahead for Quantum Computing

1. **Research and Materials**:
   a. Advancing quantum computing will require research into **semiconducting materials** like silicon, gallium, and germanium.
   b. These materials could lead to more efficient qubits and better-performing quantum chips.
2. **Global Collaboration**: To accelerate progress, global collaboration is vital. Initiatives such as the **Quad Critical and Emerging Technology Working Group** and **Quantum Centers of Excellence** are pushing for cooperation and sharing knowledge in the quantum field.
3. **Investment and Policy**:
   a. To overcome the challenges in quantum computing, increased investment and the development of clear policies and regulations are crucial.
   b. This will help guide the ethical and responsible use of quantum technologies.
4. **Talent Development**: Building a workforce proficient in quantum theory, physics, and computer science is essential for pushing the boundaries of what quantum computing can achieve.

Willow represents a significant leap forward in quantum computing. While challenges remain—such as qubit fragility, noise interference, and high costs—ongoing advancements in quantum theory and technology, along with global collaboration and increased investment, offer hope for a future where quantum computers can solve problems beyond the reach of today's classical systems. For aspiring quantum computing experts, this is an exciting time to get involved in this cutting-edge field!

4. India's first Hyperloop test track, built by IIT Madras

Avishkar Hyperloop team of **IIT Madras** in collaboration with TuTr (a startup) has recently completed a 410-meter Hyperloop test track, the **first such experiment** in Hyperloop technology in India.

What is Hyperloop Technology?

Hyperloop is a proposed ultra-high-speed transportation system that uses pods traveling through low-pressure tubes to achieve extraordinary speeds. The concept was first proposed by **Elon Musk**, CEO of SpaceX, in 2013, and has since been open-sourced for global development.

How Does Hyperloop Work?

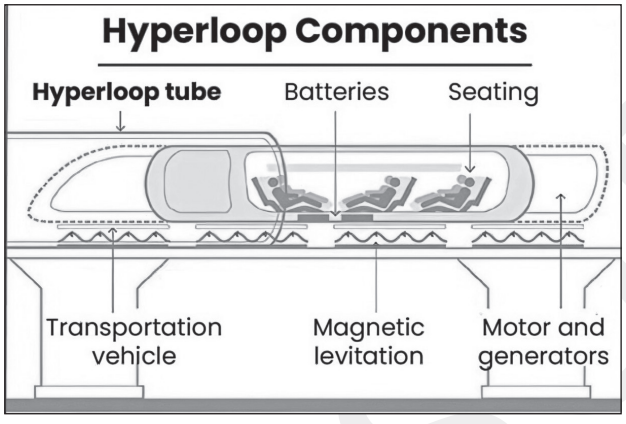
1. **Functionality**: Hyperloop is based on **magnetic levitation (maglev)** technology. The system uses magnets to:
   a. **Repel the capsule**: This allows the capsule to float above the track.
   b. **Propel the capsule**: Another set of magnets pushes the capsule forward, enabling ultra-high speeds.

The track is a **low-pressure tube** designed to reduce air resistance and allow pods to travel at speeds up to **1,200 km/h**.

2. **Technology Building Blocks**:
   a. The system works by maintaining **vacuum** conditions inside the tube, reducing air pressure to almost zero, which drastically reduces friction and enables the high-speed travel.
   b. Hyperloop could **significantly reduce travel times** over long distances, offering a potential solution for faster, more efficient travel.

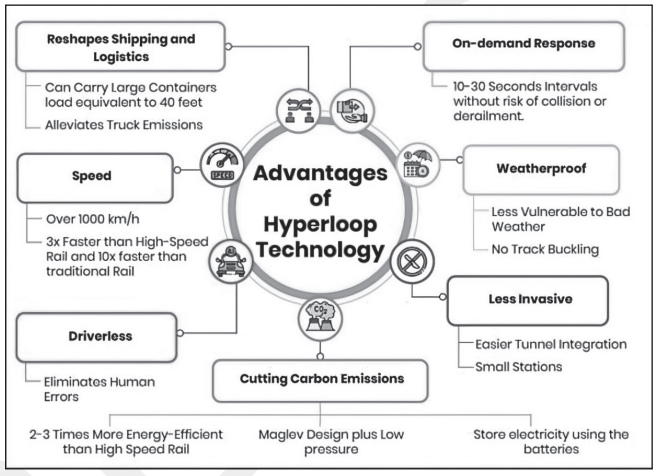
Components of Hyperloop

1. **Tube**: Two steel tubes are welded together, allowing capsules to travel in both directions. The internal air pressure is maintained around **100 Pa** (Pascals), which is extremely low.
2. **Capsule**: The capsule is a pressurized vehicle capable of carrying passengers. It is propelled by **magnetic linear accelerators**, which provide thrust.
3. **Compressor**: Located at the front of the capsule, the compressor ensures that the capsule can move through the low-pressure tube without obstructing airflow.
4. **Suspension**: **Air bearing suspensions** are used to ensure smooth and safe travel for the capsule, providing stability and reliability.
5. **Propulsion**: **Linear Induction Motors (LIM)** are used to accelerate and decelerate the capsule. LIMs are more efficient than permanent magnet motors and help reduce the overall weight and cost of the system.



Challenges with Hyperloop Technology

1. **Costs**: A report by **NASA** estimated that the technology alone would cost between **$25-$27 million per mile**, excluding land acquisition and construction costs.
2. **Safety Concerns**:
   a. While the low-pressure environment inside the tubes reduces the risk of fire, the potential for a **fire inside the pod** remains a serious concern.
   b. Evacuating passengers in case of an emergency could also be challenging, as the tube has limited exits.
3. **Vacuum Maintenance**: Maintaining a continuous vacuum inside the tubes over long distances would require significant energy and infrastructure, which presents a major challenge.
4. **Acceleration Impact**: Hyperloop's **acceleration** is currently seven times greater than the **Shinkansen** (bullet train) system in Japan. Such high acceleration could cause discomfort and even **nausea** for passengers.
5. **Need for Straight Track Layouts**: To maintain high speeds, hyperloop tracks need to be **straight** and stable over long distances, which may require **elevated or tunnel-like structures**. This adds to the construction complexity.



Other Emerging Modern Transit Systems

1. **Autonomous Helicopters (eVTOL)**: **Airbus** has tested its **Vahana electric vertical take-off and landing (eVTOL)** aircraft. This technology aims to reduce traffic congestion in densely populated cities by creating fleets of eVTOL aircraft that operate from rooftops.
2. **Smart Roads**:
   a. **Portugal** is building 1,000 kilometers of **smart roads** that communicate wirelessly with smart cars.
   b. **Sweden** has piloted a **2-kilometer electrified road** that recharges electric vehicles as they drive.
3. **India's Bullet Train Project**: India is working on its first **High-Speed Rail Project** between **Mumbai** and **Ahmedabad**, utilizing **Japanese Shinkansen technology**. This initiative aims to revolutionize transportation in India.

The Way Forward for Hyperloop Technology

1. **Financial Backing and Market Growth**:
   a. Hyperloop's market is projected to reach **USD 24.85 billion by 2031**, with a compound annual growth rate (**CAGR**) of **36.6%**.
   b. Significant financial investment from both private companies and governments will be necessary to

fund **research and development** for improving the technology.

2. **Continued Research and Development**: Further advancements are needed in key areas such as **Linear Induction Motors (LIM)**, which are crucial for efficient propulsion, and systems for **vacuum maintenance**.
3. **Infrastructure Requirements**: Hyperloop requires substantial infrastructure, not only for the **pods** but also for the **stations** and **track systems**. This will require coordination with existing transportation networks like roads, railways, and aviation.
4. **Regulations and Safety Standards**: Countries, including **India**, could develop regulations for Hyperloop, following the example of **European nations**. The **Joint Technical Committee (JTC)** on Hyperloop, established in 2020, sets safety standards and technical guidelines.

Hyperloop represents a revolutionary leap in transportation technology, potentially transforming how we travel across long distances. However, significant challenges remain, including high costs, safety concerns, and infrastructure requirements. Continued **innovation, research**, and **collaboration** will be critical for overcoming these barriers.

For aspiring engineers, researchers, and innovators, the development of Hyperloop technology presents exciting opportunities to work on cutting-edge transportation solutions that could shape the future of global mobility.

5. CDSCO Approves First Anti-Complement Therapy for Rare Diseases

India's Central Drugs Standard Control Organisation (CDSCO) approves **first anti-complement therapy for rare diseases.**

Key Developments and Judicial Involvement

1. Earlier, Delhi High Court had issued several directives to the Union Government aimed at **improving the funding and treatment infrastructure for rare diseases** in India.
   a. Also, in **Master Arnesh Shaw v. Union of India & Anr. Case**, the Delhi High Court underscored that patients, particularly children, suffering from rare diseases should not be denied treatment solely due to the prohibitive cost of drugs or therapies.
2. The Court further affirmed that **the Right to Health, as an integral component of the Right to Life under Article 21,** must be upheld universally, including for those with rare diseases.

What Are Rare Diseases?

1. The **World Health Organization (WHO)** defines a rare disease as a debilitating, lifelong condition with a prevalence of fewer than 1 in 1,000 individuals. Examples include **Fanconi Anemia** and **Osteopetrosis**.
2. While WHO provides this definition, each country may have its own criteria suited to its population and health system.
3. In India, **63 rare diseases** are listed under the **National Policy for Rare Disease 2021 (NPRD 2021)**, and these diseases are classified into three groups:
   a. **Group 1:** Diseases amenable to one-time curative treatment (e.g., Urea cycle disorders, Fabry disease).
   b. **Group 2:** Diseases requiring long-term treatment with relatively lower costs (e.g., Phenylketonuria, Homocystinuria).
   c. **Group 3:** Diseases with definitive treatment options but with challenges such as very high costs and lifelong therapy (e.g., Gaucher Disease, Pompe Disease).

Do you know?

Rare diseases also come under the category of **'orphan diseases'**. Drugs to treat such diseases are called "orphan drugs" as the number of persons suffering from individual rare diseases is small and do not constitute a significant market for drug manufacturers.

Global and Indian Initiatives for Rare Diseases

Global Initiatives:

1. **WHO's Fair Pricing Forum:** It promotes dialogue among regulators, pharmaceutical companies, insurers, and patient groups to ensure sustainable access to orphan drugs.
2. **Rare Diseases International (RDI):** A global alliance of people living with rare diseases.

Indian Initiatives:

1. **National Policy for Rare Diseases, 2021:**
   a. Aims to lower the incidence and prevalence of rare diseases through integrated preventive strategies.

   b. Financial assistance of up to **₹50 lakhs** per patient for treatment at **Centres of Excellence (CoEs)**.
   c. Establishment of the **National Consortium for Research and Development on Therapeutics for Rare Diseases (NCRDTRD)** to streamline research.
2. **Rashtriya Arogya Nidhi:** Provides financial support to poor patients suffering from rare diseases.
3. **Exemptions on GST and Customs Duty**: There are exemptions on GST and basic customs duties for drugs imported for individual use or via CoEs.
4. **Drugs Controller General of India (DCGI) Circular**: Under Rule 101 of the **New Drugs and Clinical Trials Rules, 2019**, CDSCO has waived local clinical trials for new drugs already approved in countries like the United States, UK, Japan, etc.

Issues in managing Rare Diseases in India

1. **High prevalence rate:** India accounts for **one-third of global rare disease cases**, with over 450 identified diseases.
2. **Limited clinical trials**: With over 8000 global clinical trials for rare diseases underway, hardly 80 (<0.1%) of them have a site in India.
3. **Lack of definition:** India currently lacks sufficient epidemiological data for a **standard definition.**
4. **Low budgetary support:** The 2023-24 Budget allocation for rare diseases stands at ₹93 crore, still low despite gradual increases.
5. **Underutilization of funds by Centre of Excellences**: Over ₹47 crore of the ₹71 crore allocated for financial assistance to 11 CoEs remains unused.

Other Challenges associated with Rare Disease			
Delayed diagnosis/ Misdiagnosis	**Limited treatment options**	**Limited R&D**	**Impact on patients**
• **Inadequate screening/ diagnostic facilities** • Diverse Symptoms • Low awareness among primary care physicians	95% rare diseases have no approved treatment	• **Inadequate clinical experience** due to Small patient pool	• **Financial Strain (**High **Cost of Orphan drugs)** • **Psychosocial Effects like** stress, anxiety, and social isolation etc.

Way Forward

1. **Implement Key directives of the recent Delhi High Court judgement:**
   a. Establish a **National Fund for Rare Diseases (NFRD)** with an allocation of **₹974 crore** for FY 2024-25 and FY 2025-26. The allocated funds should not lapse or be refunded due to non-utilization.
   b. The **NFRD** will be managed by the **National Rare Disease Cell** under the Ministry of Health and Family Welfare (MoH&FW).
   c. The **National Rare Diseases Committee (NRDC)**, established in 2023, will continue its work for another five years, chaired by the Director General of the Indian Council of Medical Research (ICMR).
   d. Development of a **centralized National Rare Disease Information Portal** within three months, to provide resources like patient registries and available treatments.
   e. Direct CDSCO and DCGI to monitor both local and global clinical trials to ensure greater patient enrollment.
   f. Create a **Fast Track Approval Process** for rare disease drugs and therapies.
   g. Mandate pharmaceutical companies importing rare disease therapies to submit a plan to MoH&FW and NRDC within 90 days for establishing local manufacturing/distribution facilities.
   h. Enable Corporate Social Responsibility (CSR) contributions for rare diseases by adding donations for rare diseases to Schedule VII of the **Companies Act**.
   i. Allow flexibility in the **₹50 lakh** upper limit for treatment under NPRD 2021 for **Group 3** diseases, based on NRDC recommendations.

2. **Other steps that can be taken**
   a. **Strengthen Epidemiological Research**: Focus on developing a clear and standardized definition for rare diseases, and gather comprehensive data on prevalence.
   b. **National Registry for Rare Diseases**: A hospital-based registry has already been initiated to collect epidemiological data across India.
   c. **Expand Centres of Excellence (CoEs):** Increase the number of CoEs, especially in underserved regions, to enhance accessibility to diagnosis and treatment.
   d. **Incentivize Domestic Drug Manufacturing:** Encourage domestic manufacturing of orphan drugs through the **Production-Linked Incentive Scheme**.

6. First Successful Clinical Demonstration of RNA Editing in Humans

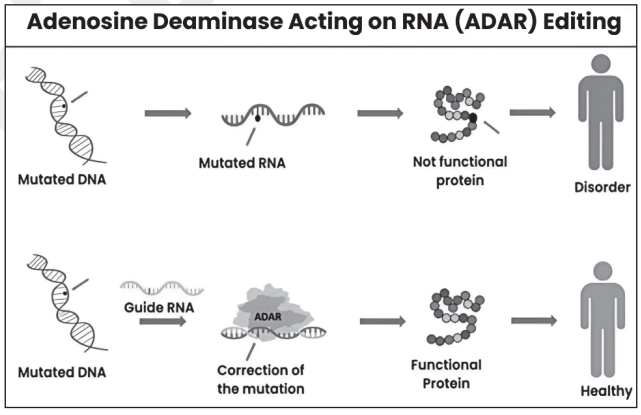
1. Recently, the first successful clinical demonstration of **RNA editing in humans** was conducted.
2. **Wave Life Sciences** (US based biotechnology company) has successfully performed RNA editing to treat alpha-1 antitrypsin deficiency (AATD, an inherited disorder).
3. In **AATD,** levels of protein Î±-1 antitrypsin build up and affect liver and lungs.

About RNA (Ribonucleic acid) Editing

1. It is a process that modifies genetic information on RNA sequences through insertion, deletion or substitution.
2. Scientists used technique called 'Adenosine Deaminase Acting on RNA (ADAR)' with guide RNA (gRNA). (refer image)
   a. GRNA are small RNA molecules that direct editing machinery by base-pairing with mRNA in specific regions for modification.
3. **Process**
   a. RNA has four building blocks: A (Adenine), G (Guanine), U (Uracil), and C (Cytosine).
   b. ADAR converts adenosine in mRNA to inosine, which mimics function of guanosine. (adenosine and guanosine are nucleosides combining A and G with ribose respectively).
   c. Cell detects Inosine in Adenosine's position, triggering cellular response to correct the mismatch.
   d. The process thus restores mRNA's original function, and cell starts making normal proteins.
4. **Challenges in RNA Editing: Lack of Specificity and Transient nature and nascent stage of development**

Comparison between RNA and DNA editing

1. **Form of change:** DNA editing makes permanent changes while RNA editing makes temporary changes which may fade over time.
   a. Thus, RNA editing is safer and flexible compared to DNA editing which may result in irreversible errors.
2. **Allergic and immune reactions:** DNA editing has higher risk of undesirable reactions compared to RNA editing.
   a. DNA editing tools use proteins from certain bacteria to perform cutting functions while RNA editing relies on ADAR enzymes, already occurring in human body.



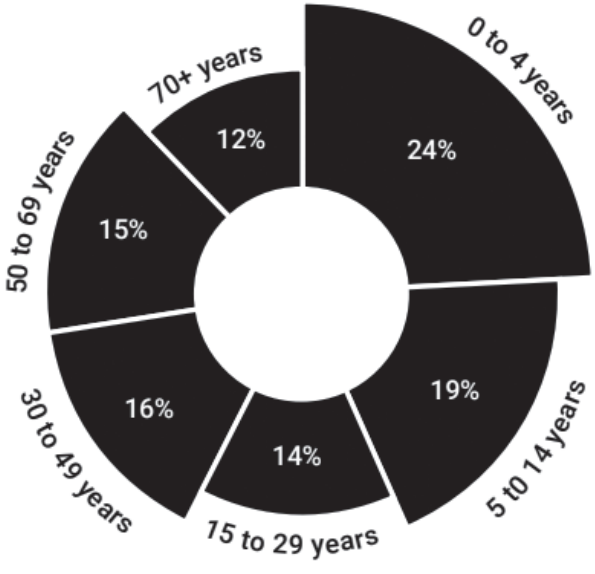
7. WHO released 1st global status report on drowning prevention

1. In December 2024, the **World Health Organization (WHO)** released its **1st global status report on drowning prevention** in Geneva.
2. The report highlights that **3,00,000 people died by drowning globally in 2021**, equivalent to approximately **30 deaths every hour**.
   a. The report was developed following a request from member states through **World Health Assembly Resolution 76.18 (2023)** and supported by **Bloomberg Philanthropies**.

Key Highlights

1. **Geographical Impact**: About **92% of drowning deaths** occurred in **low-and middle-income countries**, disproportionately affecting **marginalized and poor communities**.
   a. The **WHO's South-East Asia Region**, including India, accounted for **83,000 deaths**, representing **28% of the global burden**.
2. **Uneven Progress in Prevention:** The report, which included data from **139 countries**, reveals that drowning deaths declined by **38% since 2000** but the progress had been uneven and the pace is slow
   a. But **European Region** achieved a significant **68% reduction** while **South-East Asia Region** witnessed a decline of only **48%**, indicating slower progress.
3. **Vulnerability of Children:** Children and young people are the most at risk -
   a. **Under 5 years**: Account for **24% of drowning deaths**.
   b. **Aged 5 to 14 years**: Represent **19%** of deaths.
   c. **Aged 15 to 29 years**: Contribute to **14%** of deaths.
   d. Globally, drowning ranks as the **4th leading cause of death** for children aged 1–4 years and the **3rd leading cause of death** for those aged 5–14 years.

Fig. 7. Proportion of drowning deaths by age group, globally, 2021



4. **Data Limitations:** The report acknowledges that these figures are likely **underestimates** due to missing data on drowning deaths from natural disasters (e.g., floods) and incidents involving water transport.
   a. **Climate Change**: With increased flooding due to climate change, drowning prevention has become a higher priority, as **75% of flood-related deaths** are due to drowning.
5. **Importance of Training and Education:** While several countries have begun implementing **WHO's drowning prevention measures**, challenges remain like:
   a. Only **33% of countries** provide national programs for safe rescue and resuscitation training for bystanders.
   b. Merely **22% of countries** include swimming and water safety training in school curriculums.
   c. Collecting quality data on drowning incidents remains a persistent issue.
6. **Future Projections:** If current trends persist, **over 7.2 million people**, mainly children, could die due to drowning by 2050. However, the report stresses that nearly all drowning deaths are **preventable**.
7. **Key measures suggested** in the report include:
   a. **Establishing day care services for preschool children** to reduce their exposure to water-related risks.
   b. **Teaching basic swimming and water safety skills in schools**, particularly in countries with high drowning rates.
8. **Economic Implications**: Investing in these initiatives could save millions of lives and prevent economic losses estimated at **$4 trillion by 2050**.

Statistics of Incidents associated with Drowning: India

1. **Data on Drowning Fatalities:** Approximately 38,000 Indians lose their lives to drowning annually.
2. **The National Crime Records Bureau (NCRB) Report 2022** highlights drowning as a major public safety concern, accounting for **9.1% of accidental deaths** in India. In 2022, there were **38,503 drowning fatalities**.
3. **State-Wise Statistics:**
   a. **Madhya Pradesh** reported the highest number of deaths (5,427).
   b. **Maharashtra** followed with 4,728 fatalities, and **Uttar Pradesh** reported 3,007.

4. **Gender and Age Distribution of Drowning Deaths:** Children between **1-14 years** face the highest risk, making drowning one of the leading causes of death in this age group.

Preventive Measures for Drowning

1. **Install Physical Barriers:** Place barriers around water bodies such as wells, pools, and ponds to limit access. Secure fencing and covers can reduce the risk, especially for young children.
2. **Establish Safe Zones:** Create designated safe areas for children and adults away from water bodies. These zones should have engaging activities to divert attention from potentially hazardous areas.
3. **Train in Rescue Techniques:** Teach individuals lifesaving skills like **Cardiopulmonary Resuscitation (CPR)** and safe rescue methods. Community programs should focus on training bystanders to act during emergencies.
4. **Include Water Safety in Education:** Integrate water safety lessons into school curriculums to build awareness from a young age.
5. **Strengthen Boating Regulations:** Enforce strict rules for boating and shipping, such as: Mandatory life jackets, Regular vessel maintenance, Compliance with safety protocols.
6. **Improve Flood Risk Management:** Develop flood-resistant infrastructure and early warning systems to minimise drowning risks during floods. Local governments should invest in such systems to boost community preparedness and resilience.

8. Squid-Inspired Pills: Can Replace Injections

1. Recently, a **group of researchers created pills that can release medicine directly into the stomach** or other parts of the digestive system.
2. This new technology **could replace injections for delivering drugs like insulin, which are usually given with needles.**
3. The idea for these pills came from **cephalopods, like squids and cuttlefish, that directly release drugs inside the stomach and other parts of the digestive system**.
4. These pills can be an alternative to injections.
5. The study, "Cephalopod-inspired jetting devices for gastrointestinal drug delivery"**, was published in the** Nature **journal.**
6. The research was done by scientists from the **Massachusetts Institute of Technology (MIT)**, **Brigham and Women's Hospital**, and the drug company **Novo Nordisk**.

Why Are These Capsules Important?

1. Injections are used for giving certain treatments, such as **insulin**, **hormones**, **vaccines**, **antibodies**, and **cancer treatments**, because **these drugs are usually too large to be taken in pill form.**
2. **Large drugs can be broken down by digestive juices** or the **liver before they can be absorbed into the body.**
3. However, injections have several problems:
   a. They can cause **pain**, **infection**, and **skin irritation**.
   b. **Getting injections can be uncomfortable and inconvenient for patients,** especially for those who need them often.
4. **Taking pills is much easier, but the problem has been creating a pill that can deliver large or complex drugs effectively.**
5. These **new capsules could offer a better solution for delivering these kinds of drugs.**
6. A **bioengineering professor at Rice University explained that while many attempts have been made to create pills for large drugs**, they haven't been very effective.
7. However, these new capsules are able to deliver the drugs **efficiently**, meaning the body can absorb more of the medicine.

How Do the Capsules Work?

1. The design of these new pills was inspired by cephalopods like **squids** and **octopuses**.
2. These animals can shoot ink in a **jet-like way, which helps them move quickly or defend themselves.**
3. The researchers used the **same idea to create a drug delivery system that can target the stomach or digestive system directly.**
4. **How the Capsule Works:**

5. **Inspired by Cephalopods**:
   a. Squids and octopuses use **jet propulsion** to shoot ink. **By adjusting the pressure and direction, they can control how the ink is expelled.**
   b. The researchers **copied this jet action to push medicine out of the capsule into the stomach or intestines.**
6. **How the Capsule Functions**:
   a. The capsule is designed to release medicine by creating **pressure** inside the stomach or intestines.
   b. To do this, the capsule contains **compressed carbon dioxide (CO2)** or **coiled springs**.
   c. These **create enough force to push liquid medicine out of the capsule.**
   d. The capsule is sealed with a **carbohydrate trigger**, which is **meant to dissolve when it comes into contact with moisture or stomach acid.**
   e. Once the trigger dissolves, it lets the gas or spring expand, creating a **jet of medicine** that is forced out of the capsule and absorbed into the body.

Why Are These Capsules Useful?

1. **Better Drug Delivery**:
   a. The **jetting action helps deliver more of the drug into the body before it is broken down.**
   b. This makes the treatment more effective.
2. **Less Need for Injections**: These capsules could reduce the need for injections, making it easier and less painful for people to take their medicine.
3. **Better for Patients**: Pills are **easier to take than injections, especially for people who need regular treatments,** like those with diabetes or other long-term health conditions.

Challenges and What Comes Next:

1. **Safety and Testing**: These capsules will need to go through more testing and clinical trials to make sure they are safe for use in humans.
2. **Wider Use**: While these capsules may help deliver insulin, they could also be used for other drugs, like cancer treatments or vaccines.

This new pill technology is a big step forward in making drug delivery easier and more comfortable. It could replace injections for certain treatments, helping patients take their medicine without pain or discomfort. By using ideas from nature, these capsules may soon be an important way to make medicines more effective and easier to take.

9. FSSAI Packaged drinking water as 'High Risk Food Category'

FSSAI has classified packaged drinking water as 'High Risk Food Category'.

About High Risk Food

1. High risk foods are ready to eat foods that support **multiplication of pathogenic bacteria that could be harmful.**
2. These include **dairy products**; meat products including poultry; fish and fish products, etc.
3. Food products that come under High-Risk category are **subjected to mandatory risk-based inspections.**
4. All Central Licensed Manufacturer/Processors under High-Risk Food Categories shall get its business **audited by FSSAI focusing on food safety auditing agency every year**.

10. India Declares Snakebites a 'Notifiable Disease'

1. The **Ministry of Health and Family Welfare (MoHFW)** in India has officially designated snakebite cases and related deaths as a 'notifiable disease'**.**
2. This development is a part of the country's broader health efforts, which include the launch of the **National Action Plan for Prevention and Control of Snakebite Envenoming (NAPSE).**
3. The **aim of NAPSE** is to reduce snakebite-related deaths and disabilities **by half by the year 2030**.

What are notifiable diseases?

A *notifiable disease* is any disease that is legally required to be reported to government authorities. This ensures that the relevant information is collected and monitored to track the disease's progress. The key features of notifiable diseases include:

1. **Responsibility for Notification:** The responsibility to notify diseases lies with state governments, ensuring that the relevant authorities are informed in a timely manner.
2. **Purpose of Reporting:** The collation of this data allows government authorities to monitor disease trends and act promptly. It also helps provide early warnings in case of potential outbreaks.

3. **Other notified diseases:** AIDS, hepatitis, dengue, etc.
4. **WHO's International Health Regulations,** require disease reporting to the WHO in order to help with its global surveillance and advisory role.

11. World Malaria Report 2024

World Health Organisation (WHO) released World Malaria Report 2024.

About Malaria

1. It is mosquito borne blood disease caused by **Plasmodium Parasites (PP).**
2. **Five Plasmodium species cause malaria in humans**: P. falciparum, P. vivax, P. malariae, P. ovale, P. knowlesi.
   - **P. falciparum and P. Vivax pose the greatest threat.**
3. Malaria is mostly found in the tropical and subtropical areas and spread by the bite of an infected female Anopheles mosquito.
4. Parasites travel to the liver, mature, and then infect RBC (Red Blood Cells).
5. **Symptoms** – fever, chills, headache and tiredness.
6. It is both preventable through vaccine and curable through medicine.
7. **Malaria Vaccines: RTS, S/AS01 vaccine** (WHO approved first vaccine in 2021), **R21/Matrix-M** (WHO approved second vaccine in 2023).

Key Findings of the report

GLOBAL

1. Globally, Malaria cases rose to **263 million** in 2023, with an incidence of **60.4 per 1000 population at risk**, up from **58.6 in 2022**.
2. The **WHO African Region** accounted for **94% of global cases**.

Global initiative for Malaria

1. **WHO's GMP (Global Malaria Programme)**- It sets the target of reducing global malaria incidence & mortality rates by at least 90% by 2030.
2. **Bill and Melinda Gates Foundation**- Malaria elimination initiative through diverse strategies (mosquito reduction, and technology development, treatment accessibility).
3. **WHO's E-2025 initiative** in 2021 to stop malaria transmission in 25 countries by 2025.

INDIA

India's Journey Toward a Malaria-Free Future

1. At the time of **independence in 1947**, malaria was one of the most severe public health issues in India, with approximately **7.5 crore cases** annually and **800,000 deaths**.
2. Over the decades, relentless efforts have drastically **reduced these numbers by more than 97%,** with malaria cases dropping to just 2 million and deaths falling to **83 by 2023.**
3. Notable achievements include a substantial reduction in malaria cases and **malaria-related deaths between 2017 and 2023.**
4. These advancements are underscored by India's exit from the WHO's **High Burden to High Impact (HBHI)** group in 2024.
5. These results reflect India's strong public health interventions and its goal of **achieving malaria-free status by 2030.**

Epidemiological Progress: State-wise Transformation

1. India's progress is evident in the transition of states to lower disease burden categories.
2. From 2015 to 2023, several states moved from higher-burden categories to significantly lower or zero-burden categories.
3. **2015**: 10 states and Union Territories (UTs) were classified as high burden (Category 3).
4. **2023**: Only two states, Mizoram and Tripura, remained in **Category 3**, while four states—Odisha, Chhattisgarh, Jharkhand, and Meghalaya—reduced their malaria cases and moved to **Category 2.**
   a. Additionally, **Andaman & Nicobar Islands**, **Madhya Pradesh**, **Arunachal Pradesh**, and **Dadra and Nagar Haveli** reduced their caseloads and moved to Category 1 in 2023.
   b. **Category 1** now includes 24 states and UTs that report an Annual Parasite Incidence (API) of less than 1 case per 1000 population.
5. As of **2023**, **Ladakh**, **Lakshadweep**, and **Puducherry** are in **Category 0**, reporting zero indigenous malaria cases.
6. These areas are now eligible for subnational verification of malaria elimination.

7. Additionally, **122 districts across various states** reported **zero malaria cases in 2023**, reflecting the success of targeted interventions.

Decline in Malaria Cases and Deaths

According to World Malaria Report 2024, Between 2015 and 2023, both malaria cases and deaths in India dropped by around 80%.

1. **Malaria Cases**: Decreased from **1,169,261** in 2015 to **227,564** in 2023.
2. **Malaria Deaths**: Decreased from **384** in 2015 to just **83** in 2023.

Strategic Frameworks for Malaria Elimination

The foundation of India's success lies in its comprehensive, multi-pronged strategy:

1. **National Framework for Malaria Elimination (NFME)**: Launched in 2016, the NFME set the stage for eliminating indigenous malaria cases by **2027**.
2. **National Strategic Plan for Malaria Elimination (2023-2027)**: This plan builds on the NFME and focuses on enhanced surveillance, prompt case management (through a "testing, treating, and tracking" approach), and the development of real-time data tracking through the Integrated Health Information Platform (IHIP).

Integrated Vector Management (IVM) and Control Strategies

India's malaria control efforts are grounded in Integrated Vector Management (IVM). Key strategies include:

1. **Indoor Residual Spraying (IRS)** and the **distribution of Long-Lasting Insecticidal Nets (LLINs)** to reduce mosquito populations and interrupt the transmission cycle.
2. Targeted management of the **Anopheles stephensi** mosquito, which is crucial for urban malaria control.

Research and Collaboration

1. Research initiatives, including studies on **insecticide resistance** and **therapeutic efficacy**, have provided valuable data to refine intervention strategies.
2. The **Intensified Malaria Elimination Project-3 (IMEP-3)** targets **159 districts** across **12 states**, focusing on vulnerable populations. The project supports LLIN distribution, entomological studies, and enhanced surveillance systems.

India remains steadfast in its goal to eliminate malaria by **2030**. The government is committed to achieving **zero indigenous malaria cases by 2027** and ensuring the prevention of malaria re-establishment.

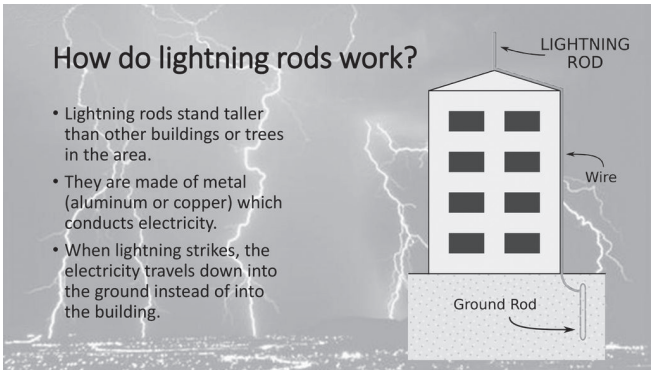
12. How Lightning Rods Prevent Lightning Strikes from Reaching People

1. With **climate change**, the frequency and intensity of **lightning strikes** around the world have been increasing.
2. Every year, about **24,000 people** are killed by lightning strikes globally, and in India, **2,887 people** were killed in **2022** alone.
3. Due to this growing danger, there have been calls to treat lightning as a **natural disaster** in India to help survivors access better protection and rehabilitation.
4. In this context, **lightning rods** have become a critical tool to protect people from lightning strikes by guiding the energy safely into the ground.

What is Lightning?

1. **Lightning** is a **high-energy electrical discharge** between **charged particles** in a cloud and the **ground**.
2. Typically, the air around us is an **electrical insulator**, meaning it does not conduct electricity. However, when electrical energy builds up in the air to **3 million volts per meter**, the air can break down and allow electricity to flow.
3. Lightning strikes happen when **electrical charges** in clouds grow so strong that the air can no longer stop them from discharging to the ground.

What is a Lightning Rod?



A **lightning rod** is a metal conductor designed to protect buildings and structures from lightning strikes.

1. Lightning always follows the **path of least resistance**, meaning it will strike the object that provides the easiest route for electrical current.
2. Lightning rods are designed to be **pointed** (sharp tips), which creates a stronger **electric field** around them.
3. This makes it easier for the lightning to "**choose**" the rod over other objects nearby.
4. A professor at IIT Kanpur, explains that pointed objects, like lightning rods, create **stronger electric fields**, which **ionize** (or charge) the air near them. This ionized air acts as a **pathway** for the lightning to travel down safely.

Where Does the Current Go After the Lightning Strikes the Rod?

When lightning strikes a rod, it carries the electric charge safely into the ground.

1. **Flow of Current**:
   a. Just like **heat** moves from a hot object to a cooler one, **electricity** flows from a place with **higher electric potential** (where the charge builds up) to a place with **lower electric potential** (the ground).
   b. The **earth** is a natural, infinite source of low electrical potential, so it can easily absorb the lightning's charge.
2. **How the Current is Dissipated**:
   a. The lightning rod is connected to a **wire** that runs down the building into the **earth**, where the charge is safely spread out.
   b. **Lightning arresters** are special devices that prevent lightning from damaging electrical systems by diverting the current away from sensitive equipment.

Can Lightning Evade a Lightning Rod?

Yes, a lightning strike can **avoid** a lightning rod if certain conditions are not met:

1. **Improper Installation**: If the rod is **too short**, **too far from the structure**, or **not properly grounded**, lightning may not strike it.
2. **Environmental Factors**: If multiple thunderstorms are happening nearby, the lightning may prefer other objects or structures to the rod.
3. If the rod is **damaged**, **corroded**, or **misshapen** over time due to lack of maintenance, it may not be able to attract lightning effectively.
4. In some cases, the **ground** might send out an upward discharge that **meets the lightning** before it reaches the rod. This can **bypass** the rod.
5. **Attraction to Taller Structures**: If a tall building or nearby tree is more attractive to lightning, it might strike them instead of the rod.

Engineers have developed new techniques to improve the effectiveness of lightning rods, such as ensuring that the rod is positioned at **the best possible height and angle to attract lightning** first.

Dangers Posed by Lightning Rods:

While lightning rods protect buildings from lightning strikes, they need to be **carefully designed and installed** to avoid causing additional hazards:

1. **Arcing**: If the wire connected to the rod bends into a **U-shape**, the current can arc between the two arms, causing **short circuits** or **fire risks**.
2. **Electrical Safety**: The wire must be installed in a way that it doesn't cause the current to arc to other nearby objects or people.
3. **Grounding**:
   - To safely dissipate the electric charge, engineers bury the **grounding wire** in materials with good **electrical conductivity**.
   - **Herbert Ufer**, a U.S. engineer, developed the **concrete-encased electrode system**, which improves the efficiency of grounding by using **concrete** to enhance the conductivity.
4. **Standards and Regulations**:
   - The **International Electrotechnical Commission (IEC)** provides global standards for designing and installing lightning rods to ensure safety and effectiveness.
   - These standards guide engineers on where to place lightning rods, how to design them, and how to estimate the **risk** of lightning strikes in different areas.

13. What is Disease X?

1. In December 2024, the **Democratic Republic of Congo** reported a **mysterious outbreak** that has **claimed over 400 lives**. Although the disease remains unidentified, experts suspect it could be an instance of Disease X.
2. **Disease X** is not an actual disease but a hypothetical one. The **World Health Organization (WHO)** introduced the term in 2018 to represent an unknown pathogen with the potential to cause a severe epidemic or pandemic.

What is WHO's Priority List of Pathogens?

1. The WHO's focus on Disease X gained traction after the **West African Ebola epidemic of 2014–2016**, which **claimed over 11,000 lives** and exposed critical gaps in global epidemic preparedness.
2. **COVID-19** is widely seen as the **1st real instance of Disease X**. The emergence of **SARS-CoV-2** as an **unknown pathogen** that triggered a global pandemic.
3. In 2018, the **WHO** published a **priority list of pathogens** to direct global attention and resources toward the most critical infectious disease threats.
4. The list prioritises diseases with epidemic or pandemic potential that lack adequate medical countermeasures like vaccines or treatments.
5. **Objective:** To guide research and development, allocate resources effectively and strengthen global preparedness. This list aids policymakers, researchers, and health organisations in prioritising efforts to combat these diseases.
6. **Current Pathogens on the List:** Ebola virus disease, Marburg virus disease, Lassa fever, Nipah virus, Rift Valley fever, Crimean-Congo haemorrhagic fever, Zika virus, Disease X
7. These pathogens are prioritised due to factors such as **high mortality rates, rapid transmission potential**, and **inadequate preventive or treatment options**.

What is Disease X?

1. It is not a specific disease but a placeholder for an **unknown pathogen capable of causing a global health crisis**.
2. The WHO incorporated it into its **Blueprint for Priority Diseases in 2018** to prepare for the risks posed by emerging, unidentified diseases.
3. Disease X lies at the intersection of **"known unknowns"** (threats we know exist but cannot fully predict) and **"unknown unknowns"** (completely unanticipated threats).
4. **Potential Sources:** Disease X could emerge from various agents - Viruses, Bacteria, Parasites, Fungi, Helminths, Prions (misfolded proteins causing neurological diseases)
5. **Unpredictability:** Since 1940, **over 300 emerging infectious diseases** have been identified, with around **70% originating from zoonotic spillover** (transmission from animals to humans).
6. Factors contributing to zoonotic spillover include: human encroachment on wildlife habitats, deforestation, intensified agricultural practices.
7. Additional risks include **antimicrobial resistance, bioterrorism** (deliberate release of bioweapons to cause death or disease in humans, animals, or plants), and **accidental laboratory leaks**, adding further uncertainty.

Are There Any Patterns in Emerging Diseases?

1. Previous viruses like HIV, SARS, MERS, and Ebola have been closely tied to ecological disruptions caused by humans.
2. Human-induced changes like **deforestation, urbanisation, and climate change** have brought humans and wildlife closer together, increasing the chances of disease transmission.
3. Epidemiologists estimate that **over 1.7 million undiscovered viruses exist in wildlife**, with hundreds of thousands of them potentially able to infect humans.
4. The **occurrence of new outbreaks** has **risen significantly since the mid-20th century**, driven by environmental, demographic, and global factors.
5. Areas with high biodiversity and poor healthcare systems, such as the Congo Basin, are at greater risk. The ease of international travel and trade helps local outbreaks to escalate into pandemics, as seen with COVID-19.
6. While epidemiology cannot predict the exact time or source of Disease X, it helps identify regions and behaviours that increase its chances of emerging.

What are the Challenges in Predicting Disease X?

1. **Unpredictable Factors:** Predicting the next Disease X is challenging because its emergence depends on various unpredictable factors. Zoonotic diseases are the most likely origin, given their role in past epidemics.
   a. However, other possibilities, such as pathogens evolving to avoid treatment, lab accidents, or intentional biological attacks, cannot be excluded.

b. Climate change is also altering how diseases spread, expanding the reach of vector-borne illnesses like malaria and dengue fever while pushing pathogens to adapt to new hosts and environments.

2. **Unidentified Pathogens**: Only a small fraction of viruses that can infect humans have been discovered, leaving many potential threats undiscovered.
3. **Role of Technology**: **Genomic sequencing** and **artificial intelligence** are becoming crucial in identifying and narrowing down potential threats. However, predicting the exact origin, timing, and characteristics of Disease X is still beyond reach.

What Preparations need to be done for Disease X?

1. **Robust surveillance systems** are essential for early detection. Advances in genomic sequencing, artificial intelligence, and real-time data sharing are vital for developing diagnostics, treatments, and vaccines.
2. **Strengthening healthcare infrastructure**, especially in low- and middle-income countries, is also critical.
3. **Proactive Investments**: Organisations like the **Coalition for Epidemic Preparedness Innovations (CEPI)** are working on **"prototype pathogen"** platforms that can be quickly adapted to tackle unknown diseases within 100 days of identification.
4. **Need for Global Collaboration:** Key efforts by the World Health Organization (WHO), such as the **priority pathogens list** and the **proposed Pandemic Treaty**, are designed to promote a unified global response to health crises.
5. **Frameworks like the Nagoya Protocol**, which ensures the fair sharing of benefits from genetic resources, could be adapted to include biological materials such as pathogens.

Initiatives to Combat Disease X

Global Efforts	Indian Efforts
1. **WHO Pandemic Treaty**: Focuses on fostering worldwide collaboration for pandemic preparedness and ensuring fair distribution of resources. 2. **Pandemic Fund**: Supports the strengthening of health systems in low-income countries. 3. **mRNA Technology Hub**: Expands vaccine production capabilities in developing nations. 4. **BioHub System**: Promotes international sharing of pathogens and viruses for research and response. 5. **WHO Hub for Pandemic Intelligence**: Works on enhancing research to close gaps in the early detection of outbreaks.	1. **Integrated Disease Surveillance Programme (IDSP)**: Monitors and tracks disease outbreaks and ongoing trends. 2. **National Institute of Virology**: Specializes in researching viral pathogens and diseases transmitted from animals to humans. 3. **Biotech Initiatives**: Focuses on developing local vaccines and diagnostic solutions. 4. **Emergency Response Fund**: Provides immediate funding for rapid response during pandemics.

14. Novo Nordisk's Push to Ban Compounded Semaglutide

1. **Novo Nordisk**, the Danish pharmaceutical company behind the popular weight-loss drug **Wegovy** and diabetes medication **Ozempic**, has urged authorities in the United States (US) to stop the **compounding** of these products.

2. The company has expressed concerns that compounded versions could pose **safety risks**.

What is Compounding?

1. The **US Food and Drug Administration (FDA)** allows **human drug compounding**, where licensed pharmacists or physicians mix, combine, or adjust a drug's ingredients to meet specific patient needs, especially when a branded drug is in short supply.

2. **Wegovy** and **Ozempic**, both containing **semaglutide**, have been in high demand for several months. To meet this demand, many compounding pharmacies in the US have started making their own versions of these drugs.

Novo Nordisk's Request:

- On **October 22**, **Novo Nordisk** asked the **FDA** to place **semaglutide** on the **Demonstrable Difficulties for Compounding (DDC) list**.

- The **DDC list** restricts pharmacies from compounding a drug when a commercial version is available.
- The FDA considers placing a drug on this list when factors like **stability**, **dosage requirements**, **bioavailability**, or **sterile handling** make it difficult to create a safe and effective compounded version.
  - Novo Nordisk flagged that **compounded versions** of semaglutide have led to **reported adverse effects**, which have been recorded in the **FDA's Adverse Event Reporting System (FAERS)**.

Concerns Raised by Novo Nordisk:

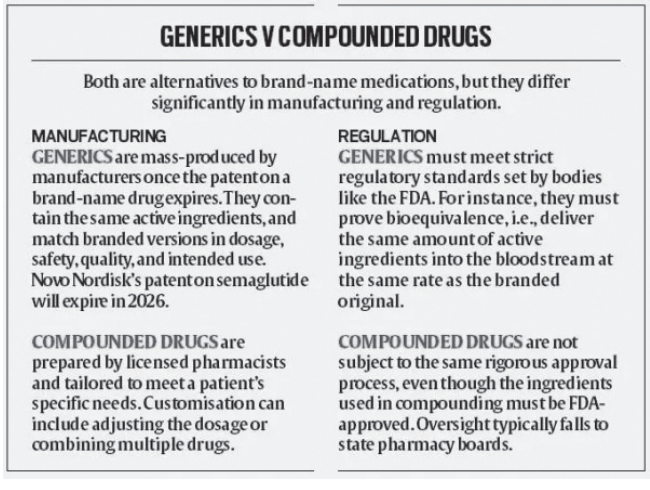
1. **Delivery Mechanism** refers to how a drug is released into the body to work effectively. A **compounded version** of **semaglutide** may not be absorbed properly, affecting its efficacy.
2. **Bioavailability** is the degree to which the active ingredient in a drug reaches the bloodstream and is used by the body.
   - **Semaglutide** has naturally **low bioavailability**, and an improperly compounded version may not produce the intended effects. This could result in ineffective treatment for obesity and diabetes, leading to severe health consequences such as **heart attacks**, **strokes**, **nerve damage**, **kidney disease**, or even the need for **amputations**.
3. **Contamination and Stability Risks:**
   - **Compounding semaglutide** requires specialized facilities and equipment. **Contamination** with other ingredients is a major concern if the equipment is not properly sanitized.
   - Additionally, **semaglutide** is **temperature-sensitive**. Storing it at temperatures higher than **30°C** could compromise its **stability**.

Do You Know India's Role in Biosimilars

1. **India's Leadership in Biosimilars:**
   a. **India** is a **pioneer** in the global **biosimilar** market. It was the **first country** to approve a **biosimilar product** for **Hepatitis B**.
   b. As of now, **98 biosimilars** have been approved in India, with at least **50 available in the market**—the highest number of any country. Many **India-made biosimilars** have also been approved in markets like the **US**.
2. **Market Growth**:
   a. The Indian **biosimilar market** was valued at **$349 million** in 2022 and is expected to grow at a **25.2% annual growth rate** from 2022 to 2030. It is projected to reach **$2,108 million** by **2030**.
3. **Government Initiatives**:
   a. Under the **Make in India** initiative, the Indian government launched the **National Biopharma Mission (NBM)**, a collaborative industry-academia mission supported by the **Biotechnology Industry Research Assistance Council (BIRAC)**.
   b. The **$250 million mission**, co-funded by the **World Bank**, aims to accelerate **biopharmaceutical development** in India.
4. **Challenges in the Biosimilar Market**:
   a. Despite these advancements, India holds only a **3% share** of the **global biosimilar market**.
   b. One of the major **barriers** faced by Indian biosimilar manufacturers is **patent evergreening**, where companies extend the lifespan of patents, limiting the production of biosimilars.

Novo Nordisk's efforts to ban compounded versions of **semaglutide** reflect growing concerns over the safety and efficacy of these products. The company's request to the **FDA** is based on the risks associated with compounded drugs, including potential contamination, improper absorption, and instability due to incorrect storage.

In contrast, **India** continues to lead in the **biosimilar market**, with significant government support and a growing market for affordable **biopharmaceuticals**. However, challenges such as **patent evergreening** persist, hindering India's full potential in the global biosimilar space.



F. GEOGRAPHY & ENVIORNMENT

1. What is the SC directive on sacred groves?

1. In December 2024, the Supreme Court ordered the Rajasthan Forest Department to map and **classify sacred groves** as **'forests'** and **'community reserves'** under the **Wildlife Protection Act, 1972.**
2. This order shifts control of sacred groves from **community-based management to the Forest Department.**
3. The Court also recommended the Union Environment Ministry to **identify sacred groves** across the country and formulate a policy for their protection.

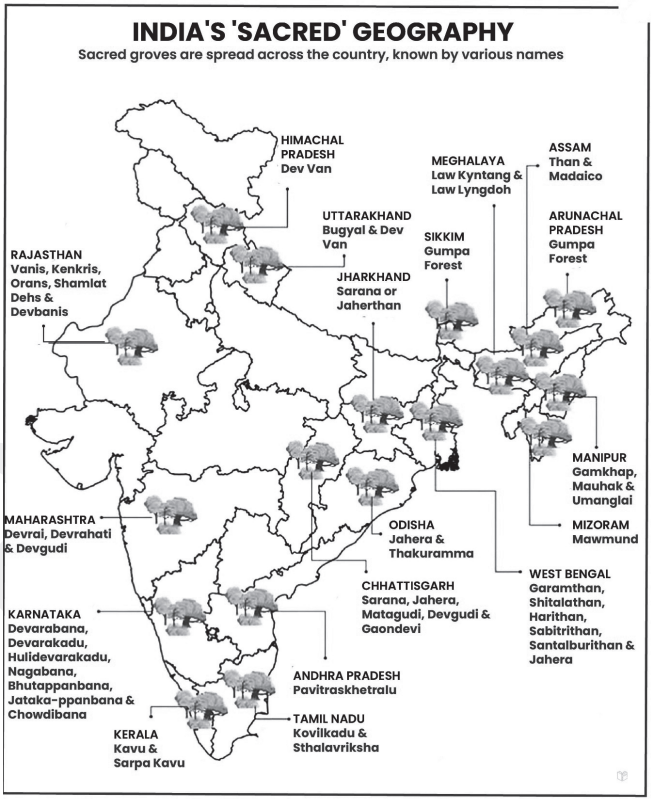
What are sacred groves?

1. **Sacred groves** are forests that are **protected by local communities** due to their **religious and cultural significance.**
2. They are often associated with temples, monasteries, shrines, pilgrim sites, and/or burial grounds.
3. **How are they called in different regions of India?**

Region	Names
Karnataka	'devara kadu'
Kerala	'kavu' and 'sarpa kavu'
Gujarat	'sabarkantha', 'dahod' or 'banaskantha'
Rajasthan	'orans', 'malvan', 'deo ghat', and 'baugh'
Chota Nagpur Plateau region	'sarna'
Chhattisgarh	'devbani'
Odisha	'jahera' or 'thakuramma'
Maharashtra and Chhattisgarh – by the Muria, the Madia, and the Gond adivasis	'devgudi'
Himachal Pradesh	'devban'
Meghalaya	'ki law lyngdoh', 'ki law kyntang' or 'ki law niam'

4. India has the **highest number of sacred groves** in the world, ranging up to 10 lakh groves. Rajasthan has around 25,000 and they cover about six lakh hectares of the State.

INDIA'S 'SACRED' GEOGRAPHY: Sacred groves are spread across the country, know by various names:



What is the background of the case?

1. **SC's definition of 'forest land':**
   a. In T.N. Godavarman v. Union of India, 1996, it was held that **'forest land'** in Section 2 of the **Forest (Conservation) Act, 1980**:
      i. Will not only include 'forest' as understood in the **dictionary sense**,
      ii. But also, **any area recorded as forest** in the government record **irrespective of the ownership** of the land.
   b. State governments were directed to form **expert committees** to identify such areas.
2. **Expert committee report of the Rajasthan government (2004):**

a. Identified only those sacred groves as 'forests' that fulfilled the criteria of **'deemed forests',** while the remainder was not.
   i. **Criteria of 'deemed forests'**: Trees covering 5 hectares of land with at least 200 trees per hectare

3. **Disagreement of Supreme Court's Central Empowered Committee (CEC):** Because the report of the expert committee was not in line with SC's definition of 'forest land'.
4. **SC's direction:** In 2018, the Rajasthan government was directed to implement the recommendations immediately.
5. Since 2018, the Rajasthan government has **only notified** around 5,000 out of 25,000 orans (sacred groves) as deemed forests.

What is the significance of sacred groves?

1. **Part of cultural identity**:
   a. The myths, legends and beliefs surrounding a sacred grove is closely tied with how the community identifies itself.
   b. It thus has a strong **emotional and psychological connection** with the community.
   c. According to anthropologists, they are closely related with the concept the **Nature-Man-Spirit Complex (NMS Complex)** which highlights the relationship between people, nature, and the spiritual world.
   d. For instance, in the **Mawphlang Sacred Forest of Meghalaya**, rituals are conducted to appease the spirits of the forest for their blessings.
2. **Biodiversity hotspots**:
   a. They are sites that support the growth of **unique and endemic** flora and fauna.
   b. For instance, the **sacred groves of Kerala** help in the preservation of rare species such as Malabar civet, Lion-tailed macaque etc.
3. **Water Conservation:**
   a. They are frequently sources of perennial streams, ponds, or sacred springs, helping maintain local hydrology.
4. **Disaster mitigation:**
   a. They have helped communities **mitigate the effects** of floods, landslides, and droughts on their lives while stabilising the soil and preventing erosion.
5. **Traditional knowledge**:
   a. They act as repositories of indigenous knowledge of herbal medicines, sustainable forest management etc.
6. **Livelihood source:**
   a. They provide a variety of resources like medicinal plants, fruits, fuelwood, fodder, and even water for communities.

What are community reserves?

1. **Community reserves** are **community-owned lands** where local communities actively **participate in wildlife conservation** while continuing their traditional land-use practices.
2. They are a category of **protected areas** introduced through the Wildlife Protection (Amendment) Act, 2002 under the **Wildlife Protection Act, 1972 (WLPA).**
3. **Volunteering by the locals:** To conserve habitats to protect "fauna, flora, and traditional or cultural conservation values and practises".
4. **Responsibilities of the locals:**
   a. Prevent any offences specified in the WLPA
   b. Assist the authorities in arresting any offenders
   c. Report the "death of any wild animal,"
   d. Prevent or extinguish any fires

Some of Offences include:
Damaging the boundary marks
Teasing or molesting wild animals
Littering in the community reserve
Setting fires or allowing a fire to burn
Using any chemical substances that endanger wildlife

5. **Control:** The Chief Wildlife Warden, under whose jurisdiction community reserves fall, effectively has overall control of the reserve and its management plan.
6. **Community Reserve Management Committee:**
   a. Must be constituted by the **State Government** to conserve, maintain, and manage the reserve and to protect wildlife and habitats.
   b. **Consists of**:
      i. At least five members nominated by the gram panchayat (or members of the gram sabha if there is no gram panchayat)
      ii. A representative of the Forest or Wildlife Department in whose jurisdiction the community reserve is located.

c. If the reserve is on **private land**, the committee will consist of:
   i. The landowner
   ii. A representative of the Forest or Wildlife Department
   iii. A representative of the concerned Panchayat or tribal community
d. The elected chairperson of the committee will be designated the reserve's **'Honorary Wildlife Warden'.**
e. **Land-use pattern** within a community reserve cannot be changed without the approval of the reserve management committee and the State government.

What are the other protected areas under WLPA, 1972?

1. **National Parks:** Areas designated for the protection of wildlife and biodiversity, with **strict regulations against human activities.**
2. **Wildlife Sanctuaries:** Areas where certain species of flora and fauna are protected, with **some regulated human activities allowed**.
3. **Conservation Reserve:** They are reserves that are created on **government-owned land** that is not part of a National Park or Wildlife Sanctuary.

Conservation Reserve vs Community Reserve

Criteria	Conservation Reserve	Community Reserve
Ownership	Government-owned land	Typically, private land
Management	Managed by the government	Managed by the community with a committee
Purpose	To protect wildlife and biodiversity	To conserve biodiversity through community involvement

How will the directive clash with the FRA's provisions?

1. The directive which would lead to the **takeover of the control of sacred groves by the Forest department** defies the **Forest Rights Act (FRA) 2006**.
2. **FRA 2006** sought to **recognise traditional and customary rights** over all forest lands under the control of **the Gram Sabhas** (took away the control of the Forest Department).
3. **Currently**,
   a. **All sacred groves in forest areas** come under **'community forest resources'** as per the FRA 2006.
      i. **Community forest resource:** As per FRA 2006, it is the "customary common forest land within the traditional or customary boundaries of the village… including reserved forests, protected forests and protected areas to which the community had traditional access".
      ii. **Authority of the Gram Sabha:** To protect, regenerate, conserve or manage community forest resources, along with the wildlife, flora, and biodiversity within.
   b. **All sacred groves outside forest land**, if any, also come under the FRA's purview if a proposal to notify them as 'forest land' comes into being
4. **With the directive, if sacred groves are notified as community reserves**:
   a. The sacred groves would be controlled by the forest department. Thus, **undermining the traditional governance** in such areas.
   b. It could lead to **conflict with the customs** of communities threatening their cultural identities.
   c. The **traditional and customary rights** of the communities could be lost.

Forest Rights Act, 2006

1. **Aim:**
   a. To recognize the rights of forest-dwelling communities over forest land and resources.
   b. Seeks to address historical injustices faced by these communities regarding their traditional land use and forest rights.
2. **Key Provisions**
   a. **Recognises 4 types of rights:**
      i. **Title rights:** Ownership rights to Forest Dwelling Scheduled Tribes and Other Traditional Forest Dwellers of land used for farming up to 4 hectares.
      ii. **Use rights:** Use for grazing, collecting Minor Forest Produce etc.

iii. **Relief and development rights:** Right to rehabilitation in case of illegal or forced displacement.

iv. **Forest management rights:** The right to protect, regenerate, conserve or manage any community forest resource.

b. Central role of Gram Sabha

i. Gram Sabha initiates the **process of verification** of claims.

ii. **No eviction** of forest dwellers is allowed unless Gram Sabha consents and scientific alternatives are explored.

iii. Role in protection of **community forest resources**

2. India Launches First Bio-Bitumen Highway Stretch

1. India has recently inaugurated its **first bio-bitumen-based National Highway** stretch on **NH-44 in Mansar, Nagpur, Maharashtra**
2. This stretch of road features **lignin-based bio-bitumen technology**, which was developed through a collaboration between **Praj Industries, CSIR-CRRI, NHAI, and Oriental Structural Engineers.**

BITUMEN

1. Bitumen is a **viscous material derived** from the **distillation of crude oil**, known for its robustness and long-lasting properties.
2. It plays an essential role as **a binder in road construction**, effectively holding together different aggregates to form asphalt.
3. Unlike **tar**, which **comes from coal**, bitumen is mainly produced from petroleum, although it can also be found in **natural deposits** such as **Trinidad's famous Pitch Lake.**
4. **PAHs polycyclic aromatic hydrocarbons** are **toxic compounds** that can be released into the air during the production, storage, and application of bitumen.
5. **Modified bitumen,** which is commonly used in roofing and waterproofing applications, **can release hydrogen sulfide gas** when exposed to certain conditions.
6. **Asphalt**, often referred to as "**flexible pavement,**" is a widely used composite material for paving roads, driveways, and parking lots.
7. It typically consists of approximately **5% bitumen as a binder** and **95% aggregates**, such as sand, stones, and other fillers.

BIOBITUMEN

1. **Bio-bitumen** is a **petroleum-free alternative** to Bitumen
2. It's made using **non-petroleum-based renewable resources** and can be made from **vegetable oils, synthetic polymers,** or both, making it a more sustainable model long term.
3. Bio-bitumen is a type of **asphalt mixture** that is made **with lignins from various waste streams.**
4. **Lignins** are **polymeric biopolymers** that can be found in the **cell walls of plants**. They provide structure to the plant and help it grow.
5. When these lignins are blended with other polymers, such as bitumen and sulfur, they form a binding agent that can be used in asphalt.
6. This is called bio-asphalt or bio-bitumen, and it has many benefits over conventional asphalt.
7. Bio-bitumen is **created from waste by heating waste mixtures** at around **500°C** without oxygen. In the production of biofuels, this process is called **pyrolysis**, which is the same as making **charcoal and biochar**.

USES OF BITUMEN

1. **Road Construction:** Suitable for both hot mix and cold mix asphalt, bio-bitumen can be used in flexible pavement constructions.
2. **Waterproofing:** It can be applied in various forms such as bituminous paint, membranes, and coatings to prevent water penetration.
3. **Rust-proof Coating:** Applied on metal surfaces, it prevents corrosion by blocking moisture and air penetration.
4. **Damp-proof Courses:** Used in building foundations and structures to prevent moisture absorption from the soil.
5. **Roof and Pipeline Insulation:** In areas with heavy rainfall, bio-bitumen is used for roofing, especially with shingle roofs, and as a protective coating on pipelines to prevent chemical degradation.

BIO-BITUMEN OFFERS SEVERAL ENVIRONMENTAL ADVANTAGES OVER TRADITIONAL ASPHALT:

1. **Biobitumen reduces urban heat island effect** by **significantly reducing** the **amount of solar radiation** absorbed by road surfaces, bio-bitumen helps lower surface and air temperatures in urban areas.
2. This **cooling effect** can reduce energy consumption from air conditioning, lower air pollution levels, and decrease heat-related health issues.
3. **Sustainable Production:** Utilizing waste products and renewable resources for bio-bitumen production helps reduce waste and dependence on non-renewable crude oil.

INDIA'S BITUMEN CONSUMPTION

1. Bitumen consumption **reached 8.8 million metric tonnes** in FY24, marking a 10% increase from the previous year.
2. The forecast for 2024-25 suggests consumption will rise to 10 million metric tonnes.
3. Approximately **50% of India's bitumen is imported**, with annual costs ranging between ₹25,000 crore to ₹30,000 crore. This makes it a significant economic and strategic concern.
4. **Bio-bitumen** is not only a sustainable alternative but also **cost-effective, priced at ₹40 per kg compared to ₹50 per kg for traditional bitumen**.
5. The Indian Oil Corporation (IOC) has initiated a project in Panipat that produces 150 tonnes of bio-bitumen daily from rice straw, which also yields ethanol and bio-aviation fuel.
6. There is dual role of farmers as food and energy producers, with technologies developed by CRRI and the Indian Institute of Petroleum enabling the conversion of paddy straw into **bio-bitumen, bio-gas, and biochar.**
7. One tonne of paddy straw can yield 350 kg each of bio-gas and biochar, and 30% of it converts into bio-bitumen.
8. With the **second largest road network globally, where 90% of the roads use bituminous layers**, India is pushing towards incorporating bio-bitumen to make road construction more sustainable and less dependent on imports.
9. The government has approved the **mixing of up to 35% bio-bitumen** with petroleum-based bitumen for road construction

3. Global Status of Salt-Affected Soils Report

1. The **Food and Agriculture Organization (FAO)** has released its first major assessment on soil, titled **"Global Status of Salt-Affected Soils"**.
2. This report provides valuable insights into the impact of salinization and sodification on soils, emphasizing the consequences for soil fertility and plant growth.

What Are Salt-Affected Soils?

Salt-affected soils are those that have an elevated presence of **soluble salts** (saline soils) or **exchangeable sodium ions** (sodic soils), which are measured in terms of **high electrical conductivity**. These conditions adversely affect soil fertility and hinder plant growth.

Factors Contributing to Salinization and Sodification

Anthropogenic Factors

Several human activities contribute to the increase in salinization and sodification, including:

1. **Inefficient Agricultural Practices**:
   - **a.** Overuse of fertilizers
   - **b.** Use of poor-quality water
   - **c.** Overexploitation of aquifers for irrigation
   - **d.** Inadequate drainage systems
2. **Deforestation**:
   - **a.** Removal of deep-rooted vegetation leads to **dryland salinization**.
3. **Other Activities**:
   - **a.** Excessive water pumping in coastal and inland areas
   - **b.** Mining activities, which can exacerbate soil salinity

Natural Factors

1. **Climate Crisis**: Increasing aridity is a key driver of salinization.
2. **Permafrost Thawing**: The thawing of permafrost also contributes to the salinization process.

Key Findings of the Report

Global Overview

1. **Extent of Salt-Affected Soils**: Around **10%** of the global land area, which amounts to about **1.4 billion hectares**, is affected by salinization and sodification. This is expected to increase to **24-32%** in the near future.
2. **Countries Most Affected**:
   a. **Australia** has the largest area affected by salt-affected soils.
   b. **Oman** is the most affected country in terms of percentage of land area.

India-Specific Findings

1. **Extent of Affected Land**: Approximately **2.1%** of India's total geographic area (about **6.72 million hectares**) is affected by salt-affected soils.
2. **Most Affected States**: **Gujarat** has the largest area affected, followed by **Uttar Pradesh**, **Maharashtra**, **West Bengal**, and **Rajasthan**.
3. **Irrigated Land**: About **17%** of India's **irrigated agricultural land** is affected, primarily due to the use of **brackish groundwater** for irrigation.

Sustainable Management Practices and Mitigation Strategies

To address the challenges posed by salt-affected soils, various sustainable management practices and mitigation efforts are recommended, including:

1. **Mitigation Efforts**:
   - **Mulching**: Applying organic or synthetic materials to protect the soil surface and reduce evaporation, which helps in managing salinity.
2. **Adaptation Strategies**:
   - **Breeding Salt-Tolerant Plants**: Developing plant varieties that can thrive in saline soils.
   - **Bioremediation**: Using biological processes to reduce soil salinity, such as introducing certain types of plants or microorganisms that can help reclaim saline soils.

4. India Launched the World's First Green Steel Taxonomy

1. In December 2024, the **Union Ministry of Steel** in India launched the **Green Steel Taxonomy**, making it the world's first classification system for green steel.
2. This **initiative aims** to create a framework to promote environmentally sustainable steel production.

Key Features of Green Steel Taxonomy

1. **Definition of Green Steel**
   a. **Green Steel** is defined as steel with a **CO2 equivalent emission intensity** of **less than 2.2 tonnes of CO2e** per tonne of finished steel.
   b. This threshold is designed to foster the development of steel manufacturing processes that significantly reduce carbon emissions.
2. **Star Rating System (Based on Greenness):** The **Star Rating System** evaluates the environmental impact of steel production based on emission intensity. The ratings are updated every three years.
   a. **Five-Star Green-Rated Steel**: Emission intensity lower than **1.6 tonnes**.
   b. **Four-Star Green-Rated Steel**: Emission intensity between **1.6 and 2.0 tonnes**.
   c. **Three-Star Green-Rated Steel**: Emission intensity between **2.0 and 2.2 tonnes**.
3. **Nodal Agency:** The **National Institute of Secondary Steel Technology (NISST)** has been designated as the **nodal agency**. NISST will oversee the measurement, reporting, and verification (MRV) process, and will issue **annual greenness certificates** and **star ratings** to qualifying steel producers.

Importance of Green Steel Taxonomy

1. **Advancing the National Mission on Green Steel**
   a. The Green Steel Taxonomy is part of India's broader commitment to sustainable steel production, including a proposed **₹15,000 crore mission** under the upcoming **Green Steel Policy**.
   b. This mission will help modernize and decarbonize the steel industry, supporting its transition to a greener future.
2. **Boosting Global Competitiveness**
   a. The launch of this taxonomy helps Indian steel remain competitive globally, particularly in the context of international policies like the **EU's Carbon Border Adjustment Mechanism (CABM)**.
   b. By adopting this classification system, India positions itself as a leader in **green steel manufacturing**.

3. **Promoting Innovation and Growth**
   a. The taxonomy represents a **transformative framework** for steel production that encourages **innovation**.
   b. It will create a market for **low-carbon products**, stimulate growth within India's steel industry, and attract investment in clean technologies.

Key Initiatives to decarbonise steel sector in India

1. **National Mission for Enhanced Energy Efficiency**: It is one of the eight missions under the National Action Plan for Climate Change (NAPCC).
2. **Perform Achieve & Trade (PAT) Scheme:** Market-based mechanism under NMEEE to enhance energy efficiency through Energy Saving Certificates (ESCerts).
3. **Other initiatives**: Green Hydrogen Energy Mission, National Solar Mission, Steel Scrap Recycling Policy, 2019, etc.

5. Can the Oceans Turn the Tide in the Fight Against Climate Change?

1. Oceans, often referred to as Earth's **"blue lung,"** have played a critical role in mitigating the impacts of climate change. For decades, they have:
   a. Absorbed **25%** of anthropogenic carbon dioxide emissions.
   b. Taken in over **90%** of the excess heat caused by greenhouse gases.
2. These processes have helped buy humanity critical time by alleviating some of the worst effects of climate change.
3. However, this absorption capacity comes with its own consequences, and the oceans' ability to continue mitigating climate change is being challenged.

Challenges Posed by the Ocean's Climate Mitigation Role

While the ocean helps regulate the planet's climate, its ability to absorb carbon and heat is **not without** significant impacts:

1. **Ocean Acidification**
   a. **Ocean acidification** refers to the ocean becoming more acidic due to the increased amount of **CO2** in the atmosphere.
   b. **Mechanism**: When CO2 is absorbed by seawater, it reacts with water to form **carbonic acid**, which dissociates into hydrogen ions and bicarbonate ions, making the water more acidic.
   c. This process threatens marine organisms, especially those with **calcium carbonate shells** like **coral reefs** and **shellfish**.
2. **Warming Oceans**
   a. **Warming oceans** alter ocean currents and cause **marine habitats** to lose oxygen, which in turn impacts marine biodiversity.
   b. These disturbances affect essential services such as **fisheries** and **carbon sequestration**.
3. **Cascading Ecological Effects:** These oceanic disturbances have cascading effects on ecosystems, affecting food webs and ocean productivity.

Despite these challenges, the ocean continues to absorb carbon, though at a slower rate, and the long-term ecological costs remain uncertain.

A New Approach: Marine Carbon Dioxide Removal (mCDR)

Given the ocean's essential role in climate regulation, **Marine Carbon Dioxide Removal (mCDR)** strategies are being explored. These approaches aim to enhance or replicate the ocean's natural processes to capture and store CO2, mitigating climate change.

What is Marine Carbon Dioxide Removal (mCDR)?

Marine Carbon Dioxide Removal (mCDR) refers to a set of techniques that use the ocean to remove carbon dioxide (CO2) from the atmosphere.

Types of Marine Carbon Capture Strategies

1. **Abiotic Approaches (Non-Living Processes)**
   a. **Ocean Alkalinity Enhancement (OAE):** **OAE** involves adding alkaline minerals like **crushed limestone** or **olivine** to seawater. The minerals react with CO2, converting it into stable bicarbonate and carbonate ions that can be stored in the ocean for millennia.
   b. **Current Projects:**
      - **Project Vesta (USA & Caribbean)**: Testing olivine weathering for ocean alkalinity enhancement and carbon sequestration.

- **Carbon to Sea Initiative (USA)**: Exploring OAE's potential on a larger scale.
- **GEOMAR Helmholtz Centre for Ocean Research (Germany)**: Conducting controlled studies to understand OAE's scalability.

c. Direct Ocean Capture

- This method involves using engineered systems to capture CO2 directly from seawater.
- The captured carbon can either be stored, converted into useful products, or removed from the water permanently.
- Key Engine**ered Methods:**

i. Electrochemical CO_2 Removal (Electrodialysis & pH Manipulation):

- Uses electricity to split seawater into acidic and basic solutions. The acidic part releases dissolved CO_2, which is captured and stored.
- **Projects**:
  - **Captura (California, USA)** – Developed by Caltech, uses electrodialysis for CO_2 extraction.
  - **SeaO2 (Netherlands)** – Developing electrochemical seawater CO_2 capture.

ii. Membrane-Based CO_2 Extraction:

- Uses selective membranes that allow CO_2 to pass through and be captured while leaving seawater behind.
- **Project**: **GEOMAR Helmholtz Centre (Germany)** researching membrane CO_2 extraction.

iii. Ocean-Based Direct Air Capture (DAC-O):

- Captures CO_2 from the ocean's air and increases ocean CO_2 uptake.
- **Project**: **Global CCS Institute (Various Locations)** investigating DAC-O integrated with ocean systems.

iv. Mineralization & Precipitation Methods:

- Treats seawater with alkaline minerals like **lime** or **magnesium hydroxide**, precipitating CO_2 as **calcium carbonate**.
- **Project**: **Vesta Project (USA & Caribbean)** – Uses olivine to enhance ocean alkalinity and mineralize CO_2.

2. **Ocean Fertilization:** Ocean fertilization is a geoengineering technique that involves adding nutrients such as **iron**, **nitrogen**, or **phosphorus** to ocean waters to stimulate phytoplankton growth. The idea is that this growth will absorb CO_2 from the atmosphere and sequester it in the deep ocean.

a. How Ocean Fertilization Works

- **Nutrient Addition**: Adding specific nutrients to iron-deficient ocean regions to boost phytoplankton growth.
- **Phytoplankton Bloom Formation**: Phytoplankton absorb atmospheric CO_2 and support marine food chains.
- **Carbon Sequestration**: Dead phytoplankton biomass sinks to the deep ocean, potentially storing carbon for centuries.

b. Notable Ocean Fertilization Projects:

- **LOHAFEX Experiment (2009)**: Tested iron fertilization in the South Atlantic. Phytoplankton bloomed, but zooplankton consumed most of it, reducing carbon sequestration.
- **Southern Ocean Iron Fertilization**: Planned by **Woods Hole Oceanographic Institution** to test long-term carbon storage potential.
- **IronEx I & II (1993 & 1995)**: Demonstrated that small iron additions could trigger large phytoplankton blooms.
- **Planktos (2007)**: A private project that was abandoned due to scientific and regulatory concerns.

3. **Seaweed Cultivation (Macroalgae Farming)**

a. Seaweed absorbs CO_2 through photosynthesis, and large-scale seaweed farming can help increase carbon capture.

b. The biomass can either be used for **biofuels** or sunk to the deep ocean for long-term sequestration.

c. Current Seaweed Projects:

- **Running Tide (Maine, USA)**: Growing seaweed on floating buoys and sinking the biomass for carbon storage.
- **Seaweed Generation (Antigua, Caribbean)**: Using robots to transport sargassum seaweed to the deep ocean.

- **Carbon Clean Solutions (California, USA)**: Exploring the potential of seaweed farming to offset industrial CO_2 emissions.

4. **Blue Carbon Ecosystem Restoration**
   a. Focusing on the restoration of coastal ecosystems like **mangroves**, **seagrasses**, and **salt marshes**, which act as natural carbon sinks.
   b. **Restoration Projects:**
      - **Mangrove Restoration (Florida, USA & Southeast Asia)**: Efforts to restore mangrove forests in coastal areas.
      - **Seagrass Restoration (UK & Australia)**: Projects aimed at restoring seagrass meadows to enhance carbon sequestration.

6. EMERGING BIODIVERSITY CREDIT MARKETS

WHAT ARE BIODIVERSITY CREDIT ?

1. Biodiversity credits are a **market-based mechanism** designed to fund conservation and restoration of biodiversity.
2. Biodiversity credits enables private companies and other entities to invest in these activities through the purchase of credits.
3. Each credit represents a quantifiable, verifiable benefit to biodiversity, such as the preservation of a certain area of habitat or the restoration of a specific ecosystem.
4. Biodiversity credits are usually sold based on the area they cover, measured in hectares, unlike forest carbon credits which are measured by the tonne of CO_2 equivalent.
5. Biodiversity credits are typically issued for five years but can vary from one month up to the entire duration of the project.

GLOBAL TRENDS IN BIODIVERSITY CREDIT

1. The biodiversity credit market is currently valued at $8 million.
2. Projections suggest it could expand to $2 billion by 2030 and reach $69 billion by 2050.
3. The Kunming-Montreal Global Biodiversity Framework aims to raise $200 billion annually for conservation by 2030, promoting innovative financing methods.
4. The Kunming-Montreal Global Biodiversity Framework aims to secure $200 billion annually by 2030 for conservation efforts through innovative financing methods.
5. These credits are recognized as nature-based solutions under target 19 of the Kunming-Montreal Global Biodiversity Framework.
6. The Pollination Group released a report in 2024 providing details about voluntary Biodiversity credit
7. Between 2020, sales of biodiversity credits ranged from $325,000 to $1.87 million, supporting conservation across 26,000-125,000 hectares.
8. 88% of companies recognized a difference between voluntary biodiversity credits and offsets, noting that the system does not support offsets.
9. **Biodiversity Credits** are usually generated through proactive conservation efforts that aim to enhance or preserve biodiversity in a specific area before any damage occurs.
10. In contrast, biodiversity offsets are typically reactive they are created in response to specific environmental damage caused by development projects. The aim is to compensate for the loss by ensuring equivalent biodiversity gains elsewhere.
11. Major buyers include large companies, banks, and small businesses, primarily motivated by marketing opportunities and risk management.
12. Most buyers are in Europe (44%), followed by Latin America and the Caribbean (25%), and Oceania and North America (19%).

BIODIVERSITY CREDIT ALLIANCE

1. The Biodiversity Credit Alliance (BCA) is an international voluntary alliance formed to facilitate the creation of a credible and scalable market for biodiversity credits.
2. BCA was launched during the 15th Conference of the Parties (COP 15) to the Convention on Biological Diversity (CBD), underlining its significance and alignment with global biodiversity strategies.
3. The alliance is supported by major international organizations such as the United Nations Development Programme (UNDP), the United Nations Environment Programme Finance Initiative (UNEP FI), and the Swedish International Development Cooperation Agency (SIDA).

ISSUES WITH BIODIVERSITY CREDIT MARKET

1. **Fungibility Issues:** Biodiversity credits can't easily be interchanged because each location's biodiversity is unique. For example, you can't compare a lone forest patch to one that's connected to a larger area.
2. **Quantification Challenges:** Measuring biodiversity often reduces its complexity to just a number or a basic category, which can ignore important factors like how species interact or the area's cultural importance.
3. **Detection Uncertainties:** It's tough to confirm if biodiversity has been properly conserved or restored because the methods to measure it aren't always reliable. For instance, tracking changes in butterfly populations needs long-term data, and short studies might not give accurate results.
4. **Additionality Concerns:** It's challenging to prove that efforts to improve biodiversity are actually making a difference beyond what would happen normally. Collecting the necessary data is expensive, and extra spending doesn't always guarantee better outcomes.
5. **Leakage and Adjustment Mechanisms:** When actions to save biodiversity in one place cause damage elsewhere, it's called leakage. This happens, for example, when land used for farming is turned into a biodiversity credit site, pushing farmers to clear land somewhere else. Methods to measure and prevent this are not very clear.
6. **Regulatory and Enforcement Needs:** rules can help in managing these risks, but enforcing these rules in the market for voluntary biodiversity credits requires a lot of effort from the industry, as well as clear transparency and monitoring by society.

The biodiversity credit market is essential for driving financial support toward preserving and enhancing global biodiversity. It incentivizes landowners and businesses to invest in conservation by monetizing biodiversity benefits, introducing innovative and sustainable financing streams. This market supports international conservation goals, helps maintain critical ecosystem services, and enables businesses to demonstrate environmental responsibility and manage ecological risks effectively.

7. IPBES Nexus Assessment Report

1. The **Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)** has released the **Nexus Assessment Report**, also known as the **Assessment Report on the Interlinkages Among Biodiversity, Water, Food, and Health**.
2. This report offers a scientific evaluation of the complex interconnections between **biodiversity, water, food, health, and climate change,** while exploring response options to maximize co-benefits across these domains.

About Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)

1. **Headquarters:** Bonn, Germany
2. **Established**: 2012
3. **Objective**: Strengthening the science-policy interface to promote the conservation and sustainable use of biodiversity, human well-being, and sustainable development.
4. **Membership**
   a. **Independent Intergovernmental Body**: Comprising **150 member governments**, including **India** as a founding member.
   b. **Secretariat Services**: Though IPBES is not a UN body, the **UN Environment Programme** provides secretariat services to the platform.

Key Findings of the Nexus Assessment Report

1. **Unaccounted-for Economic Costs**
   a. The report estimates that the **unaccounted-for costs** of current economic activities, which affect the nexus elements (biodiversity, water, food, health), amount to at least **$10-25 trillion per year**.
   b. These costs, along with **public subsidies**, create **private financial incentives** that encourage investments in nature-damaging economic activities.
2. **Biodiversity Decline:** The rate of biodiversity decline over the past **30-50 years** has averaged **2-6% per decade**, reducing ecosystems' ability to sequester carbon and accelerating **climate change**.
3. **Indirect Drivers of Biodiversity Loss: Global trends** over the past 50 years show that **indirect socio-economic drivers**, such as increasing waste, overconsumption, and population growth, have intensified the **direct drivers** of biodiversity loss, including:

   a. Land and sea-use change
   b. Pollution
   c. Invasive alien species
4. **Water Quality and Climate Resilience: Unsustainable freshwater withdrawal**, **wetland degradation**, and **forest loss** have significantly reduced **water quality** and **climate change resilience**.
5. **Emerging Infectious Diseases:** Approximately **50% of emerging infectious diseases** are driven by the interconnections between **ecosystems**, **animal health**, and **human health**.

Way Ahead

The report emphasizes the need for comprehensive and synergistic approaches to address the challenges highlighted:

1. **Restoration of Carbon-Rich Ecosystems**: Focus on restoring ecosystems like **forests** and **mangroves**, which are crucial for carbon sequestration and climate resilience.
2. **Biodiversity Management to Reduce Disease Risks**: Effective management of biodiversity is vital to reduce the risks of diseases spreading from animals to humans.
3. **Other Key Strategies**
   a. **Urban Nature-Based Solutions**: Utilizing nature-based solutions within urban environments.
   b. **Knowledge of Indigenous Peoples**: Incorporating traditional knowledge and practices for biodiversity conservation.
   c. **Sustainable Agricultural Practices**: Adopting practices that promote ecological balance and long-term food security.
   d. **One Health Approach**: A holistic approach addressing the health of humans, animals, and ecosystems together.

8. Delhi Govt. Launches Scheme for Vehicle Tax Discounts on Scrapping Old Vehicles

1. Recently, the **Delhi government introduced** a new **vehicle scrapping and registration scheme** to promote the **replacement of old, polluting vehicles** with **newer, cleaner models**.
2. **Under this scheme, owners who scrap their old petrol and diesel vehicles that have completed 15 years (for petrol) and 10 years (for diesel)** will be eligible for **tax concessions** on the registration of a new vehicle.

Details of the tax concessions for vehicle registration in Delhi:

Category	Details
1. Tax Concessions for Vehicle Registration	
Non-Transport Petrol, CNG, or LPG Vehicles	20% discount on **motor vehicle tax** for new vehicle registration when old vehicle (15+ years for petrol, 10+ years for diesel) is scrapped.
Non-Transport Diesel Vehicles	15% discount on **motor vehicle tax** for new diesel vehicle registration when the old vehicle is scrapped.
2. For Transport Vehicles (Commercial Vehicles)	
Petrol, CNG, or LPG Transport Vehicles	15% concession on **registration tax** for new transport vehicles.
Diesel Transport Vehicles	10% concession on **registration tax** for new diesel transport vehicles.
3. Eligibility for Discounts	
Required Document	Certificate of Deposit (COD) for old vehicle, scrapped at a government-approved Registered Vehicle Scrapping Facility (RVSF).
Validity of COD	COD is valid for 3 years from the date of issue and can be electronically traded.

Background and Implementation:

1. The scheme aims to reduce pollution in **Delhi, which has been suffering from high levels of air pollution due to the large number of old vehicles** still operating in the city.
2. In line with the new scheme, the Transport Department of Delhi has launched a joint drive with agencies like the Municipal Corporation of Delhi (MCD) and Traffic Police.
3. As part of the plan, the **Transport Department** has already impounded over **3,000 old vehicles** that were either illegally plying or parked in public spaces.
4. **Delhi's Vehicle De-registration:** Around **5.5 million** old vehicles have already been **de-registered** in Delhi.
5. However, an estimated **1 to 1.5 lakh old vehicles remain in the city, still contributing to pollution.**
6. **Notification Details:** The **notification for the scheme** was published on **October 15**, and has already been implemented.

7. **People can now avail of the incentives as part of the program.**

Importance of the Scheme:

1. To improve the city's **air quality** and reduce the number of **polluting vehicles** on the roads.
2. promotes more **eco-friendly vehicles** like those running on **CNG** and **LPG**.
3. The scheme will also provide a boost to the **vehicle scrapping industry** in Delhi by encouraging people to use authorized **scrapping centers**, which must be certified by the government.

India's Vehicle Scrapping Policy: Why Scrap Old Vehicles, and How?

1. India has launched a **Vehicle Scrapping Policy**, also known as the **Voluntary Vehicle-Fleet Modernisation Programme**, to encourage the phasing out of old, polluting vehicles and promote the use of newer, more efficient and environmentally friendly cars.
2. **The policy was announced in Parliament in March 2021** by **Nitin Gadkari**, the Minister of Road Transport and Highways, and later discussed by **Prime Minister Narendra Modi** at an investor summit in Gujarat.

Features of the Policy:

Feature	Details
1. Targeted Vehicles for Scrapping	
Commercial Vehicles Over 15 Years	Vehicles that fail the automated fitness test will be scrapped.
Personal Vehicles Over 20 Years	Vehicles that fail the fitness test will also be scrapped.
Vehicles Passing the Test	Can continue operating, but will face higher re-registration charges. These charges could increase from eight times to as much as 20 times the original cost
2. Scrap Certification and Incentives	● Vehicle owners who choose to scrap their old vehicle will receive a Certificate of Deposit (COD) to claim benefits. Benefits are- o Tax rebates on the registration of a new vehicle. o Discounts on purchasing a new vehicle. o The COD is tradable and can be used by anyone, not just the owner of the scrapped vehicle.
3. Implementation Timeline	a. Heavy commercial vehicles will begin mandatory testing from April 2023. b. Personal vehicles will start undergoing tests from June 2024.

Challenges and opportunities related to Infrastructure Readiness and Model Fitness Centres in India:

Category	Challenges	Opportunities
Infrastructure Readiness	Lack of infrastructure to test and scrap vehicles on a large scale.	Government has laid out standards and specifications for fitness centres and scrapping yards.
	Limited number of fitness testing and scrapping centres across the country.	Potential for growth of the scrapping industry with private sector incentives to set up facilities.
Model Fitness Centres	Setting up model centres requires significant investment (Rs 17 crore each).	Government promoting the creation of model fitness testing centres in each district.
	Need for infrastructure in remote or underdeveloped regions.	At least 718 fitness centres planned, with extra focus on cities like Delhi.
	Ensuring automated and transparent processes at each centre.	Standardization of fitness and emission tests across the country.

9. UN Champions of the Earth for 2024

The **UN Champions of the Earth** initiative, established in 2005 by the United Nations Environment Programme (UNEP), represents the highest environmental honor bestowed by the United Nations. This prestigious award recognizes individuals, groups, and organizations whose actions have significantly impacted the environment, providing innovative and transformative solutions to pressing environmental issues. The awards are categorized into several sections, including:

- **Policy Leadership**: Honoring those in the public sector who have implemented significant environmental policies either nationally or internationally.
- **Inspiration and Action**: Acknowledging bold environmental actions that have inspired others.
- **Entrepreneurial Vision**: Awarding those who have integrated environmental sustainability with business practices.
- **Science and Innovation**: Celebrating groundbreaking scientific contributions that positively affect the environment.

The 2024 laureates were announced on December 10, continuing the tradition of honoring environmental leaders who are pioneering efforts to safeguard the planet and promote sustainable development.

Name	Country	Category	Contribution
Amy Bowers Cordalis	USA	Inspiration and Action	Member of California Yurok tribe.Led ecological restoration of the Klamath River, enhancing salmon habitats and Indigenous rights.
Lu Qi	China	Science and Innovation	Key figure in China's "Great Green Wall" project also known as Three north project , a massive afforestation initiative.
Gabriel Paun	Romania	Inspiration and Action	Activist combating illegal logging in Romania's forests, protecting old-growth forests.
SEKEM	Egypt	Entrepreneurial Vision category	Advances biodynamic agriculture to transform desert into fertile land, promoting sustainable practices.
Sonia Guajajara	Brazil	Policy Leadership category.	Advocates for Indigenous rights and environmental conservation in the Amazon.
Madhav Gadgil	India	Lifetime Achievement category.	Authored the Gadgil Report, advocating for sustainable management and conservation of the Western Ghats.

10. CYCLONES IN 2024

The 2024 global tropical cyclone season saw **85 named storms**, close to the 1991-2020 average of 87.7. Of these, **42 became tropical cyclones** (winds ≥74 mph), and **23 reached major tropical cyclone strength** (winds ≥111 mph). Four storms reached **Category 5** on the Saffir-Simpson scale, with a **global ACE** (Accumulated Cyclone Energy) **21% below the long-term average**.

OCEAN WISE CYCLONE OCCURENCES

1. **North Atlantic**:
   a. 18 named storms (above average).
   b. 11 hurricanes, including 5 major ones.
   c. **Hurricanes Helene and Milton** were the most destructive, with Helene causing catastrophic flooding in the U.S.
   d. **Beryl** was the season's earliest Category 5, hitting the Caribbean.
2. **East Pacific**:
   a. 13 named storms, with 5 hurricanes (3 major).
   b. **Hurricane John** caused significant flooding in Mexico.
   c. **Hurricane Kristy** reached Category 5 strength, the strongest of the season.

3. **West Pacific**:
   a. 23 named storms, with 15 tropical cyclones and 9 major ones.
   b. **Super Typhoon Man-Yi** was the only Category 5-equivalent typhoon.
   c. Typhoons Yinxing, Toraji, Usagi, and Yagi caused severe damage in the Philippines and China.
4. **North Indian Ocean**:
   a. 4 named storms, with **Remal** and **Dana** being the most significant, causing fatalities and damage in India and Bangladesh.
5. **South Indian Ocean**:
   a. 13 named storms, with **Tropical Cyclone Belal** causing significant damage to the Mascarene Islands.
6. **Australian Region**:
   a. 10 named storms, with **Severe Tropical Cyclone Jasper** being the strongest, causing heavy rainfall and significant impacts in northern Australia.
7. **Southwest Pacific**:
   a. 6 named storms, with **Cyclone Lola** being the most notable, causing severe damage in Vanuatu.

Notable Cyclones

1. **Most Intense Storm: Hurricane Milton**
   a. Pressure: Minimum barometric pressure of **897 hPa** (26.49 inHg), making it the most intense tropical storm of the year.
2. **Costliest Cyclone: Hurricane Helene**
   a. Damage: Estimated at **$78.7 billion**, with the majority of the damage occurring in the Southeastern United States.
3. **Deadliest Cyclone: Typhoon Yagi**
   a. Fatalities: At least 844 deaths, mainly in Southeast Asia (Myanmar, Vietnam, Thailand, the Philippines) and South China.
4. **Possible Additional Fatalities from Cyclone Chido**
   a. Cyclone Chido may have claimed more lives, particularly in **Mayotte**, though precise fatality counts are still being investigated.

CYCLONIC STORMS THAT AFFECTED INDIA IN 2024

Cyclone Name	Origin	Affected Areas	Storm Category
Asna	Formed over Madhya and Uttar Pradesh.	Gujarat, Madhya Pradesh	Cyclonic Storm, Cyclone Asna was a rare occurrence, in that it formed over land as a depression, intensified into a cyclone and moved into the Arabian Sea in the month of August. Only three similar incidents have happened since 1891; in 1976, 1964 and 1944.
Remal	Bay of Bengal	Odisha, Bangladesh, West Bengal	Severe Cyclonic Storm
Dana	Bay of Bengal	Odisha Coast (Habalikhati Nature Camp, Dhamra Port)	Severe Cyclonic Storm (Category 1 Tropical Cyclone)
Fengal	Southeast Bay of Bengal	Tamil Nadu, Sri Lanka, Coastal Karnataka	Cyclonic Storm

Important atmospheric phenomena affecting cyclones

1. The **Madden-Julian Oscillation (MJO)** is a large-scale atmospheric phenomenon that plays a significant role in the formation, intensity, and movement of tropical cyclones (also known as hurricanes or typhoons).
   The MJO is an **eastward-moving pulse** of **convection (thunderstorms)** and **associated atmospheric disturbances** that travels across the tropics. It typically has a cycle of **30 to 60 days**. The MJO has two key phases that influence weather patterns:

a. **Active Phase (Convection)**: High convection and rainfall, typically associated with low pressure, leading to favorable conditions for cyclones.
b. **Inactive Phase (Suppressed Convection)**: Low convection and drier conditions, making it less favorable for cyclone formation.

How the MJO Affects Cyclones:

1. **Favorable Conditions for Cyclone Formation (Active MJO Phase)**:
   a. When the MJO is in its **active phase**, it creates **increased convection** and **lower pressure** over the ocean.
   b. This **enhances tropical disturbance** and leads to **better conditions for the formation of cyclones**.
   c. The active MJO phase encourages **warm, moist air** to rise, leading to **low pressure areas** that can develop into tropical depressions, storms, or cyclones.
   d. It helps **trigger and intensify tropical cyclones**, especially in regions like the **Indian Ocean**, **South Pacific**, and **Western Pacific**.
2. **Suppressing Cyclone Development (Inactive MJO Phase)**:
   a. During the **inactive phase** of the MJO, **convection decreases**, and there is a **reduction in rainfall** and **cloud activity**.
   b. This leads to **higher pressure**, and the atmosphere becomes **more stable**, making it less conducive to cyclone formation.
   c. Cyclones are less likely to form or intensify when the MJO is in its **inactive phase** due to these unfavorable conditions.

The **Indian Ocean Dipole (IOD)** is a climate phenomenon that influences the distribution of sea surface temperatures (SST) in the Indian Ocean and can significantly affect the behavior of tropical cyclones in the region.

What is the Indian Ocean Dipole (IOD)?

The IOD is an oscillation (alternating pattern) of sea surface temperatures and atmospheric pressure across the **Indian Ocean**, especially between the **western** and **eastern parts**:

1. **Positive IOD**: The western part of the Indian Ocean (near Africa) is **warmer** than the eastern part (near Indonesia), creating a **gradient** in temperatures.
2. **Negative IOD**: The eastern part of the Indian Ocean (near Indonesia) is **warmer** than the western part, reversing the temperature gradient.

The IOD can be **positive**, **neutral**, or **negative**, and its phase can influence cyclone activity in the Indian Ocean and surrounding regions.

How the IOD Impacts Cyclones:

1. **Positive IOD (Warmer Western Indian Ocean)**:
   a. In a **positive IOD phase**, the western Indian Ocean (near the coast of **East Africa** and **Arabian Peninsula**) becomes warmer than the eastern part (near **Indonesia** and **Australia**).
   b. **Warm sea surface temperatures** in the western Indian Ocean provide **more fuel** for tropical cyclones, leading to **stronger storms**.
   c. The **positive IOD** enhances **cyclone formation** and **intensification** in the **North Indian Ocean**, particularly over the **Bay of Bengal**.
   d. **Cyclones in the Bay of Bengal and Arabian Sea** are generally **stronger** during a positive IOD phase due to the availability of **warm water**.
   e. It can also affect cyclone **track**: Cyclones may be **more likely to move toward** the western parts of the Indian Ocean, potentially impacting **India, Bangladesh**, and even the **Horn of Africa**.
2. **Negative IOD (Warmer Eastern Indian Ocean)**:
   a. In a **negative IOD phase**, the **eastern Indian Ocean** (near **Indonesia** and **Australia**) becomes warmer than the western part (near **East Africa**).
   b. The **warm water** in the eastern part reduces the **temperature contrast** between the two sides of the ocean, which weakens the **convection** and **cyclone formation** in the western Indian Ocean.
   c. During a negative IOD, the **formation of cyclones** in the **Bay of Bengal** may be **reduced**, and the **intensity** of storms can be lower.
   d. This phase may also **shift the cyclone tracks**, with storms possibly heading more toward the **eastern Indian Ocean** and impacting regions like **Indonesia** and **Australia** instead of the Bay of Bengal.
3. **Neutral IOD**:
   a. In a **neutral IOD phase**, there is no significant temperature difference between the eastern and

western Indian Ocean. In this case, the IOD has a **less pronounced effect** on cyclone activity, and other factors (like the **Madden-Julian Oscillation**, **sea surface temperatures**, and atmospheric conditions) will play a more dominant role in cyclone formation and development.

Atlantic Nina

An **Atlantic Niña** refers to cooler-than-normal sea surface temperatures in the **equatorial Atlantic**, which can significantly affect tropical cyclone formation in the region.

How Atlantic Niña Affects Cyclone Formation:

1. **Reduced Cyclone Activity**:
   a. The cooler sea surface temperatures in the equatorial Atlantic lead to **weaker convection** (cloud formation and thunderstorms), which is less conducive to the development of tropical cyclones.
   b. **Cooler waters** do not provide enough **heat and moisture** to fuel the intensification of storms, making it harder for cyclones to form or strengthen.
2. **Shifts in Wind Patterns**:
   a. **Shifts in trade winds** and the **Atlantic zonal mode** (the movement of winds across the Atlantic) can cause upwelling of cooler water from deeper layers of the ocean, further cooling the surface.
   b. These changes in wind patterns can **disrupt** the typical conditions needed for cyclone formation, such as **low vertical wind shear** (which allows cyclones to build vertically without being torn apart).
3. **Impact on Cyclone Tracks**:
   a. The presence of **cooler water** in the Atlantic can **shift cyclone tracks**, often steering storms away from the **western Atlantic** or **Caribbean** regions where they might otherwise intensify.
   b. This may reduce the frequency and intensity of storms in regions like the **Caribbean**, **Gulf of Mexico**, and **East Coast of the United States**.

Cyclone formation is also influenced by El Niño/La Niña, sea surface temperature, vertical wind shear, Rossby waves, trade winds, monsoon troughs, and tropical waves. These factors either enhance or suppress cyclone development by affecting atmospheric conditions and ocean temperatures.

11. Silicosis in India

Silicosis is a long-term lung disease caused by inhaling large amounts of crystalline silica dust.

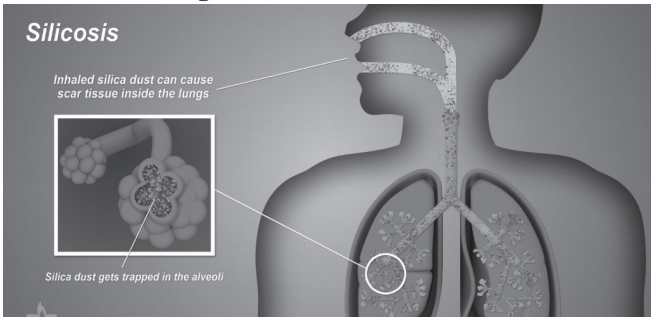
What is Silicosis?

1. **Cause**: Silicosis occurs when fine particles of crystalline silica dust, found in substances like stone, rock, sand, and clay, are inhaled into the lungs.
2. **Impact on Health**: Once inhaled, silica particles cause swelling (inflammation) and gradually lead to scarring (fibrosis) of lung tissue. This scarring impairs lung function over time.
3. **Treatment**: Unfortunately, there is no cure for silicosis because the lung damage cannot be reversed. Treatment focuses on relieving symptoms and improving the quality of life for affected individuals.

Industries at High Risk for Silicosis

Silicosis is common in industries where workers are exposed to silica dust over prolonged periods. Key industries that face higher risks include:

1. **Stone masonry and stone cutting** (especially with sandstone)
2. **Construction and demolition** (due to exposure to concrete and paving materials)
3. **Worktop manufacturing and fitting**
4. **Pottery, ceramics, and glass manufacturing**
5. **Mining and quarrying**
6. **Sand blasting**



National Green Tribunal (NGT) Directions on Silica Mining and Washing Plants

1. The **National Green Tribunal (NGT)** directed the **Central Pollution Control Board (CPCB)** to draft new guidelines for granting permissions to silica mining and washing plants.
2. The NGT also ordered the **Uttar Pradesh government** and its **Pollution Control Board** to set up healthcare facilities in areas where silica mines are present.

Challenges Faced by India in Addressing Silicosis

India faces several challenges in tackling silicosis, particularly in regions with high concentrations of silica-based industries. Some of the key issues are:

1. **Prevalence**: Silicosis is a common occupational disorder in India, especially in the **Central** and **Western states**. It is a significant cause of respiratory morbidity.
2. **Cottage and Small-Scale Industries**: A large number of silicosis cases are likely to come from smaller units and cottage industries, which often lack the infrastructure and resources to follow safety guidelines.
   a. Small enterprises may be **exempt from statutory norms** under the **Factories Act, 1948**, and the **Mines Act, 1952**.
   b. Employers in these sectors frequently neglect the **Occupational Safety, Health, and Working Conditions Code 2020**, which mandates that employers notify risks to workers' health, including diseases like silicosis.
3. **Data Deficiency**: The **lack of comprehensive data** on silicosis cases hampers effective action by the government.
4. **Diagnostic Challenges**:
   a. There are no standardized diagnostic algorithms and guidelines for silicosis certification.
   b. Many cases are **misdiagnosed** as tuberculosis, leading to delayed or improper treatment.
5. **Ineffective Health Initiatives**: Free annual health checkups have not proven effective in reversing or preventing silicosis.

12. Amendment to ALMM Order, 2019

The **Ministry of New and Renewable Energy (MNRE)** has approved an amendment to the **Approved Models and Manufacturers of Solar Photovoltaic Modules (ALMM) Order, 2019**.

Key Highlights of the Amendment

1. **Introduction of ALMM List-II (Solar PV Cells)**:
   a. All solar photovoltaic (PV) modules used in **government-backed projects**, **net-metering projects**, and **open-access renewable energy initiatives** must source their **solar cells** from the newly introduced **ALMM List-II**.
   b. **ALMM List-I**, which was issued in 2021, mandates that PV modules must be sourced from manufacturers listed under **List I**.
2. **Exemption Clause**: Projects that have already been awarded or completed their bidding process before the issuance of this order will be **exempted** from the new sourcing requirement.
3. **Promoting Technology Innovation**: **Thin-film solar modules** manufactured in **integrated solar PV module manufacturing units** will be considered compliant with the requirement to use solar PV cells from List-II.
4. **Implementation Timeline**: The amendment will come into effect on **1st June 2026**.

Challenges for India's Solar Manufacturing Sector

Despite efforts to boost domestic solar manufacturing, India's sector faces several challenges that hinder its growth:

1. **Inadequate Manufacturing Capacity**: India heavily relies on imports for solar equipment, with **62% of solar products** being imported from **China**, as well as other countries like **Vietnam** and **Malaysia**.
2. **Limited Access to Affordable Technology**: The lack of affordable technology for **mining and processing critical minerals** hampers the production of solar cells and modules.
3. **Additional Challenges**:
   a. **Low research and development (R&D)** investment.
   b. Difficulties in **sourcing raw materials**.
   c. Shortage of **skilled labor** in the solar manufacturing sector.

Initiatives Promoting Domestic Solar Manufacturing

1. **Production Linked Incentive (PLI) Scheme** for High Efficiency Solar PV Modules.
2. Scheme for **"Development of Solar Parks and Ultra Mega Solar Power Projects"** extended up to FY2025-26.
3. Foreign Direct Investment (FDI) up to 100 percent under the automatic route.
4. **Other:** Domestic Content Requirement (DCR), imposition of Basic Customs Duty on import of solar PV cells & modules.

13. Species in News

Species Name/Type	Context	Location	Description
Bald Eagle **(*Haliaeetus leucocephalus*)** Animal- (birds of prey/ Raptor)	Officially recognised as **America's national bird**	• **Natural Range** Most of Canada and Alaska, all of the contiguous United States, and northern Mexico • **Habitat** Varied habitat from bayous of Louisiana to the Sonoran Desert and the eastern deciduous forests of Quebec and New England	Opportunistic feeder, primarily fish. • Builds the **largest nest** of any North American bird, typically in old-growth trees. • Was listed as **"endangered," recovered to "threatened,"** and fully delisted by 2007. **Recovery Efforts**-Ban on DDT, protection under various wildlife acts, habitat preservation. **Population Trends** Declined to minimum in 1950s, substantially increased from 1966 to 2015. Northern birds are migratory, while southern birds are resident. Adult is mainly brown with a white head and tail. Females are about 25% larger than males
Lion-tailed Macaque (*Macaca silenus*) **Animal** –Mammal, beard ape, old world monkey. Also known as Wanderoo.	Adaptation to urban settings in Valparai, highlighting the complex relationship between wildlife and human activities, necessitating urgent conservation measures.	Endemic to the Western Ghats of India .Anamalai Hills, Nelliyampathy, Nilambur Ghats, Sholayar, Gavi, Sabarimala, Vallimalai Hills, Agumbe	• **IUCN Red List**: Endangered-CITES: Appendix I- Wildlife (Protection) Act, 1972: Schedule I • **Habitat**: Resides in the upper canopy of tropical moist evergreen and monsoon forests. • **Activity**: Diurnal, active during daylight. Save Silent Valley Campaign (1977-1980): This movement marked India's most intense environmental debate of the 1970s, focusing on the endangered lion-tailed macaque in Kerala's Silent Valley.

GANGES RIVER DOLPHIN **Animal,** Mammal, Freshwater dolphin	India Conducts First-ever Ganges River Dolphin Tagging in Assam. Organisation involved wildlife institute of India+ MOEFCC+Assam forest department + Aranyak+CAMPA	The species is found in the Ganges and its tributaries across South Asia, particularly within the territories of India, Nepal, and Bangladesh. Found in the Ganges-Brahmaputra-Meghna and Karnaphuli-Sangu river systems, and rivers in Nepal.	Solitary or found in small groups, shy around boats, making scientific observation challenging. Susu, soons, soans, or soos (Hindi); shushuk (Bengali); hiho or hihu (Assamese); bhagirath, shus, or suongsu (Nepali). Listed as 'Endangered' indicating a very high risk of extinction in the wild.
MONARCH BUTTERFLY	U.S. Fish and Wildlife Service proposed listing the monarch butterfly as a threatened species. 4,395 acres designated in California as "critical habitat"	In the Americas, the monarch ranges from southern Canada through northern South America.	99% risk of extinction for the western population by 2080 if trends continue.
DAMSELFISH SPECIES, *CHROMIS ABADHAH* ***Animal*** *species*	Newly discovered species	Mesophotic zone, deep-sea coral reefs in the Maldives	Pearly white body with pale blue undertones. - Darker back, lighter below the eyes. - Reflective scales below the eyes. - Silvery-blue circle around the iris. - Color changes to reddish-brown when preserved.
STELLARIA BENGALENSIS **Plant** /Annual herb	Newly discovered species	Sangser Forest, Kalimpong, West Bengal Mostly distributed in the Himalayan region of India	Related to Stellaria mcclintockiae found in the Nelliyampathy Hills of Kerala
Gympie-Gympie- **plants**/ Angiosperms	This Plant Is So Toxic It Makes People Who Touch It Suicidal	Found in rainforest areas of Australasia, the Moluccas, and Indonesia	Contains 'gympietides', a neurotoxin that affects pain receptors similar to toxins found in spiders and cone snails, resulting in severe pain.

G. Society And Culture

1. Right to Disconnect

1. The **Right to Disconnect** is a growing concern in India, especially in the wake of a tragic incident involving the **death of a young female employee due to work stress**.
2. This issue has sparked discussions on the necessity of establishing a formal law that recognizes the right to disconnect from work.

What is the Right to Disconnect?

1. The **Right to Disconnect** refers to the concept that employees should not be compelled to respond to calls or messages from their employers after work hours.
2. Employees exercising this right should not be subjected to any form of disciplinary action by their employers.
3. This would help in maintaining a balance between work and personal life, allowing individuals to truly disconnect once their official workday is over.

Need for the Right to Disconnect in India

There are several pressing reasons to introduce and enforce a law recognizing the Right to Disconnect in India:

1. **Psycho-Social Impact:**
   a. Continuous work-related communication after office hours weakens social bonds, often leading to feelings of isolation.
   b. It may also increase the risk of mental health issues, cardiovascular diseases, and other health problems associated with chronic stress.
2. **Impact on Women:** A recent report highlights that woman in professional sectors like auditing, IT, and media work over **55 hours a week** on average. The lack of a work-life balance disproportionately affects women, further exacerbating gender inequalities in the workplace.
3. **Other Concerns:**
   a. The absence of a proper disconnect from work leads to **loss of productivity** over time.
   b. Extended work hours, excessive screen time, and disrupted sleep cycles cause issues like **insomnia** and poor overall health, diminishing employee well-being and performance.

Global Position on the 'Right to Disconnect'

1. Several countries have implemented legal frameworks or judicial rulings that support the **Right to Disconnect**.
2. These **laws and regulations** ensure that employees are not required to respond to **work-related communications** outside of their designated working hours.

Below is a summary of how different countries have approached this issue:

1. **France, in 2001**, the **Labour Chamber of the French Supreme Court** ruled that employees are **under no obligation** to work from home or take-home files and working tools. This ruling affirmed the principle that employees should be able to disconnect from work once their working hours are over, promoting a better work-life balance.
2. **Portugal** has enacted a **Right to Disconnect** law, which makes it **illegal** for employers to contact employees outside working hours, except in cases of emergencies. This legislation provides clear boundaries to prevent overwork and ensures that employees have the right to rest.
3. In **Spain**, public workers and employees are granted the **right to switch off devices** and disconnect from work outside of working hours. This law aims to protect employees from the pressures of constant availability and ensures that they have personal time free from work-related interruptions.
4. **Australia** has recognized the **right to disconnect** by passing a parliamentary measure that gives employees the **right to disconnect from work outside of working hours**. This regulation helps protect workers from the strain of after-hours work demands.

Status of the Right to Disconnect in India

India currently lacks specific laws that recognize or guarantee the Right to Disconnect from work. However,

there are certain constitutional provisions and judicial pronouncements that are relevant to the broader issue of worker welfare.

1. **Constitutional Provisions:**
   a. **Article 38**: Directs the state to promote the welfare of its people, which includes protecting employees from undue work stress.
   b. **Article 39(e)**: Mandates the state to secure the strength and health of workers, which can be interpreted to include work-life balance and protection from excessive work demands.
2. **Judicial Pronouncements:**
   a. **Vishakha v. State of Rajasthan (1997)**: This landmark case emphasized the need for a **safe working environment for women** and the prevention of workplace harassment, indirectly supporting the need for rules like the Right to Disconnect.
   b. **Ravindra Kumar Dhariwal and Ors v. Union of India (2021)**: This case stressed the importance of accommodating **persons with disabilities** in the workplace, again highlighting the broader context of employee well-being.
3. **Recent Initiative:**
   a. In **2018**, a Private Member's Bill was introduced in the **Lok Sabha** that sought to define and enforce the **Right to Disconnect** from work after official working hours.
   b. This bill was a step forward in addressing the growing concern about work-life balance in India.

As the need for work-life balance becomes increasingly urgent, especially in the context of modern working conditions and the adverse impact on health, the **Right to Disconnect** is an essential step towards ensuring employee well-being in India. Legal recognition of this right could have far-reaching effects on mental health, gender equality, and productivity, ultimately contributing to healthier and more sustainable work environments.

2. Sexual Harassment Case Cannot Be Closed Based on Compromise: Supreme Court

The **Supreme Court of India** in the case of **Ramji Lal Bairwa & Anr vs State of Rajasthan & Ors** held that cases of **sexual assault** under the **Protection of Children from Sexual Offences (POCSO) Act, 2012** cannot be quashed based on a compromise between the parties. This decision came after the **Rajasthan High Court** had quashed a sexual assault case under the Act, which was based on a compromise between the victim's family and the accused.

Context of the Case:

1. The case involved a **16-year-old girl** who was allegedly sexually molested by a teacher at a school in **Sawai Madhopur**, **Rajasthan**.
2. Despite the allegations, the accused teacher was not arrested, and a compromise was allegedly reached between the victim's family and the teacher.
3. The **Rajasthan High Court** accepted this compromise and **quashed the FIR**, ending the case without a trial.
4. **Ramji Lal Bairwa**, a **public interest litigant (PIL)** from Rajasthan, challenged this decision by filing a petition before the **Supreme Court**.
5. **Supreme Court's Jurisdiction**: The case was heard under **Special Leave Petition** (SLP), which is a special power vested in the Supreme Court under **Article 136** of the Constitution, allowing it to grant leave to appeal against any judgment or order passed by any court or tribunal.

Supreme Court's Key Observations:

1. **Rejection of Compromise in Such Cases**:
   a. The **Supreme Court** referred to the **State of M.P. v. Laxmi Narayan (2019)** case, which established the **precedent** that offenses against society cannot be compromised.
   b. The **Delhi High Court** judgment in **Sunil Raikwar v. State** was also endorsed, which reaffirmed that **POCSO** offenses cannot be settled by compromise.
2. **Non-Private Nature of the Offense**:
   a. The Court emphasized that sexual offenses under the **POCSO Act** are not private matters and, therefore, cannot be treated as cases eligible for settlement through compromise.
   b. It was further observed that crimes with **serious societal implications**, especially involving children, should not be dismissed based on a settlement between the parties.

About the POCSO Act, 2012:

1. **Aim of the POCSO Act**:
   a. The **POCSO Act** is **gender-neutral** legislation aimed at ensuring the safety and protection of children from **sexual abuse**, **harassment**, and exploitation.
   b. The Act punishes offenders based on the **severity of the offenses** and provides a comprehensive framework to address child sexual abuse.
2. **Definition of a Child**: As per the Act, a **child** is defined as any individual who is **below 18 years of age**.
3. **Categories of Sexual Offenses**: The Act covers three broad categories of sexual offenses:
   i. **Sexual Assault**
   ii. **Sexual Harassment**
   iii. **Using a Child for Pornography**
4. **2019 Amendment**: The **2019 amendment** introduced **stricter punishments**, including the **death penalty**, for those committing sexual offenses against children.

3. Female Labor Force Participation in India

The **Economic Advisory Council to the Prime Minister (EAC-PM)** has released a **working paper** highlighting a significant **increase in the Female Labor Force Participation Rate (LFPR)** in India. This paper discusses the **trends, factors, and challenges** affecting female participation in the workforce.

Key Findings

1. **Rural Female LFPR**: Increased sharply from 24.6% in 2017-18 to 47.6% in 2023-24 (~69% growth).
2. **Urban Female LFPR**: Rose modestly from 20.4% to 25.4% (~25% growth).
3. **Regional Variation**: States such as **Bihar**, **Punjab**, and **Haryana** exhibit lower female LFPR compared to other regions.

Factors Influencing Female LFPR

The working paper highlights three key factors affecting female LFPR:

1. **Age**:
   a. Female LFPR follows a **bell-shaped curve**:
   a. **Rises** between the ages of 20-30.
   b. **Peaks** during 30-40 years.
   c. **Declines sharply** thereafter.
   b. In contrast, male LFPR remains high (~100%) between the ages of 30-50 and gradually declines afterward.
2. **Marriage**:
   a. Marriage significantly reduces female LFPR, especially in **urban areas**, where the decline is more pronounced compared to rural settings.
   b. This is largely due to **household responsibilities**, which are more prevalent in urban areas.
3. **Parenthood**:
   a. The presence of **children under 14** significantly reduces female LFPR, particularly among women aged 20-35.
   b. This reduction is **more pronounced in urban areas**, suggesting that **childcare responsibilities** are a major factor in women's decisions to join the workforce.

Reasons for Low Participation of Women in the Workforce

Several factors contribute to the low participation of women in the workforce, including:

1. **Safety Concerns**:
   - Workplace sexual harassment cases have risen from **402 in 2018** to **422 in 2022**, according to the National Crime Record Bureau.
   - This increase in harassment cases contributes to the reluctance of women to join or remain in the workforce.
2. **The Double Burden**:
   - Women's **unpaid care work** contributes **3.1%** to India's GDP, while men's contributions are only **0.4%**, as per the Economic Survey 2024.
   - The disproportionate burden of domestic and caregiving work limits women's ability to participate in paid labor.
3. **Education**: According to the **Periodic Labor Force Survey (PLFS)**, **37.94%** of women stay out of the workforce to continue their education, indicating that pursuing education is a priority for many women.

4. **Digital Divide**: The **National Family Health Survey-5 (2019-2021)** found that only **33%** of women in India have used the internet, pointing to the challenges women face in accessing digital tools and opportunities in the workforce.
5. **Social Protection**:
   a. The **eShram database** (March 2022) reveals that women constitute **52.7%** of the **287 million registered unorganized workers**, surpassing men in this sector.
   b. The lack of social protection in informal sectors often leads to limited security and stability for women workers.
6. **Increased Household Income**: As household incomes increase, women are more likely to **drop out of the labor force**. This is because domestic, non-market work is perceived to have a higher status than market work, according to the **International Labor Organization**.

Refer Current Affairs Total (CAT) Magazine November 2024, Page 102-105 for Comprehensive Coverage of ***Female Labor Force Participation in India.***

4. Supreme Court Action on Manual Scavenging

1. The **Supreme Court of India** recently sought an **Action Taken Report** (ATR) regarding its directions issued in the **Dr Balram Singh V. Union of India & Ors (2023)** case.
2. The case centers around the need to eradicate manual scavenging and improve the conditions of sewage workers across the country.

Directions Issued in Dr Balram Singh V. Union of India & Ors (2023) Case

The Apex Court directed the **Union Government**, **State Governments**, and **Union Territories** to take several measures to tackle the issue of manual scavenging:

1. **Eradication of Manual Scavenging**: Immediate steps must be taken to eliminate manual scavenging and hazardous cleaning practices across the country.
2. **Rehabilitation Measures**: Full rehabilitation for sewage workers and their families, including:
   a. Employment opportunities for the next of kin
   b. Education for the children of deceased workers
   c. Skill training for the families of sewage workers
3. **Enhanced Compensation**:
   a. Compensation for sewer deaths was increased to **₹30 lakh** from the earlier **₹10 lakh**.
   b. Compensation for sewer victims who suffer disabilities was enhanced to **₹20 lakh** from the previous **₹10 lakh**.
4. **National Survey**: The Supreme Court directed the government to conduct a comprehensive national survey within **one year** to identify manual scavengers across states and union territories.
5. **Coordination of Agencies**: The **National Commission for Safai Karamcharis** (NCSK), **National Commission for Scheduled Castes** (NCSC), **National Commission for Scheduled Tribes** (NCST), and the **Union Government** are required to coordinate and prepare training and education modules to be used by district and state-level agencies, in accordance with the **2013 Act**.

About Manual Scavenging

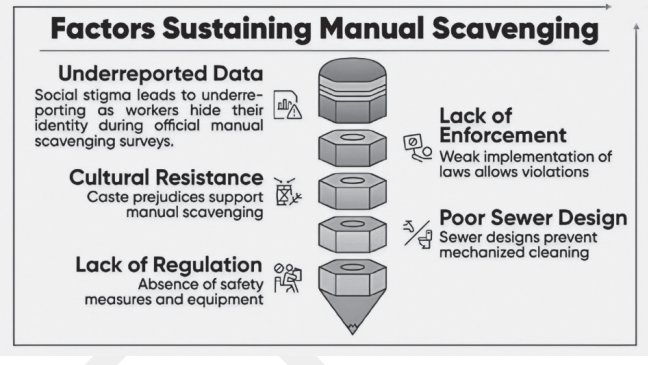
1. According to the **Prohibition of Employment as Manual Scavengers and their Rehabilitation (PEMSR) Act, 2013**, manual scavenging refers to the practice of manually cleaning, carrying, or handling human excreta from insanitary latrines, open drains, or pits.
2. **Manual scavenging** has been officially banned since **1993** under the **Employment of Manual Scavengers and its Prohibition Act, 1993**.
3. As of **31st July 2024**, **732 out of 766 districts** in India have reported themselves as **manual scavenging-free**.

Government Steps to End Manual Scavenging

1. **Legislative Measures:**
   a. **Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013**:
      - Prohibits employment as manual scavengers and provides for the rehabilitation of manual scavengers and their families.
      - Every offence under this Act is **cognizable and non-bailable**.
   b. **Employment of Manual Scavengers and Construction of Dry Latrines (Prohibition) Act, 1993**: Prescribes punishment for individuals who employ manual scavengers or construct dry latrines/toilets.

c. **Other Relevant Acts**:
   - **The Protection of Civil Rights Act, 1955**
   - **The SC/ST (Prevention of Atrocities) Act, 1989**

2. **Schemes to Support Rehabilitation:**
   a. **NAMASTE Scheme (2023)**:
      - A **Central Sector Scheme** implemented by the **National Safai Karamchari Financial Development Corporation** (NSKFDC) under the Ministry of Social Justice.
      - Aims to ensure the **safety, dignity, and rehabilitation** of hazardous sanitation workers.
   b. **Swachh Bharat Mission (Urban 2.0)**: Rs **371 crore** approved for release to states for acquiring machines and improving mechanization in smaller towns.
3. **Dedicated Institutions:**
   a. **National Commission for Safai Karamcharis (NCSK)**: Initially created as a statutory body in **1994** but later became a non-statutory body under the Ministry of Social Justice after the Act lapsed.
   b. **National Safai Karamchari Financial Development Corporation (NSKFDC)**: Established in **1997**, it operates as a non-profit company under the Ministry of Social Justice to uplift Safai Karamcharis through various loan and non-loan-based schemes.



Way Forward

1. **Suggestions by the National Human Rights Commission (NHRC):**
   a. **Distinction Between Sanitation Workers and Manual Scavengers**: The NHRC suggests clarifying the distinction between sanitation workers and manual scavengers in the **2013 Act**.
   b. **Regulation of De-sledging Market**: Empanelment and regulation of the de-sledging market to ensure safer practices.
   c. **Safety Gear and Awareness Workshops**: Providing necessary safety gear to workers and conducting awareness workshops about safe practices.
   d. **Support for Technological Innovations**: Providing **financial assistance** to innovators working on technological solutions for hazardous waste cleaning.
2. **Technological Intervention:** Modern sanitation technologies, such as **automated sewer cleaning machines** and **robots**, can significantly reduce dependence on human labor for cleaning sewers and septic tanks.
   - **Example**: **Kerala's Bandicoot**, a robotic scavenger, represents a successful technological intervention.
3. **Upgrading Sanitation Infrastructure: Investments in improved sanitation infrastructure**, including advanced sewage and sewage treatment systems, will help reduce the need for manual labor.
4. **Survey and Identification of Manual Scavengers: Periodic surveys** should be conducted to identify manual scavengers across India, ensuring they benefit from rehabilitation schemes. The last survey was conducted in **2018**.

While legislative measures, schemes, and dedicated institutions have been set up to tackle manual scavenging in India, continued efforts are necessary to completely eradicate this practice. The Supreme Court's directions in the **Dr Balram Singh V. Union of India & Ors (2023)** case, alongside technological advancements and stronger regulatory frameworks, offer a path forward toward eliminating manual scavenging and improving the dignity and safety of sanitation workers.

5. LMV Holders Can Drive Transport Vehicles

1. Recently, the **Supreme Court** ruled that a person holding a **driving licence** for a **light motor vehicle (LMV)** is also entitled to drive a **transport vehicle** with an unladen **weight upto 7,500 kg.**
2. The **SC upheld its 2017** verdict, which also permitted **LMV licence** holders to drive transport vehicles under **7,500 kg** gross weight.
   - The 2017 decision was accepted by the Central Government, leading to amendments in the **Motor Vehicles Rules, 2017.**

3. As per **Section 2(21)** of **The Motor Vehicles Act, 1988,** a light motor vehicle is a **transport vehicle, omnibus, motor car, tractor, or road-roller** with a gross vehicle weight or unladen weight **not exceeding 7,500 kilograms**.
4. The SC verdict challenged the practice of insurance companies rejecting claims in accidents involving transport vehicles driven by those with LMV licence.

6. South Korea Becomes a 'Super-Aged' Society

1. Recently, the South Korean Ministry of the Interior and Safety formally declared that South Korea has transitioned into a **"super-aged"** society.
2. This milestone occurred as the share of the population aged 65 or over surpassed 20%, making South Korea the **second country in Asia, after Japan**, to achieve this status.

Definition of a "Super-Aged" Society:

According to the United Nations (UN), the classification of a society based on its elderly population is as follows:

1. **Aging Society**: When the share of people aged 65+ exceeds 7%.
2. **Aged Society**: When the share of people aged 65+ reaches 14% or more.
3. **Super-Aged Society**: When the share of people aged 65+ exceeds 20%.

Global Status of Aging Populations:

1. The global population aged 60 and above was 1 billion in 2020. It is projected to reach 2.1 billion by 2050.
2. Population aging, which initially affected high-income countries like Japan, is accelerating in low- and middle-income countries. By 2050, two-thirds of the elderly population will reside in these countries.

India's Future Aging Demographics:

India's elderly population is projected to exceed 20% of the total population by 2050, according to the UNFPA (2023).

Challenges of an Aging Society:

As societies become increasingly aged, several challenges arise, spanning economic, social, and infrastructure-related aspects:

1. **Economic Challenges:**
   a. **Shrinking Workforce**: A declining working-age population will reduce the labor force, which may hinder economic growth.
   b. **Rising Healthcare Costs**: As the elderly population increases, healthcare demand and associated costs will also rise.
   c. **Increased Expenditure on Social Security Systems**: Governments may face greater pressure to provide for pension schemes, healthcare support, and other social welfare programs.
2. **Social Challenges:**
   a. **Caregiving Responsibilities**: Families will face greater caregiving duties for elderly relatives, leading to increased personal and societal burdens.
   b. **Bridging Generational Gaps**: Societal cohesion will require efforts to maintain understanding and cooperation between younger and older generations.
3. **Infrastructure Challenges:**
   a. **Age-friendly Urban Spaces**: Cities and urban areas need to be restructured to accommodate the needs of an aging population, including accessible public spaces and housing.
   b. **Transportation Systems**: Modifications to public transport systems may be required to support reduced mobility among the elderly.

Steps Taken for the Welfare of Older Adults: Global and National Initiatives

Global Initiatives	India's Initiatives
1. **UN - Madrid International Plan of Action on Ageing (2002)**: Promotes a better quality of life for older adults globally, focusing on their rights and well-being.	1. **National Policy for Older Persons (1999)**: The policy aims to ensure a life of dignity for older persons and focuses on promoting their welfare, health, and economic security.

2. **WHO Global Strategy (2016-2020)**: Focuses on healthy aging and the creation of age-friendly environments that support the health and participation of older adults in society.	2. **Maintenance and Welfare of Parents and Senior Citizens Act, 2007**: Ensures the maintenance and welfare of parents and senior citizens, mandating that children and heirs provide necessary care and support.
3. **UN Sustainable Development Goals (SDGs)**: • **Goal 3: Health** – Addresses aging through the promotion of healthy lives and well-being for all at all ages. • **Goal 10: Reduced Inequality** – Focuses on reducing inequalities that older people face, ensuring inclusivity and equal access to opportunities.	3. **National Programme for the Health Care for the Elderly (NPHCE)**: Focuses on providing preventive, curative, and rehabilitative treatment for older adults, ensuring comprehensive health care services for the elderly population.
4. **UN Decade of Healthy Ageing (2021-2030)**: Aims to improve the lives of older adults by promoting healthy aging and reducing age-related inequalities through coordinated global action over the decade.	4. **Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJAY)**: A public health insurance scheme that provides affordable and accessible healthcare to the elderly, along with other vulnerable populations, ensuring financial protection against medical expenses.

7. Winter Char Dham Circuit in Uttarakhand

1. In December 2024, the **Uttarakhand state government** inaugurated the **Winter Char Dham Circuit**, with the aim of attracting tourists to the region during the off-season winter months.
2. This initiative is designed to provide an alternative to the peak-season pilgrimage and boost tourism in Uttarakhand during the winter.

Char Dham in Uttarakhand

The Char Dham refers to four sacred Hindu shrines located in the **Garhwal Himalayas** in Uttarakhand. These shrines hold great religious significance and attract millions of pilgrims each year.

1. **Gangotri**: Shrine of Goddess Ganga (located in Uttarkashi)
2. **Yamunotri**: Shrine of Goddess Yamuna (located in Uttarkashi)
3. **Kedarnath**: Shrine of Lord Shiva (located in Rudraprayag)
4. **Badrinath**: Shrine of Lord Vishnu (located in Chamoli)

Each year, from **May to November**, lakhs of pilgrims visit these shrines, accounting for about **8.4%** of Uttarakhand's annual domestic tourist footfall.

Winter Char Dham Circuit

During the **winter months**, heavy snowfall renders the Char Dham shrines inaccessible, and their gates are closed. To ensure that the pilgrimage continues during this period, the presiding deities of these temples are moved to lower-altitude shrines, known as their **winter seats**.

1. **Gangotri**: Moved to **Mukhba** in Uttarkashi
2. **Yamunotri**: Moved to **Kharsali** in Uttarkashi
3. **Kedarnath**: Moved to **Omkareshwar Temple** in Ukhimath, Rudraprayag

4. **Badrinath**: Moved to **Pandukeshwar** in Chamoli

This **Winter Char Dham Circuit** aims to draw pilgrims to these winter seats of the shrines, promoting religious tourism and increasing tourist footfall to Uttarakhand during the off-season months.

Concerns and Challenges

The Winter Char Dham Circuit, while beneficial for tourism, raises several concerns:

1. Overcrowding
2. Commercialization of Sacred Sites
3. Strain on Local Infrastructure
4. Environmental Impact
5. Safety, Security, and Health Risks
6. **Wildlife Disturbance**:

Recommendations

The **National Green Tribunal** has recommended that the Uttarakhand state government assess the **carrying capacity** of the Char Dham shrines and their surrounding areas. This assessment is crucial to maintaining a **delicate balance** between the **infrastructure development** needed for tourism and the **environmental considerations** necessary to preserve the region's natural and cultural heritage.

8. Sahitya Akademi

Naga writer Easterine Kire's "Spirit Nights" wins Sahitya Akademi Award 2024.

About Sahitya Akademi

1. **Genesis:** Formally inaugurated in **1954** and Registered under the **Societies Registration Act, 1860.**
2. **Ministry:** An autonomous body under **Ministry of Culture.**
3. **Role:** Undertakes **literary activities in 24 languages** (22 scheduled languages and **English** and **Rajasthani**).
   - Honoured as **'India's National Academy of Letters'.**
4. **Its major awards:** Sahitya Akademi Award, **Bhasha Samman.**

9. Indira Gandhi Prize

Former Chile President, Michelle Bachelet is to be conferred the **Indira Gandhi Prize for Peace, Disarmament and Development, 2024.**

- She would be awarded for her work to improve gender equality, human rights and democracy.

About Indira Gandhi Prize

1. Awarded **annually** to a **person or organization** in recognition of creative efforts towards **promoting international peace and disarmament**, etc.
2. It consists of an **award of Rs.10 million** and a **trophy with a citation.**
3. Scrutiny of proposals and final selection is made by **a jury of 5 to 9 eminent persons,** named by the Chairperson of the Indira Gandhi Memorial Trust.

10. Gharchola Sari from Gujarat

The **Gharchola**, a traditional wedding sari from **Gujarat**, has recently been granted the prestigious **Geographical Indication (GI) tag**. This sari holds immense cultural significance, particularly in **Hindu** and **Jain** weddings.

About Gharchola

1. **Traditional Colors**: The Gharchola sari is historically crafted in **auspicious colors** such as **red**, **maroon**, **green**, and **yellow**.
2. **Cultural Significance**: This sari is traditionally worn during **Hindu** and **Jain** wedding ceremonies, symbolizing the rich cultural heritage of Gujarat.

About Geographical Indication (GI) Tag

A **Geographical Indication (GI)** is a sign used on products that possess qualities, reputation, or characteristics inherently linked to a specific geographical origin.

1. **Legal Framework in India**: The GI tag in India is governed under the **Geographical Indications (GI) of Goods Act, 1999**.
2. **Validity**: The registration of a GI tag is valid for a period of **10 years**, with the option for **renewal**.

Benefits of GI Tag

1. **Legal Protection**: GI tags provide **legal protection** to products, preventing unauthorized use by others and safeguarding the identity of the product linked to its geographical origin.
2. **Boost to Exports**: GI protection enhances the reputation of the product, promoting its uniqueness and quality, thus **boosting exports** both domestically and internationally.

H. ETHICS

1. The Multifaceted Dimensions of Peace: A Global Commitment to Harmony and Justice

In today's tumultuous world, peace remains an ideal and a necessity for fostering global stability and individual well-being. The 10th Global Forum of the UN Alliance for Civilizations recently saw world leaders adopt the **Cascais Declaration**, emphasizing the importance of promoting peace through intergenerational dialogue, sustainable development, and human rights. In alignment with these efforts, the **UNESCO HK Association's 2012 Peace Project** introduced the concept of the *Aspects of Peace*, redefining peace as a harmonious state both within individuals and across various facets of life.

The Five Aspects of Peace

1. **Individual/Inner Peace**
   - **Concept:** Inner peace enables individuals to manage life's challenges, reduce stress, and positively contribute to society. It involves cultivating emotional stability and self-awareness.
   - **Challenges:** Mental health issues, such as anxiety and depression, exacerbated by work-life imbalance and economic instability. Consumerism and materialism, which can detract from deeper, meaningful fulfillment.
2. **Social Peace**
   - **Concept:** Social peace focuses on building peaceful relationships within communities through collaboration, conflict resolution, equality, and justice.
   - **Challenges:** Discrimination and exclusion, leading to resentment and violence. Misinformation, hate speech, and prejudices related to gender, race, and other identities.
3. **Ecological Peace**
   - **Concept:** Ecological peace underscores the importance of sustainable development and maintaining a balanced relationship with the environment to ensure a peaceful future.
   - **Challenges:** Climate change and extreme weather patterns driving resource conflicts and displacement. Insufficient global cooperation on critical environmental issues.
4. **Cultural Peace**
   - **Concept:** Cultural peace encourages understanding, respect, and appreciation for cultural diversity through exchange and collaboration across cultural boundaries
   - **Challenges:** Ethnocentrism, cultural intolerance, and hate speech that fuel divisions and conflict.
5. **Political Peace**
   - **Concept:** Political peace promotes just and non-violent relationships between groups, governments, organizations, and societies to foster harmony and cooperation.
   - **Challenges:** Global challenges such as territorial disputes, rivalries, weak international governance, and nuclear proliferation. National issues, including corruption, nepotism, and lack of the rule of law.

Philosophical Foundations of Peace

1. **Gandhian Conception of Peace:** Rooted in **Ahimsa** (nonviolence) and **Satya** (truth), Gandhi's approach emphasizes self-purification, simplicity, and compassion as necessary components for societal peace.
2. **Utilitarian Concept of Peace:** Peace is achieved when actions maximize overall happiness and minimize suffering, creating a society that enhances collective well-being.
3. **Kantian Notion of Peace:** Immanuel Kant argued that peace is an active moral obligation for individuals and nations. He envisioned **perpetual peace** through rationality, universal morality, and international cooperation.

Key Stakeholders in Promoting Peace

Category	Key Stakeholders	Role in Promoting Peace
Global/Political Peace	Governments	Enact policies, laws, and regulations that promote peace, human rights, and justice.
	International Organizations (e.g., UN)	Mediate conflicts, promote diplomacy, and coordinate global efforts toward peace.
	Civil Society Organizations	Advocate for peace, human rights, and social justice at local, national, and global levels.
Social and Cultural Peace	Community Leaders	Help resolve conflicts, advocate for justice, and promote social cohesion within communities.
	Religious & Spiritual Leaders	Promote peace by encouraging love, compassion, forgiveness, and tolerance.
	Mainstream and Social Media	Counter misinformation, hate speech, and encourage peaceful dialogue.
Individual/Inner Peace	Individuals	Practice tolerance, empathy, and understanding in daily life, creating peaceful environments within families and communities.
	Families	Instill values of nonviolence, respect, and conflict resolution in children, laying the foundation for peace.
	Educational Institutions	Shape future generations through curricula and teachings that emphasize peaceful values, critical thinking, social justice, and sustainability.

Initiatives Undertaken to Restore and Promote Peace

1. **Global Peace:** Various global institutions like World Bank, UN, etc. fostering the dialogue and cooperation, multipolarity to ensure global stability and peace.
2. **Political Peace:** Global institutions like **International Court of Justice** (ICJ) and several peace negotiations and treaties ensure peaceful dispute settlement.
3. **Ecological Peace:**Initiatives like **Paris Agreement** address environmental degradation to **prevent resource-based conflicts**. Programs like **WWF's Earth Hour** raise awareness about **ecological sustainability**.
4. **Inner Peace:**Global events such as **International Yoga Day** and **World Meditation Day** foster mental well-being.
5. **Cultural Peace: UNESCO's World Culture Forums** promote understanding between diverse cultural groups.
    - UNESCO's **cultural heritage Programe** works to preserve cultural landmarks prevent destruction during conflicts, symbolizing unity and peace.

Peace is a holistic and multifaceted concept. It is not merely the absence of conflict, but the active presence of harmony, justice, equality, and understanding across all areas of life—within individuals and between nations. The commitment to building peace from the inside out fosters sustainable solutions to global challenges such as human rights, environmental protection, and economic equity. The promotion of peace requires the collective effort of individuals, communities, governments, and international organizations. Together, we can create a peaceful world, one step at a time.

2. Case Study - Emotional Intelligence in Corporate Offices

Scenario: Ranbir, the CEO of a growing company, faces a recurring problem in the bi-monthly open meetings with staff. These meetings, intended to address employee grievances and concerns, have become a source of frustration for Ranbir. Employees often bring up complaints about minor issues, such as insufficient lounge space, inadequate bathrooms, and crèche facilities. Despite acknowledging space constraints, employees continue voicing the same issues, frustrating Ranbir. He has developed a habit of attending these meetings with a cheerful demeanor but a disengaged attitude, mentally "switching off" during the proceedings. This lack of attention and empathy has contributed to employee dissatisfaction, and several staff members have left the company, negatively impacting the business.

Question: What actions would you take in Ranbir's situation, and why?

Analysis

Key Issues in the Case:

1. **Employee Dissatisfaction:**
   a. The staff feels unheard and frustrated due to unresolved grievances.
   b. The ongoing lack of attention to employee concerns leads to a decline in morale and increasing attrition.
2. **CEO's Attitude:**
   a. Ranbir's dismissive and disengaged behavior during meetings exacerbates the situation, preventing meaningful resolution.
   b. His failure to empathize with employees' concerns contributes to a lack of trust and respect between the management and staff.
3. **Company Growth:**
   a. As the company has recruited new specialists, the physical infrastructure has become inadequate, further highlighting the need for Ranbir to address the issue promptly.
   b. The company's growth and the resulting strain on resources have created a situation that demands swift action.

Stakeholders:

1. **Ranbir (CEO):** Responsible for managing the company, addressing employee grievances, and ensuring organizational health.
2. **Employees (Old and New):** Their morale, productivity, and retention are impacted by management's response to their concerns.
3. **Shareholders:** Concerned about the company's performance, employee satisfaction, and overall growth.
4. **Functional Heads and Managers:** Responsible for facilitating communication and addressing departmental issues.

Situational Challenges for the CEO:

1. **Crisis Management:**
   a. Ranbir must handle the employee dissatisfaction with limited resources while minimizing the negative impact on the organization.
   b. Effective decision-making is crucial to restoring the company's culture and preventing further attrition.
2. **Conflict Management:**
   a. Ranbir must manage conflicts arising from employee grievances, which are critical to maintaining a positive work culture.
   b. He needs to address both tangible (space) and intangible (emotional) issues to resolve conflicts effectively.
3. **Leadership Challenges:**
   a. Ranbir's leadership style appears detached and indifferent, which negatively impacts the relationship with employees.
   b. He needs to display emotional intelligence and empathy to reconnect with his team.

Ethical Components to Apply:

1. **Emotional Intelligence (EI):**
   a. **Self-awareness**: Recognizing his own emotional response to meetings and its impact on staff morale.
   b. **Self-regulation**: Managing his reactions and disengagement in meetings.
   c. **Motivation**: Keeping the focus on company goals while being mindful of employee concerns.
2. **Emotional Quotient (EQ):**
   a. **Empathy**: Understanding and acknowledging the emotions and frustrations of the employees.
   b. **Social Skills**: Building rapport, communicating openly, and resolving conflicts effectively.
   c. **Interpersonal Relationships**: Strengthening connections between management and employees to foster a collaborative environment.
3. **Leadership Styles:**
   a. **Transformational Leadership**: Inspiring and motivating employees by addressing their concerns and demonstrating commitment to change.
   b. **Servant Leadership**: Prioritizing the well-being and needs of employees, helping them feel valued and supported.

CEO's Course of Action:

Concrete Plan of Action:

1. **Immediate Workspace Improvements:**
   a. **Office Expansion:** Given the company's growth, Ranbir should prioritize finding a larger workspace. This can be an immediate, long-term solution to employee concerns.
   b. **Temporary Solutions:** Until a permanent solution is found, temporary adjustments can be made:

- Allocating nearby office space on rent to relieve the pressure on the current infrastructure.
- Introducing flexible work-from-home policies (hybrid model), reducing the number of employees in the office at any given time.

2. **Engage More Actively in Meetings:**
   a. **Active Listening:** Ranbir should participate more attentively in the meetings. Rather than mentally checking out, he must listen to employee grievances with empathy and patience, even if they seem trivial.
   b. **Acknowledging Concerns:** By showing that he values their input, Ranbir will foster a sense of **emotional connection** and **respect**. This can rebuild trust between the management and employees.
   c. **Responsive Feedback:** Addressing the concerns, even if partial solutions are offered initially, will show employees that their voices are heard and valued.
3. **Encourage Open Dialogue and Transparency:**
   a. **Focus Group Discussions:** In addition to the open meetings, Ranbir could consider having smaller, focused discussions with specific departments or teams. This would allow for deeper, more targeted conversations on issues affecting their work and well-being.
   b. **Regular Follow-ups:** Establishing a **follow-up system** ensures that issues raised in meetings are tracked and resolved over time, giving employees confidence that their concerns are being actively addressed.
4. **Empathy and Emotional Intelligence Training:**
   a. Ranbir, along with other managers, should undergo **empathy training** to better understand the emotional needs of their teams.
   b. Developing **emotional intelligence** within the leadership team can help in responding to employee grievances in a more constructive and empathetic manner.
5. **Addressing the Underlying Culture:**
   a. **Cultivating Emotional Intelligence (EQ):** Ranbir can introduce EQ-based workshops for all staff to improve self-awareness, emotional regulation, and social skills. This would help to foster a more harmonious and emotionally intelligent workplace culture.
   b. **Recognize Employee Needs:** Moving beyond mere infrastructure concerns, addressing **employee well-being** holistically (e.g., work-life balance, health, professional development) would help boost morale and retention.

Conclusion:

In this scenario, the resolution of conflict and improvement of organizational dynamics requires a shift from an **indifferent, disengaged approach** to one that is **empathetic, attentive, and responsive**. Ranbir must prioritize **emotional intelligence** and **active listening** to rebuild trust and restore a healthy work culture. While addressing physical infrastructure challenges, he must also nurture emotional well-being among employees to ensure that they feel valued. By fostering a culture of **open communication, empathy**, and **emotional awareness**, Ranbir can resolve the conflict, enhance employee satisfaction, and strengthen the organization in the long run.

3. When For-Profit Companies Fund Research, How is Science Affected?

Case Study: The Release of AlphaFold 3 by Google DeepMind (May 2024)

Introduction to AlphaFold 3

1. **AlphaFold 3** is a **powerful AI tool released by Google DeepMind in May 2024, designed to predict the shapes of proteins.**
2. This **new version is based on previous versions of AlphaFold** and **AlphaFold 2**, both of **which were made open-source, meaning the code was available for free for scientists to use and improve.**
3. **AlphaFold 3**, however, **was different.**
4. The **full code wasn't shared with the public.**
5. Some parts, like the protein-drug interactions simulator, were kept private.

Why Was Information Withheld?

1. **Isomorphic Labs**, a company spun off from DeepMind**, is using AlphaFold 3 to help develop new drugs, which is why DeepMind chose to keep some parts of the code private.**
2. Head of AI science at DeepMind, explained that they wanted to balance sharing the tool with **making sure Isomorphic Labs could still make money from its drug research.**

The Debate: Science vs. Intellectual Property (IP)

1. The main issue here is the **conflict between making scientific work open and protecting it for profit**.
2. For-profit companies, like those behind AlphaFold 3, often use **patents** and **intellectual property (IP)** laws to protect their ideas and inventions.
3. However, **science traditionally works best when it is open**, allowing other researchers to check, build upon, and improve the work.

Key Views on the Issue

1. A professor at the University of Toronto, argues that **keeping scientific discoveries secret** goes against the goal of **advancing science**.
2. He believes that **making research available to everyone benefits society as a whole.**
3. Some scientists, **like Haibe-Kains, believe in sharing the basic software or algorithms but keeping a commercial version for sale or exclusive use.**
4. This lets researchers contribute to public knowledge while also making money from a more advanced version.
5. **Pressure to Commercialise:** Many universities and research institutions rely on **commercialisation** to fund their research.
6. **This creates pressure for scientists to patent their discoveries** and potentially keep parts of their work private.

How Can Scientists Balance Openness and Commercialisation?

1. One possible approach is **to publish the basic version of the code and algorithms openly, but keep the more advanced version,** which is ready to use, for commercial use.
2. This allows scientists to contribute to the public **but still make money from their work.**
3. **Thomas Hemmerling's Approach:** Hemmerling, a professor in anesthesiology, **worked on a robot that administers anesthesia automatically**.
4. He published the basic algorithms but patented specific parts of the technology.
5. This allowed others to use his methods while protecting his **intellectual property**.

The Role of Government Funding

1. **Government Funding vs. Private Companies:** Some argue that **government funding** could help solve the **conflict between openness and commercialisation.**
2. With government support, **researchers wouldn't be tied to private companies** and could publish their findings without worrying about profit.
3. **Advantages of Public Funding:**
   a. Researchers can focus on **innovation** without restrictions from companies.
   b. It reduces dependence on corporate funding, which often comes with strings attached, like limiting what can be published or researched.
4. Even with more public funding, **universities and research institutions** often still want to **commercialise** their discoveries to earn revenue.
5. This desire to profit remains strong, even if government funding is available.

Ethical Concerns and Long-Term Implications

1. Many scientists believe that withholding key details, like in the case of AlphaFold 3, undermines the **integrity of science**.
2. If other scientists can't verify or replicate the work, it can slow down progress.
3. **Commercialisation and Ethics:** While it's important for researchers to make money from their discoveries, some argue that **keeping too much secret** harms the wider scientific community.
4. Other scientists should be able to see the data, understand the methods, and build on the work.

Real-World Example: McSleepy

1. **Thomas Hemmerling** and his team developed a robot called **McSleepy**, which could give anesthesia on its own.
2. They published the algorithms used to create the robot, allowing other researchers to understand and build upon their work.
3. This example shows that **commercialisation** and **openness** can coexist.
4. While some parts of the technology were patented, the basic research was made available for others to use.

Conclusion: Is AlphaFold 3 a Good Example?

After facing criticism, the authors of the AlphaFold 3 paper agreed to release the full code within **six months**, and they made it available earlier in November 2024. **Haibe-Kains** believes that while releasing the code later is better than not releasing it at all, **science should be open from the start**. Waiting to release the full details undermines the research process.

I. ESSAY

1. Research : A Blind Date with Knowledge

In 1928, Alexander Fleming made an unexpected discovery that changed medicine forever. While working with bacteria in his lab, he noticed something strange: one of his petri dishes had been accidentally contaminated with mold, and where the mold had grown, the bacteria had disappeared. This was a simple observation, but it led to the **discovery of penicillin, the first antibiotic**, which saved millions of lives.

Fleming's discovery happened by chance, much like how research often begins. It **starts with curiosity, but you don't always know where it will lead.** This is similar to going on a blind date—you don't know what will happen, but you're open to finding something special.

Research is the process of exploring the unknown, driven by curiosity and questions. It's like a blind date – sometimes awkward and frustrating, but the rewards often make it worth it. At its core, research is a continuous search for answers and a deeper understanding of the world around us.

In today's world, where technology is advancing rapidly and we have more information at our fingertips than ever before, research plays a vital role in shaping progress. It helps improve every field, from science and technology to social studies and the arts. But like a blind date, the path to discovering new knowledge isn't always smooth. It requires patience, persistence, and an open mind. This essay will explore how research is similar to a blind date with knowledge, using examples from both India and the world to illustrate the idea.

The Beginning: The Excitement and the Unknown

Research often begins much like the excitement before a blind date. There's expectations, but also some uncertainty. You don't know exactly where things will go, but you hope something valuable will come out of it. A researcher starts with a question or idea, hoping to find an answer—this is like sending out an invitation to knowledge. At first, this stage can feel overwhelming. The researcher does their best to gather the right information, study existing work, and prepare themselves with the right tools. But, like getting ready for a date, there is a mixture of excitement and doubt. The hope is that by engaging with knowledge, they will uncover something meaningful.

Consider India's efforts to develop **space technology in the 1960s.** The Indian Space Research Organisation (**ISRO**) was just starting out, with very few resources and limited technology. Despite these challenges, ISRO's scientists and engineers embarked on their mission to explore space. They didn't know for sure how they would succeed, but there was a sense of curiosity and hope that they might achieve something great. **In 1969, ISRO launched Aryabhata, its first satellite,** marking a significant step forward despite the limited technology of the time. This was a blind date with knowledge—ISRO didn't have all the answers, but they were ready to take the first step into the unknown.

On a global level, the **discovery of DNA's structure by James Watson and Francis Crick in 1953** offers another example. At that time, scientists had limited knowledge about genetics. Watson and Crick, along with others, had access to **different pieces of data—X-ray images,** chemical research, and theoretical models—but the full picture was still missing. Their discovery was not the result of one big breakthrough, but rather a series of smaller steps. Just as you don't know how a blind date will turn out, they didn't know if their theory was correct. But their willingness to explore led them to a discovery that changed biology forever.

Once research begins, it is similar to the conversation on a blind date. It's not always easy, and there are moments of confusion or frustration. Just as during a conversation you might not always understand the other person immediately, researchers may not find the answers they're looking for right away. Research is a process of trial and error. Sometimes you hit dead ends, get conflicting results, or realize you need to rethink your approach. But, like a good conversation, persistence and patience help to move things forward. Eventually, something meaningful is discovered.

In India, the Green Revolution in the 1960s is a great example. Faced with food shortages and poverty, India turned to agricultural research to improve food production. Researchers worked on developing high-yielding varieties of wheat and rice and finding better irrigation and pest control methods. At first, there was doubt—many people didn't think the new crops would succeed. But after lots of trials, failures, and adjustments, scientists developed varieties that helped increase crop yields and solve food shortages. Like a blind date where you keep talking to understand each other better, agricultural researchers had to keep engaging with their work before they found the answers.

Globally, research into HIV/AIDS in the 1980s offers another example. When the disease was first discovered, little was known about how the virus worked, how it spread, or how to treat it. The early years were full of confusion and limited understanding. However, scientists kept researching, and eventually, they developed antiretroviral drugs that helped people live longer, healthier lives. It was a long, challenging journey, but the continued efforts led to a breakthrough that saved millions of lives. The early stages were like a blind date filled with uncertainty, but by engaging with the problem, researchers eventually made significant progress.

A successful blind date often ends with a meaningful connection, and in the same way, research ends with a discovery—an insight that expands our understanding. These moments can feel like a sudden realization, when everything seems to fall into place and the world makes a little more sense. However, these breakthroughs don't always come quickly. It can take a lot of time, effort, and patience to make sense of all the data, experiments, and ideas. But when that moment of understanding comes, it can change everything.

One example of this in India is the development of the polio vaccine. Polio was a serious threat to public health in India, and the country faced an uphill battle to eliminate the disease. Through years of research in virology, immunology, and vaccine development, scientists created a polio vaccine that helped eliminate the disease from India. **In 2014, the World Health Organization declared India polio-free**—a huge achievement. This discovery was the result of many years of hard work and dedication, much like the connection you might form after a series of successful blind dates.

On a global scale, the completion of the **Human Genome Project in 2003 is one of the most remarkable examples of research leading to discovery.** This international effort involved thousands of scientists working together to sequence the entire human genome. The research provided crucial insights into human biology and led to major advances in medicine. Personalized medicine, where treatments are tailored to individual genetic makeup, became possible thanks to this research. This was a monumental moment of discovery that changed how we view human health and genetics. Like a blind date that leads to a deep connection, the Human Genome Project expanded our understanding of the human body in ways that were previously unimaginable.

A blind date, even if it doesn't lead to a lasting relationship, can still be a valuable experience. Similarly, research is a process of constant learning. Even when a hypothesis is proven wrong or a research question is left unanswered, the journey continues. Each discovery leads to more questions, and that's what drives the ongoing search for knowledge. Research doesn't have a final destination; it's an ongoing exchange between the researcher and the world of knowledge.

In India, the country continues to push the boundaries of science and technology. Challenges such as climate change, renewable energy, and public health need constant research and new solutions. Indian researchers are continuously exploring new frontiers, and each discovery builds upon the last.

Globally, the importance of research is growing as we face major global challenges. Whether it's finding solutions to climate change, improving health care, or addressing social inequalities, research will play a crucial role in shaping the future. The path to knowledge may be uncertain, but just like a blind date, it's the effort to explore and learn that leads to growth and progress.

Ultimately, research is like a blind date with knowledge. It may not always be easy or straightforward, but the process is always worth it. Like any meaningful relationship, it requires patience, persistence, and a willingness to embrace the unknown. And in the end, it is through this process that we make the discoveries that help improve lives and shape the future.

J. SCHEME

1. Samarth Scheme for Capacity Building in the Textile Sector

1. The **Samarth Scheme** is an initiative by the Government of India (GOI) to provide skill development and training to individuals in various textile-related sectors, excluding spinning and weaving.
2. The scheme **aims** to improve employment opportunities, promote sustainable livelihoods, and enhance the overall capacity of the textile industry.
3. The scheme has been **extended until March 2026**, with a total budget allocation of Rs. 495 crore to train 3 lakh individuals.

Objectives of the Samarth Scheme:

1. **Industry-aligned Training:** To deliver NSQF-compliant training across various textile sectors (excluding spinning and weaving) to improve employment opportunities.
2. **Skilling and Upskilling:** To promote skilling, upskilling, and reskilling in traditional sectors such as handlooms, handicrafts, sericulture, and jute.
3. **Sustainable Livelihoods:** To provide sustainable livelihood opportunities through wage employment or self-employment for all sections of society, across the country.

Salient Features of the Scheme:

1. **Ministry:** Ministry of Textiles
2. **Launch Year:** 2017
3. **Valid Till:** March 2026
4. **Implementing Agencies:**
   - **(a)** Textile Industry
   - **(b)** Institutions and organizations affiliated with the Ministry of Textiles or State Governments, with training infrastructure and placement tie-ups with the textile industry.
   - **(c)** Reputed training institutions, NGOs, trusts, societies, companies, startups, and entrepreneurs actively engaged in the textile sector with placement tie-ups.
5. **Implementation Framework:** The scheme follows the implementation framework in alignment with national policies such as Common Norms and the National Skills Qualifications Framework (NSQF), adopted by the Ministry of Skill Development & Entrepreneurship (MSDE). It includes entry-level courses and a "Training of Trainers" program.
6. **Branding of Training Centres:** Training centres will adhere to government-mandated branding guidelines for standardized marketing of the scheme and its centres.
7. **Selection of Trainees:** Preference will be given to marginalized social groups including women, SC/ST, differently-abled persons, minorities, BPL individuals, and people from Aspirational Districts (as identified by NITI Aayog).

Current Status of the Scheme:

- **Number of Candidates Trained:** 3.27 lakh
- **Number of Candidates Employed:** 2.6 lakh (79.5% employment rate)
- **Women Trainees:** 2.89 lakh (88.3% women trainees)

Funding: The scheme's funding covers the cost heads aligned with the Common Norms outlined by MSDE and is agreed upon by the Ministry under this scheme.

Key Components:

1. **Management Information System (MIS):** An integrated, web-based MIS platform will monitor scheme implementation, facilitate stakeholder registration, and track progress across training programs.
2. **Aadhaar-based Biometric Attendance:** The scheme mandates the use of an Aadhaar-enabled biometric

attendance system, integrated with the centralized MIS, to ensure real-time tracking of trainer and trainee attendance. A minimum attendance of 80% is required for assessments.

3. **Soft Skills Development:** In addition to technical skills, the program will incorporate soft skills (life management skills) training for all participants.
4. **Assessment and Certification:** A third-party assessment and certification process will be mandatory for all eligible trainees.
5. **Grievance Redressal:**
   a) Grievances can be submitted via three modes: Call Centre, Mobile App, or Scheme Website.
   b) If a grievance remains unresolved within 15 days, it will be escalated to the Director handling Samarth, who will act as the Grievance Redressal Officer (GRO) and resolve the issue within the next 21 days.
6. **Employment Linkage:**
   a) **For entry-level courses**: 70% placement linkage is mandatory.
   b) **For upskilling courses:** 90% placement linkage is mandatory.

This scheme is designed to empower individuals in the textile sector by equipping them with relevant skills, enhancing employability, and promoting sustainable livelihoods across different sections of society.

2. Credit Guarantee Scheme For E-NWR Based Pledge Financing Launched

The Credit Guarantee Scheme for E-NWR Based Pledge Financing (CGS-NPF) aims to support farmers in availing loans against electronic Negotiable Warehouse Receipts (e-NWRs) after depositing their commodities in Warehousing Development and Regulatory Authority (WDRA) accredited warehouses.

About e-NWRs (Electronic Negotiable Warehouse Receipts)

1. **Definition**: e-NWR is the digital version of the traditional warehouse receipt, governed by the Warehousing (Development and Regulation) Act, 2007.
2. **Function**: It allows goods deposited in a registered warehouse to be transferred or sold through endorsement.
3. **Mandatory Shift**: Since 2019, the WDRA has mandated the issuance of NWRs in electronic form.

About WDRA (Warehousing Development and Regulatory Authority)

1. **About**: A statutory body established under the Warehousing (Development & Regulation) Act, 2007.
2. **Objective**: To introduce the NWR system, allowing farmers to store their produce in nearby scientifically managed warehouses.
3. **Key Functions**:
   a. Regulating warehouses.
   b. Promoting scientific storage.
   c. Boosting supply chain efficiency.
4. **Headquarters**: New Delhi.

Key Features of the CGS-NPF Scheme

1. **Ministry**: Ministry of Consumer Affairs, Food & Public Distribution
2. **Total Corpus**: Rs. 1,000 crore allocated for post-harvest finance.
3. **Loan Coverage**:
   a. Loans up to Rs. 75 lakh for agricultural purposes.
   b. Loans up to Rs. 200 lakh for non-agricultural purposes.
4. **Eligible Institutions**: All scheduled banks and cooperative banks.
5. **Eligible Borrowers**:
   a. Small and marginal farmers
   b. Women farmers
   c. SC/ST/PwD farmers
   d. MSMEs
   e. Traders
   f. Farmer Producer Organizations (FPOs)
   g. Farmer cooperatives
6. **Risks Covered**: Credit and warehouseman risks.
7. **Guarantee Coverage**:
   a. 85% for loans up to Rs. 3 lakh for small and marginal farmers, women, SC/ST/PwD farmers.

b. 80% for loans between Rs. 3 lakh to Rs. 75 lakh for the above category.

c. 75% for other borrowers.

Significance of the Scheme

1. **Minimizing Distress Selling**: Ensures the availability and accessibility of finances for targeted beneficiaries, helping farmers avoid distress selling of their produce.
2. **Instilling Confidence in Bankers**: Addresses defaults arising from both credit and warehouseman risks, thereby boosting confidence among lenders.

This scheme is a significant step toward supporting farmers and other eligible stakeholders by improving access to finance while minimizing risks associated with agricultural and warehouse operations.

3. 'Jalvahak' Scheme to boost Inland Waterways

The Union Government of India has unveiled the **'Jalvahak' Scheme** aimed at encouraging business enterprises to move cargo via inland waterways. This initiative focuses on providing safe, timely, and cost-effective delivery of cargo while promoting **sustainable transportation across National Waterways (NW) - 1, NW-2, and NW-16.**

Inland Waterways in India

- **National Waterways:** To promote Inland Water Transport, **111 waterways** were declared as National Waterways under the **National Waterways Act, 2016**.
- Notable National Waterways include:
  - **NW-1**: Haldia to Allahabad
  - **NW-2**: Dhubri to Sadiya
  - **NW-16**: Barak River

Institutional Structure: The **Inland Waterways Authority of India (IWAI)** was established under the **IWAI Act, 1985**, and is responsible for the regulation and development of National Waterways in India.

About the Jalvahak Scheme

1. **Ministry:** Union Ministry of Ports, Shipping & Waterways.
2. **Implementation:** The scheme will be jointly implemented by:
   a. Inland Waterways Authority of India (IWAI)
   b. Inland & Coastal Shipping Ltd (ICSL), a subsidiary of the Shipping Corporation of India.
3. **Objective:** The Jalvahak Scheme aims to incentivize the modal shift of 800 million tonnes-kilometers (MTKM) through an investment of **₹95.4 crores**.
4. **Time Frame:** The scheme is valid for an initial period of **3 years**.
5. **Route:** Fixed Day Scheduled Sailing Services will operate along the following stretches of National Waterways:
   a. NW-1: Kolkata – Patna – Varanasi – Patna – Kolkata
   b. NW-2: Kolkata – Pandu (Guwahati)
   c. NW-16: Indo-Bangladesh Protocol Route (IBPR)
6. **Incentives:** The scheme offers a reimbursement of up to **35%** of the total operating expenditure incurred while transporting cargo via inland waterways.
7. **Criteria for Eligibility:** To qualify for the incentive, cargo must be transported via inland waterways for a distance of **more than 300 km**.
8. **Significance:** The scheme has several key benefits:
   a. Reduced logistics costs
   b. Decongestion of road and rail transportation
   c. Promotion of sustainable transportation modes

By encouraging the use of inland waterways, the Jalvahak Scheme will play a vital role in enhancing transportation efficiency, reducing environmental impact, and supporting economic growth through improved logistics networks in India.

4. Scheme for Medical Device Industry

Recently, Scheme for Strengthening the Medical Device Industry launched by the **Ministry of Chemicals and Fertilizers.**

Overview of the Scheme

The Scheme for Strengthening the Medical Device Industry aims to address critical areas within the medical device sector and foster the growth of a robust domestic

industry. India's medical device market is currently valued at approximately $14 billion and is expected to grow to $30 billion by 2030.

Features of the Scheme

The scheme consists of **five key sub-schemes**, each addressing a specific challenge or need in the industry:

Sub-Scheme	Objective
I. Common Facilities for Medical Devices Clusters	Enhance infrastructure by creating shared facilities, including R&D labs, design and testing centers, and animal labs.
II. Marginal Investment Scheme for Reducing Import Dependence	Promote localized production of key components, raw materials, and reduce reliance on imports.
III. Capacity Building and Skill Development for Medical Devices	Provide financial support to run courses for developing a skilled workforce in the medical device sector.
IV. Medical Device Clinical Studies Support Scheme	Provide financial aid for conducting animal studies, human trials, and clinical performance evaluations.
V. Medical Device Promotion Scheme	Support industry associations and export councils for organizing conferences, conducting studies, and surveys.

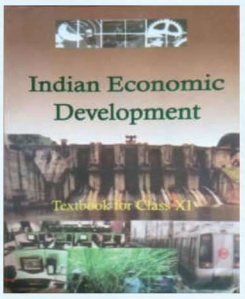
Challenges Faced by the Medical Device Industry

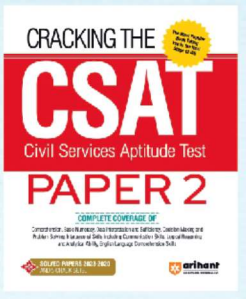
The medical device industry in India faces several challenges, which this scheme aims to address:

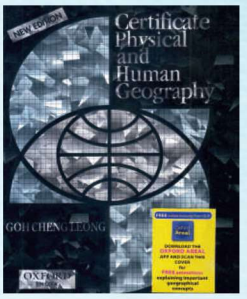
1. **Lack of Infrastructure**: Insufficient R&D labs, design and testing centers, and other necessary infrastructure.
2. **High Import Dependence**: A heavy reliance on imported high-end medical devices and components.
3. **Low Capital Investment**: Limited investment in the sector, hindering its growth.
4. **Inverted Duty Structure**: The inverted duty structure impacts the cost of raw materials and components, making domestic manufacturing uncompetitive.

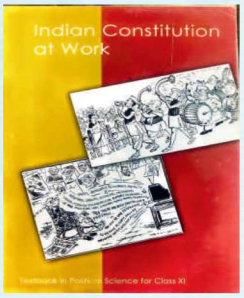
The Scheme for Strengthening the Medical Device Industry aims to overcome the existing challenges in the medical device sector by promoting local manufacturing, enhancing infrastructure, and building a skilled workforce. By doing so, it seeks to help India become self-reliant in the sector and meet the growing demand in both domestic and international markets.

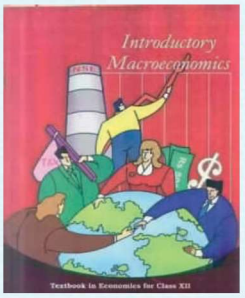
New List of Books to be provided to our classroom students since December 2023

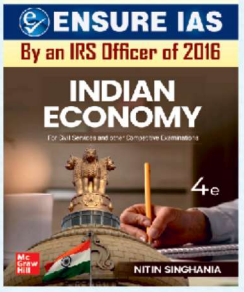


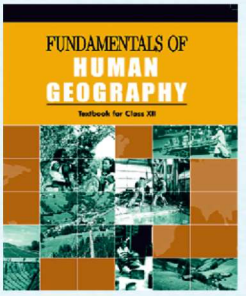


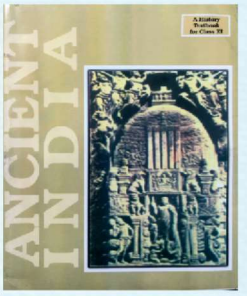


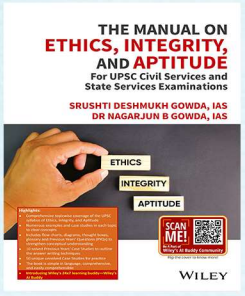


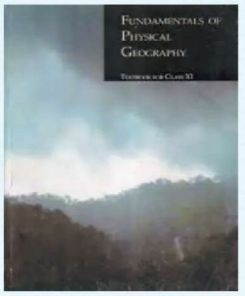


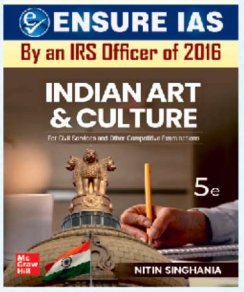


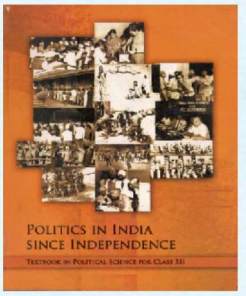


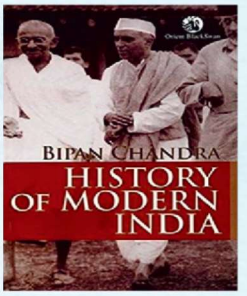


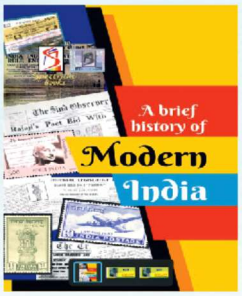


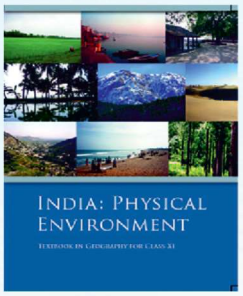


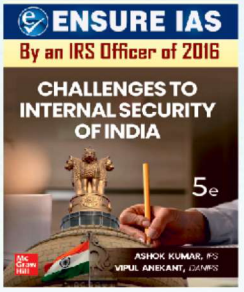


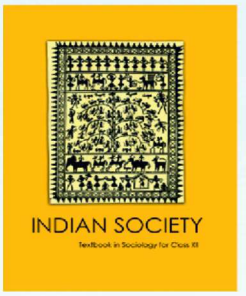


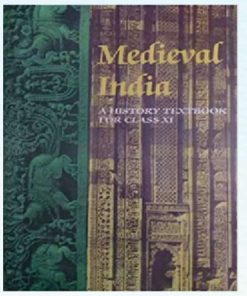


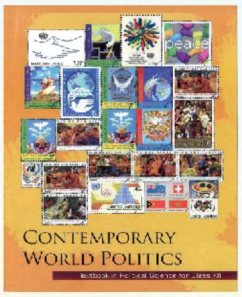


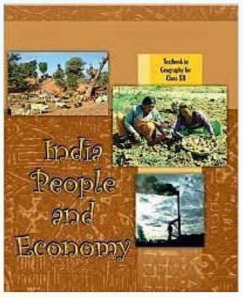


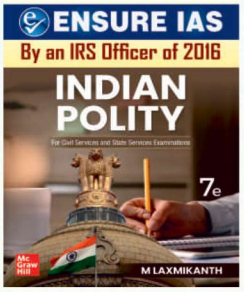


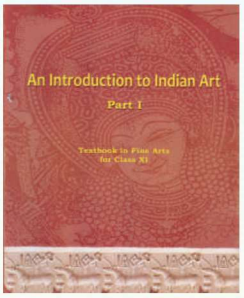


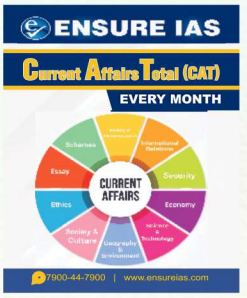












and many more .....

22-B, First Floor, Near Karol Bagh Metro Pillar No. 112, Above Domino's, Bada Bazar Marg, Old Rajinder Nagar, Delhi-110060

7900-44-7900