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GENERAL STUDIES – 2

Topics: Functions and responsibilities of the Union and the States, issues and challenges pertaining to the federal structure, devolution of powers and finances up to local levels and challenges therein.

1. FISCAL FEDERALISM: KERALA'S GOVERNMENT CASE AGAINST CENTRE

Context:

The Supreme Court advised Kerala to meet with the **Centre's team again and accept the ₹13,608 crore** offered to address the immediate financial crisis in the state.

What is the case about?

The issue revolves around the **Centre's imposition of a Net Borrowing Ceiling (NBC)** on Kerala, restricting the state's borrowing capacity. Kerala challenges the **legality of NBC** in the Supreme Court, arguing that it hampers the state's ability to finance essential services and welfare schemes.

What is Net Borrowing Ceiling (NBC)?

The Net Borrowing Ceiling (NBC) is a **restriction imposed by the central government** on the borrowing capacity of states in India. It limits the amount of funds that states can borrow from various sources, including open market borrowings.

As of December 2023, the **normal net borrowing ceiling for states in India is ₹8,59,988 crore, or 3% of the state's gross domestic product (GDP)**. However, the government has approved an additional borrowing ceiling of ₹60,880 crore for 22 states to participate in the **National Pension Scheme (NPS)**.

Aim of NBC: It aims to regulate state finances and prevent excessive borrowing, ensuring fiscal discipline.

Extra-budgetary borrowing included under NBC:

Centre has included the **debt taken by state-owned enterprises in the NBC**. As such, many states' statutory bodies (such as the **KERALA INFRASTRUCTURE INVESTMENT FUND BOARD**) cannot raise extra loans exceeding the 3% limit of NBC. This move has raised constitutional concerns regarding the **central government's authority to regulate state finances**.

Kerala's Arguments Against NBC:

1. Kerala argues against the **imposition of the Net Borrowing Ceiling (NBC)** on several grounds.
2. Kerala contends **that including debts of state-**

owned enterprises, such as the Kerala Infrastructure Investment Fund Board (KIIFB), within the NBC framework raises constitutional concerns.

3. Kerala notes that the **15th Finance Commission Report does not explicitly** recommend the inclusion of state enterprise debts in NBC calculations, further questioning the validity of this approach.
4. **Kerala highlights Article 266(2)** of the Constitution, asserting that transactions related to the public account fall within the jurisdiction of the state, thus challenging their incorporation into NBC calculations.
5. **Kerala cites the Kerala Fiscal Responsibility Act, 2003**, as a mechanism ensuring fiscal discipline within the state, thereby questioning the necessity for central intervention through the imposition of NBC.
6. **Kerala references Article 202 of the Constitution and Entry 43 of the State List** to assert the state's authority over its public debt and financial matters, challenging the central government's imposition of NBC as an infringement upon state autonomy.

What did SC say?

1. The Supreme Court urged Kerala to meet with the Centre's team and **consider accepting the ₹13,608 crore offered** (only half of what the Kerala government demanded) to address the immediate financial emergency in the state.
2. SC reasserted that **Kerala Government has the right to reach court** and the Centre cannot put conditions (that Kerala withdraws its suit) for releasing funds.
3. The case is ongoing in the SC

What is Fiscal Federalism?

Fiscal federalism deals with the **division of financial powers as well as the functions between multiple levels** of the government in a country. It has within its ambit the imposition of taxes as well as the division of different taxes between the Centre and the constituent units.

Constitutional Provision:

1. **Article 293 of the Constitution:** The executive power of a State extends to borrowing within the territory of India upon the security of the Consolidated Fund of the State.
2. **Article 293(3)** restricts states from borrowing without the Government of India's consent if previous loans or guarantees exist.
3. **Parliament's authority over "Public Debt of the State"** conflicts with states' exclusive jurisdiction over public debt matters, as per **Entry 43 of the State List**.
4. Kerala argues that balances in the state's public

account should be exempt from the NBC, citing Article 266(2) of the Constitution, which falls under the purview of the State Legislature.

- Article 131 of the Constitution:** The Supreme Court has exclusive and original jurisdiction in matters of law between states or between states and the Union.

For basics of Fiscal Federalism, Tools for Fiscal Federalism, Issues in Fiscal Federalism in India, Key principles that guided 15th Finance Commission recommendations, and Suggested measures for improving centre-state fiscal relations: [Click Here: Fiscal Federalism: Distribution of funds from Centre to States](#)

Insta Links:

- [Rethink the dynamics of India's fiscal federalism](#)
- [The poor state of India's fiscal federalism](#)

Prelims Links:

Q. Which of the following is/are included in the capital budget of the Government of India? (UPSC 2016)

- Expenditure on acquisition of assets like roads, buildings, machinery, etc.
- Loans received from foreign governments
- Loans and advances granted to the States and Union Territories

Select the correct answer using the code given below:

- 1 only
- 2 and 3 only
- 1 and 3 only
- 1, 2 and 3

Ans: D

[Topics: Parliament and State Legislatures – structure, functioning, conduct of business, powers & privileges and issues arising out of these.](#)

2. SC REVOKES IMMUNITY FOR MPS AND MLAS IN THE BRIBERY CASE

Context:

The Supreme Court ruled that **MPs and MLAs can't claim immunity for bribery**. [Article 105\(2\) and 194\(2\)](#) protections have been overturned.

- The case involved **Sita Soren** (daughter-in-law of JMM chief Shibu Soren) accused of taking bribes for the vote.

What is a Bribe-for-vote?

Bribe-for-vote refers to the act of offering or **accepting a bribe in exchange for casting a vote in a specific manner**, typically during elections or legislative proceedings.

It undermines the integrity of the electoral process and is considered a form of corruption.

Examples of Bribe-for-vote:

- Cash-for-vote Scandal (2008):** During a trust vote in the Indian Parliament in 2008, several Members of Parliament (MPs) were allegedly offered bribes to vote in favour of the ruling coalition
- Jharkhand Mukti Morcha (JMM) Bribery Case (1993)** (also known as **P V Narasimha Rao case**): In this case, JMM chief and former Union Minister Shibu Soren and some of his party members were accused of accepting bribes to **vote against a no-confidence motion against the then Prime Minister P.V. Narasimha Rao's government**.
 - The Supreme Court had **quashed the case against the JMM MPs**, citing immunity under **Article 105(2) of the Constitution**

What does Article 105(2) and 194(2) say?

Articles 105(2) and 194(2) **grant immunity to members of Parliament and state legislatures** from prosecution in courts for **anything said or any vote given in the respective legislative bodies**. This immunity ensures that legislators can perform their duties without fear of legal consequences.

What is the present case about?

Sita Soren Bribery Case (2012): Sita Soren, a member of the Jharkhand Mukti Morcha (JMM), was accused of accepting a bribe to cast her vote in favour of a certain candidate in the Rajya Sabha elections of 2012. She claimed immunity under **Article 194(2)**, citing the **SC 1998 Ruling in the P.V. Narasimha Rao Case**

Key takeaways from the 7-bench SC ruling:

- No violation of the doctrine of stare decisis:** The Court can change prior rulings, such as in the P.V. Narasimha Rao case if it has wide ramifications on public interest, probity in public life, and parliamentary democracy.
 - The principle of stare decisis** requires courts to follow **precedent**.
- Legislative privileges must conform with constitutional parameters:** Unlike the UK's historic rights, India's parliamentary privileges derive from statute and constitutional privilege, **subject to judicial review**.
- Constitutional immunity from bribery charges lacks a "two-fold test":** Immunity from prosecution for bribery contradicts the purpose of fostering debate and deliberation in the legislature, failing to meet the test of necessity for a legislator's

essential duties.

- a. **The “two-fold test” is used to determine the validity of claims to legislative privileges:** It involves (i) assessing **whether the privilege claimed is essential** to the collective functioning of the legislative body and (ii) whether the privilege claimed is **necessary for the discharge of the essential duties** of a legislator.
4. **Bribery not immune:** Bribery doesn’t enjoy immunity under **Article 105(2)** if it’s not intrinsic to the voting process, challenging the interpretation that any act related to parliamentary duties is immune from prosecution.
 - a. Accepting a bribe constitutes a **criminal offence**
5. **Courts and the House can exercise parallel jurisdictions:** The Court’s jurisdiction to prosecute bribery charges doesn’t interfere with the House’s authority to address breaches of discipline, as judicial proceedings and House actions operate independently.
6. **Corruption by legislators erodes the foundation of democracy:** Legislative corruption undermines democratic values and citizens’ representation, eroding probity in public life and creating a polity that deprives citizens of a responsible democracy.
7. **Legislative privileges apply equally to Rajya Sabha elections:** The principles regarding legislative privileges extend to Rajya Sabha elections and appointments of the President and Vice-President, ensuring consistency and adherence to constitutional principles.

Impacts of the Supreme Court’s judgment:

Positive Impacts	Negative Impacts
Upholds Judicial Review: Allows for reconsideration of past rulings, ensuring alignment with constitutional principles.	Potential Legal Uncertainty: Overturning established precedent may lead to legal uncertainty and interpretation challenges.
Combatting Corruption: Strengthens the fight against corruption by removing immunity for legislators facing bribery charges.	Impact on Legislative Independence: Some argue that subjecting legislators to criminal prosecution may impede their independence and effectiveness in fulfilling their duties.
Preservation of Democratic Principles: Reinforces the integrity of democratic institutions by holding legislators accountable for their actions.	Political Ramifications: The judgment may have political ramifications, potentially affecting the candidates who had been elected through bribery.
Clarity on Bribery Offenses: Clarifies that bribery offences are not immune from prosecution, ensuring accountability and transparency in governance.	Challenges in Implementation: Implementing the judgment effectively may pose logistical and procedural challenges for law enforcement agencies and the judiciary.
Equal Application of Law: Ensures equal treatment under the law by removing special privileges for legislators accused of bribery.	

What are Parliamentary Privileges?

Parliamentary privileges are **special rights, immunities, and exemptions** enjoyed by MPs and MLAs, defined in **Articles 105 and 192** of the Indian Constitution. Members of Parliament and state assemblies are **exempted from civil liability (not criminal) for statements** or acts during their duties. These privileges are only applicable while they are serving as members; they cease once their membership ends.

Parliamentary Privilege	Description
Freedom of Speech in Parliament	Members of Parliament have the freedom of speech and expression , distinct from the general freedom guaranteed under Article 19(2) of the Constitution.
	Limitations: The freedom of speech is subject to constitutional provisions and parliamentary rules (Article 118). Members cannot discuss the conduct of judges under Article 121 , except in certain cases.

Freedom from Arrest	Members are immune from arrest in civil cases 40 days before and after a session . Within Parliament's limits, arrest requires the house's permission. Limitations: Members can be arrested outside Parliament's limits for criminal charges under specific acts like the Preventive Detention Act, Essential Services Maintenance Act (ESMA), etc.
Right to Prohibit Publication	Article 105(2) grants immunity from liability for publishing reports or discussions under a member's authority . The public's awareness of parliamentary proceedings is crucial.
Right to Exclude Strangers	Members have the authority to exclude non-members from parliamentary proceedings to ensure free and fair discussion.

Parliamentary privileges

Collective for Parliament

Individual to Members

- 44th Amend. 1978 restored freedom of press to publish reports of parliament without prior. **But not of secret sitting**
- Exclude strangers from secret
- Make rules to regulate its own procedure
- Punish members/outside for breach of privileges / contempt (suspension or expulsion).
- Right to receive info. of the arrest, detention etc. of a member.
- Institute inquiries + order attendance of witnesses etc.
- Courts can not inquire into proceedings
- No member from proceedings can be arrested, without the permission of the presiding officer.

- Can't be arrested during session of Parliament & 40 days before/after. (privilege NOT available in CRIMINAL cases)
- Freedom of speech in Parliament. (Not liable to anything said or vote given in Parliament + committees.
- Exempted from jury service.** CAN refuse to give evidence and appear as a witness in pending case (if session going on)

About the Privileges Committee:
 It comprises 15 members in the Lok Sabha and 10 in the Rajya Sabha and safeguards the freedom, authority, and dignity of Parliament. It examines breaches of privilege, determines facts, and makes recommendations. If a matter is referred, it **investigates and presents a report to the House for consideration**, followed by a debate and action based on the House's decision. Typically, it handles cases where MPs allege breach of privilege by outsiders or other MPs, with powers to recommend admonitions, reprimands, suspension, or expulsion, often resolved with an apology.

Insta Links:

- [Parliamentary privileges](#)

Mains Links:

Q. Individual parliamentarian's role as the national lawmaker is on a decline, which in turn, has adversely impacted the quality of debates and their outcome. Discuss. (UPSC 2019)

3. NEED FOR REFORMS IN ANTI-DEFECTION LAW

Context:

Six Himachal Pradesh MLAs, disqualified for cross-voting in the Rajya Sabha polls, have moved the Supreme Court against the Speaker's decision.

What is Anti-defection law (ADL)?

ADL in India, enshrined in the **Tenth Schedule of the Constitution**, aims to curb political instability by preventing elected representatives from switching parties. While it has achieved some success in its stated goal, there are concerns that it might also have unintended consequences, such as individual MP actions and opinions. The Parliament of India added it to the Constitution as the **Tenth Schedule in 1985 (52nd Amendment)**.

Aspect	Description
Anti-defection law	Aims to penalize individual MPs/MLAs for switching parties to ensure government stability.
	However, it allows a group (at least 2/3rd) of MP/MLAs to join/merge with another political party without inviting the penalty for defection.
What leads to defection?	Voluntarily leaving one's party. Voting against the party's directives
	When an independent MP/MLA joins a party later. A nominated legislator can join a political party within six months of being appointed to the House and not after such time
Deciding authority	Presiding Officers of the Legislature: Speaker, Chairman
	No specific time frame was provided for deciding defection cases
	Supreme Court suggests a decision within 3 months
	Legislators can appeal decisions to the higher judiciary

The SC's views on the 10th schedule:

1. **Manipur Judgment (2020):** The Supreme Court sets a three-month deadline for Speakers to decide on disqualification petitions, stressing prompt resolutions.
2. **Kihoto Hollohan Case (1992):** Affirmed that the 10th Schedule isn't an unreasonable restriction on free speech and allows judicial review of the Speaker's order.
3. **Ravi Naik and Balasaheb Patil Cases:** Defined 'voluntary giving up of membership' broadly, beyond resignation, including conduct like absenteeism or acting against party interests.
4. **Vishwanathan Case:** Established that expelled members remain part of their original party unless joining a new one, averting instant disqualification.
5. **Shiv Sena Case (2023):** Directed the Election Commission to assess a party's real representation using the organizational test, not just the legislative majority.

Defection Manipulation:

1. **Pre-Defection Tactics:** Defectors often submit no-confidence letters against the Speaker before defecting, citing loose interpretations of legal cases.
2. **Speaker's Bias:** Speakers, usually from the ruling party, show bias in deciding disqualification cases, affecting opposition and ruling party defectors differently.
3. **Election Commission and Party Symbols:** Defectors may seek recognition as the real party from the Election Commission, benefiting from a legislative majority test.
4. **Fast-Track EC Hearings:** While Speakers delay disqualification disputes, EC hearings are expedited, further legitimizing defections.
5. **Engineered Resignations:** Opposition parties engineer resignations in the ruling party, promising positions to defectors in a new government.

Challenges with Anti-Defection Law:

1. **Paragraph 4 Provision:** Allows two-thirds party merger without disqualification, undermining representative democracy.
2. **Recognition of Split:** The Law only recognizes party mergers, not splits, allowing wholesale defections.
3. **Impact on Debate:** Shifts focus from debate to party loyalty, weakening parliamentary deliberations and democratic discourse.
4. **Echo Chambers:** The law discourages open dissent within parties, which **stifles diverse perspectives** and limits constructive debate on policy issues.
5. **Limited Accountability:** MPs are less likely to vote against their party line even if it goes against the wishes of their constituents. This reduces their **accountability** to the electorate and undermines the responsiveness of the political system.
6. **Suppression of Conscience:** The law restricts MPs' freedom to vote according to their conscience on **moral, social or religious** issues.
7. **Erosion of Trust:** The anti-defection law has been used by party leaders to punish dissent and silence criticism. This can erode **public trust** and **discourage participation** in democratic processes.

Reform Suggestions:

1. **Abolish the 10th Schedule:** Replace with a law mandating resignations and re-elections for party defectors.
2. **Prohibit Ministerial Posts sans Re-Election:** Bar defectors from holding ministerial positions without re-election to deter opportunistic defections.
3. **Remove Speaker's Adjudication Role:** Simplify the process to eliminate Speaker's involvement, mitigating bias and partiality.
4. **Select Neutral Speakers:** Establish a convention where parties agree on neutral Speaker's pre-elections to ensure fairness and impartiality.

International Experience:

Freedoms enjoyed by MPs in the United Kingdom and lessons for India:

- Conscience Votes:** UK MPs are free to vote against their party line on **matters of conscience**. This allows them to represent the views of their constituents and uphold their personal beliefs.
- Whip conventions:** Defying a “three-line whip” in UK parliament is very serious, and the member is effectively **expelled from their party**, however, the member still keeps their seat and sits as an independent. This is contrary to ADL in **India** where the member is **expelled from the house**.
- Stronger Internal Party Democracy:** UK political parties have well-established internal democratic processes that encourage open debate and participation. This allows diverse perspectives to be heard and considered in policy decisions.
- Focus on Constituent Service:** UK MPs are more focused on serving their constituents and addressing their local concerns. This fosters a stronger connection between voters and their elected representatives.
 - Eg:** In 2021, **55 MPs** from Prime Minister **Boris Johnson’s party** voted against their own government’s proposal for stricter lockdown restrictions.

Conclusion:

Thus, India might consider re-evaluating the balance between party discipline and individual freedom of MPs, learning from the UK’s system to enable more informed and independent decision-making. Finding this equilibrium could enhance the vibrancy of India’s parliamentary democracy while ensuring effective governance and accountability.

Insta Links: [Anti-defection law](#)

Mains Links:

Q. The role of individual MPs (Members of Parliament) has diminished over the years and as a result, healthy constructive debates on policy issues are not usually witnessed. How far can this be attributed to the anti-defection law, which was legislated but with a different intention? (UPSC 2013)

Prelims Links: (UPSC 2014)

Q. Which one of the following Schedules of the Constitution of India contains provisions regarding anti-defection?

- Second Schedule
- Fifth Schedule
- Eighth Schedule
- Tenth Schedule

Ans: 4

GENERAL STUDIES – 3

Topics: Infrastructure: Energy, Ports, Roads, Airports, Railways etc.

1. POTENTIAL OF PRADHAN MANTRI SURYA GHAR MUFT BIJLI YOJANA

Context:

Recently Pradhan Mantri Surya Ghar Muft Bijli Yojana was approved with a **budget of 75,021 crores**, and aims to **provide 300 units of free electricity monthly to 1 crore households** through rooftop solar setups.

About Pradhan Mantri Suryodaya Yojana:

About	Description
Name of the Scheme	Pradhan Mantri Suryodaya Yojana
Objective	Aims to provide 300 units of free electricity monthly to 1 crore households through rooftop solar setups
Definition of Rooftop Solar Panels	Photovoltaic panels installed on building rooftops connected to the main power supply unit
Subsidies	60% of installation costs are covered for 2 kW systems. 40% of installation costs covered for systems of 2-3 kW capacity

National Portal	It will facilitate subsidy applications and assist in finding a suitable vendor for installing rooftop solar. Additionally, it will aid decision-making by providing relevant information as needed.
Related Government Initiatives	The Rooftop Solar Programme was launched in 2014 . Aims for 40 GW rooftop solar capacity by 2022 (deadline extended to 2026). Pradhan Mantri Suryodaya Yojana complements efforts to achieve the 40 GW target
Other Government Initiatives to Harness Solar Energy	National Solar Mission ; Solar Park Scheme ; Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM-KUSUM) ; Surya Mitra Skill Development Programme; International Solar Alliance

Need for the Scheme:

- India's Energy Demand:** Projected highest growth globally over the next three decades.
- To achieve India's aims for 500 GW** of renewable energy capacity by 2030.
- Targets 50% electricity generation from non-fossil fuel sources** by 2030, with renewables contributing 30% currently.
- Current Solar Capacity in India: India has** Rooftop Solar capacity is about 11 GW (as of December 2023). Gujarat leads with 2.8 GW, followed by Maharashtra with 1.7 GW.
 - This is significantly below the target of 40GW.
 - Only 20% of rooftop solar installations** are in the residential sector, according to a CEEW report.
- Huge potential:** India's 25 crore households could deploy 637 GW of solar energy on rooftops, **meeting one-third of the country's residential electricity demand.**

Total Installed Capacity: India's solar power capacity is about 73 GW as of December 2023, with Rajasthan (18.7 GW) and Gujarat (10.5 GW) leading.

Benefits of the Pradhan Mantri Suryodaya Yojana:

- Reduction in Electricity Bills:** By installing rooftop solar systems, households can significantly reduce their electricity bills, benefiting both the poor and middle classes.
- Energy Self-Reliance:** The initiative aims to make India self-reliant in the energy sector by promoting decentralized solar power generation.
- Energy Security:** Promoting rooftop solar power contributes to enhancing energy security by diversifying energy sources and reducing dependence on traditional fossil fuels like coal.
- Environmental Sustainability:** Solar energy is a clean and renewable energy source, leading to reduced greenhouse gas emissions and environmental pollution, thereby supporting sustainable development.
- Increased Energy Access:** By targeting individual households, the scheme aims to increase en-

ergy access, especially in rural and remote areas where grid connectivity is limited.

- Fulfilling International Commitments:** The initiative aligns with India's international commitments to increase the share of non-fossil fuel-based energy sources in its energy mix, contributing to global efforts to combat climate change.
- Potential for Economic Growth:** The growth of rooftop solar power capacity creates opportunities for economic growth, job creation, and technological innovation in the renewable energy sector.
- Uniform Distribution of Solar Potential:** Unlike large solar parks that require extensive land and infrastructure, rooftop solar systems can be installed uniformly across all states and regions, tapping into the solar potential of every locality.

Challenges in the Implementation of Pradhan Mantri Suryodaya Yojana:

Challenges	Details
Free electricity issue	The provision of free electricity by many states discourages people from adopting rooftop solar systems.
Financial Constraints for DISCOMs	Discoms foresee losses due to the net metering system, as they already incur fixed costs and pay contracted charges to power generators
	Fear of increased costs for discoms due to compensating consumers for absorbing power from rooftop solar plants.
The limited success of previous schemes	The rooftop solar program fell short of expectations, achieving only about 11 GW by December 2023, compared to the 40 GW target.
	The majority of capacity is contributed by commercial and industrial consumers, with limited adoption by households.

Flip-Flopping Policies	GST hike on solar system components increases capital cost, affecting the attractiveness of rooftop solar.
Regulatory Framework	Slow growth due to the absence or withdrawal of state-level policy support, especially for business and industrial segments
Inconsistent Rules on Net and Gross Metering	Power ministry's new rules exclude rooftop solar systems above 10 kW from net-metering , potentially stalling the adoption of larger installations.
Low Financing	Banks advised by MNRE to offer loans for rooftop solar at subsidized rates, but nationalized banks have limited offerings. Private players in the market offer loans for rooftop solar at higher rates, up to 10-12% , posing financing challenges for adoption.

Way forward:

- Increase awareness** about the long-term benefits of rooftop solar.
- Offer incentives or subsidies** to offset initial installation costs.
- Review net metering policies** to ensure fair compensation for both consumers and DISCOMs.
- Establish clear and stable regulatory frameworks** to provide certainty to stakeholders.
- Empower distribution companies** and create an enabling environment for greater penetration of rooftop solar.
- Develop innovative financing mechanisms** tailored to the needs of rooftop solar projects.

Insta Links:

[Rooftop solar scheme](#)

Mains Links:

Q. India has immense potential for solar energy though there are regional variations in its developments. Elaborate. (UPSC 2020)

Prelims Links:

Q. With reference to solar power production in India, consider the following statements: (UPSC 2018)

- India is the third largest in the world in the manufacture of silicon wafers used in photovoltaic units.
- The solar power tariffs are determined by the Solar Energy Corporation of India.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only

- (c) Both 1 and 2
- (d) Neither 1 nor 2

Ans: D

Q. 'Net metering' is sometimes seen in the news in the context of promoting the (UPSC 2016)

- (a) production and use of solar energy by households/ consumers
- (b) use of piped natural gas in the kitchens of households
- (c) installation of CNG kits in motor cars
- (d) installation of water meters in urban households

Ans: A

Q. Consider the following statements: (UPSC 2016)

- The International Solar Alliance was launched at the United Nations Climate Change Conference in 2015.
- The Alliance includes all the member countries of the United Nations.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Ans: A

Q1. Consider the following statements: (UPSC 2022)

- Gujarat has the largest solar park in India.
- Kerala has a fully solar-powered International Airport.
- Goa has the largest floating solar photovoltaic project in India.

Which of the statements given above is/are correct?

- (a) 1 and 2
- (b) 2 only
- (c) 1 and 3
- (d) 3 only

Answer: B: 2 only

[Topics: Science and Technology- developments and their applications and effects in everyday life Achievements of Indians in science & technology; indigenization of technology and developing new technology.](#)

2. BENEFITS AND CHALLENGES OF THE GENOME INDIA PROJECT

Context:

The Genome India Project, funded by the Department of Biotechnology, has **completed sequencing 10,000 Indian genomes**, creating a reference for Indian genetic diversity.

What is the Genome India Project?

It endeavours to sequence 10,000 Indian human genomes and create a database. This research (inspired by the International **Human Genome Project**) was carried out by 20 national institutes with support from the Department

of Biotechnology, Government of India

What is a Genome?

A genome is a genetic material that provides instructions for the development, growth, and functioning of all living organisms, composed of DNA with a sequence of chemical bases that determines an organism's characteristics.

An analogy to understand Genome:

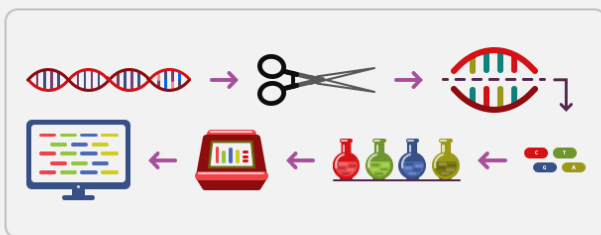
The genome can be **compared to a reference book**. In this analogy, a genome contains the DNA- instructions for life. It's composed of **a vast array of nucleotides (letters)** that are packaged into **chromosomes (chapters)**. Each chromosome contains **genes (paragraphs)** that are regions of DNA which code for the specific proteins that allow an organism to function.

What is Genome Sequencing?

Genome sequencing is the process **of determining the complete DNA sequence of an organism's genome**. It involves identifying **the order of nucleotides (A, T, C, G) that** make up the DNA molecule in each of the chromosomes of an organism.

GENOMIC SEQUENCING

What is Genomic Sequencing?



GENOMIC SEQUENCING

Genomic sequencing refers to methods of determining the entire DNA sequence of an organism's genome. In simpler terms, it determines the order of As, Ts, Cs and Gs that make up an organism's DNA. A genomic sequence is depicted by a very long line of these letters arranged in a specific order.

Importance of Human Genome Sequencing as a scientific breakthrough:

- **Advancing genetics:** Human Genome Sequencing has revolutionized genetics by providing a **comprehensive map of genetic information** in human DNA.
 - This knowledge enhances our understanding of genetic diseases, hereditary traits, and human evolution.
- **Disease understanding:** Genome sequencing has shed light on the **genetic basis of numerous diseases**, including cancer, rare genetic disorders, and complex conditions like diabetes and cardiovascular diseases.
 - **INSACOG initiative** of the **Department of Biotechnology** advocated Genome sequencing that allowed scientists to identify threats emerging from the **COVID-19**

pandemic and also how it spreads.

- **Identifying genetic diseases:** it has huge potential in the field of genetic diseases. India has witnessed a rise in cases of diseases like **Sickle cell anaemia, thalassemia** etc.
- **Decreasing disease burden;** genomic testing can help recognize **what diseases people are at risk** for so that could then also be quickly applied to the task of managing diseases in these groups as well as be used for **genetic counselling** that could reduce their **incidence in future generations**.
- **Vaccine development:** Only genome sequencing can identify various mutations which further will help in vaccine development and testing.
- **Evolutionary insights:** It provides insights into **human evolution, ancestry, and migration** patterns by comparing genomes from different populations and hominin species.
- **Personalised medicines:** genome-wide association studies have enabled us to **tailor the diagnostics and treatment** of these diseases for individuals in the form of personalised medicine.
- **Precision medicine:** By identifying genetic variations, researchers can tailor medical treatments and interventions to an individual's unique genetic makeup.
 - This has the potential to enhance **treatment efficacy** and **reduce adverse effects**.

India's contributions to Genome Sequencing research:

Over the years, India has developed rigorous regulatory policies to oversee research and applications done in the field of genomics and genetics.

- **In the last 10 years**, genetic testing in India has evolved by leaps and bounds, which can be recognized from the proliferation of genomic databases, such as **Index-DB and, the Indian Genetic Disease Database (IGDD)**, to name a few.
- **Mapmygenome project:** With a vision to "Touch 100 million lives", Mapmygenome was established in 2013, heralding the advent of improved healthcare through genomics-based healthcare.
 - Mapmygenome also provides regular health checks and Covid testing along with Genomics in Hyderabad, Delhi and Bangalore.
- **Genome India project:** Taking inspiration from the **Human Genome Project**, the **Department of Biotechnology (DBT)** initiated the ambitious "Genome India Project" (GIP) on 3rd January 2020.
 - The GIP aims to **collect 10,000 genetic** samples from citizens across India, to build a reference genome.
- **IndiGen initiative:** The IndiGen initiative was un-

dertaken by CSIR in April 2019. The objective is to enable genetic epidemiology and develop public health technology applications using population genome data.

- This has enabled **benchmarking the scalability of genome sequencing** and computational analysis at a population scale in a defined timeline.

Challenges faced by the Genome India Project:

- **Representative Diversity:** Sequencing 10,000 genomes doesn't fully represent India's diverse population of over one billion, comprising around 4,500 population groups.
- **Complex Genetic Landscape:** India's history of endogamy within castes preserves rare, potentially harmful genetic variants, complicating genetic analysis.
- **Limitations of Monogenic Disease Focus:** Most diseases are not monogenic (Monogenic refers to traits or diseases caused by variations in a single gene.), posing challenges in simplifying genetic research to establish direct disease links.
- **Affordability of Treatments:** Even with identified genetic causes of diseases, treatments are often unaffordable for many.
- **Data Accessibility:** Ensuring widespread access to project findings beyond academia is a significant challenge.
- Additional challenges in **data generation and analysis** include issues of sample contamination, accuracy of genetic tests **without genotype-phenotype correlations**
- **Ethical concerns** regarding sensitive genomic data sharing, data security, and privacy.

About the Human Genome Project:
The Human Genome Project (1990 to 2003) was an international scientific research project with the goal of determining the base pairs that make up human DNA, and of identifying, mapping and sequencing all of the genes of the human genome from both a physical and a functional standpoint.

Human Pangenome Project
 It is an **International Alliance of genomics partners**, that aims to **create a Pangenome Reference** representing the genetic diversity of the human population. It differs from the Human Genome Project in several ways:

1. **Inclusivity:** Unlike the Human Genome Project's focus on a limited set of populations, the Pangenome Project aims to encompass genetic variations from diverse populations worldwide.
2. **Graph-Based Representation:** Unlike linear sequences used in the reference genome, the Pangenome is represented as a graph, acknowledging the

- dynamic nature of human genetics.
- 3. **Deeper Exploration:** The Pangenome Project delves deeper into structural and rare genetic variants compared to the Human Genome Project.
- 4. **Error-free:** The Pangenome map boasts high accuracy in representing genetic information, essential for reliable analyses and interpretations.

Conclusion
Genome India Project and Human Genome Sequencing exemplify the power of science to unravel the mysteries of our genetic code, offering hope for improved healthcare and a deeper understanding of our species' genetic legacy. Its continued exploration and responsible application promise to shape the future of medicine and biology.

Mains Link:
Q. What is Genome Sequencing and what are its benefits? Also, enumerate the steps taken by India in this direction. (10M)

Prelims Links:
 With reference to agriculture in India, how can the technique of 'genome sequencing', often seen in the news, be used in the immediate future? (UPSC 2017)

1. Genome sequencing can be used to identify genetic markers for disease resistance and drought tolerance in various crop plants.
2. This technique helps in reducing the time required to develop new varieties of crop plants.
3. It can be used to decipher the host-pathogen relationships in crops.

Select the correct answer using the code given below:
 (a) 1 only
 (b) 2 and 3 only
 (c) 1 and 3 only
 (d) 1, 2 and 3
Ans: D

Topics: Conservation related issues, environmental pollution and degradation, environmental impact assessment.

3. BENGALURU'S WATER CRISIS AND LESSONS FOR INDIA

Context:
 Bengaluru faces a **looming water crisis**, prompting concerns of a **potential Day Zero scenario akin to Cape Town.**

Status:

1. As per the Report, **223 of the 236 talukas in Karnataka** are affected by drought, including Mandya and Mysuru districts, the sources of Bengaluru's water.

- A BBC report highlighted **Bengaluru as one of the cities likely to run out of drinking water**, second only to Sao Paulo, Brazil, by 2031

What is Day Zero?

Day Zero is a term used to describe the day **when a city's municipal water supply** is expected to be **depleted entirely**, forcing authorities to shut down water connections for homes and businesses.

Reasons Behind Bengaluru's Severe Water Scarcity:

Reasons	Details
Reduced Rainfall and Empty Water Reservoirs	Insufficient rainfall affects the Cauvery River. Water levels in reservoirs like Harangi, Hemavathi, and Kabini at 39% capacity
Depletion of Groundwater Sources	Urban growth leads to reduced groundwater recharge. Excessive extraction causes rapid depletion, and many borewells dry up
Inadequate Infrastructure	Infrastructure lagging behind urban growth. Completion of Phase-5 of the Cauvery project is expected only by May 2024 for improved water supply
Climate Change	Erratic rainfall and prolonged droughts due to climate change. El Niño phenomenon cited as a cause by the Indian Meteorological Department
Pollution of Water Bodies	About 85% of Bengaluru's water bodies polluted, per an EMPRI study
Mismanagement and Inequitable Distribution	Inefficient water management practices exacerbating the crisis
Legal and Political Challenges	Disputes over water sharing with neighbouring states, complicate resource management. Tussles between central and state governments affecting relief efforts

India's Status:

India is endowed with rich water resources:

- India has **4% of the world's water resources**
- India has **1123 billion cubic metres** of surface and groundwater resources.
- Rainfall:** According to the Central Water Commission, **India receives 4,000 billion cubic metres** in rainfall, which is **higher than its requirement**.
- However, in 2023**, around **91 million Indians** will not have access to safe water. This data indicates the massive water shortage in India.

Despite being endowed with water resources, India faces a water crisis due to the following reasons:

- Uneven Rainfall:** Uneven distribution of rainfall with around **70% of India's rainfall being confined to 3-4 months**. And there is **regional variability** with some regions having very high rainfall while others suffer from scarcity.
- River basins:** **Uneven flow** of water in different river basins. For instance, the **surplus in the Ganga-Brahmaputra basin** but the **deficit in seasonal rivers in Indian peninsular regions**.
- Inadequate rainfall:** According to data released by the **India Meteorological Department**, the **South-West monsoon** during June- August 2023 has been **below normal in 42 per cent** of the districts.
- Groundwater overuse:** According to the **Stockholm International Water Institute**, with farmers providing **electricity subsidies** to help power the groundwater pumping, the water table has seen a drop of up to **4 meters** in some parts of the country.
- Water pollution:** The **Central Pollution Control Board** reported that of the 603 rivers assessed, there are **311 Polluted stretches** in 279 rivers in 30 States & Union Territories.
- Climate change:** **Changing rainfall patterns, increase in the frequency of droughts** etc. have affected water availability in various regions. **Eg: El Niño** episodes are becoming more frequent
- Agriculture policies and practices:** Fertilizer subsidies, free electricity, price support for water-intensive crops and practices like flood irrigation.

The role of caste exacerbates water access challenges in India:

- Violence and discrimination:** Dalit students face violence for accessing water, such as the case of Indra Meghwal beaten to death in Rajasthan.
- Purity and pollution:** Dalits often face untouchability in accessing safe drinking water, with over 20% lacking access, according to the National Campaign on Dalit Human Rights.
- Intersectional water justice:** Water access is intertwined with caste, class, and gender, perpetuating structural inequalities, as seen in the disparity between water allocation in Delhi's army cantonments and its unauthorised colonies.
- Modulates human-water interactions:** The caste structure influences human impact on the hydrological cycle, as illustrated by the correlation between caste hierarchy and topographic maps in Indian towns.
- Limited representation in decision-making:** Upper-caste dominance in Indian environmental studies results in little understanding of how lower castes experience water and the environment.

Key Government Schemes To Tackle The Groundwater Crisis in India:

1. **MGNREGA**: Supports water conservation through rural employment.
2. **Jal Kranti Abhiyan**: Raises awareness on water conservation.
3. **National Water Mission**: Promotes sustainable water management.
4. **Atal Bhujal Yojana (ABHY)**: Improves ground-water management.
5. **Jal Jeevan Mission (JJM)**: Aims to provide tap water to rural households.
6. **National Mission for Clean Ganga (NMCG)**: Addresses Ganga basin groundwater issues.

Steps to Address the Water Crisis in India:

1. **Inclusive Water Governance**: Inclusive representation in local water management committees and decision-making bodies to ensure that the voices of all castes are heard.
2. **Interlinking of Rivers**: Connect surplus rivers to deficient regions.
3. **Promote Water Conservation**: Encourage rain-water harvesting and efficient irrigation.
4. **Invest in Infrastructure**: Allocate funds for water projects and explore financing options.
5. **Promote Sustainable Agriculture**: Support water-efficient farming practices.
6. **Address Pollution**: Enforce regulations to combat industrial and agricultural pollution.
7. **Adopt One Water Approach**: Manage water sources sustainably and inclusively.
8. **Legal measures**: Strengthen and enforce laws that prohibit discrimination based on caste in accessing water resources. E.g.: SC/ST PoA, 1989.
9. **Community-based water management**: Empower local communities to collectively address water access challenges by actively involving members from all castes.
10. **Awareness generation**: Conduct educational programs to raise awareness about the importance of equitable water access. Challenge stereotypes and prejudices that contribute to discriminatory practices.

To learn about [Traditional Methods of water conservation in India](#): [Click Here](#)

Conclusion:

India, despite its water surplus, grapples with a water crisis, highlighting the need for **improved water resource management**. The key lies in **credible data collection** to understand water demand across various sectors like **agriculture, domestic, and industrial use**. Prioritizing water distribution among these sectors is crucial. Embracing the principles of **reduce-recycle-re-**

use and promoting water conservation methods are vital steps. Furthermore, there's a need for the **convergence of laws, schemes, and agencies** to ensure optimal utilization of water resources.

Insta Links:

- [Regenerative agriculture: A step towards water conservation](#)

Mains Links:

Q. How and to what extent would micro-irrigation help in solving India's water crisis? (UPSC 2021)

Q. What is water stress? How and why does it differ regionally in India? (UPSC 2019)

Prelims Links:

Q. What are the benefits of implementing the 'Integrated Watershed Development Programme'? (UPSC 2014)

1. Prevention of soil runoff
2. Linking the country's perennial rivers with seasonal rivers
3. Rainwater harvesting and recharge of groundwater table
4. Regeneration of natural vegetation

Select the correct answer using the code given below:

- (a) 1 and 2 only
- (b) 2, 3 and 4 only
- (c) 1, 3 and 4 only
- (d) 1, 2, 3 and 4

Ans: C

GENERAL STUDIES - 4

1. EXAMPLES OF ETHICS

Example 1: [Calcutta High Court Judge Gangopadhyay to join the BJP](#)

Recently, **Calcutta High Court Judge Gangopadhyay joined the BJP**. It raises concerns about **judicial propriety and impartiality**. His contentious record on the bench, marked by controversies and accusations of partisanship, casts **doubt on the integrity** of his decisions. While judges have transitioned into politics before, Gangopadhyay's case is notable for the circumstances surrounding his resignation and his history of confrontations with the elected government. His rationale for joining the BJP, citing insults from TMC leaders, lacks **credibility and undermines the impartiality** expected of a constitutional court judge. Overall, his move into politics **compromises the integrity of his judicial legacy**.

Experts Opinion:

Experts argue that **such actions not only damage the Judiciary's credibility** but also violate constitutional principles, notably **Article 50**, which mandates the **separation of the judiciary from the executive**. There's concern that **post-retirement prospects could influence pre-retirement judgments**. The constitution remains silent on post-retirement rehabilitation.

SC adopted the "**Restatement of Values of Judicial Life**" in 1997. As per it:

1. Any act of a Judge which erodes the credibility of the judiciary has to be avoided
2. A Judge should not contest the election to any office of a Club, society or other association.

14th Law Commission Report (1958) recommended that judges should be barred from accepting employment with the Union or the state, as a post-retirement job.

Example 2: Ganesh Baraiya (World's Shortest Doctor)

Ganesh Baraiya from Gujarat, **standing at just 3 feet tall**, recently completed his MBBS, potentially becoming the **world's shortest doctor**. Despite facing initial rejection from the Medical Council of India due to his **dwarfism**, he fought a long legal battle that resulted in a **landmark Supreme Court ruling** in his favour. With determination and support from mentors and friends, he fulfilled his dream of becoming a doctor. Now working as an intern at a **Bhavnagar hospital, Dr Baraiya's** story showcases the resilience and the triumph of the human spirit in overcoming adversity.

Ganesh Baraiya's journey embodies ethical values such as **perseverance, determination, and resilience**.

"You don't have to be a fantastic hero to do certain things, to compete. You can be just an ordinary chap, sufficiently motivated to reach challenging goals."

— Edmund Hillary

Example 3: Iris (Kerala's first generative AI teacher)

Kerala's KTCT Higher Secondary School in Thiruvananthapuram recently introduced **Iris, the state's first generative AI teacher**. Developed in collaboration with Makerlabs Edutech Private Limited, **Iris is a humanoid designed to enhance learning experiences**. It can communicate in three languages, answer complex questions, and offer features like voice assistance, interactive learning, and mobility.

Iris was created as part of the **Atal Tinkering Lab project by NITI Aayog** to promote extracurricular activities in schools. Powered by Robotics and Generative AI technol-

ogies, Iris aims to revolutionize education by providing personalized learning experiences tailored to each student's needs and preferences.



The introduction of Iris, Kerala's first generative AI teacher, reflects ethical values such as **innovation, inclusivity, and student-centred learning**.

CONTENT FOR MAINS ENRICHMENT

2. SUSTAINABLE LIFESTYLE

Context:

The United Nations Environment Assembly (UNEA) adopted a resolution on sustainable lifestyles submitted by India, and co-sponsored by Sri Lanka and Bolivia.

The resolution acknowledges the **10-Year Framework of Programmes on Sustainable Consumption and Production (SCP), initiated at Rio+20 in 2012**. This framework includes six programs covering areas such as

1. Public procurement
2. Consumer information
3. Tourism
4. Lifestyles
5. Education
6. Buildings and construction
7. Food systems

Implemented by the One Planet Network, the resolution urges member states to promote collaboration between public and private sectors and to undertake education and awareness initiatives regarding sustainable lifestyles.

What is Sustainable Lifestyle?

A sustainable lifestyle involves **adopting behaviours and practices that minimize harm** to the environment, promote social equity, and ensure economic prosperity for current and future generations. It encompasses:

1. Conscious consumption
2. Renewable energy use

3. Waste reduction
4. Eco-friendly transportation
5. Ethical sourcing
6. Responsible water usage

The goal is to **maintain a balance between meeting present needs while preserving resources** and ecosystems for future generations.

Mission LiFE, introduced by India at UNFCCC COP26 (Oct 2022), aims to encourage individual and community actions for environmental preservation. It operates in three phases: changing demand by nudging individuals towards eco-friendly practices, changing supply by enabling industries to meet this demand, and changing policy to support Sustainable Consumption and Production (SCP).

3. GROWTH WITHOUT BASIC RIGHTS IS POINTLESS: SC

Context:

The Supreme Court, in its verdict on the Vedanta case, emphasized the **fundamental importance of basic rights such as clean air, water, and soil, alongside** economic growth.

Upholding the closure of Vedanta’s copper smelting plant in Thoothukudi, Tamil Nadu, the court stressed the need to prioritize the protection of these rights for sustainable progress.

Important Principles stated by SC:

Principle	Definition	Examples
Public Trust Doctrine	The state holds natural resources in trust for the benefit of the public.	Government protects forests, rivers, and other natural resources for the well-being of the public.
Intergenerational Equity	Present residents of the earth hold the earth in trust for future generations.	Implementing policies to reduce carbon emissions to mitigate climate change and preserve the environment for future generations.
Polluter Pays Principle	Those who pollute or degrade the environment should bear the costs of mitigation and restoration.	Industries responsible for water pollution funding cleanup efforts to restore affected ecosystems and water bodies; Extended Producers’ Responsibilities Law
Sustainable Development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.	Investment in renewable energy sources to ensure energy security while minimizing environmental impact for future generations.

Usage: These principles can be used in Essay/Ethics/Environment questions

FACTS FOR PRELIMS

GS-1

1. CRITICAL AND STRATEGIC MINERALS

Context: The Union Cabinet, has approved the amendment of the **Second Schedule to the Mines and Minerals (Development and Regulation) Act, 1957.**

- This amendment specifies the **royalty rates for 12 critical and strategic minerals**, including **Beryllium, Cadmium, Cobalt, Gallium, Indium, Rhenium, Selenium, Tantalum, Tellurium, Titanium, Tungsten, and Vanadium.**
- With this approval, the **exercise of rationalizing royalty rates for all 24 critical and strategic minerals is completed.**

About Critical and Strategic Minerals:

- Critical and strategic minerals are those that are deemed essential for the **economic and national security** of a country due to their importance in various **industrial sectors, including defence, energy, electronics, and manufacturing.**
- These minerals are crucial for the **production of key technologies, such as renewable energy systems, electric vehicles, and advanced weaponry.**
- They are often characterized by their **scarcity, high economic value, and irreplaceability in specific applications.**

2. TEMPLE BILL

Context:

The **Karnataka Legislative Assembly** passed the **Karnataka Hindu Religious Institutions and Charitable Endowments (Amendment) Bill, 2024**, after it was previously defeated in the Legislative Council by the BJP-JD(S) alliance.

- The bill proposes the **creation of a Common Pool Fund under the Hindu Religious Institutions and Charitable Endowments Department** to support religious activities in the state.
- The amendment **requires temples with incomes above Rs one crore to contribute 10%, those with incomes between Rs 10 lakh to one crore to contribute five per cent, and temples with incomes below Rs 10 lakh are exempt from contributions.**

Constitutional Provisions for passing of bills:

- According to **Article 197 of the constitution**, if a **bill is rejected by the Legislative Council** for the first time, the **Legislative Assembly has the option to pass the bill again, with or without the amendments suggested by the Legislative Council.**
- Once **the bill is passed for the second time by the Legislative Assembly**, it is **sent back to the Legislative Council.**
- The bill is considered to have **been passed by both houses if the Legislative Council either rejects the bill, takes no action on it for more than one month, or passes the bill with amendments to which the Legislative Assembly does not agree.**

Temple regulation in India:

1. **Article 25(2) of the constitution allows states to enact laws for regulating the secular activities of religious places and for social welfare, reform, or the opening of Hindu religious institutions to all sections of Hindus.**
2. The management of religious endowments and institutions **falls under the concurrent list of the Constitution**, meaning that **both the central and state governments have the authority to legislate on this matter.**

3. SEAMOUNTS

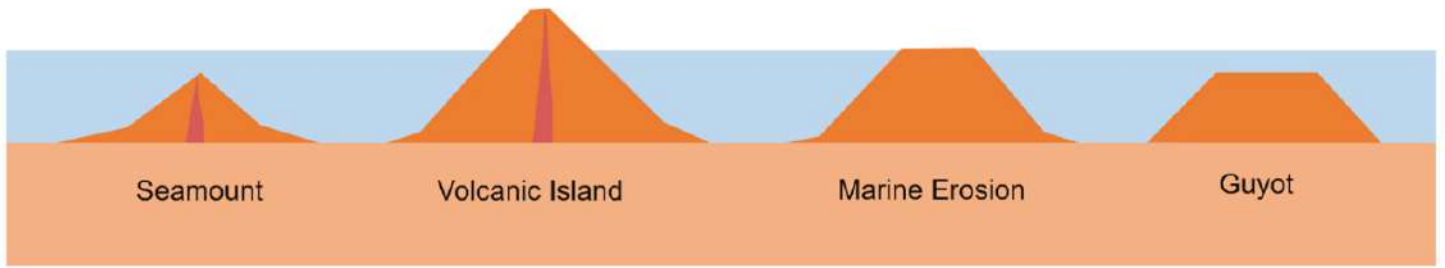
Context:

Researchers aboard the **Schmidt Ocean Institute's Falkor research vessel** have discovered **four massive seamounts off the coast of Peru and Chile.** The tallest of these underwater mountains rises over **1.5 miles (2.4 kilometres)** from the seafloor, making it three times taller than the world's tallest building.

Detected through gravitational anomalies, these extinct volcanoes create subtle changes in the ocean's surface height.

About Seamounts:

Category	Information
About Seamounts	Seamounts are underwater mountains formed through volcanic activity and are recognized as hotspots for marine life.
Formation	Near mid-ocean ridges, intraplate hotspots, or oceanic island chains.
Mapping	Echo sounders/multibeam sonar on ships for topographic mapping, or satellite altimetry for gravity-field mapping. Efforts like Seabed 2030 aim to map the world's seafloor to better understand these ecosystems.
Importance	Provide information about mantle composition and tectonic plate evolution , influence ocean circulation and absorption of heat/CO2, and support diverse biological communities. Seamounts serve as biological hotspots , supporting diverse marine life
Example	The Emperor Seamounts , a chain of seamounts in the Pacific Ocean.
India's contribution	The SARAL satellite , developed in collaboration with France, helped expand the seamount catalogue through improved radar noise reduction.
Seamounts Vs Guyots	Seamounts differ from Guyots, which are also formed from undersea volcanoes but were once above the surface of the ocean and have since submerged to form flat-topped undersea mountains.



4. CAVUM CLOUDS

Context:

NASA's Terra satellite recently captured a **cluster of cavum clouds over the Gulf of Mexico off Florida's west coast**.

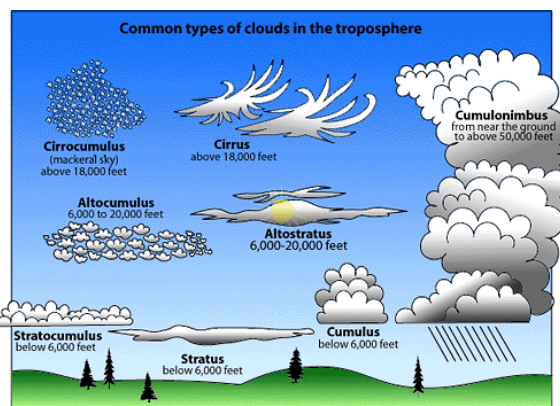
What are Cavum clouds (also known as hole-punch clouds or fall-streak holes)?

They are **formations in the atmosphere that appear as if a large circle or ellipse** has been neatly cut from the clouds, leaving feathery wisps in the middle of the hole. They are a **result of aeroplanes flying through banks of altocumulus clouds**, causing supercooled water droplets to freeze into ice crystals due to adiabatic expansion. The falling ice crystals leave a hole in the cloud layer, with wispy trails of precipitation visible in the centre known as **virga**.






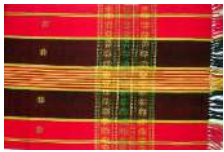





Types of Clouds:

Type	Description
Cirrus Clouds	Wispy, curly, or stringy clouds found high in the atmosphere, usually made of ice crystals. Signal clear, fair weather.
Stratus Clouds	Horizontal, layered clouds that can blanket the entire sky. Occur close to the Earth's surface. Form at the boundary of warm fronts, where warm, moist air is forced up over cold air.
Cumulus Clouds	Large, lumpy clouds that stretch vertically into the atmosphere. Created by strong updrafts of warm, moist air.
Nimbostratus Clouds	Low and middle dark grey clouds with precipitation falling from them.
Stratocumulus Clouds	Low clouds with irregular masses, rolling or puffy in appearance.
Cumulonimbus Clouds	Large clouds with dark bases and tall billowing towers. Can have sharp well-defined edges or an anvil shape at the top. Precipitation can obscure the base of the clouds.



5. GI TAGS AWARDED TO DIFFERENT PRODUCTS

State	Product	Description
Odisha	Cuttack Rupa Tarakasi (Silver Filigree)	 <p>The incorporation of silver filigree into jewellery dates back to around 3500 BCE in Mesopotamia, and it is still practised today as Telkari work. It was introduced to Cuttack from Persia via Indonesia.</p>
West Bengal	Banglar muslin (Traditional Handloom Craft)	 <p>Banglar muslin is a traditional handloom craft made of cotton.</p>
Andhra Pradesh	Narasapur Crochet Lace Products	 <p>Crochet lace products were introduced to Narasapur by missionaries.</p>
Madhya Pradesh	Ratlam Riyawan Lahsun (Garlic)	 <p>Ratlam Riyawan Lahsun refers to garlic from Ratlam, known for its unique taste and aroma.</p>
Assam	Majuli Mask and Majuli Manuscript Painting	 <p>Majuli Mask and Majuli Manuscript Painting are traditional art forms from Majuli, Assam.</p>
Tripura	Risa Textile	 <p>Risa Textile is a traditional tribal attire from Tripura, known for its vibrant designs and cultural significance</p>

Telangana	Hyderabad Lac Bangles		Lac bangles made in Hyderabad are known for their intricate designs and craftsmanship.
Gujarat	Kutch Rogan Craft		Rogan Craft from Kutch is an ancient art form involving the use of castor oil and pigments to create intricate designs on fabric.
Gujarat	Ambaji White Marble		Ambaji White Marble is formed when limestone is re-crystallized under the earth's crust, known for its purity and durability.

About GI Tags:

A Geographical Indication (GI) is a **designation used on products with a specific geographical origin**, indicating qualities or reputation linked to that origin. Internationally recognized **under the Paris Convention**, GI is part of **Intellectual Property Rights (IPRs)**, covered by the **WTO's TRIPS Agreement, Madrid Agreement, and Lisbon Agreement**.

In India, GI registration is governed by the **Geographical Indications of Goods (Registration and Protection) Act of 1999**. Administered by the Registrar of Geographical Indications (RGI), it identifies **agricultural, natural, or manufactured goods**, providing legal protection **for 10 years**, renewable. The **Department for Promotion of Industry and Internal Trade, Ministry of Commerce and Industry**, oversees GI registration, offering protection against unauthorized use, promoting exports, and ensuring quality and distinctiveness.

6. SANGEET NATAK AKADEMI FELLOWSHIPS AND AWARDS

Context:

President of India, presented the **Sangeet Natak Akademi Awards for the years 2022 and 2023**

The **Sangeet Natak Akademi (SNA)** is India's national academy for performing arts. It was established **in 1952**

by the Indian Ministry of Education and inaugurated in 1953.

The SNA's purpose is to **preserve and promote India's diverse culture through music, dance, and drama**. The SNA Awards **have been given since 1952 to recognize sustained individual work and contribution**. The awards are given in the following categories:

- Music
- Dance
- Theatre
- Other traditional arts and puppetry
- Contribution/scholarship in performing arts

The **SNA Fellowship (Akademi Ratna) is the highest honour** given to artists in the field of performing arts

7. SHANKARACHARYA TEMPLE

Context:

During his recent visit to Kashmir, the PM paid homage at the Shankaracharya Hill, home to the **Shankaracharya Temple** situated in the **Zabarwan Range**.

About the Temple:

Dedicated to **Lord Shiva**, the temple sits at an **elevation of 1100 feet** and is revered as the **oldest shrine in the Kashmir valley**. Named after the philosopher and saint Adi Shankaracharya, who visited the site and propounded the **Doctrine of Advaita**, the temple holds historical

significance. **Adi Shankaracharya also established four maths**, including Dwarka, Joshimath, Puri, and Sringeri.

	Adi Shankaracharya	Sri Ramanujacharya
Birth and Lifetime	Born in 788 CE in Kaladi, Kerala, and passed away in 820 CE 	Born in 1017 CE in Sriperumbudur, Tamil Nadu, and passed away in 1137 CE 
Philosophy	Advaita Vedanta (Non-Dualism)	Vishishtadvaita Vedanta (Qualified Non-Dualism)
Interpretation of Vedas	Argued that the ultimate reality is Brahman and that the universe is an illusion (Maya)	Argued that Brahman is the ultimate reality, but also that the universe is real and a manifestation of Brahman
Approach to God	Emphasized the importance of renunciation and meditation to realize the ultimate reality	Emphasized devotion (bhakti) to achieve union with the divine
Scriptures	Emphasized the importance of the Upanishads and the Brahma Sutras	Emphasized the importance of the Bhagavad Gita and the Divya Prabandham
Influence	Revived Hinduism and helped unify various philosophical schools of thought. Founded four mathas (monasteries) in India.	Popularized devotion to Vishnu and helped revive the Bhakti movement in India.
Key Works	Vivekachudamani, Upadesa Sahasri, and commentaries on the Upanishads, Bhagavad Gita, and Brahma Sutras	Sri Bhashya, Vedanta Sara, and commentary on the Bhagavad Gita
Legacy	His teachings have had a profound impact on Indian intellectual and spiritual life.	His teachings have had a significant impact on the development of the Bhakti movement and culture
Statue	A 12-foot statue of Adi Shankaracharya at Kedarnath (Uttarakhand)	Statue of Equality on the outskirts of Hyderabad, Telangana Visit Insights IAS Daily Current Affairs

8. DESERT STAR DUNES

Context:

Scientists have revealed the **secrets of Earth’s magnificent desert star dunes**, showcasing the **internal structure and formation process** of these geological wonders.

The study focused on the **Lala Lallia star dune in eastern Morocco**, uncovering its intricate layers and estimating it took about **900 years to form**, accumulating sand at a rate of approximately 6,400 metric tons annually. These star dunes, accounting for **under 10% of Earth’s desert dunes**, are the tallest and most impressive, resembling pyramids with arms extending from a central peak.



Desert star dunes have a distinctive internal structure and formation process:

- Internal Structure:** Revealed through ground-penetrating radar, it shows layers formed over time through accumulating sand. Some parts

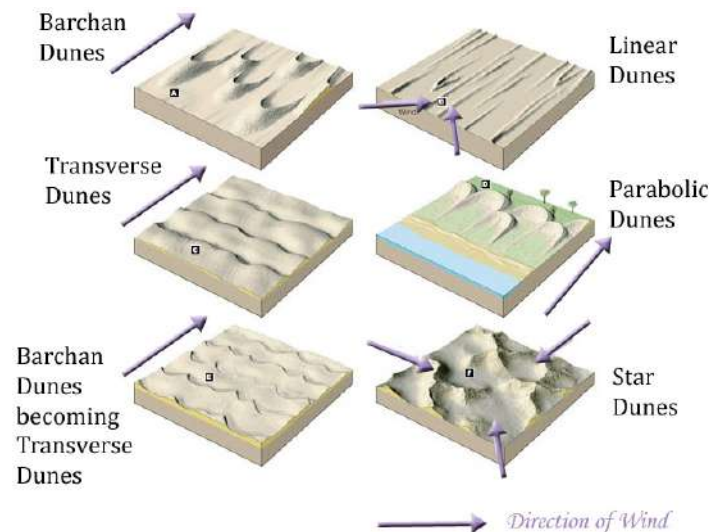
resemble other types of dunes.

- Formation Process:** Formed by opposing winds with changing directions, resulting in a unique star shape. Winds blowing from different directions lead to net sand accumulation, creating giant dunes.

What are Dunes and its different types?

Dunes are **mounds, ridges, or hills of sand** formed by the wind in deserts, coastal areas, or other sandy environments. They come in various shapes and sizes. The different types of dunes include:

- Barchan Dunes:** Crescent-shaped dunes with the tips pointing downwind, commonly found in areas with limited sand.
- Linear Dunes:** Long and straight dunes that form parallel to the prevailing wind direction.
- Star Dunes:** Pyramid-shaped dunes with arms radiating from a central peak, forming in areas with complex wind regimes.
- Transverse Dunes:** Long ridges of sand perpendicular to the wind direction, often found in extensive sand seas or deserts.
- Parabolic Dunes:** Similar to barchan dunes but with the tips pointing upwind, typically forming in areas with abundant sand and vegetation.
- Dome Dunes:** Rounded mounds of sand with no specific orientation to the wind direction, often found in coastal regions or sandy plains.



GS-2

1. PM JANJATI ADIVASI NYAY MAHA ABHIYAAN (PM-JANMAN)

Context:

The housing component of the **PM Janjati Adivasi Nyay Maha Abhiyaan (PM-JANMAN)** is facing hurdles due to discrepancies in **data on Particularly Vulnerable Tribal**

Groups (PVTGs).

- The government set a target of **sanctioning 2.5 lakh houses by February 15 but only 1.59 lakh houses could be sanctioned due to challenges in collecting accurate beneficiary data.**

PM Janjati Adivasi Nyay Maha Abhiyaan (PM-JANMAN) is a government initiative launched in India with the aim of **addressing the needs and welfare of tribal communities, particularly those living below the poverty line (BPL)**

The initiative was announced in the **Union Budget speech of 2023.**

PM-JANMAN encompasses various schemes and programs aimed at **improving the lives of tribal populations, including housing, healthcare, education, and economic development.**

2. UNIFORM HOSPITAL TREATMENT CHARGES

Context: The **Supreme Court** has directed the **central government** to **swiftly establish uniform hospital treatment charges**, aiming to **streamline the cashless health insurance system.**

- The court's decision **follows a PIL urging for standardized fees nationwide.**
- The general insurance industry, which heavily relies on **health premiums, awaits the outcome, hoping for standardization to facilitate the 'Cashless Everywhere' scheme.**
- The **PIL cited disparities in treatment costs, ranging from private hospitals to government facilities.**
- Despite the Central Government's efforts to establish rates, **responses from state governments and union territories have been lacking.**

With over 40,000 registered hospitals in India, the decision aims to benefit over 30 crore health insurance policyholders by offering cashless services.

3. SCHEME FOR INTERNALLY DISPLACED PERSONS (IDP)

Context:

The **Election Commission of India (ECI)** has introduced a **scheme allowing internally displaced persons (IDPs)** of Manipur to **vote at relief camps.**

- Following **ethnic violence in May 2023**, over **60,000 people were displaced and housed in relief camps, with an additional 9,000 in Mizoram.**

According to the **Guiding Principles on Internal Dis-**

placement, internally displaced persons (also known as "IDPs") are "**persons or groups of persons** who have been **forced or obliged to flee or to leave their homes or places of habitual residence**, in particular as a result of or in order to avoid the **effects of armed conflict, situations of generalized violence, violations of human rights or natural or human-made disasters, and who have not crossed an internationally recognized border.**"

4. ADITI SCHEME

Context:

Raksha Mantri launched the **Acing Development of Innovative Technologies with iDEX (ADITI) scheme**, aiming to **promote innovations in critical and strategic defence technologies.**

- Under this scheme, start-ups can receive a **grant-in-aid of up to Rs 25 crore for their research and development efforts in defence technology.**

More about the Scheme:

- The scheme is part of **the iDEX framework** and aims to **develop about 30 deep-tech critical and strategic technologies while bridging the gap between defence requirements and innovation capabilities.**

Additionally, the event unveiled the **11th edition of the Defence India Start-up Challenge (DISC)** with 22 problem statements, inviting innovators to propose solutions to enhance defence capabilities.

The Innovations for Defence Excellence (iDEX) framework is a program that **aims to promote innovation and technology development** in India's defence and aerospace sectors.

5. THE WORLD BANK RELEASES WOMEN, BUSINESS AND THE LAW 2024

Context:

The "Women, Business and the Law 2024" report by the World Bank Group examines **laws and regulations affecting women's economic opportunities** across 190 economies.

The report analyzes challenges hindering women's workforce entry and economic contribution, updating the Women, Business and the Law index with new indicators like Safety and Childcare. Findings reveal a **significant global gap in women's legal rights**, with potential economic growth if discriminatory laws are eliminated. India's rank in the report improved marginally to **113 out of 190.**

Key aspect of the Report:

Aspects	Findings
10 Indicators of Assessment include	Safety: Women globally have a third of the legal protection needed from domestic violence, sexual harassment, child marriage, and femicide.
	Workplace and Pay: Women earn just 77 cents for every dollar paid to men. Less than 20% of economies have adopted enforcement mechanisms for the pay gap. Indian women have just 60% of the legal rights compared to men
	Parenthood: Women spend nearly 2.4 hours more per day on unpaid care work than men, primarily childcare.
	Childcare: Nearly all economies performed poorly in childcare support.
	Mobility, Entrepreneurship, Assets and Pension.
Recommendations	Expand maternity and paternity leave provisions. Enact legal mandate for equal pay and lift restrictions on women’s work in industrial jobs.
	Implement legally binding quotas for women on corporate boards. (Already implemented in India). Ensure equal retirement benefits for women , considering childcare-related work absences.
India’s initiatives for gender equality in the workplace	The Code on Wages, 2019: Prohibits gender discrimination in wages and recruitment. Maternity Benefit Amendment Act, 2017: Provides maternity benefits and creche facility. Sexual Harassment of Women at Workplace (Prevention, Prohibition, and Redressal) Act, 2013 (POSH Act).

6. HOLISTIC PROGRESS CARD (HPC)

Context:

The **National Council for Educational and Research Training (NCERT)** is introducing a new **‘holistic progress card’ (HPC)** to **replace traditional report cards**.

- The **HPC, developed by the Performance Assessment, Review, and Analysis of Knowledge for Holistic Development (PARAKH)**, assesses academic **performance along with interpersonal relationships, self-reflection, creativity, and emotional application** in classrooms.

Features:

- It is designed **for the foundational stage (Classes 1-2), preparatory stage (Classes 3-5), and middle stage (Classes 6-8), aligning with the National Education Policy (NEP) 2020.**
- Unlike traditional cards, the **HPC relies on a 360-degree evaluation**, assessing students’ abilities through class activities and considering their active participation.
- It involves **self and peer evaluation, incorporating parents’ inputs to bridge home-school connections.**

The HPC aims to **promote self-awareness, critical thinking, and holistic growth**, aligning with NEP’s emphasis on competency-based evaluation and formative assessment.

7. ABORTION AS A CONSTITUTIONAL RIGHT

Context:

France has become the only country to explicitly guarantee abortion as a **constitutional right**.

- The bill **enshrines a woman’s right to voluntarily terminate a pregnancy in France’s constitution.**
- The historic move **follows the Dobbs ruling by the U.S. Supreme Court in 2022** and aligns with France’s **commitment to women’s rights.**
- The amendment pays tribute **to Simone Veil, who championed the bill decriminalizing abortion in France in 1975.**
- The amendment process is **rare in France, with the Constitution being amended only 17 times since its enactment in 1958.**

Abortion is a **medical procedure that terminates a pregnancy**, resulting in the **removal of the foetus or embryo** from the uterus, **either surgically or medically.**

8. VARIOUS GOVERNMENT REGULATIONS IN NEWS

Topic	Details
Union Ministry of Environment, Forest and Climate Change notified Living Animal Species (Reporting and Registration) Rules, 2024	Notified living animal species are those listed under the Living Animal Species (Reporting and Registration) Rules, 2024, which require mandatory electronic registration for possession, transfer, birth, and death reporting of certain scheduled animal species. These rules aim to regulate and monitor the ownership and movement of endangered or protected animals, as listed in the Appendices of CITES or Schedule IV of the Wild Life (Protection) Act, 1972 Top of Form
	The rules require mandatory electronic registration for possession of animal species under captivity, within 6 months . Birth of offspring must be reported within 7 days and transferred within 15 days.
Competition Commission of India (CCI) Regulations, 2024	The Competition Commission of India (CCI) issued new regulations under the Competition (Amendment) Act 2023
	1. Penalties based on global turnover to address abuse of dominant position by enterprises.
	2. Introduction of Commitment and Settlement mechanisms to efficiently resolve competition law concerns without a lengthy legal process
Central Consumer Protection Authority (CCPA) Advisory on Advertisement of Illegal Activities	The advisory prohibits advertisements or endorsements of activities prohibited by law, such as betting or gambling , subject to rigorous scrutiny. Violations will lead to stringent measures against manufacturers, advertisers, publishers, intermediaries, social media platforms, endorsers, etc.
	Betting and gambling fall under the State subject in India , governed by laws enacted by State Governments based on the Public Gambling Act, 1867 .
	Additionally, in 2023, the Ministry of Information & Broadcasting issued an advisory on advertisements, including surrogate advertisements of online betting platforms .
	Central Consumer Protection Authority: Statutory body under Section 10 of the Consumer Protection Act 2019. Its objective is to promote, protect, and enforce consumer rights.
Drugs and Magic Remedies (Objectionable Advertisements) Act, 1954	The Supreme Court has prohibited Patanjali Ayurved from denigrating allopathy and advertising products purported to treat chronic conditions, under the Drugs and Magic Remedies (Objectionable Advertisements) Act, 1954 .
	The act aims to control certain drug advertisements and prohibit magic remedy claims . Penalties include imprisonment and fines.
	Despite being the brand ambassador, Mr Ramdev's lack of legal ownership in Patanjali Ayurved may shield him from scrutiny
Rajasthan Police Subordinate Service Rules, 1989	The Supreme Court upheld Rajasthan's rule limiting police constable candidates to those with two or fewer children . Rule 24(4) of the Rajasthan Police Subordinate Service Rules, 1989, was deemed non-discriminatory and constitutional . The rule disqualifies candidates with more than two children since June 1, 2002. This ruling aligns with similar policies in other states aimed at promoting family planning and population control .
	Population control falls under the concurrent list

9. SWEDEN JOINS NATO

Context:

Sweden has officially become the **32nd member of NATO**, joining the military alliance two years after applying following Russia's invasion of Ukraine.

Sweden's NATO membership was **delayed due to objections from Turkey and Hungary**, but eventually received approval.

NATO	Details
Formation	1949 (HQ: Brussels, Belgium)
Members	32 member countries (as of 2023, including Finland and Sweden)
Founding Members	Belgium, Canada, Denmark, France, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, the United Kingdom, and the United States
Article 5 of NATO	A key provision of the NATO treaty states that an attack on one member is an attack on all members . It has been invoked only once after the 9/11 terrorist attacks in the United States. However, NATO's protection does not extend to members' civil wars or internal coups .
Alliances	Euro-Atlantic Partnership Council (EAPC), Mediterranean Dialogue, Istanbul Cooperation Initiative (ICI)

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Nato's European expansion since 1949



10. DYING DECLARATION

Context:

In the **Naeem vs. The State of Uttar Pradesh** case on March 05, 2024, the Supreme Court (SC) ruled that **a dying declaration can serve as the sole basis of conviction** if it inspires full confidence, without requiring further corroboration.

What was the case about?

The case involved **Shahin Parveen**, who accused her brother-in-law (Pappi), his wife (Naeema), and Naeema's brother (Naeem) of setting her on fire. Despite affirming Pappi's conviction based on the dying declaration, the court acquitted Naeema and Naeem due to a lack of specific evidence against them. The judgment highlights the significance of credible dying declarations in criminal proceedings.

What is Dying Declarations?

A dying declaration is a **statement made by a person who believes they are about to die**, regarding the cause or circumstances of their impending death. It is **admissible as evidence** in legal proceedings, based on the belief that **a dying person would be unlikely to lie**.

11. DENOTIFICATION OF 10 CANTONMENTS

Context:

The Ministry of Defence has **denotified civil areas of 10 cantonments**, including ones in Uttarakhand, UP, Maharashtra, Jharkhand, and Rajasthan. The process involves **merging these areas with state municipalities**. Himachal Pradesh, with seven cantonments, is also undergoing this process, with Khas Yol already denotified.

What is the plan?

In 2023, the Ministry of Defence had notified that plan to **carve out the military areas in cantonments** and convert them into **"exclusive military stations"** with the Army exercising **"absolute control" over them**. The civilian areas, in turn, will be **merged with the local municipalities** to provide them with the benefits of various government schemes. **Not all cantonments will become military stations** as some army and civilian pockets are intertwined.

What are the issues with Cantonments?

Cantonments have **strict restrictions on construction, road use, and common area occupation, causing tension between civilians and the military**. Civilians face challenges in obtaining home loans and accessing government schemes. Even basic renovations require multiple permissions.

About Cantonments:

Information	Description
Definition	A proclaimed area under the Cantonments Act, 2006 , governed and controlled by the central government of India to provide municipal services for civilians living in the area.

History	It was established by the East India Company after the Battle of Plassey in 1757. Barrackpore (Calcutta) was the first Cantonment established in 1765. Currently, there are 62 cantonments in India .
Categories	Cantonment Boards are categorized into four categories based on population: Category I (>50,000), Category II (10,000-50,000), Category III (2,500-10,000), and Category IV (<2,500).
Administration	Cantonment administration falls under the purview of the Union Government (Ministry of Defence), as outlined in the Cantonments Act, 2006 , following the guidelines set by the 74th Constitutional Amendment . While the Union Government holds administrative authority, State Governments have the prerogative to implement schemes within Cantonment areas.
Composition	Consists of up to eight members: three ex-officio members, three nominated military members (garrison engineer, station commander, and senior executive medical officer), and one representative of the district magistrate.
Services Provided	Sanitation, primary education, street lighting, water supply, maintenance of roads, bridges, and public hospitals.
Cantonments vs Military station	Cantonments are civilian areas that are under the control of the military , and they usually have a civilian population living in them as well. Military stations, on the other hand, are purely military areas where only military personnel and their families reside.

12. UNNATI - 2024

Context:

The Union Cabinet approved the **Uttar Poorva Transformative Industrialization Scheme, 2024 (UNNATI - 2024)** for a duration of 10 years, to incentivize **investors to set up new units or expand existing ones**.

Aspect	Details
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About	The Uttar Poorva Transformative Industrialization Scheme (UNNATI - 2024) is a 10-year Central Sector Scheme aimed at fostering industrial development and employment generation in the Northeast Region (NER) . Certain industries are kept on a positive list , while others are on a negative list to maintain environmental balance .
Scheme Period	10 years with an additional 8 years for committed liabilities
Eligibility	All new industrial units and expanding units
Benefits	It offers incentives to new and expanding industrial units , with a maximum benefit of Rs 250 crore per unit
Categorization of Districts	Zone A (Industrially Advanced Districts) & Zone B (Industrially Backward Districts)
Scheme Division	Part A: Incentives for eligible units; Part B: Implementation and institutional arrangements for the scheme
Earmarking of Funds	60% to 8 Northeastern states , 40% on a FIFO basis
Implementation Agency	Department for Promotion of Industry and Internal Trade (DPIIT)
Committees for Oversight	Steering Committee, State Level Committee, Secretary Level Committee
Other Related Schemes	PM DevINE Scheme, NITI Forum for North East, North East Special Infrastructure Development Scheme

GS-3

1. NATIONAL ELECTRONIC FUNDS TRANSFER (NEFT)

Context:

Recently, **the National Electronic Funds Transfer (NEFT) system processed a record 4.10 crore transactions**, marking the **highest number of transactions processed in a single day**.

- The NEFT system, along with the **Real Time Gross Settlement (RTGS) system, is managed by the Reserve Bank of India** for settling **retail and wholesale payments, respectively**.
- Both NEFT and RTGS have been operating on a **24x7x365 basis**.

DIFFERENCE BETWEEN NEFT, RTGS AND IMPS

BASIS OF COMPARISON	NEFT	RTGS	IMPS
Minimum transfer value	Re. 1	Rs. 2 lakh	Re. 1
Payment options	Online and offline	Online and offline	Online
Maximum transfer value	No limit	No limit	Rs.2 lakh
Settlement type	Half hourly basis	Real time	Real time
Inward transaction charges	No charges	No charges	Decided by the individual member banks and PPIs

paisabazaar

2. BHARAT TEX 2024

Context:

Bharat Tex 2024, India's largest textile event, concluded after four days of showcasing over 100 product announcements, international Memoranda of Understanding (MoUs), investment decisions, and research collaborations.

- The event attracted **3,000 buyers from over 100 countries** and saw participation from over **10,000 artisans, weavers, students, factory workers, NGOs, and producer companies**.
- Bharat Tex 2024 also served as a platform for launching **various initiatives and projects, including IndiaTEX and the Textile Grand Innovation Challenge**, aimed at fostering innovation and sustainability in India's textile industry.

About IndiaTEX:

The project 'Accelerating the Transition of the Indian Textile Sector towards Circularity' (IndiaTex) is a four-year initiative funded by the Ministry of Foreign Affairs of Denmark and implemented in collaboration with the Government of India's Ministry of Textiles.

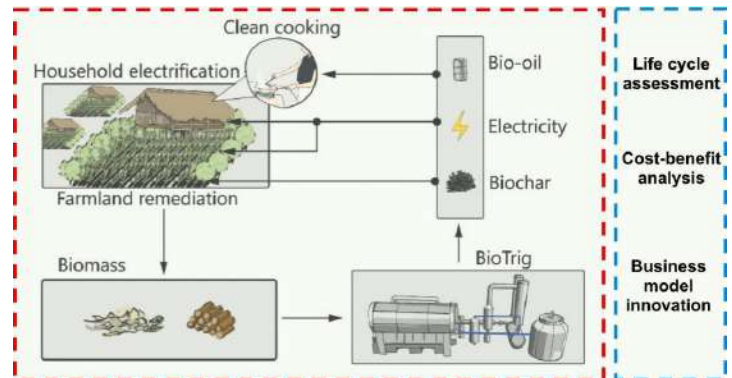
- IndiaTex aims to expedite the transition of the Indian textile sector towards circularity.
- The project, spanning from December 2023 to December 2027, will focus on working with industry stakeholders, including small and medium-sized enterprises (SMEs) and textile clusters.
- Specific objectives include supporting SMEs in calculating their Product Environmental Footprint (PEF), assisting SME brands in adopting circular business models, and collaborating with the Indian government to develop and implement circular textile policies.

3. BIOTRIG

Context:

A recent study introduces a waste management technology called 'BioTRIG,' utilizing pyrolysis at the community level in rural India.

- This process converts organic waste into useful products like bio-oil, syngas, and biochar fertilizer.
- The BioTRIG system aims to address various rural challenges, including indoor air pollution, soil degradation, and lack of reliable electricity.



4. REINTRODUCTION OF TIGERS

Context:

India and Cambodia Forge Alliance to Restore Tigers in Cambodia, drawing from India's expertise in Project Tiger.

The last record of a tiger in Cambodia was from a camera trap in 2007 and the big cats were declared "functionally extinct" in Cambodia in 2016, and are now extinct, requiring active reintroduction and reinforcement to rebuild the population.

World Tiger Day:
29th July

About Tigers (Panthera Tigris)
IUCN: Endangered
WPA: Schedule I
Cites: Appendix I
Tigers are the largest cat species and is both flagship and Umbrella species

Numbers: According to the tiger census of 2019, India has 2967 tigers, of which 526 are in Madhya Pradesh (highest).
Sub species: Traditionally eight subspecies of tigers have been recognized, out of which three are extinct— Caspian tiger, Javan tiger and Bali tiger.
Other sub species are Bengal Tigers, Amur tiger (Amur Rivers region of Russia and China, and North Korea), South China tiger, Sumatran tiger, Indo-Chinese tiger.
Largest Tiger Reserve: Nagarjunsagar Srisailem Tiger Reserve, Andhra Pradesh
Smallest: Bor tiger reserve in Maharashtra
Highest Density of Tigers: Jim Corbett National Park

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5. SAMUDRA LAKSAMANA

Context:

India and Malaysia conducted the bilateral maritime exercise Samudra Laksamana from February 28 to March 2, 2024, in Visakhapatnam. The exercise involves the **Indian Naval Ship Kiltan and the Royal Malaysian Ship KD Lekir**.

Other exercises between India and Malaysia:

Exercise Harimau Shakti: This is a bilateral military exercise between the **Indian Army and the Malaysian Army**, aimed at enhancing cooperation and interoperability in counter-terrorism and jungle warfare.

6. STATE ENERGY EFFICIENCY INDEX (SEEI) 2023

Context:

Bureau of Energy Efficiency 22nd Foundation Day: Celebrated on March 1, 2024, the 22nd Foundation Day commemorates the establishment of the organization under the Ministry of Power, with the goal of reducing energy intensity in the Indian economy.

- The theme of the celebration is **“Energy Transition through Electrification and Decarbonization in India”**.
- **SEEI 2023 was released on this occasion**

About SEEI 2023:

Aspect	Description
SEEI 2023	It assesses the performance of 36 states and UTs in Energy Efficiency (EE) implementation using 65 indicators distributed across seven demand sectors: Buildings, Industry, Municipal services, Transport, Agriculture, Distribution Companies (DISCOM), and Cross-Sector Initiatives.
Objective	Driving decarbonization efforts in states and providing recommendations to aid states in promoting energy efficiency, contributing to the fulfilment of Sustainable Development Goals (SDGs) and Nationally Determined Contributions (NDC).

Developed by	Bureau of Energy Efficiency (BEE) in collaboration with the Alliance for an Energy-Efficient Economy (AEEE).
	Assesses the annual progress of states and Union Territories (UTs) in implementing energy efficiency measures
Front Runner Category	States scoring greater than 60 points: Karnataka (the only state with an active “Energy Conservation and Energy Efficiency Policy”) followed by Andhra Pradesh.
Achiever Category	States scoring between 50-60 points in the index. 15 states improved scores compared to SEEI 2021- 22 with Maharashtra and Haryana showing the most improvement.
About BEE	The Bureau of Energy Efficiency (BEE) was established in 2002 under the Energy Conservation Act, 2001, and is headquartered in New Delhi. It assists in formulating policies and strategies focusing on self-regulation and market principles. The Energy Conservation Act assigns regulatory and promotional roles to BEE.

7. WORLD POVERTY CLOCK

Context:

India has made significant progress in **reducing extreme poverty, with less than 3% of its population** now living below the poverty line, according to the latest data from **the World Poverty Clock**.

- This achievement aligns with the **United Nations’ Sustainable Development Goal (SDG) of ending extreme poverty by 2030**.
- The **World Poverty Clock monitors progress against ending extreme poverty**, funded by organizations like **IFAD and the Federal Ministry for Economic Cooperation and Development of Germany**.

Key Findings:

- It calculates **poverty rates based on income levels, with the poverty line set at \$2.15 a day**.
- As a result, the **number of people living in extreme poverty in India has decreased to approximately 3.44 crore in 2024 from 4.69 crore in 2022**, representing a decline **to 2.4% of the total population**.
- Additionally, a recent **NITI Aayog discussion paper highlights the decline in multidimensional poverty in India, from 29.17% in 2013-14 to 11.28% in 2022-23**.

The **international poverty line of \$2.15 a day is used to measure progress towards the World Bank's target of reducing extreme poverty to less than 3% by 2030**, while SDG target 1.1 aims for zero poverty by 2030.

8. WTO BACKS REMITTANCE COST CUT

Context:

India's proposal to **reduce the cost of cross-border remittances** has **received support from many World Trade Organization (WTO) members, except the US.**

- The initiative aims **to lower remittance costs to less than 3 per cent**, in line with UN Sustainable Development Goals.
- Lower costs could **boost remittance inflows, reduce reliance on informal channels, and benefit Indian businesses**, especially the Unified Payments Interface (UPI) for global expansion.
- India received **\$125 billion in remittances in 2023**, with associated costs **reaching \$7-8 billion.**
- Lowering remittance costs will **benefit the Indian diaspora, and MSMEs, and increase competitiveness in export.**

Remittance refers to the **transfer of money or funds from one individual or entity to another, typically across borders or from one country to another.** Remittances are **often sent by migrants who are working abroad to their families or relatives in their home countries.**

9. NATIONAL URBAN CO-OPERATIVE FINANCE AND DEVELOPMENT CORPORATION LIMITED

Context:

The Home Minister launched the **National Urban Co-operative Finance and Development Corporation Limited (NUCFDC)**, serving as the **umbrella organization for Urban Cooperative Banks (UCBs).**

- The initiative aims to **modernize and strengthen the UCB sector, benefiting both banks and customers.**

The **National Urban Co-operative Finance and Development Corporation (NUCFDC)** was established based on the recommendation of the **Vishwanathan Committee on Primary (Urban) Co-operative Banks, formed by the Reserve Bank of India (RBI)**

NUCFDC is registered with the **RBI as a non-deposit-taking Non-Banking Financial Company (NBFC)**, and UCBs can voluntarily subscribe to its capital

The key objectives of NUCFDC include **expanding the number of credit societies and UCBs, facilitating di-**

alogue between banks and regulators, providing liquidity to UCBs, establishing IT infrastructure for shared use by members to enhance service offerings, and more.

10. SWACHHATA GREEN LEAF RATING INITIATIVE

Context:

The **Swachhata Green Leaf Rating (SGLR) initiative**, launched by **the Department of Drinking Water & Sanitation in collaboration with the Ministry of Tourism**, aims to **elevate hygiene and sanitation standards** in India's tourism industry.

- **Bison Resorts in Madhai, Madhya Pradesh**, received the **first Five Swachhata Green Leaf Rating Certificate**, setting a benchmark for responsible tourism practices.

The SGLR program aligns with the **Travel for LiFE program, aiming to foster sustainable tourism practices for economic viability and environmental resilience.**

11. APP DELISTING

Context:

The Indian government, strongly opposes **Google's recent delisting of Indian apps from its Play Store due to a dispute over service fee payments.**

- The government emphasizes the **importance of protecting the Indian start-up ecosystem and asserts that their fate cannot be determined solely by big tech companies** like Google.

IAMAI (Internet and Mobile Association of India), an industry association, condemned app removals, raising **digital monopoly** concerns. Recommendations from the Standing Committee on Finance include categorizing leading digital market players as Systemically Important Digital Intermediaries (SIDIs) and **enacting the Digital Competition Act.**

Measures suggested to address digital monopolies include:

1. Strengthening the **Competition Commission of India (CCI)**
2. Implementing **Consumer Protection (E-Commerce) Rules, 2020**
3. Enforcing the **Digital Personal Data Protection Act, 2023**, for data privacy and security

App delisting refers to the **removal or exclusion of an application (app) from an online platform or marketplace where it was previously available for download or purchase.**

This action is **typically taken by the platform operator, such as Google Play Store or Apple App Store, for various reasons**, including violations of **platform policies, legal issues, or disputes between the platform and the app developer.**

When an app is delisted, it becomes **inaccessible for users to download or use through the platform, and it may also lose visibility and exposure to potential users.**

12. STATUS OF LEOPARDS IN INDIA

Context:

The report on the **Status of Leopards in India** was recently released by the Union Minister for Environment, Forest and Climate Change.

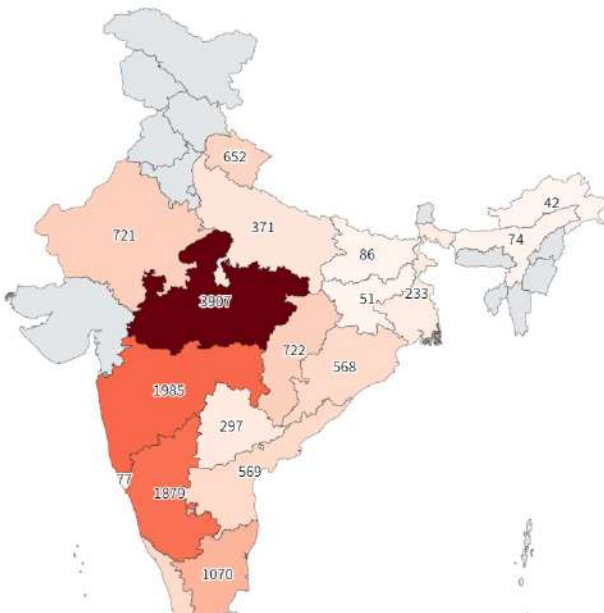
The fifth cycle leopard population estimation, conducted by the **National Tiger Conservation Authority** and Wildlife Institute of India, revealed key findings:

- Overall population:** India's leopard population increased by **8%** from 12,852 in 2018 to 13,874 in 2022.
- Regional variation:** Central India's leopard population remains stable or slightly growing, while the Shivalik hills and Gangetic plains experienced a decline.
- State-level distribution:** **Madhya Pradesh** has the highest number of leopards (3,907), followed by Maharashtra, Karnataka, and Tamil Nadu.
- Benefits From Tiger Conservation Efforts:** The Central India and Eastern Ghats landscape, home to the largest leopard population, is benefiting from tiger conservation efforts.
- Common Threats:** Threats include poaching, habitat loss due to human activities, and road accidents.

Leopard count in states

The estimated leopard population in 2022 is 13,874

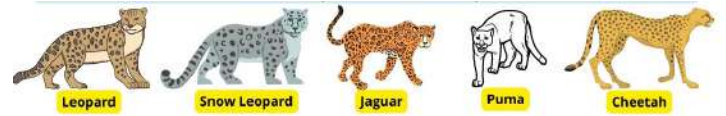
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About IBCA:

The **International Big Cat Alliance (IBCA)** is a **coalition of 97 countries (HQ: India)**, conservation partners, and scientific organizations dedicated to conserving big cat species and their habitats.

- Last year, the government, marking the **50th anniversary of Project Tiger**, announced the establishment of the **IBCA**.



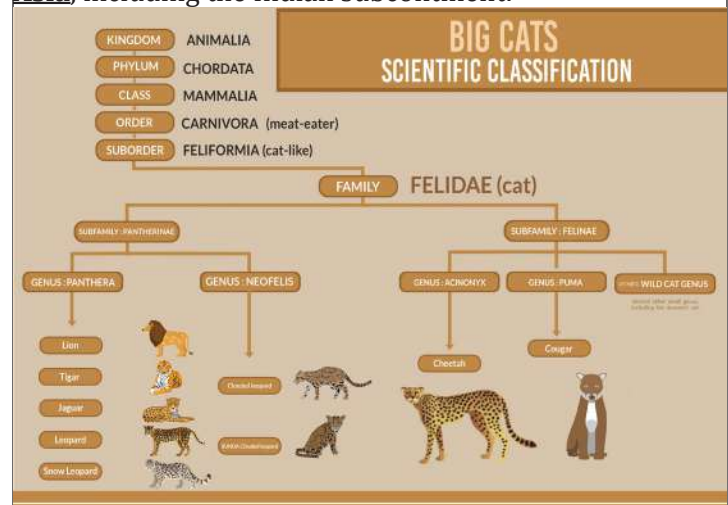
About International Big Cat Alliance (IBCA)

Purpose	Description
Purpose	Protection and conservation of the 7 major big cats - tiger, lion, leopard, snow leopard, puma, jaguar and cheetah
Member countries	97 range countries and other interested nations and organs.
Activities	Advocacy, partnerships, knowledge portal, capacity building, eco-tourism, expert groups and finance tapping
Governance structure	General Assembly, Council, and Secretariat
Funding	\$100 million grant assistance by India for the first 5 years; later through membership fees, contributions from bilateral and multilateral institutions, and the private sector
Previous initiatives	India had in 2019 called for an Alliance of Global Leaders to curb poaching and illegal wildlife trade in Asia .
Importance of saving the tiger	India is the only country in the world to have 5 big cats in wild (all except pumas and Jaguars). Big cats are umbrella and flagship species whose loss can set off a "trophic cascade," (prey populations may explode, resulting in overgrazing and degrading the health of the landscape). India is home to 75% of global tigers .

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About Leopard:

The leopard (IUCN: Vulnerable; CITES Appendix-I; Schedule-I in WPA), **scientifically known as Panthera pardus**, is the **smallest member of the Big Cat family** and is **highly adaptable** to various habitats. It is **nocturnal and preys on smaller herbivores like chital and wild boar**. **Melanism**, resulting in black skin and spots, is common but often mistaken for a different species called the black panther. Leopards inhabit a wide range **from Africa to Asia**, including the Indian subcontinent.



Prelims Links:

Q. Consider the following: (UPSC 2012)

- Black-necked crane
- Cheetah
- Flying squirrel

4. Snow leopard
Which of the above are naturally found in India?
(a) 1, 2 and 3 only
(b) 1, 3 and 4 only
(c) 2 and 4 only
(d) 1, 2, 3 and 4
Ans: B

13. E-KISAN UPAJ NIDHI

Context:

Union Minister for Consumer Affairs, Food & Public Distribution launched the **'e-Kisan Upaj Nidhi' initiative**, aiming to **ease warehousing logistics for farmers and ensure fair prices for their produce.**

- The initiative will **reduce security deposit charges at WDR-registered warehouses** from 3% to 1%, **encouraging small farmers to utilize them.**
- The platform can **prevent distress sales by farmers, offering improved post-harvest storage opportunities.**
- The initiative facilitates **simplified digital processes for farmers to store produce at WDR warehouses for six months at 7% interest per annum.**

14. DRY ICE

Context:

The Gurugram Police arrested the manager of an eatery that **served dry ice instead of mouth freshener**, resulting in their **hospitalization with severe corrosive injuries to the oral cavity and food pipe.**

Dry ice is solid carbon dioxide (CO₂) formed by **compressing and cooling carbon dioxide gas**. Unlike regular ice, **which melts into liquid water, dry ice undergoes sublimation**, transitioning directly from a **solid to a gas without passing through a liquid phase.**

This sublimation process **releases large volumes of CO₂ gas, making dry ice useful for applications such as cooling, preservation, and creating special effects like fog or smoke.**

However, dry ice can be hazardous if mishandled or ingested. When in contact with moisture in the **mouth or digestive tract, dry ice sublimates rapidly, releasing CO₂ gas and potentially causing serious internal injuries, such as burns, bloating, vomiting**, and even life-threatening complications like stomach or intestinal perforation.



15. INDIA'S 1ST GREEN HYDROGEN STEEL PLANT

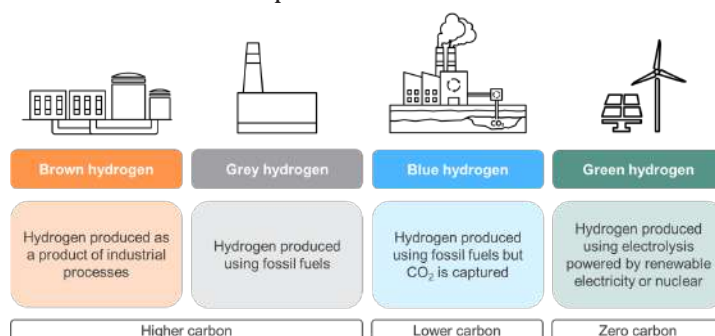
Context:

The Union Minister of Steel inaugurated **India's 1st Green Hydrogen Plant in the Stainless Steel Sector**, located at **Jindal Stainless Limited, Hisar.**

It is the **world's first off-grid Green Hydrogen plant** for the stainless steel industry and features rooftop & floating solar. The initiative underscores India's commitment to green growth and job creation, driving towards the target of **net zero carbon emissions by 2070.**

Related Government Initiatives include:

1. **Steel Scrap Recycling Policy, 2019:** Enhances availability of domestically generated scrap to reduce coal consumption in steel making.
2. **National Green Hydrogen Mission:** Ministry of New and Renewable Energy (MNRE). Aims to make **India a Global Hub** for the production, usage and export of Green Hydrogen and its derivatives
3. **Motor Vehicles (Registration and Functions of Vehicles Scrapping Facility) Rules September 2021:** Increases availability of scrap in the steel sector.
4. **NEDO Model Projects:** Japan's New Energy and Industrial Technology Development Organization (NEDO) projects for energy efficiency improvement in steel plants.



16. INDIA'S FIRST INDIGENOUS FAST BREEDER REACTOR

Context:

PM witnessed **core loading at India's first indigenous Fast Breeder Reactor** at Kalpakkam, Tamil Nadu.

- **This reactor, developed by BHAVINI**, marks a significant step in India's nuclear capabilities.

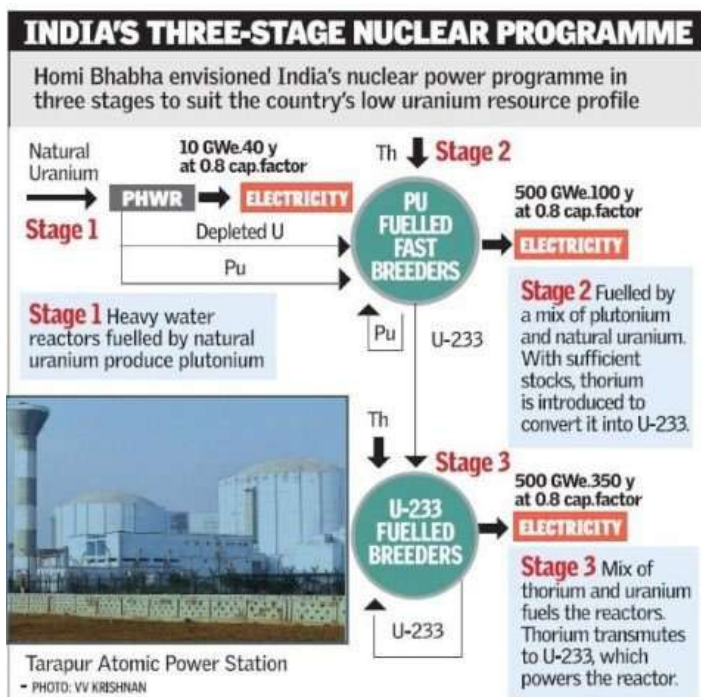
What is Core Loading?

Core loading is the **process of placing nuclear fuel assemblies into the core of a nuclear reactor**. This fuel **comprises enriched uranium or plutonium pellets** housed in metal tubes **called fuel rods**. Core loading is a **critical step in initiating the reactor's operation**

What is FBR?

A **Fast Breeder Reactor (FBR)** is a type of nuclear reactor that uses **fast neutrons** to cause the **fission of uranium-238** (unlike conventional nuclear reactors that use slow neutrons). The **term "breeder" refers** to the ability of these reactors to produce more fissile material (Plutonium-239) than they consume.

FBR is the key to **India's three-stage nuclear power programme**. Prototype Fast Breeder Reactor (PFBR) is capable of reprocessing both carbide and oxide fuels discharged from the fast reactors. Once commissioned, **India will only be the second country after Russia** to have commercial operating FBR. It initially employs **Uranium-Plutonium Mixed Oxide (MOX)** fuel and **liquid sodium coolant**. It is set to be **operational by December 2024**. By producing more plutonium than the fuel it consumes, PFBR reduces nuclear waste and is relatively safer than conventional reactors.



About BHAVINI:

Bharatiya Nabhikiya Vidyut Nigam Limited (BHAVINI) is a **government company under the Department of Atomic Energy (DAE)**. Established in 2003, its primary goal is to construct and operate Fast Breeder Reactors (FBRs) for electricity generation. BHAVINI has built the **500 MWe Prototype Fast Breeder Reactor (PFBR)** at Kalpakkam, representing India's energy security future with technology from the **Indira Gandhi Center for Atomic Research (IGCAR)**.

17. NATIONAL DOLPHIN RESEARCH CENTRE

Context:

The **National Dolphin Research Centre (NDRC)**, India's first dolphin research facility, was **inaugurated in Patna by Bihar**.

- The centre aims **to study Gangetic dolphins and understand the river ecosystem**. It is located on the **Ganges within the Patna University campus**.

Protection Status of Gangetic Dolphins:

1. International Union for the Conservation of Nature (IUCN): Endangered
2. Indian Wildlife (Protection) Act 1972: Schedule I
3. Convention on International Trade in Endangered Species (CITES): Appendix I
4. Convention on Migratory Species (CMS): Appendix 1

18. INTEROPERABLE PAYMENT SYSTEM

Context:

The **Reserve Bank of India (RBI)** plans to launch an **interoperable payment system for internet banking in 2024**.

- This system, expected to be launched in the current calendar year, **aims to expedite fund settlements for merchants and enhance online transactions**.
- The interoperable system will be implemented by **NPCI Bharat BillPay Ltd (NBBL)**, a subsidiary of the **National Payments Corporation of India (NPCI)**, following **RBI approval**.
- It will **enable customers to make net banking payments to businesses regardless of whether their banks and the merchants' payment aggregators are integrated**.

Currently, **online merchant transactions rely on non-interoperable payment aggregators**, requiring separate integration with each aggregator, **leading to de-**

lays and settlement risks.

Interoperability is the **basic ability of multiple digital systems**, applications and databases to **connect and communicate with each other**.

Payment platforms leverage **financial technology to connect and share data** among ecosystem partners like **banks, payment gateways, payment processors, merchants and consumers**.

19. CITY-SPECIFIC ZERO CARBON PLAN

Context:

Nagpur has initiated **India's first city-specific Zero Carbon Buildings Action Plan (ZCBAP)**, aiming to **achieve net-zero carbon emissions from buildings by 2050**.

- The plan covers **public buildings, affordable housing, commercial buildings, and homes**, focusing on decarbonization and sustainable development.
- Developed by **Nagpur Municipal Corporation (NMC) and Nagpur Smart and Sustainable City Development Corporation Limited (NSSCDCL)**, with support from international partners, **the ZCBAP aligns with India's climate goals and global commitments**.
- It addresses **GHG emissions reduction through building materials, design, construction, management, and deconstruction**, targeting a significant portion of Nagpur's energy consumption and emissions.

20. METHANESAT

Context:

MethaneSAT, launched aboard a **SpaceX Falcon9 rocket**, is a satellite designed to **track and measure methane emissions globally**.

- MethaneSAT aims to **monitor the oil and gas sector**, providing data on **emission sources, trends, and changes over time**.

About MethaneSAT:

- Developed by the **Environmental Defense Fund (EDF)** in partnership with **Harvard University, the Smithsonian Astrophysical Observatory, and the New Zealand Space Agency**, **MethaneSAT will orbit the Earth 15 times a day, collecting data that will be made publicly available in near real-time**.
- Equipped with advanced technology, **including a high-resolution infrared sensor and spectrometer**, MethaneSAT can **detect methane concentrations as small as three parts per billion and identify both large and small emitters**.

Methane is a **colourless, odourless, flammable gas** that's the **main component of natural gas**. It's also a **greenhouse gas (GHG) that affects the Earth's climate system**.

21. INS JATAYU (LAKSHADWEEP)

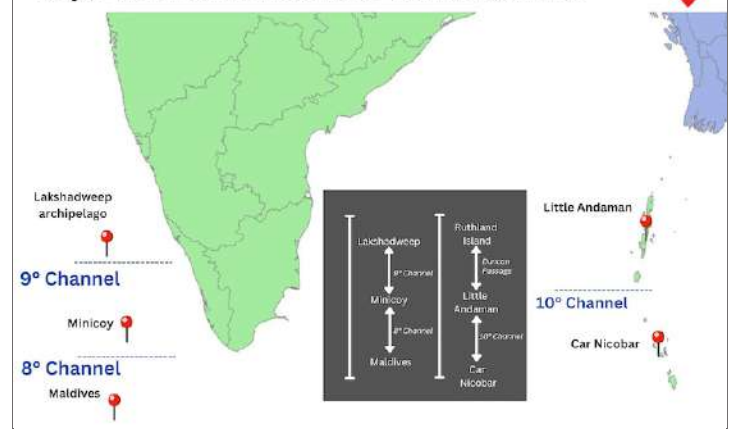
Context:

INS Jatayu, **India's new naval base on Minicoy Island in Lakshadweep**, signifies a crucial step in bolstering security infrastructure in the strategic archipelago. It is the second naval base in Lakshadweep. Situated in a strategically important location, the base strengthens India's operational capability in the region, aiding anti-piracy and anti-narcotics operations in the western Arabian Sea.

About Lakshadweep

It is an **archipelago consisting of 36 islands** (divided into three subgroups: Laccadive Islands, Amindivi Islands, and Minicoy), **including 12 atolls, three reefs, and five submerged banks**. Situated between the **Arabian Sea and the Laccadive Sea**, the islands are located approximately **220-440 km off the Malabar Coast** of mainland India. Divided into three subgroups, the islands cover a total land area of about 32 km², with a coastline of 132 km and a lagoon area of 4,200 km². The territory, forming part of the **Lakshadweep-Maldives-Chagos group of islands**, sits atop the **Chagos-Lakshadweep Ridge**, a vast undersea mountain range. The islands' formation is attributed to the subsidence of volcanic islands, resulting in the growth of **fringing reefs**.

Major commercial routes to Southeast Asia



22. UDGAM PORTAL

What is the UDGAM portal?

Developed by RBI, it stands for **Unclaimed Deposits-Gateway to Access inforMation**. It serves as a centralized platform for the public to search for unclaimed deposits across multiple banks.

The portal allows users to search for various types of accounts covered by the **Depositor Education and Awareness (DEA) Fund of RBI**. Users are required to register on the portal and provide specific inputs depending on whether they are searching for individual or non-individual accounts. While the portal facilitates the search for unclaimed deposits, **it does not enable users to settle or claim these deposits directly**; claims must be made directly with the respective bank.

As of March 4, 2024, **30 banks are part of the UDGM portal, covering approximately 90% of unclaimed deposits in the DEA Fund**. Each unclaimed deposit is assigned a **unique Unclaimed Deposit Reference Number (UDRN)** generated by banks, ensuring seamless settlement of claims.

23. KOLKATA UNDERWATER CORRIDOR

Context:

The Prime Minister inaugurated the **Howrah Maidan-Esplanade section of Kolkata Metro's East-West corridor**, marking India's **debut into underwater metro services**.

- The **underwater tunnel, spanning 520 meters beneath the Hooghly River**, will facilitate swift travel.
- Key points about the metro project include its **status as India's first transportation tunnel beneath a river, boasting the country's deepest metro station**, Howrah Metro station.
- The tunnel, **akin to Eurostar's London-Paris corridor**, lies 13 meters below the riverbed and 33 meters below ground level.

24. PENICILLIN G

Context:

India is set to **restart the manufacturing of the common antibiotic Penicillin G** after three decades, with **Hyderabad-based Aurobindo Pharma** leading the initiative.

- The **halt in Penicillin manufacturing in India during the '90s was primarily due to cheaper Chinese products** flooding the market, rendering Indian production unviable.

About Penicillin G:
Benzylpenicillin (Penicillin G) is a **narrow-spectrum antibiotic** used to **treat infections caused by susceptible bacteria**. It is a **natural penicillin antibiotic** that is **administered intravenously** or intramuscularly due to **poor oral absorption**.

The government's **Production Linked Incentive (PLI) scheme**, launched during the pandemic to **promote do-**

mestic manufacturing, has played a **crucial role in re-starting production by offering incentives to companies on incremental sales**.

An **active pharmaceutical ingredient (API)** is the main **ingredient in a medicine that causes the desired effect**.

25. FRONTIER TECHNOLOGY LABS

Context:

Atal Innovation Mission (AIM) and Meta have collaborated to launch **Frontier Technology Labs (FTLs)** in schools across India, aiming to **democratize access to future technologies and empower youth to innovate**.

- These labs, an **advanced version of Atal Tinkering Labs (ATLs)**, will provide **state-of-the-art infrastructure for students** to engage with technologies like **Artificial Intelligence, Augmented & Virtual Reality, Blockchain, Cybersecurity, Robotics, 3D Printing, and the Internet of Things**.
- Through workshops, interactive sessions, and project-based learning, **students will learn to use AI tools effectively, explore AR & VR, and address cybersecurity challenges**.

The initiative aligns with AIM's vision to **foster a culture of innovation and entrepreneurship in schools**. These labs will be managed by **Meta's partner 1M1B (One Million for One Billion)**.

26. PINE NEEDLES-BASED FUEL-MAKING TECHNOLOGY

Context:

CSIR-Indian Institute of Petroleum (IIP) and UCOST have signed a Memorandum of Understanding (MoU) under the **"Adarsh Champawat" mission**.

- The MoU aims to **deploy technology for producing fuel from pine needles**.
- The technology involves, **Briquetting, the process of converting biomass residues into a fuel**. Briquetting uses **compaction methods for the densification of waste materials and converts them into fuel**.



About Pine Trees:

Pine trees are **evergreen, coniferous trees or shrubs that can grow up to 260 feet tall**. They are native to northern temperate regions but are found all over the world. Pines are a **key part of taiga, coniferous, and mixed forests**.

27. CYCAS CIRCINALIS

Context:

Cycas circinalis, also known as Eenthu Pana in Kerala, is facing extinction in northern Kerala due to an unknown and fast-spreading plant disease.

- These trees, known for their **medicinal and nutritional properties**, are dying out **without a focused research and action plan**.

Cycas circinalis, also known as **the queen sago or sago palm**, is a species of **cycad native to southern India and Sri Lanka**. It is an **evergreen shrub that can grow up to 6 meters tall and can tolerate full sun or shade**. It is found in **dense, dry, scrubby woodlands** in hilly areas in the states of Kerala, Karnataka, Tamil Nadu, and the south of Maharashtra



28. UNCOVER PROGRAM

Context:

Recent research (under [JWST's UNCOVER Program](#)), utilizing a massive galaxy cluster as a magnifying glass, suggests that small, faint dwarf galaxies likely produced enough ionising light to end the Dark Ages, contradicting previous theories favouring larger galaxies or exotic objects like black holes.

About 400,000 years post Big Bang, the universe was dark with dense hydrogen gas. Over time, gravity formed clumps that eventually ignited the first stars. Their light initially struggled to escape the gas fog but eventually cleared it, marking the “epoch of reionisation.” Observations from the [James Webb Space Telescope](#) confirmed that these faint galaxies emitted **significantly more ionising light** than expected, suggesting they played a substantial role in the reionisation epoch.

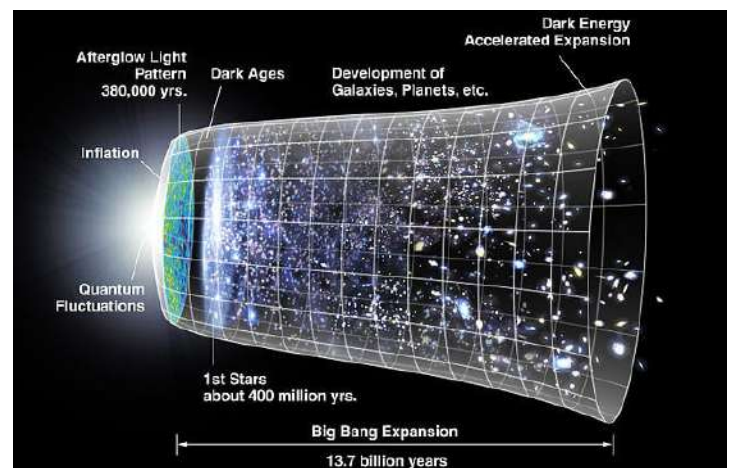
What is the Uncover program?

The UNCOVER program is part of the [James Webb Space Telescope \(JWST\) initiative](#) aimed at uncovering insights about the early universe. Specifically, UNCOVER, which stands for **Ultra-deep NIRC*am* and NIRSpec Observations Before the Epoch of Reionization**, focuses on two main goals:

1. Identifying first-light galaxies **during the Dark Ages**
2. Studying ultra-low luminosity galaxies responsible for the **epoch of reionization**.

What is the Dark Ages in the Universe?

The “Dark Ages” in the universe refers to a period about 400,000 years after the Big Bang when the cosmos was largely dark. During this time, the universe was filled with dense hydrogen gas, with no sources of light. This period ended with the **emergence of the first stars**, which slowly ignited and began emitting light, eventually leading to the **“epoch of reionization”** as more stars formed and their light cleared away the hydrogen gas, creating the transparent universe we observe today.



29. INDIAAI MISSION

Context:

The Union Cabinet has **approved the IndiaAI Mission** for the next five years, focusing on **bolstering Artificial Intelligence (AI) innovation**.

About IndiaAI Mission	Description
	The IndiaAI Mission is a strategic initiative that aims to catalyze AI innovation, democratize computing access, provide startup capital, ensure ethical AI, and drive inclusive growth in India's AI ecosystem.
Purpose	Address the shortage of computing hardware in unlocking opportunities around generative AI by subsidizing private companies to establish AI computing capacity in India
	To establish a comprehensive ecosystem that catalyzes AI innovation through strategic programs and partnerships across the public and private sectors.
	Drive responsible, inclusive growth of India's AI ecosystem
	Create highly skilled employment opportunities to harness the demographic dividend
	Demonstrate the potential of transformative technology for societal good .
Implementation	Led by the 'IndiaAI' Independent Business Division under Digital India Corporation .
Funding	Approved with an outlay of Rs 10,372 crore for the next five years
Components	IndiaAI Compute Capacity: One-stop solution for critical resources required for AI innovation. Under this, the government will establish a computing capacity of more than 10,000 GPUs and develop foundational models with a capacity of more than 100 billion parameters trained on datasets covering major Indian languages for priority sectors like healthcare, agriculture, and governance
	IndiaAI Innovation Centre: Focuses on developing and deploying indigenous Large Multimodal Models (LMMs).
	IndiaAI Datasets Platform: Offers seamless access to non-personal datasets for Indian startups and researchers.
	IndiaAI Application Development Initiative: Concentrates on adopting impactful AI solutions for large-scale socio-economic transformation
	IndiaAI FutureSkills: Aims to mitigate barriers to entry into AI programs
	IndiaAI Startup Financing: Supports and accelerates deep-tech AI startups by providing funding
	Safe & Trusted AI: Facilitates the implementation of Responsible AI projects.
	What is AI?
	Machine Learning (ML) is a subset of AI, and Deep Learning (DL) techniques enable automatic learning from large volumes of unstructured data like text, images, or video.
Other Government Schemes for AI	INDIAai; Global Partnership on Artificial Intelligence (GPAI); US India Artificial Intelligence Initiative; Responsible Artificial Intelligence (AI) for Youth; Artificial Intelligence Research, Analytics and Knowledge Assimilation Platform.

MAPPING

1. AGALEGA ATOLL (MAURITIUS)

Context: The Prime Ministers of India and Mauritius have **jointly inaugurated an airstrip and the St James Jetty on North Agaléga Island** in the Indian Ocean.

The joint inauguration signifies:

For Mauritius:

- **Economic benefits:** Reduced travel time, job creation, and tapping into tourism potential.
- **Strategic advantages:** Enhanced maritime surveillance and security capabilities through Coast Guard deployment.

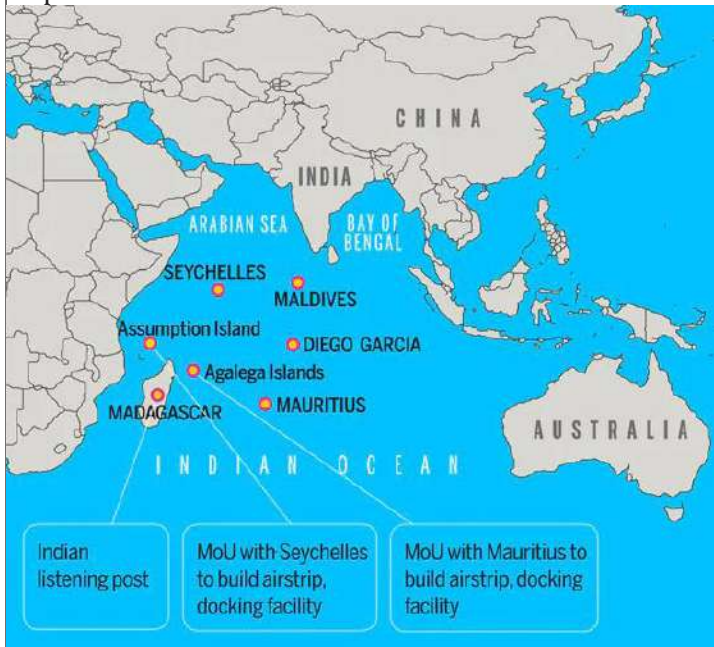
For India:

- **Strengthening India-Mauritius relations:** Enhanced goodwill and multi-dimensional cooperation.
- **Geostrategic significance:** Supports India's SAGAR initiative, counters China's "string of pearls" strategy (by India's "Necklace of Diamond"), enhances Indian Ocean surveillance, and reinforces India's role as a peace provider in the region.

About Agaléga

It is an atoll, comprising two islands, North and South Agaléga. It is governed by Mauritius and used by India for various purposes. Despite this, it remains under the sovereignty of Mauritius. **A 2015 memorandum of understanding on India-Mauritius military cooperation** envisaged developing the Agaléga islands for an Indian military base.

Note: An atoll is a **ring-shaped coral reef**, island, or series of islets that encircle a lagoon, often found in warm, tropical waters.



2. KULASEKHARAPATTANAM (TN)

Context: Recently, PM laid the **foundation stone for India's second spaceport at Kulasekharapattanam**, Tamil Nadu.

The new spaceport is **dedicated to Small Satellite Launch Vehicles (SSLVs)** developed by the private sector. Operational in about two years, it will **exclusively serve private sector launches**.

The SSLV is a cost-effective, flexible launch vehicle capable of deploying satellites up to 500kg into a 500-km orbit. Additionally, plans for a **small space manufacturing park** near the spaceport aim to further support private sector initiatives.

The new spaceport has advantages over the Sriharikota facility:

1. **Close to the equator**, saving fuel
2. Rockets can **launch directly south**, avoiding detours over Sri Lankan Airspace
3. **Proximity to ISRO's Propulsion Research Complex** aids quick and safe transportation of rocket components.

Why launching sites are generally located on the Eastern Coast?

The rotation of the Earth **moves from west to east**, which means that launching towards the east takes **advantage of this natural motion**, providing an extra boost to the rocket's velocity. This boost, known as the **"Earth's rotational velocity"**, helps reduce the amount of energy needed for the rocket to reach orbit, making launches more efficient and cost-effective.

Kulasekharapattanam, an **ancient port town in Thoothukudi district**, has historical significance dating back to the **1st century AD**.



3. BLUE LINE

Context:

US envoy Amos Hochstein emphasized the importance of pursuing a diplomatic solution to end the escalating hostilities between Israel and Hezbollah (in Lebanon), along the Blue Line, demarcated by the United Nations.

What is Blue Line?

The Blue Line is a border demarcation established by the United Nations in 2000 after Israeli troops withdrew from southern Lebanon. It serves as the boundary between Lebanon and Israel, aiming to prevent conflicts and provide a basis for security arrangements in the region.



ty, reaching 260 in 2022 from 231 four years earlier.

The reserve is traversed by rivers like Ramganga, Pal-laen, and Sonanadi, and is characterized by local grasslands known as Chaur. Its vegetation primarily comprises tropical dry and moist deciduous forests.

National Parks & Sanctuaries of Uttarakhand



4. CORBETT TIGER RESERVE (UTTAR-KHAND)

Context:

The Supreme Court has mandated the establishment of a committee to address environmental damage resulting from, Animal Safari, illegal construction and tree felling within the Corbett Tiger Reserve.

The Committee will determine responsibilities for the damage and suggest measures for recovery. Additionally, it will consider guidelines for tiger safaris in buffer zones and recommend eco-friendly tourism practices.

About Jim Corbett National Park

Established in 1936 as Hailey National Park, later declared a Tiger Reserve in 1973, Jim Corbett National Park is India's first national park and the inaugural participant in the Project Tiger initiative. Located in the Shivalik hills of the Himalayas, it spans Pauri Garhwal, Nainital, and Almora districts in Uttarakhand. Recognized for its global prominence, the reserve recorded an impressive increase in tiger densi-