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POLITY & GOVERNANCE

1.1. CHIEF OF DEFENCE STAFF (CDS)

Context:

- **Recently**, General N.S. Raja Subramani took charge as India's third Chief of Defence Staff (CDS) on May 31, 2026, following the completion of General Anil Chauhan's tenure. According to reports, this high-level transition is aimed at accelerating tri-service integration and advancing the implementation of integrated theatre commands.



1. Evolution of the Post

- **Kargil Review Committee (1999):** First officially proposed a unified military head to bridge inter-service coordination gaps.
- **Group of Ministers (GoM) Report (2001):** Formally recommended the establishment of the CDS.
- **Naresh Chandra Task Force (2012):** Suggested a permanent Chairman of the Chiefs of Staff Committee (CoSC) as a midway solution.
- **Lt. Gen. D.B. Shekatkar Committee (2016):** Reiterated the urgent need for a four-star CDS to enhance joint combat readiness.
- **Creation:** Formally approved by the Union Cabinet on December 24, 2019. General Bipin Rawat took charge as India's first CDS on January 1, 2020.

2. Status and Rank

- **Nature of Post:** It is neither a constitutional nor a statutory body. It is an executive position created via amendments to the Government of India (Allocation of Business) Rules, 1961.
- **Rank:** A four-star military officer who is "**first among equals**" inside the Chiefs of Staff Committee. The CDS carries the same rank and pay scale as the three Service Chiefs but outranks them in the official Order of Precedence (12th rank).

3. Eligibility and Tenure

- **Appointing Authority:** Appointments Committee of the Cabinet (ACC), chaired by the Prime Minister.
- **Eligibility:** Serving or retired three-star (Lieutenant General/equivalent) or four-star (General/equivalent) military officers. The candidate must be below 62 years of age at the time of appointment.
- **Tenure:** No fixed term is specified, but the upper age limit to serve in the office is strictly capped at **65 years**.

4. Core Mandates and Responsibilities

- **Head of Department of Military Affairs (DMA):** Functions as the administrative Secretary of the DMA within the Ministry of Defence, handling tri-service logistics, deployments, and promotional structures.
- **Principal Military Advisor:** Advises the Union Defence Minister on all tri-service matters. (Note: Individual Service Chiefs continue to advise the Minister on matters exclusive to their respective forces).

- **Military Advisor to Nuclear Command Authority (NCA):** Serves as the designated military advisor to the PM-led Political Council of the NCA.
- **Permanent Chairman of CoSC:** Heads the Chiefs of Staff Committee to ensure structural continuity across services.
- **Theaterisation:** Mandated to restructure the armed forces into integrated joint theatre commands to optimize operational efficiency.
- **Command Restrictions:** The CDS **does not** exercise direct operational military command over the individual Service Chiefs.

1.2. RIGHT TO BE FORGOTTEN

Context:

- **Recently**, the Right to be Forgotten came into the spotlight after a major High Court judgment ruled that a person's past legal issues should not permanently ruin their life online. The court decided that individuals who have been proven innocent, or those involved in settled private family disputes, have a right to privacy under Article 21 of the Constitution.
- To protect their reputation and future opportunities, internet search engines and legal websites were ordered to remove their names from public search results so that a casual online search does not follow them like a permanent shadow.



1. Concept and Mechanism

- **Definition:** The Right to be Forgotten (RTBF) enables individuals to seek the restriction, masking, or removal of personal information from public digital availability when it becomes irrelevant or no longer serves a legitimate public purpose.
- **De-indexing vs. Erasure:** De-indexing does not mean erasing the case record from official archives. It modifies online search engines so that an individual's name ceases to act as a primary keyword to fetch the record, protecting personal privacy while upholding institutional records.
- **Origin:** Formally recognized globally by the European Court of Justice in *Google Spain (2014)* and codified under the EU's General Data Protection Regulation (GDPR).

2. Legal Status in India

- **Constitutional Basis:** It is an un-enumerated right implicitly included under **Article 21 (Right to Life and Personal Liberty)** via the Supreme Court's landmark *K.S. Puttaswamy v. Union of India (2017)* privacy judgment.
- **Statutory Framework:** While the judiciary notes a lack of an explicit, comprehensive statutory code dedicated solely to de-indexing court records, the underlying principle of personal data erasure is supported by provisions within the **Digital Personal Data Protection (DPDP) Act, 2023**.
- **Intermediary Duty:** Under the **IT Rules, 2021**, digital intermediaries must restrict or de-index specific content when ordered by a court of law.

3. Key Judicial Exceptions (Not an Absolute Right)

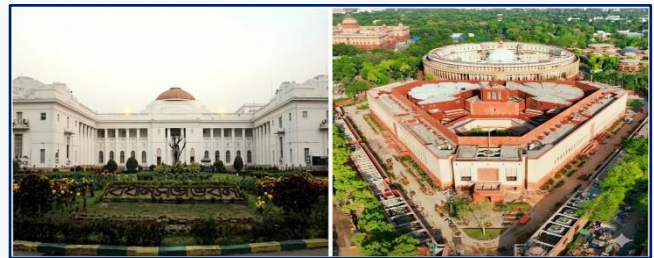
The RTBF is subject to reasonable restrictions and is **denied** by courts in the following scenarios:

- Convictions for heinous crimes or offences against women and children.
- Financial fraud, corruption, or systemic breaches of public trust by public officials.
- Matters where a continuous public interest exists, or where deletion would distort historical records.
- **Geographical Scope:** Courts hold that to be effective against digital borderlessness, verified de-indexing mandates must apply **globally** across all regional domain extensions of a search engine.

1.3. LEADER OF THE OPPOSITION (LoP)

Context:

- **Recently**, an expelled political leader was officially appointed as the Leader of the Opposition (LoP) in the West Bengal Legislative Assembly after proving the physical support of a majority faction of 58 MLAs to the Assembly Speaker.
- This internal party shift and subsequent recognition by the Speaker highlights the critical procedural powers wielded by the Presiding Officer in deciding the official status and leadership of the opposition in a legislative house.



1. Legal Status & Evolution

- **Status:** It is a **statutory post**, not a constitutional one.
- **Origin:** Formally recognized under **The Salary and Allowances of Leaders of Opposition in Parliament Act, 1977**.
- **History:** First officially recognized in **1969**. The post remained vacant at the central level between 2014 and 2024 as no single opposition party secured the required threshold.
- **Rank:** Enjoys the rank, salary, and perks equivalent to a **Cabinet Minister**.

2. Numerical Criteria

- **The 10% Quorum Rule:** Based on the directions of the Presiding Officers, a party must win at least **one-tenth (10%) of the total seats** of the House to claim the post.
- **No Alliance Aggregation:** This 10% requirement must be met by a single political party, not a pre-poll or post-poll coalition.
- **Deciding Authority:** The **Speaker** (Lok Sabha/Legislative Assembly) and the **Chairman** (Rajya Sabha/Legislative Council) hold final recognition powers based on numerical strength and internal party support.

3. Key Functions & Appointment Committees

- **Role:** Acts as the "Alternative Prime Minister" (or Alternative Chief Minister at the state level), standing ready to form a government if the ruling setup falls.
- **Appointment Panels:** The LoP of the Lok Sabha is a mandatory member of critical statutory selection committees:

- Lokpal
- Central Vigilance Commission (CVC)
- Central Information Commission (CIC)
- National Human Rights Commission (NHRC)
- CBI Director
- **The Single Largest Group Rule:** If there is no official LoP due to the 10% rule, amended central acts permit the leader of the **single largest opposition party** to sit on these panels instead.

4. Global Comparison

- **UK System:** The United Kingdom uses an official "**Shadow Cabinet**" where opposition MPs track and scrutinize individual ministerial portfolios.
- **Indian System:** India does not have an officially instituted or statutory Shadow Cabinet system at either the Central or State levels.

1.4. ARTICLE 142

Context:

- **Recently,** the Supreme Court utilized its extraordinary powers under Article 142 to overturn a 10-year POCSO prison sentence. The court observed that the couple fell in love while the victim was a minor and later married once she attained adulthood. Invoking Article 142 to ensure "complete justice" where existing statutory laws fell short, the court quashed the conviction to allow the couple to live peacefully as spouses.



What is Article 142 of the Indian Constitution?

Article 142 provides a unique, self-contained constitutional mechanism that empowers the Supreme Court of India to pass any decree or execute any order necessary for doing "complete justice" in any cause or matter pending before it.

Key Characteristics

- **Extraordinary Power:** It acts as an equitable, inherent safety valve that allows the apex court to transcend procedural gridlocks or legislative vacuums to rectify a manifest travesty of justice.
- **Enforceability:** Any decree passed or order made by the Supreme Court under this article is completely enforceable throughout the entire territory of India.
- **Supplementary Nature:** The provision complements existing laws rather than replacing them, enabling the court to provide a remedy when statutory laws are silent or insufficient.

Boundaries and Limitations of "Complete Justice"

While the phrase "complete justice" offers vast discretionary latitude, the Supreme Court has formulated explicit guidelines to ensure this power does not dilute the rule of law.

- **Fundamental Rights:** The Supreme Court cannot pass orders under Article 142 that directly violate the Fundamental Rights enshrined in Part III of the Constitution.

- **Express Statutory Provisions:** The court cannot completely ignore or override express, substantive statutory laws passed by the legislature; it fills gaps rather than replacing the legislative text.
- **Non-Precedential:** Specific orders passed under Article 142 are often tailored exclusively to the unique facts of a particular case and do not automatically serve as a binding legal precedent for lower courts.

Landmark Judgments

- **Union Carbide Corporation v. Union of India (1991):** The Supreme Court asserted that its power under Article 142 is independent of statutory limitations, allowing it to bypass specific legislative procedures to provide a quick financial settlement for the victims of the Bhopal Gas Tragedy.
- **Supreme Court Bar Association v. Union of India (1998):** The court established that Article 142 cannot be used to replace existing substantive laws. It ruled that the power to punish an advocate for professional misconduct rests with the Bar Council, not the court's extraordinary powers.
- **Shilpa Sailesh v. Varun Sreenivasan (2023):** A Constitution Bench ruled that the Supreme Court can use Article 142 to grant a divorce decree on the ground of an irretrievable breakdown of marriage, bypassing the mandatory six-month cooling-off period required under the Hindu Marriage Act, 1955.

High Courts vs. Supreme Court Jurisdiction

Parameter	Supreme Court (Article 142)	High Courts (Article 226)
Explicit Power	Holds explicit, distinct constitutional power to pass any order or decree to deliver "complete justice."	Does not possess an explicit constitutional mandate for "complete justice" equivalent to Article 142.
Inherent Jurisdiction	Possesses broad plenary powers that can bypass procedural laws when a legislative vacuum exists.	Possesses wide inherent powers to prevent abuse of the court's process, but operates within stricter statutory limits.
Geographical Reach	Orders are enforceable across the entire territory of India.	Orders are limited to its specific state or multi-state territorial jurisdiction.

1.5. AFSPA & ASSAM-NAGALAND ACCORD

Context:

- The Central Government, Assam, and Nagaland recently signed a historic tripartite Memorandum of Understanding (MoU) to resume mineral and oil exploration in their disputed boundary areas, ending a three-decade deadlock.
- Concurrently, the Union Home Ministry announced plans to withdraw the Armed Forces (Special Powers) Act (AFSPA) from the majority of the Northeast by next year, citing an 80% reduction in violence and the successful signing of 12 peace accords since 2019.



About Armed Forces Special Powers Act (AFSPA), 1958

- **Historical Origin:** Originated from the British-era Armed Forces Special Powers Ordinance of 1942, promulgated to suppress the Quit India Movement.
- **Enactment (1958):** Enacted by the Indian Parliament to counter the Naga insurgency in undivided Assam and Manipur.
- **1972 Amendment:** Conferred the Central Government with the authority to unilaterally declare any region a "disturbed area" and impose AFSPA without requiring the consent of the respective State government.
- **Expansion:** Following the 1972 amendment, the Act was extended to Meghalaya, Nagaland, Tripura, and Arunachal Pradesh.

Key Features of AFSPA, 1958

- **Declaration of Disturbed Areas (Section 3):** The Central Government, State Governor, or Union Territory Administrator can designate a region as a "disturbed area" through an Official Gazette notification.
- **Special Operational Powers (Section 4):** Empowers armed forces personnel to:
 - Use force, including lethal measures, against individuals violating the law.
 - Arrest suspects without a warrant based on reasonable suspicion.
 - Enter and search premises without a warrant.
 - Prohibit the assembly of five or more individuals to prevent unrest.
- **Legal Immunity (Section 6):** Shields armed forces personnel from prosecution and legal suits for actions taken under the Act, unless prior sanction is granted by the Central Government.
- **Periodic Review:** Mandates regular government assessment of the security situation to determine the continued necessity of the "disturbed area" classification.

Operational Utility & Security Role of AFSPA

- Provides operational flexibility and legal immunity to security forces for swift counter-insurgency actions.
- Instrumental in securing porous borders and curbing transnational organized crime, such as drug trafficking from the Golden Triangle.
- Aids in restoring political stability in severely disturbed regions, enabling the resumption of civilian administration.

Key Challenges & Criticisms

- **Prolonged Enforcement:** Imposed continuously in states like Nagaland since 1958, leading to civilian alienation.
- **Human Rights Concerns:** Faces severe criticism over allegations of extrajudicial killings and disproportionate use of force.

Supreme Court Interventions

- **Naga People's Movement of Human Rights v. Union of India (1997):** Upheld the constitutional validity of AFSPA. However, the Court mandated that 'disturbed area' declarations must have a limited timeframe and undergo mandatory periodic reviews every **six months**.
- **2016 Judgement (Extrajudicial Killings):** The Court ruled that AFSPA does not grant absolute immunity ("no license to kill"). It ordered investigations into alleged fake encounters in Manipur, emphasizing that security forces are subject to human rights accountability.

1.6. SUPREME COURT NOTICE ON APPOINTMENT OF BIHAR MINISTER UNDER ARTICLE 164(4)

Context:

- **Recently**, the **Supreme Court of India** issued notice on a plea challenging the appointment of **Deepak Prakash**, a minister in the Bihar government, on the ground that he was appointed as a minister without being elected to either House of the State Legislature.
- The petition questions whether his appointment is constitutional under **Article 164(4)** of the Indian Constitution.



Article 164(4) of the Constitution

- **Article 164(4)** permits a person who is **not a member of the State Legislature** to be appointed as a Minister.
- However, such a person must get elected or nominated to the State Legislature **within six consecutive months** from the date of appointment.
- If the person fails to become a member of the Legislature within six months, he/she **ceases to hold ministerial office**.

Supreme Court's Earlier Interpretation

- **S.R. Chaudhuri Case (2001)**
 - The Supreme Court ruled that the **six-month period cannot be repeatedly used** to appoint a non-legislator as a minister without obtaining an electoral mandate.
 - Reappointment of a person as minister after the expiry of six months, without becoming a legislator, would be unconstitutional.

Council of Ministers in States: Relevant Constitutional Articles

- **Article 163** – Council of Ministers to aid and advise the Governor.
- **Article 164** – Appointment, tenure, and responsibilities of Ministers.
- **Article 167** – Duties of the Chief Minister towards the Governor.

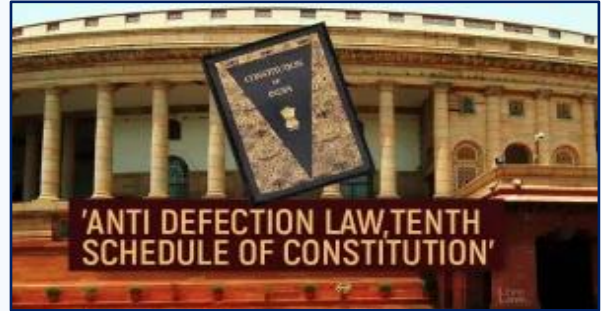
Appointment of Ministers

- Governor appoints the Chief Minister.
- Other Ministers are appointed by the Governor on the advice of the Chief Minister.
- Council of Ministers is collectively responsible to the **Legislative Assembly**.

1.7. TENTH SCHEDULE AND PARTY MERGERS UNDER THE ANTI-DEFECTION LAW

Context:

- **Recently**, the merger of several MPs from the Trinamool Congress (TMC) with the Nationalist Congress Party (NCP) reignited debate over the interpretation of merger provisions under the Tenth Schedule of the Constitution. The issue has raised questions regarding the conditions under which elected representatives can avoid disqualification after switching political parties.



Tenth Schedule (Anti-Defection Law)

- Added by the **52nd Constitutional Amendment Act, 1985**.
- Intended to curb **political defections** and ensure stability of elected governments.
- Provides for **disqualification of legislators** who defect from their political party.

Grounds for Disqualification

A Member of Parliament (MP) or Member of Legislative Assembly/Council (MLA/MLC) can be disqualified if:

- They voluntarily give up membership of their political party.
- They vote or abstain from voting contrary to the party whip without prior permission.

Key Definitions

- **Political Party:** Refers to the entire political organization at the national or state level.
- **Legislature Party:** Consists of all elected members of a political party within a particular House (Lok Sabha, Rajya Sabha, Legislative Assembly, etc.).

Merger Provision under the Tenth Schedule

- **Original Law (1985):** Contained two primary exemptions protecting members from disqualification:
 - **Split (Paragraph 3):** If **one-third (1/3)** of the members of a legislature party split to form a separate group.
 - **Merger (Paragraph 4):** If a political party merges with another, provided it is approved by **two-thirds (2/3)** of the members of its legislature party.
- **91st Constitutional Amendment Act, 2003:**
 - **Deleted Paragraph 3 (Split Exception):** Recognizing that the 'split' provision was being misused for mass defections, the amendment completely removed it.
 - **Current Standing:** Only a **merger** involving at least **two-thirds (2/3)** of the legislature party is exempt from disqualification.

Recent Controversy: Why the Debate?

- The **Tenth Schedule** permits the merger of an original political party with another political party.
- Such a merger must be **supported by at least two-thirds of the members of its legislature party**.
- The Schedule does **not explicitly allow two-thirds of legislators alone to merge themselves with another political party**.
- Therefore, the **legislature party cannot independently initiate a merger** and claim protection from disqualification.
- The protection from defection is available only when the **original political party undergoes a valid merger**.
- The requirement of two-thirds support is meant to **approve a party merger**, not to authorize legislators to switch parties on their own.
- This issue remains a matter of constitutional interpretation and judicial scrutiny.

Role of the Presiding Officer

- The **Speaker of the Lok Sabha** or **Chairman of the Rajya Sabha/Legislative Council** decides questions of disqualification.
- Their decision is subject to **judicial review**.

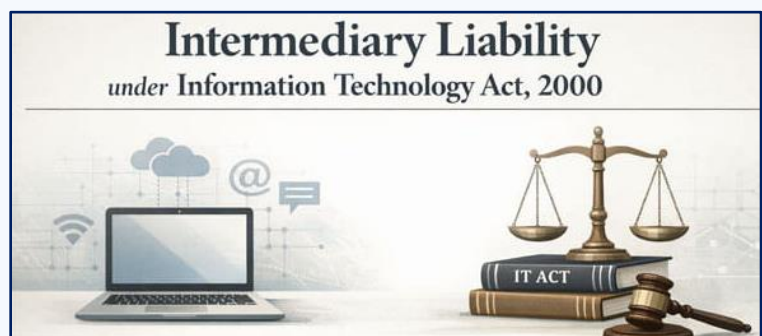
Landmark Judgment: Kihoto Hollohan v. Zachillhu (1992)

- Supreme Court upheld the constitutional validity of the Tenth Schedule.
- Held that decisions of the Speaker are subject to judicial review.

1.8. SECTION 69A OF THE IT ACT & INTERMEDIARY LIABILITY

Context:

- **Recently**, the Union Government directed the blocking of access to Telegram under Section 69A of the Information Technology (IT) Act, 2000, citing concerns related to national security, public order, and misuse of the platform for unlawful activities.
- Telegram challenged the blocking order before the Delhi High Court, arguing that the restrictions violate the fundamental right to freedom of speech and expression under Article 19(1)(a) of the Constitution.
- The case has once again brought **Section 69A of the IT Act** and the scope of government powers over online content into focus.



About the Section 69A of the Information Technology (IT) Act, 2000

- **Power to Block:** It authorizes the Central Government to direct intermediaries or government agencies to block public access to any information generated, transmitted, received, stored, or hosted in any computer resource (including applications and websites).
- **Grounds for Blocking:** Blocking orders can only be issued if the government is satisfied that it is necessary or expedient in the interest of:
 - Sovereignty and integrity of India
 - Defence of India
 - Security of the State
 - Friendly relations with foreign States
 - Public order
 - Preventing incitement to the commission of any cognizable offence relating to the above.
- **Procedural Safeguards:** Orders must adhere to the *Information Technology (Procedure and Safeguards for Blocking Access to Information by the Public) Rules, 2009*.

Constitutional Provisions Involved

- **Article 19(1)(a):** Protects **freedom of speech and expression**. Restrictions or blocking orders under Section 69A directly interfere with this right.
- **Article 19(1)(g):** Guarantees the right to practice any profession or to carry on any occupation, trade, or business. Digital platform bans affect creators, educators, and entrepreneurs utilizing these platforms to maintain contact with subscribers and earn a livelihood.

Section 66A of the Information Technology Act, 2000

- Section 66A was introduced through the Information Technology (Amendment) Act, 2008.
- It **criminalized** the sending of certain types of messages through a computer resource or communication device.
- The provision came into force on 27 October 2009.

Section 79 of the IT Act: 'Safe Harbour' Provision

- **Definition:** Section 79 establishes an intermediary **safe harbour provision**, meaning online platforms are generally not held liable for third-party content or data hosted by them.
- **Conditions:** To qualify for immunity, intermediaries must:
 - Exercise due diligence.
 - Follow the *Information Technology Rules, 2021*.
 - Act quickly to remove or disable access to illegal content upon receiving actual knowledge of it.

Important Judicial Precedent

- **Anuradha Bhasin v. Union of India** In this landmark case, the Supreme Court examined indefinite blanket bans on internet services. The Court held that freedom of speech and expression (Article

19(1)(a)) and the freedom to practice any profession/trade over the internet (Article 19(1)(g)) are constitutionally protected.

- The Court concluded that internet restriction orders must meet the **proportionality test**:
 - They must be strictly necessary.
 - They must deploy the least restrictive measures available.
 - They must be open to judicial review.
- In *Shreya Singhal vs Union of India* (2015), declared **Section 66A** unconstitutional (on the grounds of violating the freedom of speech guaranteed under Article 19(1)(a) of IC).

1.9. PM VIKSIT BHARAT ROZGAR YOJANA (PM-VBRY): A PUSH FOR FORMAL EMPLOYMENT

Context:

- The Prime Minister recently initiated the disbursement of ₹2,400 crore in incentives to 15 lakh beneficiaries via Direct Benefit Transfer (DBT) under the newly approved Pradhan Mantri Viksit Bharat Rojgar Yojana (PM-VBRY).



About Pradhan Mantri Viksit Bharat Rozgar Yojana (PM-VBRY)

- Nature of Scheme:** An **Employment Linked Incentive (ELI)** initiative designed to support the 'Viksit Bharat' vision through inclusive, formal job creation.
- Financial Outlay:** ₹99,446 crore.
- Operational Timeline:** August 1, 2025, to July 31, 2027.
- Employment Target:** Generation of over **3.5 crore new formal jobs** within a two-year window.

Structural Components of the Scheme

Part A: Incentives for First-Time Employees

- Target Beneficiary:** First-time formal workforce entrants registered with the **Employees' Provident Fund Organisation (EPFO)**.
- Salary Cap:** Applicable strictly to individuals earning up to **₹1 lakh per month**.
- Financial Support:** The government provides EPF wage support of up to **₹15,000**, disbursed in two instalments.
- Transfer Mechanism:** Executed via Direct Benefit Transfer (DBT) using the Aadhaar-Based Payment System (ABPS).
- Behavioral Nudge:** A designated portion of the incentive is retained in a savings or deposit account to inculcate long-term saving habits among new earners.

Part B: Incentives for Employers

- Sectoral Applicability:** Available across all sectors, but specifically heavily incentivizes the **manufacturing sector**.
- Eligibility Criteria:** Employers must hire additional staff drawing a monthly salary of up to ₹1 lakh.

- **Minimum Hiring Thresholds:**
 - Micro/Small Firms (< **50 employees**): Must hire at least **2 new employees**.
 - Medium/Large Firms (≥ **50 employees**): Must hire at least **5 new employees**.
- **Duration of Support:** Standard incentive support lasts for **2 years**. Crucially, for the manufacturing sector, this benefit is extended into the **3rd and 4th years**.
- **Transfer Mechanism:** Employer incentives (up to ₹3,000 per month per new employee) are credited directly into **PAN-linked** corporate bank accounts.

1.10. SOLICITOR GENERAL OF INDIA

Context:

- The Appointments Committee of the Cabinet (ACC) has approved the reappointment of Tushar Mehta as the Solicitor-General (SG) of India for an additional three-year term. Alongside the SG, five Additional Solicitors-General (ASGs) for the Supreme Court were also reappointed for a matching tenure to ensure continuity in the Union government's legal representation before constitutional courts.



Constitutional Status & Evolution

- **Nature of Post:** Unlike the Attorney General (AG), the Solicitor General of India is a **statutory post** governed under the Law Officers (Conditions of Service) Rules.
- **Rank:** The SG acts as the second-highest-ranking law officer in the country and functions subordinate to the AG.
- **Colonial Roots:** The office originated during British rule to represent the interests of the Crown and was appointed by the Governor-General.

Appointment, Tenure & Removal Rules

- **Appointing Authority:** Appointed by the President of India on the explicit recommendation of the Prime Minister-led Appointments Committee of the Cabinet (ACC).
- **Qualifications:** Not explicitly detailed in the Constitution or statutory law; however, selection requires a senior advocate with extensive legal practice.
- **Tenure & Location:** Holds office for a **three-year term** and is eligible for reappointment. The official headquarters is located in New Delhi.
- **Exit Mechanism:** The SG can voluntarily resign by addressing a letter to the President or can be removed by the President on government advice due to misconduct, incompetence, or structural policy shifts following a general election.

Primary Legal Duties

- **Advisory & Representation:** Advises the Government of India on critical legal matters and appears in the Supreme Court or High Courts on its behalf.

- **Presidential References:** Represents the Union in the Supreme Court during constitutional references made by the President under Article 143.
- **Institutional Support:** Collaborates closely with and assists the Attorney General while coordinating with various Union ministries to streamline litigation.

Service Limitations & Prohibitions

- **Non-Binding Character:** The legal advice rendered by the SG is strictly advisory and does not bind the executive.
- **Private Practice Ban:** Barred from private practice or representing any private party against the Government of India or Public Sector Undertakings (PSUs).
- **Holding Outside Offices:** Cannot accept outside appointments, join any Ministry/Department, or accept a role in any PSU/statutory body without formal clearance via the Department of Legal Affairs.

The Comparative Matrix: Solicitor General vs. Attorney General

Parameter	Solicitor General of India (SG)	Attorney General for India (AG)
Status	Statutory Post (Subordinate Rank)	Constitutional Post (Article 76)
Hierarchy	Second-highest law officer in the country	Highest law officer in the country
Parliamentary Rights	No right to participate in Parliamentary proceedings	Holds the right to speak and take part in Parliamentary proceedings
Primary Function	Assists the AG and coordinates specific litigation	Oversees broader national legal affairs and advises on vast constitutional issues

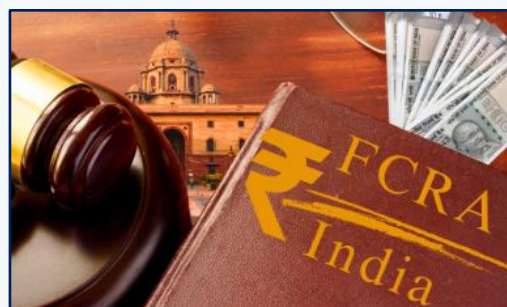
Historical Trivia

- **The Pioneer:** C.K. Daphtary was the first Solicitor General of India (appointed in 1950) and remains the longest-serving SG (13 years).
- **The Incumbent:** Tushar Mehta (appointed originally in 2018) holds the distinction of being the second longest-serving Solicitor General of India.

1.11. AMENDMENTS TO THE FOREIGN CONTRIBUTION REGULATION ACT (FCRA) RULES

Context:

- **Recently**, the Union Ministry of Home Affairs (MHA) has notified significant changes to the Rules of the Foreign Contribution Regulation Act (FCRA), 2010.
- The latest updates place stricter compliance norms on Non-Governmental Organisations (NGOs) seeking or receiving foreign funding, standardizing the disclosure of activities and geographical scopes to enhance transparency.



Key Highlights of the Amended FCRA Rules

- **Categorization of Permitted Activities:** NGOs receiving foreign funds must stick to a legally specified list of activities grouped under five structural categories: **Educational, Economic, Religious, Social, and Cultural**. This is the first time distinct activity lists have been drawn out under each category.
- **Mandatory Comprehensive Disclosures:** NGOs are now required to explicitly disclose their exact activities, geographical outreach, websites, social media accounts, and publications. They must also declare if they or their key functionaries have released any publications (books, magazines, articles) during the year.
- **Decentralized Fee Structure:** Instead of the earlier single-fee structure for FCRA registrants, NGOs must now pay **separate fees** for each category and individual State or Union Territory they choose to operate in.
- **Broadening of 'Key Functionary':** The definition of an NGO's core management has expanded beyond traditional office-bearers and directors. It now captures trustees, partners, the *Karta* or head of a Hindu Undivided Family (HUF), governing body members, and anyone exercising managing control.
- **Restrictions on Foreign Nationals:** Associations that feature foreign nationals (excluding Persons of Indian Origin) as key functionaries will ordinarily be disqualified from obtaining registration or prior permission.
- **Tight Penalty Framework:**
 - Any basic procedural violations will attract a **minimum fine of ₹1 lakh**.
 - Specific violations (such as excess administrative spending, speculative investments, unauthorized use, or utilizing funds in unapproved States/UTs) will attract a fine of **30% of the amount misused or ₹1 lakh, whichever is higher**.

Important Information Regarding FCRA

- **What is it?** The Foreign Contribution Regulation Act (FCRA) was originally enacted in 1976 during the Emergency. Its primary purpose is to regulate the acceptance and utilization of foreign contributions/hospitality by individuals or associations to ensure that such funds do not adversely affect national security, internal security, or democratic values.
- **Implementing Authority:** The Act is implemented strictly by the **Ministry of Home Affairs (MHA)**, Government of India. It does *not* fall under the Ministry of Finance.
- **Validity of Registration:** Once granted, FCRA registration is valid for **5 years**. NGOs must apply for renewal within six months before the registration expires.
- **Who CANNOT Receive Foreign Funds?** Under the Act, certain entities are explicitly prohibited from accepting foreign funding. These include:
 - Candidates standing for election.
 - Journalists, columnists, cartoonists, editors, owners, printers, or publishers of a registered newspaper.
 - Judges, government servants, or employees of any corporation controlled or owned by the government.

- Members of any Legislature (MPs and MLAs) and political parties or their office-bearers.
- **The SBI Account Mandate:** Amendments mandate that all foreign contributions must be received exclusively in a designated "FCRA Account" opened at the **State Bank of India (SBI), Main Branch, New Delhi**. No other bank account can receive these initial inflows, though NGOs can open utilization accounts in other banks later.
- **Cap on Administrative Expenses:** Through recent amendments, the portion of foreign funds that an NGO can utilize for its own administrative expenses has been slashed down to a maximum of **20%** (previously it was 50%).

1.12. PHASING OUT PG MEDICAL DIPLOMAS: NMC'S PUSH FOR STANDARDIZATION

Context:

- The National Medical Commission (NMC) has ordered the gradual discontinuation of two-year postgraduate medical diploma courses by the academic year 2026-27. Starting in 2027-28, specialist medical training across India will be exclusively conducted through three-year MD (Doctor of Medicine) and MS (Master of Surgery) degree programs.



What is the Transition Timeline?

- **Final Admissions:** The 2026-27 academic session will be the last year to admit students into traditional postgraduate diploma courses.
- **Exclusive Degree Training:** From 2027-28 onwards, medical colleges will strictly offer specialist training through MD and MS degree programs.
- **Seat Conversion:** Medical institutions are mandated to convert their existing diploma seats into equivalent degree seats.
- **Nodal Authority:** Colleges must apply for this conversion through the **Medical Assessment and Rating Board (MARB)**, an autonomous board under the NMC.

Why is the NMC Phasing Out Diplomas?

- **Standardization:** To create a uniform and standardized framework for postgraduate medical education across the country.
- **Quality Enhancement:** To improve the overall quality, depth, and recognition of specialist medical training.
- **Modern Alignment:** To align Indian medical qualifications with current, contemporary educational standards.
- **Resource Optimization:** To ensure better and more efficient utilization of existing infrastructure within medical colleges.

How do Diplomas and Degrees Differ?

- **Duration:** Traditional diplomas (such as those in ENT, ophthalmology, dermatology, tuberculosis, and public health) are typically **two-year** programs, whereas MD and MS degrees require **three years** of comprehensive training.
- **Historical Role:** Diplomas have traditionally provided a quicker educational route, playing a crucial role in rapidly supplying specialist doctors to smaller towns and district-level hospitals.

What is the Potential Rural Health Impact?

- **Supply Concerns:** The shift to exclusively three-year degree programs raises concerns about the future availability of medical specialists in rural areas.
- **Policy Challenge:** Health experts are evaluating whether the conversion to MD/MS will successfully elevate medical quality without simultaneously creating a deficit of specialists outside major urban centers.

1.13. PASSPORT IS A TRAVEL DOCUMENT, NOT PROOF OF CITIZENSHIP

Context:

- A senior official from the Ministry of External Affairs (MEA) recently clarified that the Indian passport is strictly a **"travel document"** and **not a "citizenship document."** This clarification emerged during the 14th Passport Seva Divas, responding to queries on whether a passport could be used to challenge exclusions from the voter list during Special Intensive Revisions (SIR) of electoral rolls.



Passport: Purpose and Legal Status

- A passport is issued under the **Passports Act, 1967**.
- It facilitates:
 - International travel.
 - Identification of the holder abroad.
 - Consular assistance from Indian missions.
- It is **not equivalent to a citizenship certificate**.

Why Passport is Not Proof of Citizenship?

- Passport issuance involves verification of identity and nationality but is not intended to conclusively establish citizenship status.
- Citizenship determination is governed by:
 - **Citizenship Act, 1955**
 - Relevant rules and government records.
- Citizenship can be established through multiple documents and legal processes, whereas a passport primarily enables travel.

About Passport Seva Divas

- **Date:** Marked annually on **June 24**.
- **E-Passports:** Currently, around **10% of Indian passport holders possess an e-passport**, which features a chip-based secure document system designed to make international travel seamless.
- **Network Coverage:** There are **545 Passport Seva Kendras (PSKs)** across India, practically covering almost every Lok Sabha constituency to ease service delivery.
- **Support Framework: One-stop centres** have been setup to support distressed Indian women in the diaspora, notably in Gulf countries and Singapore.

About e-Passports

- Embedded electronic chip storing biometric and personal data.
- Enhanced security against forgery and tampering.
- Faster immigration clearance.
- Compliant with international standards of the **International Civil Aviation Organization (ICAO)**.

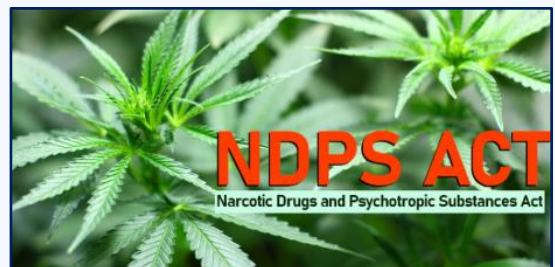
Citizenship: Constitutional & Legal Provisions

- **Constitutional Provisions: Articles 5–11** deal with citizenship at the commencement of the Constitution and empower Parliament to regulate citizenship matters.
- **Citizenship Act, 1955: Modes of Acquiring Citizenship:**
 - By Birth
 - By Descent
 - By Registration
 - By Naturalization
 - By Incorporation of Territory
- **Modes of Losing Citizenship:**
 - Renunciation
 - Termination
 - Deprivation

1.14. AMENDMENTS TO THE NDPS ACT

Context:

- The Union Government has announced that the **Narcotic Drugs and Psychotropic Substances (NDPS) Act, 1985** will be amended to address emerging challenges in drug trafficking. The proposed amendments aim to strengthen legal provisions, improve inter-agency coordination, and adopt a technology-driven approach to dismantle drug trafficking networks rather than targeting only individual offenders.



The Narcotic Drugs and Psychotropic Substances (NDPS) Act, 1985

- The **NDPS Act, 1985** is the principal legislation governing the control of narcotic drugs and psychotropic substances in India.
- NDPS Act, 1985 is administered by the **Ministry of Finance** (Department of Revenue).
- It prohibits the production, manufacture, possession, sale, purchase, transport, storage, consumption, import, and export of narcotic drugs and psychotropic substances, except for medical and scientific purposes.
- The Act also provides stringent punishments for drug-related offences and empowers enforcement agencies to investigate and prosecute offenders.

Objectives of the Act

- Prevent illicit trafficking of narcotic drugs.
- Regulate the legitimate use of narcotic and psychotropic substances.
- Fulfil India's obligations under international drug control conventions.
- Combat organized drug-related crimes.

What are the Proposed Amendments?

According to the Government, the amendments will focus on:

- Closing legal loopholes exploited by drug trafficking syndicates.
- Shifting investigations from targeting individual offenders to dismantling entire drug networks.
- Greater use of **technology, artificial intelligence (AI)**, and **data analytics** in investigations.
- Strengthening coordination among Central and State enforcement agencies.
- Enhancing international cooperation against cross-border drug trafficking.

Narcotics Control Bureau (NCB)

- The **Narcotics Control Bureau (NCB)** is India's apex drug law enforcement agency.
- **Key Facts**
 - **Established:** 1986
 - **Ministry:** Ministry of Home Affairs
 - **Headquarters:** New Delhi
 - **Legal Basis:** Constituted under the **NDPS Act, 1985**
- **Functions**
 - Enforces the provisions of the NDPS Act.
 - Coordinates anti-narcotics operations among Central and State agencies.
 - Collects and shares intelligence on drug trafficking.
 - Investigates major narcotics cases, especially those involving interstate and international syndicates.
 - Coordinates with international organizations to combat transnational drug crimes.

International Conventions Related to Drug Control

India is a signatory to the three major United Nations conventions on narcotic drugs:

- **Convention on Psychotropic Substances, 1971**
- **United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances, 1988.**
- To target drug traffickers and gangsters operating from abroad, Indian agencies will utilize **Red Corner Notices** through the Central Bureau of Investigation (CBI), which acts as the National Central Bureau for Interpol in India.

Drug Trafficking in India

- India is geographically located between the **Golden Crescent** and the **Golden Triangle**, making it particularly vulnerable to illicit drug trafficking.
- **Golden Crescent;** The Golden Crescent comprises:
 - Afghanistan
 - Iran
 - Pakistan
- **Golden Triangle;** The Golden Triangle comprises:
 - Myanmar
 - Laos
 - Thailand

It is another major global centre for the production of **opium and synthetic drugs**.

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UPSC PRELIMS PRACTICE QUESTIONS

Q. Consider the following statements regarding the office of the Chief of Defence Staff (CDS) in India:

1. The office of the Chief of Defence Staff was created as a statutory body under an amendment to the National Security Act.
2. The maximum age limit up to which an officer can serve as the Chief of Defence Staff is 65 years.
3. The Chief of Defence Staff exercises direct operational and administrative command over the individual Chiefs of the Army, Navy, and Air Force.

Which of the statements given above is/are correct?

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

Ans. (b)

Explanation:

- **STATEMENT 1 IS INCORRECT:** The office of the Chief of Defence Staff is an executive position created via amendments to the Government of India (Allocation of Business) Rules, 1961, rather than a statutory body.
- **STATEMENT 2 IS CORRECT:** As per the updated military service regulations, the maximum service age limit for holding the post of CDS is capped at 65 years.
- **STATEMENT 3 IS INCORRECT:** The CDS does not exercise direct operational or military command over the individual Service Chiefs, who retain direct operational control over their respective forces.

Q. Consider the following statements regarding the Right to be Forgotten in India:

Statement I: The Right to be Forgotten is an absolute fundamental right explicitly codified under Part III of the Constitution of India.

Statement II: De-indexing a judicial record under the Right to be Forgotten permanently erases the judgment from public legal databases and court archives.

Which one of the following is correct in respect of the above statements?

- (a) Both Statement I and Statement II are correct and Statement II is the correct explanation for Statement I
- (b) Both Statement I and Statement II are correct and Statement II is not the correct explanation for Statement I
- (c) Statement I is correct but Statement II is incorrect
- (d) Both Statement I and Statement II are incorrect

Ans. (d)

Explanation:

- **STATEMENT I IS INCORRECT:** The Right to be Forgotten is not an absolute right, nor is it explicitly written into Part III. It is an unenumerated right derived through the judicial interpretation of Article 21 (*K.S. Puttaswamy* case) and is limited by exceptions like open justice and public interest.
- **STATEMENT II IS INCORRECT:** De-indexing does not mean permanent deletion or erasure of a judgment from official repositories. It simply stops the individual's name from pulling up the case on public search engines, while keeping the case records fully intact via direct legal citations or case numbers.

Q: Consider the following statements regarding the office of the Leader of the Opposition (LoP) in India:

Statement-I: The Leader of the Opposition in the Lok Sabha is a constitutional office that must be mandatorily filled after every general election.

Statement-II: The Leader of the Opposition receives statutory recognition and enjoys the rank and status equivalent to a Cabinet Minister under an Act passed in 1977.

Which one of the following is correct in respect of the above statements?

- (a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I
- (b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I
- (c) Statement-I is correct but Statement-II is incorrect
- (d) Statement-I is incorrect but Statement-II is correct

Ans. (d)

Explanation:

- **STATEMENT I IS INCORRECT:** The position is statutory, not constitutional. It can remain vacant, and it did remain vacant at the federal level from 2014 to 2024 because no single opposition party secured the necessary 10% seats of the total strength of the House.
- **STATEMENT II IS CORRECT:** The position was officially defined and granted Cabinet Minister rank under *The Salary and Allowances of Leaders of Opposition in Parliament Act, 1977*.

Q. With respect to the Armed Forces (Special Powers) Act (AFSPA) and its current status, consider the following statements:

- I. The Act empowers armed forces personnel to arrest individuals without a warrant on the basis of reasonable suspicion in a designated disturbed area.
- II. Any prosecution or legal suit against security personnel for actions taken under AFSPA

requires the prior sanction of the respective State Government.

- III. Owing to a significant reduction in insurgent activities, the Act has been completely repealed from the states of Tripura and Meghalaya.

Which of the statements given above are correct?

- (a) Only I and II
- (b) Only I and III
- (c) Only II and III
- (d) I, II and III

Ans. (b)

Explanation:

- **Statement I is correct:** Under the special operational powers of AFSPA, armed forces are legally empowered to **arrest suspects without a warrant** and search premises to maintain public order in a disturbed area.
- **Statement II is incorrect:** The Act provides strict legal immunity to security forces. No prosecution or legal proceedings can be initiated against them without the **prior sanction of the Central Government**, not the State Government.
- **Statement III is correct:** Due to a continuous decline in violence and the signing of successful peace accords, AFSPA has been **completely withdrawn from Tripura (2015) and Meghalaya (2018)**. Additionally, its operational footprint has been partially reduced across Assam, Nagaland, and Manipur in recent years.



Scan to attempt more questions

INTERNATIONAL RELATIONS

2.1. INDIA-NEPAL BOUNDARY DISPUTES

Context:

- Recently, Nepal's Prime Minister Balendra Shah stated in Parliament on Sunday that Nepal too has encroached upon Indian territories in many places. This statement, marking the first time a Nepalese head of government has made such an admission, was delivered in response to a lawmaker's query regarding the disputed Kalapani region and triggered a significant political uproar from opposition parties like the Nepali Congress and the Nepali Communist Party.
- The long-standing boundary dispute over **Lipulekh, Limpiyadhura, and Kalapani** recently resurfaced after India announced the revival of the Kailash Mansarovar Yatra pilgrimage via the Lipulekh route, prompting Nepal to send diplomatic notes to both India and China, while India maintains that these territories are an integral part of Uttarakhand.



Historical Genesis of the Border

- **The Treaty of Sugauli (1816):** This treaty was signed between the Kingdom of Nepal and the British East India Company following the Anglo-Nepalese War of 1814–1816, establishing the modern territorial limits of Nepal.
- **Border Rivers:** The treaty designated the **Kali River** (Mahakali) as Nepal's western boundary with India and the **Mechi River** as its eastern boundary.
- **The Root Cause:** The treaty text did not include a definitive map or clarify the exact geographic source of the Kali River, creating room for conflicting cartographic interpretations.

Major Disputed Sectors

1. The Northwestern Tri-Junction (Kalapani, Lipulekh, Limpiyadhura)

- **Limpiyadhura:** Nepal claims the Kali River originates further northwest at Limpiyadhura, asserting that all land east of this stream belongs to it.
- **Kalapani:** India maintains the river originates from a different set of springs at Kalapani, placing the border along the ridge line east of the springs.
- **Lipulekh Pass:** This strategic high-altitude pass is controlled by India and serves as a vital trade and pilgrimage route to Tibet, but it is claimed by Nepal as part of its territory.

2. The Susta Sector

- **The Location:** Susta is situated in the southern Terai plains along the border between Bihar and Nepal.
- **The Dispute:** The boundary was originally defined by the course of the **Gandak River** (Narayani). Over the decades, the river shifted its course southward due to flooding, leading to conflicting claims over the newly exposed lands.

Divergent Positions of India and Nepal

- **Nepal's Stance:** Kathmandu relies strictly on the text of the 1816 Treaty of Sugauli. In 2020, Nepal passed a constitutional amendment adopting a new political map that includes Kalapani, Lipulekh, and Limpiyadhura within its borders.
- **India's Stance:** New Delhi relies on British administrative survey maps drawn after 1860, which depict Kalapani within Indian territory. India maintains continuous administrative control and security presence in the region and rejects unilateral cartographic changes.

Mechanisms for Resolution

- **Joint Technical Level Boundary Committee (JTB):** This body successfully mapped and agreed upon nearly 97% of the 1,850 km border, leaving only Kalapani and Susta unresolved.
- **Fixed Boundary Principle:** To counter the shifting nature of the Gandak and Mechi rivers, both nations agreed to lock the boundary at fixed geographic coordinates based on historical surveys, ensuring river migration does not alter sovereign titles.

2.2. SEA OF AZOV: GEOGRAPHY, ECOLOGY, AND STRATEGIC CHOKEPOINTS

Context:

- A recent drone attack on foreign-flagged cargo vessels has spotlighted the Sea of Azov, underscoring its status as a highly contested and volatile maritime zone caught in the geopolitical crossfire between Russia and Ukraine.



Geographical Extent and Mapping

- **Bordering Territories:** The inland sea is bordered by **Ukraine** to the north and northwest, **Russia** to the east and southeast, and the **Crimean Peninsula** to the west.
- **Strategic Chokepoint:** The **Kerch Strait** serves as the exclusive maritime gateway, connecting the Sea of Azov southward to the Black Sea. Following the 2014 annexation of Crimea, Russia assumed authority over both sides of this critical passage.
- **Bathymetry:** Covering roughly 37,600 square kilometers, it holds the geographical distinction of being the **shallowest sea in the world**, with a maximum depth of only 14 meters.

Hydrology and Oceanography

- **Drainage System:** The basin is primarily fed by the **Don** and **Kuban** rivers. The heavy deposition of sand and silt from these rivers actively shapes the coastline, forming numerous bays, limans, and narrow spits (e.g., the Fedotova Spit).
- **Salinity and Ecology:** The massive freshwater influx ensures **low salinity levels**. Sitting in a transition zone between steppe and forest-steppe ecosystems, the nutrient-rich waters support abundant plant life, such as green algae, and highly productive fisheries.
- **Climatology:** The region experiences a temperate continental climate with regular winter fogs. Extreme frosts lead to stationary ice formation along the northern shores between December and March, necessitating the deployment of icebreakers for navigation.

Economic Corridors and Infrastructure

- **Major Port Cities:** The coastline hosts critical freight and passenger hubs, including **Taganrog**, **Yeysk**, **Mariupol**, and **Berdyansk**.
- **Inland Connectivity:** The regional network is augmented by the **Volga-Don Canal**, a vital artificial waterway that links the Caspian Sea basin to Central Asia, highlighting the broader economic reliance on this maritime corridor.

2.3. UN MILITARY GENDER ADVOCATE OF THE YEAR AWARD

Context:

- Prime Minister of India recently, congratulated **Major Abhilasha Barak** on being conferred the prestigious **2025 United Nations Military Gender Advocate of the Year Award**.
- Major Barak was formally presented with the honor by UN Secretary-General António Guterres at the United Nations Headquarters in New York during a ceremony marking the International Day of United Nations Peacekeepers.



1. Profile of the Awardee

- **The Trailblazer:** Major Abhilasha Barak is widely recognized as the **first woman combat helicopter pilot** of the Indian Army, breaking new ground in military aviation after being commissioned into the Army Air Defence Corps in 2018.
- **UN Peacekeeping Role:** She was deployed with the **United Nations Interim Force in Lebanon (UNIFIL)** as the *Engagement Team Commander* and *Gender Focal Point* with the Indian Battalion in Sector East, southern Lebanon.
- **Key Contributions:** She conducted 539 gender-focused field activities (the highest in the mission) and led all-women patrols during periods of heightened tension. She also introduced the **Lebanon Gender Initiative**—an artificial intelligence-driven platform designed to enable confidential reporting of gender-based violence and access to helplines.

2. About the UN Military Gender Advocate of the Year Award

- **Establishment:** Created in **2016** by the Office of Military Affairs within the UN Department for Peace Operations (DPO).
- **Objective:** It recognizes the dedication and effort of an individual military peacekeeper (male or female) who has best integrated a gender perspective into peacekeeping activities.
- **Core Pillars:** The award promotes the implementation of **UN Security Council Resolution 1325 (UNSCR 1325)** on *Women, Peace, and Security*.

3. About UNSCR 1325

- Passed in 2000, **UN Security Council Resolution 1325** is a landmark international framework that addresses how women are inordinately impacted by conflict. The resolution forms the

foundation of the UN's Women, Peace, and Security (WPS) agenda and is built upon **four core pillars**: Participation, Protection, Prevention, Relief & Recovery.

4. India's Track Record with the Award

India is historically one of the largest troop and police-contributing countries to UN Peacekeeping missions. Major Barak is the **third Indian recipient** of this elite award:

1. **Major Suman Gawani (2019)**: Served with the UN Mission in South Sudan (UNMISS).
2. **Major Radhika Sen (2023)**: Served with the UN Stabilization Mission in the Democratic Republic of the Congo (MONUSCO).
3. **Major Abhilasha Barak (2025)**: Served with UNIFIL in Lebanon.

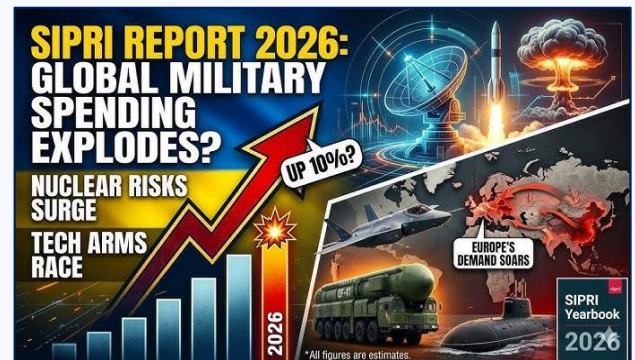
5. About UNIFIL

- **Establishment**: Originally created by the UN Security Council in **1978** to confirm Israeli withdrawal from Lebanon, restore international peace and security, and assist the Government of Lebanon in ensuring the return of its effective authority in the area.
- **The Blue Line**: Following the 2006 war, UNIFIL's mandate was enhanced to monitor the cessation of hostilities and support the Lebanese Armed Forces along the **Blue Line** (the border demarcation between Lebanon and Israel).
- **India's Presence**: India is one of the top troop contributors to UNIFIL, maintaining hundreds of personnel to secure peace in the highly volatile West Asian theatre.

2.4. GLOBAL NUCLEAR GOVERNANCE ARCHITECTURE

Context:

- The Stockholm International Peace Research Institute (SIPRI) Yearbook 2026 highlights India's ongoing nuclear arsenal expansion, its shift in strategic focus, and its consistent position as one of the world's top military spenders and arms importers.



India's Nuclear Arsenal & Strategic Shift

- **Arsenal Expansion**: India's nuclear stockpile expanded to approximately 190 warheads by early 2026, an increase from 180 warheads in 2025.
- **Strategic Reorientation**: The nuclear modernisation programme is increasingly prioritizing the development of longer-range weapons capable of reaching targets across China, while concurrently maintaining its deterrence posture against Pakistan.

Where does India Stand in Global Defence Economics?

- **Military Expenditure (2025)**: India ranks as the **fifth-largest** military spender globally (\$92.1 billion). The top four spenders are the United States, China, Russia, and Germany.
- **Arms Imports (2021-25)**: India is the **second-largest** importer of major arms globally, accounting for 8.2% of global imports.

- **Top 5 Importers:** Ukraine holds the top spot, followed by India, Saudi Arabia, Qatar, and Pakistan. Together, they account for 35% of all global arms transfers.

What is the Global Nuclear Landscape?

- **Nuclear-Armed States:** There are exactly **nine** countries possessing nuclear weapons: the US, Russia, the UK, France, China, India, Pakistan, North Korea, and Israel.
- **Modernisation:** All nine states are actively expanding and modernising their nuclear delivery systems, reinforcing nuclear weapons as primary instruments of national power.

About SIPRI

- **Core Mandate:** SIPRI is an independent international institute dedicated to research into conflict, armaments, arms control, and disarmament.
- **Data Source:** The institute's rigorous assessments, data sets, and policy recommendations are based exclusively on open sources.
- **Global Authority:** It serves as an authoritative and widely cited reference for policymakers, diplomats, scholars, and journalists regarding international security dynamics.

Global Nuclear Governance Architecture

1. Treaty on the Non-Proliferation of Nuclear Weapons (NPT)

- **The Nuclear Matrix:** The NPT separates states into Nuclear-Weapon States (NWS)—defined strictly as those that manufactured and exploded a nuclear device before January 1, 1967 (the US, Russia, UK, France, and China)—and Non-Nuclear-Weapon States (NNWS).
- **Non-Signatory Realities:** India, Pakistan, Israel, and North Korea possess functional nuclear stockpiles completely outside the NPT framework.

2. Bilateral Arms Control Disruption: Expiry of New START

- **Strategic Cap Removal:** The New START Treaty was the primary bilateral mechanism regulating and limiting the deployed strategic nuclear weapons of the United States and Russia.
- **February 2026 Expiry:** The treaty officially expired in February 2026 without any successor agreement or replacement framework being negotiated. This legal vacuum eliminates formal limits on strategic deployments, directly correlating with the global modernization trends reported by SIPRI.

3. Treaty on the Prohibition of Nuclear Weapons (TPNW)

- Entering into force in 2021, the TPNW acts as a legally binding multilateral instrument that completely prohibits the possession, development, and deployment of nuclear weapons.

4. International Atomic Energy Agency (IAEA)

- Established in 1957 in Vienna, the **International Atomic Energy Agency (IAEA)** is an autonomous UN nuclear watchdog operating under the mandate **“Atoms for Peace and Development.”** It enforces global **non-proliferation safeguards**, sets **nuclear safety standards**, and promotes **peaceful nuclear applications** in healthcare and energy. India, a founding member, subjects only its civilian reactors utilizing imported uranium to IAEA oversight.

2.5. KHARG ISLAND

Context:

- **Recently**, U.S. President Donald Trump announced a pause on planned military bombings against Iran, signaling a potential diplomatic deal after hours of intense escalation where he threatened to strike the country "very hard" and explicitly seize **Kharg Island** and its vital energy infrastructure.
- This critical geopolitical standoff directly highlights Kharg Island's status as a primary strategic target and a global economic flashpoint.



Overview of Kharg Island

- **The Body of Water:** Kharg Island is a low-lying, continental island situated in the northern zone of the **Persian Gulf**.
- **Proximity to Mainland:** It is located approximately 25 kilometers (16 miles) off the southwestern coast of the Iranian mainland and falls under the administrative jurisdiction of the coastal **Bushehr Province**.
- **Distance from Chokepoints:** The island is located about 660 kilometers northwest of the **Strait of Hormuz**, which serves as the most critical maritime oil transit chokepoint globally.
- **Physical Characteristics:** Unlike many low sandy islands in the region, Kharg Island is primarily a **coral and limestone outcrop** that features unique deep-water approaches along its coast, rendering it naturally suitable for large marine vessels. It is also one of the few islands in the Persian Gulf possessing its own natural freshwater supply.

Economic and Infrastructure Significance

- **The Backbone of Iranian Exports:** Kharg Island operates as the principal maritime terminal for Iran, historically handling **up to 90% of the country's crude oil exports**.
- **Storage and Logistics:** The island hosts a massive concentration of interconnected infrastructure, including specialized marine terminals, extensive pipeline networks linked directly to major inland oilfields (such as Aghajari), and storage facilities capable of holding up to 30 million barrels of crude oil.
- **Deep-Water Terminals:** The deep coastal waters allow the island to accommodate **Very Large Crude Carriers (VLCCs)**, which are essential for long-distance international energy trade, particularly shipments heading toward major Asian markets like China.

Historical and Archaeological Background

- **Ancient Maritime Trade:** Because of its position along historic maritime corridors connecting India, Persia, and Mesopotamia, the island served as a critical trading post long before the discovery of fossil fuels.
- **Colonial Control:** The island was historically occupied and fortified by European colonial powers, including the Portuguese Empire during the 16th and 17th centuries, and subsequently the Dutch East India Company in the 18th century.

- **Cultural Heritage:** The island preserves several protected archaeological sites, including a 7th-century Christian monastery complex, ancient tombs, and a historic **Achaemenid cuneiform inscription** dating between 550 BCE and 330 BCE.

Implications for Global Security and India

1. Geopolitical Vulnerability

- **Single Point of Failure:** Because Iran's oil export capacities are heavily centralized on this single island, it presents a critical economic vulnerability during periods of military conflict.
- **Regional Escalation:** Any direct kinetic intervention or prolonged blockade of Kharg Island increases the risk of broader retaliatory measures across the Strait of Hormuz, threatening international merchant shipping and subsea data cables.

2. Impact on Indian Interests

- **Energy Security and Price Volatility:** Although India has diversified its crude imports, any severe disruptions in the Persian Gulf inevitably trigger global crude price shocks, driving up India's import bills, fiscal deficit, and domestic inflation.
- **Safety of Indian Seafarers:** A substantial portion of the commercial vessels operating within the Persian Gulf and the Gulf of Oman employ Indian nationals, making regional military strikes a direct threat to the safety and security of Indian citizens working abroad.

2.6. STRAIT OF HORMUZ SECURITY INITIATIVE & INDO-FRENCH MARITIME COOPERATION

Context:

- Ahead of Prime Minister of India's bilateral talks with French President at the G7 Summit, France has proposed a broader multinational maritime security partnership with India. This initiative aims to ensure maritime security and freedom of navigation in the geopolitically sensitive **Strait of Hormuz** amid rising regional tensions in West Asia.



Key Bilateral & Multilateral Highlights

- **Proposed Participants:** The West Asia-focused initiative, discussed on the margins of the G7 Summit, is expected to involve **India, the United States, France, Qatar, Saudi Arabia, and the UAE.**
- **Core Agenda of India-France Talks:** Defense cooperation, maritime security, military hardware acquisition, and geopolitical developments in West Asia.

Connected Initiatives

- **Operation Sankalp:** India's own independent maritime security operation launched by the Indian Navy in 2019 in the Persian Gulf and the Gulf of Oman to ensure the safety of Indian flagged merchant vessels following security incidents in the region.

- **EMASOH (European Maritime Awareness in the Strait of Hormuz):** It is a **French-led maritime monitoring mission** with the goal to protect maritime flows through the Strait of Hormuz. It is headquartered at the French naval base in Abu Dhabi and comprises a diplomacy track (EMASoH) and a military track (AGENOR).
- **Naval Exercise - VARUNA 2025:** Exercise Varuna has evolved into a cornerstone of the India-France strategic partnership, enhancing cooperation in anti-submarine warfare, air defence, and surface combat operations.

About the Group of Seven (G7)

- **What is it?** The G7 is an **informal bloc** of industrialized, advanced economies that meet annually to discuss global economic governance, international security, and energy policy.
- **Origin:** Began in 1975 as the G6 (France, West Germany, Italy, Japan, the UK, and the US) in response to economic crises and the oil shock of the 1970s.
 - Canada joined in 1976, creating the G7.
 - Russia joined in 1997, forming the G8.
 - Russia's membership was suspended in 2014 following the annexation of Crimea, and the group returned to the G7 format.
- **Institutional Setup:** Crucially, the **G7 does not have a permanent secretariat**, a legal charter, or a formal treaty.

2.7. INDIA-SLOVAKIA: HISTORIC MILESTONE

Context:

- India and Slovakia elevated their ties to a **'Comprehensive Partnership'** by signing multiple MoUs across key sectors during Prime Minister **Narendra Modi's** historic visit to **Bratislava**. The visit was particularly significant as it marked the **first-ever visit by an Indian Prime Minister to Slovakia since its establishment in 1993**, opening a new chapter in bilateral relations



Key Pillars of India-Slovakia Comprehensive Partnership

1. Joint Action Against Terrorism and Global Security

- **Joint Working Group (JWG):** Both nations agreed to formalize the formation of a Joint Working Group on Terrorism to institutionalize intelligence and security sharing.
- **Condemnation of Terror Attacks:** Prime Minister Modi and his Slovak counterpart Robert Fico strongly condemned the April 2025 terror attacks in Pahalgam.
- **Global Sanctions and Frameworks:** The leaders jointly called for action against entities listed in the UN Security Council 1267 Sanctions Committee, alongside the sponsors of terrorism. Furthermore, they agreed to actively work towards the swift adoption of the Comprehensive Convention on International Terrorism (CCIT) within the United Nations framework.

2. Economic Ties, Trade, and Industry

- **Sectoral Focus:** The expanding trade map primarily targets critical industrial sectors including automobiles, railways, electronic goods, green technology, and advanced manufacturing.
- **Trade Booster:** Prime Minister Modi underlined that the ongoing India-EU Free Trade Agreement negotiations will add significant momentum to this newly minted bilateral partnership.

3. Labour Mobility and Social Security

- **Regulated Migration:** A major MoU on labor migration was signed to facilitate safer, regular mobility and structured information exchange between the designated authorities of both nations.
- **Social Security Agreement:** The two administrations agreed to conclude a comprehensive social security agreement to protect the welfare of professionals moving across borders.

4. Education, Institutional Linkages, and Multilateralism

- **STEM & Academic Exchange:** An MoU between the Higher Education Ministries was finalized to facilitate deeper academic linkages, prioritizing the mutual mobility of researchers and students in STEM fields and humanities.
- **UN Reform:** Reaffirming their commitment to a multipolar world order, both sides called for an expansion of permanent and non-permanent seats within a reformed United Nations Security Council (UNSC).

Mapping Dynamics for Prelims

Slovakia is a strategically significant landlocked nation in Central Europe. Candidates must retain a clear map memory of its immediate neighborhood:

- **Land Borders:** Slovakia is bordered by 5 countries:
 - **Poland** (North)
 - **Ukraine** (East)
 - **Hungary** (South)
 - **Austria** (Southwest)
 - **Czech Republic** (Northwest)
- **Geographical Trap:** It does *not* share a land border with Germany or Romania.
- **Capital City: Bratislava**, situated close to the borders with Austria and Hungary, sits on the banks of the famous **Danube River**.

2.8. EXERCISE PITCH BLACK 2026 & INDIA'S PARTICIPATION

Context:

- **Recently**, the **Indian Air Force (IAF)** announced its participation in **Exercise Pitch Black 2026**, the premier multinational air combat exercise hosted by the **Royal Australian Air Force (RAAF)**. The exercise is scheduled to be held in **Northern Territory, Australia**, from **July 20 to August 7, 2026**.



What is Exercise Pitch Black?

- **Exercise Pitch Black** is the largest and most significant multinational air combat exercise conducted by the **Royal Australian Air Force (RAAF)**.
- Hosted in the **Northern Territory of Australia**.
- Designed to enhance:
 - **Air combat capabilities**
 - **Interoperability among participating air forces**
 - **Joint operational planning and execution**
 - **Multinational military cooperation**

Key Features

- One of the world's largest air warfare exercises.
- Involves **complex and realistic combat scenarios**.
- Provides training in:
 - Air-to-air combat
 - Air-to-ground operations
 - Coalition warfare
 - Strategic force integration

India's Participation in Pitch Black 2026

- The **Indian Air Force (IAF)** will participate as an official partner nation.
- India's participation reflects:
 - Growing defence cooperation with Australia.
 - Commitment to a **free, open and inclusive Indo-Pacific**.
 - Enhanced military interoperability with partner countries.
- s-based order.

About Northern Territory (Australia)

- Capital: **Darwin**
- Located in **northern Australia**.
- Strategic location facing the **Timor Sea** and Southeast Asia.
- Hosts major Australian military training facilities and air bases.
- **Uluru-Kata Tjuta National Park**: Located 450 km southwest of Alice Springs, it features the sacred giant red monolith (348m high) and the rust-colored domes of Kata Tjuta.
- **Kakadu National Park**: A massive UNESCO World Heritage-listed reserve 171 km east of Darwin, featuring wetlands, spectacular waterfalls, and ancient Aboriginal rock art galleries dating back tens of thousands of years

2.9. INDIAN OCEAN RIM ASSOCIATION (IORA)

Context:

- **Recently**, Canada's formal application to become a dialogue partner of the Indian Ocean Rim Association (IORA) is being examined during the 28th meeting of the Committee of Senior Officials (CSO) held in New Delhi.
- IORA Secretary-General Sanjiv Ranjan highlighted that Canada's vast coastal zones and expertise in maritime safety, security, and connectivity could significantly benefit member states, while also addressing critical regional developments like a potential U.S.-Iran peace deal to end hostilities in the Strait of Hormuz and the disproportionate climate change challenges facing the Indian Ocean.



Core Institutional Framework of IORA

1. Genesis and Evolution

- **Origin:** The organization was initially established as the Indian Ocean Rim Initiative in March 1995 and formally evolved into the Indian Ocean Rim Association for Regional Cooperation (IOR-ARC) during a ministerial meeting in March 1997. It was later rebranded simply as the Indian Ocean Rim Association (IORA).
- **Founding Philosophy:** The framework was heavily inspired by an address delivered by former South African President Nelson Mandela in New Delhi in 1995, where he underscored the immense potential of a collaborative ocean-bound partnership.
- **Secretariat:** The permanent secretariat and coordinating center of IORA is situated at **Ebene, Mauritius**.

2. Membership Structure

- **Member States:** The association currently comprises **23 Member States** that share a contiguous coastline with or are situated within the Indian Ocean.
- **Geographical Distribution:** Membership spans multiple continents, including Africa (e.g., South Africa, Mauritius, Madagascar), Asia (e.g., India, Bangladesh, Indonesia, Iran, UAE), and Oceania (Australia).
- **Dialogue Partners:** IORA maintains **12 Dialogue Partners** (including major global powers like the United States, China, Japan, the United Kingdom, France, and Germany) who support the association's wider geopolitical objectives but do not hold voting privileges.
- **Notable Exclusion:** **Pakistan has never been granted membership** in the association. The country applied for membership in the early 2000s, but its application was blocked because it refused to extend Most Favoured Nation (MFN) trading status to India, thereby failing to satisfy the mandatory "sovereign equality and trade facilitation" prerequisites of the IORA Charter.

3. Key Organizational Organs

- **Council of Ministers (COM):** This is the apex, ultimate decision-making body of IORA. It meets annually to formulate broad policies, review structural progress, and direct the association's geopolitical roadmap.

- **Committee of Senior Officials (CSO):** Functioning as the second-highest decision-making organ, the CSO is composed of senior diplomats from member states. It reviews institutional projects, coordinates working groups, and sets the operational agenda for the COM.

Guiding Principles & Functional Priorities

1. Architectural Safeguards

- **Bilateral Exclusion:** The foundational IORA Charter explicitly bars members from introducing contentious bilateral disputes into formal multilateral deliberations to preserve a strictly cooperative environment.
- **Sovereign Equality:** Decisions across all structural levels of the association are reached exclusively through consensus, and cooperation is strictly voluntary.

2. Six Priority Areas & Two Cross-Cutting Focus Themes

The structural mandate of IORA is anchored upon eight pillars designed to maximize regional integration:

Priority Areas	Cross-Cutting Themes
1. Maritime Safety and Security	1. The Blue Economy
2. Trade and Investment Facilitation	2. Women's Economic Empowerment
3. Fisheries Management	
4. Disaster Risk Management	
5. Academic, Science and Technology Cooperation	
6. Tourism and Cultural Exchanges	

India and IORA: Strategic Synergy

- **Chairship Focus (2025–2027):** India is currently leading the association as its institutional Chair. New Delhi has leveraged this platform to advance maritime safety amidst growing global volatility and is actively drafting the next comprehensive **IORA Action Plan (2028–2032)**.
- **Strategic Alignments:** India integrates its domestic maritime doctrine, **SAGAR** (Security and Growth for All in the Region), and its **MAHASAGAR** framework directly with IORA priorities to act as a primary security provider and first responder to natural disasters across the Indian Ocean Region.

2.10. INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA)

Context:

- **Recently**, the International Atomic Energy Agency (IAEA) chief Rafael Grossi announced that the agency is ready to define the "concrete steps" required to implement a new U.S.-Iran deal aimed at ending the war in West Asia. Under the explicit terms of this diplomatic agreement, the UN's nuclear watchdog will be directly responsible for overseeing and verifying the process as Iran dilutes its enriched uranium stockpiles.



Core Institutional Framework of the IAEA

- **Origin:** Established in 1957 as the world's "Atoms for Peace" organization, inspired by US President Dwight D. Eisenhower's 1953 address to the United Nations General Assembly.
- **UN Status:** The IAEA is **not a Specialized Agency of the United Nations**. It is an **autonomous international organization** established by its own founding treaty, the IAEA Statute.
- **Dual Reporting Mandate:** It reports independently to **both** the United Nations General Assembly (UNGA) and the United Nations Security Council (UNSC) whenever a state party is found to be in non-compliance with its non-proliferation obligations.
- **Headquarters:** Vienna, Austria.
- **Dual Mandate:**
 - **Promotional Pillar:** Promotes the safe, secure, and peaceful use of nuclear technologies in sectors like health, energy, and agriculture.
 - **Verification Pillar:** Implements robust inspection systems to ensure nuclear materials are not diverted for military purposes.

Governance and Structural Organs

- **The General Conference:** The highest plenary organ consisting of representatives from **all Member States**. It meets annually to approve the budget, program of work, and global nuclear resolutions.
- **The Board of Governors:** The executive arm consisting of **35 member states**. It holds the exclusive authority to approve Safeguards Agreements and publish global nuclear safety standards.
- **The Secretariat:** The permanent administrative and professional staff of the agency, headed by the **Director General** (currently Rafael Mariano Grossi), who serves a four-year term.

The Safeguards System: Mechanics of Verification

- **Comprehensive Safeguards Agreements (CSAs):** Mandated primarily under Article III of the Non-Proliferation Treaty (NPT) for non-nuclear-weapon states. It gives the IAEA the authority to verify that all declared peaceful nuclear material within a country is not diverted to nuclear weapons.
- **The Additional Protocol (AP):** An optional, legally binding document paired with a state's existing safeguards agreement. It expands the IAEA's verification rights significantly, granting inspectors **short-notice access to undeclared sites** to verify the absolute absence of undeclared nuclear materials.

India and the IAEA: Key Strategic Facts

- **Non-NPT Status:** India is a nuclear-armed state that is **not a signatory** to the Non-Proliferation Treaty (NPT).
- **India-Specific Safeguards Agreement (ISSA):** Following the 2008 civil nuclear milestone (Indo-US Civil Nuclear Deal), India signed a unique safeguards agreement (INFCIRC/754) with the IAEA.

- **The Separation Plan:** India operates a strict dual-track framework for its domestic nuclear infrastructure:
 - **Civilian Facilities:** Reactors that use imported uranium fuel or are declared for peaceful energy production are placed under permanent IAEA safeguards.
 - **Military Facilities:** Strategic facilities utilizing domestic uranium supplies are kept separate and are entirely exempt from IAEA inspection or safeguards oversight.
- **India's Additional Protocol:** Ratified by India in 2014, this protocol is highly customized and significantly more limited than the standard model. It primarily covers the monitoring of exported and imported nuclear materials, ensuring that India's defense-related installations remain entirely insulated from intrusive international scrutiny.

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UPSC PRELIMS PRACTICE QUESTIONS

Q. Consider the following statements regarding the boundary alignment between India and Nepal:

STATEMENT I: The Treaty of Sugauli, signed in 1816 between the Kingdom of Nepal and British India, established the Kali River as the natural western boundary of Nepal.

STATEMENT II: The recent territorial dispute over the Susta sector in the southern plains is primarily caused by the shifting course of the Mechi River over several decades.

Which one of the following is correct in respect of the above statements?

- (a) Both Statement I and Statement II are correct and Statement II is the correct explanation for Statement I
- (b) Both Statement I and Statement II are correct and Statement II is not the correct explanation for Statement I
- (c) Statement I is correct but Statement II is incorrect
- (d) Statement I is incorrect but Statement II is correct

Ans. (c)

Explanation:

- **STATEMENT I IS CORRECT:** The 1816 Treaty of Sugauli officially concluded the Anglo-Nepalese War and designated the Kali River as the western international boundary of Nepal, separating it from India's Kumaon region.
- **STATEMENT II IS INCORRECT:** The territorial dispute in the Susta sector is caused by the changing course of the **Gandak River** (also known as the Narayani River), not the Mechi River. The Mechi River defines a portion of the eastern border of Nepal, whereas Susta lies in the south adjacent to Bihar.

Q. With respect to the Sea of Azov consider the following statements:

- I. The Kerch Strait acts as its exclusive maritime connection to the Black Sea.
- II. The Don and Kuban rivers are the primary drainage systems emptying into it.
- III. High freshwater influx from surrounding rivers results in exceptionally high salinity levels.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Ans. (b)

Explanation:

Statement I is correct: The **Kerch Strait** is the sole maritime gateway that physically connects the Sea of Azov southward to the **Black Sea**, making it a critical geopolitical chokepoint.

Statement II is correct: The hydrological profile of the sea is primarily sustained by the **Don and Kuban rivers**, which discharge massive amounts of freshwater, silt, and sand into the basin.

Statement III is incorrect: Due to the massive freshwater influx from primary rivers, the Sea of Azov is characterized by **exceptionally low salinity levels**, not high salinity.

Q. Consider the following statements regarding the UN Military Gender Advocate of the Year Award:

- 1. The award was established in 2016 by the Office of Military Affairs under the UN Department for Peace Operations.
- 2. It recognizes military peacekeepers who effectively integrate a gender perspective into peacekeeping operations.

3. The award promotes the implementation of UN Security Council Resolution 1325 on Women, Peace and Security.

Which of the statements given above is/are correct?

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

Ans. (d)

Explanation:

- **Statement 1 is Correct:** The **UN Military Gender Advocate of the Year Award** was established in **2016** by the **Office of Military Affairs** within the United Nations Department of Peace Operations.
- **Statement 2 is Correct:** The award recognizes military peacekeepers who have successfully integrated a **gender perspective** into peacekeeping activities.
- **Statement 3 is Correct:** The award supports the implementation of United Nations Security Council Resolution 1325 on **Women, Peace and Security (WPS)**.

Q. With respect to the global military and nuclear landscape, consider the following statements:

- I. India was the world's largest importer of major arms during the 2021-25 period.
- II. The integration of cyberoperations into active military conflict was observed for the first time between India and Pakistan during Operation Sindoor.

III. There are exactly nine globally recognized nuclear-armed states that are currently modernising their arsenals.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Ans. (b)

Explanation:

- **Statement I is incorrect:** During the 2021-25 period, India remained the **second-largest** importer of major arms, accounting for 8.2% of global imports, closely following Ukraine.
- **Statement II is correct:** During the May 2025 military crisis known as Operation Sindoor, India and Pakistan integrated cyberoperations into an active military conflict for the first time, highlighting the evolving nature of warfare.
- **Statement III is correct:** There are nine nuclear-armed states globally—the United States, Russia, the United Kingdom, France, China, India, Pakistan, North Korea, and Israel—all of which are actively modernising their nuclear arsenals.



Scan to attempt more questions

3.1. REMITTANCES & BoP ACCOUNTING

Context:

- **Recently**, inward remittances have emerged as a vital macroeconomic anchor for India's external sector, doing the heavy lifting to finance the structural trade deficit and protect the Indian rupee from aggressive depreciation.
- While net Foreign Direct Investment (FDI) and net Foreign Portfolio Investment (FPI) flows have dropped into negative territory due to global economic disruptions and energy crises, steady net secondary income inflows—amounting to \$138 billion—have consistently financed more than half of India's total trade deficit, serving as a highly resilient stabilizer against external sector vulnerabilities.



1. BoP Accounting Framework

- **Classification:** Remittances are recorded under the **Current Account** (not the Capital/Financial Account).
- **Sub-category:** They are explicitly classified under **Invisibles** \rightarrow **Net Secondary Income (NSI) surplus**, which accounts for India's huge net positive private transfers.
- **Nature:** They function as **unrequited unilateral transfers** (transfers and not claims). Unlike FDI or FPI, they do not generate future liability outflows or investment income outflows.

2. Key Trends & Core Data

- **Global Standing:** India attracts the highest volume of remittances globally by a wide margin, securing \$138 billion in 2024.
- **Proportion to GDP:** Net remittances average about **3% of India's Gross Domestic Product (GDP)**, making them substantially higher than net FDI and FPI flows during economic slowdowns.
- **Stability Factor:** Unlike foreign portfolio investments, remittances are not prone to sudden halts or capital flight; they are driven by the resilient income and savings decisions of the overseas Indian diaspora.
- **Deficit Cushioning:** Since mid-2013, remittances have on average financed **more than half of India's total trade deficit**.

3. Macroeconomic Impact

- **Countervailing Depreciation:** As the Indian rupee faces downward pressure (losing nearly 12% against the U.S. dollar between May 2025 and early 2026), remittances act as a vital shock absorber.
- **CAD Management:** They directly bridge the gap left by a persistent merchandise trade deficit, keeping the CAD within manageable parameters.

- **Insulation from Capital Ebbing:** When the Financial Account faces stress due to declining or negative net FDI and FPI, steady remittance flows prevent severe balance-of-payments vulnerabilities.

3.2. PURCHASING MANAGERS' INDEX (PMI) AND SECTORAL GROWTH TRACKING

Context:

- **Recently**, India's manufacturing sector recorded stronger growth in May 2026, supported by rising domestic demand, infrastructure development, and increased new orders.
- The seasonally adjusted **HSBC India Manufacturing PMI** rose to **55.0 in May 2026** from **54.7 in April**, reaching a three-month high. The sector continued to expand despite higher costs of fuel, transportation, and raw materials due to global inflationary pressures.



1. What is the Purchasing Managers' Index (PMI)?

- **Definition:** It is a survey-based economic indicator designed to track and gauge the month-on-month changes in business and economic conditions.
- **Compilation:** For India, it is compiled monthly by **S&P Global** (sponsored by HSBC) based on questionnaires sent to senior executives/purchasing managers at roughly 400 to 500 private manufacturing firms.
- **Types of PMI:** It is calculated separately for the **Manufacturing sector** and the **Services sector**, which are subsequently aggregated into a **Composite PMI**.

2. How to Interpret the PMI Score?

The PMI is expressed as a headline number ranging from **0 to 100**:

- **Score > 50:** Indicates an **expansion** in economic activity compared to the previous month.
- **Score < 50:** Indicates a **contraction** in activity compared to the previous month.
- **Score = 50:** Represents **no change** or status quo in business conditions.

3. PMI vs. IIP

Feature / Parameter	Purchasing Managers' Index (PMI)	Index of Industrial Production (IIP)
Compiled By	Private entity (S&P Global / HSBC).	Government entity (National Statistical Office - NSO , Ministry of Statistics & Programme Implementation - MoSPI).
Nature of Indicator	Leading Indicator: Reflects forward-looking business expectations and sentiment.	Lagging Indicator: Reflects actual, historical physical output from a past period.
Basis of Measurement	Month-on-Month (m-o-m): Compares the current month's conditions directly to the preceding month.	Year-on-Year (y-o-y): Compares production volumes against a fixed base year (Current Base Year: 2022-23).

Sectoral Coverage	Covers Manufacturing and Services sectors.	Covers Mining, Manufacturing, and Electricity (broad industrial sector).
Formal vs. Informal	Under-represents small and medium enterprises (SMEs) and informal units; leans toward large firms.	Broader, more formal, statistical representation via fixed commodity baskets.

3.3. INDIA'S STRUCTURAL SHIFT FROM WPI TO PPI

Context:

- The Ministry of Commerce and Industry is executing a major structural reform in India's inflation-mapping architecture. Over the next five years, the traditional **Wholesale Price Index (WPI)** will be systematically phased out and entirely replaced by the globally standardized **Producer Price Index (PPI)**.



1. The Transition Roadmap

To prevent economic disruptions, the Department for Promotion of Industry and Internal Trade (DPIIT) is executing a dual-track parallel release starting June 15:

- Base Year Revision:** The temporary WPI series updates its base year from **2011-12 to 2022-23**.
- The 5-Year Parallel Run:** Because WPI is legally embedded in corporate and government price-escalation contracts, it will be published alongside the new PPI for five years. This allows commercial entities a smooth operational transition before WPI is permanently discontinued.

2. The New PPI Architecture

Unlike the single-metric approach of the wholesale index, the new PPI tracks price changes at different entry and exit points of production through three separate indices:

- Output PPI:** Captures the average change in basic prices received by domestic producers when the finished goods leave the factory floor.
- Trial Input PPI:** Measures the price fluctuations of raw materials and intermediate inputs as they enter the production pipeline.
- Services PPI:** Brings the services economy into production-level inflation tracking for the first time.

Phase 1 Services Basket: The index initiates tracking across **seven** foundational service sectors: **Banking, Securities Transactions, Insurance, Management of Pension Funds, Railways, Air (Passenger), and Telecom.**

3. WPI vs. PPI

Parameter	Wholesale Price Index (WPI)	Producer Price Index (PPI)
Core Measurement	Tracks price changes of goods traded in bulk at the wholesale level.	Tracks average change in prices received by domestic producers for their output/input.

Services Sector	Completely excluded.	Included (7 sectors in Phase 1, expanding later).
Global Alignment	Out of sync with advanced economies; criticized for omitting consumer-facing services.	Aligned with International Monetary Fund (IMF) best practices.
Margins & Taxes	Includes trade and transport margins between the producer and wholesaler.	Measures basic prices received by the producer, eliminating trade/transport distortions.

4. About the WPI Framework

- **Compiling Authority:** Published on a monthly basis by the **Office of the Economic Adviser, DPIIT, Ministry of Commerce and Industry.**
- **The Three Pillars of WPI Weightage:**
 - **Manufactured Products (64.23%):** The largest component, encompassing metals, chemicals, machinery, and textiles.
 - **Primary Articles (22.62%):** Covers raw food items, non-food agricultural items, and crude petroleum.
 - **Fuel & Power (13.15%):** Tracks corporate energy inputs like electricity, petrol, diesel, and LPG.
- **The WPI Food Index:** This is a distinct sub-index calculated by combining the weightage of 'food articles' from the Primary Articles group and 'food products' from the Manufactured Products group.

3.4. CABINET APPROVES PRICE STABILIZATION FUND

Context:

- **Recently,** the Union Cabinet, chaired by the honourable PM, approved a one-time financial support of up to ₹10,000 crores for Oil Marketing Companies (OMCs).
- This support will help stabilize Aviation Turbine Fuel (ATF) prices for scheduled Indian airlines operating domestic and international flights.



Key Components of the ATF Price Stabilisation Fund

1. **₹10,000 Crore Interest-Free Support:** OMCs will receive interest-free advances to compensate for losses when international ATF prices rise above a benchmark level.
2. **Recovery Mechanism:** When international ATF prices fall, OMCs will repay the support amount to the Consolidated Fund of India until the entire advance is fully recovered.
3. **Coverage of Domestic and International Operations:** Available to all willing scheduled Indian airlines for both domestic and international operations.
4. **Fixed ATF Pricing:** Provides airlines with predictable fuel costs and protection from sudden price spikes.

5. **Exclusive rights of ATF supply to OMCs:** Participating airlines will buy ATF only from OMCs for up to 3 years or until the support amount is fully recovered.
6. **Monitoring & Audit:** A Monitoring Committee comprising representatives of the Ministry of Civil Aviation, Ministry of Petroleum & Natural Gas and Department of Expenditure shall oversee implementation, claim verification, reconciliation and settlement.
7. **Duration of Price Stabilization support:** The scheme will operate for 36 months, subject to annual review, and may be extended if required.

Expected outcome

- The proposed mechanism will provide enhanced stability and predictability in ATF pricing for Indian airlines, enabling better operational and financial planning.
- It will shield Oil Marketing Companies (OMCs) from losses arising from volatile and elevated ATF prices during the ongoing West Asia crisis.
- The measure will help protect and sustain domestic and international air connectivity, ensuring continuity of air services.
- It will reduce the pass-through of fuel price shocks to passengers, thereby helping to moderate fare volatility.
- The arrangement will support continued air connectivity to remote, regional, Tier-II and Tier-III cities, promoting balanced regional development and inclusive growth.

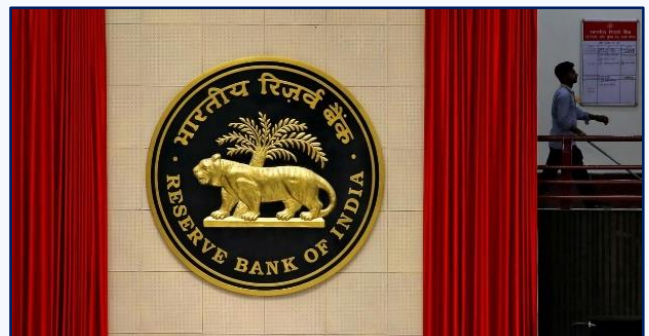
Key Benefits

- Stable airline operations help sustain employment across airlines, airports, ground handling agencies, MROs, travel agencies, hospitality and logistics sectors.
- Continued air connectivity will facilitate movement of passengers, high-value cargo, business travellers and tourists, thereby supporting economic activity across sectors.
- The measure will have positive spill-over effects on tourism, hospitality, trade, exports, regional development and investment.
- It will help ensure optimum utilisation of airport infrastructure developed across the country, including airports operationalised under the **UDAN scheme**.
- By preserving domestic and international connectivity, the initiative will strengthen India's integration with global markets and support long-term economic growth.

3.5. MONETARY POLICY COMMITTEE (MPC)

Context:

- **Recently**, the Monetary Policy Committee (MPC) of the Reserve Bank of India (RBI) concluded its second bi-monthly meeting for the financial year 2026–27, deciding unanimously to keep the policy repo rate unchanged at 5.25% and maintain its "neutral" stance.



- This decision was influenced by mounting macroeconomic headwinds stemming from the escalated conflict in West Asia, which has pushed international crude oil prices higher and triggered significant foreign capital outflows, exerting persistent pressure on the Indian rupee.
- In response to these supply-side shocks and energy disruptions, the MPC revised its Consumer Price Index (CPI) inflation projection upward for the fiscal year to 5.1% while concurrently scaling down India's real Gross Domestic Product (GDP) growth forecast to 6.6% to balance economic stability with price control.

1. Statutory Genesis and Institutional Evolution

- **Historical Genesis:** Prior to the institutionalization of the MPC, the RBI Governor possessed absolute, unilateral veto power over the determination of key policy interest rates, receiving only non-binding recommendations from a Technical Advisory Committee.
- **Legislative Amending Act:** The Monetary Policy Committee was formally established as a statutory body through an amendment to the **Reserve Bank of India Act, 1934** via the Finance Act, 2016.
- **The Urjit Patel Committee:** The structural shift toward a committee-based framework was explicitly recommended by the Executive Committee headed by Dr. Urjit Patel in 2014 to ensure collective, institutional wisdom, reduce individualized bias, and enhance the transparency of the inflation-targeting framework.

2. Organizational Composition and Structural Balance

The MPC is a balanced, six-member committee designed to bridge institutional experience from central banking with independent academic and market expertise.

Component	Number of Members	Designated Institutional Positions / Selection Method
Internal RBI Ex-Officio Members	3 Members	Includes the Governor of the RBI (serving as the Ex-Officio Chairperson), the Deputy Governor of the RBI in charge of monetary policy, and an officer of the RBI nominated by the Central Board.
External Government Appointees	3 Members	Appointed by the Central Government on the recommendations of a cabinet-headed Search-cum-Selection Committee.

- **Eligibility and Tenure:** External members must be experts in fields related to economics, banking, finance, or monetary policy, and they hold office for a **fixed term of four years** without any provision for reappointment.
- **Prohibitions on Office:** Members of Parliament, members of State Legislatures, and public servants are legally barred from being appointed as external members of the MPC to preserve institutional autonomy.

3. Statutory Mandate and Target Architecture

- **Flexible Inflation Targeting (FIT):** Under Section 45ZA of the RBI Act, the Central Government, in consultation with the RBI, legally determines the inflation target once every five years.

- **The Primary Directive:** The core statutory directive of the MPC is to maintain price stability while remaining mindful of the objective of growth.
- **The Numeric Framework:** The current long-term inflation target is structurally anchored at **4% for Consumer Price Index (CPI) Headline Inflation**, with a permissible upper tolerance limit of **6%** and a lower tolerance limit of **2%** (expressed mathematically as 4% - 2%).

4. Voting Protocol and Functional Mechanics

- **Meeting Frequency:** The MPC is statutory mandated to meet **at least four times a year**, though it typically meets bi-monthly to review evolving domestic and global economic data.
- **Quorum Requirements:** A minimum of **four members** must be present to form a valid quorum for a scheduled policy evaluation meeting.
- **Decision Matrix:** Each member of the committee possesses one vote. Decisions regarding the policy repo rate require a simple majority of members present and voting.
- **Casting Vote Safeguard:** In the event of an exact equality of votes (a 3–3 tie), the **Governor of the RBI holds a casting vote** in addition to their primary vote, serving as a tie-breaker.
- **Transparency Mandate:** The RBI is legally bound to publish the official minutes of each MPC meeting on the 14th day following its conclusion, publicizing the individual votes cast and the specific economic rationale of each member.

5. Institutional Accountability for Policy Failure

- **Defining Failure:** Under the statutory framework, the RBI is deemed to have failed to meet its inflation target if headline CPI inflation remains outside the 2% -6% tolerance band for **three consecutive quarters**.
- **The Remedial Report:** Upon such an event, the RBI must submit a formal, transparent report to the Central Government detailing:
 - The definitive structural or supply-side reasons behind the failure to maintain price stability.
 - The precise remedial policy actions the central bank proposes to implement.
 - An estimated time matrix within which the inflation trajectory is expected to return to the target midpoint.

6. Key Monetary Policy Concepts Explained

- **Policy Repo Rate:** The benchmark interest rate at which the Reserve Bank of India lends short-term, liquidity-backed funds to commercial banks against the collateral of government securities.
- **Standing Deposit Facility (SDF):** An uncollateralized liquidity absorption mechanism introduced to replace the reverse repo floor, allowing banks to park overnight surplus liquidity with the RBI without requiring government securities as collateral.
- **Marginal Standing Facility (MSF):** A penal, emergency window through which commercial banks can borrow overnight funds from the RBI by dipping into their statutory liquidity ratio portfolio up to a specified limit at a premium rate.
- **Core Inflation vs. Headline Inflation:** Headline inflation measures total inflation within an economy, including highly volatile food and energy products. Core inflation is calculated by stripping out food and fuel components from headline inflation to isolate structural demand-driven price pressures.

3.6. NATURAL GAS DISCOVERY IN ANDAMAN OFFSHORE BLOCK

Context:

- **Recently**, the State-owned explorer-producer Oil India Ltd. (OIL) has successfully confirmed the presence of natural gas in the Andaman shallow offshore block.

Key Highlights

- **Location of Discovery:** The natural gas was discovered in the **Andaman shallow offshore block**.
- **Specific Well Name:** The discovery was confirmed in the third exploratory well drilled in this block, named **Vijayapuram-3**.
- Geologically, the AN basin lies at the intersection of the Andaman and Nicobar Basins, part of the Bengal-Arakan sedimentary system



Strategic Importance for India

- **Energy Security:**
 - India remains heavily dependent on imported hydrocarbons, with crude oil import dependence reaching about **88%** in FY 2024–25, while nearly **50% of its natural gas requirements** are met through imports.
 - Major suppliers of Liquefied Natural Gas (LNG) include **Qatar, the United States, and the United Arab Emirates (UAE)**.
- **Gas Based Economy:** The discovery aligns with India's vision of establishing a Gas Based Economy by 2030 and increasing share of natural gas in its primary energy basket to **15 percent by 2030**.

Initiatives for Natural Gas Exploration

- **Open Acreage Licensing Policy (OALP):**
 - It is a key component of the Hydrocarbon Exploration and Licensing Policy (HELP). Under HELP, exploration is governed by a **revenue-sharing model**, replacing the profit-sharing system of the earlier New Exploration Licensing Policy (NELP).
 - HELP also provides a **single license** for exploration and production of **all hydrocarbons**, including both conventional and unconventional resources.
- **National Deep Water Exploration Mission:** Deepwater Exploration Mission is a flagship energy security initiative of the Ministry of Petroleum and Natural Gas aimed at exploring untapped oil and natural gas reserves beneath India's seabed to enhance domestic hydrocarbon production and reduce import dependence.
- **FDI Policy: 100% FDI allowed in the natural gas sector under automatic route.**

3.7. HDFC BANK HIKES LENDING RATE BY UP TO 10 BASIS POINTS

Context:

- India's largest private sector lender, HDFC Bank, hiked its **Marginal Cost of Funds-Based Lending Rate (MCLR)** by up to 10 basis points across various tenors. This rate hike directly increases the Equated Monthly Instalments (EMIs) for existing borrowers whose floating-rate retail and corporate loans are linked to the bank's internal benchmarks.



Core Economic Concept: Understanding MCLR

1. What is MCLR?

- It is the **minimum interest rate** below which a bank cannot ordinarily lend money (except in certain cases permitted by the Reserve Bank of India). It was introduced by the RBI in **April 2016** to ensure faster transmission of policy rate changes to borrowers.
- Example:**
- If a bank's **1-year MCLR** is **8.5%**, a home loan may be offered at: $8.5\% + \text{spread (e.g., } 0.5\%) = 9.0\%$.

2. How Does an MCLR Hike Affect Borrowers?

- When MCLR rises, the interest rate on linked floating-rate loans also increases.
- As a result:
 - EMIs may increase**, or
 - Loan tenure may extend** (depending on the bank's policy).

3. Why was it introduced?

- To replace the **Base Rate System**.
- To make lending rates more transparent.
- To ensure RBI policy rate changes are reflected more quickly in loan interest rates.

4. How is MCLR Calculated?

- Unlike older systems that relied on average costs, MCLR is calculated based on the **incremental (marginal) cost** of raising new funds. It comprises four critical components:
- $\text{MCLR} = \text{Marginal Cost of Funds} + \text{Negative Carry on CRR} + \text{Operating Costs} + \text{Tenor Premium}$
- Marginal Cost of Funds (90% weightage):** The interest rate the bank pays to raise fresh deposits or borrowings (e.g., current deposit rates, repo borrowings), alongside its return on net worth.
- Negative Carry on CRR (Cash Reserve Ratio):** Banks do not earn any interest on the cash they keep locked with the RBI as CRR. The cost of these locked, zero-earning funds is factored in here.
- Operating Costs:** The operational expenses of running the bank (salaries, branches, infrastructure).

- **Tenor Premium:** The additional risk premium charged based on the length of the loan commitment (e.g., a 2-year loan carries a higher tenor premium than an overnight loan).

5. The Evolution of Lending Rate Frameworks in India

To evaluate monetary transmission, the RBI has progressively changed benchmarks. For Prelims, understand this chronological evolution:

1. **Prime Lending Rate (PLR) / Benchmark PLR (BPLR):** High degree of bank discretion; banks frequently lent to AAA-rated corporates below the officially declared BPLR, hiding true pricing from retail consumers.
2. **Base Rate (2010):** Introduced a minimum floor rate below which banks could not lend. Calculated using the *average cost of funds*. It failed to transmit RBI rate cuts quickly because older, expensive long-term deposits kept the average cost high.
3. **MCLR (2016):** Shifted the formula to *marginal (incremental) cost of funds*. While better than the Base Rate, it still suffered from a **transmission lag** because banks delayed updating their internal deposit rates or reset periods were long (typically 6 to 12 months).
4. **External Benchmark Lending Rate - EBLR (October 1, 2019):** To eliminate bank discretion entirely, the RBI mandated that all **new floating-rate retail loans** (home, auto) and **MSME loans** must be linked to an **external market benchmark** rather than internal calculations.

6. Key Differences: MCLR vs. EBLR

Feature	Marginal Cost of Funds-Based Lending Rate (MCLR)	External Benchmark Lending Rate (EBLR)
Type of Benchmark	Internal (calculated uniquely by each bank based on its own financial health).	External (linked to public, market-determined or RBI-determined rates).
Reset Frequency	Typically once every 6 to 12 months .	Mandatory reset at least once every 3 months .
Policy Transmission	Slow & lagged. Banks take months to pass on RBI repo rate cuts.	Immediate & dynamic. A change in the repo rate triggers an automatic shift in loan rates.

3.8. INDIAN RESERVOIRS CAN HOST 102 GW FLOATING SOLAR CAPACITY

Context:

- The **National Institute of Solar Energy (NISE)**, an autonomous institute under the **Ministry of New and Renewable Energy (MNRE)**, has released the first comprehensive national assessment report titled "**Solar PV Potential of India (Floating Solar)**".



- The report highlights that India's reservoirs have the potential to host approximately **102 Gigawatts (GW)** of floating solar capacity, offering a major solution to the sector's biggest constraint: land acquisition.

Key Findings of the Report

1. Total Estimated Capacity & Geographic Distribution

- **Total Potential:** 102.18 GW across India's inland water bodies.
- **Top Contributing States:** Five states account for the bulk of this potential:
 1. **Maharashtra** (16.28 GW)
 2. **Madhya Pradesh** (14.89 GW)
 3. **Karnataka** (13.69 GW)
 4. **Odisha** (12.81 GW)
 5. **Telangana** (10.72 GW)

2. Flagship Projects

- **Omkareshwar Floating Solar Park:** Located on the **River Narmada** in the Khandwa district of **Madhya Pradesh**.
- **Status:** It is currently India's flagship floating solar project with a capacity of **278 MW**, with plans to scale it up to **600 MW**.

3. Methodology & Criteria Used

To calculate the total feasible area, NISE filtered India's inland water bodies using six distinct criteria:

- **Type & Size:** Lakes and reservoirs larger than **10 hectares**.
- **Water Availability:** Water must be present for at least **11 months/year**.
- **Depth:** Water depth must be between **3 to 30 meters**.
- **Logistics:** Proximity within **10 km** of existing roads and substations.
- **Self-Imposed Ecological Cap:** The calculation restricts solar panel coverage to a maximum of **20% of any reservoir's surface area** to minimize ecological impact.
 - **Example Case Study:** At Odisha's **Hirakud reservoir**, these filters whittled down 499 sq. km. of total water surface to 99.5 sq. km. of usable surface area.

Comparative Analysis: Floating Solar vs. Ground-Mounted Solar

- **Land Use Efficiency:** Ground-mounted systems need **3–4 times more area per megawatt (MW)** than the panels themselves occupy. Floating solar bypasses this issue entirely, mitigating land acquisition conflicts with agriculture and habitation.
- **Cost Factor:** Floating solar units cost about **25% more upfront** than ground-mounted counterparts (based on a 2021 U.S. National Renewable Energy Laboratory benchmark).

Global Scenario

- Globally, floating solar reached about **9.6 GW** by 2024.
- **Asia** dominates the sector, holding almost **90%** of the global share.

- **Key Global Examples:**

- **China:** Leads with mega-installations, including a 120 MW plant on a fish farm in **Poyang Lake**.
- **Singapore:** Features a 1 MW Tengeh Reservoir test-bed that provides vital performance data.
- **Netherlands:** Accounts for about 3/4th of Europe's capacity, built largely on quarry lakes.

India's Solar Surge

- The solar sector has expanded at an unprecedented pace over the past decade, growing from just 3 GW in 2014 to **150.26 GW in March 2026**.
- According to the IRENA Renewable Energy Statistics 2025, India stands **3rd in solar energy**, 4th in wind energy, and 4th globally in total installed renewable energy capacity.

Related Concepts for Prelims

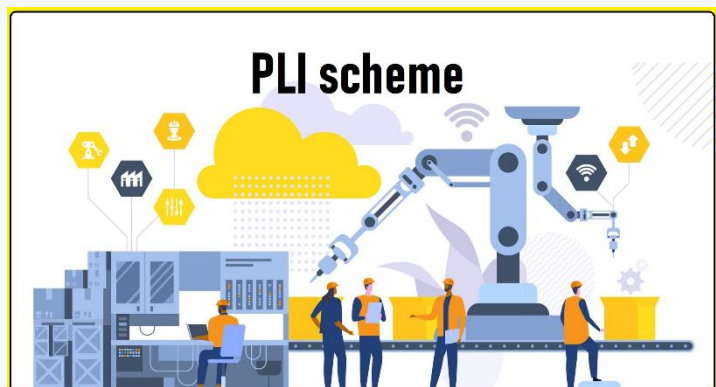
1. Agri-photovoltaics (Agri-PV)

- **Definition:** The practice of co-developing the same area of land for both solar photovoltaic power and agriculture.
- **Mechanism:** Solar panels are mounted on elevated structures sheltering farm beds below, allowing crops to grow underneath while generating electricity.

3.9. THE PRODUCTION LINKED INCENTIVE (PLI) SCHEME

Context:

- **Recently**, the Union government approved 22 new applicants under the Production Linked Incentive (PLI) Scheme for textiles. This latest round of approvals is expected to bring in a total investment of ₹2,339.14 crore, generate a projected turnover of ₹15,561.34 crore in notified products, and create 36,217 employment opportunities across the textile value chain.



Core Framework and Operational Mechanics

The Production Linked Incentive (PLI) scheme is a performance-linked fiscal policy designed to expand domestic manufacturing, reduce import dependencies, and boost exports. Launched in 2020, it replaces traditional input subsidies with output-based financial rewards.

- **Incentive Basis:** Cash incentives are calculated directly as a percentage (ranging from 4% to 6% on average) of a company's **incremental sales over a fixed base year**.
- **Eligibility Thresholds:** To qualify for yearly disbursements, companies must meet a mandatory minimum target of fresh capital investment and achieve an annual increase in turnover.
- **Tenure:** Financial support is structured to run for a period of five to six years per sector, with incentive rates tapering off in the final years to promote self-reliance.

The 14 Strategic Sectors

The program runs across fourteen targeted manufacturing segments, each managed by its respective nodal ministry:

1. Mobile Manufacturing & Electronics Components
2. Critical API / Drug Intermediates & Key Starting Materials
3. Medical Devices Manufacturing
4. Electronic and Technology Products
5. Pharmaceutical Drugs
6. Telecom and Networking Products
7. Food Products Processing
8. White Goods (Air Conditioners & LEDs)
9. High-Efficiency Solar PV Modules
10. Automobiles and Auto Components
11. Advanced Chemistry Cell (ACC) Battery Storage
12. Specialty Steel Alloys
13. Textiles (Man-Made Fiber Fabrics and Technical Textiles)
14. IT Hardware (Laptops, Servers, and Tablets)

Policy Modifications (Up to 2026)

- **Relaxed Entry Barriers:** To increase MSME participation, the government slashed investment minimums in lagging sectors like Textiles (dropping from ₹300 crore to ₹150 crore in higher-tier applications) and reduced mandatory sales growth targets from 25% to 10%.
- **Upstream Subsidies:** New allocations explicitly prioritize raw component manufacturing (such as printed circuit boards and sensors) over simple downstream final assembly.
- **Realized Impact:** By 2026, the cumulative scheme has drawn over ₹3.2 lakh crore in private investment, driving substantial export growth in smartphones and pharmaceutical categories.

Core Challenges

- **Uneven Progress:** Electronics and pharma sectors show rapid progress, whereas capital-heavy sectors like specialty steel and advanced battery storage face structural project delays.
- **Low Local Value Addition:** While final assembly lines have scaled quickly, companies remain heavily reliant on imported raw components, limiting deeper domestic integration.

3.10. DECODING RETAIL INFLATION & PRICE INDICES

Context:

- Retail inflation, measured by the Consumer Price Index (CPI), rose to a 16-month high of 3.9% in May, driven by a surge in food prices (particularly cereals). Published by the Ministry of Statistics and Programme Implementation (MoSPI), this brings the headline inflation just shy of the Reserve Bank of India's (RBI) median target of 4%.



I. Core Concepts of Price Fluctuation

- **Inflation:** A sustained increase in the general price level of goods and services, leading to a gradual loss of purchasing power.
- **Deflation:** The exact opposite of inflation; a general decline in prices resulting in increased purchasing power.
- **Core Inflation:** Calculated by excluding highly volatile components, specifically **food, fuel, and electricity prices**, from headline inflation.

II. Types of Inflation (Based on Rate)

- **Creeping (Mild/Low):** Gradual price rise (< 3% annually). Considered manageable and healthy for economic stimulation.
- **Walking (Trotting):** Moderate pace (3% to 10% annually). Can lead to economic overheating if left unchecked.
- **Galloping (Hopping/Running):** Rapid price increase (10% to 50% annually). Severely disrupts macroeconomic stability.
- **Hyperinflation:** Extreme and uncontrollable surge (> 50% monthly), leading to the collapse of the currency's value.

III. Types of Inflation (Based on Cause)

- **Demand-Pull:** Occurs when excess money supply causes aggregate demand to outpace the economy's production capacity ("too much money chasing too few goods").
- **Cost-Push:** Driven by an increase in input costs (e.g., raw materials, labour) which producers pass on to consumers.
- **Built-in (Wage-Price Spiral):** Driven by adaptive expectations; workers demand higher wages to counter expected inflation, prompting businesses to raise prices further.
- **Structural Inflation:** Caused by systemic economic bottlenecks, rigid supply chains, or monopolistic practices.

IV. Key Inflation Measuring Indices

Feature	Wholesale Price Index (WPI)	Consumer Price Index (CPI)
Measures	Price changes in the wholesale market (goods traded between businesses).	Cost of a typical basket of goods and services consumed by retail buyers.
Coverage	Excludes services.	Includes services (housing, education, etc.).
Publishing Agency	Office of Economic Adviser (DPIIT, Ministry of Commerce & Industry).	Central Statistics Office (CSO), MoSPI.
Base Year	2022-23	2024

- **Producer Price Index (PPI):** Measures price changes from the perspective of the producer/manufacturer, capturing shifts in input costs before they hit retail.
- **GDP Deflator:** The most comprehensive measure of inflation. It covers **all domestically produced goods and services**.

Advantage: It does not rely on a fixed base year or a static basket of goods like the CPI or WPI.

V. Inflation Targeting & Mitigation Framework

Monetary Policy (RBI)

- **Inflation Target:** The Monetary Policy Committee (MPC) is mandated to maintain retail inflation at **4% with a tolerance band of +/- 2%** (i.e., 2% to 6%).
- **Tools:** Adjusting benchmark policy rates (Repo Rate), Open Market Operations (selling government securities to absorb excess liquidity), and qualitative controls (e.g., raising loan margins for specific commodities).

Fiscal & Administrative Policy (Government)

- **Fiscal Restraint:** Cutting public expenditure and adjusting direct or indirect taxes to cool down aggregate demand.
- **Supply-Side Interventions:** Releasing buffer stocks, restricting exports, or subsidizing essential commodities (food, fuel) to stabilize immediate price shocks.

3.11. INDIA'S EXPORTS HIT RECORD HIGH

Context:

- **Recently**, official data from the Ministry of Commerce and Industry revealed that India's merchandise exports reached a record high of \$45.2 billion in May 2026. However, the overall trade deficit widened to \$10.5 billion due to a sharper growth in the import of both goods and services.



1. Core Concepts

- **Balance of Trade (BoT):** The net difference between the value of a country's exports and imports of visible merchandise over a specific timeline.
- **Merchandise vs. Services Trade:** Merchandise trade involves tangible goods (e.g., engineering items, electronics). Services trade (invisibles) involves intangible sectors like software, tourism, and financial services.
- **Trade Deficit:** An economic condition where the total monetary value of imports exceeds the total value of exports.
- **Current Account Deficit (CAD):** A broader metric comprising the net trade in goods and services, net factor income, and net transfer payments (remittances).

2. Institutional Framework

- **Data Release:** The trade data is compiled and released on a monthly basis by the Department of Commerce under the **Ministry of Commerce and Industry**.
- **Statistical Agency:** The **Directorate General of Commercial Intelligence and Statistics (DGCI&S)**, based in Kolkata, acts as the premier government agency for tracking and processing foreign trade statistics.

3. Key Trade Basket Trends

- **Top Merchandise Exports:** Engineering goods (typically the largest segment), petroleum products, gems and jewellery, electronic goods, and organic/inorganic chemicals.
- **Top Merchandise Imports:** Crude petroleum/oil (the primary driver of India's import bill), electronic goods, gold, machinery, and coal.
- **Structural Dynamic:** India consistently runs a structural deficit in merchandise trade, which is partially mitigated by a structural surplus in services exports.

4. Macroeconomic Implications

- **Currency Depreciation:** A widening trade deficit increases demand for foreign currency (like the US Dollar), putting downward pressure on the value of the Indian Rupee (INR).
- **CAD Expansion:** A widening merchandise deficit directly strains the Current Account Balance, requiring higher capital inflows (FDI/FPI) to maintain macroeconomic stability.

3.12. INDIA ACHIEVES RECORD DEFENCE PRODUCTION OF ₹1.78 LAKH CRORE (FY 2025–26)

Context:

- **Recently,** the **Ministry of Defence (MoD)** announced that **India's annual defence production reached an all-time high of ₹1.78 lakh crore in FY 2025–26**, registering a **15.6% increase** over the previous financial year.
- The milestone reflects the success of the Government's **Aatmanirbhar Bharat** initiative, defence indigenisation policies, and growing participation of the private sector in defence manufacturing.



Key Highlights

I. Defence Production

- **Record Production:** ₹1.78 lakh crore in **FY 2025–26**.
- **Growth:** **15.6%** over FY 2024–25.
- **Production has more than doubled** since FY 2013–14 (₹43,746 crore).

II. Contribution

- **Defence Public Sector Undertakings (DPSUs):** ~**76%** of total production.
- **Private Sector:** ~**24%** of total production, with increasing participation in indigenous manufacturing.

Government Initiatives Driving Defence Indigenisation

I. Aatmanirbhar Bharat in Defence

- Promotes **indigenous design, development, and manufacturing** of defence equipment.
- Reduces dependence on imports and strengthens strategic autonomy.

II. Defence Acquisition Procedure (DAP), 2020

- Gives preference to **Buy (Indian-IDD)** (Indigenously Designed, Developed and Manufactured).
- Encourages procurement from domestic industries.

III. Positive Indigenisation Lists

- Ministry of Defence has notified multiple **Positive Indigenisation Lists** banning the import of specified defence items within stipulated timelines.
- Separate lists have also been issued by **DPSUs** for indigenous procurement of components and sub-systems.

IV. Innovations for Defence Excellence (iDEX)

- Launched in **2018**.
- Supports **start-ups, MSMEs, innovators, and academia** in developing indigenous defence technologies.

V. SRIJAN Portal

- Online portal launched by the Ministry of Defence.
- Facilitates **indigenisation of imported defence items** by connecting DPSUs, armed forces, and domestic industries.

VI. Defence Industrial Corridors

- **Uttar Pradesh Defence Industrial Corridor.**
- **Tamil Nadu Defence Industrial Corridor.**
- Aim to develop defence manufacturing clusters and attract investment.

VII. FDI in Defence Sector

- Foreign Direct Investment (FDI) limit in defence sector was enhanced in 2020 up to 74% through the Automatic Route for companies seeking new defence industrial license, and up to 100% through the Government Route wherever it is likely to result in access to modern technology

Defence Exports (Important for Prelims)

- India has witnessed a **record increase in defence exports** in recent years.
- Major export destinations include **Armenia, the Philippines, the United States, France, and several countries in Southeast Asia and Africa.**
- **Key exported items include:**
 - BrahMos missile components
 - Dornier aircraft
 - Offshore patrol vessels
 - Artillery systems
 - Radars
 - Bulletproof jackets
 - Ammunition

- Electronic warfare systems

Major Indigenous Defence Platforms

- **LCA Tejas** – Indigenous light combat aircraft.
- **Arjun Main Battle Tank.**
- **Akash Surface-to-Air Missile.**
- **Pinaka Multi-Barrel Rocket Launcher.**
- **Advanced Towed Artillery Gun System (ATAGS).**
- **Dhanush Artillery Gun.**
- **Light Combat Helicopter (Prachand).**
- **Light Utility Helicopter (LUH).**
- **INS Vikrant** – India's first indigenously built aircraft carrier.

3.13. WORLD BANK APPROVES \$1.5 BILLION SUPPORT FOR INDIA'S REFORM PLAN

Context:

- **Recently, the World Bank approved US\$1.5 billion for India under its Development Policy Financing (DPF) programme. The financial assistance aims to support structural reforms that promote private sector-led job creation, economic growth, tax simplification, trade integration, and improvements in the business environment.**
- According to the World Bank, these reforms could create employment opportunities for nearly **11 million young people entering India's labour market annually over the next two decades.**



Development Policy Financing (DPF)

- Development Policy Financing (DPF) is a **policy-based lending instrument** of the World Bank that provides **quick-disbursing financial assistance** directly to a country's government.
- Unlike project loans, DPF does not finance a specific infrastructure project; instead, it supports governments undertaking **policy and institutional reforms**. The funds are released after agreed reform measures have been implemented.
- **Key Features**
 - Budget support to governments.
 - Linked with policy reforms.
 - Quick-disbursing financial assistance.
 - Promotes macroeconomic and structural reforms.

About the World Bank: Important Facts

- The **World Bank** was established in **1944** at the **Bretton Woods Conference** and began operations in **1946**.

- Its headquarters is located in **Washington, D.C., USA**.
- The institution works to reduce poverty and promote sustainable economic development by providing financial and technical assistance to developing countries.
- Only countries that are members of the **International Monetary Fund (IMF)** can become members of the World Bank.

World Bank Group

The World Bank Group consists of **five institutions**, each performing a distinct role in development financing.

Institution	Full Form	Main Function
IBRD	International Bank for Reconstruction and Development	Loans to middle-income and creditworthy low-income countries
IDA	International Development Association	Concessional loans and grants to the poorest countries
IFC	International Finance Corporation	Supports private sector investment
MIGA	Multilateral Investment Guarantee Agency	Political risk insurance for investors
ICSID	International Centre for Settlement of Investment Disputes	Resolves investment disputes. India is not a member of the ICSID.

India and the World Bank

- India is a **founding member** of the World Bank and has remained one of its largest borrowers.
- World Bank assistance extends across sectors such as **infrastructure, agriculture, health, education, urban development, renewable energy, climate resilience, and governance reforms**.
- The recent DPF operation reflects the Bank's increasing focus on supporting **policy reforms** alongside development financing.

Difference Between World Bank and IMF

- Although both institutions emerged from the Bretton Woods Conference, their objectives differ.
- The **World Bank** primarily finances **long-term development projects and structural reforms**, whereas the **IMF** focuses on **macroeconomic stability, exchange rate management, and balance of payments support**.

3.14. REGIONAL CONNECTIVITY SCHEME (RCS) - UDAN

Context:

- **Recently**, scheduled commercial flight operations commenced from the captive airport at Mundra under the **Regional Connectivity Scheme (RCS)**, connecting it to four domestic destinations to enhance affordable regional transit.



Structural Framework of UDAN

- **Nodal Ministry:** Administered by the Ministry of Civil Aviation under the National Civil Aviation Policy.
- **Implementing Agency:** Executed by the Airports Authority of India (AAI).
- **Nature & Tenure:** A Central Sector Scheme with an operational tenure of 10 years.
- **Target Segments:** Focuses on reviving unserved aerodromes (no commercial flights) and underserved aerodromes (less than one commercial flight daily).

Financial Mechanism & Incentives

- **Seat Capping:** Operators must reserve a minimum of 50% of aircraft capacity for subsidized, distance-capped fares.
- **Viability Gap Funding (VGF):** Provided to offset losses; shared between the Center and States in an 80:20 ratio (90:10 for North-Eastern states, hilly regions, and Union Territories).
- **VGF Resource Mobilization:** Financed through a standard levy imposed per flight on major, lucrative trunk routes.
- **Fiscal Concessions:** Central excise duty on Aviation Turbine Fuel (ATF) is capped at 2% at RCS airports; States lower VAT/GST on ATF to 1% or less for 10 years.
- **Operational Exemptions:** Complete waiver on landing, parking, and terminal navigation landing charges for participating airlines.

Phased Evolution

- **UDAN 1.0 to 4.0:** Progressed from initial route revival to incorporating helipads (2.0), seaplanes and tourism loops (3.0), and prioritizing island and North-Eastern territorial connectivity (4.0).
- **UDAN 5.0 Core:** Dismantled the previous 500 km stage-length cap and focused heavily on category-2 and category-3 aircraft.
- **Krishi UDAN:** Specialized cargo-centric iteration designed to optimize agricultural logistics for perishable goods from tribal, hilly, and North-Eastern districts.

3.15. RBI TWEAKS PROCESS TO ONBOARD MSMES ON TReDS PLATFORM

Context:

- The Reserve Bank of India (RBI) has revised the onboarding norms for Micro, Small and Medium Enterprises (MSMEs) on the Trade Receivables Discounting System (TReDS) platform. The objective is to simplify access to invoice financing and improve liquidity for MSMEs.



Key RBI Changes

- **Relaxation in Net Worth Requirement:** MSMEs will now need a minimum net worth of ₹25 crore only if they use TReDS through a statutory auditor for accounting services.
- **Compliance Deadline:** 31 March 2028; Existing service providers have been given time until 31 March 2028 to comply with the revised net worth norms.
- **Objective:** To make invoice financing easier and address operational issues faced by MSMEs while converting receivables into cash.

What is TReDS?

- **Definition:** It is an institutional mechanism set up by the RBI to facilitate the financing/discounting of trade receivables of MSMEs from multiple financiers (including banks and non-banking financial companies).
- **Working Mechanism:** It operates as an **online electronic platform** where small businesses can auction their invoices or trade receivables to unlock stuck working capital.
- **Significance:** It addresses the critical issue of delayed payments and cash flow crunches faced by MSMEs when converting trade receivables into liquid cash

Why is TReDS Important?

- MSMEs often face delayed payments from large buyers.
- TReDS allows them to receive funds before the invoice due date.
- It reduces dependence on traditional bank loans.
- It improves cash flow and working capital management.

What is an MSME?

- An enterprise engaged in manufacturing, processing, or services and classified based on investment in plant & machinery/equipment and annual turnover.

Current MSME Classification (Revised Criteria)

Here is the data from the image structured into a clean, markdown table format for your notes:

ENTERPRISE CATEGORY	PAST INVESTMENT LIMIT	REVISED INVESTMENT LIMIT	PAST TURNOVER LIMIT	REVISED TURNOVER LIMIT
MICRO ENTERPRISE	₹1 crore	₹2.5 crore	₹5 crore	₹10 crore
SMALL ENTERPRISE	₹10 crore	₹25 crore	₹50 crore	₹100 crore
MEDIUM ENTERPRISE	₹50 crore	₹125 crore	₹250 crore	₹500 crore

(Latest enhanced classification announced by the Government of India in Union Budget 2025-26.)

Important Facts on MSMEs

- MSMEs contribute significantly to GDP, exports, and employment.
- They are regulated under the Micro, Small and Medium Enterprises Development (MSMED) Act, 2006.
- The Ministry of MSME is the nodal ministry.
- Udyam Registration is the official registration mechanism for MSMEs.
- Classification is based on both investment and turnover criteria.

3.16. DECODING THE INDEX OF SERVICES PRODUCTION (ISP)

Context:

- The Ministry of Statistics and Programme Implementation (MoSPI) has finalized the framework for India's first-ever Index of Services Production (ISP). Designed as the services-sector equivalent to the Index of Industrial Production (IIP), it will shift the measurement of services growth from survey-based sentiment (PMI) to actual statistical output.



About Index of Services Production (ISP)

Parameter	Key Details
Nodal Agency	National Statistical Office (NSO) under MoSPI
Base Year	2024-25
Release Frequency	Monthly (with a 60-day lag, released on the 29th of every month)
First Release	Scheduled for July 14, 2026 (for the month of April 2026)
Committee	Technical Advisory Committee (TAC) headed by Debjani Ghosh (NITI Aayog)
Target Sector	Over 40 service sub-sectors (Banking, Real Estate, Transport, etc.)

Core Methodology & Data Sources

Unlike the Purchasing Managers' Index (PMI), which relies on business sentiment surveys, the ISP is an **output-based measure** utilizing hard statistical data.

- Primary Data Source:** The **GST Network (GSTN)** will serve as the primary source to measure production and outward supplies in formal service activities in real-time.
- Supplementary Data:** Sector-specific administrative data from government ministries and regulatory authorities.
- Survey Data:** MoSPI's Annual Survey of Incorporated Services Sector Enterprises (ASISSE) will provide enterprise-level structural data.

Inflation Adjustment (Deflators)

To convert nominal output data into real output, the data must be adjusted for inflation.

- Interim Proxy:** MoSPI will temporarily use the **Non-food Consumer Price Index (CPI)** and sub-sector specific CPI indices.
- Long-term Plan:** The Department for Promotion of Industry and Internal Trade (DPIIT) is developing a comprehensive **Producer Price Index (PPI)** to eventually replace these proxy deflators.

Sectors Excluded from ISP

- **Informal Sector:** Initially excluded due to severe data constraints, missing nearly 33% of total services Gross Value Added (GVA).
- **GST-Exempt Sectors:** Sectors that fall outside the GST net, primarily **Health and Education** (contributing ~10% of services GVA), cannot be fully captured through the primary GSTN data.

About Industrial Production (IIP)?

The IIP is a volume-based macroeconomic indicator that measures short-term changes in the physical production of a basket of industrial goods. Like the ISP, it is compiled and published monthly by the NSO under MoSPI.

Comparison: ISP vs. IIP

	Index of Services Production (ISP)	Index of Industrial Production (IIP)
Base Year	2024-25	2022-23
Sectors Covered	Services (Banking, Trade, IT, Transport, Real Estate, etc.)	Industrial (Manufacturing, Mining, Electricity)
Indicator Type	Output-based metric of service activity	Volume-based metric of physical goods production
Primary Data Source	Digital and administrative records (heavily reliant on GSTN)	Physical quantities produced by factories and establishments

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UPSC PRELIMS PRACTICE QUESTIONS

Q. Consider the following statements regarding the external sector of India:

Statement I: Personal remittances received from the Indian diaspora overseas are recorded under the Capital Account of the Balance of Payments framework.

Statement II: Remittances into India function as unrequited unilateral transfers that do not create future debt or repayment liabilities for the country.

Which one of the following is correct in respect of the above statements?

- (a) Both Statement I and Statement II are correct and Statement II is the correct explanation for Statement I
- (b) Both Statement I and Statement II are correct and Statement II is not the correct explanation for Statement I
- (c) Statement I is correct but Statement II is incorrect
- (d) Statement I is incorrect but Statement II is correct

Ans. (d)

Explanation:

- **STATEMENT I IS INCORRECT:** Personal remittances are systematically classified under the **Current Account** (specifically under the Net Secondary Income surplus) because they represent current unilateral income transfers rather than changes in the asset or liability positions of the nation.
- **STATEMENT II IS CORRECT:** Remittances are explicitly classified as unrequited unilateral transfers (they are transfers and not claims). They represent one-way financial flows sent home by workers without any concurrent entry of corresponding economic balances or goods, meaning they create zero future debt obligations or repayment liabilities for India.

Q. With reference to the Purchasing Managers' Index (PMI), consider the following statements:

1. It is a survey-based economic indicator.
2. It measures month-on-month changes in business conditions.
3. It is compiled by the National Statistical Office (NSO).

Which of the statements given above are correct?

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

Ans. (a)

Explanation:

Statement 1 is correct: PMI is a **survey-based economic indicator** that assesses business activity and economic conditions.

Statement 2 is correct: It tracks **month-on-month changes** in business conditions such as output, new orders, employment, and prices.

Statement 3 is incorrect: In India, PMI is compiled by **S&P Global (sponsored by HSBC)**, not by the **National Statistical Office (NSO)**. NSO compiles the **Index of Industrial Production (IIP)**.

Q. With respect to the transition from the Wholesale Price Index (WPI) to the Producer Price Index (PPI), consider the following statements:

- I. The Wholesale Price Index completely excludes the services sector, whereas the newly introduced Producer Price Index integrates it.
- II. The Producer Price Index measures the basic prices received by producers by including trade margins and transport costs.

Which of the statements given above is/are correct?

- (a) I only
- (b) II only
- (c) Both I and II
- (d) Neither I nor II

Ans. (a)

Explanation:

Statement I is Correct: The **Wholesale Price Index (WPI)** primarily tracks price changes in goods and **does not cover the services sector**. The proposed **Producer Price Index (PPI)** is intended to provide broader coverage and include **services alongside goods**, making it a more comprehensive measure of producer-level inflation.

Statement II is Incorrect: The **Producer Price Index (PPI)** measures the **basic prices received by producers**. These prices **exclude trade margins, transport costs, and product taxes**, as they are not part of the amount retained by the producer.

Q. Consider the following statements regarding the ATF Price Stabilisation Fund:

- 1. It provides interest-free financial support to Oil Marketing Companies (OMCs).
- 2. The scheme is applicable only to domestic airline operations.

- 3. The support amount will be recovered when international ATF prices moderate.

Which of the statements given above are correct?

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

Ans. (c)

Explanation:

Statement 1 is Correct: The ATF Price Stabilisation Fund provides **interest-free financial support to Oil Marketing Companies (OMCs)**.

Statement 2 is Incorrect: The scheme covers **both domestic and international operations** of scheduled Indian airlines, not just domestic flights.

Statement 3 is Correct: When international ATF prices decline, the support amount will be **recovered from OMCs and returned to the Consolidated Fund of India**.



Scan to attempt more questions

4.1. WEBB TELESCOPE CAPTURES WEATHER ON EXOPLANET

Context:

- **Recently**, a landmark study published in the journal *Science*, used **NASA's James Webb Space Telescope (JWST)** to observe **daily cloud cycles and changing weather patterns** on the exoplanet **WASP-43b** for the first time. The discovery provides a more accurate understanding of exoplanet atmospheres and helps scientists improve estimates of their chemical composition.



1. What is WASP-43b?

- A **Hot Jupiter** exoplanet located about **280 light-years** from Earth.
- Similar in size to Jupiter but much closer to its parent star.
- Completes one orbit in approximately **19 hours** (less than one Earth day).
- **Tidally locked**: one side permanently faces the star while the other remains in darkness.

2. Atmospheric Conditions

- Day-side temperatures are high enough to **melt rocks**.
- Night-side temperatures are significantly cooler.
- Presence of **water vapour** and **cloud formations** detected.
- Experiences extreme weather patterns due to temperature differences.

3. Significance of the Research

- Helps scientists understand how **planetary systems formed from protoplanetary disks** of gas and dust.
- Atmospheric composition reveals a planet's **formation history and original location** in the disk.
- Enables comparison between the formation of **Hot Jupiters** and smaller rocky planets like Earth.
- Provides insights into the early evolution of our **Solar System about 4.6 billion years ago**.
- Improves understanding of the processes that shape **diverse planetary architectures** across the universe.

4. About James Webb Space Telescope (JWST)

- Launched by NASA in 2021.
- Joint project of NASA, European Space Agency and Canadian Space Agency.
- Studies the universe primarily in the **infrared spectrum**.
- Successor to the Hubble Space Telescope.

5. Future Instruments

- **Extremely Large Telescope (ELT):** Currently being constructed by Europe in **northern Chile**. Once operational, its main objective will be to discover and analyze "exoplanet nurseries" around distant stars, dramatically increasing the chances of finding extra-solar, Earth-like rocky planets.

4.2. SUMMER AIR POLLUTION IN INDIAN CITIES & MITIGATION MECHANISMS

Context:

- While air pollution in India is heavily associated with winter, data from 2026 highlights an alarming rise in **summer air pollution** across major Indian metros (Delhi, Mumbai, Bengaluru, Chennai, Hyderabad, and Kolkata).
- The Commission for Air Quality Management (CAQM) revoked winter curbs under the **Graded Response Action Plan (GRAP)** but had to re-impose Stage 1 of GRAP as temperatures soared to combat summer air pollution driven by heatwaves.



1. Key Differences: Winter vs. Summer Air Pollution

Feature	Winter Air Pollution	Summer Air Pollution
Primary Pollutants	Fine particulate matter pm 2.5 dominates.	Coarser particulate matter pm 10 and Ground-level Ozone dominate.
Meteorological Factors	Low temperatures, low wind speeds, and inversion layers trap pollutants close to the ground (especially in the Indo-Gangetic plain's basin-like topography).	High temperatures, intense sunlight, heatwaves, and strong convective winds (dust storms).
Additional Sources	Biomass burning for heating, agricultural residue burning (stubby burning).	Dust storms (Andhi/Loo) , road dust resuspension, and secondary chemical reactions accelerated by intense solar radiation.

2. Pollutant Dynamics

A. Ground-Level Ozone (O3) — A Secondary Pollutant

- **Mechanism of Formation:** Ozone is **not emitted directly** into the atmosphere from tailpipes or chimneys.
- It is a **secondary pollutant** formed through photochemical reactions between primary precursor gases under the influence of strong sunlight and high temperatures:
- **Precursor Sources:** Vehicle exhaust, industrial emissions, paints, solvents, and fuel combustion.
- It forms when **nitrogen oxides (NOx) and volatile organic compounds (VOCs)** react in the presence of **strong sunlight**.
- **Health Impact:** Severe respiratory illnesses.

- **National Ambient Air Quality Standard (NAAQS):** The hourly ozone safety standard is **180 $\mu\text{g}/\text{m}^3$** .

B. Summer PM 10 Spikes & Meteorological Drivers

- **Low-Pressure Dynamics:** Hot conditions over the Indian subcontinent create a local low-pressure area. Its interaction with surrounding high-pressure areas produces hot, windy conditions.
- **Loo:** Strong, hot, and dry summer winds blowing from West Asia and the Thar Desert across North India, carrying massive amounts of dust.
- **Andhi:** Localized, short-duration dust storms associated with thunderstorms that lift loose soil high into the atmosphere.
- **The Summer Standard:** The 24-hour NAAQS threshold for PM 10 is **100 $\mu\text{g}/\text{m}^3$** . During peak summer days, cities frequently breach this threshold due to dust storms and active construction.

3. Key Institutional Frameworks & Technology Initiatives

- **CAQM (Commission for Air Quality Management):** A statutory body responsible for air quality management in the National Capital Region (NCR) and adjoining areas.
- **GRAP (Graded Response Action Plan):** A set of layered emergency measures implemented depending on the severity of air pollution. Traditionally a winter mechanism, parts of it are now deployed during summer heatwaves.
- **AQEWS (Air Quality Early Warning System):**
 - Originally created in 2018 to predict severe dust storms and winter smog episodes in Delhi; it now **runs year-round**.
 - It has expanded its footprint to other major cities like **Jaipur and Mumbai**.
 - Provides multi-pollutant forecasts several days in advance and a 3-day Air Quality Index (AQI) forecast for **140 Indian cities**.
- **AQDSS (Air Quality Decision Support System):** Developed by the Brihanmumbai Municipal Corporation (BMC) in collaboration with the *Council on Energy, Environment and Water (CEEW)* to monitor construction sites and track heavy-vehicle movement to lower localized particulate matter.

4.3. FIRST EVER SIGHTING OF YELLOW-THROATED MARTEN IN KAZIRANGA NATIONAL PARK

Context:

- **Recently**, during routine camera-trapping conducted by the Kaziranga Tiger Cell, a yellow-throated marten (*Martes flavigula*) was photographed for the first time in the semi-evergreen forest patches of the Kaziranga National Park and Tiger Reserve, Assam.



About the Yellow-Throated Marten

- **Taxonomy & Family:** It belongs to the **Mustelidae** family (popularly known as the weasel family), which also includes **otters, badgers, and wolverines**.
- **Physical Characteristics:** It is a medium-sized **carnivore**, unique for its striking bright golden-orange fur across its throat and upper chest, contrasting with a darker head, lower back, and long bushy tail. It is known for a highly aggressive and fearless temperament.
- **Ecological Status:** It is a **mesopredator** (a mid-ranking predator in the food web, sitting below apex predators like tigers).
- **Behavior:** It is a primarily **diurnal** (active during the day) and highly proficient **arboreal** (tree-climbing) animal.
- **Ecological Role:** While it is an omnivorous hunter feeding on rodents, birds, insects, and small ungulates, it also consumes a large volume of fruits, berries, and nectar, making it an essential **seed disperser** for natural forest regeneration.
- **Geographical Distribution:** Native to the Himalayas, Northeast India, East Asia, and Southeast Asia. The Kaziranga sighting confirms its local presence within known regional distribution limits.

Legal & Conservation Status

- **IUCN Red List:** Least Concern (LC) due to its wide distribution and relatively stable global populations.
- **Wildlife Protection Act (WPA), 1972:** Protected under **Schedule II**.

Comparison: Marten Species in India

Species	Primary Habitat Range	Key Distinction
Yellow-throated Marten	Himalayas & Northeast India	Bright golden throat; highly adaptable to semi-evergreen and temperate forests.
Nilgiri Marten	Western Ghats (Endemic)	Endemic to Southern India; dark brown coat with a distinct lemon-yellow throat patch; Vulnerable on IUCN Red List.
Stone Marten / Beech Marten	Higher altitudes of Himalayas	White throat patch; prefers rocky landscapes and open alpine fields.

Key Geography & Facts about Kaziranga National Park

- **Status:** Declared a National Park in 1974, a **UNESCO World Heritage Site** in 1985, and a Tiger Reserve in 2006.
- **Location:** Spread across the **Golaghat and Nagaon districts** of Assam.
- **Rivers:** The River Difalu, a tributary of the Brahmaputra, flows through the National Park while another tributary, Moradifalu, flows along its southern boundary.
- **Key Species:** It hosts the world's largest population of the **Great Indian One-Horned Rhinoceros**. It is also famous for the "Big Five" of Kaziranga: Rhinoceros, Tiger, Asian Elephant, Asiatic Wild Water Buffalo, and Swamp Deer.

4.4. MANGROVES

Context:

- Recently, expert highlighted that natural mangrove buffers protect coastal communities more effectively and economically than engineered structures. Despite mangroves protecting more people per hectare in India than in almost any other country, public spending heavily favors grey infrastructure (such as concrete seawalls) over ecological missions. Experts are urging a policy shift toward Ecosystem-based Adaptation (EbA) to embed these natural shields into core coastal planning.



Core Ecological Concepts of Mangroves

Mangroves are highly specialized, salt-tolerant (halophytic) intertidal plant communities that occupy the **ecotone** between terrestrial and marine environments.

1. Specialized Adaptations

- Pneumatophores (Respiratory Roots):** Vertical root extensions covered with **lenticels** (pores) that grow upward to breach water surfaces, allowing atmospheric oxygen intake in anaerobic, waterlogged mudflats.
- Stilt and Prop Roots:** Adventitious root networks branching from the lower trunk to firmly anchor the flora in unstable, shifting substrates against powerful wave impacts and tidal surges.
- Vivipary Reproduction:** An evolutionary adaptation where seeds germinate while still attached to the parent tree, developing into mature **propagules** before dropping, which prevents seeds from rotting or suffocating in tidal muds.
- Salt Regulation Mechanisms:** Species either filter out bulk salt at the root level via ultrafiltration (*Rhizophora*) or channel and excrete absorbed salt through specialized secretory glands located on their leaves (*Avicennia*).

2. Geographic Distribution in India

Coastline	Major Sites	Key Ecological Features
East Coast <i>(Largest Share)</i>	Sundarbans (WB), Bhitarkanika (Odisha), Pichavaram (TN), Coringa (AP).	Supported by massive river deltas providing rich sediment and heavy freshwater influx. The Sundarbans acts as a primary buffer against Bay of Bengal cyclones.
West Coast <i>(Highly Fragmented)</i>	Gulf of Kutch (Gujarat), Thane Creek (MH), Mandovi-Zuari (Goa).	Characterized by steep rocky coasts and lower silt loads. Gujarat holds the second-largest mangrove area in the country.
Islands	Andaman & Nicobar Islands.	Pristine, deep fringing mangrove formations that transition directly into coral reef systems.

Strategic Value & Conservation Frameworks

1. Ecosystem-based Adaptation (EbA) vs. Grey Infrastructure

- The Adaptation Asset:** Research identifies India as a global "hotspot" for coastal EbA, with mangroves protecting more individuals per hectare than almost any other country. They act

as superior natural buffers compared to hard structures like seawalls, which are expensive to maintain and often transfer erosion risks to adjacent coastal stretches.

- **Blue Carbon & Co-benefits:** Mangroves sequester up to four times more carbon than terrestrial tropical rainforests. Ground-level projects in the Sundarbans have restored over 4,600 hectares, creating tangible socio-economic co-benefits by protecting local livelihoods through crab farming and honey collection.

2. Policy Bottlenecks and Governance

- **Terminology Confusion:** The policy space suffers from overlapping labels like Nature-based Solutions (NbS), Ecosystem-based Disaster Risk Reduction (Eco-DRR), and Coastal Adaptation (EhCA). This lacks a clear classification system, meaning interventions are often hidden within generic developmental programs rather than tracked as distinct climate adaptations.
- **The MISHTI Scheme:** The Mangrove Initiative for Shoreline Habitats & Tangible Incomes (MISHTI) aims to restore 540 square kilometers across nine States. However, it is primarily framed as a standalone restoration scheme rather than a core component embedded within integrated coastal planning and adaptation policies.
- **Legal Protections:** Mangroves are legally shielded under the **Coastal Regulation Zone (CRZ-I)** classification of the Environment (Protection) Act, 1986, which heavily restricts industrial and commercial construction in these eco-sensitive areas.

4.5. THE ECOLOGICAL REVIVAL OF MANAS: ASSAM'S FIRST GRASS NURSERY INITIATIVE

Context:

- Assam's Manas National Park recently established its first grass nursery, financially backed by the State Compensatory Afforestation Fund Management and Planning Authority (CAMPA). This initiative aims to ecologically restore the park, which has lost over 60% of its critical grasslands over the past 35 years.



About Grass Nursery Initiative

- **Objective:** To restore the damaged grassland ecosystem for animals that depend on it.
- **Implementing Agency:** Executed by the Assam Environment and Forest Department and Manas Park Authorities.
- **Funding:** Financially supported by the State CAMPA (Compensatory Afforestation Fund Management and Planning Authority).

Geographical and Hydrological Profile

- **Location:** Geographically anchored at the foothills of the Eastern Himalayas in Western Assam.
- **Transboundary Link:** Shares a contiguous northern border with Bhutan's Royal Manas National Park.
- **River System:** The **Manas River** flows directly through the park, sustaining its ecosystem.
- **Topography:** Forms a crucial ecological junction between the Sub-Himalayan Bhabar Terai and Himalayan subtropical broadleaf forests.

Institutional Conservation Status

- **Multiple Designations:** It uniquely holds six concurrent tags: National Park, the core zone of a Tiger Reserve, the core zone of an Elephant Reserve, a national Biosphere Reserve, an Important Bird Area (IBA), and a **UNESCO Natural World Heritage Site** (designated in 1985).

Flora and Fauna (Biodiversity)

- **Rare & Endemic Fauna:** Serves as a vital refuge for highly endangered species including the **pygmy hog, hispid hare, golden langur**, red panda, wild buffalo, and the Gangetic dolphin.
- **Avian Species:** Home to globally threatened birds like the **Bengal florican** and various species of hornbills.
- **Vegetation:** Contains four major vegetation types, with the **Hoolong** tree being the dominant plant species across its alluvial grasslands and deciduous forests.

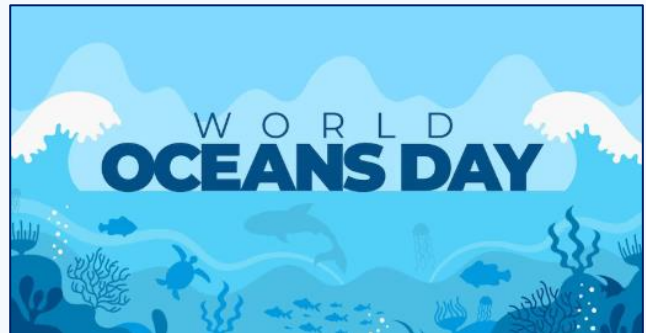
Socio-Cultural Link

- **Indigenous Inhabitants:** The **Bodo** tribe is the primary indigenous community living in and around the park's boundaries.

4.6. WORLD OCEANS DAY 2026

Context:

- **Recently, World Oceans Day was celebrated on June 8, 2026.** The official theme for World Oceans Day 2026 is **“Reimagine: Beyond the World We Know, a New Relationship with Our Ocean,”** with the action theme focused on **“Strong Marine Protected Areas for Our Blue Planet.”**
- This year's observance holds massive geopolitical and environmental significance because it marks a critical transition period following the historic ratification of the **BBNJ Agreement (Biodiversity Beyond National Jurisdiction)**, also known as the **High Seas Treaty**.



1. About the History of World Oceans Day

- **Origin:** The concept was first proposed by Canada at the Earth Summit in Rio de Janeiro in **1992**.
- **UN Recognition:** The UN General Assembly officially designated it through a resolution in **2008**, and the first official UN celebration took place on June 8, 2009.
- **Nodal Agency:** It is coordinated by the **Division for Ocean Affairs and the Law of the Sea (DOALOS)** under the Office of Legal Affairs of the UN.

2. Exam-Oriented Key Facts

- **The Carbon Sink:** The ocean holds **60 times more carbon** than the atmosphere and absorbs almost **30% of carbon dioxide (CO₂)** emissions from human activities.
- **Oxygen Production:** Marine organisms—primarily **phytoplankton, kelp, and algal plankton**—produce at least **50% of the world's oxygen** through photosynthesis.

- **The Triple Planetary Crisis:** Oceans are the primary victims of climate change,
- Witnessing **Ocean Acidification** (driven by excess CO₂ absorption lowering pH), **Marine Heatwaves** (causing catastrophic coral bleaching), and **Deoxygenation** (creating hypoxic "dead zones").

3. Major International Conservation Agreements

Treaty / Framework	Core Mandates
UNCLOS (1982)	Known as the "Constitution of the Seas." It divides marine areas into 5 zones: Internal Waters, Territorial Sea (12 nautical miles), Contiguous Zone (24 nm), Exclusive Economic Zone (200 nm), and the High Seas.
BBNJ / High Seas Treaty	An international agreement under UNCLOS. It sets up a legal framework to establish Marine Protected Areas (MPAs) in the High Seas (which cover nearly half the planet's surface but were previously largely unregulated).
The 30x30 Target	Part of the Kunming-Montreal Global Biodiversity Framework (GBF) under the CBD. It aims to designate 30% of the world's land and ocean as protected areas by the year 2030.
International Maritime Organization (IMO) Conventions	Regulate marine pollution from ships through treaties such as MARPOL and the Ballast Water Management Convention.
UNESCO Intergovernmental Oceanographic Commission (IOC) Initiatives	Promotes international cooperation in ocean research, monitoring, and sustainable ocean management.
SDG 14: Life Below Water	Explicitly targets the conservation and sustainable use of oceans, seas, and marine resources.

4.7. THE ZOJILA TUNNEL AND BORDER PREPAREDNESS

Context:

- **Recently**, the strategically important Zojila Tunnel achieved its final excavation breakthrough. Built by Megha Engineering and Infrastructures Ltd., this major milestone brings India closer to establishing an all-weather road link to the border regions, ensuring year-round connectivity between Kashmir and Ladakh.



1. About the Zojila Tunnel

- **Geographic Alignment:** The tunnel spans **13.14 km** (main tunnel length is approx. 13.15 km) under the treacherous **Zoji La Pass** on National Highway 1 (NH-1). It directly connects the **Ganderbal district (Sonamarg/Baltal) of Kashmir** with the **Dras/Kargil district (Minimarg) of Ladakh**.

- **Key Dimensions:** It is a **horseshoe-shaped, single-tube, two-lane bi-directional road tunnel** constructed at an extreme altitude of approximately **11,578 feet** above sea level. This makes it one of the longest high-altitude, single-tube bi-directional road tunnels globally.
- **Engineering Standard:** Built using the **New Austrian Tunnelling Method (NATM)** to successfully mitigate the challenges of volatile seismic activity (**Seismic Zone IV**) and unstable, fragile Himalayan rock formations.
- **Core Significance:**
 - **All-Weather Connectivity:** Historically, the Zoji La Pass remains completely choked by heavy snowfall and avalanches for 3 to 6 months in winter, severing Ladakh's land link with the rest of India. The tunnel eliminates this seasonal isolation.
 - **Drastic Time Reduction:** It slashes the treacherous commute time across the pass from **3 hours down to just 15–20 minutes**.

2. Strategic Implication: The Line of Actual Control (LAC)

The Line of Actual Control (LAC) is the effective, non-demarcated border that separates Indian-controlled territory from Chinese-controlled territory (primarily across Ladakh, Uttarakhand, Himachal Pradesh, Sikkim, and Arunachal Pradesh).

- **Year-Round Logistics:** Eliminates the need for massive winter stockpiling of rations, fuel, and ammunition in Ladakh.
- **Rapid Military Deployment:** Ensures all-weather movement of troops, tanks, heavy equipment, and supplies to forward areas along the LAC.
- **Enhanced National Security:** Strengthens India's preparedness against threats from both Pakistan and China by maintaining uninterrupted military mobility.

3. Other Strategic Tunnels and Passes in the Region

To secure border logistics, India has created a vast web of high-altitude bypass networks:

Infrastructure	State / UT
Z-Morh Tunnel	Jammu & Kashmir
Atal Tunnel	Himachal Pradesh
Sela Tunnel	Arunachal Pradesh
Dr. Syama Prasad Mookerjee Tunnel	Jammu & Kashmir
Banihal-Qazigund Road Tunnel	Jammu & Kashmir

4.8. PARAQUAT TOXICITY AND REGULATORY FRAMEWORK

Context:

- **Recently,** Telangana became the 3rd Indian state (after Kerala & Odisha) to ban paraquat — on March 31, 2026 via a 60-day state-wide ban.
- Telangana Legislative Assembly passed a unanimous resolution (March 30, 2026) urging the Central govt to impose a permanent nationwide ban.



Paraquat — What Is It?

- **Chemical name:** N,N'-dimethyl-4,4'-bipyridinium dichloride (Paraquat Dichloride 24% SL)
- **Type:** Contact herbicide — world's most widely used non-selective weed killer
- **Use in India:** Widely used to kill weeds in paddy, tea, cotton, and plantation crops
- **Status in India:** Registered as 'deemed to be registered' under Insecticides Act, 1968 — never underwent mandatory safety evaluation
- **Global status:** Banned in 78 countries including EU, UK, Switzerland, South Korea, Vietnam, USA

Health Hazards — Key Facts

- **Lethality:** Kills 72.7–100% of those who consume it; NO specific antidote exists
- **Routes of exposure:** Ingestion, inhalation, and skin absorption — all toxic
- **Organs affected:** Lungs (fibrosis), kidneys, liver, heart; causes multi-organ failure
- **Long-term risk:** Linked to Parkinson's disease from occupational exposure
- **Other risks:** Birth defects, developmental and learning disorders
- **Suicide tool:** Easy availability makes it the most common agent in farmer suicides

Regulatory Framework

Law / Body	Key Provision
Insecticides Act, 1968	Governs registration, manufacture, sale & use of pesticides; allows state to ban for 60 days (Section 27) + 30-day extension
CIBRC	Central Insecticides Board & Registration Committee — apex body for pesticide registration
Pesticide Management Bill, 2025	Proposed replacement for 1968 Act; pending in Parliament; digital traceability, stricter penalties, state powers for 1-year bans

International Conventions on Hazardous Chemicals

- **Rotterdam Convention:** An international treaty governing the Prior Informed Consent (PIC) procedure for certain hazardous chemicals and pesticides in international trade. Inclusion under this convention does not mean an outright ban, but mandates trade transparency.
- **Stockholm Convention:** A global treaty focused on protecting human health and the environment from Persistent Organic Pollutants (POPs).
- **Kunming-Montreal Global Biodiversity Framework:** Sets global targets for 2030, including the active reduction of pesticide-related environmental risks. High Total Applied Toxicity (TAT) presents compliance challenges for signatory nations like India.

4.9. DECODING THE INDIAN MONSOON: FROM THERMAL CONTRASTS TO ITCZ SHIFTS

Context:

- India is currently facing a 35% nationwide monsoon rainfall deficit, largely due to stalled cloud progression over central and western regions. Consequently, the India Meteorological Department (IMD) has lowered its seasonal forecast to 90% of the Long-Period Average (LPA), signaling the potential impact of a 'Super El Niño'.
- This delay has prompted the Union government to initiate crop contingency plans, as agricultural disruptions risk driving up retail food inflation.



Understanding the Monsoon

Basics and Origin

- Etymology:** Derived from the Arabic word *mausin* or the Malayan word *monsin*, meaning 'season'.
- Definition:** Monsoons are rhythmic, periodic secondary winds characterized by a complete seasonal reversal in direction.
- Mechanism:** They function as massive, large-scale convection cells, acting similarly to land and sea breezes. While peculiar to the Indian Subcontinent, they also affect South East Asia and parts of Central Western Africa.

The Dual Monsoon System

Feature	South-West (SW) Monsoon (Summer)	North-East (NE) Monsoon (Winter)
Origin point	Intense low-pressure system over the Tibetan plateau.	High-pressure cells over the Tibetan and Siberian plateaus.
Wind Direction	Sea to Land.	Land to Sea.
Key Beneficiaries	Most of India, Indonesia, Myanmar, and Bangladesh.	South-eastern Indian coast (Tamil Nadu, South Seemandhra), SE China, Japan.

Factors Influencing the SW Monsoon

1. Factors Governing Onset:

- Intense summer heating of the Tibetan plateau.
- Presence of a permanent high-pressure cell in the South Indian Ocean (east to north-east of Madagascar).
- Movement of the **Subtropical Jet Stream (STJ)** and the **Tropical Easterly Jet (TEJ)**.
- Northward migration of the **Inter-Tropical Convergence Zone (ITCZ)**.

2. Factors Governing Intensity:

- Pressure gradients between the Tibetan Low and the South Indian Ocean High.

- **Somali Jet** (Findlater Jet) and the **Somali Current**.
- Indian Ocean branch of the Walker Cell and the **Indian Ocean Dipole (IOD)**.

The Role of ITCZ & Coriolis Force

- **What is the ITCZ?** A low-pressure zone near the equator where South-East (SE) and North-East (NE) trade winds converge, characterized by ascending air and heavy clouds.
- **The Summer Shift:** As the Sun moves vertically over the Tropic of Cancer, the ITCZ shifts northwards (20°- 25° N) over the Indo-Gangetic Plain, becoming the **Monsoon Trough**.
- **The Coriolis Deflection:** The SE trade winds from the southern hemisphere cross the equator. Under the influence of the Coriolis force, they are deflected right, blowing from a south-west to north-east direction, effectively becoming the SW Monsoon.

Core Meteorological Terminologies

- **El Niño:** A climate pattern characterized by the unusual warming of surface waters in the eastern tropical Pacific Ocean, which disrupts the global Walker Cell circulation and historically suppresses the intensity of the Indian South-West monsoon.
- **Somali Jet:** A low-level, high-velocity cross-equatorial atmospheric wind current (also called the Findlater Jet) that flows along the coast of East Africa and directly modulates the moisture transport and baseline intensity of the incoming summer monsoon winds over the Arabian Sea.
- **Indian Ocean Dipole (IOD):** An ocean-atmosphere phenomenon in the Indian Ocean defined by the temperature differential between its western basin (near Africa) and eastern basin (near Indonesia), where a positive phase enhances Indian monsoon rainfall and a negative phase suppresses it

4.10. COMPRESSED BIOGAS BLENDING GOALS & CLEAN ENERGY TRANSITION

Context:

- India is on track to meet its statutory target of blending 3% compressed biogas (CBG) with Compressed Natural Gas (CNG) and domestic Piped Natural Gas (PNG) for FY27. Fueled by a robust rollout of processing infrastructure under the GOBARdhan scheme, India's baseline commercial blending rate has effectively doubled to reach approximately 2% at present.



India's Gas Sector Baseline

1. Consumption and Blending Milestones

- **Daily Gas Profile:** India's baseline structural consumption of natural gas for the vehicle transport sector (CNG) and household distribution networks (PNG) combined is **34–35 million metric standard cubic metre per day (MMSCMD)**.
- **Commercial Payout:** Recent performance parameters show commercial CBG supply hitting **0.66 MMSCMD in April** and **0.63 MMSCMD in May**, satisfying the current ~2% blending baseline.

2. Infrastructural Pipeline Under GOBARdhan

- **Active Execution:** Data fetched from the Ministry of Petroleum and Natural Gas's dedicated **GOBARdhan portal** notes that construction of **324 CBG/bio-CNG plants** is actively underway.
- **Future Capacity Expansion:** Preliminary pre-development work and administrative approvals have been mapped for an additional **1,261 upcoming facilities**.

3. Macro-Strategic Implications for India

- **Energy Security Buffer:** Scaling up domestic alternative bio-fuels isolates the domestic market from erratic geopolitical shifts and external energy supply constraints.
- **Import Substitution:** Mandated infrastructure-level integration helps curb deep structural dependencies on imported Liquefied Natural Gas (LNG), helping save valuable foreign exchange reserves.

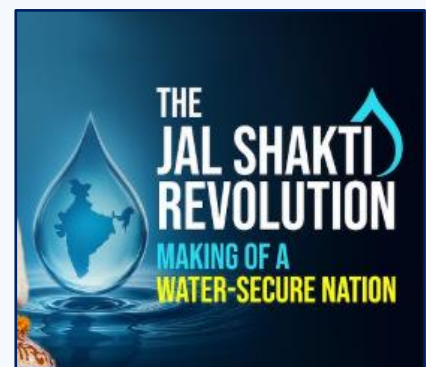
Essential Climate Modulators & Project Concepts

- **Compressed Biogas (CBG):** An energy-rich fuel produced via the anaerobic decomposition of organic materials (like cattle dung, agricultural residue, and municipal solid waste). It undergoes advanced purification to remove impurities (carbon dioxide and hydrogen sulfide), resulting in a refined gas containing **over 90% methane**, which is chemically identical to conventional natural gas.
- **GOBARdhan (Galvanizing Organic Bio-Agro Resources Dhan):** An inter-ministerial umbrella initiative focused on converting biodegradable waste into wealth. It aims to support the rural economy, promote clean energy, and drive circular economic parameters toward achieving India's net-zero emission targets.
- **SATAT (Sustainable Alternative Towards Affordable Transportation):** Launched by the Ministry of Petroleum and Natural Gas to promote the establishment of commercial CBG production plants by private entrepreneurs, ensuring efficient production and integration into existing city gas distribution networks.
- **Compulsory Blending Obligation (CBO) Trajectory:** Announced by the National Biofuels Coordination Committee (NBCC), the blending framework transitions from voluntary stages into a strictly mandatory regime with specified legal targets:
 - **FY26:** 1% of total CNG and domestic PNG consumption.
 - **FY27:** 3% mandatory target.
 - **FY28:** 4% mandatory target.
 - **FY29 onwards:** 5% mandatory target floor.

4.11. WATER SECURITY & MAJOR JAL SHAKTI INITIATIVES IN INDIA

Context:

- **Recently**, Union Minister of Jal Shakti highlighted that water security is fundamental to achieving the vision of Viksit Bharat (Developed India). He emphasized that flagship initiatives such as the **Jal Jeevan Mission (JJM)**, **Swachh Bharat Mission (SBM)**, **Namami Gange Programme (NGP)**, and **Atal Bhujal Yojana (ABHY)** have significantly improved access to safe drinking water, sanitation, groundwater management, and river conservation, thereby strengthening India's water security.



- India is rapidly transitioning toward an integrated water management ecosystem to address a fundamental geographical disparity: India sustains nearly **18% of the world's population** but possesses only about **4% of global freshwater resources**.

Some Important Flagship Initiatives

1. Jal Jeevan Mission (JJM)

- Launched in 2019
- **Scale:** It is classified as the world's largest rural drinking water supply programme.
- **Coverage Status:** Rural household tap water coverage has increased from approximately 17% (3.23 crore households) at the time of launch to over **81% (15.8 crore households)**.
- **Target:** The government aims to achieve **100% coverage by 2028**.
- **Socio-Economic Impact:** The expansion of tap water saves an estimated 5.5 crore person-hours daily, primarily reducing the water-fetching burden historically placed on rural women.

2. Swachh Bharat Mission-Grameen (SBM-G)

- Launched in 2014
- **Health Impact:** According to a World Health Organisation (WHO) assessment, SBM-Grameen averted more than 3 lakh diarrhoea-related deaths between 2014 and October 2019.
- **SBM-Grameen 2.0:** The mission has evolved beyond achieving Open Defecation Free (ODF) status. The defining characteristic of Phase 2.0 is the transition toward **sustainable solid and liquid waste management**.

3. Groundwater Conservation

- **Initiative:** Jal Sanchay Jan Bhagidari.
- **Infrastructure:** Over 1.55 crore rainwater harvesting and groundwater recharge structures have been established across the country (as of May 2026).
- **Outcome:** These conservation efforts have led to a measurable improvement in groundwater recharge, specifically resulting in a **reduction in the number of "over-exploited assessment units"** in various parts of the country.

4. River Interlinking Projects

- **Project:** Ken-Betwa River Linking Project.
- **Significance:** It is India's *first* major river interlinking initiative.
- **Beneficiary Region:** Primarily designed to transfer water to the arid **Bundelkhand region**.

5. Namami Gange Programme (Environmental Indicators)

- Launched in 2014.
- **Infrastructure:** Added 4,260 million litres per day (MLD) of sewage treatment capacity over the past decade.
- **Biochemical Oxygen Demand (BOD):** The project has successfully reduced BOD from 26 tonnes per day (TPD) in 2017 to 10.75 TPD in 2024. *(PYQ Focus: UPSC frequently tests BOD as an indicator of water pollution; a reduction in BOD signifies lower organic pollution and improved water health).*

- **Water Quality:** Monitoring indicates that **pH and dissolved oxygen** levels in the Ganga currently meet standard "bathing criteria" at all monitored locations.

6. Atal Bhujal Yojana (Atal Jal)

- **Atal Bhujal Yojana (Atal Jal):** A **Central Sector Scheme** launched on **25 December 2019** to promote **community-led sustainable groundwater management** in water-stressed areas of **7 States—Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, and Uttar Pradesh.**
- **Significance:** The scheme supports **water source sustainability for the Jal Jeevan Mission (JJM)** through participatory groundwater management, water budgeting, and aquifer recharge.

7. Mission Amrit Sarovar

- Launched in April 2022, Mission Amrit Sarovar is a flagship Government of India initiative to develop and rejuvenate at least 75 water bodies in every district across the country.
- Each pond is planned to have a minimum area of one acre (0.4 hectare) and a water storage capacity of about 10,000 cubic metres.

- **Central Ground Water Board:** The CGWB, established under the Ministry of Water Resources, (now Ministry of Jal Shakti), is the apex body for managing, exploring, monitoring, assessing, and regulating groundwater resources in India. **Headquarter at Faridabad.**
- **Central Ground Water Authority (CGWA):** Central Ground Water Authority (CGWA) was constituted under sub-section (3) of Section 3 of the Environment (Protection) Act, 1986 for the purposes of regulation and control of ground water development and management in the country.
- **Country's Groundwater Resources:** India extracts over 245 billion cubic meters of groundwater (25%) annually, fulfilling roughly 85% of rural drinking water and 62% of irrigation needs.

The percentage of Over Exploited Assessment units have declined from 17.24 % in 2017 to 11.13 % in 2024.

4.12. BIOCHAR: THE CARBON-NEGATIVE CATALYST FOR SUSTAINABLE AGRICULTURE

Context:

- The massive generation of agricultural residue and municipal solid waste in India presents a dual challenge of air pollution and soil degradation. Converting this organic waste into biochar offers a highly stable, carbon-negative solution to enhance soil fertility, build climate resilience, and generate carbon credits.



About Biochar

- **What is Biochar:** It is a highly porous, stable, and carbon-rich granular material derived from organic biomass, including agricultural residue and municipal solid waste.

- **Pyrolysis (The Production Method):** Biochar is obtained by heating organic waste at high temperatures (400°C to 600°C) inside a kiln-shaped structure under **low-oxygen or oxygen-free conditions**.
- **Carbon Sequestration Sink:** Its stable physiochemical structure breaks down extremely slowly, effectively locking carbon in the soil for 100 to 1,000 years, making it a persistent carbon dioxide removal technology.

Multi-Sectoral Applications and Benefits

1. Agriculture and Soil Health

- **Moisture Retention:** The highly porous nature of biochar increases the water-holding capacity of soils by 10% to 25%, which is critical for mitigating moisture stress in semi-arid and drought-prone regions.
- **Soil Fertility:** It aggregates soil particles, improves soil organic carbon content, and creates a suitable micro-environment that stimulates the growth of beneficial, nitrogen-fixing microorganisms.
- **Emission Abatement:** Applying biochar to agricultural fields can reduce the emissions of Nitrous Oxide (N₂O)—a highly potent greenhouse gas—by 30% to 50%.
- **Yield Enhancement:** Field trials indicate that its application can improve overall crop productivity by 10% to 30%, particularly in degraded and nutrient-depleted soils.

2. Infrastructure and Construction

- **Low-Carbon Building Material:** Integrating a small percentage of biochar into concrete significantly boosts its mechanical strength and heat resistance.
- **Embodied Carbon Reduction:** Utilizing biochar in the construction sector transforms conventional building materials into stable, long-term carbon sinks.

3. Energy Generation and Wastewater Treatment

- **Energy By-products:** The pyrolysis process utilized to create biochar simultaneously yields valuable combustible by-products—specifically **syngas** and **bio-oil**—which can be harnessed to generate electricity and offset fossil fuel dependency.
- **Pollution Control:** Biochar functions as an economical and highly effective adsorbent for treating wastewater and reducing water pollution.

Challenges of Using Biochar

- **Reduces Earthworm Activity:** Biochar can limit the movement and function of earthworms, which are naturally essential for maintaining soil health and fertility.
- **Causes Soil Compaction:** Adding too much biochar can make the soil dense and hard. This restricts the roots from growing properly and ultimately lowers crop yields.
- **Lowers Pesticide Efficiency:** Biochar tends to absorb chemicals in the soil. This makes applied pesticides less effective at protecting crops from pests and diseases.

UPSC PRELIMS PRACTICE QUESTIONS

Q. With reference to the exoplanet WASP-43b and the James Webb Space Telescope (JWST), consider the following statements:

1. WASP-43b is classified as a Hot Jupiter and is located about 280 light-years from Earth.
2. The planet is tidally locked, with one side permanently facing its parent star.
3. JWST primarily observes the universe in the ultraviolet spectrum.
4. The study of WASP-43b's atmosphere can provide insights into planetary formation and the early evolution of the Solar System.

Which of the statements given above are correct?

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

Ans. (a)

Explanation:

- **Statement 1 is Correct:** WASP-43b is a **Hot Jupiter** located about **280 light-years** away.
- **Statement 2 is Correct:** It is **tidally locked**, with one side always facing its star.
- **Statement 3 is Incorrect:** JWST studies the universe primarily in the **infrared spectrum**, not ultraviolet.
- **Statement 4 is Correct:** Atmospheric composition helps scientists understand **planetary formation, migration, and Solar System evolution**.

Q. Consider the following statements:

1. Ground-level ozone is directly emitted from industrial chimneys.
2. Heatwaves and strong sunlight can accelerate ozone formation.

3. PM10 levels can increase due to dust storms and construction activities.

Which of the statements given above is/are correct?

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

Ans. (a)

Explanation:

Statement 1 is incorrect: Ground-level ozone (O₃) is **not directly emitted** from industrial chimneys or vehicles. It is a **secondary pollutant** formed through photochemical reactions.

Statement 2 is correct: **Heatwaves, high temperatures, and strong sunlight** accelerate the reaction between NO_x and VOCs, increasing ozone formation.

Statement 3 is correct: **Dust storms (Andhi), Loo winds, road dust resuspension, and construction activities** can significantly raise PM₁₀ concentrations.

Q. With reference to the Yellow-Throated Marten (*Martes flavigula*), consider the following statements:

1. It belongs to the Mustelidae family.
2. It is an apex predator in forest ecosystems.
3. It is known for its bright golden-orange throat and upper chest.

Which of the statements given above is/are correct?

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

Ans. (a)

Explanation:

Statement 1 is Correct: The Yellow-Throated Marten belongs to the **Mustelidae (weasel) family**, which also includes otters, badgers, and wolverines.

Statement 2 is Incorrect: It is a **mesopredator (mid-ranking predator)**, not an apex predator like a tiger or leopard.

Statement 3 is Correct: It is easily identified by its **bright golden-orange throat and upper chest** contrasting with a darker body.

Q. With reference to coastal protection and adaptation strategies in India, consider the following statements:

1. Over the past decade, public expenditure by coastal states has leaned heavily toward engineered grey measures like seawalls and groynes rather than natural ecological buffers.
2. The MISHTI initiative is an integrated framework designed explicitly to align blue carbon accounting directly with industrial carbon credit registries.
3. Hard infrastructure solutions like coastal seawalls can cause structural trade-offs by shifting erosion risks and damage to adjacent coastal areas.

Which of the statements given above are correct?

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

(c) 1 and 3 only

(d) 1, 2 and 3

Ans. (c)

Explanation:

- **STATEMENT 1 IS CORRECT:** Public spending across India's coastal landscape reveals a strong preference for engineered measures over green interventions, with states allocating over ₹2,641 crore to hard protection measures during the last decade.
- **STATEMENT 2 IS INCORRECT:** The MISHTI scheme focuses primarily on the physical restoration of mangrove habitats across states to safeguard coastal communities. It is currently framed as a restoration program and is not yet fully integrated into mainstream coastal adaptation policies or industrial carbon accounting systems.
- **STATEMENT 3 IS CORRECT:** Engineered grey structures are not only expensive to maintain but can also alter local wave dynamics, which can displace underlying risks and accelerate coastal erosion in neighboring areas.



Scan to attempt more questions

5.1. DRDO SUCCESSFULLY FLIGHT-TESTS INDIGENOUS RudraM-II MISSILE

Context:

- The Defence Research and Development Organisation (DRDO), along with the Indian Air Force (IAF), successfully flight-tested the indigenously developed **RudraM-II air-to-surface missile** from a Su-30 MKI fighter jet off the coast of Odisha.



About RudraM-II Missile

- **Type of Missile:** It is an indigenous, Next-Generation **Anti-Radiation Missile (ARM)**.
- **Role/Tactics:** Developed to enhance the IAF's **Suppression of Enemy Air Defence (SEAD)** and Destruction of Enemy Air Defence (DEAD) capabilities. It targets and neutralizes adversary radar, communication assets, and radio frequency (RF) sources.
- **Propulsion:** Powered by a solid-propelled rocket motor.
- **Speed:** Hypersonic/high-supersonic capabilities, reaching terminal speeds up to **Mach 5.5**.
- **Range & Payload:** Operates at a strike range of approximately **300 km** (a major step up from RudraM-I's 150 km range) and carries a **200 kg warhead**.
- **Launch Platform:** Tested primarily via the frontline **Su-30 MKI** fighter jet, with future plans to integrate it across other IAF platforms like the HAL Tejas and Mirage 2000.
- **Nodal Development Agency: Research Centre Imarat (RCI), Hyderabad** (a premier DRDO laboratory), along with DRDL (Hyderabad), HEMRL & ARDE (Pune).
 - Along with the Development-cum-Production Partners (DcPPs), agencies such as Hindustan Aeronautics Limited (HAL), the Regional Centre for Military Airworthiness, the Missile System Quality Assurance Agency, and several industry partners contributed to the project, according to the Ministry of Defence (MoD).

5.2. S-400 TRIUMF AIR DEFENCE SYSTEM

Context

- India has received the fourth squadron of the Russian-made S-400 air defence system, which is expected to be deployed soon. After delays caused by the Russia-Ukraine conflict, deliveries are back on schedule, and the fifth and final squadron is expected to arrive in 2027.



Key Highlights of the Deal

- **The Agreement:** India and Russia signed a **\$5.43 billion** government-to-government agreement in **2018** for the acquisition of **five S-400 regimental systems** (squadrons).

- **Current Status:** With this latest delivery, four squadrons have been received, leaving only one remaining.
- **Modern Integration:** The S-400 systems will be integrated with **AI-enabled decision-support capabilities**. This technology will assist human operators by identifying, prioritizing, and recommending target selections based on the nature of incoming threats. However, the **final engagement decision remains with the human operator**.

Technical Capabilities of the S-400

- **Type:** It is a mobile, surface-to-air missile (SAM) system designed by Russia's Almaz Central Design Bureau.
- **Multi-Layered Air Shield:** It can engage all types of aerial targets, including aircraft, unmanned aerial vehicles (UAVs), and ballistic/cruise missiles.
- **Range & Tracking:** It can track up to 100 airborne targets simultaneously and engage up to 36 of them at a distance of up to **400 km** at altitudes up to 30 km.
- **Radar Network:** It integrates multifunction radar, autonomous detection and targeting systems, anti-aircraft missile systems, and a command and control centre.

India's Indigenous Air Defence Layer

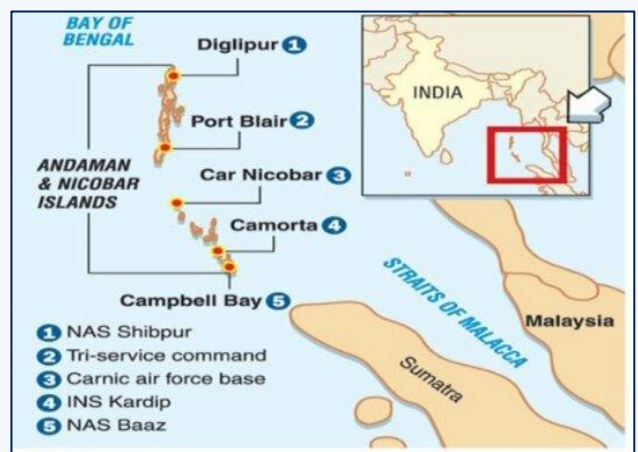
While the S-400 forms the long-range outer layer of India's air defense, India uses a multi-tiered network:

- **Project Kusha:** India's indigenous Long-Range Surface-to-Air Missile (L-SAM) system being developed by DRDO, aiming for a 350 km range (similar to S-400 capabilities).
- **MRSAM & Akash:** The Medium-Range Surface-to-Air Missile (jointly developed with Israel) and the **indigenous Akash missile** system handle medium and short-range threats.

5.3. INS BAAZ AND THE GREAT NICOBAR AIRPORT PROJECT

Context:

- The government plans to build a new ₹13,000 crore dual-use airport at Galathea Bay in Great Nicobar, citing environmental limits on expanding the existing INS Baaz runway. However, this new project is facing criticism because clearing large areas of protected forest will severely impact the local ecology and the habitat of the vulnerable Shompen tribe.



About INS Baaz

- **Status & Commissioning:** Commissioned in July 2012, it is the southernmost air station of the Indian Armed Forces.
- **Geographical Location:** Situated at Campbell Bay on Great Nicobar Island (the largest and southernmost island of the Union Territory). It is located in close proximity to Indira Point.
- **International Proximity:** Located less than 250 km by sea from Banda Aceh, Indonesia.

- **Strategic Utility:** Operates under the Andaman and Nicobar Command (ANC) to build Maritime Domain Awareness (MDA) via airborne surveillance using aircraft and Unmanned Aerial Vehicles (UAVs).
- **Geopolitics:** Often described as India's "window into East and Southeast Asia," ensuring maritime security across the Bay of Bengal and the Andaman Sea.

Geographical Significance: The Great Channel

- **Location:** Situated at six degrees north of the equator, earning it the popular name '**Six Degree Channel**'.
- **Demarcation:** Acts as the critical maritime boundary separating Great Nicobar Island (India) and Aceh Province (Indonesia).

Institutional Setup: Andaman and Nicobar Command (ANC)

- **Establishment & Uniqueness:** Created in 2001, it holds the distinction of being the **first and only tri-service command** of the Indian Armed Forces.
- **Headquarters:** Port Blair, Andaman and Nicobar Islands.
- **Primary Objective:** Safeguards India's strategic interests in the critical choke point of the **Strait of Malacca** and Southeast Asia.
- **Operational Role:** Provides vital logistical and administrative support for Indian naval ships deployed in the East Asia and Pacific Ocean regions.

5.4. PROJECT KUSHA AND INDIA'S EVOLVING AIR DEFENCE ARCHITECTURE

Context:

- **Recently,** the Defence Minister inaugurated the Advanced Weapon System Complex at DRDL, part of the Dr. A.P.J. Abdul Kalam Missile Complex in Hyderabad. He described the indigenous Project Kusha air defence programme as a major "game changer" for strengthening India's security and defence capabilities.



Key Highlights: Project Kusha

- **Type of System:** It is an indigenous, **long-range air defence missile system**.
- **Developing Agency:** Being developed completely by the **Defence Research and Development Organisation (DRDO)**.
- **Core Function:** Designed to provide a comprehensive, protective umbrella/shield against a wide array of aerial threats.
- **Operational Track Record:** The Defence Minister asserted that the system's operational importance and effectiveness have already been successfully demonstrated during **Operation Sindoor**.

Broader Air Defence Frameworks & Initiatives

1. "Mission Sudarshan Chakra"

- **Origin:** Announced by the Prime Minister during Independence Day in 2025.
- **Objective:** An ambitious initiative aimed at establishing a **multi-layered missile defence shield** across India by 2035.
- **Scope:** It is designed to safeguard three critical pillars:
 1. Military assets.
 2. Critical infrastructure.
 3. Civilian establishments across the country.
- **Key Feature:** Built to offer robust protection while minimizing inconvenience to citizens, along with possessing the capability to deliver a decisive retaliatory response when necessary.

2. Integrated Air Defence Weapon System (IADWS)

- The system is being developed as a key component of Mission Sudarshan Chakra, India's proposed multi-layered national air defence shield.
- **Components of the mission include:**
 - QRSAM — Quick Reaction Surface-to-Air Missile
 - VSHORAD — Very Short Range Air Defence System
 - Directed Energy Weapons (DEW) / Laser-based systems

India's Multi-Layered Air Defence Architecture

Layer	System / Assets
Layer 1 (Very Short)	Counter-drone systems MANPADS VSHORAD
Layer 2–3 (Short-Medium)	Point air defence QRSAM MR-SAM (Barak-8) Akash
Layer 4 (Long-Range)	S-400 Triumf (Future) Project Kusha (150–350 km)

5.5. JIO EYES SATELLITE COMMUNICATIONS

Context:

- **Jio Platforms Ltd.**, a subsidiary of Reliance Industries, is preparing to enter India's **satellite communication (SatCom)** sector.
- The company has announced agreements with **SpaceX's Starlink** and **SES** to provide satellite broadband services in India, subject to regulatory approvals.
- Jio is also partnering with **Luxembourg-based SES** to use its **O3b mPOWER medium Earth orbit (MEO)** satellite constellation.



Why is Jio Entering Satellite Communications?

- Satellite communication is expected to complement terrestrial telecom networks by providing internet connectivity in **remote, rural, mountainous, island, and disaster-prone areas** where laying fibre-optic cables or mobile towers is difficult.

- It is also essential for sectors such as defence, maritime, aviation, disaster management, and digital inclusion.

What is Satellite Communication (SatCom)?

- **Satellite communication** is a technology that transmits voice, data, and multimedia signals between ground stations through artificial satellites orbiting the Earth. It enables communication over large geographical areas without relying entirely on terrestrial infrastructure.

Major Advantages

- Connectivity in inaccessible and remote regions.
- Supports disaster recovery when terrestrial networks fail.
- Enables broadband services in maritime and aviation sectors.
- Bridges the digital divide through universal internet access.

O3b mPOWER Satellite Constellation

- **O3b** stands for "**Other 3 Billion**," referring to people without reliable internet access.
- It is a **Medium Earth Orbit (MEO)** satellite constellation developed by **SES**.
- Operates at an altitude of around **8,000 km**, offering **lower latency than geostationary satellites** while covering larger areas than low Earth orbit satellites.
- Designed to deliver **high-speed, low-latency broadband connectivity**.

Types of Satellite Orbits

Orbit	Approximate Altitude	Key Features	Examples
LEO (Low Earth Orbit)	160–2,000 km	Low latency, high speed, requires many satellites	Starlink, OneWeb
MEO (Medium Earth Orbit)	2,000–35,786 km	Moderate latency and wider coverage	O3b mPOWER
GEO (Geostationary Orbit)	35,786 km	Appears stationary, ideal for broadcasting and weather monitoring	INSAT, GSAT

Key Satellite Internet Projects

SpaceX Starlink

- Satellite internet service operated by **SpaceX**.
- Uses a **Low Earth Orbit (LEO)** satellite constellation.
- Aims to provide global high-speed broadband connectivity.

Project Kuiper

- A satellite-based broadband initiative by Amazon to provide high-speed internet globally via Low Earth Orbit (LEO) satellites.
- It aims to deploy over 3,200 satellites operating at altitudes between 590 km and 630 km.

Related Government Initiatives

- **Digital India Programme** – Expanding digital infrastructure and internet access.
- **BharatNet** – Broadband connectivity to Gram Panchayats through optical fibre.
- **Indian Space Policy, 2023** – Encourages greater private sector participation in the space sector.
- **IN-SPACe (Indian National Space Promotion and Authorization Centre)** – Facilitates and regulates private sector activities in India's space ecosystem.

NVIDIA GPUs and AI Infrastructure

- As part of its AI expansion strategy, **Jio Platforms** announced that it will operationalise an initial fleet of **NVIDIA GB300 GPUs (Graphics Processing Units)** to build large-scale AI computing infrastructure in India.
- The **GB300-based computing capacity** is equivalent to **over 75,000 NVIDIA H100 GPUs** for AI inference.
- Once the first **120 MW AI data centre** becomes fully operational, the capacity can be scaled to **more than 2 lakh H100-equivalent GPUs**.
- This would make Reliance one of the **largest AI infrastructure platforms** globally.

What are GPUs?

- A **Graphics Processing Unit (GPU)** is a specialised processor designed to perform **massive parallel computations**. While originally developed for graphics rendering, GPUs are now the backbone of **Artificial Intelligence (AI), Machine Learning (ML), High-Performance Computing (HPC), scientific simulations, and data analytics**.
- Compared to CPUs, GPUs can process thousands of operations simultaneously, making them ideal for training and deploying large AI models.

5.6. VITILIGO: UNDERSTANDING THE CONDITION AND ADDRESSING SOCIAL STIGMA

Context:

- **Recently**, experts highlighted the psychological and social challenges faced by children living with **vitiligo**, emphasizing the need to eliminate stigma and promote awareness in schools and communities.
- Although vitiligo is **medically harmless and non-contagious**, misconceptions continue to expose affected children to bullying, social exclusion, and emotional distress.



What is Vitiligo?

- **Vitiligo** is a **chronic autoimmune skin disorder** characterized by the loss of **melanocytes** (pigment-producing cells), resulting in **depigmented white patches** on the skin.
- It can affect individuals of **all ages, genders, and ethnicities**.
- The condition is **non-infectious, non-contagious**, and is **not caused by poor hygiene**.

Causes of Vitiligo

The exact cause remains unknown, but the condition is associated with:

- **Autoimmune response**, where the immune system mistakenly destroys melanocytes.
- **Genetic predisposition**.
- **Environmental triggers**, such as stress, skin injury, or sunburn in genetically susceptible individuals.

Key Clinical Features

- Well-defined **white patches** on the skin.
- May affect the **face, hands, feet, lips, scalp, and genital region**.
- Hair growing in affected areas may also turn **white (leukotrichia)**.
- Usually painless and does not affect physical health.

Types of Vitiligo

- **Non-segmental Vitiligo (NSV)**: Most common type; symmetrical distribution of patches.
- **Segmental Vitiligo (SV)**: Affects one side of the body and usually appears at an earlier age.
- **Universal Vitiligo**: Extensive depigmentation covering most of the body.

Psychological and Social Impact

Children with vitiligo often experience:

- Low self-esteem and poor body image.
- Bullying, teasing, and social exclusion.
- Anxiety, chronic stress, and depression.
- Reluctance to participate in school activities.
- Emotional distress, particularly during adolescence due to concerns about appearance and peer acceptance.

Why Does Stigma Persist?

Common misconceptions include:

- Vitiligo is contagious.
- It results from poor hygiene.
- It is a communicable skin disease.

Fact: None of these beliefs are scientifically correct.

Diagnosis

Diagnosis is generally based on:

- Clinical examination.
- **Wood's lamp** examination to highlight depigmented patches.
- Skin biopsy (rarely required).
- Screening for associated autoimmune disorders such as:

- Thyroid disorders
- Type 1 Diabetes
- Pernicious anemia

Treatment Options

- Although there is **no permanent cure**, treatment aims to restore pigmentation and prevent progression.

Medical Management

- Topical corticosteroids.
- Calcineurin inhibitors.
- Phototherapy (Narrowband UV-B).
- Excimer laser therapy.
- Oral immunomodulatory therapy in selected cases.

Surgical Options

- Skin grafting.
- Melanocyte transplantation (for stable vitiligo).

Supportive Care

- Sunscreen to protect depigmented skin.
- Cosmetic camouflage.
- Psychological counselling.

5.7. DECODING THE INDIAN NAVY'S HISTORIC TRIPLE COMMISSIONING

Context:

- The Prime Minister recently commissioned three technologically distinct, indigenously built naval warships—**INS Dunagiri**, **INS Sanshodhak**, and **INS Agray**—in Kolkata. This historic "tri-commissioning" highlights a major push toward self-reliance, with more than 75% of the components manufactured domestically through Indian shipyards and over 200 MSMEs.



The Three Vessels at a Glance

1. INS Dunagiri — The Blue-Water Stealth Frigate

- **Project Classification:** Built as an advanced stealth guided-missile frigate under **Project 17A**.
- **Stealth Capability:** Engineered with structural modifications to ensure reduced radar cross-section (RCS) and lower sensor visibility.
- **Armament & Systems:** Equipped with BrahMos surface-to-surface missiles, Medium-Range Surface-to-Air Missile (MRSAM) systems, MFSTAR radar, and advanced electronic warfare suites.

- **Strategic Role:** Designed for deep-sea blue-water operations against high-intensity conventional and non-conventional threats.
- **Sister Ships:** Belongs to the same class as INS Nilgiri, Himgiri, Taragiri, Udaygiri, and Vindhyagiri.

2. INS Sanshodhak — The Hydrographic Survey Vessel

- **Project Classification:** The final ship of the **Sandhayak-class** Survey Vessels – Large (SVL).
- **Technological Payload:** Integrated with Autonomous Underwater Vehicles (AUVs), Remotely Operated Vehicles (ROVs), and multi-beam echo sounders.
- **Strategic Role:** Tasked with underwater hydrographic mapping, measuring ocean depths, plotting navigational routes, and gathering critical oceanographic data.
- **Core Significance:** Sub-surface mapping is vital for safe submarine route planning, anti-submarine warfare environment assessment, and marine resource tracking.

3. INS Agray — The Littoral Anti-Submarine Hunter

- **Project Classification:** An Anti-Submarine Warfare Shallow Water Craft (ASW SWC) belonging to the **Arnala-class**.
- **Armament Payload:** Fitted with lightweight torpedoes, indigenous anti-submarine rocket launchers, and specialized hull-mounted sonars.
- **Strategic Role:** Specifically optimized to detect, track, and neutralize enemy submarines in noisy, acoustically cluttered coastal zones and littoral waters near ports and naval bases.

Stragic Significance

- **Layered Naval Defense:** The simultaneous induction builds a multi-layered security umbrella spanning deep-sea combat (Dunagiri), hydrographic intelligence (Sanshodhak), and coastal defense (Agray).
- **Strategic De-hyphenation:** Projecting advanced naval platforms helps India frame itself as a *Vishwabandhu* (global benefactor) offering non-threatening public goods to secure the Indo-Pacific region.
- **Industrial Boost:** Complements multi-ministerial infrastructure goals like the **Sagarmala Project** and the newly announced **₹70,000 crore incentive package** designed to expand domestic shipbuilding capacity and reduce maritime logistics costs.

5.8. THE SOUTH ASIAN PHENOTYPE AND SUBTYPES OF DIABETES

Context:

- A landmark research paper published in the journal *Diabetologia* highlights that South Asian populations possess a distinct metabolic profile characterized by higher insulin resistance and visceral fat at a lower Body Mass Index (BMI).
- This structural variation underscores the need for precision medicine over generic global models and emphasizes the study of pancreatic endocrinology and the different typologies of diabetes for public health interventions.



Insulin: Synthesis and Functions

- **Production Site:** Insulin is a vital hormone synthesized in significant quantities exclusively by the **beta (beta) cells** located within the **islets of Langerhans** in the pancreas.
- **Etymology:** The name originates from the Latin word "*insula*", translating directly to "island," representing its isolated cellular source within the pancreas.
- **Discovery:** The hormone was successfully isolated and discovered in 1921 by Sir Frederick G. Banting, Charles H. Best, and J.J.R. Macleod.

Biological Functions

- **Glucose Regulation:** Secreted primarily in response to elevated blood glucose levels, insulin regulates glucose homeostasis by directing cells in the liver, muscles, and fat tissues to absorb glucose from the bloodstream.
- **Glycogen Storage:** It causes excess blood glucose to be converted into **glycogen**, which is subsequently stored inside the liver and skeletal muscles for future energy needs.
- **Lipid Management:** Insulin actively prevents the utilization of fat as an energy source by inhibiting the breakdown of fats.
- **Starvation Shift Mechanism:** In conditions where insulin levels are critically low or absent, cellular glucose uptake fails, forcing the human body to alter its pathway and burn **fat as an alternative energy source**.
- **Amino Acid Regulation:** The hormone also coordinates other body systems by regulating cellular amino acid uptake and protein synthesis.

Diabetes: Types and Pathophysiology

- **Mechanism:** Diabetes is a chronic disease that occurs when the pancreas can no longer produce insulin, or when the body cannot effectively utilize the insulin it produces.
- **Hyperglycaemia:** Uncontrolled diabetes results in chronically raised blood glucose levels, clinically termed **hyperglycaemia**.
- **Organ Damage:** Over the long-term, hyperglycaemia causes serious damage to the body's systems, especially the nerves and blood vessels, acting as a major cause of blindness, kidney failure, heart attacks, stroke, and lower limb amputation.

The Four Subtypes of Diabetes

Type of Diabetes	Core Pathophysiology and Etiology	Key Clinical Markers
Type 1	Autoimmune Reaction: The body's immune system mistakenly attacks and destroys the insulin-producing beta (beta) cells in the pancreas.	Previously known as insulin-dependent or juvenile-onset; linked to genetic predisposition; requires daily external insulin shots.
Type 1.5	Latent Autoimmune Diabetes in Adults (LADA): An autoimmune variation that shares characteristics but manifests later in life.	Manifests strictly during adulthood; sets in gradually, mimicking the visual and clinical timeline of Type 2 diabetes.

Type 2	Insulin Resistance: A metabolic condition where the body is stopped from using the insulin it produces properly.	Formerly called adult-onset diabetes; accounts for 90–95% of global cases; heavily driven by diet and low physical activity.
Gestational	Pregnancy-Induced Hyperglycaemia: Raised blood glucose values above normal but below full diagnostic thresholds.	Develops transiently in some individuals strictly during the course of pregnancy.

South Asian Diabetes Subtype and Physical Traits

- **The BMI Paradox:** People in the South Asian region develop diabetes at a significantly lower Body Mass Index (BMI) compared to populations in high-income nations.
- **Adipose Distribution:** Phenotypes in this geographic zone possess higher amounts of **visceral fat** paired with greater **insulin resistance**.
- **Environmental Triggers:** The acceleration of this condition is strongly linked to regional lifestyles, particularly the high intake of highly refined carbohydrates and low levels of physical activity.
- **Precision Medicine:** Due to this metabolic heterogeneity, clinical science is moving away from a one-size-fits-all paradigm toward a personalized approach based on precision medicine to account for variations in clinical characteristics, complication risks, and treatment responses.

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UPSC PRELIMS PRACTICE QUESTIONS

Q. With reference to the RudraM-II missile, consider the following statements:

1. It is an indigenous Next-Generation Anti-Radiation Missile (ARM).
2. It is designed to target enemy radar and radio frequency sources.
3. It is a surface-to-air missile developed for ballistic missile defence.

Which of the statements given above is/are correct?

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

Ans. (a)

Explanation:

Statement 1 is Correct. RudraM-II is an indigenous **Next-Generation Anti-Radiation Missile (ARM)** developed by DRDO.

Statement 2 is Correct. It is designed to destroy **enemy radar systems, communication assets, and other radio-frequency (RF) emission sources.**

Statement 3 is Incorrect. RudraM-II is an **air-to-surface missile**, not a **surface-to-air missile**. It is intended for **Suppression and Destruction of Enemy Air Defence (SEAD/DEAD)** missions, not ballistic missile defence.

Q. Consider the following statements regarding the S-400 Triumf air defence system:

1. It is a long-range surface-to-air missile system acquired by India through a bilateral agreement with Russia.
2. The system integrates Artificial Intelligence (AI) to automatically fire at and neutralize incoming aerial threats without human intervention.

3. The US law 'CAATSA' primarily targets countries engaging in significant defense transactions with Russia, North Korea, and Iran.

Which of the statements given above are correct?

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

Ans. (c)

Explanation:

Statement 1 is correct – The S-400 is a long-range air defence missile system that India bought from Russia.

Statement 2 is incorrect – The S-400 is highly advanced, but it does not automatically fire missiles on its own. Human operators make the final decision.

Statement 3 is correct – **CAATSA** is a US law that can impose sanctions on countries making major defence deals with **Russia, Iran, or North Korea.**

Q. With respect to the strategic geography and military infrastructure of the Andaman and Nicobar Islands, consider the following statements:

- I. INS Baaz is the southernmost air station of the Indian Armed Forces located at Campbell Bay.
- II. The Six Degree Channel acts as the maritime boundary separating Great Nicobar Island and the Aceh Province of Indonesia.
- III. The Andaman and Nicobar Command (ANC) is a dedicated naval-only command established to safeguard India's interests in Southeast Asia.

Which of the statements given above are correct?

- (a) Only I and II
- (b) Only II and III
- (c) Only I and III
- (d) I, II and III

Ans. (a)

Explanation:

- **Statement I is correct:** INS Baaz is commissioned as the southernmost air station of the Indian Armed Forces and is strategically located at Campbell Bay on Great Nicobar Island.
- **Statement II is correct:** The Great Channel, popularly known as the Six Degree Channel, is the critical maritime boundary that separates Great Nicobar Island of India and the Aceh Province of Indonesia.
- **Statement III is incorrect:** The Andaman and Nicobar Command (ANC), created in 2001, is the first and only tri-service command of the Indian Armed Forces, not a dedicated naval-only command.

Q. With reference to India's defence capabilities mentioned in recent news, consider the following statements:

1. Project Kusha is a short-range, quick-reaction surface-to-air missile system developed jointly by India and Israel.
2. "Mission Sudarshan Chakra" is aimed at establishing a multi-layered nationwide missile defence shield to protect both military and civilian assets.

3. The Advanced Weapon System Complex at DRDL was recently inaugurated in Hyderabad.

Which of the statements given above are correct?

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

Ans. (b)

Explanation:

- **Statement 1 is incorrect:** According to image_08dd8b.png, Project Kusha is an *indigenous, long-range* air defence missile system being developed by the DRDO, not a short-range joint venture.
- **Statement 2 is correct:** Mission Sudarshan Chakra aims to create a multi-layered missile defence shield protecting military assets, critical infrastructure, and civilian establishments.
- **Statement 3 is correct:** The Defence Minister inaugurated the Advanced Weapon System Complex at DRDO's DRDL facility in Hyderabad.



Scan to attempt more questions

HISTORY & CULTURE

6.1. BIRSA MUNDA & THE ULGULAN

Context:

- **Recently**, June 9 marked the death anniversary of Birsa Munda, a charismatic tribal leader, freedom fighter, and folk hero who spearheaded an anti-colonial and anti-feudal movement in the Chotanagpur Plateau region during the late 19th century.



1. Core Background & Influences

- **The Preceding Movement:** The **Sardari Larai** (or Sardar movement) of the late 19th century preceded Birsa's uprising. It heavily influenced the political and agitational climate in the Chotanagpur region, fighting against the destruction of tribal land systems.
- **The Enemy (Dikus):** The rebellion targeted the British colonial authorities, Christian missionaries, and the *dikus*—**outsiders** consisting of landlords (*zamindars*), moneylenders, and traders who exploited the indigenous population.

2. The Uprising: Ulgulan

- **The Term "Ulgulan":** The Munda uprising led by Birsa Munda at the turn of the 20th century is popularly known as the **Ulgulan**, which translates to the "**Great Tumult**".
- **Famous Slogan:** Birsa Munda gave the iconic slogan calling for the end of British rule:
"Abua raj ete jana, maharani raj tundu jana" > (Let the kingdom of the queen be ended and our kingdom be established).

3. Socio-Religious Reforms

- **New Faith Community:** Birsa Munda rejected Christian missionary activities and traditional superstitious tribal practices. He advocated for a return to their **original roots and monotheism**, giving rise to a distinct faith community known as **Birsait**.
- **Principles:** Followers of the Birsait sect worshipped **one God (Singhbonga, a tribal deity)**, clean living, and strictly prohibited cow slaughter, sacrifices, and alcohol consumption.

4. Capture, Death, and Literary Records

- **Cause of Death:** Birsa Munda was captured by the British and died in **Ranchi Jail** on **June 9, 1900**. The official cause of death recorded by the British authorities was **cholera**, though historical debates surround the true nature of his sudden demise.
- **Ethnographic Records:** The famous, definitive photograph of Birsa Munda (arms crossed, wearing a turban) was reproduced in the pioneering ethnographic work titled ***The Mundas and Their Country*** (1912) by the renowned anthropologist **Sarat Chandra Roy**.

5. Aftermath and Legacy

- **Chotanagpur Tenancy Act (CNT), 1908:** The ultimate legal outcome of the Ulgulan. The British administration passed this act to protect tribal lands, legally banning the **forced labor (*beth-begari*)** system and prohibiting the transfer of tribal land to non-tribals (*dikus*).

- **Janjatiya Gaurav Divas:** In recognition of his massive contribution to the Indian freedom struggle, his birth anniversary (**November 15**) is celebrated as Janjatiya Gaurav Divas (Tribal Pride Day) in India.

6.2. DANCING GIRL OF MOHENJO-DARO: NCERT RESTORES ORIGINAL IMAGE

Context:

- Recently, the **National Council of Educational Research and Training (NCERT)** announced that it will restore the **original image of the "Dancing Girl" figurine of Mohenjo-daro** in its Class 9 Arts textbook *Madhurima*.
- The decision came after criticism over a modified version of the image in which shading was added to cover the figurine's bare torso, resulting in a "clothed" appearance.

About the Dancing Girl Figurine

- One of the most iconic artefacts of the **Indus Valley Civilization (IVC)**.
- Discovered from **Mohenjo-daro** (present-day Sindh, Pakistan).
- Belongs to the **Harappan Civilization**.
- Estimated age: Around **2500 BCE**.
- Material: **Bronze**.
- Height: Approximately **10.5 cm**.
- Prepared using the **Lost-Wax Casting Technique**.
- Represents the advanced metallurgical skills and artistic excellence of the Harappans.



Distinctive Features

- Depicts a young female figure in a confident posture.
- Left hand placed on the hip.
- Right arm hanging freely.
- Adorned with numerous bangles.
- Considered evidence of developed craftsmanship and cultural sophistication.

Mohenjo-daro: Key Facts

- **Meaning:** Mohenjo-daro means "**Mound of the Dead**".
- **Location:** Situated on the banks of the **Indus River** in present-day **Sindh Province, Pakistan**.
- **Discovery:** Discovered in **1922** by **R. D. Banerji (Rakhal Das Banerji)**.

Important Structures

- Great Bath, Granary, Assembly Hall, Advanced drainage system, Citadel and Lower Town

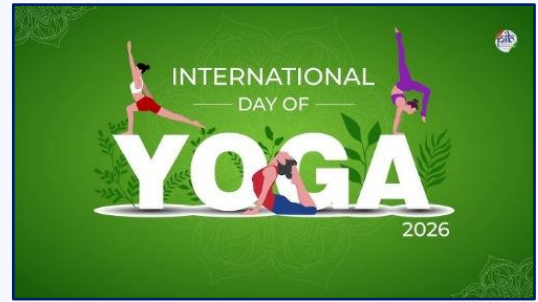
UNESCO Status

- Declared a **UNESCO World Heritage Site** in **1980**.

6.3. INTERNATIONAL DAY OF YOGA 2026

Context:

- The Prime Minister recently led the International Day of Yoga celebrations in Kolkata, emphasizing the discipline's transition from an ancient tradition to the world's largest collective community celebration. The event highlighted the role of yoga in fostering global unity, physical vitality, and mental resilience.



Key Highlights of International Day of Yoga (IDY) 2026

- Theme for 2026:** "Yoga for Healthy Ageing". It explicitly aligns with the **WHO Decade of Healthy Ageing (2021–2030)**.
- Yoga Sangam Initiative:** A flagship national program connecting institutions through synchronized yoga sessions based on the standard **Common Yoga Protocol (CYP)**.

Governance and Institutional Framework

- UNGA Resolution:** Adopted on December 11, 2014, under the "**Global Health and Foreign Policy**" agenda.
- Significance of Date:** June 21 marks the **Summer Solstice** (longest day in the Northern Hemisphere), mythologically associated with the dawn of Yogic science.
- Nodal Agency:** The **Ministry of Ayush** coordinates all IDY celebrations and policy implementations in India.
- IDY Logo:** Features folded hands (union of consciousness) with elements representing Earth (brown leaves), Nature (green leaves), Water (blue), Fire (brightness), and the Sun (energy)

Evolution of Yoga

- Philosophical Roots:** Yoga is one of the **six orthodox (Astika) schools** of Indian philosophy (along with Nyaya, Vaisheshika, Sankhya, Mimamsa, and Vedanta).
- Etymology:** Derived from the Sanskrit root '**Yuj**', meaning to join or unite (individual consciousness with Universal Consciousness).
- Indus Valley Origin:** The earliest historical evidence is the **Pashupati Seal** (c. 2700 B.C.), depicting figures in traditional yogic postures.
- Classical Development:**
 - Patanjali** systematically compiled yogic knowledge, introducing **Ashtanga Yoga** (the Eight Limbs).
 - The **Bhagavad Gita** categorizes paths to liberation into Bhakti Yoga, Jnana Yoga, and Karma Yoga.
- Medieval Texts:** The **Hatha Yoga Pradipika** (15th Century CE) was authored by Yogi Swatmarama, focusing on physical preparation for higher meditation.

Strategic and Economic Initiatives

- **Countering Dominance:** India leverages Yoga and Ayurveda to strategically counterbalance China's push for Traditional Chinese Medicine (TCM).
- **Institutional Anchoring:** The **WHO Global Centre for Traditional Medicine** has been established in **Jamnagar, Gujarat**.
- **Medical Value Travel (MVT):** The Ministry of AYUSH executes the **"Heal in India"** blueprint to scale India's wellness market, supported by the Ministry of Home Affairs via dedicated **E-Tourist Visas**.

6.4. RAKHIGARHI EXCAVATIONS: INSIGHTS INTO THE LARGEST INDUS VALLEY METROPOLIS

Context:

- The Archaeological Survey of India (ASI) has officially transferred human skeletal remains excavated from Rakhigarhi to the Anthropological Survey of India (AnSI). This collaboration aims to conduct advanced DNA and scientific studies to understand the ancestry, environment, and lifestyle of the Indus Valley Civilization.



Location and Status

- **Geography:** Located in Hisar district, Haryana, along the dried Ghaggar-Hakra (Sarasvati) river plain.
- **Largest Settlement:** Spreading across 550 hectares, it is officially recognized as the **largest known settlement** of the Harappan Civilization, surpassing Mohenjodaro, Harappa, and Dholavira.
- **Chronology:** The site shows continuous habitation across three stages: the Early, Mature (2600–1900 BCE), and Late Harappan periods.

DNA Findings and Ancestry

- **Mound 7 Discoveries:** Excavations at this dedicated burial plot yielded 56 skeletons, including a highly preserved 4,600-year-old female skeleton.
- **Indigenous Origin:** Genomic analysis of these remains revealed a complete **absence of the "steppe pastoral" (Indo-Aryan) gene** and ancient Iranian farmer ancestry. This crucial finding refutes earlier migration theories and points to a distinct, indigenous origin for the Harappan people.

Urban Architecture and Economy

- **Town Planning:** The settlement features mud and burnt-brick houses with highly efficient drainage and sanitation systems.
- **Class Divisions:** Excavations at Mound 3 revealed an aristocratic settlement with prominent burnt-brick structures.
- **The Granary:** A prominent mud-brick granary with seven rectangular chambers and traces of decomposed grains was discovered.

- **Trade and Lapidary:** A flourishing trade economy is evident from the discovery of steatite beads, standardized weights, fish hooks, and a rich "toy culture".

Rituals and Artefacts

- **Ceremonial Practices:** Evidence of complex rituals includes the discovery of **triangular fire altars** and designated areas indicating animal sacrifices.
- **Unique Seals:** A notable discovery is a seal depicting an **alligator symbol** accompanied by five Harappan letters.

Heritage Development

- **Global Museum:** Following an MoU signed in 2022, Rakhigarhi is being developed to host the **world's largest museum** dedicated exclusively to Harappan culture.
- **Endangered Status:** In 2012, the Global Heritage Fund recognized Rakhigarhi as one of the ten most endangered heritage sites in Asia.

6.5. KHEER BHAWANI MELA 2026: A CONFLUENCE OF HERITAGE AND HARMONY IN KASHMIR

Context:

- In 2026, a record number of displaced Kashmiri Pandits gathered at the Mata Kheer Bhawani temple in Tulmulla, Ganderbal, to celebrate the Jyeshtha Ashtami festival. Facilitated by improved security conditions and welcomed by the local community, this historic pilgrimage highlights the enduring communal harmony and cultural revival in the Kashmir Valley.



The Kheer Bhawani Mela: Cultural Significance

- **Primary Deity:** The festival is dedicated to the highly revered **Mata Ragnya Devi**, locally known as Kheer Bhawani.
- **Occasion:** The annual pilgrimage is strictly observed by Kashmiri Pandits on the auspicious day of **Jyeshtha Ashtami**.
- **Scale and Symbolism:** It is recognized as one of the largest Hindu religious gatherings in the region, second only to the Amarnath Yatra. Over the decades, the mela has evolved into a prominent symbol of communal brotherhood and fraternity in Kashmir.

Architectural and Geographical Features

- **Geographical Location:** Situated in the Tulmulla village of the Ganderbal district, northeast of Srinagar.
- **The Sacred Spring (*Syendh*):** The temple premises enclose a septa-gonal (seven-sided) spring. This spring is famous for its distinct phenomenon of changing colors—displaying hues of red, pink, orange, green, blue, and white.
- **Unique Deity Placement:** A lofty chamber built on an island within the spring houses both a revered goddess idol and a Shiva linga. This amalgamation is a unique characteristic of this sacred site.

Patronage and Construction:

- The original temple was constructed by Dogra ruler **Ranbir Singh** (1830-1885).
- The current structure and temple pond were established in the 1910s by **Maharaja Pratap Singh**, with further renovations executed by **Maharaja Hari Singh**.

Historical and Literary References

The site holds deep antiquity and is documented in several ancient and medieval texts:

- **Kalhana's Rajtarangini:** Explicitly mentions the sacred spring of "Tula Mula," noting its geographical location in a marshy area that was once engulfed by ancient floods.
- **Ain-i-Akbari:** Authored by Abu'l-Fazal during the Mughal era, it provides geographical details, describing the Tula Mula area as spanning a hundred bighas that would sink into marshlands during summer.
- **Bhriгу Samhita:** The ancient astrological text also features references to the sanctity of Kheer Bhawani.

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UPSC PRELIMS PRACTICE QUESTIONS

Q. With respect to the Kheer Bhawani Mela, consider the following statements:

- I. It is an annual pilgrimage dedicated to the worship of Goddess Ragnya Devi, whose principal shrine is situated over a sacred hexagonal spring in the Kashmir Valley.
- II. The architectural construction of the current temple edifice surrounding the sacred spring was historically commissioned by the medieval Shah Miri dynasty.

Which of the statements given above is/are correct?

- (a) I only
- (b) II only
- (c) Both I and II
- (d) Neither I nor II

Ans. (a)

Explanation:

Statement I is correct: The Kheer Bhawani Mela is a highly revered annual festival dedicated to the Vaishnavite deity **Goddess Ragnya Devi**. The principal temple at Tulmulla is uniquely constructed over a **sacred hexagonal natural spring**, which is central to the ritualistic offerings of milk and rice pudding (kheer).

Statement II is incorrect: The present architectural edifice of the Kheer Bhawani temple was not commissioned by the Shah Miri dynasty. It was historically constructed under the patronage of the **Dogra monarch Maharaja Pratap Singh** in 1912, and the surrounding infrastructure was later developed by Maharaja Hari Singh

Q. With reference to the "Dancing Girl" figurine of the Indus Valley Civilization, consider the following statements:

1. It was discovered from Mohenjo-daro in present-day Pakistan.

2. The figurine is made of bronze using the Lost-Wax Casting Technique.
3. It belongs to the Mature Harappan period and is dated to around 2500 BCE.
4. It was discovered by Sir John Marshall in 1922.

Which of the statements given above are correct?

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

Ans. (a)

Explanation:

- **Statement 1 is correct:** The Dancing Girl was discovered at **Mohenjo-daro** (Sindh, Pakistan).
- **Statement 2 is correct:** It is a **bronze sculpture** made using the **Lost-Wax Casting Technique**.
- **Statement 3 is correct:** It belongs to the **Harappan Civilization** and is dated to around **2500 BCE**.
- **Statement 4 is incorrect:** Mohenjo-daro was discovered in **1922 by R. D. Banerji (Rakhal Das Banerji)**, not Sir John Marshall.

Q. With respect to the International Day of Yoga and its historical evolution, consider the following statements:

- I. The UN General Assembly adopted the resolution to celebrate the International Day of Yoga under the "Global Health and Foreign Policy" agenda.
- II. Yoga is recognized as one of the heterodox (Nastika) schools of ancient Indian philosophy.

III. The Ministry of Health and Family Welfare is the designated nodal agency for coordinating IDY celebrations in India.

Which of the statements given above is/are correct?

- (a) I only
- (b) I and II only
- (c) II and III only
- (d) I, II and III

Ans. (a)

Explanation:

Statement I is correct: In 2014, the UN General Assembly adopted an India-led resolution under the "Global Health and Foreign Policy" agenda to officially declare June 21 as the International Day of Yoga.

Statement II is incorrect: Yoga is classified as one of the six **orthodox (Astika)** schools of Indian philosophy, which accept the authority of the Vedas, alongside Nyaya, Vaisheshika, Sankhya, Mimamsa, and Vedanta.

Statement III is incorrect: The **Ministry of Ayush** is the apex nodal agency responsible for coordinating the International Day of Yoga celebrations and related wellness initiatives in India, not the Ministry of Health and Family Welfare.

Q. With respect to the archaeological site of Rakhigarhi, consider the following statements:

- I. It is the largest known settlement of the Indus Valley Civilization, located in the Ghaggar-Hakra river plain.
- II. Recent DNA analysis of skeletal remains from the site confirmed the presence of the

steppe pastoral gene among the Harappan people.

III. The site features evidence of triangular fire altars and a seal depicting an alligator symbol.

Which of the statements given above is/are correct?

- (a) I and II only
- (b) II and III only
- (c) I and III only
- (d) I, II, and III

Answer: C

Explanation:

- **Statement I is correct:** Rakhigarhi, located in Hisar, Haryana, along the Ghaggar-Hakra river plain, is officially the **largest known settlement** of the Harappan civilization, surpassing sites like Mohenjodaro and Harappa.
- **Statement II is incorrect:** Genomic analysis of the skeletal remains revealed the **absence of the "steppe pastoral" gene** and ancient Iranian farmer ancestry, pointing to a distinct, indigenous origin rather than confirming an external migration.
- **Statement III is correct:** Archaeological excavations at the site have uncovered distinct ceremonial practices, including **triangular fire altars**, and a unique seal depicting an **alligator symbol**.



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