



ENSURE IAS

Current Affairs Total (CAT)

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A. POLITY & GOVERNANCE

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1. New flag and insignia of the Supreme Court

1. In September 2024, the **President Droupadi Murmu** unveiled the **new flag and insignia of the Supreme Court**, marking **75 years since its establishment** (26th January 1950).
 - a. The unveiling took place at the **National Conference of District Judiciary** in New Delhi.
2. Also, the PM Modi released a **commemorative postage stamp** celebrating **75 years of the Supreme Court of India**.
3. **New Flag Features:** The **new flag is blue in colour** and prominently features:
 - a. **Ashoka Chakra:** Symbol of India's sovereignty and justice.
 - b. **Supreme Court building:** Representing the institution's physical presence.
 - c. **Book of the Constitution of India:** Central to India's legal foundation.
4. **New Insignia Details:**
 - a. The insignia includes the **inscription "Supreme Court of India."**
 - b. The phrase "**Yato Dharmastato Jayah**" (**in Devanagari script**), translating to "Where there is Dharma, there is victory," or "Victory lies where Dharma (righteousness) prevails" reflects the court's commitment to justice.
 - c. Conceptualized by the **National Institute of Fashion Technology (NIFT), Delhi**.
 - d. The flag is available in multiple designs like cross table flat, single table flag, pole flag, and wooden frame.

Key Highlights of the Supreme Court's 75-Year Journey

1. **Role of Judiciary in Strengthening Democracy:** The judiciary has safeguarded democracy and liberal values since independence.

- a. It acts as the **guardian of the Constitution**, **protector of marginalized rights**, and a **counter-majoritarian institution**.

Evolution of Supreme Court: Four Phases

1. **First Phase (1950-1967): Judicial Restraint**
 - a. **Judicial Review:** The judiciary followed a conservative approach, strictly interpreting the Constitution without overstepping and exercised judicial review to check legislative actions without overstepping its boundaries.
 - b. **Avoiding Ideological Influence:** It avoided government ideologies, e.g., in the **Kameshwar Singh case (1952)**, declaring zamindari abolition illegal but respecting Parliament's constitutional amendments.
 - c. **Respect for Legislative Supremacy:** The judiciary upheld legislative decisions in cases like **Champakam Dorairajan, 1951**, striking down reservations but avoiding direct conflict with Parliament.
2. **Second Phase (1967-1976): Judicial Activism and Confrontation**
 - a. **Expansion of Fundamental Rights: The Golak Nath judgment (1967)** limited Parliament's power, asserting that **Fundamental Rights cannot be abridged** (take away), marking a shift towards **judicial activism**.
 - b. **Basic Structure Doctrine:** In the **Keshavananda Bharati case (1973)**, the SC introduced the '**basic structure**' doctrine, limiting Parliament's power to amend the Constitution, leading to conflict with the executive.
 - c. **Emergency Impact:** During the national emergency, judicial independence suffered in the **ADM Jabalpur vs. Shivkant Shukla case (1976)**, where the SC supported the **suspension of the right to life**, exposing the judiciary's vulnerability.





3. Third Phase (1978-2014): Judicial Activism and Public Interest Litigation (PIL)

- a. **Post-Emergency Course Correction:** The judiciary aimed to restore its independence after the Emergency. The **Maneka Gandhi case (1978)** expanded the interpretation of **Article 21**, broadening the scope of life and personal liberty.
- b. **Rise of PILs:** Cases like **Hussainara Khatoon (1979)** allowed public-spirited individuals to **file petitions on behalf of marginalized groups**, increasing access to justice.
- c. **Judicial Activism in Action:** PILs addressed various issues, including human rights, environmental protection, and governance.
- d. **Collegium System:** To maintain autonomy, the judiciary introduced the collegium system for judge appointments, which faced challenges from the **National Judicial Appointments Commission Act (2014)** but was struck down to protect judicial independence.

4. Fourth Phase (2014-Present): Liberal Interpretation

- a. **Liberal Interpretation of the Constitution:** The Supreme Court upheld significant changes like the revocation of **Article 370**, ensuring **full integration of Jammu & Kashmir into the Indian Union**.
- b. **Sustaining Judicial Activism:** Despite criticisms, the judiciary continued its activism, such as invalidating the **opaque electoral bonds scheme** and **protecting constitutional rights**.
- c. **Important Verdicts:** In 2018, the Supreme Court struck down **Section 497 of the IPC (criminalizing adultery)** as it violated **Article 14**.

Dominance of Special Leave Petitions (SLPs): Majority of cases are SLPs, affecting focus on constitutional and writ cases. <ul style="list-style-type: none"> • Under Art. 136, the aggrieved party is provided a special permission to be heard in Apex Court, in appeal against the order or judgment of any court or tribunal in the territory of India, when any substantial question of law is involved or gross injustice has been done. 	Promote Alternative Dispute Resolution Mechanisms: Encourage arbitration to reduce the burden on the Supreme Court.
Selective Prioritization of Cases: Some cases are fast-tracked while others face delays, leading to perceptions of bias.	Transparent Case Listing: Develop a transparent protocol for prioritizing cases and public tracking through the Supreme Court Portal.
Judicial Evasion: Important cases, like Aadhaar and electoral bonds, are avoided or delayed.	Clarify Institutional Goals: Set clear priorities through Judicial Performance Evaluation to prevent evasion of key cases.
Conflict of Interest and Integrity: Allegations of corruption and potential conflicts of interest undermine public confidence.	Strengthen Accountability Mechanisms: Establish an Independent Judicial Accountability Commission to monitor judicial conduct.
Concerns of Appointment of Judges: Collegium system faces criticism for lack of transparency in judge appointments.	All India Judicial Recruitment: Implement a national judicial recruitment process to ensure transparency and quality across all levels.

Challenges and Solutions

Challenges	Solutions
Volume of Pending Cases: Over 82,887 cases are pending in the Supreme Court alone (as of August 31, 2024, according to the National Judicial Data Grid).	Case Management Reforms: Use e-Courts Project to digitize operations and improve case management.



Black Coat Syndrome in Courts

1. During the National Conference of District Judiciary, in an address highlighting delays in justice delivery, President Droupadi Murmu used the term “Black Coat Syndrome” to describe the anxiety experienced by ordinary citizens in court settings.
2. This term draws a parallel with “White Coat Hypertension,” where individuals experience elevated (increase in) blood pressure in medical settings due to anxiety.

Reasons for the Perception of “Black Coat Syndrome”

1. **High Pendency of Cases**
2. **Frequent Adjournments:** These cause significant mental and financial strain, particularly for individuals traveling from rural areas to courts.
3. **Issues with District Judiciary**
 - a. **Lack of female-friendly infrastructure** (only 6.7% of court infrastructure at the district level is designed to be female-friendly).
 - b. District-level courts play a crucial role in shaping public perception of the judiciary, making improvements at this level vital.

2. One Nation One Election

1. The concept of “One Nation, One Election” (ONOE), recently gaining momentum in India, proposes holding simultaneous elections for the **Lok Sabha, State Legislative Assemblies, and local bodies**. This move aims to address various challenges associated with frequent elections.
2. In September, 2024 the Union Cabinet has accepted the recommendations of the **High-Level Committee on Simultaneous Elections**, chaired by former President Ram Nath Kovind.

About Simultaneous Elections

1. **Simultaneous Elections (popularly known as One Nation, One Election:ONOE)** means holding elections to the House of the People, all the State Legislative Assemblies, and local bodies i.e., Municipalities and Panchayats, together.
 - a. **Importantly**, simultaneous elections do not mean that voting across the country for all elections needs to happen on a single day.

- b. India successfully conducted simultaneous elections in 1951-52, 1957, 1962, and 1967. This practice was disrupted due to premature dissolutions of Assemblies and the Lok Sabha in the late 1960s and early 1970s.

Need for Simultaneous Elections

1. **Governance and Development:** Frequent elections hinder development programs due to the **Model Code of Conduct (MCC)**, impacting economic growth and investment decisions. Simultaneous elections
 - Model Code of Conduct is a **set of guidelines issued by the Election Commission of India** for the conduct of political parties and candidates during elections. Model code of conduct consists of seven sections which deal with **general conduct, meetings, processions, party in power, polling booth, polling day and election manifestos**. It also **prevents the ruling party from misusing its position** during elections. It prohibits using government resources for **campaigning, bans public fund propaganda, and disallows new schemes, grants, or appointments** to influence voters.
2. **Financial Burden:** Holding separate elections for different tiers of government incurs significant expenditure. ONOE would reduce this financial burden considerably.
3. **Human Resource Diversion:** Elections require the deployment of security forces and election officials, often diverting them from their primary duties. ONOE would minimize this disruption.
4. **Reduced Burden on Courts:** Fewer elections would lead to fewer election-related disputes, easing the workload on the judiciary.
5. **Curbing Identity Politics:** Frequent elections can exacerbate identity politics, potentially causing social divisions. ONOE could help mitigate this issue.
6. **Enhanced Voter Participation:** “Voter fatigue” associated with frequent elections can lead to lower voter turnout. ONOE could encourage higher participation.

Challenges and Complexities

1. **Constitutional challenges :**
 - a. The Indian Constitution currently mandates that both the Lok Sabha and state assemblies must





serve five-year terms, unless dissolved earlier. **If a government collapses mid-term, this could disrupt the synchronized election cycle .**

- b. Key challenge for implementing One Nation, One Election is that currently, state assemblies have different election cycles. To synchronize them, **some assemblies’ terms would need to be either curtailed or extended**, raising legal and political concerns about fairness and representation.
- 2. **Overshadowing Regional Issues:** National issues may dominate the discourse during simultaneous elections, potentially sidelining regional concerns.
- 3. **Impact on Regional Parties:** ONOE could give national parties an advantage over regional parties.
- 4. **Political Accountability:** Fixed terms under ONOE might reduce accountability compared to frequent elections.
- 5. **Federalism Concerns:** Constitutional amendments related to state assemblies can be implemented without state ratification, potentially undermining federal principles.
- 6. **Logistical Challenges:** Implementing ONOE requires significant resources, including EVMs and trained personnel.

Key Recommendations of the High-Level Committee

- 1. **Phased Implementation:**
 - a. **Phase 1:** Simultaneous elections for Lok Sabha and State Assemblies.
 - b. **Phase 2:** Local body elections within 100 days of general elections.
- 2. **Constitutional Amendments:**

For Simultaneous Elections, following articles must be amended:	
Article 82A	facilitate the synchronization of elections for Lok Sabha and state assemblies.
Articles 83(2) and 172(1)	concerning the duration of Houses of Parliament and State Legislatures.
Article 324A	related to simultaneous elections for local bodies.
Article 325	Need to be amended to allow the Election Commission to prepare a single electoral roll for all levels of government.

- 3. **Single Electoral Roll:** A single electoral roll to be prepared by the Election Commission of India (ECI)

in consultation with State Election Commissions, requiring **amendments to Article 325** and ratification by states.

- 4. **Logistical Arrangements:**
 - a. ECI to plan for EVMs/VVPATs, polling personnel, and security forces for Lok Sabha and Assembly elections.
 - b. State Election Commissions, in consultation with the ECI, to plan logistical requirements for local body elections.
- 5. **Implementation Group:** Formation of a dedicated group to monitor the execution of ONOE.

Back in 2018, Law commission report on Simultaneous Election highlighted:-

Problem in Election	Solution proposed by Law Commission
1. Election Cycle is long (5 years).	1. Election cycle can be reduced (holding elections twice in five years).
2. Every year some or other elections keep happening.	2. If Simultaneous Elections are not feasible at least all elections can be conducted in 1 calendar year.
3. Sometimes after No-Confidence Motion, no party is able to prove majority. It leads to further election.	3. There should be Constructive Vote of No-Confidence Motion. In this, ruling party can be ousted only if other party is able to form the government. Now no need for fresh election.
4. If no party secures majority and is not able to form government, again election may be required.	4. Opportunity should be given to largest or alliance to prove majority. This way election can be avoided.

Conclusion

While ONOE offers potential benefits in terms of efficiency and governance, careful consideration must be given to its implications for federalism, democratic principles, and political plurality. A balanced approach is crucial to ensure that the implementation of ONOE strengthens India’s electoral process while upholding its core constitutional values.



3. West Bengal’s anti-rape ‘Aparajita’ Bill

In response to the tragic rape and murder of a junior doctor at R G Kar Medical College and Hospital in Kolkata in August 2024, the West Bengal Assembly has unanimously passed the Aparajita Woman and Child (West Bengal Criminal Laws and Amendment) Bill, 2024. This Bill introduces severe penalties for rape and seeks to expedite the legal process.

Key Provisions of the Aparajita Bill 2024:

The Bill amends provisions of the Bharatiya Nyaya Sanhita 2023 (BNS), the Bharatiya Nyaya Suraksha Sanhita 2023 (BNSS), and the Protection of Children Against Sexual Offences Act 2012 (POCSO) in the state.

1. Capital Punishment for Severe Cases:

- a. The Bill proposes the **death penalty** for rape if the attack results in the victim’s **death** or a **permanent vegetative state**. For other cases, it mandates a **life sentence without parole**.
- b. Under BNS Laws, the penalties for rape are as follows: a fine and a minimum of 10 years imprisonment for rape; a minimum of 20 years imprisonment for gang rape, which may extend to life imprisonment; and a minimum of 20 years of rigorous imprisonment for rape resulting in the victim’s death or a vegetative state, with the possibility of life imprisonment or the death penalty.

2. Faster Investigation and Trials:

- a. **Investigations** must be completed within **21 days** of the initial report.
- b. Under **Bharatiya Nyaya Suraksha Sanhita 2023 (BNSS) laws**, the time limit for investigation and trial is **2 months** from the date of FIR.

- c. A senior **police officer** can extend this period by up to **15 days** if necessary.

3. Women Officers Leading Investigations:

- a. **Women officers** will lead investigations conducted by a **Special Task Force** dedicated to handling **sexual violence** cases.

4. Establishment of Fast-Track Courts:

- a. The Bill proposes setting up **specialized courts** to handle rape and sexual offence cases **quickly** and **effectively**.

5. Aparajita Task Force:

- a. A **Special Task Force** at the district level, led by a **Deputy Superintendent of Police**, will investigate rape and related **crimes** against women and children.

6. Amendments to Existing Laws:

- a. The Bill aims to amend parts of the **Bharatiya Nyaya Sanhita (BNS) 2023**, the **Bhartiya Nagarik Suraksha Sanhita (BNSS) 2023**, and the **Protection of Children from Sexual Offences (POCSO) Act, 2012**, to increase **punishments** and expedite legal procedures.

7. Penalties for Delays and Negligence:

- a. **Police** and **medical staff** who delay investigations or show negligence will face penalties, including possible **imprisonment**.

8. Protection of Victim Identity:

- a. The Bill includes strict penalties for unauthorized publication of **court proceedings** related to sexual offences, with imprisonment of **3 to 5 years**.

Criminal law in India is **regulated by both state and central governments**, as it falls under the **concurrent list** of the Constitution, enabling both levels to legislate on the subject.



West Bengal legislation versus Existing law		
Features	WB Bill	Existing law
Punishment for rape and murder	Death sentence if the victim dies or is left in a vegetative state	Under BNS, if rape results in the victim’s death or leaves her in a vegetative state, death penalty is only one of the punishments besides life term or minimum 20 years in jail





Fast-track courts	Establishment of special courts for cases of sexual violence	Under a centrally sponsored scheme, the department of justice provides funds to states for setting up fast track special courts for trial of cases relating to sexual offences
Probe deadlines	Investigation must be concluded within 21 days of the initial report	Under BNSS, investigation must be concluded within two months of the filing of FIR. For trial, it specifies framing of charge within 60 days from the first hearing and judgment within 30 days (maximum of 60 days) after arguments conclude
Disclosing victim's identity	Imprisonment of 3 to 5 years	2 years imprisonment and fine

Challenges Related to Aparajita Bill 2024?

- 1. Constitutional Validity:** The Aparajita Women and Child (West Bengal Criminal Laws Amendment) Bill, 2024 seeks to amend central laws, raising concerns about its constitutional validity and jurisdictional issues.
 - a.** Under Article 246 of the Indian Constitution, states have the authority to legislate on issues listed in the State List. However, the concurrent jurisdiction over criminal laws introduces complexity. If the bill overrides the central law, it needs a President's assent.
- 2. Unrealistic Timeframe:** Completing investigations within 21 days is a significant challenge given the complexity of rape cases and the existing backlog in the legal system.
- 3. Legal Challenges:** There have been many instances in which state amendments to central laws have been contested in Courts. For instance:
 - a. State of West Bengal v. Union of India (1964):** In this the Supreme Court invalidated the West Bengal Land Reforms Act, 1955, for conflicting with the central Land Acquisition Act, 1894, affirming Parliament's supremacy.
 - b. KK Verma v. Union of India (1960):** In this case the Supreme Court struck down the Madhya Pradesh Agricultural Produce Markets Act, 1958, for inconsistency with central laws.
 - i.** These cases underline the judiciary's stance on central legislation's supremacy over state amendments.

- 4. Implementation Challenges:** The Bill's effective implementation may face hurdles, requiring upgrades to law enforcement infrastructure and specialised training for police and judicial officers.
- 5. Overburdened Courts:** Indian courts face severe delays, with cases taking an average of over 13 years to resolve. This backlog could hinder timely trials following the expedited investigations.
- 6. Legal Rights of the Accused:** The legal framework guarantees the right to a fair trial for the accused, which can prolong the process through appeals and mercy petition

Other Similar State Laws to Curb Sexual Assaults on Women:

- Before West Bengal, the Andhra Pradesh (**Disha Bill**) and Maharashtra (**Shakti Bill**) Assemblies had passed laws prescribing the death penalty for rape by amending the criminal laws in force at the time.
 - a. The Disha Bill 2019** introduced the death penalty as punishment for the crimes of rape, including against a minor below 16 years of age, gang rape and for repeat offenders.
 - b. The Shakti Bill 2020** too introduced the death penalty in rape cases and provided shortened timelines for concluding the investigation and trial.
 - c. Neither Bills has received the mandatory assent of the President yet.**
- Earlier, the **Madhya Pradesh** (in 2017) and **Arunachal Pradesh** (in 2018) Assemblies introduced the death penalty for the rape or gangrape of a woman up to 12 years of age.



4. Govt sets up 23rd Law Commission for legal reforms

The President of India has approved the constitution of the 23rd Law Commission for a three-year term, commencing on September 1, 2024, and concluding on August 31, 2027.

Law Commission of India (LCI)

1. It is a non-statutory body constituted by a notification of the Ministry of Law and Justice.
2. **Aim:** Reform laws to maximize justice and promote good governance under the rule of law.
3. It conducts research and provides recommendations based on the defined Terms of Reference (ToRs).
4. First constituted in 1834 by the Governor-General under the Charter Act of 1833, chaired by Lord Macaulay.

Mandate

The primary mandate of the 23rd Law Commission is to comprehensively review the Indian legal system and recommend reforms to enhance its efficacy and relevance.

Composition

The Commission will be composed of:

- a. A full-time chairperson
- b. Four full-time members
- c. Ex-officio members (including Secretaries from the Department of Legal Affairs and the Legislative Department)
- d. Part-time members (not exceeding five)

Terms of Reference (ToR)

The 23rd Law Commission has been tasked with a broad range of responsibilities, including:

1. **Review/Repeal of Obsolete Laws:**
 - a. Identify and recommend the repeal of outdated and irrelevant laws.
 - b. Develop a Standard Operating Procedure (SOP) for the periodic review of existing laws, with a focus on simplification.
 - c. Suggest amendments to align laws with current economic needs.
2. **Law and Poverty:**
 - a. Examine the impact of laws on economically disadvantaged populations.

- b. Conduct post-enactment audits of socio-economic legislation to assess their effectiveness.

3. Review of Judicial Administration:

- a. Recommend measures to improve the efficiency of the judicial system, including the elimination of delays and the speedy clearance of case backlogs.
- b. Simplify judicial processes and harmonize rules across different High Courts.

4. Directive Principles of State Policy (DPSPs):

- a. Examine existing laws and suggest reforms to ensure the effective implementation of DPSPs.
- b. Promote legal reforms that help achieve the objectives outlined in the Preamble of the Constitution.

5. Gender Equality:

- a. Strengthen laws and suggest amendments to promote gender equality.

6. Revision of Central Acts:

- a. Revise Central Acts to remove anomalies and inequities.

7. Globalization and its Impact:

- a. Examine the impact of globalization on critical areas such as food security and unemployment.
- b. Recommend measures to protect the interests of marginalized groups in the face of globalization.

5. Report on Atrocities Against SCs and STs

1. In September 2024, the union government released a report under the **Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Act, 1989**.
 - a. It presents data on atrocities against **Scheduled Castes (SCs)** and **Scheduled Tribes (STs)** in 2022.

Key Findings of the Report

1. **Case Statistics:** There were around **51,650 cases** of atrocities reported against **Scheduled Castes (SCs)** and around **9,730 cases** against **Scheduled Tribes (STs)**.
2. Nearly **97.7%** of all cases of atrocities against **Scheduled Castes** in 2022 were reported from **13 States**, with **Uttar Pradesh, Rajasthan and Madhya Pradesh** recording the highest number of such crimes.





3. The majority of atrocities against **Scheduled Tribes (STs)** were also **concentrated in 13 states**, which reported **98.91%** of all cases in 2022.
4. **States with the Highest Incidents**
 - a. **For SCs: Uttar Pradesh:** 12,287 cases (23.78%); **Rajasthan:** 8,651 cases (16.75%); **Madhya Pradesh:** 7,732 cases (14.97%); **Bihar:** 6,799 cases (13.16%); **Odisha:** 3,576 cases (6.93%); **Maharashtra:** 2,706 cases (5.24%)
 - b. **For STs: Madhya Pradesh:** 2,979 cases (30.61%); **Rajasthan:** 2,498 cases (25.66%); **Odisha:** 773 cases (7.94%); **Maharashtra:** 691 cases (7.10%); **Andhra Pradesh:** 499 cases (5.13%)
5. **Charge Sheets and Investigations:**

SC-related cases	ST-related cases
<ul style="list-style-type: none"> • Charge sheets filed in 60.38% of cases. • 14.78% concluded with final reports due to false claims or lack of evidence. • Around 17,160 cases still under investigation by the end of 2022. 	<ul style="list-style-type: none"> • Charge sheets filed in 63.32% of cases. • 14.71% concluded with final reports. • Around 2,700 cases still under investigation by the end of 2022.

6. **Conviction Rates:** Conviction rate under the Act declined from **39.2% in 2020** to **32.4% in 2022**, highlighting a **worrying trend in judicial outcomes**.
7. **Infrastructure Deficiencies:** Out of **498 districts** in 14 states, only **194 districts** have special courts to expedite trials. States like **Uttar Pradesh** have not identified **atrocities-prone areas**, despite having the highest number of cases.
8. **Protection Cells:** SC/ST protection cells have been established in states such as **Andhra Pradesh, Assam, Bihar, Gujarat, Tamil Nadu**, and union territories like **Delhi, Jammu and Kashmir, Puducherry**.

Reasons for Crimes Against SC and ST Communities

1. **Caste Prejudice and Untouchability:** Deep-rooted caste systems continue to marginalize SC/ST communities, leading to **violence and discrimination** based on their caste identity.
2. **Land Disputes and Alienation:** Due to historical deprivation of land, SC/ST communities often face conflicts over land access, especially with dominant castes.
3. **Economic Marginalization:** Limited access to education and economic resources makes SC/ST groups more vulnerable to exploitation and violence.
4. **Social and Political Power Imbalance:** Dominant castes hold significant political and social influence, often escaping legal consequences for discrimination.
5. **Inadequate Law Enforcement:** While laws like the SC/ST Act exist, weak enforcement and bias within police and bureaucracy often prevent justice.
6. **Political Opportunism:** Politicians sometimes exploit caste tensions for electoral gains, worsening community divides and increasing conflict.

About Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Act, 1989

1. **Purpose:** Enacted to protect SCs and STs from caste-based violence and discrimination.
2. **Objective:** Aims to enforce **Article 15** and **Article 17** of the Constitution, protecting disadvantaged communities and addressing gaps in earlier laws like the **Protection of Civil Rights Act, 1955**.
3. **Rules and Implementation**
 - a. **Central Government Role:** Empowers the Central Government to **create rules for enforcement**.
 - b. **State Governments' Role:** State Governments and Union Territories are **responsible for implementation**, with support from the central authorities.

Key Provisions

1. **Offences:** Defines crimes such as physical violence, harassment, and social discrimination against SC/ST members as atrocities, with stricter punishments than the **Indian Penal Code, 1860** (now **Bharatiya Nyaya Sanhita (BNS)**).

Atrocities on Dalits, tribal people

The chart shows the States accounting for 97.7% of total cases of atrocities against members of Scheduled Castes during the year 2022.



2. **Anticipatory Bail: Section 18** prevents the use of anticipatory bail under **Section 438** of the **Code of Criminal Procedure (CrPC), 1973**.
 - a. The Bharatiya Nagarik Suraksha Sanhita, 2023 (BNSS) replaces **Section 438(1)** with **Section 482**, which has relaxed the conditions for granting anticipatory bail.
 - b. BNSS omits the factors that courts were required to consider when granting anticipatory bail, such as: nature and gravity of the accusation, applicant's antecedents and possibility of the applicant fleeing from justice
3. **Special Courts:** Requires setting up **Special Courts** for speedy trials and **SC/ST Protection Cells** at the state level, overseen by senior police officers.
4. **Investigations:** Investigations must be conducted by officers of the rank of **Deputy Superintendent of Police (DSP)** or higher, and must be completed within a specific timeframe.
5. **Relief and Compensation:** Provides victims with **financial compensation, legal aid, rehabilitation,** and support services.
6. **Exclusions:** The Act does not apply to crimes between members of SC and ST communities, meaning they cannot use the Act against each other.

Recent Amendments

1. **Amendment Act, 2015:** Expanded the list of offences to include actions like **manual scavenging, social ostracism, sexual exploitation,** and dedicating SC/ST women as **devadasis**.
 - a. Public servants who fail in their duties towards SCs and STs can also face imprisonment.
2. **Amendment Act, 2018:** Removed the requirement for approval from a **Senior Superintendent of Police (SSP)** before arresting an accused, allowing immediate arrests without prior clearance.

Judicial Rulings on the SC/ST (Prevention of Atrocities) Act, 1989

1. **Kanubhai M. Parmar v. State of Gujarat (2000):** The Gujarat High Court ruled that the Act does not apply to crimes between SC/ST members, as it was meant to protect them from external atrocities.

2. **Raj Mal v. Ratan Singh (1988):** The Punjab & Haryana High Court clarified that **Special Courts** under the Act are specifically for offenses under this law, separate from regular courts.
3. **Arumugam Servai v. State of Tamil Nadu (2011):** The Supreme Court ruled that insulting an SC/ST person constitutes an offense under the Act.
4. **Subhash Kashinath Mahajan v. State of Maharashtra (2018):** The Supreme Court ruled that the **bar on anticipatory bail is not absolute**, allowing courts to grant bail if allegations seem baseless.
5. **Shajan Skaria v. The State of Kerala (2024):** The Supreme Court clarified that not every insult or intimidating remark against an SC/ST individual qualifies as an offense under the Act.

How Can We Improve Protections for SC/ST Communities?

1. **Strengthening Legal Framework:** Improve infrastructure for **special courts** to ensure timely trials and convictions. Increase the number of trained personnel to handle SC/ST cases sensitively.
2. **Improving Reporting Mechanisms:** Develop better systems for reporting and monitoring atrocities, allowing victims to report without fear of retribution.
3. **Awareness and Education:** Launch awareness campaigns to inform communities about SC/ST rights and legal protections under the Act.
4. **Targeted Interventions:** Identify **atrocidity-prone districts** and implement measures to address the root causes of caste-based violence.
5. **Monitoring and Evaluation:** Establish a framework to assess the effectiveness of interventions, ensuring accountability and continuous improvements.
6. **Collaboration with NGOs:** Work with NGOs and civil society organizations to support victims, advocate for their rights, and ensure their voices are heard in policy-making.

6. Bombay High Court Strikes Down IT Rules Amendment on Fact-Checking Units

1. In a significant ruling, the Bombay High Court struck down the 2023 amendment to Rule 3 of the IT Rules, which mandated the establishment of Fact-Checking Units (FCUs).



2. This verdict was delivered in the *Kunal Kamra vs Union of India case (2024)* and has important implications for online freedom of speech and expression in India.

Background

- The **2023 amendment to the IT (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021**, empowered the government to identify and flag “fake news” related to its activities on social media platforms.
- This identification was to be carried out by FCUs, and social media intermediaries were obligated to take down flagged content.
- Non-compliance could lead to legal action against intermediaries and the loss of their safe harbor protection.
- Earlier, in 2023, the Supreme Court had stayed the Centre’s notification establishing an FCU within the Press Information Bureau (PIB).

Key Observations of the Bombay High Court

The High Court’s decision to strike down the amendment was based on several key observations:

- Ultra Vires:** The amendment was deemed to be *ultra vires* (beyond the legal power or authority) of the IT Act, 2000, exceeding the scope of the original legislation.
- Violation of Fundamental Rights:** The court held that the amendment violated fundamental rights guaranteed under Articles 14 (Equality before Law), 19(1)(a) (Freedom of Speech and Expression), 19(1)(g) (Freedom to practice any profession), and 21 (Right to Life and Personal Liberty) of the Indian Constitution.
- Vagueness:** The amendment lacked clarity in defining “fake” or “misleading” news, creating ambiguity and potential for misuse.
- Absence of “Right to Truth”:** The court emphasized that the State does not have a responsibility to ensure only government-approved information is circulated, especially in the absence of a legally recognized “right to truth.”
- Disproportionate:** The amendment failed the “test of proportionality,” meaning the restrictions imposed on online speech were excessive in relation to the stated objective of combating fake news.

Implications

This ruling is a significant victory for proponents of free speech online. It underscores the importance of upholding fundamental rights in the digital age and highlights the judiciary’s role in checking potential overreach by the government in regulating online content. The decision also raises important questions about the definition of “fake news” and the role of the state in combating misinformation.

Test of Proportionality

Measures to restrict Fundamental Rights must satisfy the following:

- Legitimacy:** Evaluates if the law serves a valid government objective.
- Suitability:** Checks if the law effectively addresses that objective.
- Necessity:** Considers whether the law is essential, or if less restrictive alternatives are available.
- Balancing:** Weighs the benefits of the law against the rights it may infringe upon.

7. Rights of Detenu in Preventive Detention

Understanding Preventive Detention

Preventive detention allows authorities to detain individuals without trial to prevent potential future offenses that could threaten public order or national security. This power is granted under Article 22(3) of the Indian Constitution. However, to safeguard against arbitrary detention, the Constitution provides certain safeguards under Article 22(5).

Laws for Preventive Detention in India

Several laws in India empower authorities to detain individuals preventively:

- National Security Act, 1980:** This act allows for preventive detention if the government believes a person may act in a manner prejudicial to:
 - the defense of India,
 - the relations of India with foreign powers, or
 - the security of India.
- Unlawful Activities (Prevention) Amendment Act, 1967:** This act enables preventive detention to prevent individuals from engaging in unlawful activities that threaten the integrity and sovereignty of India.



3. Conservation of Foreign Exchange and Prevention of Smuggling Activities Act (COFEPOSA), 1974: This act allows for preventive detention to prevent smuggling activities and violations of foreign exchange regulations.

4. Prevention of Black marketing and Maintenance of Supplies of Essential Commodities Act (PBMSECA), 1980: This act empowers authorities to detain individuals involved in black marketing and hoarding of essential commodities, ensuring their availability to the public.

Jaseela Shaji vs Union of India Case (2024)

This landmark Supreme Court case reinforced the rights of individuals detained under preventive detention, emphasizing the importance of effective representation. The court highlighted that any failure or delay in providing the grounds and supporting documents for detention hinders the detenu's ability to challenge their detention, violating their rights under Article 22(5).

Key Rights of Detenu

- 1. Right to Information:** The detaining authority must promptly inform the detenu about the grounds for their detention. This includes providing access to all relevant documents relied upon for the detention order.
- 2. Right to Representation:** The detenu must be given the earliest opportunity to make a representation against the detention order. This ensures that the detention is not arbitrary and allows for a legal challenge.
- 3. Timely Review:** No preventive detention can exceed three months unless an Advisory Board approves it. This safeguard prevents indefinite detention without due process.

Constitutional Safeguards

The Supreme Court, in the Jaseela Shaji case, underscored the importance of upholding these constitutional safeguards. The court stressed that authorities must act diligently and avoid unnecessary delays in communicating the grounds of detention and providing access to relevant documents. Any delay in considering the detenu's representation is a violation of their fundamental rights.

Conclusion

While preventive detention is a necessary tool for maintaining public order and national security, it must be exercised with utmost caution and respect for individual liberty. The Supreme Court's pronouncements

in the Jaseela Shaji case serve as a crucial reminder of the importance of upholding the rights of detenus and ensuring that preventive detention is not misused.

8. Himachal Pradesh: Raising marriage age for women from 18 to 21

Prohibition of Child Marriage (Himachal Pradesh Amendment Bill 2024) proposes to amend The Prohibition of Child Marriage Act, 2006 and related acts in the State.

1. Earlier, in June 2024, a Central bill '**Prohibition of Child Marriage (Amendment) Bill, 2021**' lapsed in Lok Sabha which aimed to bring uniformity in the age of marriage for men and women.
2. 2021 Bill was based on **recommendations of Jaya Jaitley Committee**

Benefits of Raising age of Marriage for Women

- 1. Secure Constitutional mandate of Gender Equality:** Age for marriage for men is 21 years
- 2. Reproductive Health:** improved physical and psychological health through lower maternal mortality rate, bringing down teenage pregnancies
- 3. Women Empowerment :** Better education and employment outcomes
- 4. Helps in achieving SDG5 (Gender Equality), SDG10 (Reduced Inequalities).**

Concerns

- 1. Illegal Marriages:** May push a portion of the population into non-institutional marriages
- 2. Negatively impact marginalized communities** with high prevalence of marriage at lower ages
- 3. Misuse by Parents:** to control daughter's choice, may give rise to meta-son preference, female foeticide.
- 4. Does not address the social and cultural patriarchal norms**

Other steps that can be taken

- 1. Formalisation of Sex education** in the school curriculum
- 2. Formulation of specific programmes** for girl's health and nutrition

Historical perspectives related to age of marriage in India

- 1. The Child Marriage Restraint Act, 1929/(Sarda Act):** Fixed marriage age for girls at 14 years and 18 years for boys.
- 2. Prohibition of Child Marriage Act, 2006:** Replaced 1929 Act to prohibit solemnisation of child marriages raising age to 18 for bride and 21 for groom.

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B. INTERNATIONAL RELATIONS

1. PM Modi's U.S. Visit And Wilmington Declaration

1. In September 2024, **PM Modi's 3-day visit to the United States** highlighted a new phase in India-U.S. relations.
2. **The visit focused on 3 key themes -**
 - a. **Quad Leaders' Summit:** On September 21, 2024, the leaders of **Australia, India, Japan, and the United States** met for the **4th in-person Quad Leaders' Summit** in **Wilmington, Delaware**.
 - i. Over the past 4 years, Quad Leaders have met 6 times, including twice virtually.
 - ii. India will host the 2025 Quad Leaders' Summit.
 - b. **India-US Bilateral Meeting:** Discussions with President Joe Biden focused on enhancing India-U.S. relations through trade, defense, and technology.
 - c. **UN Summit of the Future:** Global issues, including the Ukraine conflict, were discussed, reinforcing India's stance on international peace and cooperation.

What is Quad?

1. Quad, or the **Quadrilateral Security Dialogue**, is a diplomatic alliance involving **Australia, India, Japan, and the United States**.
2. It aims to enhance **stability and prosperity in the Indo-Pacific region**, advocating for an **open, stable, and resilient environment**.
3. **"Quad-plus"** meetings have included countries like **South Korea, New Zealand, and Vietnam**, suggesting potential for expanding the partnership in the future.

Key Highlights of the 2024 Quad Leaders' Summit

Reiterating that the Quad remains a **"force for global good"**, the Leaders' Summit adopted the **'Quad Wilmington Declaration'** to take the agenda forward.

Key Announcements in the Declaration

1. **Health Security:** **'Quad Cancer Moonshot'**, a partnership to save lives in the Indo-Pacific region by **combating cervical cancer**.
2. **Quality Infrastructure:** **'Quad Ports of the Future Partnership'** which will harness the Quad's collective expertise to support sustainable port infrastructure development.
3. **Critical and Emerging Technologies:** A **'Semiconductor Supply Chains Contingency Network Memorandum of Cooperation'** to enhance resilience of Quad's semiconductor supply chains.
4. **Climate and Clean Energy:** Collective Quad effort to boost energy efficiency, including deployment and manufacturing of **high-efficiency affordable cooling systems** in the region.
5. **Space:** India's establishment of a **space-based web portal for Mauritius**, to support the concept of **open science** for space-based monitoring of extreme weather events and climate impact.
6. **Maritime Security:**
 - a. **'Maritime Initiative for Training in the Indo-Pacific (MAITRI)'** to maximize tools provided through Indo-Pacific Partnership for Maritime Domain Awareness (announced in 2022) and other Quad initiatives.
 - b. **'Quad-at-Sea Ship Observer Mission'** in 2025 to improve interoperability and advance maritime safety.

India-US Bilateral Meeting

1. During his official visit to the United States, **Prime Minister Narendra Modi met with President Joseph Biden on the sidelines of the Quad Summit in Wilmington, Delaware**. The visit marked the adoption of 2 significant documents.



- a. **Joint Fact Sheet** titled “**The United States and India Continue to Expand Comprehensive and Global Strategic Partnership,**” outlines the expanding cooperation between the 2 countries across various strategic areas.
- b. “**Roadmap for U.S.-India Initiative,**” focuses on building safe and secure global clean energy supply chains, highlighting both nations’ commitment to enhancing manufacturing capacities and ensuring energy security.

Key highlights of the India-US Joint Fact Sheet

Charting a Technology Partnership for the Future:

1. **New Semiconductor Fabrication Plant:** India and the US announced a partnership to set up a **semiconductor fabrication plant** focused on advanced sensing, communication, and power electronics, supporting national security, telecom, and green energy.
 - a. **Key Materials:** Named ‘Shakti’, the fab will concentrate on producing infrared, gallium nitride, and silicon carbide semiconductors, with support from the India Semiconductor Mission.
 - b. **Strategic Partners:** The project will be supported by the **India Semiconductor Mission** and strategic technology partnership between Bharat Semi, 3rdiTech, and the U.S. Space Force.
 - c. The facility will not only mark India’s 1st such plant but will also be among the world’s pioneering multi-material fabs focused on national security.
2. **GlobalFoundries (GF) Initiative:** GF will establish the **GF Kolkata Power Center** in Kolkata, to enhance R&D linkages in chip manufacturing for zero-emission vehicles, IoT devices, AI, and data centers.
3. **Joint Space Exploration Efforts:** NASA and ISRO aim to conduct 1st **joint scientific research onboard the International Space Station** by 2025.
4. **U.S.-India Global Challenges Institute:** Over the next five years, both governments will mobilize **\$90+ million** to support **high-impact R&D partnerships** between U.S. and Indian universities.
 - a. **Advanced Materials R&D Forum:** A new forum will promote collaboration between universities, national labs, and private sector researchers in both countries.

5. **Joint Funding for Emerging Technologies:** Selection of 11 funding awards in telecommunications, connected vehicles, and machine learning will receive **\$5+ million** in funding.
6. **Cooperation in AI, Quantum, and Critical Technologies:** The U.S. and India held their 2nd **Quantum Coordination Mechanism** meeting, with 17 new awards announced for R&D in AI and quantum.
 - a. **IBM Partnership:** IBM signed MOUs with India to use its **watsonx platform** on India’s **Airawat supercomputer**, boosting AI innovation and supporting the **National Quantum Mission**.

Powering a Next-Generation Defense Partnership:

1. **MQ-9B Aircraft Procurement:** US acknowledged India’s progress in procuring **31 MQ-9B remotely piloted aircraft (16 Sky Guardian and 15 Sea Guardian) from General Atomics**.
 - a. These aircraft will improve India’s intelligence, surveillance, and reconnaissance (ISR) across land, sea, and air.
2. **U.S.-India Defense Roadmap:** Both leaders praised ongoing projects under the **Defense Industrial Cooperation Roadmap**, including **collaborations on jet engines, munitions, and ground mobility systems**.
3. **Co-development of Unmanned Vehicles:** **Liquid Robotics** and **Sagar Defence Engineering** are teaming up to co-develop unmanned surface vehicles, enhancing undersea and maritime domain awareness.
4. **Security of Supply Arrangement (SOSA):** A new SOSA agreement will **strengthen the mutual supply of defense goods and services**.
5. **C-130J Super Hercules Agreement:** **Lockheed Martin** and **Tata Advanced Systems Limited** signed an agreement to establish a **Maintenance, Repair, and Overhaul (MRO) facility** for C-130J Super Hercules aircraft in India.
6. **INDUS-X Ecosystem:** Launched in 2023, the **India-U.S. Defense Acceleration Ecosystem (INDUS-X)** promotes collaboration across governments, businesses, and academia, with the 3rd summit held in Silicon Valley recently.



7. Strengthening Military Interoperability: India hosted the largest, most complex bilateral tri-service **TIGER TRIUMPH Exercise**, demonstrating enhanced military partnership and interoperability in the Indo-Pacific region.

8. Advancing Cooperation in Cyber and Space: A U.S.-India cyber engagement will focus on threat information sharing, cybersecurity training, and vulnerability mitigation in critical sectors like energy and telecommunications.

a. Advanced Domains Defense Dialogue: The 2nd U.S.-India dialogue in May 2024 included a defense space table-top exercise, marking the 1st bilateral engagement in space defense.

Catalysing the Clean Energy Transition:

1. U.S.-India Clean Energy Roadmap: India and the US launched an initiative to **strengthen safe, secure clean energy supply chains** through U.S. and Indian manufacturing.

a. Both nations will unlock **\$1 billion** in multilateral financing for projects in renewable energy, energy storage, power grids, high-efficiency cooling systems, zero-emission vehicles, and emerging clean technologies.

2. DFC and Private Sector Partnerships: The U.S. International **Development Finance Corporation (DFC)** partnered with India's private sector to diversify clean energy manufacturing.

3. Strategic Clean Energy Partnership (SCEP): It strengthened energy security, boosted innovation, and addressed climate change while creating employment opportunities and promoting industry-R&D partnerships.

4. Hydrogen and Energy Storage Initiatives: India will establish the **National Center for Hydrogen Safety** to enhance hydrogen safety.

a. Renewable Energy Technology Action Platform (RETAP): Collaboration on clean energy manufacturing and global supply chains, focusing on hydrogen and energy storage through public-private task forces.

5. Green Transition Fund: Administered by India's **National Investment and Infrastructure Fund (NIIF)** and **DFC** to encourage private sector investments in renewable energy and battery storage.

Empowering Future Generations and Promoting Global Health and Development:

1. Indo-Pacific Economic Framework for Prosperity (IPEF): India ratified agreements under IPEF's Pillar III, Pillar IV, and the overarching framework, advancing resilience, sustainability, inclusiveness, and economic competitiveness.

a. It's **14 partner countries** represent **40% of global GDP** and **28% of global trade** in goods and services.

2. U.S.-India Drug Policy Framework: A new policy framework, aims to curb synthetic drug production and trafficking while enhancing public health partnerships.

3. U.S.-India Cancer Dialogue: Inaugural Cancer Dialogue, held in August 2024, promoted R&D collaboration on cancer treatments.

a. Bio5 Partnership: Involving the **U.S., India, Japan, EU, and South Korea**, this partnership strengthens pharmaceutical supply chains.

4. MSME Collaboration: The **Ministry of MSME** signed an MoU with the U.S. Small Business Administration to promote global market access for small enterprises, especially women owned businesses from both the countries.

5. U.S.-India Agricultural Partnership: The U.S. Department of Agriculture and India's Ministry of Agriculture will collaborate on **climate-smart agriculture**, productivity growth, and regulatory innovation.

6. Global Digital Development Partnership: A U.S.-India initiative to deploy responsible digital technologies in Asia and Africa.

7. Triangular Development with Tanzania: Led by USAID and India's Development Partnership Administration, it promotes renewable energy in Tanzania and explores health cooperation for digital health and capacity building.

8. Cultural Property Agreement: A new bilateral agreement under the **1970 UNESCO Convention** aims to **prevent illicit trade in cultural artifacts**.

a. Antiquities Repatriation: In 2024, **297 Indian artifacts were returned** to India that had been stolen or trafficked from India from the U.S., demonstrating commitment to heritage preservation.



2. UN Summit of the Future and the Reform in UN Institutions

1. In Sept 2024, UN Secretary-General Antonio Guterres addressed the **UN Summit of the Future 2024**, emphasizing the need for immediate reforms in outdated UN institutions related to peace, security, and finance.
 - a. The Prime Minister of India also participated in the summit.

Key Highlights of the UN Summit of the Future

1. **Objective:** The UN Summit of the Future aims to **reform and strengthen global governance** to tackle modern challenges and **secure a sustainable future for future generations**.
 - a. It builds on recent UN efforts like the **2022 UN Environment Stockholm+50** and the **High Seas Treaty**.
 - b. **2022 UN Environment Stockholm+50** was held in 2022 to commemorate the 50th anniversary of **1972 United Nations Conference on the Human Environment**, which was the 1st to make the environment a global issue.
 - c. **The High Seas Treaty** establishes a legal framework to create marine protected areas in the high seas, which are areas of the ocean that aren't part of a country's territorial sea, exclusive economic zone, or internal waters.
2. **Theme:** "Multilateral Solutions for a Better Tomorrow."
3. **Outcome:** The summit concluded with the adoption of a key document, **A Pact for the Future**, which includes the **Global Digital Compact** and **A Declaration on Future Generations**.

Key Agreements

1. **Pact for the Future:** Focuses on speeding up progress on **Sustainable Development Goals (SDGs)** and implementing the **Paris Agreement** for climate action.
 - a. It includes commitments to transition from fossil fuels and work towards a peaceful and sustainable future.

2. **Global Digital Compact:** Promotes fair access to technology and ensures its benefits are shared globally.
 - a. **AI Governance:** Introduces the 1st universal agreement on the governance of **Artificial Intelligence (AI)**.
 - b. It advocates for establishing a **multidisciplinary Independent International Scientific Panel on AI** within the UN, ensuring representation from all regions.
 - c. The goal is to enhance scientific understanding by assessing AI's impacts, risks, and opportunities, leveraging existing research and initiatives (**SDG 17**).
3. **Declaration on Future Generations:** Encourages long-term thinking, urging leaders to consider the needs of future generations.
 - a. It commits to **nuclear disarmament**, regulating **autonomous weapons**, and preventing an **arms race in outer space**. This marks the 1st multilateral support for nuclear disarmament in over a decade.

India's Position at the Summit

1. **Call for UN Reform:** India advocated for reforms in the UN and Security Council, pushing for **expanded permanent membership**, including representation from **India and African nations**.
2. **New Conflict Areas:** The Indian Prime Minister highlighted **cyber, maritime, and space** as emerging conflict zones and urged for global frameworks to ensure security in these areas.
3. **Digital Governance and Cooperation:** India supported global digital governance and offered its **digital public infrastructure** for international collaboration.
4. **Support for Key Initiatives:** India endorsed the **Pact for the Future**, **AI governance frameworks**, and **digital cooperation initiatives** at the summit.

Why is the need for UN Reforms?

1. **Outdated Structure:** The UN was founded in 1945 with just 51 member states, but today there are **193 members**.
 - a. The global economy has grown over twelve times since 1945, while the financial system, designed during colonial times, remains outdated.



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2. **Global Disparities:** Developing nations face rising debt and inequalities that hinder sustainable development, showing that current global systems fail to meet today's needs.
 3. **Technological and Geopolitical Shifts:** Technological advances and changing global power dynamics expose the weaknesses of post-World War II institutions in tackling modern challenges like climate action, sustainable development, and economic disparities.
 4. **Legitimacy and Credibility Issues:** The Security Council's legitimacy is increasingly questioned. To maintain global peace and security, it must represent the will of all member states, not just the few permanent members.
 - a. Reform is crucial to boost the legitimacy of its decisions, as the permanent membership doesn't reflect today's geopolitical landscape.
 5. **Inequitable Representation:** Regions such as Asia, Africa, and Latin America are underrepresented in the Security Council. This imbalance weakens decision-making and raises concerns about fairness in representation.
 - a. A more equitable distribution of non-permanent seats is vital to addressing these disparities.
 6. **Financial and Administrative Reform:** The UN's financial sustainability is critical, especially as demands for peacekeeping and development rise.
 - a. Japan's proposal highlights the need to align financial contributions with member states' responsibilities, ensuring fair and proportional funding.
 - b. The international financial system, including the IMF, World Bank, and WTO, needs to better support developing nations struggling with debt and achieving the Sustainable Development Goals (SDGs).
 7. **Global Security Challenges:** Today's security landscape includes regional conflicts, terrorism, and humanitarian crises. A reformed Security Council is essential to address these issues effectively.
 2. **Increased Agility:** A more agile Peacebuilding Commission and revised peace operations will enable quicker responses to emerging global challenges.
 3. **Strengthened Financial Architecture:** Reforming the international financial system will better support developing countries in managing debt and advancing toward Sustainable Development Goals (SDGs).
 4. **Digital Governance:** The Global Digital Compact seeks to regulate artificial intelligence and digital technologies, ensuring their alignment with sustainable development and human rights.
 - a. It addresses the digital divide and cybersecurity concerns.
 5. **Youth Engagement:** The Pact for the Future encourages greater involvement of young people in decision-making, ensuring future generations' interests are considered.
 6. **Conflict Resolution:** New norms and accountability mechanisms will strengthen the multilateral system, helping manage geopolitical competition and improve conflict prevention and resolution.

How Does India Critique the United Nations?

1. **Ineffectiveness in Crisis Management:** India has pointed out that the UN Charter has failed to address key challenges like the COVID-19 pandemic, the Russia-Ukraine conflict, terrorism, and climate change.
 - a. India urges reforms to make the UN more relevant and responsive to current geopolitical realities.
2. **Veto Power Concerns:** India has criticized the disproportionate influence of the P-5 nations (U.S., U.K., France, Russia, China) due to their veto power.
3. **Charter Review:** India calls for a comprehensive review of the UN Charter, which still includes outdated references to former entities like the Soviet Union and classifies some nations as "enemy states."
 - a. India emphasizes the need to update the Charter to reflect modern international dynamics.
4. **Slow Reform Process:** India has expressed frustration over the slow progress of the Intergovernmental Negotiations (IGN) on UN reform, which began in 2008 but has not led to significant change.
 - a. India stresses the importance of making UN reform a global priority.

How Will UN Reforms Impact Global Governance?

1. **Enhanced Inclusivity:** The reforms aim to give a stronger voice to developing nations and underrepresented regions like Africa and Latin America. This could lead to more equitable decision-making in global governance.



3. India-US Signed SOSA

India and the US have signed a **Security of Supply Arrangement (SOSA) and Memorandum of Agreement (MoU) regarding the Assignment of Liaison Officers**, during the Defence Minister's visit to the US.

1. Security of Supply Arrangement (SOSA)

- a. **Promote national defence:** Governments to secure the mutual timely provision of **defence-related goods and services during peacetime, emergency, and armed conflict.**
- b. **Meet national security needs:** It would allow both countries to request each other for priority delivery of certain defence items.
- c. India is the **18th SOSA partner** of the US. It is **legally non-binding.**
- d. The US and India are negotiating a **binding Reciprocal Defence Procurement (RDP) Agreement.**

2. MOU on Assignment of Liaison Officers: Increase information-sharing between India and the US, and post-Indian armed forces officers in key strategic US Commands

- a. India will deploy the **first Liaison Officer** to the **US Special Operations Command** headquarters in Florida.

India-US cooperation milestones on defence

1. **The Framework for the US-India Defence Relationship (2015):** Formalized both countries' commitment to enhancing cooperation in the defence sector.
2. **The US designated India as a Major Defence Partner in 2016:** This led to India's 2018 elevation to **Strategic Trade Authorization tier 1 status**, granting **license-free access to various military and dual-use technologies.**
3. **The 2+2 meetings between India-US (2018):** The 2+2 meetings signify the participation of Ministers holding Foreign and Defence portfolios, from each of the two countries.
 - a. **Aim:** To build a stronger, more integrated strategic relationship in a rapidly changing global environment.

4. **The roadmap for defence industrial cooperation (2023):** Priority areas of cooperation included Intelligence, Surveillance, and Reconnaissance (ISR), Undersea Domain Awareness, Air Combat and Support, etc.

5. **The US-India Initiative on Critical and Emerging Technology (iCET) (2023):** To expand the strategic technology partnership and defence industrial cooperation.

- a. **INDUS-X:** Took forward the commitment to build a defence innovation bridge under iCET.

6. India and the US have signed four following foundational agreements:

- i. **General Security of Military Information Agreement (GSOMIA) in 2002:** To facilitate sharing of military information. An extension to GSOMIA, the Industrial Security Annex (ISA), was signed in 2019 to facilitate the exchange of classified information between the defence industries of the two countries.
- ii. **The Logistics Exchange Memorandum of Agreement (LEMOA) in 2016:** Established the basic terms, conditions, and procedures for reciprocal provision of logistic support, supplies, and services between the two militaries.
- iii. **Communications Compatibility and Security Agreement (COMCASA) in 2018:** Signed to secure military communication between the countries, facilitate access to advanced defence systems, and enable India to optimally utilise its existing US-origin platforms.
- iv. **Basic Exchange and Cooperation Agreement (BECA) in 2020:** Aimed to facilitate the sharing of military information including maps, nautical charts, and other unclassified imagery and data.

Significance of India-US defence cooperation

1. **Diversifying India's Defence Suppliers: Russia supplied 65% of India's weapons purchases of more than \$60 billion during the last two decades, according to the Stockholm International Peace Research Institute (SIPRI).**
 - a. E.G., SOSA allows India to diversify defence suppliers, reducing dependence on Russian equipment.



- 2. Intensifies the Indo-US strategic partnership:** The four 'foundational agreements' bring India closer to the US; give India access to advanced US intelligence information, etc.
- 3. Deepen military partnership and interoperability:** E.g., The Malabar exercises (India hosted Australia, Japan and U.S. forces in 2024) have provided a shared platform for **exchanging doctrines, refining training skills**, etc.
- 4. Counter China in the Indo-Pacific:** India's increasing role in shaping regional security by ensuring freedom of navigation, now especially as a member of the Combined Maritime Force (CMF).
- CMF is a **multi-national naval partnership to promote security, stability, and prosperity across** approximately 3.2 million square miles of **international waters**.
- 5. Access to advanced US defence technology:** E.g., India became the first non-treaty partner to be offered a MTCR Category-1 Unmanned Aerial System-the Sea Guardian UAS.
- 6. Industrial growth:** The growing synergies in defence ecosystems under the INDUS-X can help to diversify investment opportunities, high-potential start-ups, exposure to emerging defence markets, etc.

Challenges in India-US Defence cooperations

- Strategic Divergences:** India's ties with Russia (arms & oil purchases), and US relations with Pakistan create friction in the defence partnership.
 - Treat of US's **Countering American Adversaries Through Sanctions Act (CAATSA)** for procuring military hardware from Russia.
- Lack of technology transfer:** The US companies prefer arms sales over technology sharing.
- Regulatory Hurdles:** India's slow acquisition process and offset credit issues deter US firms.
- Indo-US defence partnership escalates tensions:** The closer Indo-US strategic partnership raises a regional security issue, as China sees it as a threat.
- Intellectual property concerns:** US has included India in the 'priority watch list' of countries for alleged problems related to IP protection and enforcement,

and has said there will be particularly intense bilateral engagement on the matter during the coming year.

Way forward

- Focus on interoperability:** Increase joint military exercises and training programs to improve interoperability between US and Indian forces.
- Expand intelligence sharing:** Deepen intelligence cooperation, particularly in areas of mutual concern such as counter-terrorism and regional security threats.
- Conclude the Reciprocal Defence Procurement (RDP) Agreement:** It promotes rationalisation, standardisation, interchangeability, and interoperability of conventional defence equipment with US allies and other friendly governments
- Conclude pending negotiations:** E.g., Negotiations are underway to manufacture GE F-414 jet engines in India for the LCA MK 2 fighters.
- Advance Multilateral Coordination:** Prioritise coordination in forums like the Quad and I2U2 (**India, Israel, the US, and the UAE**) to address international strategic issues.

Conclusion

India-US defence agreements mark a significant step forward, enhancing strategic ties, fostering technology sharing, and bolstering regional security through deeper cooperation and mutual commitment to shared goals.

4. India and Uzbekistan Sign Bilateral Investment Treaty (BIT)

- In September 2024, India and Uzbekistan have signed a **Bilateral Investment Treaty (BIT)** in Tashkent to enhance **economic cooperation** and promote a stronger, more resilient investment environment.
 - This agreement will increase **investor confidence** by providing a greater sense of security.
- The treaty guarantees **fair treatment and non-discrimination** for investors.
- It provides an option for **independent arbitration** to resolve disputes.
- Both countries retain the **right to regulate** in the public interest while maintaining **adequate policy space** without compromising investor protection.



What is Bilateral Investment Treaty (BIT)?

1. A **Bilateral Investment Treaty (BIT)** is a **reciprocal agreement** (both agree to help each other in a similar way) designed to protect investments made by nationals and companies from one country in the territory of another.
2. **India's new Model BIT text** was approved in 2015, replacing the earlier **1993 Model BIT**.
3. Since 2015, this **Model BIT** is used for negotiating and re-negotiating BITs and investment chapters of **Free Trade Agreements (FTAs)** and **Economic Partnership Agreements**.

India - Uzbekistan Relations

1. Uzbekistan is **India's key Partner** in the Central Asian Region.
2. **Historical Connection: Lal Bahadur Shastri**, India's 2nd Prime Minister, passed away in **Tashkent, Uzbekistan** in 1966, just hours after signing the **Tashkent Declaration**.
 - a. It ended the **Indo-Pakistani War of 1965** through a **ceasefire agreement**.
3. **Economic Relations: India is one of Uzbekistan's top 10 trade partners**, with bilateral trade reaching **USD 756 million**.
4. Indian investments in Uzbekistan total **USD 61 million**, covering sectors such as:
 - a. **Pharmaceuticals**
 - b. **Amusement parks**
 - c. **Automobile components**
 - d. **Hospitality industry**
5. **Trade Agreement Feasibility Study:** In 2019, both countries agreed to conduct a **feasibility study** for negotiating a **Preferential Trade Agreement (PTA)**.
6. **Security and Defense Cooperation:** India and Uzbekistan conducts the joint military exercise '**DUSTLIK**.'
7. **Multilateral Engagement:** Both countries cooperate in international forums such as the UN, G20, BRICS, and SCO.
8. **Energy Security:** India has signed a contract with Uzbekistan to supply uranium ore concentrates.
9. **People-to-People Ties:** Approximately 14,000 Indians reside in Uzbekistan.

5. India Elected to Steering Committee of GloBE Network

1. In September 2024, India has been elected to the **15-member steering committee** of the **Global Operational Network of Anti-Corruption Law Enforcement Authorities (GloBE Network)** during the plenary session held in **Beijing, China**.
2. It will **allow India** to influence global strategies against corruption and help to recover assets obtained through corrupt means.

What is GloBE Network?

1. The **Global Operational Network of Anti-Corruption Law Enforcement Authorities (GloBE Network)** originated as an initiative of the **G-20**, supported by India in 2020.
 - Officially launched in **June 2021**, during a special event at the **UN General Assembly Special Session against Corruption (UNGASS)**.
2. The network has **121 member countries including India** and **219 member authorities**.
3. It serves as a unique platform for agencies worldwide to **exchange best practices**, share **criminal intelligence**, and develop **strategies to fight corruption**.
4. The **steering committee** comprises a **chair**, a **vice-chair**, and **13 members**, who provide guidance and direction to the network.
5. The network is managed by its members and supported by the **United Nations Office against Drugs and Crime (UNODC)**, which acts as its secretariat.
6. In India, the **Ministry of Home Affairs (MHA)** is the central authority, with the **CBI** and **Enforcement Directorate (ED)** serving as member authorities.
7. **Role of India in the GloBE Network:** India will significantly influence the **global agenda against corruption, leveraging its expertise and experience**.
 - Participation aims to increase efforts against **cross-border financial crimes**.
8. During **India's G20 presidency 2023**, two **high-level principles** were adopted to combat corruption, focusing on utilizing the GloBE Network.

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Anti-Corruption Efforts

1. Global Initiatives:

- United Nations Convention Against Corruption (UNCAC).
- Transparency International's Corruption Perception Index (CPI).
- G20 Anti-Corruption Working Group.

2. National Efforts: Lokpal and Lokayuktas Act, 2013.

6. India Considers Russia's SWIFT Alternative for Rupee-Rouble Trade

- In September 2024, Russia has suggested using its own **Financial Messaging System, System for Transfer of Financial Messages (SPFS)**, as an **alternative to SWIFT** to streamline **Rupee-Rouble trade settlements** with India.
 - The **Reserve Bank of India (RBI)** has reviewed the proposal and concluded that it is **"doable."** Despite this assessment, discussions are ongoing, and a final decision is pending.

Key Points

- Diplomatic Context:** The proposal follows a recent meeting between Indian Prime Minister Narendra Modi and Russian President Vladimir Putin in Moscow.
 - Both leaders agreed to advance trade settlements in their national currencies and explore digital financial tools to support these exchanges.
 - Senior officials from the RBI, public sector banks, and their Russian counterparts have held discussions on adopting the proposed messaging system.
- SWIFT Ban:** Major Russian banks are prohibited from using SWIFT due to Western sanctions imposed following Russia's Ukraine conflict, ongoing since February 2022.
- Russia's Request:** Russia is seeking to engage significant trading partners, including India and other BRICS nations, in adopting its messaging system to maintain international transaction flow despite SWIFT restrictions.
- System Functionality:** Russia's system ensures continuous financial message exchanges among network members, similar to SWIFT, though onboarding new participants may require time.

- Trade Statistics:** India-Russia trade totalled \$65 billion in 2023-24, largely driven by India's oil imports from Russia, with a **target of \$100 billion by 2030.**
- Currency Settlement Goals:** Both countries are exploring a settlement mechanism in their national currencies, aiming to reduce dependency on the US dollar.
 - This would involve direct rupee-rouble exchange rates without referencing the dollar.

What is SWIFT?

- The SWIFT (Society for Worldwide Interbank Financial Telecommunication) network is a **global, secure messaging system** that enables financial institutions to exchange information about transactions reliably.
- Founded:** 1973, in Belgium.
- Purpose:** SWIFT facilitates secure, standardized communication between financial institutions, allowing them to send and receive transaction information with high reliability and security.
- Members:** Over 11,000 financial institutions in more than 200 countries use SWIFT.

How SWIFT Works

- Message Types:** SWIFT offers a standardized format for a variety of financial messages, such as - Payment instructions, Trade confirmations, Securities transactions, Treasury operations
- Network Role:** SWIFT itself does not move funds but sends payment orders between institutions' accounts using a **unique SWIFT code** or **Bank Identifier Code (BIC)**.
- Security:** Known for its **high-security standards**, SWIFT ensures the **safe exchange of sensitive financial information.**

Importance of SWIFT

- Global Standard:** SWIFT is the recognized standard for international financial transactions, forming a backbone of the global banking system.
- Efficiency:** It enables fast, secure, and error-free communication between banks, significantly lowering fraud and errors in cross-border transactions.



3. **Sanctions Tool:** SWIFT's central role in finance makes it a tool for enforcing sanctions. When a country or institution is cut off from SWIFT, it faces major obstacles in international trade and finance, making SWIFT access critical for global economic participation.

7. India Signed First-Of-Its-Kind Agreements Under IPEF

India recently concluded groundbreaking agreements under the Indo-Pacific Economic Framework for Prosperity (IPEF), marking a significant step in regional economic cooperation. These agreements focus on three key areas:

- i. Clean Economy
- ii. Fair Economy
- iii. IPEF Overarching Arrangement

Understanding IPEF

IPEF is structured around four pillars:

1. Trade
2. Supply Chains
3. Clean Economy
4. Fair Economy

Key Highlights of the Agreements

IPEF Clean Economy Agreement (Pillar III)

1. **Focus:** Accelerating energy security, climate resilience, and emissions mitigation through the development and deployment of clean energy technologies.
2. **Investment and Capacity Building:** Supporting industries, particularly MSMEs, and integrating Indian companies into global value chains via initiatives like the IPEF Catalytic Capital Fund and IPEF Accelerator.

IPEF Fair Economy Agreement (Pillar IV)

1. **Transparent and Predictable Environment:** Fostering a fair trade and investment environment by combating corruption and promoting tax transparency, domestic resource mobilization, and efficient tax administration.
2. **Enhanced Cooperation:** Improving information sharing, facilitating asset recovery, and strengthening cross-border investigations and prosecutions.

About IPEF

1. **Launched:** 2022 in Tokyo, Japan
2. **Member Countries (14):** Australia, Brunei, Fiji, India, Indonesia, Japan, Republic of Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand, Vietnam, and USA.
3. **India's Status:** Member
4. **Objective:** Strengthen economic engagement and cooperation among partner countries in the Indo-Pacific region.
5. **Four Pillars:** Trade, Supply Chain Resilience, Clean Economy and Fair Economy
6. **India's Participation:** India joined Pillars II to IV of IPEF and has observer status in Pillar I (Trade).
7. **Initiatives under IPEF**
 - i. **IPEF Upskilling Initiative:** Focuses on upskilling women and girls in IPEF emerging and middle-income partner countries.
 - ii. **Critical Mineral Dialogue:** Aims to strengthen the critical mineral supply chain and ensure sustainable mining practices in the region.
 - iii. **Other Initiatives:** Tech Council, Cooperative Work Program (CWP), etc.

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Overarching IPEF Agreement

1. **High-Level Oversight:** Establishes a ministerial-level framework to oversee the implementation of various IPEF agreements.
2. **Formal Mechanism:** Provides a formal structure and identity to the IPEF partnership, ensuring its longevity and potential to enhance India's productive capacity and integration into global supply chains.

Significance for India

These agreements hold immense significance for India, offering potential benefits such as:

1. **Enhanced Trade and Investment:** Access to new markets and opportunities within the Indo-Pacific region.
2. **Clean Energy Transition:** Support for India's clean energy goals and initiatives.
3. **MSMEs Growth:** Integration of Indian MSMEs into global value chains, fostering their growth and competitiveness.
4. **Strengthened Governance:** Collaboration in combating corruption and promoting fair economic practices.





C. SECURITY

1. India Launches Its First Reusable Hybrid Rocket 'RHUMI-1'



India has launched its first reusable hybrid rocket, RHUMI-1, developed by the Tamil Nadu-based start-up Space Zone India in collaboration with the Martin Group. The launch took place on August 24, 2024, from Thiruvudandai in Chennai. The rocket was designed to collect data on global warming and climate change, carrying 3 Cube Satellites and 50 PICO Satellites.

Key Features of RHUMI-1

1. **Hybrid Propulsion System:**
 - a. **Integration:** Combines solid and liquid propellants, offering enhanced efficiency and reduced operational costs.
 - b. **Advantages:** The hybrid system aims to leverage the benefits of both fuel types for better performance and cost savings.
2. **Adjustable Launch Angle:**
 - a. **Flexibility:** The engine allows precise trajectory control with adjustable angles ranging from 0 to 120 degrees.
3. **Electrically Triggered Parachute System:**
 - a. **Descent Mechanism:** Features an advanced, eco-friendly parachute system for the safe recovery of rocket components.

- b. **Benefits:** Offers cost-effectiveness and environmental advantages, avoiding traditional pyrotechnics and TNT.

4. Environmentally Friendly Design:

- a. **Sustainability:** Completely free of pyrotechnics and TNT, demonstrating a commitment to reducing environmental impact.

About Space Zone India

1. Overview:

- a. **Space Zone India (SZI)** is an aero-technology company based in Chennai, specializing in low-cost, long-term space solutions.
- b. They provide practical training on aerodynamic principles, satellite technology, drone technology, and rocket technology.

2. Educational Initiatives:

- a. **Mission Dr. A.P.J Abdul Kalam Students Satellite Launch (2023):** Engaged over 2,500 students from diverse schools across India in designing and constructing a student satellite launch vehicle. The vehicle could carry a payload of 150 Pico Satellites for research experiments.

What are Reusable Launch Vehicles (RLVs)?

RLVs are spacecraft designed for multiple launches and recoveries. They aim to be used again after each mission.

1. Advantages:

- a. **Cost Savings:** Reusable rockets can be up to 65% cheaper compared to building new rockets for every launch.
- b. **Reduction of Space Debris:** By reusing rocket components, the amount of discarded debris is minimized.
- c. **Increased Launch Frequency:** Faster turnaround times allow for more frequent launches.

2. Difference from Multi-Stage Rockets:

- a. **Multi-Stage Rockets:** Typically discard the first stage after its fuel is depleted, with subsequent stages continuing the journey to orbit.

- b. **RLVs:** Recover and reuse the **first stage**. After separation, the first stage returns to Earth using engines or parachutes for controlled landing, facilitating reuse.

Conclusion

The launch of **RHUMI-1** marks a significant milestone in India's **space exploration** and **technology development**. By integrating a **hybrid propulsion system** and emphasizing **environmental sustainability**, RHUMI-1 represents a forward-thinking approach to space missions. The involvement of **Space Zone India** and **educational outreach initiatives** underscores the growing role of **private players** and **student engagement** in advancing **space technology**. As India continues to develop **reusable launch vehicles**, these innovations promise to enhance **cost efficiency** and **sustainability** in space exploration.

2. India: 3rd Most Powerful Nation in Asia

- In September 2024, the **Lowy Institute** released the Asia Power Index 2024 in September 2024, and India surpassed Japan to become the **3rd-largest power across 27 Asia-Pacific countries**, reflecting its increasing geopolitical stature.
- This achievement is driven by India's dynamic growth, youthful population, and expanding economy, solidifying its position as a leading force in the region.

Criteria and Parameters of Power Measurement

This framework is built on two fundamental categories of power determinants: **resource-based and influence-based**. A country's overall power score is then calculated by taking a weighted average of eight key measures, which fall under these two categories.

- Resource-Based Determinants:**
 - Economic Capability
 - Military Capability
 - Resilience
 - Future Resources
- Influence-Based Determinants:**
 - Economic Relationships
 - Defense Networks
 - Diplomatic Influence
 - Cultural Influence

Key Factors Behind India's Rise:

- Economic Growth:** Post-pandemic recovery has significantly boosted India's Economic Capability, leading to a **4.2-point rise** in the index.
- Future Potential:** India's **Future Resources score** increased by **8.2 points**, reflecting the potential demographic dividend from its youthful population.
- Diplomatic Influence:** India's non-aligned strategy has enabled it to navigate complex global dynamics, ranking 6th in diplomatic dialogues in 2023, showcasing its active role in multilateral forums.
- Cultural Influence:**
 - India benefits from a robust global diaspora and cultural exports, contributing to its cultural influence score.
- Security Cooperation:**
 - India's role in multilateral security dialogues**, particularly through the **Quad**, has enhanced its influence in regional security dynamics.
 - Incremental improvements in defense sales, including the **BrahMos missile deal** with the Philippines, indicate India's growing geopolitical assertiveness.

3. Robotic MULEs: Modernizing the Indian Army's Logistics and Surveillance

The Indian Army has inducted 100 robotic Multi-Utility Legged Equipment (MULE) units to enhance its capabilities in forward (combat) areas, particularly in challenging high-altitude terrains.

Capabilities of the Robotic MULE:

- Versatile Mobility:** These robots are designed for all-weather operation and can navigate complex terrains, including stairs, steep hills, and even rivers. They can function in extreme temperatures ranging from -40 to +55 degrees Celsius.
- Advanced Technology:** Equipped with electro-optics and infrared technology, the robotic MULEs possess advanced object recognition capabilities.
- Logistics Support:** Each unit can carry a payload of 15kg, enabling them to transport critical supplies to frontline soldiers.



4. **Enhanced Surveillance:** The robotic MULEs will significantly enhance the Army's surveillance capabilities without risking human lives in hazardous environments.

Impact and Future Implications:

1. **Reducing Reliance on Animals:** While mules remain crucial for supply delivery in high-altitude areas, the Army aims to reduce their usage by 50-60% by 2030 through the integration of robotic MULEs and logistics drones (currently under testing).
2. **Staying Ahead in the Technological Race:** The induction of robotic MULEs reflects a growing trend of robotics deployment in military settings globally. China's integration of robotic dogs into its military operations further highlights this evolving landscape and the potential for a new arms race.

4. REAIM Summit 2024: Blueprint for Action on Responsible AI in Military

The **REAIM (Responsible AI in the Military Domain)** Summit 2024, held in Seoul, South Korea, produced a legally non-binding “**Blueprint for Action**” to guide the responsible use of AI in military applications.

What is REAIM?

REAIM, with its inaugural summit held in 2023, serves as a global platform for discussions among all stakeholders on ensuring responsible military AI applications.

Key Highlights of the ‘Blueprint for Action’

1. **Impact of AI on International Peace and Security:**
 - a. AI applications in the military domain should be developed, deployed, and used in a manner that preserves and strengthens international peace, security, and stability.
 - b. Recognizes that AI applications can present both foreseeable and unforeseeable risks, including the risks of an arms race, miscalculation, escalation, and lowering the threshold of conflict.
 - c. Emphasizes the necessity of maintaining human control and involvement in all actions critical to informing and executing sovereign decisions regarding nuclear weapons employment, without jeopardizing the ultimate objective of a world without nuclear weapons.

2. **Implementing Responsible AI in the Military Domain:**

- a. AI applications should be ethical and human-centric, applied in accordance with applicable national and international law.
- b. Promotes dialogue on rigorous testing and evaluation (T&E) protocols for AI systems.

3. **Future Governance of AI in Military Domain:**

- a. Discussions on governance should be conducted in an open and inclusive manner to fully incorporate a wide range of perspectives.
- b. Strengthens international cooperation on capacity-building to bridge the knowledge gap on responsible AI development and deployment.

5. FATF Praises India's Anti-Money Laundering and Terror Financing Measures

1. In Sept 2024, the **Financial Action Task Force (FATF)**, a global anti-money laundering and terror financing body, released its **2024 Mutual Evaluation Report on India**.
2. The report praised India's systems for combating money laundering and terror financing while it also urged India to expedite (speed up) its prosecutions in financial fraud cases.
3. During its plenary session in **Singapore** (June 2024), FATF adopted the report, recognizing India's “**high level of technical compliance**” with global standards.
 - a. India was placed in the “**regular follow-up**” category, FATF's **highest rating** for countries.
 - b. India became the **only major economy with a federal structure** to achieve this status.
 - c. Other G-20 countries in this category include the **UK, France, and Italy**.

FATF's Mutual Evaluation Process

1. **Purpose:** A comprehensive and rigorous assessment to **measure a country's compliance with international anti-money laundering (AML) and counter-terror financing (CTF) standards**.

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2. India and FATF's Mutual Evaluation:

- a. **Previous Evaluation:** In **June 2010**, India was placed in the “**regular follow-up**” category, which was **removed in June 2013**.
- b. **Next Evaluation:** India's next mutual assessment is scheduled for **2031**.

Key highlights of the FATF's mutual evaluation report on India

1. **India in the regular follow-up category:** India is in the “**regular follow-up**” category for compliance with anti-money laundering (AML) and counter-terror financing (CTF) standards.

- a. This category reflects India's high compliance in tackling money laundering (ML) and terror financing (TF), though some non-financial sectors need better supervision and preventive measures.
- b. India **joins four other G20 countries** (UK, France, Italy, and suspended Russia) in this classification.
- c. Developing countries, in contrast, are mostly in the “**enhanced follow-up**” category, which requires more frequent reporting (annually vs. every three years).
- d. **India's Compliance Record:** India fully or largely complied with **37 out of 40 FATF recommendations** and met all of the “**Big Five**” requirements.

2. **Areas for Improvement:** India has had **limited prosecutions and convictions** in money laundering and terror financing cases.

- a. **Delays in prosecuting terror financing cases**, due to constitutional challenges to the **Prevention of Money Laundering Act (PMLA)** between 2014-2022, were flagged.
- b. Despite an increase in **Enforcement Directorate (ED) investigations**, prosecutions and concluded trials have not grown proportionately.
- c. **Risk Profiling:** Financial institutions in India need to improve customer risk-profiling (process that evaluates a customer's financial risk by analyzing their financial behavior).

d. **MCA Registry Oversight:** Better monitoring of **accurate ownership information** in the **Ministry of Corporate Affairs (MCA)** registry is required.

e. **Human Trafficking Link:** There is a need to focus more on the connection between money laundering and human trafficking.

f. **Non-Profit Organisations (NPOs):** Charitable NPOs with tax exemptions may be vulnerable to terror financing. India needs stronger measures to mitigate risks linked to these organisations.

g. **Politically Exposed Persons (PEPs):** Ambiguities exist regarding the source of wealth and funds for domestic PEPs. The government must address these issues and clarify beneficial ownership rules.

h. **Designated Non-Financial Businesses and Professions (DNFBPs):** There are regulatory gaps in supervising DNFBPs, especially in relation to money laundering and terror financing.

- DNFBPs significantly contribute to India's GDP, with precious metals and stones accounting for 7%, and real estate 5%.

3. **Financial Inclusion and Transparency:** India has made notable progress in financial inclusion, with more bank account holders and increased use of digital payment systems. Simplified due diligence for small accounts has enhanced financial transparency.

a. **Jan Dhan-Aadhaar-Mobile (JAM) and GST:** FATF praised the JAM initiative for **increasing financial inclusion** and **reducing reliance on cash**.

b. The **introduction of GST**, with e-invoices and e-bills, was acknowledged for improving supply chain transparency.

4. **Money Laundering Risks:**

a. **Sources of Money Laundering:** Illegal activities like fraud, cyber fraud, corruption, and drug trafficking pose significant money laundering risks within India.

b. **Vulnerability of Precious Metals and Stones (PMS):** The PMS sector can be exploited for money laundering due to the ease of moving large funds without clear ownership trails.



- India's large PMS market, with around 1,75,000 dealers, adds to the risk, though only 9,500 are registered with the **Gems and Jewellery Export Promotion Council (GJEPC)**.

- **Cross-border criminal networks** in this sector may be under-investigated. As a global hub for diamonds and gems, India must continuously monitor fraud and smuggling techniques.

- c. **Need for Better Risk Understanding:** India requires deeper data and improved risk assessment concerning money laundering and terror financing linked to gold and diamond smuggling.

5. **Terrorist Financing Threats:** India faces significant terror threats, particularly from ISIL and Al-Qaeda-linked groups in Jammu and Kashmir, as well as insurgencies in the Northeast and Left-Wing Extremist groups.

- a. **Efforts to Combat Terrorist Financing:** India emphasizes preventing and disrupting terror financing, but more work is needed to successfully prosecute and convict those involved in terrorist financing.

- b. **Effective Enforcement:** The FATF acknowledged the **National Investigation Agency (NIA)** and the **Enforcement Directorate** for their effective actions against terror financing.

6. **Enforcement Achievements:** The **Enforcement Directorate (ED)** confiscated around ₹16,500 crore in assets and recovered ₹141 billion in the Vijay Mallya case.

- a. The FATF recognized ED's success in handling complex, large-scale, cross-border money laundering cases and "hawala" operations.

7. **Key Compliance Measures:** India's **Cybercrime Coordination Centre**, **MCA's beneficial ownership registry**, and the **Central KYC Records Registry (CKYCR)** were highlighted as important steps.

- a. Task forces and high-level committees to combat corruption, black money, drug trafficking, and fake currency were commended.

8. **Shell Companies Task Force:** FATF noted the removal of 3,82,875 shell companies and the disqualification of over 3 lakh directors for not filing financial statements.

9. **International Cooperation and Asset Recovery:** India's efforts in coordinating against illicit financial flows, international cooperation, and implementing targeted financial sanctions were appreciated.

10. **Targeted Financial Sanctions:** India needs to improve the framework for implementing targeted financial sanctions for freezing funds and assets quickly. The process needs streamlining for better communication.

Implications of FATF's Mutual Evaluation for India

1. **International Collaboration and Asset Recovery:** FATF recognition improves India's ability to collaborate with other nations in tracking and recovering illicit assets, including those linked to fugitives like Vijay Mallya and Nirav Modi.

- a. **Stronger counter-terror financing efforts:** Better coordination with global financial watchdogs strengthens India's role in combating terror financing.

2. **Improved Access to Global Financial Systems:** Positive FATF ratings facilitate India's entry into international financial markets, making borrowing and investments easier with global institutions.

- a. **Support for UPI expansion:** The recognition boosts India's Unified Payments Interface (UPI), promoting it as a preferred option for cross-border digital payments.

3. **Strengthening Investor Confidence and credibility:** A favourable FATF evaluation enhances India's financial credibility, encouraging foreign investors to see India as a more attractive destination for Foreign Direct Investment.

Financial Action Task Force (FATF)

1. **Established:** 1989 during the **G7 Summit in Paris**.
2. **Purpose:** Global watchdog against money laundering and terror financing.
3. **Members:** 38 jurisdictions and 2 regional organizations.

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4. **India's Membership:** Observer status in 2006; became the **34th member on June 25, 2010.**
5. **Role:** Sets international standards to **prevent illegal financial activities and their societal impact.**
6. **Governance:** Operates as an independent body with a **one-year presidency** elected by the plenary.
7. **Secretariat:** Located at the **OECD headquarters in Paris.**

Functions

1. **FATF Standards:** Developed to ensure a coordinated global response to crimes like money laundering, corruption, and terrorism.
2. **Identify Vulnerabilities:** FATF identifies risks in national systems to protect the international financial network.
3. **Criminal Finance Targeting:** Helps authorities trace criminal funds, including those from drug trafficking, human trafficking, and other illegal activities.
4. **Weapons Funding:** Works to prevent the funding of weapons of mass destruction.

6. Cyber slavery in Southeast Asia

What is Cyber Slavery and Why it is a Rising Threat?

1. This refers to situations where individuals, often lured by promises of lucrative jobs to other countries. But, coerced into working in illegal online operations, such as **cyber fraud**, hacking, or scamming.
2. **Forms of Cyber Slavery:** **Coercive** (forceful) involvement in cybercrime, **forced employment** in online fraud, **exploitation in the gig economy**, **involuntary slavery** through online manipulation.
3. **The effects of cybercrime trafficking go beyond individual victims:**
 - a. It fuels a larger ecosystem of illegal activities such as identity theft, financial fraud, and data breaches.
 - b. Stolen funds and personal data are channelised into other criminal enterprises.
 - c. This keeps the cycle of exploitation and revenue for criminal organizations going.

4. **Psychological Impact of Captivity:** Indian victims trafficked to Cambodia for cybercrime operations have suffered severe psychological harm.

- a. Victims were confined to cybercrime operation rooms with no outside contact, leading to **feelings of isolation and helplessness.** They were regularly beaten and threatened with harm to their families if they resisted.
- b. They reported **severe anxiety and depression** after being held captive for months without contact with loved ones. Few have displayed PTSD symptoms, including nightmares and flashbacks, even months after the rescue.
- c. This type of psychological trauma can have lasting effects, making it difficult for survivors to reintegrate into society.

In September 2024, data from Bureau of Immigration (MHA) shows that 29,466 Indians who travelled to Cambodia, Thailand, Myanmar, and Vietnam between January 2022 and May 2024 on visitor visas have not returned.

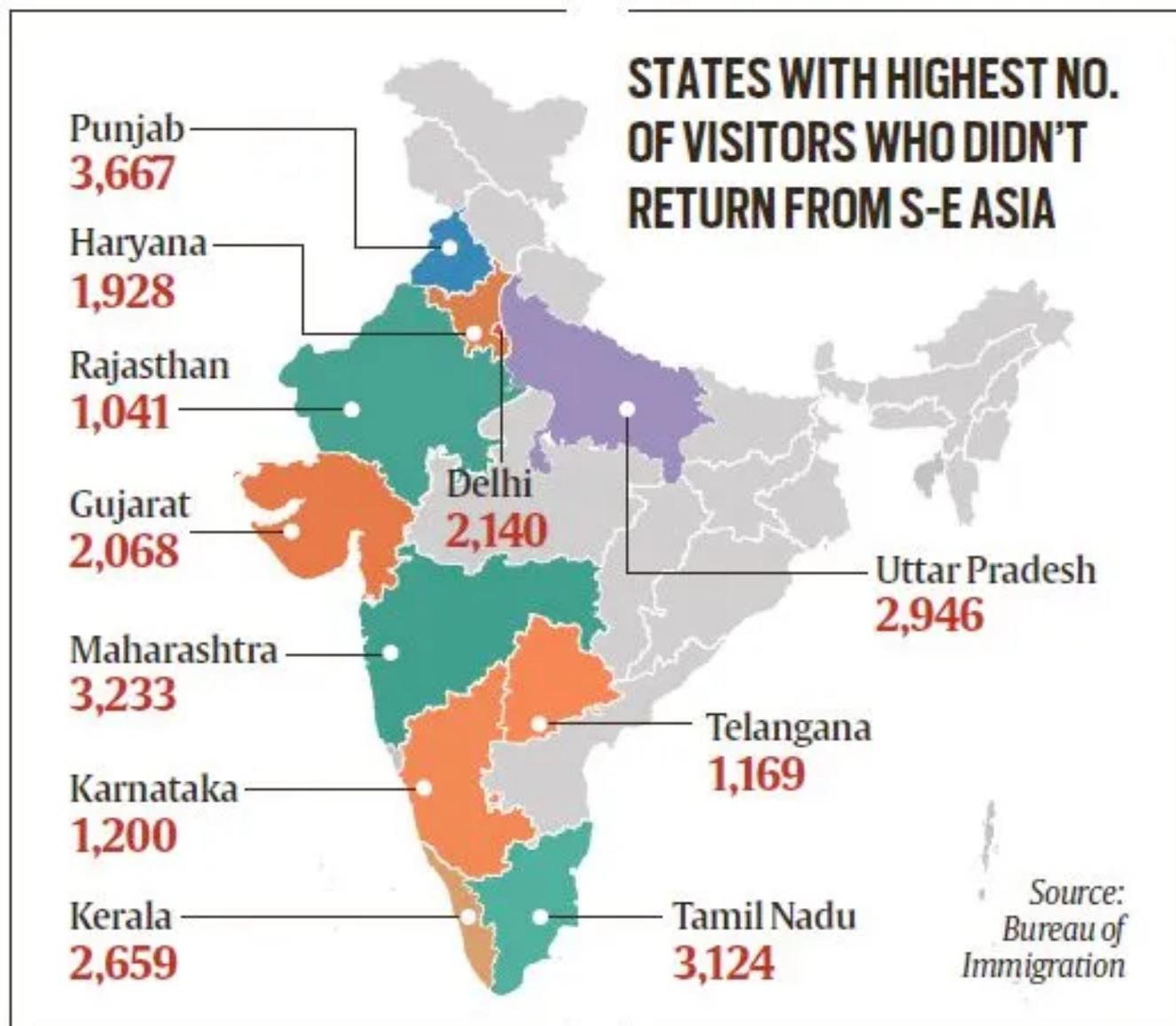
- a. More than half (17,115) of these are in the 20-39 years age group; 21,182 are males.
- b. Over 1/3rd are from 3 states — **Punjab, Maharashtra and Tamil Nadu**; and Thailand accounts for over 69 per cent of the total at 20,450.
 - A **high-level inter-ministerial panel**, set up by the Centre in May, has directed all States and Union Territories (UTs) to verify details of these individuals on the ground.

1. Victims are lured (attract) with high-paying job offers but are trapped in '**cyber slavery**', forced to commit **cyber fraud and illegal activities** under threats of violence.
 - a. Over 5,000 Indians trapped in Cambodia, forced into cyber frauds.
 - b. 45% of cybercrimes targeting Indians originate from Southeast Asia.
 - c. Since January 2023, about 100,000 cyber complaints have been registered on the **National Cyber Crime Reporting Portal.**

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- Victims are forced to create **fake social media profiles**, using images of women, to lure people into **cryptocurrency frauds**. Once targets invest, they are either **blocked** or **ghosted**, resulting in financial loss.
- Victims are mostly young and tech-savvy people who are forced into illegal activities like **money laundering**, **crypto fraud**, and **love scams**.
- Task Force Findings:** An inter-ministerial panel identified gaps in **banking**, **immigration**, and **telecom** systems contributing to cybercrime.



India's Initiatives Against Cyber-Related Human Trafficking

- India has signed **bilateral agreements** with countries like Cambodia to enhance intelligence sharing and coordinate efforts against transnational crime and trafficking.
- The Ministry of Home Affairs (MHA) has **implemented training programs** to improve law enforcement's ability to combat cybercrime and identify trafficking victims.
- In partnership with NGOs, the government has **launched campaigns** to educate the public, especially in vulnerable areas, about traffickers' tactics and the dangers of deceptive job offers.

- India has enacted strict laws, such as the **Trafficking of Persons (Prevention, Protection, and Rehabilitation) Act, 2018**, to prosecute traffickers and safeguard victims effectively.
- Telecom Ministry's** has disconnected **21.7 million mobile phone connections** linked to cyber slavery operations and **blocked approximately 226,000 handsets** to disrupt communication channels used by scammers.

Steps Taken by India to Combat Cyber Attacks

- Indian Computer Emergency Response Team (CERT-In):** Operational since 2004, CERT-In collects, analyzes, and shares information on cyber incidents to improve cybersecurity.
- National Cyber Security Coordinator:** This role, under the **National Security Council Secretariat**, coordinates cybersecurity efforts among different agencies at the national level.
- National Critical Information Infrastructure Protection Centre (NCIIPC):** Established to safeguard the country's critical information infrastructure from cyber threats.
- Cyber Swachhta Kendra:** A Botnet Cleaning and Malware Analysis Centre, launched to detect malicious software and provide free tools to remove them.
- Indian Cyber Crime Coordination Centre (I4C):** An initiative by the Ministry of Home Affairs to combat cybercrime across the country.
- Cyber Surakshit Bharat:** A program aimed at raising awareness about cybersecurity and ensuring proper safety measures for Chief Information Security Officers (CISOs) and IT staff in government departments.
- Cyberdome:** A specialized facility of the **Kerala State Police**, focused on preventing cybercrime and protecting the state's critical information infrastructure from security threats.

Global Cybersecurity Index (GCI) 2024

- In September 2024, International Telecommunication Union (ITU) releases 5th Global Cybersecurity Index (GCI) 2024.
- India has achieved a significant milestone in cybersecurity by reaching **Tier 1 status** in the **5th edition** of the **Global Cybersecurity Index (GCI) 2024**.
- The GCI aims to improve survey quality, promote international collaboration, knowledge sharing, and raise awareness of the different aspects of cybersecurity.
- GCI 2024** assesses country-level cybersecurity commitments **across 5 pillars: i) legal ii) technical iii) organizational iv) capacity development iv) cooperation**.
- It uses a new **5-tier analysis (Tier 1 to Tier 5)** to assess each country's advances with cybersecurity commitments and resulting impacts.
 - Tier 1:** Role-modelling (Score: 95–100), **Tier 2:** Advancing (Score: 85–95), **Tier 3:** Establishing (Score: 55–85), **Tier 4:** Evolving (Score: 20–55), **Tier 5:** Building (Score: 0–20)
- The GCI 2024 assessed **194 countries**, highlighting cybersecurity threats like **ransomware attacks, breaches in critical industries, system outages, and privacy violations**.
- Global progress:** Since 2021, countries have increasingly prioritized cybersecurity, raising the global average score to **65.7/100**.
- India's Performance in GCI 2024:** India ranks in **Tier 1 (scored 98.49/100)** alongside countries like the **US, Japan, and Australia**.
- The Department of Telecommunications (DoT)** played a pivotal role as the nodal agency representing India in the GCI 2024.
- India shows improvement due to its strong legal framework, including the **Information Technology Act (2000)** and the **Digital Personal Data Protection Act (2023)**.

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Operation Chakra-II

1. India's **Central Bureau of Investigation (CBI)** has initiated **Operation Chakra-II**, aimed at targeting transnational organized financial crimes facilitated through cyber networks.
2. The operation focuses on **combating cyber-enabled financial crimes** across borders.
3. CBI has partnered with major tech companies like **Microsoft** and **Amazon**, along with national and international agencies, to disrupt the operations of illegal call centers involved in these crimes.

7. Exercises/ Operations in News

Name	Type	Participants	Brief Description
AIKYA	Disaster management exercise	representatives from six southern states/ UTs: Tamil Nadu, Kerala, Karnataka, Andhra Pradesh, Telangana, and Puducherry	<ul style="list-style-type: none"> • Organized by: National Disaster Management and the Army Southern Command in Chennai. • “Aikya,” meaning “Oneness” in Tamil,
Exercise Eastern Bridge VII	Air Force Exercise	India-Oman	<ul style="list-style-type: none"> • Edition- 7th • Concluded at- Masirah (Oman) • Beyond Eastern Bridge: India and Oman also conduct other joint exercises: <ul style="list-style-type: none"> ○ Naseem Al-Bahr: A naval exercise ○ Al Najah: A joint exercise between the Indian Army and the Royal Army of Oman.
AL NAJAH V	Joint Military Exercise	India-Oman	<ul style="list-style-type: none"> • Edition-5th • Held at- Rabkoot Training Area in Salalah, Oman
Exercise Varuna	Naval Exercise	India-France	<ul style="list-style-type: none"> • Edition-22nd • Held at- the Mediterranean Sea. • Indian Navy was represented by the frontline stealth frigate, INS Tabar, the ship borne Helicopter; LRMR Aircraft P8I,
Yudh Abhyas	Military exercise	India-US	<ul style="list-style-type: none"> • Edition-20th • Held at- Rajasthan
Tarang Shakti	Air Exercise	Multinational Exercise	<ul style="list-style-type: none"> • India's first multinational air exercise. • The exercise took place in two phases, with the first phase held in Sular, Tamil Nadu from August 6–14, 2024, and the second phase held in Jodhpur, Rajasthan from August 29–September 14, 2024.





D. ECONOMY

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1. India: World's 3rd Largest Ethanol Producer and Consumer

India is rapidly emerging as a global leader in **ethanol** production and consumption. This push towards ethanol is not just about reducing reliance on **fossil fuels**, but also about transforming the **agricultural landscape**, boosting **farmer incomes**, and achieving **environmental sustainability**.

Recent Developments:

- World's 3rd Largest Producer:** In September 2024, India achieved the milestone of becoming the world's third-largest producer and consumer of **ethanol**, driven by a strong commitment to a sustainable **sugar industry**. This has been coupled with an 18% increase in **sugarcane cultivation** and a 40% rise in **sugarcane production** over the past decade.
- Collaboration with Brazil:** India is actively collaborating with **Brazil**, the world's leading sugarcane producer, to explore opportunities in **biofuels**, including ethanol, **biodiesel**, and **biojet fuel**. This partnership also focuses on research and development in advanced biofuels like **2G** and **3G ethanol**, **green hydrogen**, and **bioplastics**.
- Ethanol Blending Programme:** The **Ethanol Blending Programme**, launched in 2003, aims to reduce **fossil fuel consumption** and **carbon emissions** by blending ethanol with **petrol**. The government has advanced its target of achieving **20% ethanol blending (E20)** from 2030 to 2025-26.

Impact on Agriculture and Trade:

- Shifting Trade Dynamics:** India's focus on **corn-based ethanol** has transformed it from a leading corn exporter in Asia to a net importer. This shift is driven by the need to meet domestic demand for ethanol while ensuring sufficient **sugar supplies** for domestic consumption.

- Agricultural Diversification:** **Corn-based ethanol** production is diversifying India's agricultural sector, providing new market opportunities for **farmers** and potentially stabilizing crop prices. In 2024, 3.5 million tons of corn were used to produce ethanol, a fourfold increase from 2023.
- Challenges for Related Sectors:** The increased demand for corn has raised local prices, impacting **poultry producers** and **starch manufacturers** who rely on corn as a feedstock. This has led to calls for **duty-free corn imports** and reconsideration of the ban on **genetically modified corn**.

Benefits for India:

- Energy Security:** Ethanol blending reduces India's dependence on **oil imports**, enhancing **energy security** and protecting the economy from volatile global oil prices.
- Environmental Sustainability:** Ethanol blending is a key strategy for reducing **greenhouse gas emissions** and improving **air quality**. E20 blending significantly lowers **carbon monoxide emissions** in vehicles.
- Technological Advancements:** Ethanol production encourages investment in advanced **biofuel technologies** like **2G ethanol**, with **Indian Oil Corporation** setting up India's first 2G ethanol plant in Panipat.
- Geopolitical Leverage:** Reducing **oil imports** strengthens India's **geopolitical position** and its role in the **global biofuel market**.
- Waste Management:** Ethanol production contributes to **waste management** through initiatives like the **GOBAR-DHAN** scheme, which converts agricultural residues into biofuel.

Ethanol 100 Fuel:

Clean Alternative: In 2024, India launched '**Ethanol 100**', a high-performance, clean fuel with a high-octane rating, suitable for a wide range of vehicles, including **flex-fuel vehicles**.



Challenges and Opportunities:

1. Balancing the needs of various agricultural sectors impacted by the increased demand for corn.
2. Ensuring the **sustainable sourcing of feedstock** for ethanol production.
3. Continuing research and development in advanced **biofuel technologies**.
4. Expanding the **infrastructure** for ethanol production and distribution.

Conclusion:

India's **ethanol revolution** is a testament to its commitment to **sustainable development**. By promoting ethanol production, India is not only addressing its **energy security** and **environmental concerns** but also transforming its **agricultural sector** and contributing to a cleaner, greener future. This initiative holds significant implications for India's **economy, environment, and geopolitical standing**.

2. White Revolution 2.0

In September 2024, the **Ministry of Cooperation** has introduced **White Revolution 2.0** with a focus on **empowering women farmers and creating employment opportunities**.

What is White Revolution 2.0?

1. **White Revolution 2.0** aims to **boost milk production** while empowering women and combating malnutrition.
 - a. It follows the success of the original **White Revolution (Operation Flood)**, launched in **1970** by **Dr. Verghese Kurien**, which transformed the dairy-deficient India into the **global leader in milk production**.
2. **Targets under White Revolution 2.0:** Dairy cooperatives are expected to procure **100 million kilograms of milk daily** by the end of 5th year of the initiative.
 - a. Milk procurement is set to rise from **660 lakh litres to 1,000 lakh litres** per day, led by cooperatives.

3. **Launch of Margdarshika (SOPs):** The Standard Operating Procedures (SOPs) aim to establish **200,000 new Multipurpose Primary Agricultural Credit Societies (MPACS)**.
 - a. It focuses on panchayats lacking cooperatives for agriculture, fisheries, and dairy activities.
 - b. The **Ministry of Cooperation** developed it with **NABARD** and **National Dairy Development Board (NDDB)**.
4. **Women Empowerment:** Women play a significant role in the dairy sector, generating business worth **₹60,000 crore** in Gujarat alone.
 - a. The initiative will empower women by providing them **formal employment** and the money will be deposited directly into their bank accounts.
5. **Fighting Malnutrition:** Increased milk availability will benefit the **poor and malnourished children**.
 - a. It will **enhance nutrition** and **contribute to reducing malnutrition**.
6. **Integration with Government Schemes:** The initiative builds on existing schemes like the **Dairy Processing and Infrastructure Development Fund (DIDF)** and the **National Programme for Dairy Development (NPDD)**.
 - a. A new phase, **NPDD 2.0**, is planned under the **Department of Animal Husbandry and Dairying** to further support cooperatives.
7. **Expansion of 'Cooperation Among Cooperatives':** The successful **'Cooperation among Cooperatives'** initiative from Gujarat will expand nationwide.
 - a. It offers dairy farmers **interest-free cash credit** via **RuPay Kisan Credit Cards** and will introduce **micro-ATMs** to bring financial services to rural areas.
8. **PACS Computerisation:** SOPs were launched to modernise **Primary Agriculture Credit Societies (PACS)**, ensuring efficient and transparent operations through computerisation.

What is the Current Status of Milk Production in India?

1. **Global Ranking:** India is the **world's largest milk producer**, with production reaching **231 million tonnes** in 2022-23. In 1951-52, the country produced **17 million tonnes** of milk.



2. **Top Milk-Producing States:** According to the **Basic Animal Husbandry Statistics (BAHS) 2023**, the top five milk-producing states are: Uttar Pradesh (16%), Rajasthan (14%), Madhya Pradesh (9%), Gujarat (8%), Andhra Pradesh (7%)
 - a. Together, these states contribute **53%** of India's total milk production.
3. **Per Capita Availability of Milk:** India's national per capita availability of milk is **459 grams/day**, higher than the global average of **323 grams/day**.
 - a. Availability varies by state, from **329 grams/day** in Maharashtra to **1,283 grams/day** in Punjab.
 - a. **Milk Production by Animal Type: Indigenous buffaloes** contribute **32%** of total milk production; **Crossbred cattle** account for **30%**; **Goat milk** contributes **3%**, and **exotic cows** (foreign breeds) make up **2%**.
4. **Dairy's Contribution to Agriculture:** Dairy products (milk, ghee, butter, lassi) accounted for **40%** of the total output value of agriculture, livestock, forestry, and fishing sectors in 2022-23.
 - a. This contribution amounted to **Rs 11 lakh crore**, surpassing cereals as the largest contributor to the agricultural sector.
5. **Rising Milk Prices:** Over the past five years, the price of milk has risen from **Rs 42 to Rs 60** per litre, driven by increasing input costs like fodder and feed.
 - a. There are concerns that further price increases could lead to **demand reduction** as milk becomes less affordable.
6. **Methane Emissions:** Livestock emissions from manure and digestive processes account for **32% of human-caused methane emissions**, contributing significantly to global warming.

What is the Need of White Revolution 2.0 for India?

1. **Increase in Milk Productivity:** India needs to boost milk productivity, especially among indigenous animals and across all regions of India.
2. **Decline in Milk Production Growth Rate:** The annual growth rate of milk production dropped from **6.47%** in 2018-19 to **3.83%** in 2022-23, showing a **slowdown in milk production growth rate**.
3. **Formalisation of Milk Consumption: 63%** of total milk production is marketed, while the remaining is used by producers for their own consumption.
 - a. About **2/3rd of marketable milk** is handled by the **unorganised sector** while in the organised sector, the **cooperatives** dominate.
4. **Milk as a Major Food Expenditure:** In rural areas, people spend an average of **Rs 314/month** on milk, more than on vegetables, cereals, or eggs.
 - a. In urban areas, the average monthly milk expenditure is **Rs 466**, exceeding that of fruits, vegetables, cereals, and meat.
1. **Genetic Improvement:** Introduction of the **Sex-Sorted (SS) Semen** increases the likelihood of female calves being born, boosting future milk production.
 - a. For breeds like Kankrej and Gir, the probability of producing female calves can reach up to 90%.
2. **Embryo Transfer (ET) Technology:** ET technology enhances the productivity of **high-genetic-merit (HGM) cows** by allowing multiple embryos to be implanted in surrogate cows.
 - a. A single HGM cow can produce up to 12 calves annually, compared to 5-7 calves over its lifetime through natural breeding.
 - b. **High genetic merit (HGM) cows** are cows with a high genetic merit for traits like milk production, fat yield, and other functional traits
 - c. **Embryo transfer technology (ETT)** is a technique used to improve the genetics of cattle by transferring embryos from a donor cow to a recipient cow, who acts as a surrogate mother.
 - d. ETT is used for a variety of purposes, including: increasing reproductive rates of genetically improved cows, planning mating, twinning, disease control, and improving pregnancy rates in repeat breeder cows.
3. **In Vitro Fertilisation (IVF) Technology:** IVF involves **fertilizing immature ova** (a mature female reproductive cell) in a lab and then implanting them in surrogate cows.
 - a. This can produce 33-35 calves per donor cow each year, rapidly increasing the population of high-yield milk cows.



- 4. Nutrition and Feed Intervention:** Along with genetic advancements, improving animal nutrition is key to reducing feed costs.
- Amul is setting up a Total Mixed Ration (TMR) plant** in Gujarat to produce **affordable, ready-to-eat fodder mixes**. These include maize, jowar, and oat grass.
 - TMR Feeding Method:** TMR combines forages, grains, proteins, vitamins, and minerals into a single, nutrient-rich feed for cows.
- 5. Improved Diet Quality:** Using digestible forages like legumes and grains reduces fermentation time and methane production.
- Specific feed additives can also slow down methane-producing microbes. The released methane can be used for biogas production.

Schemes Related to the Livestock Sector

- Animal Husbandry Infrastructure Development Fund (AHIDF)
- National Animal Disease Control Programme
- Rashtriya Gokul Mission
- National Artificial Insemination Programme
- National Livestock Mission

3. Periodic Labour Force Survey (PLFS) Report 2023-24

- In Sept 2023, the **National Statistical Office (NSO)** released the **Periodic Labour Force Survey (PLFS) report for 2023-24**.
 - It highlights key employment trends in India, including stagnating unemployment rates, increasing labour force participation, and the challenges of creating formal jobs despite significant economic growth.
- Key Highlights of the PLFS Report 2023-24**
- Stagnant Unemployment Rate:** The unemployment rate for 2023-24 stayed at **3.2%**, **unchanged** from 2022-23.
 - This is the **1st time** since the **PLFS began in 2017-18** that the **unemployment rate has not shown a year-on-year decline**.
 - Labour Force Participation Rate (LFPR) for persons of age 15 years and above:** The LFPR increased to **60.1%** in 2023-24, up from 57.9% in 2022-23 at the national level.
 - Rural LFPR** rose to **63.7%** (50.7% in 2017-18) and **Urban LFPR** increased to **52%** (47.6% in 2017-18).
 - More people in rural areas are seeking work, possibly due to **reverse migration** or fewer urban job opportunities after the pandemic.
 - LFPR** reflects the proportion of people who are either employed or seeking work.
 - Increasing Trend in Worker Population Ratio (WPR) for persons of age 15 years and above:** In rural areas, WPR increased 62.1% in 2023-24 while for urban areas it increased 49.4%.
 - The **WPR** reached **58.2%** in 2023-24 (56.0% in 2022-23).
 - Male WPR** increased slightly to 76.3% (76% in 2022-23)
 - Female WPR** increased to 40.3% (35.9 in 2022-23)
 - WPR measures the percentage of employed people in the total population.
 - Marginal Improvement in Job Quality:** A slight improvement in job quality was seen, with **salaried or regular wage workers** increasing by **0.8 percentage points** to **21.7%**.
 - Decreasing Trend in Unemployment Rate (UR):** **Rural unemployment rate** increased slightly to **2.5%** in 2023-24 from 2.4% in 2022-23.
 - Urban unemployment rate improved**, dropping to **5.1%** from 5.4%.
 - The **overall Unemployment Rate (UR)** has **remained unchanged** at 3.2%.
 - Female unemployment rate** increased to **3.2%**, up from 2.9% in 2022-23.
 - Male unemployment rate** slightly decreased to **3.2%** from 3.3%.



6. **Rise in Self-Employment and Unpaid Work:**

The share of people involved in **self-employment** (including unpaid household work) **increased to 58.4%** from 57.3% in 2022-23.

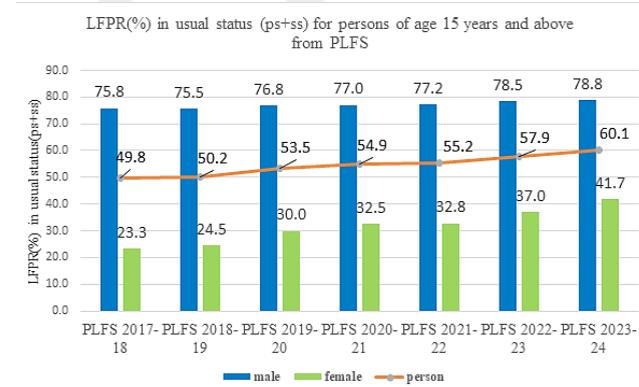
a. This includes both entrepreneurial ventures and informal work, making it a mixed indicator of job quality.

7. **Challenges in Creating Decent Jobs:** The economy struggles to create enough formal jobs, pushing more people into **self-employment**, often in the informal sector or unpaid family roles.

a. Wage employment remains lower than in the pre-pandemic period, reflecting the challenge of generating **formal and secure jobs**.

Employment Trends: Positives and Negatives

Positives	Negatives
Labour Force Participation Rate (LFPR) increased	Unemployment rate remains stagnant at 3.2%
Salaried workers saw a marginal rise to 21.7%	Youth unemployment is high (10.2%), especially for females (11%)
Worker Population Ratio (WPR) increased to 58.2%	Increase in self-employment, mostly informal or unpaid
Urban unemployment rate dropped to 5.1%	Female unemployment rate rose to 3.2% from 2.9%
Workforce participation has risen post-pandemic	Formal job creation is slow, pushing people into informal roles



Why India Struggles to Generate Enough Formal Jobs?

Challenges	Solutions
Rising informal jobs reflect a trend towards informalization. These jobs lack protection under labor laws, with no access to social or job security.	Investments in manufacturing, renewable energy, and technology can create more productive jobs with better wages.
AI and IoT advancements threaten job security, even for skilled workers. Automation in IT firms show how technology can reduce job opportunities.	Targeted financial support, tax relief, and regulatory ease can help MSMEs recover and expand employment capacity.
More educated job seekers struggle to find suitable employment. The demand for skilled jobs is shrinking, adding to the employment challenge.	Align skilling programs with future industry needs in areas like green jobs, AI ethics, cybersecurity, and data analytics.
Policies like demonetization (2016) and the poorly implemented GST (2017) hurt MSMEs, which employ most of India's workforce.	Focus on sectors like renewable energy, healthcare, and sustainable manufacturing, where automation is less likely to replace jobs.
While the output share of service sectors like transport, communication, and finance remains steady, their employment share has declined.	Boost new-age service sectors like e-commerce, logistics, and online education, which offer jobs across a range of skill levels.
The share of workers in skilled jobs dropped. Widening inequality and a falling worker-to-population ratio highlight India's unemployment problem.	Strengthening MSMEs by providing them with financial support and streamlined regulations to help recover and expand their employment capacity.



Key Facts About the PLFS Report

1. Conducted by the **National Statistical Office (NSO)** under the **Ministry of Statistics and Programme Implementation (MoSPI)**.
2. Designed to **assess employment and unemployment trends** in India.
3. Developed to address gaps in earlier labour force surveys conducted by the **National Sample Survey Office (NSSO)**.

Primary Objectives of the PLFS:

1. Measure the dynamics of labour force participation and employment status in urban areas at short intervals (every three months) using the **Current Weekly Status (CWS)** approach.
2. Estimate labour force participation for both rural and urban areas using both **Usual Status** and **CWS** parameters.

Innovations in Sampling Design and Data Collection:

1. Introduced changes in sampling design and inquiry schedule compared to previous **quinquennial surveys** (recurring every five years) by the NSSO.
2. Added new data points, including the **number of hours worked**, which were not included in earlier surveys.

Government's Initiatives Related to Employment

1. **SMILE** (Support for Marginalised Individuals for Livelihood and Enterprise)
2. **PM-DAKSH** (Pradhan Mantri Dakshta Aur Kushalta Sampann Hitgrahi)
3. **MGNREGA** (Mahatma Gandhi National Rural Employment Guarantee Act)
4. **PMKVY** (Pradhan Mantri Kaushal Vikas Yojana)
5. **Start-Up India Scheme**
6. **Rozgar Mela**

4. Central Government Increases Minimum Wage for Workers

1. **Minimum wage** refers to the **lowest remuneration** that employers are **legally** required to pay their workers.

2. In September 2024, the **Central Government** has revised the **Variable Dearness Allowance (VDA)**, leading to an increase in **minimum wage rates**, effective from **October 1**.
 - a. The **Minimum Wages Act, 1948** allows both central and state governments to set, review, and revise minimum wages
 - i. The Central Government revises the **VDA twice a year**, effective from April 1 and October 1, based on the six-month average increase in the **Consumer Price Index for Industrial Workers (CPI-IW)**.
 - ii. CPI-IW measures the relative changes in retail prices of fixed basket of goods and services consumed by industrial workers over a period of time.
 - iii. The **Labour Bureau** under the **Ministry of Labour and Employment** publishes CPI-IW data
 - b. **Variable Dearness Allowance (VDA)** is a wage adjustment mechanism that is paid to government employees and unorganized sector workers to help them cope with inflation.
3. **Beneficiary Sectors:** The revised minimum wage rates will benefit workers in sectors such as construction, loading/unloading, watch and ward, sweeping/cleaning, housekeeping, mining, and agriculture under central sphere establishments. These sectors employ a significant portion of the workforce, particularly in unorganized sectors, making this revision crucial for social welfare.
4. **Wage Categories:** Minimum wages are categorized based on skill levels (unskilled, semi-skilled, skilled, and highly skilled) and geographical areas (Area A, B, and C), reflecting variations in living costs and skill demands across different regions.
5. **Minimum wage rates per day including VDA (in Rs.) for the employees in Agriculture Sector (after revision):**

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Category of Worker	Area 'A'	Area 'B'	Area 'C'
A. Unskilled	500	457	452
B. Semi- Skilled/Unskilled Supervisory	546	502	462
C. Skilled/ Clerical	593	546	501
D. Highly Skilled	656	611	546



Minimum wage rates per day including VDA (in Rs.) for the employees in Mining Sector (after revision):

Category of Worker	For work above ground	For work below ground
A. Unskilled	526	655
B. Semi- Skilled/Unskilled Supervisory	655	783
C. Skilled/ Clerical	783	912
D. Highly Skilled	912	1020

Minimum wage rates per day including VDA (in Rs.) for the employees in Construction Sector (after revision):

Category of Worker	Area 'A'	Area 'B'	Area 'C'
A. Unskilled	783	655	526
B. Semi- Skilled/Unskilled Supervisory	868	739	614
C. Skilled/ Clerical	954	868	735
D. Highly Skilled	1035	954	868

How is Minimum Wage Calculated?

Factors Influencing Wage:

State and Area: Varies by **geographical location and development level within the state (zones).**

Industry and Occupation: Differentiated for unskilled, semi-skilled, skilled, and highly skilled workers.

Calculation Method:

India has nearly **2,000 job types** for unskilled workers and over **400 employment categories.**

The minimum wage includes:

Variable Dearness Allowance (VDA): Adjusts for inflation based on the Consumer Price Index (CPI).

House Rent Allowance (HRA)

Regular Monitoring: Minimum wage rates must be tracked as they are subject to periodic changes, especially for VDA.

Regulation of Minimum Wage

Legal Framework: Governed by the **Minimum Wages Act, 1948**, transitioning to the **Code on Wages Act, 2019**. This new code will replace:

Minimum Wages Act, 1948

Payment of Wages Act, 1936

Payment of Bonus Act, 1965

Equal Remuneration Act, 1976

Living Wage Initiative: India is considering establishing a **living wage** by 2025, working with the ILO to cover essential social expenditures like housing and healthcare.



5. Union Cabinet Approves 12 Industrial Smart Cities

1. Recently, the Union Cabinet has approved the establishment of 12 industrial smart cities across 6 major industrial corridors in 10 states with an investment of around ₹28,600 crore as part of the **National Industrial Corridor Development Programme**.
2. **The smart cities will be located in: Khurpia** (Uttarakhand), **Khurpia** (Punjab), **Dighi** (Maharashtra), **Palakkad** (Kerala), **Agra** and **Prayagraj** (Uttar Pradesh), **Gaya** (Bihar), **Zaheerabad** (Telangana), **Orvakal** and **Kopparthy** (Andhra Pradesh), **Jodhpur-Pali** (Rajasthan)

What is an Industrial Smart City?

1. An Industrial Smart City is a modern urban area that uses advanced technologies and data to improve industrial operations and promote sustainable development.
2. These cities aim to attract foreign investment, boost domestic manufacturing, and generate employment.
3. **Objectives of Developing Industrial Smart Cities:**
 - a. **Global Value Chains:** The initiative seeks to enhance India's position in global value chains by offering investors ready-to-allot land.
 - b. **Modern Urban Concepts:** It incorporates concepts like -
 - **Plug-and-play:** Pre-built infrastructure that allows businesses to start operations immediately.
 - **Walk-to-work:** Urban design encouraging people to live close to their workplaces, reducing car usage and promoting walking.
4. **Development Road Map:** These cities are being developed under the **National Industrial Corridor Development Programme (NICDP)**, which aims to create world-class industrial cities.
 - a. **NICDP Vision:** NICDP is designed to create a vibrant industrial ecosystem, facilitating investments from both large industries and MSMEs.

- b. **Implementation:** The programme is carried out by the **National Industrial Corridor Development and Implementation Trust (NICDIT)** and **National Industrial Corridor Development Corporation Limited (NICDC)**.
- c. **1st Industrial Corridor: Delhi-Mumbai Industrial Corridor** was the 1st such project which was approved in 2007.
- d. **Self-Sustaining Cities:** These industrial nodes will integrate residential and commercial spaces, functioning as self-sustaining urban areas.
- e. **Marketing and Implementation:** The government will partner with **Invest India** for project marketing.
- f. **A Special Purpose Vehicle (SPV)** will be set up to implement the parks, aiming for **completion within 3 years** depending on the cooperation from the state governments.

Key Features of Approved Industrial Smart Cities

Alignment with National Economic Goals & PM Gati-Shakti National Master Plan:

1. These smart cities align with India's goal of reaching **USD 2 trillion in exports by 2030**.
2. They will integrate with the **PM GatiShakti National Master Plan**, which includes multi-modal connectivity infrastructure for seamless movement of people, goods, and services.
3. This infrastructure will **boost logistical efficiency and improve supply chains** across the country.
4. The cities will form a '**necklace of industrial cities**' along the **Golden Quadrilateral**, promoting connectivity and industrial growth.

Significance:

1. These projects aim to **attract Foreign Direct Investment (FDI)** from countries such as Singapore and Switzerland.
2. The cities are expected to **create around 1 million direct jobs** and up to **3 million indirect jobs**, with an investment potential of Rs 1.5 lakh crore.
3. Developed under the NICDP, these cities will focus on **sustainability by using ICT-enabled utilities and green technologies** to minimize environmental impact.



4. **Ready-to-allot land parcels** will be available to attract both domestic and international investors, helping India strengthen its position in global value chains.



Challenges in Developing Industrial Smart Cities and solutions

Challenges	Solutions
Upgrading outdated infrastructure for IoT and high-speed internet requires major investment and faces logistical challenges, especially in older cities.	Create land banks, ensure fair compensation to reduce disputes, and use innovative methods like land pooling to speed up land acquisition processes.
Protecting large amounts of data from smart devices against breaches requires strong security measures and constant monitoring.	Conduct thorough environmental assessments, promote sustainable practices, and invest in infrastructure that supports sustainable growth.
Attracting financial investments, whether public or private, is challenging. Stakeholders must be convinced of the long-term benefits and return on investment (ROI).	Promote Public Private partnerships, sharing risks and rewards equitably while maintaining transparency and accountability in governance.





Addressing concerns about privacy, job losses due to automation, and lifestyle changes through effective communication and education is crucial for success.	Address skill shortages through vocational training, collaborating with industries, and providing incentives for businesses to invest in employee development.
Implementing smart city initiatives involves navigating complex local laws, regulations, and policies, which can be time-consuming and politically sensitive.	Simplify and digitize administrative processes, harmonize regulations across government levels, and increase transparency to improve efficiency and attract investors.

6. PUSA-44 rice variety: Root of farm fires in North India and its alternative

Despite being **banned** by the Punjab government in October 2023, the PUSA-44 paddy variety is still in use.

About PUSA-44

1. PUSA-44, a **non-Basmati rice**, was developed in 1993 by the Indian Council of Agricultural Research.
2. Punjab's farmers began sowing PUSA-44 in limited areas but expanded cultivation after getting a high crop yield.
3. By the 2010s, it became so popular that it covered **70-80% of paddy cultivation areas of Punjab**.

Economic Benefits of PUSA-44

1. Farmers claim that PUSA-44 yields **34-40 quintals per acre**, surpassing the 28-30 quintals per acre average of other varieties.
2. With the current paddy Minimum Support Price (MSP) at Rs 2,205 per quintal, PUSA-44's higher yield of 7-10 quintals can increase farmers' income by Rs 15,000 to 22,000 per acre.

PUSA-44

A **Non-Basmati Rice** variety for **better yield and pest resistance**.

Economic Benefits of PUSA-44

High Yield
High yield increases **profitability**

Lower Input Costs
Reduced fertilizer costs due to better **phosphorus efficiency**.

Market Preference
Strong market demand for **long-grain rice**.

Concerns with PUSA-44

Timeline

- **1990s: Release of Pusa 44**
Pusa 44 is released by IARI as a high-yield, long-duration rice variety
- **2000s: Widespread Adoption**
Pusa 44 became popular among farmers in Punjab and Haryana for its high yield, despite concerns over its long growth cycle.
- **2015: Research for Improvement:**
Research begins to improve its **phosphorus use efficiency**
- **2020s: Efforts to Address Stubble Burning**
Efforts continue to **address environmental concerns** like stubble burning.

1 Declining Groundwater Levels

PUSA-44 Maturity **155-160 Days**

PR-126 Maturity **120-125 Days**

This requires **5-6 extra irrigation cycles**, worsening **groundwater depletion** in Punjab.

2 Increased Costs

36% more on preparing paddy nursery

66.5% more expenditure on fertilizers

40% more on plant protection

21.6% more on labour cost

36% more on plant irrigation

34% higher tractor usage costs

29.6% higher cultivation costs per acre than other varieties like PR-126

3 Aggravation of Stubble Burning

PUSA 44 Harvesting (Late October)

10-15 Days

Increases the likelihood of stubble burning.

(PUSA varieties produce approximately 2% more stubble than short varieties)

Wheat Sowing (Early November)

4 Environmental and Policy Concerns

PUSA-44

↓

Groundwater Depletion

Alternatives to PUSA-44

Pusa-2090

Matures earlier, reduces stubble burning, saves water, and maintains high yield.

PR Varieties

PR 121-126 mature faster, yield more, use less water and pesticides, and are disease-resistant.



Minimum Support Price (MSP)

1. It is a **government-set minimum price** for certain agricultural goods to **safeguard farmers from market price fluctuations** and **ensure a minimum income** for their produce.
2. Simply, the MSP is the **rate at which the government buys agri-produce from farmers.**
3. But the government is **not legally bound to pay** the MSP to farmers.
 - a. So, the government is not legally obligated to buy all crops at MSP or provide compensation if market prices drop below MSP.

2. Due to Punjab's **groundwater depletion** and the **availability of shorter-duration paddy varieties**, the government seeks to conserve water by banning this variety.



Rise in Paddy Cultivation in Punjab

1. The area under paddy, a **water-intensive crop**, continues growing in Punjab.
2. More than 70% of its agricultural development blocks are declared **'dark zones'**.
3. Dark zones are areas where the groundwater depletion exceeds the recharge rate.

Concerns associated that led to its ban

Declining Ground Water Level

1. PUSA-44 is a **long-duration variety**, taking around 160 days to mature. This is around 35 to 40 days more than other varieties, requiring **5-6 extra irrigation cycles**.

Aggravate Stubble Burning

1. Due to its extended maturity period, PUSA-44 is **harvested just before wheat sowing time.**
2. It is harvested at the end of October, while the ideal time for wheat sowing is early November.
3. Farmers require **20-25 days** between **paddy harvest** and **wheat sowing** for **proper stubble disposal.**

WHY GOVT WANTS PUSA-44 OUT: IT NEEDS...

36% more on preparing paddy nursery

66.5% more on fertilizers

40% more on plant protection

36% more on irrigation

21.6% more on labour cost

34% more on usage of tractor

9% more on Mandi labour

Total 29.6% more as compared to PR-126 per acre

NURSERY TO HARVEST (in days)

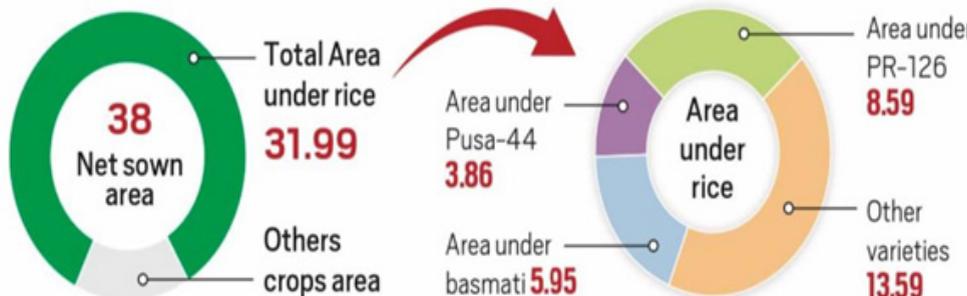
Pusa-44	PR-126
155-160	125

YIELD (quintals per acre)

Pusa-44	PR-126
35-36	30-32

HOW PUNJAB CULTIVATED RICE

(in lakh hectare)



4. However, the limited timeframe PUSA-44 cultivation offers makes stubble management through in-situ and ex-situ methods challenging. This leads to **increased incidents of stubble burning**.
5. Moreover, PUSA varieties produce approximately **2% more stubble than short varieties**, which becomes a significant concern when cultivated on a large scale.

- By 2018, the Punjab government reduced the area under PUSA-44 to 18% of the total area under paddy.
- It covered an estimated 14.8% of Punjab's total non-basmati paddy area in 2023.

Alternatives to PUSA-44

PUSA-2090 Rice Variety

- **Pusa-2090**, a rice variety, is a cross between **PUSA-44** and **CB-501** (an early-maturing Japonica rice line).

Benefits of PUSA-2090

1. **Reduced stubble burning:** PUSA-2090's shorter maturation period (**120-125 days**) allows for timely field clearance (early to mid-October against late October for Pusa-44) for wheat sowing, which reduces the need for stubble burning.
2. **Higher yield:** Maintains the **high yield** characteristics of Pusa-44. It has a strong culm (main **stem**) that makes it **less prone to lodging** (bending over or falling due to heavy winds and rains).
3. **Water-efficient:** Results in significant **water savings** due to early maturing, with at least 5-6 fewer irrigation cycles required against the normal 29-30 for Pusa-44.

PR Varieties

1. The new **non-Basmati rice varieties** developed by **Punjab Agricultural University** have become popular among Punjab farmers.
2. The new non-basmati varieties, namely PR 121, PR 122, PR 123, PR 124, and PR 126, are **better than PUSA-44** because:
 - a. Less maturing time (2-4 weeks earlier than PUSA-44)
 - b. More yield per unit area
 - c. Less pesticide use
 - d. Less irrigation required
 - e. Bacterial blight disease resistance
 - f. Less labour required

PR PADDY VARIETIES IN COMPARISON TO PUSA 44

PARAMETER	PR 121	PR 126
Time saved (days)	15-18	25-30
Fertilisers saving*	249	306
Savings of Pesticides*	1138	1411
Irrigations saved (Number)	3-4	5-6
Labour saving*	720	1040
Total variable costs*	2981	4151
Net profit*	+278	+176

* Rupees/acre

Other Measures to Address Stubble Burning

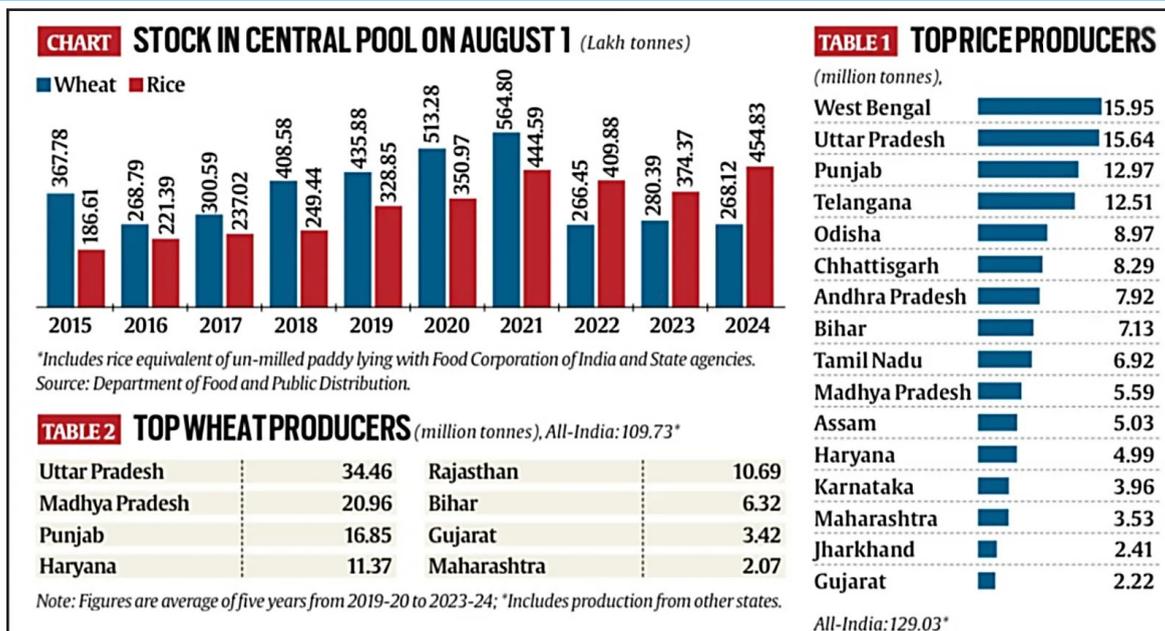
1. **Bio Enzyme-PUSA:** Developed by IARI, it decomposes stubble within 20-25 days, transforming it into nutrient-rich manure. This improves soil health and reduces fertiliser expenses.
2. **Pelletisation:** Converting paddy straw into pellets for use in thermal power plants and industries as fuel can save fossil fuels and reduce carbon emissions.
 - In 2022, the MoEFCC introduced a scheme to incentivise the establishment of paddy straw pelletisation and torrefaction plants.
3. **Happy Seeder:** Mounted on a tractor, this machine cuts and lifts straw, sows wheat and rice in soil, and deposits straw over the sown area instead of burning the stubble.
4. **Ex-situ crop residue management:** Alternative uses of paddy straw, i.e. Biomass Power Projects, Co-firing in Thermal Power Plants, feedstock for 2G Ethanol plants, Compressed Biogas plants, etc.

7. Rice-Wheat need to be de-hyphenated

Policymakers have recently emphasized the need to de-hyphenate rice and wheat production due to shifting trends in production, consumption, and related challenges.

- a. Rice is currently facing a surplus, whereas wheat is experiencing deficits and rising consumption demands.





Need to De-hyphenate Rice and Wheat Production :

Contrasting Surplus Situations:

1. Rice Surplus:

- a. **Exports:** India exported 21.21 million tonnes (mt) of rice (both basmati and non-basmati) in 2021-22, 22.35 mt in 2022-23, and 16.36 mt in 2023-24.
- b. **Stocks:** Government rice stocks were at a record high of 45.48 mt in August 2024.

2. Wheat Shortage:

- a. **Exports:** Wheat exports dropped from 7.24 mt in 2021-22 to 4.69 mt in 2022-23, and a minimal 0.19 mt in 2023-24.
- b. **Stocks:** Despite a ban on wheat exports in May 2022, stocks were at a low of 26.81 mt in August 2024.

Differences in Production Areas

1. Rice:

- a. **Seasons:** Cultivated in both kharif (monsoon) and rabi (winter-spring) seasons. For example, in West Bengal, farmers grow three rice crops: aus (summer), aman (rainy), and boro (winter).
- b. **Geography:** Grown in 16 states across a diverse range of regions (North: Punjab, UP; South: Tamil Nadu, Telangana; Central: MP, Chhattisgarh; East: West Bengal, Assam; West: Maharashtra, Gujarat).

2. Wheat:

- a. **Season:** Grown only in the rabi season.
- b. **Geography:** Produced in eight states with significant output, mainly in the northern, central, and western regions. **The top four states (UP, MP, Punjab, Haryana) account for 76% of output.**

Production Volatility

1. **Rice:** Less volatile due to extensive cultivation and better water management. For example, Telangana has significantly increased rice production due to improved irrigation and MSP assurances.
2. **Wheat:** More volatile due to its single cropping season and climate constraints. Shorter, warmer winters and unpredictable weather patterns have negatively impacted wheat yields.

Diverging Consumption Trends

1. Wheat:

- a. **Consumption:** The per capita monthly consumption of wheat is 3.9 kg in rural areas and 3.6 kg in urban areas. This translates to approximately 65 mt for a population of 1.425 billion.





- b. **Processed Forms:** Significant consumption in processed forms (e.g., bakery items, convenience foods) which is expected to rise with urbanization and higher incomes.
- 2. **Rice:**
 - a. **Consumption Patterns:** No significant increase in rice consumption. Limited innovation in rice-based convenience foods suggests stable consumption patterns.

Government Initiatives to Support Rice and Wheat Cultivation

1. National Food Security Mission
2. Hybrid Rice Seed Production
3. Rashtriya Krishi Vikas Yojana
4. Minimum Support Price (MSP)
5. Agriculture Infrastructure Fund (AIF)
6. Pradhan Mantri Krishi Sinchai Yojana (PMKSY)
7. Crop Diversification Programme (CDP)

Key Facts about Rice and Wheat

Basis	Rice	Wheat
1. Temperature	22-32°C with high humidity	10-15°C (Sowing time) and 21-26°C (Ripening & Harvesting) with bright sunlight
2. Rainfall	150-300 cm	75-100 cm
3. Soil Type	clayey and loamy soil	Well-drained fertile loamy and clayey
4. Top Producers	West Bengal >Uttar Pradesh >Punjab	Uttar Pradesh >Madhya Pradesh >Punjab
5. India's Global Position	2nd largest producer of rice in the world after China	2nd largest producer of wheat in the world after China

Recommendations to Address Rice-Wheat Consumption Divergence :

1. **Wheat Policy:**
 - a. **Short-Term:** Prepare for potential wheat importation due to rising consumption and production challenges.
 - b. **Long-Term:** Focus on improving per-acre yields and developing climate-smart varieties to enhance wheat production sustainability.
2. **Rice Policy:**
 - a. **Export Restrictions:** Lift the ban on exports of white non-basmati rice and remove the 20% duty on parboiled non-basmati rice. Eliminate the USD 950/tonne floor price on basmati rice.
 - b. **Innovation:** Encourage innovations in rice-based food processing to boost consumption, such as breakfast cereals, soups, baby foods, and packaged mixes.
3. **De-hyphenation of Policy:**
 - a. Recognize the distinct challenges and needs of rice and wheat production. Policies should

address the specific issues related to each cereal independently rather than treating them as interchangeable.

Conclusion:

De-hyphenating rice and wheat production is crucial for addressing the unique challenges faced by each crop. By developing targeted policies and addressing the specific needs and consumption trends for rice and wheat separately, India can better manage production, consumption, and food security issues effectively.

8. Canara Bank issued India's first Additional Tier I (AT1) perpetual bonds

1. Perpetual bonds are a type of debt instrument that doesn't have a specific maturity date.
2. **Perpetual Nature:** These bonds have no fixed maturity date.
3. **Interest Payments:** The issuer is obligated to pay interest to bondholders at regular intervals, typically semi-annually or annually.



- Redemption:** While there's no fixed maturity, the issuer can choose to redeem the bonds at a future date, often at a premium. However, this is not mandatory.
- Investor's Return:** Investors primarily earn returns through interest payments. They can also realize capital gains by selling the bonds in the secondary market.

Why Issue Perpetual Bonds?

- Long-Term Funding:** These bonds provide long-term, stable funding for banks.
- Regulatory Capital:** They can be used to meet regulatory capital requirements, enhancing a bank's financial strength.
- Flexibility:** Issuers have the flexibility to redeem the bonds when it's financially advantageous.

Risks for Investors:

- Interest Rate Risk:** Changes in interest rates can affect the bond's market value.
- Credit Risk:** If the issuer's financial health deteriorates, the ability to pay interest and potentially redeem the bonds may be compromised.
- Market Risk:** The bond's market value can fluctuate due to market conditions.

Additional Tier 1 (AT1) Bonds

AT1 bonds are a type of perpetual debt instrument issued by banks to bolster their capital base. They are designed to be riskier than traditional bonds, and in return, they offer higher interest rates.

Characteristics of AT1 bonds:

- Perpetual nature:** These bonds have no fixed maturity date.
- Convertible to Equity:** In times of financial stress, banks can convert these bonds into common equity shares. This feature makes them a safety net for the bank and reduces the risk of a bailout.
- Write-down Clause:** In severe financial distress, the face value of these bonds can be written down or even wiped out.
- Higher Interest Rates:** To compensate for the higher risk, AT1 bonds typically offer higher interest rates than traditional bonds.

Why do banks issue AT1 bonds?

- Regulatory Capital:** They help banks meet regulatory capital requirements, enhancing their financial stability.
- Funding Growth:** They provide a source of long-term funding for banks.

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9. National Bank For Financing Infrastructure And Development (NaBFID)

Central Government, under Companies Act, 2013, notified NaBFID as a **Public Financial Institution (PFI)**.

- Only institutions established under any **Central or State Act** or whose at least **51% paid up share capital is held by central or state government** can be notified as PFI.

National Bank for Financing Infrastructure and Development (NaBFID)

- NaBFID was established as an infrastructure focused Development Financial Institution (DFI) under the **National Bank for Financing Infrastructure and Development Act, 2021**.
- It was established to support the development of **long-term non-recourse infrastructure financing** in India including development of bonds and derivatives markets.

10. 50 Years of Indian Microfinance Sector

- India's microfinance journey began in 1974 with the establishment of the Self-Employed Women's Association (SEWA) Bank, registered as a cooperative bank.
- Nobel Laureate Muhammad Yunus** laid the foundation of modern MFIs with establishment of Grameen Bank in Bangladesh in 1976
- In India, the Reserve Bank of India (RBI) regulates MFIs.
- The Malegam Committee (2010), constituted by the RBI, recommended a comprehensive framework to regulate Non-Banking Financial Company - MFIs (NBFC-MFIs).

About Microfinance (Microcredit)

- Microfinance provides financial services, primarily small loans, to marginalized and poor individuals excluded from traditional banking.



- Services also include savings accounts, fund transfers, and micro-insurance.

Significance of the Microfinance Sector

- Financial Inclusion and Socio-economic Transformation:** Microfinance is a powerful tool for bringing financial services to the unbanked and enabling their economic participation.
- Women's Empowerment:** Microfinance often operates through Self Help Groups (SHGs), empowering women and fostering their financial independence.
- Poverty Reduction and Rural Development:** Microfinance contributes to poverty alleviation and overall development in rural areas.

Challenges Faced by the Microfinance Sector

- High Transaction Costs:** Serving a large number of small borrowers leads to high operating costs for MFIs.
- Lack of Collateral:** The absence of collateral makes it challenging to secure loans, increasing the risk for MFIs.
- Higher Interest Rates:** MFIs typically charge higher interest rates compared to commercial banks due to the higher risk involved.
- High Credit Costs:** MFIs often face difficulties in accessing affordable funding sources, impacting their lending rates.
- Other Challenges:** Low financial and digital literacy among borrowers and the continued reliance on informal moneylenders pose additional challenges.

Government Initiatives to Support Microfinance in India

- SHG-Bank Linkage Program:** This program aims to increase loan availability for SHGs and encourage a shift from non-income-generating activities to productive, income-generating ventures.
- Pradhan Mantri Mudra Yojana (PMMY):** PMMY provides loans up to ₹10 lakh to non-corporate, non-farm small/micro enterprises through various financial institutions.
 - Loans under PMMY are categorized as Shishu, Kishore, and Tarun, based on the loan amount and stage of the business.
 - The 2024 Union Budget increased the loan limit to ₹20 lakh for those who have successfully repaid previous loans under the Tarun category.

11. SPICED Scheme

In September 2024, the Union Ministry of Commerce and Industry approved 'Sustainability in spice sector through progressive, innovative and collaborative interventions for export development' (SPICED) Scheme.

- Aim:** To **expand the area under cardamom** and increase productivity of **small and large cardamom**, export promotion, capacity building & skill development of stakeholders, etc.
- Major components of the scheme:** Improving productivity, post-harvest quality upgradation, market expansion efforts, trade promotion, technology interventions, research and capacity building, and skill development.
- Implementation** during the remaining term of the 15th Finance Commission (from 2023-24 to 2025-26).

About Cardamom

- Cardamom is commercially cultivated for its dried fruits (capsules)
- Small Cardamom:**
 - Native:** Indigenous to the **evergreen forests of Western Ghats of South India.**
 - Major producers of small cardamom:** Kerala, Karnataka and Tamil Nadu
 - Favorable conditions for Small Cardamom**
 - Thick shady areas with loamy soil** which are usually acidic are ideal.
 - Elevation:** 600 to 1500 m.
 - Adequate drainage** must be provided
- Large Cardamom**
 - Distribution:** **Sub-Himalayan region** of North Eastern India, Nepal and Bhutan.
 - Favorable conditions for Large Cardamom:** average **precipitation of 3000-3500 mm spread over about 200 days.**
 - Temperature ranging from **6-30 degree C.**

About Spice Board India

- Genesis:** Constituted in 1987 under the Spices Board act 1986.
- Role:** It is an **autonomous body** responsible for the export promotion of the 52 scheduled spices and development of Cardamom (Small & Large).
- Headquarter:** Cochin, Kerala.
- Ministry:** Ministry of Commerce and Industry





E. SCIENCE & TECHNOLOGY

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1. Bharatiya Antariksh Station: India's Own Space Station

- In **September 2024**, the Union Cabinet approved the building of first unit of the Bharatiya Anatriksh Station (BAS) by extending the scope of Gaganyaan program.
- Approval by the cabinet is given for development of first module of Bharatiya Antariksh Station (BAS-1)

About the Bharatiya Antariksh Station (BAS)

- Purpose:** A national space-based facility for scientific research and technological advancements, orbiting 400-450 km above Earth.
- Structure:** Comprising five modules to be built in phases.
- Timeline:**
 - First module (Base Module) launch: 2028
 - Full operationalization: 2035
- Current Status:** Conceptualization phase, focusing on architecture, module types, and docking mechanisms.

Significance of BAS

- Advancement of Human Spaceflight:** Enables research on long-duration space missions, ensuring astronaut safety and health, and supports India's broader space exploration goals.
- Enhanced Earth Observation:** Facilitates improved spatial resolution and diverse lighting conditions for Earth observation, aiding in disaster management.
- Microgravity Research:** Provides a platform for controlled experiments on the impact of microgravity on human health, such as muscle atrophy and bone density loss.
- Innovation and Economic Growth:** Offers opportunities for small entrepreneurs to test space technologies, fostering innovation and creating employment in high-tech sectors.
 - India aims to increase its share in the global space economy from 2% to 10%.

- Technological Spin-offs:** Spin-off products are space-based innovations and technologies that find application in other sectors like use of:
 - Space-derived data processing algorithm for environmental monitoring or
 - Advanced materials developed for, automotive, construction and spacecraft for aerospace.
- International Collaboration and Prestige:** By building a space station, India joins a select group of countries, elevating its global standing and potentially fostering international collaborations.

About the Gaganyaan Programme

- Initiation:** Approved in December 2018, Gaganyaan is India's first human spaceflight mission.
- Objectives:**
 - Short-term:** Send astronauts to a 400 km orbit for a three-day mission.
 - Long-term:** Establish a sustainable Indian human space exploration program.
- Technological Advancements:** The pre-requisites for Gaganyaan mission include development of many critical technologies including:
 - Human-rated launch vehicle (LVM 3) for carrying crew safely to space,
 - Life Support System to provide an earth like environment to crew in space,
 - Crew emergency escape provision
 - Evolving crew management aspects for training, recovery and rehabilitation of crew.

Challenges regarding Indian space station:

- Project Development:**
 - Limited research and development (R&D) budget
 - Technological challenges** in developing new systems for life support, radiation protection, and orbital maintenance.



c. Geopolitical considerations and international collaborations.

- i. A space station is not only a scientific endeavour, but also a strategic asset.
- ii. The country will have to deal with potential competition from, and build cooperation with, other space-faring nations, such as the US, Russia, China and the European Union.

2. Space-related Challenges:

- a. Astronaut health hazards due to microgravity, radiation, and psychological effects of isolation.
- b. Increasing space debris posing risks to space operations.

Way Ahead

1. **Sufficient Funding:** Explore international collaborations and private sector investments to ensure funding.
2. **Capacity Building:** Upgrade ISRO's infrastructure for life support systems, radiation protection, and other essential components.
3. **Long-Term Sustainability:** Develop a comprehensive plan for maintenance, resupply missions, and upgrades to ensure its space station remains operational.
4. **Geopolitical Management:** Balance national interests with international obligations while adhering to space law and governance.
5. **International Cooperation:** Collaborate with experienced nations like the US, Russia, China to gain insights and reduce costs.

Other Space Stations

1. **Inoperative:**
 - a. **Salyut 1 (Soviet Union):** World's first space station launched in 1971
 - b. **Skylab:** USA's first space station launched in 1973
2. **Operative:**
 - a. **International Space Station (ISS):** It is a large space station that was assembled in 1998 and operational since 2000.
 - It is maintained in low Earth orbit by a collaboration of **5 space agencies** and their contractors: **NASA (United States), Roscosmos (Russia), ESA (Europe), JAXA (Japan), and CSA (Canada).**

b. Tiangong Space Station (China, 2021):

Tiangong 1 launched in 2011, Tiangong -2 launched in 2016 were test space labs and Tiangong space station was launched in 2021 (fully operational since late 2022).

3. Upcoming:

- a. **Gateway Space Station:** NASA-led Gateway Program is an international collaboration to establish **humanity's**

- a. **first space station around the Moon** as a vital component of the **Artemis campaign**.

b. Axiom Station (Commercial, low-Earth orbit):

It is a commercial space station being developed by Axiom Space to operate in low-Earth orbit. It will be the first commercial space station in the world.

2. India's First Mission to Venus in 2028

1. **In September 2024, the Union Cabinet** approved **India's 1st mission to Venus**, which will be launched in **March 2028**.
2. This mission will be India's **2nd interplanetary effort**, following the successful **Mars Orbiter Mission** launched in **2013**.

Mission Objectives:

The primary goals of the **Venus mission** include:

1. The mission aims to conduct comprehensive studies of **Venus** from orbit, examining its **surface and subsurface features, atmospheric conditions, and ionospheric interactions with solar activity**.
2. Spacecraft will carry a range of **scientific instruments** developed both in India and by **international partners** to gather data on various aspects of the planet.

Importance of Studying Venus:

1. **Earth's Twin:** **Venus** is often referred to as **Earth's twin** due to its similar **mass, density, and size**. Understanding Venus could provide crucial insights into the **Earth's formation and evolution**.
2. Venus is believed to have once had **water**, which has since evaporated, leading to its current dry state. This transformation is critical for understanding **planetary climates and atmospheres**.



Extreme Conditions:

- High Surface Temperature:** With surface temperatures averaging around **462°C**, Venus is hotter than **Mercury**, the closest planet to the **Sun**. This extreme heat is attributed to a **runaway greenhouse effect**.
- The pressure on Venus is about **90 times** that of Earth's, similar to the pressure experienced at great ocean depths.
- The atmosphere is primarily composed of **96.5% carbon dioxide**, with clouds containing **sulfuric acid**, creating a hostile environment.
- Slow Rotation:** A day on Venus (**one full rotation**) takes approximately **243 Earth days**, significantly longer than a year on Venus, which is about **225 Earth days**.

Mission Details:

- The mission, originally planned for **2023**, is now set for **March 2028** to align with optimal planetary positions.
- The spacecraft will carry approximately **100 kg** of scientific instruments to **conduct experiments and gather data**.
- The satellite will utilize **Earth's orbit** to gain speed, slingshot towards **Venus**, and take around **140 days** to reach the planet.

Aero-braking Technique:

- Initial Orbit:** The satellite will enter a highly **elliptical orbit (500 km x 60,000 km)** around Venus.
- To enter a lower, more effective orbit (**300 x 300 km** or **200 x 600 km**), the satellite will use a technique called **aero-braking**.
- This involves skimming the upper atmosphere of Venus to create **drag, allowing the spacecraft to slow down and lower its orbit**.
- The altitude at which the **satellite skims must be meticulously calculated**.
- Too deep, and it risks burning up; too shallow, and the descent will take too long. The process is expected to last around **six months**.

Scientific Payloads:

The mission will feature a variety of scientific experiments, including:

- Synthetic Aperture Radar:** This will be used for imaging the surface of Venus, helping to map its **topography and geological features**.
- Thermal Camera:** To measure **temperature variations** and understand **surface composition**.
- Interplanetary Dust Studies:** An experiment aimed at studying **dust particles** that may influence atmospheric conditions.
- High-Energy Particle Analysis:** This payload will investigate **high-energy particles** that enter Venus's atmosphere, affecting its **ionization levels**.
- Atmospheric Composition Studies:** Assessing the structure, variability, and thermal state of the **Venusian atmosphere**.

Global Context:

- Historical Missions:** Numerous missions have explored Venus, including those by the **USA**, the **USSR**, **Japan**, and the **European Space Agency (ESA)**. These missions have provided foundational knowledge about the planet.
- Upcoming Missions:** The USA plans two missions, **DaVinci** in **2029** and **Veritas** in **2031**, while ESA has the **EnVision** mission scheduled for **2030**. These missions aim to further our understanding of Venus and its complexities.

Conclusion:

India's mission to **Venus** represents a significant milestone in **space exploration**, showcasing **ISRO's capabilities** in interplanetary research. By studying Venus, scientists hope to gain insights into **planetary processes, climate evolution**, and potentially draw parallels to Earth's history. The mission will not only contribute valuable data to the scientific community but also strengthen India's position in global **space exploration** initiatives.



3. PM launches 3 PARAM Rudra supercomputers & HPC System

1. In September, 2024, PM Narendra Modi dedicated 3 PARAM Rudra supercomputers, to boost research in the fields of astronomy, medicine and high-energy physics.

- PARAM Rudra Supercomputers are developed indigenously by the Centre for Development of Advanced Computing (C-DAC) under the National Supercomputing Mission (NSM).

2. They have been deployed at three key locations: **Delhi, Pune and Kolkata:**

(i) **Giant Metre Radio Telescope (GMRT) in Pune:** It will utilize the supercomputer to study Fast Radio Bursts (FRBs) and other astronomical phenomena.

(ii) **Inter-University Accelerator Centre (IUAC) in Delhi:** It will advance research in fields such as material science and atomic physics.

(iii) **S.N. Bose Centre in Kolkata:** It will drive advanced research in areas including physics, cosmology, and earth sciences.

3. In addition, the Prime Minister also inaugurated a **High-Performance Computing (HPC)** system designed for weather and climate research, acquired by the Ministry of Earth Sciences.

- In keeping with tradition, these state-of-the-art systems have been named after celestial entities connected to the sun. Previous systems were named **Aditya, Bhaskara, Pratyush, and Mihir**. The New HPC Systems named '**Arka**' and '**Arunika**' - Reflecting their Connection to Surya, the Primary Energy Source for the Earth System. Located at **2 key sites-**

- The Indian Institute of Tropical Meteorology (IITM) at Pune and
- The National Centre for Medium Range Weather Forecasting (NCMRWF) at Noida.

i. **Arka system** at IITM has a 11.77 Peta Flop capacity and will, for the first time, help improve the country's horizontal resolution of its global weather prediction models to 6 km from the existing 12 km.

ii. **HPC Arunika** comes with a 8.24 Peta Flop capacity. This HPC will prove beneficial in upgrading weather forecast resolution at block levels.

About Supercomputers:

1. They're **largest and more powerful mainframe systems** that solve **complex computations** by **splitting tasks into multiple parts** and **working on them in parallel**.

- Speed** of a supercomputer is measured in **floating-point operations per second (FLOPS)**.

National Supercomputing Mission (NSM):

- Launched in **2015**
- Objective:** To provide country with **supercomputing infrastructure** to meet increasing **computational demands** of **academia, researchers, MSMEs, and startups**.
- NSM is steered jointly by **Department of Science and Technology (DST)** and **Ministry of Electronics and IT (MeitY)**.
 - Implemented by **Centre for Development of Advanced Computing (C-DAC), Pune** and the **Indian Institute of Science (IISc), Bengaluru**.
- Application areas:** Computational Biology, Atomic Energy Simulations, National Security/ Defence Applications, Seismic Analysis, etc.

According to TOP 500 list fastest Supercomputers of India (June 2024):

- AIRAWAT:** Rmax 8.5 TFlop/s (**110th rank**)
- PARAM Siddhi AI:** Rmax 4.62 TFlop/s (**185th rank**)
- Pratyush:** Rmax 3.76 TFlop/s (**230th rank**)
- Mihir:** Rmax 2.57 TFlop/s (**388th rank**)

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About National Quantum Mission (NQM):

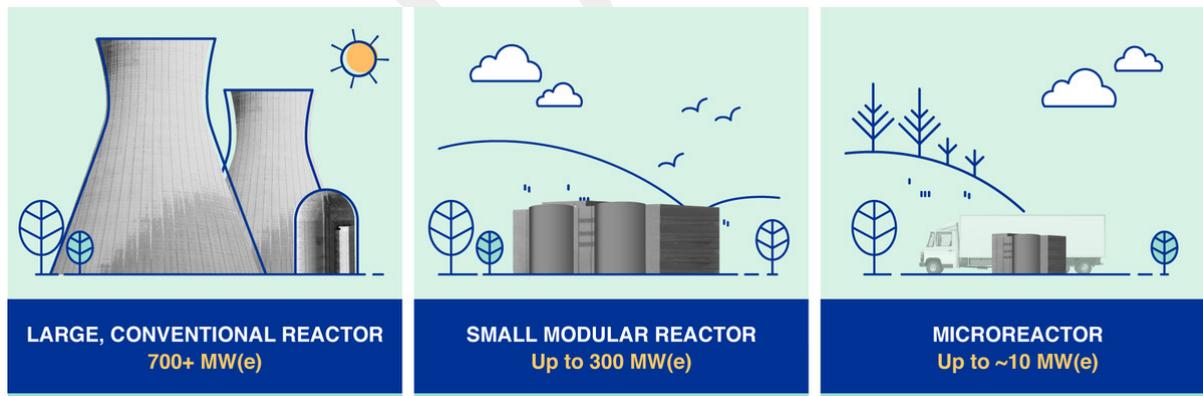
1. India in 2023 announced the setting up of the National Quantum Mission to build capabilities in quantum-related science and technology.
2. The mission focuses on **four key domains**: i) Quantum computing, ii) Quantum communications, iii) Quantum Sensing & Metrology and iv) Quantum Materials & Devices and materials.

4. India's First Silicon Carbide manufacturing Facility in Odisha

The facility, developed by RIR Power Electronics Limited, a key player in semiconductor power electronics, located at EMC Park in Infolvalley, Bhubaneswar.

Silicon Carbide (SiC)

1. It is a compound made of silicon and carbon.
2. It has excellent heat conductivity, which makes it ideal for high-temperature applications.
3. It is chemically inert and resistant to corrosion by acids, alkalis and salts.
4. It has a very high melting point, around 2,730°C (4,950°F).

What Are Small Modular Reactors (SMRs)?

1. Small Modular Reactors (SMRs) are advanced nuclear reactors that can produce up to 300 megawatts of electricity per module.
2. They are designed to be built in factories and transported to utilities, and can be used in a variety of ways, including power generation, process heat, and desalination

5. Acheson process: It is produced by this process where silica (SiO_2) and carbon (usually in the form of petroleum coke) are heated to high temperatures in an electric furnace. This process forms SiC crystals and releases carbon dioxide as a by-product.
6. **Properties:** Excellent thermomechanical characteristics, including high thermal conductivity, excellent mechanical properties, excellent resistance to wear and oxidation.
7. **Applications:** semiconductor devices, mechanical seals, structural ceramics, heat exchangers, optical mirrors, ballistic armor, etc.

5. India's Small Modular Reactor (SMR) Initiative

1. In September 2024, India is advancing its plans to enter the Small Modular Reactor (SMR) market, attracting interest from private players for potential deployment at their captive sites.
2. This initiative aims to enhance India's position in the nuclear energy sector while supporting its clean energy goals.

Strategic Importance of SMRs

1. As countries like Russia and China face challenges in expanding their nuclear operations internationally, India seeks to establish itself as a leader in SMR technology. This aligns with its commitment to a clean energy transition and presents opportunities for international collaboration.



2. India has experience operating small reactors, making it well-positioned to develop and manufacture SMRs.
3. This **shift to smaller reactors could address energy needs in regions with mid-sized grids** or decentralized power systems.
4. Technical discussions are underway to create a **roadmap for SMR deployment, including the potential involvement of the private sector and startups.**
5. This push has gained renewed momentum and **could receive support from the United States**, especially concerning financing and technology dissemination.

Current SMR Projects

Globally, **2 notable SMR projects have reached operational status:**

1. **Akademik Lomonosov (Russia):** A floating power unit with **two 35 MWe modules that began operations in May 2020.**
2. **HTR-PM (China):** A demonstration project that was **grid-connected in December 2021 and commenced commercial operations in December 2023.**

Russia Targets India for Small Nuclear Power Plants

1. Rosatom State Atomic Energy Corporation, **Russia's integrated nuclear power major, is shifting its focus towards selling low-power floating and land-based nuclear power plants globally, including in India.**
2. The **Akademik Lomonosov, the world's first floating nuclear power unit, serves as a reference site for this initiative.**

Key Features of Floating Nuclear Power Plants

1. **Design and Capacity:** The Akademik Lomonosov is a compact facility, measuring 144 meters long and 30 meters wide, with a displacement of around 21,000 tons. It houses two small light water reactors, **each with a capacity of 35 MW, similar to those used in Russian icebreakers.**

Portability: These floating plants can be connected to coastal power grids and relocated as needed, **eliminating the need for permanent land-based infrastructure.** They are also designed to be **earthquake-resistant and utilize abundant water for cooling.**

Recent Developments

1. **Successful Contracts:** Rosatom recently secured a contract with **Uzbekistan for a 330 MW nuclear power plant consisting of six 55 MW reactors**, utilizing the RITM-200N water-water reactor technology. This technology adapts ship-based innovations for land deployment.
2. **Expansion Plans:** The company is constructing **four additional floating nuclear power plants, each with a capacity of around 50 MW**, to be stationed at various locations.

Historical Context

Past Innovations: Small mobile nuclear power plants are **not a new concept for Russia; similar designs were developed during the Soviet era.** However, recent advancements focus on modernizing these technologies for current energy needs.

Challenges in the Nuclear Sector

The global nuclear industry is experiencing a downturn, with **nuclear power generation reaching its lowest levels in nearly four decades due to:**

1. Shifts in national energy strategies and safety concerns post-Fukushima.
 - a. Fukushima nuclear accident was a **major nuclear accident at the Fukushima Daiichi nuclear power plant in Ōkuma, Fukushima, Japan which began on 11 March 2011**
 - b. Without power, the **cooling systems failed in three reactors, and their cores subsequently overheated.**
 - c. This led to a **partial meltdown of the fuel rods, a fire in the storage reactor, explosions in the outer containment buildings** (caused by a buildup of hydrogen gas), and the **release of radiation into the air and ocean.**
2. The **competitiveness of renewable energy sources affecting nuclear's market share.**
3. Countries like the **U.S. and France have seen significant reductions in nuclear output**, with **Germany and Belgium shutting down reactors as part of their energy transition plans.**



Advantages of SMRs

1. SMRs are **designed for factory-based production**, which streamlines construction timelines and reduces project costs compared to traditional large reactors.
2. Smaller emergency planning zones and passive safety systems enhance the overall safety of SMRs. They can also be repurposed at sites previously occupied by fossil-fuel power plants.
3. While initial **capital investment per reactor may be lower, the cost per MW could be higher compared to larger reactors**. However, costs may decrease as more units are constructed.

6. World's First Private Spacewalk

1. The world's first private spacewalk took place in September 12, 2024, as part of the Polaris Dawn mission.
2. The Polaris Dawn mission was launched by SpaceX Falcon 9 rocket from NASA's Kennedy Space Center in Florida on September 10, 2024.
3. A rocket carried American billionaire **Jared Isaacman (commander of the crew) and three others- Scott Poteet, Anna Menon, and Sarah Gillis** into orbit.
 - **Sarah Gillis and Jared Isaacman** were the first non-government individuals to perform a spacewalk. Menon and Poteet remained inside the spacecraft during the spacewalk.
 - This is **Isaacman's second trip into space**. In 2021, he went into low-Earth orbit for three days, and then splashed down off Florida.
4. The **five-day mission**, known as Polaris Dawn, is the **first of three testing** and development missions under the **Polaris Program, jointly executed by Isaacman and Elon Musk's SpaceX**. The program **aims to develop** new technologies that could be used to send people to Mars someday.
5. Polaris Dawn has **travelled through Earth's regions of high radiation**, i.e., **South Atlantic Anomaly** and **Van Allen Radiation Belt**, to **study space radiation's impact on human health**.

About Polaris program

1. It is a first-of-its-kind effort to rapidly advance human spaceflight capabilities, while continuing to raise funds and awareness for important causes here on Earth.
2. Polaris, **a constellation of three stars more commonly known as the North Star**, has been a guiding light throughout human history to help navigate the world around us and the sky above.
3. The Polaris Program seeks to demonstrate important operational capabilities that will **serve as building blocks to help further human exploration to the Moon, Mars, and beyond**.



Mission Objectives and Outcomes:

1. **Record-Breaking Altitude:** The crew achieved a **peak altitude of 1,408.1 kilometers**, surpassing the previous record set by NASA's Gemini 11 mission in 1966. This marked the highest Earth orbit reached by humans since the Apollo missions.
2. **Space Radiation Research:** The crew conducted research within the **Van Allen radiation belts** to better understand the effects of space radiation on human health, gathering valuable data for future deep-space missions.
3. **Historic Private Spacewalk:** The mission featured the **world's first commercial spacewalk, with Jared Isaacman and Sarah Gillis** exiting the Dragon capsule.
4. **Spacesuit Testing:** The crew successfully tested new SpaceX-developed **EVA spacesuits**, equipped with cameras, heads-up displays, and improved thermal management.
5. **Starlink Laser-Based Communications:** Polaris Dawn was the **first to test Starlink laser-based communications in space**, paving the way for enhanced space communications systems for future missions to the Moon, Mars, and beyond.

What is a 'Spacewalk'?

1. A **spacewalk or an "extravehicular activity (EVA)"** is a period of activity spent outside a spacecraft by an astronaut in space.





- The **first-ever** spacewalk was carried out on **March 18, 1965**, by the Soviet cosmonaut **Alexei Leonov** at the height of the Space Race — the 20th century competition between the US and USSR over who could conquer space exploration first — during the Cold War. Leonov’s walk lasted 10 minutes.
2. Today, Spacewalks are usually done outside the International Space Station (ISS) and can last between **five and eight hours**.
 3. **Spacewalks are done for several reasons**, including to carry out **science experiments**. Astronauts can attach experiments to the outside of a spacecraft during their spacewalk, and observe how the **space environment impacts** different things. They can also **test new equipment**, and **repair satellites** or their spacecraft during the walk.
 4. To carry out a spacewalk, **astronauts have to wear a spacesuit and use rope-like safety tethers** to attach themselves to their spacecraft. “One end is attached to the spacewalker. The other end is connected to the vehicle. The safety tethers keep astronauts from floating away into space.”
 5. The other way is **to wear a SAFER (Simplified Aid for EVA Rescue)**. It is put on like a backpack, and consists of small jet thrusters to help an astronaut move around in space. SAFER is controlled by astronauts with a small joystick.

Van Allen Radiation Belt

1. Earth’s **magnetosphere traps the high energy radiation particles and shields the Earth** from solar storms and solar winds that can damage technology as well as people living on Earth.
 - a. These **trapped particles form two belts of radiation (inner and outer), known as Van Allen Belts**, that surround the Earth.
 - i. **Inner belt** results from **interactions of cosmic rays with Earth’s atmosphere** and **Outer belt** is made up of billions of **high-energy particles** that originate from Sun.

b. It was **discovered in 1958 by astrophysicist James Van Allen**.

2. Astronauts and **spacecraft must fly through Van Allen Belts to reach outer space**, so it is important to fly through this region quickly to **limit their radiation exposure**.
3. NASA plans to use its upcoming **Artemis missions** to send astronauts beyond **Van Allen Radiation Belt** to land on **South Pole of Moon** by end of 2025, and eventually on to **Mars**.

South Atlantic Anomaly

1. It is a geographical region over **South Atlantic Ocean** where **inner Van Allen radiation belt** extends down particularly close to Earth.
2. This leads to highly increased levels of **ionizing radiation** and related impacts on spacecraft in Low Earth Orbits, e.g., correspondingly **increased radiation exposure of astronauts and electronic components** on International Space Station.

Other Facts

1. **First Violin in Space**: Mission Specialist Sarah Gillis played the first violin in space as part of a global music moment.
2. **Crew Dragon Resilience’s Third Flight**: The mission marked the third successful flight of the Crew Dragon Resilience spacecraft.
3. **Splashdown near Dry Tortugas**: The mission concluded with a splashdown in the **Gulf of Mexico** near Florida’s Dry Tortugas, a new landing zone for SpaceX.

7. Impact of Starlink Satellites on Astronomy

In **September 2024**, study published in **Astronomy & Astrophysics** highlights how **Elon Musk’s Starlink satellites** are significantly hindering **astronomical research**, particularly for **radio astronomers**.

Starlink Satellite Constellation

1. More than **6,300 operational satellites** orbiting Earth at approximately **550 km altitude**.
2. **Purpose**: Designed to provide **high-speed internet access**, especially in remote areas.



Problem: Radio Noise and Unintended Electromagnetic Radiation (UEMR)

1. Starlink satellites generate “radio noise,” which is **unintended electromagnetic radiation that interferes with radio astronomical observations**.
2. **Effect on Observations:** This interference is likened to trying to see faint stars in the presence of **bright headlights**, making it difficult for astronomers to detect faint celestial signals.

Importance of Radio Astronomy

1. **Radio astronomy** studies celestial objects through **radio frequencies**, using **radio telescopes** instead of optical telescopes.
2. **Challenges:** Just as bright visible light can blind optical observers, excessive radio noise can saturate radio telescopes, preventing them from detecting **critical signals**.
3. **Cees Bassa**, lead author of the study, said that observing with a satellite in view is akin to observing faint stars near a **full Moon**.

Why are radio telescopes used instead of optical telescopes?

Radio telescopes and optical telescopes are both tools used to observe celestial objects, but they operate on fundamentally different principles.

How they work:

1. **Optical telescopes:** These telescopes collect **visible light from celestial objects**. They use lenses or mirrors to focus the light onto a detector, such as a camera or human eye.
2. **Radio telescopes:** These telescopes collect **radio waves emitted by celestial objects**. They use **large antennas or dishes to capture these waves, which are then amplified and analyzed**.

Why radio telescopes are used:

1. **Observation of invisible phenomena:** Many celestial objects emit significant **amounts of radio waves, but very little visible light**. This includes:
 - a. **Neutral hydrogen gas:** This gas, which makes up most of the universe’s mass, emits radio waves at a specific frequency.

- b. **Pulsars:** These rapidly rotating neutron stars emit regular pulses of radio waves.
 - c. **Quasars:** These extremely distant and luminous objects emit powerful radio waves.
2. **Penetration of interstellar dust:** Radio waves can **pass through interstellar dust and gas, which can obscure visible light**. This allows radio telescopes to observe objects that are hidden from optical telescopes.
 3. **24-hour operation:** Unlike optical telescopes, which are limited by daylight, **radio telescopes can operate 24 hours a day**. This is especially important for studying transient phenomena, such as solar flares or supernovae.
 4. **High angular resolution:** With advanced techniques like Very Long Baseline Interferometry (VLBI), radio telescopes can achieve very high angular resolution, allowing them to observe fine details in celestial objects.

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Findings on Starlink’s Second-Generation Satellites

1. **Increased Brightness:** The new generation of Starlink satellites emits **UEMR at levels 32 times higher** than the first generation.
2. While the **first-generation satellites were made dimmer to mitigate radio leaks**, the newer models have reversed this trend, **complicating radio astronomers’ efforts**.
3. If satellite launches continue to increase, estimates suggest there could be up to **100,000 satellites** in orbit by 2030.

Regulatory Considerations

1. Experts advocate for regulations on satellite operators to limit **UEMR**, akin to existing regulations for terrestrial electronic sources like **cellphone towers**.
2. **Challenges of Leakage:** While it’s impossible to eliminate **electromagnetic leakage** entirely, regulations can help minimize its impact on astronomical observations.



8. Neutrinos - The Ghost Particles That Make Up Our Universe

1. Researchers studying **neutrinos** in **supernovae** and **neutron star** mergers have discovered that neutrinos (also called ‘**ghost particles**’) can become quantumly entangled, leading to chaotic (a state of complete disorder) behavior.
 - a. **Quantum entanglement** is a phenomenon where the two particles (such as a pair of photons or electrons) link together in a such a way that no matter how far apart they are in space, their state remains the same/linked.
 - b. A **supernova** is what happens when a **star has reached the end of its life** (star runs out of fuel) and explodes. Each blast is the extremely bright, super-powerful explosion of a star.

China is building the world’s largest “ghost particle” detector below the South China Sea.

What is a ghost particle?

1. **Neutrinos** are similar to electrons but **have no charge**, like neutrons. They are among the **most common particles in the universe**, with trillions of them passing through us every second.
2. In recent studies, scientists have discovered that neutrinos have a **very small mass**.
3. Because neutrinos have a **weak charge** and **minimal mass**, they are **extremely difficult to detect**.
4. They only **interact with other particles on rare occasions**, making them almost invisible. This elusiveness (state of being difficult to detect) earned them the name “**ghost particles**.”
5. Every time atomic nuclei come together (like in the sun) or break apart (like in a fission reactor), they produce neutrinos.

Neutrinos and their ability to change identity

In dense neutrino environments like core-collapse supernovae, these different types of neutrinos start to interact with each other. Through these interactions, the neutrinos become **entangled**, meaning their behaviors and properties become linked, even though they are

separate particles. Because of this entanglement, over time, neutrinos of different flavors end up with similar amounts of energy, reaching a kind of balance or equilibrium. Essentially, the differences between the flavors even out in these dense environments.

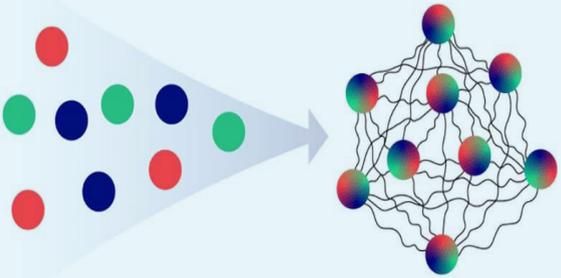


Fig: Neutrinos of different “flavor” quantum states (shown by colors) are entangled through interactions.

1. Neutrinos have an interesting ability: **they can change their “flavors” or identities**.
2. Neutrinos come in **three different types**, called **flavors—electron, muon, and tau**. When they move or interact with other particles, they can switch between these flavors.
3. In extreme environments like **core-collapse supernovae** (which are massive star explosions) or **neutron star mergers**, neutrinos start interacting with each other a lot more which leads to **quantum entanglement**.
 - a. **Quantum entanglement** is a concept in physics where particles become connected in such a way that the state of one particle instantly influences the state of another, no matter how far apart they are.
 - b. In the case of neutrinos, this means that their flavors or identities become linked.
 - c. Even if two neutrinos start out different, after interacting in these dense environments, they can become entangled, and their properties (like flavor) start influencing each other.
4. In simple terms, neutrinos can change their identity during interactions, and in places like supernovae, they can even form deep connections (entanglements) with other neutrinos, affecting how they evolve and behave together.



What is meant by Neutron Star Merger?

1. A **neutron star merger** is a phenomenon which occurs when two neutron stars come together and crash into each other.
2. Neutron stars are the **remnants** (remains/leftovers) **of massive stars that exploded in supernovae**.
3. When they merge, the **collision releases a huge amount of energy**, including gravitational waves and light.
4. This event can also create heavy elements like gold and platinum. It's a rare but powerful cosmic event that gives scientists insights into the universe and the nature of matter.

How Do Scientists Detect Ghost Particles?

1. Though neutrinos rarely interact with other particles, they sometimes collide with water molecules. For this reason, China is building its neutrino telescope underwater.
2. Researchers detect neutrinos by observing the byproducts they leave behind after passing through water or ice. These byproducts (known as **"muons,"**) emit flashes of light.
3. Advanced underwater telescopes can capture these flashes, offering scientists a way to study the energy and origins of neutrinos.
4. Currently, the largest neutrino detector is the **IceCube telescope**, located deep in **Antarctica** and managed by the **University of Wisconsin-Madison**. This telescope covers 1 cubic kilometer.
5. China's new telescope, called **"Trident,"** will cover 7.5 cubic kilometers in the **South China Sea**.
6. The sheer size of Trident will allow it to detect more neutrinos, making it 10,000 times more sensitive than existing underwater telescopes. The project has already begun, with completion expected within this decade.

Why Is Detecting Ghost Particles Important?

1. **Unexplained Behaviour:** Although neutrinos are abundant, scientists don't fully understand why neutrinos defy (go against) some established laws of physics.

2. **Unclear Origins:** The origin of neutrinos is still unknown, with some theories suggesting they played a significant role in the early universe, shortly after the Big Bang.
3. **Solving Scientific Mysteries:** Understanding neutrinos may help answer unresolved scientific questions, such as the origin of cosmic rays.
4. **Link to Cosmic Rays:** Identifying the source of neutrinos could lead to the discovery of where cosmic rays originate.
5. **Understanding the Universe's Beginnings:** Growing evidence suggests neutrinos are key to understanding the origins of the universe. The Trident telescope could bring us closer to uncovering these secrets.

Most recent Supernova: SN 2023ixf

1. **SN 2023ixf** is a **supernova** that was discovered in **May 2023** in the spiral galaxy **Messier 101 (M101)**, also known as the **Pinwheel Galaxy**.
2. It is classified as a **Type II supernova**, which occurs when a massive star (typically 8 to 50 times the mass of the Sun) exhausts its nuclear fuel and undergoes a core-collapse, leading to a massive explosion.
3. **Messier 101** is a spiral galaxy about **21 million light-years away** from Earth in the constellation **Ursa Major**.

9. Saturn's rings will briefly 'disappear' in March 2025

In March 2025, Saturn's rings will briefly 'disappear' from view when observed from Earth.

An Optical illusion

1. Saturn's rings will not truly vanish, but they will appear to 'disappear' from Earth's view due to an optical illusion.
2. **This illusion occurs because** of Saturn's unique tilt and lengthy orbit around the Sun.
3. Saturn is tilted at an **angle of 26.73 degrees** and takes about **29.4 Earth years** to complete a single orbit.

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4. During this time, for approximately **half of its orbit** (around 15 Earth years), **Saturn is tilted toward the Sun**, and for the other half, it is tilted away.
5. Since Saturn's rings share the same tilt as the planet, their appearance changes as Saturn moves along its orbital path.
6. **Every 13 to 15 years, the edge of Saturn's rings aligns directly with Earth.** This will happen in March 2025 when only the edges of the ring will be visible from our planet.
- Since Saturn's rings are very thin, just **tens of metres thick** in most places, at this position, they will reflect very little light, essentially making them invisible.
 - But as Saturn continues to go around the Sun, its rings will gradually reappear.
 - This phenomenon last occurred in 2009.
7. **In 2018, NASA confirmed that** Saturn is gradually losing its rings and will eventually be stripped of them entirely.
- The rings are slowly being pulled towards the planet due to Saturn's gravitational and magnetic forces.
 - NASA described this phenomenon as 'ring rain,'** estimating that an amount of water equivalent to that needed to fill an Olympic-sized swimming pool is drained from Saturn's rings every half hour.
 - At this pace, Saturn could lose its rings completely within the next 300 million years, or potentially even sooner.
8. **Data collected by NASA's Cassini spacecraft** has shown that Saturn's rings consist of billions of ice and rock particles, ranging in size from tiny grains of dust to massive chunks as large as mountains.
9. While it is believed that other gas giants, such as Jupiter, Uranus, and Neptune, may have once had similar rings, today they possess only faint ringlets that are barely visible, even with powerful telescopes.

10. In contrast, Saturn's rings are expansive, stretching across a distance nearly five times the diameter of Earth. The rings are divided into seven major sections, each featuring a complex and intricate structure.

About Planet Saturn

- Saturn is the **sixth planet** from the Sun.
- It is the **second-largest planet** in our Solar System, after Jupiter.
- Saturn has a diameter of approximately 116,464 kilometers (72,366 miles).
- The planet is thought to have a rocky core. **This core is surrounded by a thick layer of metallic hydrogen**, an intermediate layer of liquid hydrogen and helium, and an outer gaseous layer.
- Saturn is **known for its large and intense storm systems**, such as the **Great White Spot**. This massive storm occurs roughly once every Saturnian year (about 29 Earth years). These storms can last for months and cover vast areas.
- Saturn's rapid rotation gives it an oblate shape. It is flattened at the poles and bulging at the equator.
- Saturn and Jupiter together account for about 92% of the total planetary mass** in the Solar System. While Jupiter has a mass 318 times that of Earth, Saturn is about 95 times more massive.
- Saturn orbits the Sun at an average distance of 9.59 astronomical units (AU), or roughly 1,434 million kilometers. Its **orbital period is about 29.45 Earth years, nearly three decades** to complete one orbit.
- Saturn has a system of at least **146 identified moons**. Of these, 63 have been officially named. **Titan, the largest, is notable** for being larger (though less massive) than Mercury and is the only moon with a dense atmosphere and liquid hydrocarbon lakes.

Exploration of Saturn:

Saturn has been visited by four spacecraft. While the first three made flybys, *Cassini-Huygens* entered into orbit around the planet and deployed a probe to explore Titan's atmosphere



1. Pioneer 11 (Flyby - 1979):

- Launch:**1973
- First spacecraft to fly past Saturn.
- Provided the first close-up images of the planet and its rings.
- Discovered Saturn's F ring and a new moon.

2. Voyager 1 & 2 (Flybys - 1980 & 1981):

- Launch:**1977
- Captured stunning images of Saturn, its rings, and moons.
- Revealed the complex structure of the rings, with thousands of ringlets.
- Voyager 1 focused on Titan, while Voyager 2 continued on to Uranus and Neptune.

3. Cassini-Huygens (Orbiter and Lander - 2004-2017):

- Launch:** 1997
- Carrier Rocket:** Titan IV (401) B Centaur-T
- Operators:** NASA (United States) and ESA (European Union)
- Mission Type:** Orbiter and Titan Lander
- Outcome:** Successful
- Cassini* entered orbit around Saturn in July 2004, becoming the first spacecraft to do so.
- It discovered seven new moons and conducted extensive studies of Saturn and its rings.
- The *Huygens* probe, part of the mission, landed on Titan in January 2005, marking the farthest landing from Earth ever made by a spacecraft.
- The mission was concluded in 2017.

Future Missions:

- Dragonfly (Rotorcraft Lander for Titan)**
- Launch:** Currently planned for July 2028, with arrival at Titan expected in 2034.
- Mission Goal:** To explore Titan, Saturn's largest moon, searching for evidence of past or present life and studying its prebiotic chemistry (the chemical processes that could lead to life).

10. "Breakthrough Device" Status To Neuralink's Blindsight

- In September 2024 the **US Food and Drug Administration (FDA)** granted "**breakthrough device**" status to Elon Musk's **Neuralink's Blindsight, a Brain-Computer Interface implant**.
- This designation aims to **speed up the development and review** of innovative medical devices that **address severe conditions**.
- Neuralink (neurotechnology startup), **founded by Elon Musk in 2016**, focuses on developing brain chip interfaces that could help restore vision, aid in movement, and facilitate communication for patients with disabilities.
- The 'Blindsight Chip is aimed at **helping blind patients** (who have lost their both eyes and optic nerves) or those who have been **blind from birth** to regain their sight
 - However, regaining of sight will **only be possible if the visual cortex is intact**.

Neuralink implants brain chip in 1st human

- In January,2024**, Noland Arbaugh became the first person in the world to be implanted with a Neuralink device.
 - Noland Arbaugh has recovered fully and also able to control a computer mouse using his thoughts
- Brain-Computer Interface** (nicknamed 'Telepathy') can **monitor and stimulate brain activities** using electrical signals.
- Notable, in 2023 the U.S. FDA had given the company clearance to conduct its first trial to test its implant on humans.

What are Brain-Computer Interfaces (BCIs)?

- A BCI is a computer-based system that acquires, analyzes, and translates brain signals into commands relayed to an output device to perform a desired action. It comprises **three main components**:

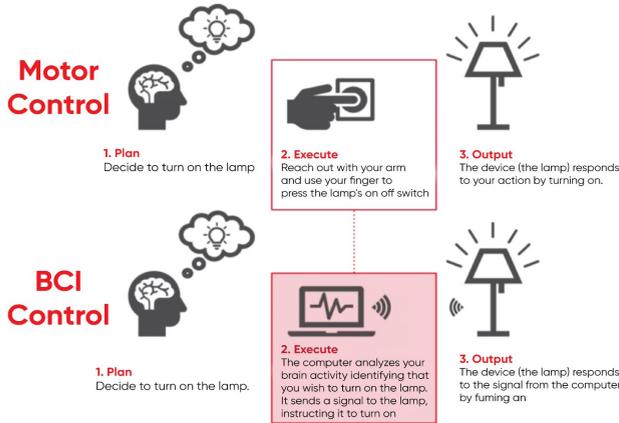
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- a. **Device to measure brain activity**, It is usually in form of a headset that has specialized sensors
- b. **A computer to process and analyze the recorded brain activity.**
- c. **Application/device to carry out command.**
- i. Once the computer has ‘determined’ what the user wants to do, it will send a signal to application/device to carry out command.

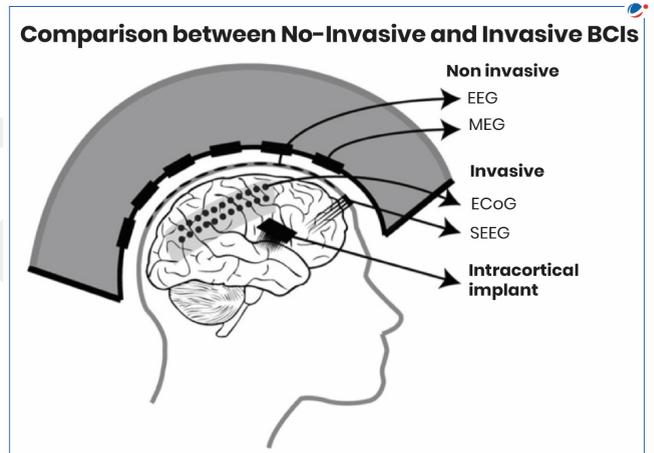
2. **Non-invasive BCI (Surface Detectors):** Set of electrodes, known as an **electroencephalograph (EEG)** attached to scalp. **Electrodes** can read brain signals.
 - a. E.g., **Electroencephalography (EEG)**, **Functional Magnetic Resonance Imaging (fMRI)** etc
3. **Partially Invasive BCIs (Dura Mater Implant):** Partially invasive BCI devices are **implanted inside the skull but rest outside the brain** rather than within the grey matter. They produce better resolution signals than non-invasive BCIs.
 - a. E.g., **Electrocorticography (ECoG)**, It records brain activity by placing electrodes in direct contact with cerebral cortex or surface of the brain.



2. **Another important part of BCI is feedback:** Providing feedback helps user **adapt to BCI system**
3. **User and BCI work together:** User, often after a period of training, generates brain signals that encode intention,
 - a. And BCI, also after training, decodes the signals and translates them into commands to an output device that accomplishes the user’s intention.
4. Thus, **BCIs do not use** the brain’s normal output pathways of **peripheral nerves and muscles.**
 - a. This definition strictly limits the term *BCI* to **systems that measure and use signals produced by the central nervous system (CNS).**
5. **BCI do not read minds** in the sense of extracting information from unsuspecting or unwilling users **but enable users to act on the world by using brain signals rather than muscles.**

Types of BCIs

1. **Invasive BCI (Brain Implants):** Implanted directly into the brain’s grey matter during neurosurgery, these offer stronger brain activity signals. **Example:** Neuralink’s Blindsight implant.



Key Application Areas of BCIs

BCIs are emerging as a transformative technology with the potential to revolutionize various fields.

1. **Medical:** BCIs hold immense promise in the medical field, aiding in the prevention, diagnosis, and rehabilitation of patients with disabilities or neurological disorders.
 - They can help restore lost motor functions, enable communication for those with speech impairments, and provide new treatments for conditions like paralysis and epilepsy.
2. **Mental Wellness:** BCIs can track real-time brain activity, providing valuable insights into mental states and cognitive processes.



- This information can be used to enhance mental health practices, such as meditation and mindfulness training, and potentially aid in the diagnosis and treatment of mental health conditions.
- Cognitive Enhancement:** BCIs offer the potential for cognitive enhancement by enhancing memory, attention, and decision-making abilities.
 - This could have significant implications for education, professional training, and personal development.
 - Gaming & Entertainment:** BCIs can enable immersive gaming experiences by allowing users to control game elements with their thoughts.
 - This technology has immense potential for developing virtual and augmented reality applications, creating more interactive and engaging entertainment experiences.

Challenges in Brain Computer Interfaces:

- Technical Challenges:** Difficulty interpreting complex neural patterns, weak signals, environmental interference.
 - Invasive BCI can **damage nerve cells and blood vessels**, hence increasing risk of infection.
- Brain Tapping:** Intercepting brain signals can **compromise privacy**, revealing emotions, preferences, and beliefs.
- Misleading Stimuli Attacks:** Manipulating signals or feedback could lead to **brain hijacking**, potentially influencing behavior.
- Legal Barriers:** Currently, **no comprehensive legal framework governs the use of BCIs**, particularly in terms of safety, efficacy, and data protection.
- Ethical concerns:**
 - Question of **Informed consent, potential for stigma and discrimination, research ethics, compromised autonomy etc.**
 - Direct interaction between brains and machines brings may result in **of cyborgization**.

- Cyborgs can have a **variety of enhanced abilities**, including: Greater strength, improved senses, Computer-assisted brains, and Built-in weaponry.

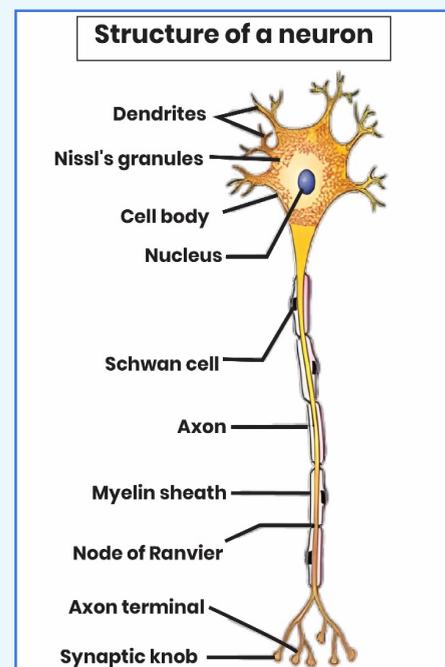
Way-forward

- Transparency & Consent:** Adhering to privacy regulations and ensuring informed consent.
- Regulatory Oversight:** Establishing legal frameworks to prevent harmful BCI practices.
- Enhanced Security:** Researching advanced security measures, including cryptographic protection.
- Public Awareness:** Educating the public about BCI risks and safety measures.

Key Concepts

1. Neuron, Control and co-ordination:

- Brain is made up of millions of cells called **neurons**. These neurons work together in large **networks** to coordinate processes in body (**Hearing, taste, heart rate etc.**) and execute movements.
- Neurons communicate using **electrochemical** signals. When a neuron is **activated**, it generates electrical signal that is transferred to next neuron in network, which will transfer it to next, and so on.



c. In this way, **information can rapidly travel throughout brain**, connecting different areas responsible for different processes and body parts.

2. Brain Activity and Its Measurement:

a. Brain activity **refers to the electrical signals and chemical processes that occur in brain**, which are responsible for various cognitive functions, emotions, sensations, and behaviors.

b. A single neuron on its own **doesn't generate much electrical activity**, but collective activity of neurons produces enough electrical activity for detection.

i. This electrical brain activity can be **measured by placing special sensors onto/into head**.

3. **Electroencephalography (EEG) based BCI:** EEG has become possible due to work and discovery by Hans Berger who discovered in 1924 that **electrical signals of the human brain** could be measured from scalp. Measuring brain activity by **external detectors or electrodes** is called **Electroencephalography (EEG)**.

11. Brightest Quasar Ever Observed

Astronomers have discovered the brightest quasar ever observed, named J0529-4351, using European Southern Observatory's (ESO) Very Large Telescope (VLT).

What are Quasars?

1. **Quasi-stellar Radio Source:** The word "quasar" is an abbreviation for "quasi-stellar radio source."
2. **Active Galactic Nuclei:** Quasars are incredibly luminous active galactic nuclei (AGN), which are the bright cores of distant galaxies.
3. **Powered by Supermassive Black Holes:** The immense energy output of quasars is generated by supermassive black holes at their centers.
4. **Extreme Luminosity:** Quasars are among the most luminous objects in the known universe, outshining entire galaxies.

5. **Invisible to the Naked Eye:** Despite their extraordinary brightness, quasars are so distant that they cannot be seen with the naked eye.

6. **Multi-Wavelength Emission:** Quasars emit radiation across the electromagnetic spectrum, including radio waves, visible light, ultraviolet rays, infrared waves, X-rays, and gamma rays.

12. Vishvasya: National Blockchain Technology Stack

In September 2024, the **Union Ministry of Electronics and Information Technology (MeitY)** launched '**Vishvasya: National Blockchain Technology Stack**,' a significant step towards harnessing blockchain technology for national development.

Additionally, MeitY has also launched:

1. **NBFLite:** A dedicated Blockchain sandbox platform for startups and academia to facilitate rapid prototyping, research, and capacity building in blockchain technology.
2. **Praamaanik:** A blockchain-powered solution that verifies the origin of mobile apps, ensuring security and trust.
3. **National Blockchain Portal:** It is developed on the theme based on Content Management System to manage the contents related to the National Blockchain Framework initiative.

About Vishvasya: National Blockchain Technology Stack

1. It offers **Blockchain-as-a-Service (BaaS)** with a geographically distributed infrastructure designed to support various permissioned Blockchain based applications.
 - a. **BaaS** is third party **cloud-based infrastructure and management** that organizations and businesses use for developing and managing blockchain applications.
2. It is a part of the broader **National Blockchain Framework (NBF)** provided under the **National Strategy on Blockchain**.





- a. **NBF** is meant for effectively utilize the **Blockchain technology in different domains** such as health, agriculture, education, finance, etc.

Features of Vishvasya BaaS

Vishvasya BaaS is designed for efficiency and security:

1. Rapid end-to-end Permissioned Blockchain Application Development & Deployment.
2. Provides ready-to-use, security-audited Blockchain containers for production environments and offers Blockchain-specific security audit guidelines.
3. Blockchain specific Security Audit Guidelines & Best Practices.
4. Features a geographically distributed infrastructure across three data centers in Hyderabad, Pune, and Bhubaneswar.
5. Framework Augmented with Documentation for easy onboarding of Stakeholders.

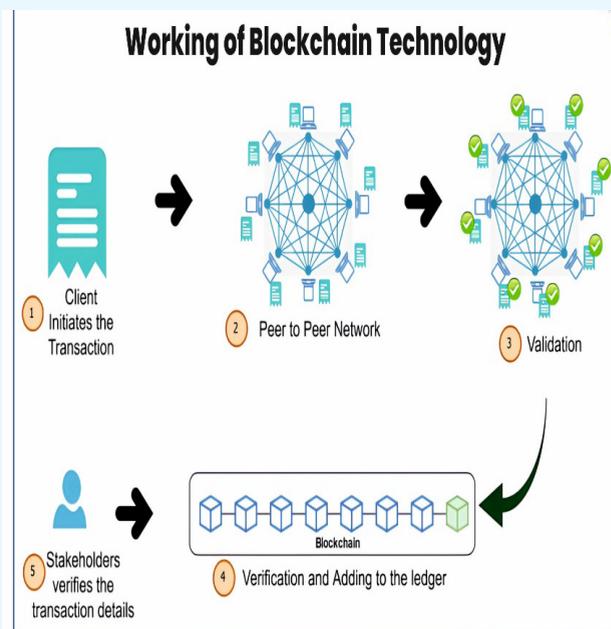
Significance of BaaS

BaaS plays a crucial role in driving blockchain adoption:

1. Facilitates in **enabling trust** by developing new types of distributed software architectures, capable of finding consensus on their shared states and providing a **single source of truth**.
2. Addresses the **challenges of Blockchain adoption** across various stakeholders including Infrastructure Providers, Smart Contract Developers and Application Developers.
3. **Provides security** assurance of various Blockchain components across the stack.

Working Mechanism

1. **Data and transactions** executed over the network are stored in the **ledger in a decentralized** manner over peer-to-peer network.
2. **Transactions** are **validated and verified** through consensus protocols across nodes of the Blockchain network.



Properties of Blockchain

1. Enables **auto-execution** of digital contracts.
2. Ensures **transparency** with all trusted participants having a copy of the ledger.
3. Any validated records are irreversible and cannot be changed.
4. A transaction **timestamp** is recorded on a block.
5. All network participants agree to the validity of each of the records.
6. **It is** decentralized and managed by multiple participants.
7. All records are individually **encrypted**.

Types of Blockchain

1. **Public Blockchain:** Operates in a decentralised open environment where there are no restrictions on the number of people joining the network (as peers or validators).
 - a. e.g., Bitcoin and Ethereum.

Understand Blockchain technology

1. **Blockchain** is an innovative **distributed ledger technology**, first introduced in the design and development of cryptocurrency, Bitcoin, in 2009, by **Satoshi Nakamoto**.
2. It is an **amalgamation** of various technologies such as distributed systems, cryptography, etc.
3. It is an **exchange process**, which works on **data blocks**. In this, one block is connected to another bloc





2. **Consortium Blockchain:** Operates in an environment where the rights to control who participates and what can be transcribed to the ledger is determined by a collection of known entities.
3. **Private Blockchain:** It is a network with a single controlling entity, who has the power to determine who the participating entities in the network would be and their rights to append information to the ledger.

6. **Others:** Law Enforcement, banking, Internet of Things, crowd funding, etc.

Challenges in Blockchain Technology implementation

Blockchain technology has the potential to revolutionize various sectors:

1. **Performance:** Replication of data on each node leads to performance issues and slows down the performance as compared to traditional centralized systems.
2. **Scalability:** Poor scalability due to factors such as complex architecture and configuration of the Blockchain platform, variable requirements for processing power, network bandwidth, etc.
3. **Storage:** Demands heavy storage as data stored is replicated at all the nodes and becomes perpetual.
4. **Energy Consumption:** Blockchain networks often require significant computational power, leading to high energy consumption.
5. **Interoperability:** Interoperability between different blockchain platforms can be a challenge, especially in environments where multiple networks coexist.
6. **Legal:** Section 43A of the **Information Technology Act, 2000** currently does not have safeguards mentioned from the perspective of Privacy when applied to Blockchain.
 - **Localization requirements:** Since public Blockchain automatically store data redundancies across all nodes on a network, it may hit a hurdle with localization requirements.

Potential applications of Blockchain Technology

Blockchain technology has the potential to revolutionize various sectors:

1. **Cryptocurrencies:** Cryptocurrencies (e.g., Bitcoin, Ethereum, Litecoin, Ripple, etc.) uses blockchain to record and verify transactions, which makes them secure and transparent.
2. **Supply Chain Management:** It enables more efficient communication and collaboration between suppliers, manufacturers, distributors, and customers.
3. **Voting Systems:** It can include features such as voter identification, eligibility checks, and ballot tracking, all of which can Identity Verification.
4. **Intellectual Property Protection:** For e.g., **companies** can use blockchain technology to manage their trademarks and patents, ensuring that their intellectual property is protected and not used without their permission.
5. **Records Management:** For e.g., Blockchain-based healthcare record management can also help improve data accuracy and integrity by providing a single source of truth for patient data.

Other Initiatives taken to promote Blockchain Technology

Global	India
1. World Economic Forum’s Presidio Principles: A Blockchain Bill of Rights issued by World Economic Forum’s Global Blockchain Council.	1. National Strategy on Blockchain by MeitY.
2. IBM’s Blockchain World Wire for global payments	2. Centre of Excellence in Blockchain Technology
3. Global Blockchain Business Council (GBBC) for industry adoption.	3. Future Skills PRIME: For upskilling and reskilling in emerging technologies including Blockchain by NASSCOM and MeitY



Conclusion

India’s journey towards blockchain adoption necessitates a comprehensive approach encompassing skill development, regulatory clarity, practical implementation, and robust security measures. By addressing these key areas, India can foster innovation and position itself as a global leader in this transformative technology.

13. Surge in Dengue Cases in 2024

- Dengue cases have **surged globally** in September 2024, with **India** reporting significant increases alongside other countries, particularly in **South America**.
- The **World Health Organization (WHO)** indicates this year’s numbers have already exceeded previous records.

What is Dengue?

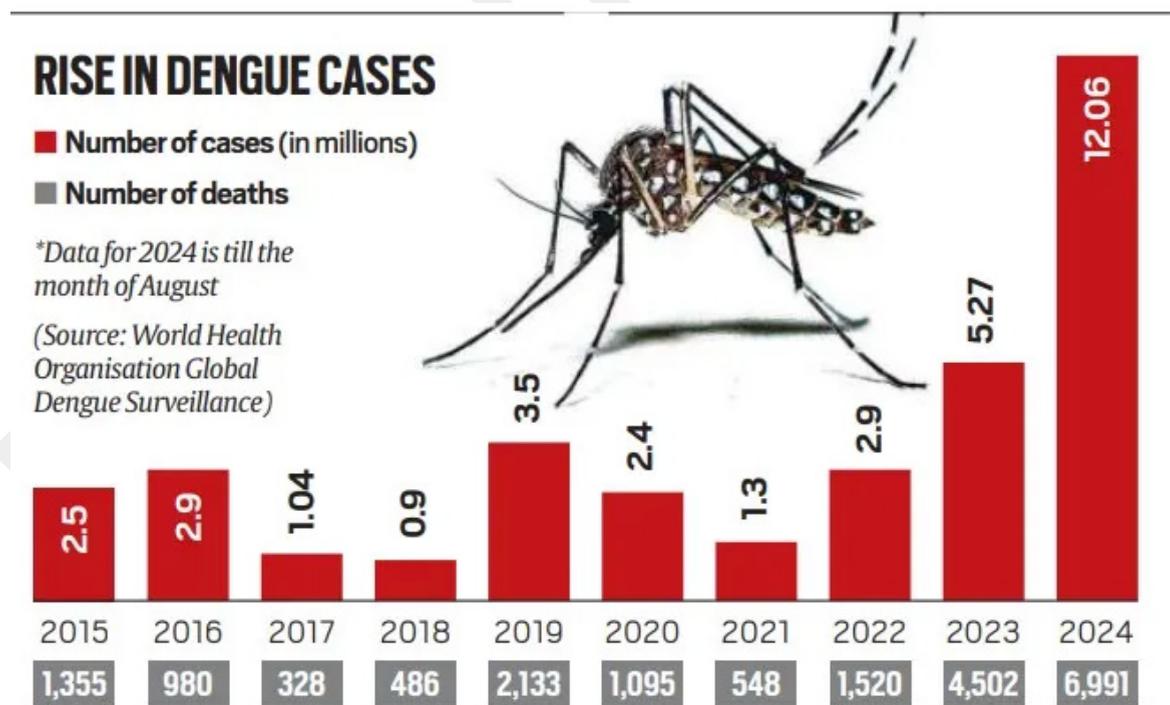
- Dengue is a **viral infection** caused by the **dengue virus** and primarily transmitted by the **Aedes aegypti** mosquito.

Global Situation

- Dengue is caused by the **dengue virus**, which belongs to the **Flavivirus** genus. There are **four distinct serotypes** of the dengue virus:
 - DENV-1
 - DENV-2
 - DENV-3
 - DENV-4

Symptoms:

- Mild:** Fever, severe headache, muscle and joint pains, nausea, vomiting, pain behind the eyes, and rashes.
 - Severe:** Can lead to internal bleeding, organ impairment, and potentially death.
- Epidemiology:** Over the last two decades, dengue cases have increased **tenfold**, marking it as the only infectious disease with rising annual **mortality rates**.



- Statistics:** As of **August 2024**, there have been more than **12 million cases** and **6,991 deaths** reported worldwide, more than double last year’s total of **5.27 million cases**.

2. Experts caution that these numbers may be **underestimated** due to **incomplete reporting from various countries.**

Dengue in India

1. **By June 2024, India reported over 32,000 cases and 32 deaths.**
2. By early August, there was a reported **50% increase** compared to the same period in 2023.
3. **Geographic Spread:** Dengue has expanded from eight states in **2001** to affecting every state and **Union Territory** in India by **2022.**

Factors Behind the Surge

1. **Urbanization:** Urban areas provide **breeding grounds for mosquitoes due to stagnant water collection. Increased rainfall and warm spells create ideal conditions** for mosquito proliferation.
2. **Climate Change:**
 - a. **Temperature Rise:** Higher temperatures allow mosquitoes to thrive in previously unsuitable areas, including higher altitudes.
 - b. **Virus Transmission:** Climate change enhances the robustness of the dengue virus, enabling better transmission and survival rates among mosquito populations.
3. **Movement of People:** **Global movement facilitates the spread of infections carried by individuals.** Improved testing and reporting may also contribute to perceived increases in cases.
4. **Co-infections:** **Other vector-borne diseases, such as chikungunya and Zika, are also on the rise.**
5. There is a **need to study whether infections reduce mosquito immunity, potentially increasing transmission rates.**

Prevention Strategies

1. **Eliminate Breeding Sites:** **Prevent water accumulation** in pots, planters, and bird baths to reduce mosquito breeding.
2. **Personal Protection:** **Wear long-sleeved clothing** and use mosquito repellent, especially during the day when *Aedes* mosquitoes are most active.

Steps Taken by the Government to Combat Dengue:

1. Regular meetings involving the **Urban Development Ministry and state officials to enhance dengue prevention** and control efforts.
2. Implementation of disease and entomological surveillance to monitor dengue cases and vector populations.
3. Ensuring availability of hospital resources, including **platelets**, to manage dengue cases effectively.
4. **Identification of Hotspots:** Mapping and geotagging of dengue cases to focus preventive measures in high-risk areas.
5. Initiatives like the **“Safai Apnao, Beemari Bhagao Campaign”** aimed at promoting cleanliness to reduce mosquito breeding sites.
6. Training healthcare professionals on updated national guidelines for dengue case management to improve clinical responses.
7. **Expanded Sentinel Surveillance:** Increasing the number of sentinel surveillance hospitals from **110** in 2007 to **848** in 2024 for better diagnosis and monitoring.

Vaccines for Dengue:

Available Vaccines: WHO recommends two vaccines:

1. **Dengvaxia (Sanofi)**
2. **QDenga (Takeda)**

Status in India: These vaccines are **not yet approved in India, although the country is developing its own vaccines** in collaboration with international institutes. Notably:

1. **Serum Institute of India** is advancing a vaccine using a genetically engineered weakened virus.
2. **Panacea Biotec** is developing a similar candidate.

14. Quad Cancer Moonshot Initiative

1. PM Narendra Modi participated in the **Quad Cancer Moonshot event** hosted by President Joseph R Biden Jr., on the sidelines of the Quad Leaders' Summit in Wilmington, Delaware.

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2. It is a collective mission leveraging public and private resources **to decrease cancer-related deaths**, initially focusing on **cervical cancer** in the Indo-Pacific.
3. **India** pledged **\$7.5 million** towards cancer testing, screening, and diagnostics in the Indo-Pacific.

Importance of the Initiative

1. Cancer is a **global health challenge** that requires cooperative efforts. The Quad partners seek to implement **innovative strategies** to prevent, detect, and treat cancer, reducing its impact on patients and their families.
2. The Quad countries will also work to **advance research and development** in cancer treatment and encourage participation from the **private and non-governmental sectors** to lower cervical cancer rates.
3. It aims to strengthen the **cancer care ecosystem** in the Indo-Pacific by improving health infrastructure, promoting research collaborations, and enhancing data systems to support prevention, detection, and treatment.
4. **Cervical Cancer Focus:** Although preventable through vaccination and treatable if detected early, cervical cancer is the **3rd leading cause of cancer deaths** among women in the Indo-Pacific.
5. Less than 10% of women in the Indo-Pacific have completed their **high-risk human papillomavirus (HPV) vaccination series** or undergone recent screenings, highlighting disparities in healthcare access and resources.
6. Through the Quad Cancer Moonshot, efforts will be made to **promote HPV vaccination**, improve access to screenings, and expand treatment options in underserved areas.

What is Cervical Cancer?

1. **Cervical cancer** develops in the **cervix** (the entrance to the uterus from the vagina), originating in its cells.

2. **Progression:** It typically **develops slowly**. Cells undergo changes (dysplasia) that, if untreated, can become cancerous and spread.
3. **Cause:** Nearly all cases are linked to **high-risk human papillomavirus (HPV)**, a common sexually transmitted infection. Persistent HPV infection can lead to cervical cancer.
4. **Prevention:** Effective **primary (HPV vaccination)** and **secondary prevention (screening)** can prevent most cases.
5. **Treatment:** When diagnosed early, cervical cancer is one of the most **treatable cancers**. Comprehensive strategies for prevention, screening, and treatment could eliminate it as a **public health issue**.
6. **Global Efforts:** In May 2018, the WHO Director-General called for action to eliminate cervical cancer, and the **Global Strategy for cervical cancer elimination** was adopted by the **World Health Assembly** in 2020.

Cervical Cancer in India

1. **Prevalence:** Cervical cancer is the **2nd most common cancer** among Indian women, causing nearly a quarter of global cervical cancer deaths, despite being largely preventable.
2. **Statistics:** Each year, about **125,000 women** are diagnosed with cervical cancer, and over **75,000 die** from the disease in India.
3. **HPV Types:** HPV types 16 and 18 are linked to around **70% of invasive cervical cancer cases worldwide**.
4. **Vaccination Efforts:** Vaccination against HPV is the most effective way to prevent cervical cancer. The **2024-25 Interim Budget** includes efforts to promote HPV vaccination among **girls aged 9-14**.
5. **Public Health Role:** As health is a **state subject**, states and Union Territories are encouraged to promote awareness about cervical cancer prevention and HPV vaccination, especially among **girl students**.





F. GEOGRAPHY & ENVIRONMENT

1. Global Warming impacting weather and climate forecasting

1. The record warming of 2023-2024 has revealed the severe impacts of global warming, from heat waves to cyclones, droughts, and wildfires.
2. Some estimates suggest that the world has already crossed the 1.5°C warming threshold, but it is unclear how long this must persist for significant impacts to manifest.

Impact of Predictability:

1. The extreme weather has also highlighted limitations in climate prediction models, which struggle with spatial-temporal scales and fail to predict natural variability with precision.
2. The 2023 El Niño caused greater warming than anticipated, possibly exacerbated by the 2022 Hunga Tonga underwater volcano and carbon emissions from wildfires.
3. The monsoon behaved unpredictably, with dry regions facing floods, and a deficit overall. While some forecast a strong La Niña for 2024 and an Indian Ocean Dipole (IOD), neither materialized as expected, challenging forecasting capabilities.
4. Current climate models are excellent at simulating natural modes like hurricanes and El Niño, but their performance is inconsistent. For example, they cannot accurately reproduce monsoon trends over recent decades and are unreliable for future forecasts. The uncertainty extends to long-term climate projections, which depend on evolving emissions and natural variability.
5. Improving models and data networks is critical, incorporating AI, machine learning, and drones for better predictions. While short-term projections (10-20 years) offer more reliability, longer-term forecasts remain uncertain due to unpredictable natural and geopolitical changes. It is crucial to assess the value of resources dedicated to projections extending to 2100.

Challenges in Predicting Extreme Weather:

1. **Inconsistent Forecasts:** Predictions for extreme weather in 2023, including the monsoon and hurricane seasons, were less accurate, highlighting the limitations of current forecasting models and observation systems.
2. **Unexpected Factors:** Events like the Hunga Tonga volcanic eruption and CO2 emissions from wildfires contributed to unexpected warming, showcasing how difficult it is for models to account for new, unforeseen factors.
3. **Censorship Concerns:** The urgency of social media platforms to remove flagged misleading content within 36 hours has raised issues around censorship and freedom of speech.

Future of Weather Prediction Models:

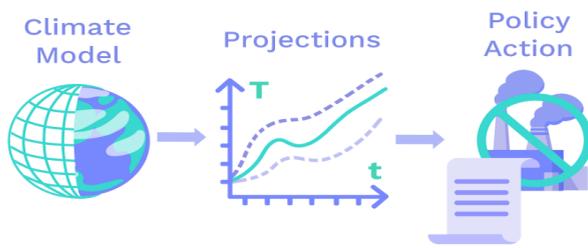
1. **Need for Refinement:** Efforts are underway to enhance models with newer technologies like AI and machine learning to improve the accuracy of weather predictions at localized levels.
2. **Natural Variability and Uncertainty:** As global warming intensifies, the predictability of natural systems like El Niño, La Niña, and the Indian Ocean Dipole may become less reliable, leading to greater uncertainty in future climate forecasts.
3. **Focus on Short-Term Forecasts:** Emphasizing short-term projections (within 10-20 years) may offer more dependable results due to the increasing difficulty of forecasting long-term climate scenarios in a warming world.

Way Forward:

1. **Improved Climate Models:** Invest in advanced technologies, such as AI, machine learning, and sophisticated sensors, to enhance the accuracy of short-term climate forecasts and better account for the effects of natural variability in a warming climate.
2. **Localized Early Warning Systems:** Build resilient early warning systems at the hyperlocal level to improve disaster preparedness, focusing on minimizing risks in vulnerable communities exposed to extreme weather events.



What are Climate Models?



The climate system is a very complex system that involves the atmosphere, oceans, ice, land, all living things on Earth. Climate models are mathematical representations of the climate system. They predict how average conditions will change in a region over the coming decades.

Climate models include more atmospheric, oceanic and land processes than weather models do—such as ocean circulation and melting glaciers. These models are typically generated from mathematical equations that use thousands of data points to simulate the transfer of energy and water that takes place in climate systems.

Use of Climate Models:

Scientists use climate models to understand complex earth systems. These models allow them to test hypotheses and draw conclusions on past and future climate systems. This can help them determine whether abnormal weather events or storms are a result of changes in climate or just part of the routine climate variation. For example, when predicting tropical cyclones during hurricane season, scientists can use climate models to predict the number of tropical storms that may form off the coast and in what regions they are likely to make landfall.

Types of Climate Models:

When creating climate models, scientists use one of three common types of simple climate models. These models use numbers to simplify the complexities that exist when taking into account all the factors that affect climate, like atmospheric mixing and ocean current.

- 1. Energy balance models:** This model takes into account surface temperatures from solar energy, albedo or reflectivity, and the natural cooling from the earth emitting heat back out into space. To predict climate, scientists use an equation that represents the amount of energy coming in versus going out, to understand the changes in heat storage—for example, as more heat-absorbing CO₂ fills up the atmosphere.
- 2. Intermediate complexity models:** They include and combine several of Earth's geographical structures—land, oceans, and ice features, for instance. These geographical features allow intermediate complexity models to simulate large-scale climate scenarios such as glacial fluctuations, ocean current shifts, and atmospheric composition changes over long timescales. Intermediate complexity models describe the climate with less spatial and time-specific detail, so they are best used for large-scale and low-frequency variations in the earth's climate system.
- 3. General circulation models:** These models include information regarding the atmospheric chemistry, land type, carbon cycle, ocean circulation and glacial makeup of the isolated area. This type of model also uses a three-dimensional grid, with each box representing around 100 square kilometers of land, air, or sea, which is better resolution than the typical 200 to 600 kilometers per box.

2. India formally joins International Big Cat Alliance

In September 2024, India has formally joined the **International Big Cat Alliance (IBCA)** to enhance the conservation of big cats and their habitats.

Note: Although India established the IBCA as a global institution, it still needs to **sign and ratify its Framework Agreement**, similar to its approach with other international agreements, like the **Paris Agreement**, **Convention on Biological Diversity (CBD)**, and the **Shanghai Cooperation Organization (SCO)**.



What is the International Big Cat Alliance (IBCA)?

1. The **International Big Cat Alliance (IBCA)** is a coalition of **96 countries**, including **big cat range and non-range nations**, conservation organizations, scientific bodies, and corporate groups.
2. Proposed by India's Prime Minister in 2019, it was officially launched in **April 2023**, commemorating the **50th anniversary of Project Tiger**.
3. **Member Countries:** Currently, **India, Nicaragua, Eswatini, and Somalia** are members of the IBCA.
4. **Eligibility:** All **UN member countries** can join the IBCA.
 - a. **Partner Organizations:** Nine international organizations have joined as partners.
 - b. **Budgetary Allocation:** The Union Cabinet allocated **Rs 150 crore** for IBCA's initiatives, covering the period from **2023-24 to 2027-28**.

Objectives

1. **Curb Illegal Wildlife Trade:** Focuses on stopping the illegal trade involving the seven big cat species.
2. **Conserve Habitats:** Aims to preserve and maintain natural habitats for big cats.
3. **Policy Advocacy:** Promotes policies that align biodiversity efforts with local needs and contributes to achieving **UN Sustainable Development Goals** among member nations.
4. **Collaborative Network:** Establishes a global network that includes conservation experts, agencies, and corporate partners to promote big cat conservation.
5. **Central Repository:** Provides a centralized collection of successful conservation practices and technical knowledge, accessible to all member countries.
6. **Financial Backing:** Leverages financial contributions to enhance conservation efforts and sustain long-term conservation goals.

Focus Species

1. **Seven Big Cats:** IBCA's focus includes **tiger, lion, leopard, snow leopard, cheetah, jaguar, and puma**.
2. **Presence in India:** Five of these species—**tiger, lion, leopard, snow leopard, and cheetah**—are found in India, with the puma and jaguar not native to the country.

Governance Structure

1. **Organizational Setup:** Comprises an **Assembly of Members**, a **Standing Committee**, and a **Secretariat** headquartered in India.
2. **Framework Model:** Follows the structure of the **International Solar Alliance (ISA)**, with a **Director-General (DG)** appointed by the **Ministry of Environment, Forest, and Climate Change (MoEFCC)**.

India's Role in IBCA

1. India's **founding membership** in IBCA underscores its commitment to leading global efforts in big cat conservation.
2. This alliance is expected to promote mutual understanding, cooperation, and strengthened conservation strategies across participating nations.

About Big Cats

1. **"Big Cat"** refers to large members of the **Felidae family**, primarily of the **Panthera genus**. The Indian subcontinent has hosted species such as the **Bengal tiger, Asiatic lion, Indian leopard, and Snow leopard**.
2. **Social Behaviour:** Lions are the only big cats that live in social groups, called **prides**, and **hunt together**. Other big cats lead mostly **solitary lives**, except for mothers with cubs.
3. **Largest Big Cat:** The **Siberian tiger**, the largest big cat, is **endangered** due to threats like trophy hunting and its use in traditional Chinese medicine.
4. **Ecosystem Role:** Big cats are **keystone species**, serving as **indicators of ecosystem health**. However, they face severe threats from poaching, illegal wildlife trade, and habitat loss.
5. **Royal Bengal Tiger**
 - a. **Population:** According to the 2018-19 Tiger Census, India's tiger population has risen to **2,967**.
 - b. **Global Share:** India holds about **70% of the world's tiger population**.
6. **Asiatic Lion**
 - a. **Habitat:** The **Gir National Park** in Gujarat is the **only remaining habitat for Asiatic Lions** worldwide.



- b. **Population Growth:** Since the late 1960s, their numbers have risen from fewer than 200 to 674 as of the 2020 census.
7. **Leopard**
- a. **Population:** India is estimated to have **12,000-14,000 leopards**.
- b. **Genetic Diversity:** Indian leopards are the **most genetically diverse** among all subspecies in Asia.
8. **Snow Leopard**
- a. **Native Range:** Found across the mountainous regions of **Central and South Asia**.
- b. **Habitat in India:** Snow leopards inhabit the western Himalayas (Jammu and Kashmir, Ladakh, Himachal Pradesh, Uttarakhand) and the eastern Himalayas (Sikkim, Arunachal Pradesh).
- c. **Population:** Out of approximately **7,500 snow leopards** globally, around **500** are in India.
9. **Cheetah**
- a. **Extinction:** **Asiatic cheetah** was declared extinct in **1952**
- b. **Reintroduction Effort:** In **September 2022**, India reintroduced **eight African cheetahs** from **Namibia**, releasing them in **Kuno National Park, Madhya Pradesh** in November 2022.

Conservation Efforts for Big Cats in India

1. Project Lion
2. Project Leopard
3. Project Cheetah
4. Cheetah Reintroduction Project
5. Wildlife Protection Act, 1972
6. Snow Leopard Conservation

3. Guiding principles for the Energy Transition by U.N

1. In September 2024 the UN report, “**Resourcing the Energy Transition: Principles to Guide Critical Energy Transition Minerals Towards Equity and Justice**,” was released.
2. It highlights the **increasing demand for critical minerals** as the world shifts from fossil fuels to renewable energy, aiming for net zero carbon emissions by 2050. This demand is projected to almost triple by 2030.

3. Without proper management, it may **lead to negative consequences** such as dependency on commodities, geopolitical tensions, and environmental and social challenges that impact livelihoods, health, human rights, and the environment.
4. To address these issues, UN Secretary-General **António Guterres** established the **Panel on Critical Energy Transition Minerals**, tasked with creating global voluntary principles for managing critical minerals.
5. The report provides **seven Guiding Principles** and **five Actionable Recommendations** to ensure the renewables transition is rooted in **justice and equity**.

Seven guiding principles for the energy transition

1. **Human rights:** Human rights should be at the core of all mineral value chains.
2. **Environmental integrity:** The planet’s environment, biodiversity, and integrity should be protected.
3. **Justice and equity:** Justice and equity should be the foundation of mineral value chains.
4. **Development:** Development should be promoted through economic diversification, value addition, and benefit sharing.
5. **Responsible investments:** Investments, finance, and trade should be fair and responsible.
6. **Good governance:** Transparency, accountability, and anti-corruption measures are necessary to ensure good governance.
7. **International cooperation:** Multilateral and international cooperation should be the foundation of global action and should promote peace and security.

Five actionable recommendations to accelerate the energy transition:

1. **Expert advisory group** Establish a high-level group to promote benefit-sharing, economic diversification, and value addition in critical energy transition minerals (CETMs)



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2. **Global traceability framework** Create a framework for transparency, accountability, and traceability along the entire mineral value chain
3. **Global Mining Legacy Fund** Establish a fund to strengthen financial assurance for mine closure and rehabilitation.
4. **Empower artisanal miners** Create an initiative to empower small-scale and artisanal miners to promote environmental stewardship, human rights, and development
5. **Material efficiency and circularity targets** Set equitable targets and timelines to reduce environmental impacts and balance consumption

4. India's first study on TEAL carbon

1. India has undertaken its first study on 'teal carbon' at **Keoladeo National Park (KNP)** in **Bharatpur, Rajasthan**.
2. Study at KNP was carried out by researchers from the **Central University of Rajasthan**, in partnership with the **U.S. Environmental Protection Agency (EPA)** and **Siobhan Fennessy from Kenyon College, Ohio, U.S.**
3. This pilot project focused on developing comprehensive, **nature-based solutions** to combat the effects of climate change.
4. **Nature-based solutions (NbS)** are strategies that utilize natural ecosystems and processes to address societal challenges, such as climate change and biodiversity loss, by enhancing ecosystem services, promoting sustainability, and improving resilience in a cost-effective manner.

What is teal carbon ?

1. Teal carbon is carbon stored in **inland wetlands(non tidal)**, such as marshes, lakes, rivers, and peatlands.
2. These ecosystems capture carbon in **plant biomass and soil**, acting as natural carbon sinks.

3. **Waterlogged soils** in wetlands **slow down organic matter decomposition**, allowing carbon to remain stored for **long periods**.
4. Teal carbon ecosystems, like wetlands, are **more effective than terrestrial forests** at sequestering carbon due to their waterlogged soils.
5. **Peatlands**, a type of teal carbon ecosystem, can store carbon for thousands of years, providing a stable, **long-term carbon storage solution**.
6. These ecosystems also offer additional benefits, including **water filtration, flood control**, and habitat for diverse species.

Challenges faced by Teal Carbon Ecosystems

1. **Degradation and Habitat Loss:** Over 87% of wetlands are lost to agriculture and urbanization, reducing carbon storage and releasing carbon, worsening climate change.
2. **Pollution and Eutrophication:** Runoff introduces excess nutrients, causing eutrophication, lowering oxygen, disrupting ecosystems, and increasing methane emissions.
3. **Water Management and Climate Change:** Dams, water diversion, and climate-driven changes in rainfall disrupt wetland hydrology, reducing their carbon storage ability.
4. **Policy and Funding Gaps:** Unlike blue carbon, teal carbon lacks policy recognition and funding, limiting conservation efforts.
5. **Monitoring Challenges:** Measuring carbon storage is complex due to wetlands' methane emissions as well as carbon sequestration requiring better methods for climate integration.
6. **Low Public Awareness:** Teal carbon ecosystems are less known, hindering conservation efforts; public awareness is essential for support.



Comparison between Blue , Green and Teal carbon ecosystem

Aspect	Blue Carbon	Teal Carbon	Green Carbon
	Carbon stored in coastal and marine ecosystems	Carbon stored in non-tidal(inland) freshwater wetlands,	Carbon stored in terrestrial forests and vegetation.
Ecosystems	Mangroves, salt marshes, seagrass meadows.	Non-tidal freshwater wetlands (e.g., swamps, marshes).	Forests, grasslands, and other terrestrial ecosystems.
	Responsible for approximately 50% of the ocean’s carbon absorption, despite covering only 2% of the ocean’s surface.	Wetlands cover only 3% of Earth’s surface yet store 30% of all land-based carbon.	The world’s forests store approximately 861 gigatonnes of carbon. Carbon Distribution: <ul style="list-style-type: none"> a. 44% in soil (to one-meter depth) b. 42% in live biomass (above- and belowground) c. 8% in dead wood d. 5% in litter This total carbon storage is equivalent to nearly a century’s worth of current annual fossil fuel emissions. Tropical rainforests account for only 30% of global tree cover but contain 50% of the world’s carbon stored in trees.
Environmental Benefits	Supports marine biodiversity, protects coastlines, and improves water quality.	Increases groundwater levels, mitigates floods, and reduces urban heat islands.	Provides habitat for terrestrial biodiversity, regulates local climates, and protects soil from erosion.
Threats	Coastal development, pollution, climate change, and habitat destruction.	Urbanization, drainage for agriculture, and pollution.	Deforestation, land-use change, climate change, and habitat fragmentation.



Keoladeo National Park (Bharatpur, Rajasthan)

Keoladeo National Park, located in Bharatpur, Rajasthan, is a haven for biodiversity and a significant site for conservation efforts.

1. **Rich in Avian Diversity:** The park provides habitat for over 370 species of birds, including the once-endangered Siberian crane. It also supports a variety of other animal life, such as pythons.
2. **Recognized for its Importance:**
 - a. Declared a national park in 1982.
 - b. Designated a UNESCO World Heritage Site in 1985, acknowledging its outstanding universal value.
3. **Environmental Challenges:** In 1990, the park was placed on the Montreux Record under the Ramsar Convention due to concerns related to water shortage and the impact of grazing on the ecosystem. This listing highlights the need for ongoing conservation efforts to ensure the park’s long-term sustainability.



5. Air Quality Management Exchange Platform (AQMx)

1. The **Air Quality Management Exchange Platform** was launched by the **Climate and Clean Air Coalition** on the occasion of the **International Day of Clean Air for Blue Skies**, celebrated on **7th September**.
2. Air Quality Management Exchange Platform (AQMx) is a critical tool in the fight against air pollution.
3. It is designed to be a **'one stop shop'** for technical tools and models, data, and knowledge to build capacity among **air quality managers worldwide**.
4. It is a component of CCAC Clean Air Flagship and contributes to implementation of UNEA-6 Resolution to increase regional cooperation and action on improving air quality globally

CCAC Clean Air Flagship

At the Climate and Clean Air Ministerial 2023 the CCAC launched the "Clean Air Flagship". It is aimed at

1. **Saving lives:** Supporting governments to achieve cleaner air as quickly as possible, consistent with improved WHO air quality interim targets
2. **Slowing climate change:** Taking full advantage of win-win opportunities to reduce the emissions of short-lived climate pollutants simultaneously with other harmful pollutants
3. **Maximizing co-benefits:** Improving agricultural productivity, economic development and the overall quality of life.

AQMx will work directly with air quality managers, to help address air quality management capacity gaps by providing curated guidance across key themes

Core Areas of Air Quality Management

1. **Monitoring:** Measures air pollutants to assess current air quality. AQMx Identifies trends and hotspots.
2. **Source Identification:** Pinpoints sources of pollution (e.g., vehicles, industries). Prioritizes control strategies.
3. **Emissions Inventory:** Quantifies pollutant emissions from various sources. Provides a baseline for evaluating control measures.

4. **Health Impact Assessment:** Evaluates health risks associated with air pollution. Informs public health policies and standards.
5. **Benefits Assessment:** Assesses co-benefits of air quality improvement (e.g., health, climate, economy). Supports sustainable development policies.
6. **Decision Support:** Provides tools and data for informed decision-making. Improves efficiency and reduces costs of air pollution control.
7. **Public Engagement:** Informs the public about air quality issues. Promotes public participation and support.
8. **Policy and Implementation:** Develops and implements laws, regulations, and policies. Ensures compliance with air quality standards.

Climate and Clean Air Coalition (CCAC)

1. The Climate and Clean Air Coalition (CCAC) is a **voluntary partnership** established in 2012, comprising over 160 governments and organizations, **convened by UNEP**.
2. It focuses on **reducing short-lived climate pollutants (SLCPs)** like methane, black carbon, hydrofluorocarbons (HFCs), and tropospheric ozone, which contribute to climate change and air pollution.
3. The coalition supports **SLCP reduction in over 70 countries** through funding and partner initiatives.
4. It aims to reduce global warming in the near term to meet Paris Agreement goals while enhancing economic development, health, and food security.
5. The **CCAC Trust Fund finances** projects in developing countries that deliver climate and air quality benefits, with funding focused on policy development and implementation of mitigation measures.
6. It provides secretariat functions for the **Global Methane Pledge** and coordinates the **Lowering Organic Waste Methane Initiative**.



6. Continuation of the Integrated Development of Wildlife Habitats

1. The Union Cabinet has approved the continuation of the IDWH scheme for the 15th Finance Commission cycle (2021-26) with an outlay of Rs. 2602.98 crore.
2. The scheme will focus on strengthening the existing components and boosting technological interventions in wildlife conservation.

About Integrated Development of Wildlife Habitats (IDWH)

The Integrated Development of Wildlife Habitats (IDWH) scheme is a Centrally Sponsored Scheme launched by the Ministry of Environment, Forest and Climate Change (MoEFCC) for the development of wildlife habitats in India. The scheme aims to enhance the protection and management of wildlife habitats across the country.

Components of the IDWH scheme:

1. Support to Protected Areas (National Parks, Wildlife Sanctuaries, Conservation Reserves and Community Reserves)
2. Protection of wildlife outside protected areas
3. Recovery programmes for saving critically endangered species and habitats

Sub-schemes under IDWH:

1. **Project Tiger:** Launched in 1973, Project Tiger is the flagship scheme of the IDWH. It aims to protect and conserve tiger populations in their natural habitats and prevent extinction.
2. **Project Elephant:** Launched in 1992, Project Elephant aims to address the decline in elephant populations due to habitat loss and poaching.
3. **Development of Wildlife Habitat:** This sub-scheme focuses on creating and enhancing habitats to support wildlife conservation and biodiversity. Project Dolphin and Project Lion are implemented under this sub-scheme.

Significance of the IDWH scheme:

The IDWH scheme plays a vital role in the conservation of wildlife in India. It has helped to increase the populations of many endangered species, including

tigers, elephants, and lions. The scheme has also helped to improve the management of protected areas and reduce human-wildlife conflict.

Benefits of the IDWH scheme:

1. Increased wildlife populations
2. Improved management of protected areas
3. Reduced human-wildlife conflict
4. Enhanced biodiversity
5. Promotion of eco-tourism

The IDWH scheme is an important tool for the conservation of wildlife in India. It is essential that the scheme is continued and adequately funded.

7. 4th Global Renewable Energy Investors Meet and Expo

1. In September 2024, the 4th Global Renewable Energy Investors Meet and Expo (RE-INVEST) was inaugurated by the Prime Minister in Gandhinagar, Gujarat.
2. The event was organized by the Ministry of New and Renewable Energy in collaboration with the Confederation of Indian Industry (CII).

Key Highlights of the RE-INVEST

1. **Financial Commitments for Green Projects:** Banks and financial institutions committed Rs 32.45 trillion for financing green projects. This financial backing reflects India's growing emphasis on renewable energy development and the robust support from financial sectors.
 - Top lenders are Reliance (Rs 6 trillion), Indian Renewable Energy Development Agency Ltd (Rs 5 trillion), State Bank of India (Rs 5 trillion), Power Finance Corporation (Rs 3 trillion) and National Bank for Financing Infrastructure and Development (Rs 1.86 trillion).
2. **Support from Developers and Manufacturers:** The manufacturers have committed additional manufacturing capacities of 340 GW in solar modules, 240 GW in solar cells, 22 GW in wind turbines and 10 GW in electrolyzers.
 - Other stakeholders except manufacturers have committed an additional 570 GW of capacity addition.

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- 3. Invitation to Investors:** India invited global stakeholders to invest in India's rapidly growing renewable energy sector. The government is focused on meeting increasing energy demand sustainably through renewable energy.
- 4. Reduction in Solar Tariffs:** India announced a significant 76% decrease in tariffs for grid-connected solar power plants, making solar energy more affordable and attractive for developers and consumers alike.
- 5. Other Achievements Highlighted:**
- Growth in Installed Capacity:** India's installed renewable energy capacity has increased from 75.52 GW in March 2014 to more than 207.7 GW in 2024.
 - Renewable Energy Generation Increase:** India's total renewable energy generation in India has increased by 86% from 193.50 billion units in 2014 to 360 billion units (BU) in 2024.

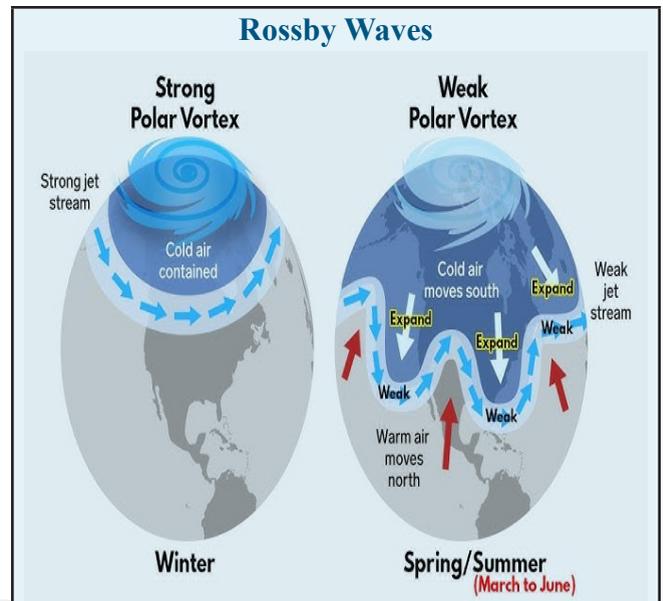
8. Arctic Sea Ice Impact on Indian Monsoon

- Recently, the research published in 'Remote Sensing of Environment' highlights that **changes in Arctic sea ice levels impact the Indian monsoon.**
- The study was conducted by scientists from India's **National Centre for Polar and Ocean Research (NCPOR)** under the **Ministry of Earth Sciences** and South Korea's **Korea Polar Research Institute.**
- Research shows that the **decline in Arctic Sea ice**, mainly due to climate change, is **making the Indian Summer Monsoon Rainfall (ISMR) increasingly variable and unpredictable.**
- The Indian monsoon, once a symbol of relief, is now increasingly marked by **unpredictable rains** that lead to both **droughts and floods.**

How Arctic Sea Ice Influences the Indian Monsoon?

- Central Arctic Sea Ice Decline:** Decreased Arctic Sea ice, especially in central areas, **reduces rainfall in western and peninsular India** but **increases it in central and northern regions.**
 - The **warming ocean** transfers more heat to the atmosphere, **strengthening Rossby waves** that reshape global weather.

- Enhanced Rossby waves create high pressure over northwest India and low pressure near the Mediterranean, shifting the **subtropical easterly jet** northward, resulting in more rain over western and peninsular India.



- Rossby waves**, also known as **planetary waves**, are **large-scale atmospheric waves** found mainly in the mid-latitudes of Earth's atmosphere.
- They significantly shape global weather patterns, impacting temperature and precipitation.

Key Characteristics

- Location:** Occur primarily in mid-latitudes within the Earth's atmosphere.
- Formation:** Form in jet streams with high-altitude air currents moving from west to east.
- Pattern:** Display a meandering shape that influences weather in both Northern and Southern Hemispheres.

Role in Global Weather

- Temperature Contrast:** Most prominent where there's a significant temperature difference between the equator and poles.
- Heat Balance:** Help distribute heat globally, preventing polar regions from extreme cold and the equator from excessive heat.
- Weather Influence:** Play a crucial role in determining temperature extremes and precipitation across the globe.



Low Sea Ice in the Barents-Kara Sea Region: Reduced ice in the Barents-Kara Sea increases atmospheric pressure over **southwest China** and a **positive Arctic Oscillation**, impacting global weather.

- a. Less ice results in rising heat, leading to calm, clear skies over northwest Europe, affecting upper atmospheric conditions in subtropical Asia and India.
 - b. Consequently, northeastern India sees higher rainfall, while central and northwest India receive less.
2. **Role of Climate Change:** A warming Arabian Sea and additional moisture from nearby waters **increase instability in monsoon patterns, heightening rainfall variability.**

Findings on Rain Surplus in Northwestern India

1. **Increased Moisture from Arabian Sea:** Higher moisture inflow from the Arabian Sea has made northwestern India's monsoon season wetter, a trend that is likely to continue, especially under high emissions scenarios.
2. **Altered Wind Patterns:** Faster winds over the Arabian Sea and slower winds over northern India trap moisture, leading to higher rainfall in northwestern India.
 - a. Increased evaporation due to these winds adds to the region's precipitation levels.
3. **Shifts in Pressure Gradients:** Changes in wind patterns result from shifts in pressure, with high pressure around the Mascarene Islands and lower pressure in the equatorial Indian Ocean intensifying monsoon winds toward northwestern India.
4. **Increased East-West Pressure Gradient:** A stronger east-west pressure gradient, fuelled by high pressure over the eastern Pacific, further amplifies these winds, potentially leading to even wetter monsoons in the future.

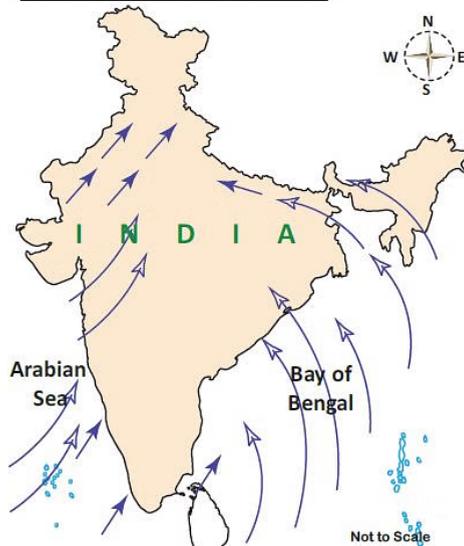
What is the Indian Summer Monsoon Rainfall (ISMR)?

1. The **Indian Summer Monsoon Rainfall (ISMR)** is a significant climatic event in which moisture-laden air from the Indian Ocean flows toward the **Indian subcontinent**, causing heavy rains.
 - a. **Duration:** Occurs from July to September, with peak rainfall in July and August.

2. **Key Influencing Factors:** ISMR is impacted by multiple oceanic and atmospheric factors:
 - a. **Ocean Surface Temperatures:** Indian, Atlantic, and Pacific Oceans play a crucial role.
 - b. **Circum-Global Teleconnection (CGT):** A large-scale atmospheric wave in mid-latitudes influences ISMR patterns.
3. **Formation Mechanism:**
 - a. **Sunlight and Low-Pressure Zone:** The Central Asian and Indian landmass heats up faster than surrounding oceans, forming a low-pressure area known as the **Intertropical Convergence Zone (ITCZ)**.
 - b. **Trade Winds and Coriolis Effect:** Southeast trade winds, deflected due to the Coriolis force, move toward India.
 - c. **Moisture Accumulation:** As winds cross the equator and pass over the Arabian Sea, they gather moisture, releasing it as rainfall over India.
 - d. **Southwest Monsoon Split into two arms.** **Arabian Sea Arm** brings rain along India's west coast while **Bay of Bengal Arm** moves toward eastern and northeastern India.
 - **Convergence:** Both arms meet over Punjab and Himachal Pradesh, intensifying rainfall.
4. **Indian Winter Monsoon Rainfall:** The northeast monsoon is the winter phase of the monsoon, marked by a shift in wind direction due to high-pressure cells over **the Siberian and Tibetan plateaus**.
 - a. **Duration:** Occurs from October to December.



South West Monsoon In India



Significance of the Monsoon for India

- Agricultural Backbone:** Monsoon is vital for India's agriculture, directly affecting food security and rural livelihoods. About 61% of farmers depend on rainfall for irrigation.
 - Supports around 55% of India's rain-fed crops, crucial for agricultural productivity and the broader economy.
- Water Resource Management:** Monsoon accounts for 70-90% of India's annual rainfall which is essential for replenishing rivers, lakes, and groundwater, supporting irrigation, drinking water, and hydroelectric power needs.
- Economic Ripple Effects:** A favourable monsoon increases rural income and boosts consumer demand while a poor monsoon can trigger food price inflation, influencing monetary policy and government spending.
- Ecological Balance:** Monsoon sustains India's diverse ecosystems, impacting biodiversity, wildlife migration, and habitat health. Variations in monsoon patterns can disturb the balance of flora and fauna across regions.
- Climate Regulation:** The Indian monsoon plays a crucial role in global climate systems, influencing atmospheric patterns. It interacts with climatic phenomena like **El Niño** and **La Niña**, affecting global weather.

About Arctic Ocean

- Location and Borders:** Smallest of the world's oceans, located around the North Pole.
 - Bordered by Canada, Greenland, Iceland, Norway, Sweden, Finland, Russia, and the United States.
- Key Seas:** Includes important seas like the Barents, Kara, Laptev, East Siberian, and Beaufort Seas.
- Ice Coverage:** Predominantly covered by sea ice, with seasonal patterns of melting and freezing.
- Climate Change Impact:** Rapid warming has reduced ice cover, opening new shipping routes (e.g., Northern Sea Route). It facilitates increased access to natural resources in previously inaccessible areas.
- Resources:** Estimated to contain around 13% of the world's undiscovered oil and 30% of its natural gas reserves.

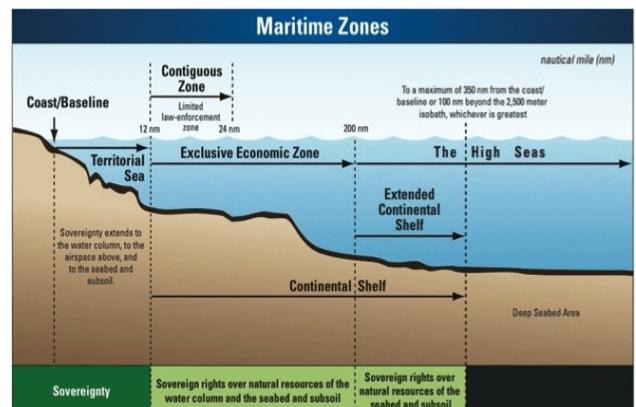
9. Tuvalu's Fight Against Rising Sea Levels

In recent times, Tuvalu, a Pacific island nation with 11,000 residents, faces severe **existential threats** from **rising sea levels**.

- NASA projects that **by 2050**, half of its **main atoll, Funafuti**, will be **submerged by daily tides**.
- Tuvalu seeks **UN-backed recognition** of its maritime boundaries and statehood, even if submerged, **amid concerns over illegal fishing and revenue loss**.

What is Tuvalu doing for this crisis?

- Tuvalu has entered into a landmark climate and security treaty with Australia in 2023 which allows 280 Tuvaluans to move to Australia annually.
- Tuvalu is **building seawalls** and **expanding artificial land** to **delay the impacts until 2100**.
- Building of 7 hectares artificial land which can stay above tides.

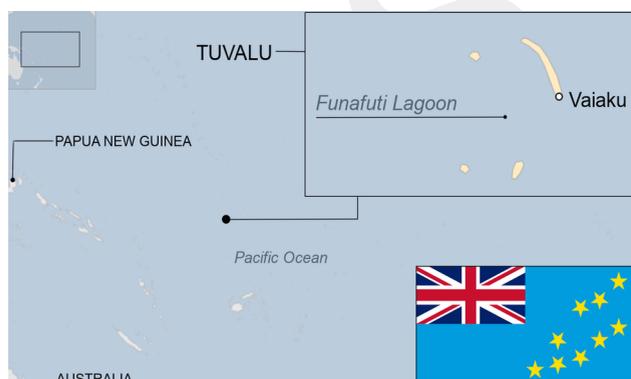


Tuvalu and UNCLOS

1. Under the UNCLOS, the extent of maritime zone is decided by features of permanently dry land.
2. Baseline for a maritime zone may be established by reference to the low-water line of a feature that is above water at all times. However, due to the rising sea level and possible submergence, island nations like Tuvalu risk losing or diminishing their Exclusive Economic Zones.
3. Thus, Tuvalu has called for amending the UNCLOS which allows countries like it to permanently retain control of its vast maritime zone with large blue economy like fishing rights and mining of seabed minerals.
4. According to current international law, dry land is also essential for recognition of sovereignty. Tuvalu has been campaigning to its maritime boundaries and statehood recognised for permanent.

Tuvalu

1. It lies in the **west-central Pacific**, halfway between **Hawaii** and **Australia**.
2. Its capital is **Funafuti**, and neighbours include **Kiribati** and **Nauru** to the north and **Fiji** as its nearest neighbour to the south.
3. It consists of 3 main islands (**Nanumanga**, **Niutao**, and **Niulakita**) and features 6 **coral atolls** (like **Funafuti**, **Nanumea**, **Nui**) along with over 100 small islets.



10. Reduction in CO2 from Transport Sector by 2050

A recent study by the World Resources Institute (WRI) India has revealed that India has the potential to significantly reduce carbon dioxide (CO2) emissions from

its transport sector by up to 71% by 2050. This ambitious goal can be achieved by implementing strong strategies focused on three key areas:

1. **Electrification:** Promoting the widespread adoption of electric vehicles (EVs) across all transport segments.
2. **Fuel Economy:** Improving fuel efficiency standards for existing vehicles to reduce reliance on fossil fuels.
3. **Modal Shift:** Encouraging a shift towards cleaner modes of transport, such as public transportation and railways, and promoting sustainable mobility options like cycling and walking.

The Urgency of Decarbonizing India's Transport Sector

1. **Growing Emissions:** In 2020, India's transport sector contributed 14% of the nation's total energy-related CO2 emissions. This figure is projected to rise significantly if current trends continue.
2. **Road Transport Dominance:** A staggering 90% of these emissions originate from road transport, with heavy-duty freight vehicles being the largest contributors.
3. **Net-Zero Target:** Achieving substantial emission reductions in the transport sector is crucial for India to meet its national goal of net-zero emissions by 2070.

Key Findings of the WRI India Study

1. **High-Ambition Strategies are Key:** Simultaneously implementing electrification, fuel economy improvements, and modal shift strategies at their highest ambition levels can lead to a 71% reduction in CO2 emissions and fossil fuel consumption by 2050.
2. **Cost-Effective Solutions:** Shifting to low-carbon transport options is not only environmentally beneficial but also economically advantageous, with estimated savings of Rs. 12,118 per tonne of CO2 emissions avoided.
3. **EVs as a Driving Force:** Expanding EV sales is a highly effective strategy for CO2 emission reduction, with an estimated annual abatement potential of 121 million tonnes of CO2 equivalent.
4. **Clean Electricity is Essential:** Decarbonizing electricity generation through increased reliance on renewable sources is crucial to maximize the benefits of transport sector electrification.



World Resources Institute (WRI)

1. It is a global research organisation founded in 1982, with its headquarters located in Washington, USA.
2. It spans more than 60 countries and focuses on six critical issues at the intersection of environment and development: climate, energy, food, forests, water, and cities and transport.
3. WRI works with government, business, and civil society to drive ambitious action based on high-quality data and objective analysis.

The Business-as-Usual Scenario

The study warns that if India continues with a “business-as-usual” approach, the transport sector will remain heavily reliant on fossil fuels until 2050. This would lead to a quadrupling of fossil fuel consumption, driven by a projected tripling of passenger travel demand and a sevenfold increase in freight travel demand.

What are the Initiatives India has Undertaken for Energy Transition?

1. **National Solar Mission:**
 - a. Launched under the National Action Plan on Climate Change (NAPCC), the mission aims to achieve 100 GW of solar capacity by 2022, later revised to 280 GW by 2030.
 - b. It promotes the development of solar energy infrastructure, focusing on large-scale solar power plants and rooftop solar installations.
2. **National Hydrogen Mission (NHM):**
 - a. NHM was launched in 2021, this initiative aims to make India a global hub for the production and export of green hydrogen.
 - b. The mission focuses on research, production, and deployment of hydrogen as a clean energy source, with plans to meet 19% of India’s industrial hydrogen demand from green hydrogen by 2070.
3. **National Biofuel Policy:**
 - a. The policy encourages the blending of biofuels with conventional fuels to reduce dependency on fossil fuels.
 - b. India aims for a 20% ethanol blending target by 2025, advancing the initial 2030 target to accelerate emission reduction in the transportation sector.

4. Faster Adoption and Manufacturing of (Hybrid & Electric Vehicles (FAME):

- a. Under the FAME initiative, the government incentivizes the adoption of EVs and hybrid vehicles.
- b. FAME-II, launched in 2019, provides subsidies for electric two-wheelers, buses, and charging infrastructure, with the objective of boosting clean mobility.

Conclusion

The WRI India study provides a clear roadmap for India to achieve significant CO2 emission reductions in its transport sector by 2050. By embracing ambitious strategies focused on electrification, fuel economy, and modal shift, India can create a cleaner, more sustainable, and economically sound transportation future. This will not only contribute to global efforts to combat climate change but also improve air quality and public health in India.

11. Ban on hunting, catching, killing, and selling Amur falcons

The Tamenglong district administration in Manipur has recently imposed an immediate ban on hunting, catching, killing, and selling Amur falcons (*Falco amurensis*) in preparation for their arrival. This article provides an overview of these fascinating birds, their migration patterns, threats they face, and conservation efforts underway.

About Amur Falcons

1. **Small and Agile:** Amur falcons are small, agile raptors locally known as ‘Kahuaipuina’ in Manipur and ‘Molulem’ in Nagaland, which is also known as the “Amur Falcon capital of the world.”
2. **Distinctive Features:** They are characterized by their dark plumage, white wing linings, and reddish-orange eyes and feet.
3. **Long Migration:** These remarkable birds undertake an epic journey, migrating from their breeding grounds in Northern China, Eastern Mongolia, and Far East Russia to South Africa, covering a distance of approximately 22,000 kilometers and passing through India.



- 4. **Insectivorous Diet:** Primarily insectivores, they feed on insects during their migration, but may also consume small vertebrates.
- 5. **Threats:** Amur falcons face numerous threats, including habitat loss, hunting, and illegal trapping.

Conservation Efforts

- 1. **Radio Tagging:** In 2016, Manipur launched a program to tag Amur falcons with radio transmitters to monitor their migration routes and identify potential threats.
- 2. **Amur Falcon Festival:** An annual “Amur Falcon Festival” is held in Tamenglong district to raise awareness about these birds and celebrate their arrival.
- 3. **Legal Protection:** Amur falcons are listed as “Least Concern” on the IUCN Red List and are protected under Appendix II of the Convention on Migratory Species (CMS) and Schedule IV of the Wildlife Protection Act, 1972.

Conclusion

The Amur falcon is a magnificent bird that undertakes an extraordinary migration journey. By protecting these birds and their habitats, we can help ensure their survival for generations to come.

12. Phrynarachne Decipiens Spider Species Discovered in Assam

- 1. Scientists in Assam have made a remarkable discovery: the *Phrynarachne decipiens*, a spider known for its **exceptional camouflage technique**.
- 2. *Phrynarachne decipiens* has been recorded for the first time in the country from **Assam’s Kamrup district and Kokrajhar district**.
- 3. This species, previously only recorded in **Malaysia and Indonesia**, has now been identified in India for the first time.

- 4. The *Phrynarachne decipiens* is renowned for its ability to **mimic bird droppings**.
- 5. This **ingenious camouflage** helps the spider to blend seamlessly into its surroundings, protecting it from **predators**.



13. State of the Rhino Report 2024

- 1. In September 2024, the International Rhino Foundation (IRF) released the State of the Rhino report 2024.
- 2. IRF, initially the International Black Rhino Foundation in 1991, is dedicated to the survival of the world’s rhino species.

Key Findings

- 1. **Global Rhino Population:** There are just under 28,000 rhinos left in the world across all five species.
- 2. **Poaching:** Rhino poaching in Africa increased by 4% from 2022 to 2023, with at least 586 rhinos poached.
- 3. **Species-Specific Trends:**
 - a. White rhino populations in South Africa are on the rise despite poaching.
 - b. The greater one-horned rhino (Indian Rhino) population remained stable.
- 4. **Conservation Success:** Chitwan National Park in Nepal, home to the world’s second-largest population of greater one-horned rhinos, made significant strides in anti-poaching efforts with a record number of arrests and a decrease in rhino deaths caused by invasive plant species.

About Rhinos

- 1. **Species:** There are **5 species** of rhino: **two African** (White Rhino, Black Rhino) and **three Asian** (Indian rhino, Sumatran Rhino, and Javan Rhino).
- 2. **Conservation Initiatives:** Key initiatives include the National Rhino Conservation Strategy 2019, the New Delhi Declaration on Asian Rhinos 2019, and Indian Rhino Vision 2020.

African vs. Asian Rhinos

Feature	African Rhino	Asian Rhino
Size	White rhino is the second-largest land mammal after elephants.	Indian rhino is the largest of all Asian rhino species.
Appearance and Behavior	Less armored look, more aggressive, two horns, poor swimmers	More armored look, less aggressive, two horns (Sumatran rhino) or one horn (Indian and Javan rhinos), good swimmers
Fighting Style	Fights with its horns	Fights with its bottom teeth



Diet	Feeds low to the ground	Grazes on tall grasses, shrubs, leaves
Habitat	Grasslands, savannas, shrublands, deserts	Tropical and subtropical grasslands, savannas, and moist forests
Conservation Status (IUCN)	White Rhino: Near threatened; Black Rhino: Critically Endangered	Indian Rhino: Vulnerable; Sumatran Rhino: Critically Endangered; Javan Rhino: Critically Endangered

14. How a tardigrade resists high levels of radiation, implications for humans

The findings could one day be harnessed to help protect astronauts from radiation during space missions, clean up nuclear pollution or improve cancer treatment, according to a report in Nature.

A team of researchers has identified the genetic mechanisms that help a newly discovered species of tardigrades (*Hypsibius henanensis*) withstand high levels of radiation. The species comprises thousands of genes, which become more active when exposed to radiation. They protect the microscopic animals' DNA from damage and repair breaks, according to the scientists.

Their study, 'Multi-omics landscape and molecular basis of radiation tolerance in a tardigrade', was published in the journal Science last week. The scientists involved in the research are affiliated with several institutions in China.

The findings could one day be harnessed to help protect astronauts from radiation during space missions, clean up nuclear pollution or improve [cancer](#) treatment, according to a report in Nature.

Lingqiang Zhang, a biologist at the Beijing Institute of Lifeomics and co-author of the study, told Nature, "This discovery may help improve the stress tolerance of human cells, benefiting patients undergoing radiation therapy."

How was the study carried out?

Zhang and his colleagues discovered a new species of tardigrade six years ago after they brought back moss samples from Funiu Mountain in China's Henan province to their laboratory.

They named it *Hypsibius henanensis* and began to analyse its characteristics. Also known as water bears or moss piglets, tardigrades have long fascinated scientists as they can withstand extreme conditions.

The team of scientists sequenced the genome of this new species and revealed that it had 14,701 genes, 30% of which were unique to tardigrades. They then exposed *Hypsibius henanensis* to radiation doses of gamma rays that were far beyond what would be survivable for humans, the Nature report said.

What did the study find?

The scientists discovered 2,801 of the genes in *Hypsibius henanensis* that were involved in DNA repair. More specifically, they found three factors that help this species survive radiation.

The first was its ability to quickly repair double-strand breaks in DNA due to radiation exposure, by using a protein called TRID1. "The second factor involved a gene that was switched on during exposure to radiation, resulting in the generation of two proteins that are known to be important for mitochondrial synthesis... in tardigrades, it appears they also help with DNA repair," according to a report by phys.org.

The third one was *Hypsibius henanensis*'s ability to produce different types of antioxidant pigments called betalains. These pigments can mop up some of the harmful reactive chemicals that radiation causes to form inside cells, the Nature report said.

Notably, the researchers tested one of the tardigrade's betalains on human cells and found it significantly improved their survival rate after radiation exposure.

15. Gondwanax Paraisensis

1. Scientists have discovered a fossil of a reptile species called **Gondwanax paraisensis** in southern Brazil.
2. The fossils of this newly discovered reptile species could provide insights into the emergence of **dinosaurs**.
3. **Gondwanax paraisensis** is about **237 million years old**, making it one of the oldest reptile fossils ever found.



Key Takeaways

1. The **Gondwanax paraisensis** was a small, four-legged reptile, roughly the size of a small dog. It measured about 1 meter (39 inches) long and weighed between 3 to 6 kg (7 to 13 pounds). This reptile likely lived in what is now southern Brazil during the **Triassic period**, a time when the Earth was much hotter.
2. The discovery was published in the journal **Gondwana Research** last month. According to paleontologist Rodrigo Temp Müller, who led the study, the fossil's age is key. "Because it's so old, it helps us understand how **dinosaurs** first appeared," he said.
3. The discovered fossil belongs to a group of extinct reptiles called **silesaurids**. Interestingly, there is no consensus among scientists on whether **silesaurids** were true **dinosaurs** or a species that came before them. A study of this newly discovered species could help in understanding what traits made **dinosaurs** so successful.
4. The fossil was originally discovered in **2014** by Pedro Lucas Porcela Aurelio. He donated it to a university in 2021, starting three years of research.
5. The name **Gondwanax** means "lord of **Gondwana**," referring to the southern part of the supercontinent **Pangaea**. The species name **paraisensis** honors the town of **Paraiso do Sul** where the fossil was found.
5. **Gondwana, Laurasia and India's tryst with dinosaurs**
6. In the **Paleozoic era**, **Gondwana** and **Laurasia** formed the supercontinent of **Pangaea**. Here many **dinosaurs** lived and went extinct, and their remains were ensconced in lava.
7. **Gondwanaland** got cracked up at the end of the **Jurassic era** to create all our southern continents, **Africa, Australia, and South America**, as well as **New Zealand, the Indian subcontinent, and the island of Madagascar**, which has long been an area of study.

Dinosaurs and India

1. **India** has been a hotspot for finding **dinosaur fossils** for decades. **Dinosaurs** have been studied in **India** for over 175 years in three distinct phases: the first lasting about 100 years until 1935, the second "quieter" phase that extended for the next 20 years, and the phase from the 1960s onward, which has seen fairly active research.

2. Records show that **dinosaurs** in **India** existed from the **Late Triassic** to the end of the **Cretaceous** — or between 200 million years and 65 million years ago.
3. **Dinosaur** remains have been found over the years in **Rajasthan, Gujarat, Madhya Pradesh, Maharashtra, Tamil Nadu, Andhra Pradesh and Karnataka**. "More recently, they have been discovered in **Meghalaya and in Pakistan**, if you think of the broader subcontinent," Prof Sahni said.
4. One of the most famous **dinosaurs** in the country is **Rajasaurus**. Its fossils were first found by **GSI geologist Suresh Srivastava** in the **1980s**. Teams from the **American Institute of Indian Studies** and the **National Geographic Society**, with the support of the **Panjab University**, spent years in order to reconstruct the excavated remains. In **2003**, **Rajasaurus** was finally given its name by geologist **Jeffrey A. Wilson**, University of Michigan.

16. Typhoon Yagi: Most Powerful Storm in Asia this year

1. Recently, **Typhoon Yagi** has severely impacted multiple countries, including the Philippines, China, Laos, Myanmar, Thailand and particularly Vietnam.
2. It is the **strongest tropical cyclone** Asia has seen this year and the **2nd most powerful** storm in the world so far this year after Hurricane Beryl (Atlantic Ocean).
 - The Japan Meteorological Agency (JMA) named Typhoon Yagi. The name **Yagi** is a **Japanese word that means "goat"** and is also the Japanese name for the constellation Capricornus.

How are Tropical cyclones formed?

1. **Tropical cyclones** form over warm ocean waters near the equator. When the warm, moist air from the ocean surface rises upward, a lower air pressure area is formed below. Air from surrounding areas with higher air pressure rushes into this low pressure area, eventually rising, after it also becomes warm and moist.
2. As warm, moist air rises, it cools down, and the water in the air forms clouds and thunderstorms. This whole system of clouds and winds gains strength and momentum using the ocean's heat, and the water that evaporates from its surface.



According to the National Oceanic and Atmospheric Administration (NOAA) “The weakest tropical cyclones are called tropical depressions. If a depression intensifies such that its maximum sustained winds reach 39 miles per hour [63 kmph], the tropical cyclone becomes a tropical storm.”

Storm systems with wind speeds of 119 kmph and above are classified as hurricanes, typhoons, or tropical cyclones.

- The category of a tropical cyclone is determined by its sustained wind speed, as measured by the **Saffir-Simpson Hurricane Wind Scale (SSHWS)**.
 - The SSHW Scale is a 1 to 5 rating based on a hurricane’s sustained wind speed. This scale estimates potential property damage.
- It is classified into 5 categories — **Category 1 to Category 5**. While **Category 1 tropical cyclones** bring winds of 119 to 153 kmph, **Category 5 tropical cyclones**, which are the strongest, have winds of 252 kmph or higher. Storms that reach **Category 3** and higher are considered major tropical cyclones due to their potential to inflict significant damage.

How did Typhoon Yagi become the strongest storm in Asia?

- Typhoon Yagi started as a tropical storm** in the western Philippine Sea on September 1. It made landfall in the Philippines the next day and started to weaken. However, due to unusually warm waters in the South China Sea, the storm intensified again. By September 4, it strengthened into a **strong typhoon with Category 3 winds**.
- The next day, it became a **Category 5 typhoon** with peak maximum **sustained winds of 260 kmph** — Typhoon Yagi is one of four Category 5 storms recorded in the South China Sea, after Pamela in 1954, Rammasun in 2014, and Rai in 2021.

Is climate change making tropical cyclones worse?

- Scientists are yet to reach an agreement over how exactly climate change is impacting tropical cyclones. That is because there are a lot of factors that determine whether a storm forms, how it develops, its strength, duration and overall characteristics. However, there is a consensus that with rising global temperatures, tropical cyclones are becoming more intense.

- For instance, a study published in the journal *Climate and Atmospheric Science* in July this year showed that tropical cyclones in Southeast Asia are now forming closer to coastlines, intensifying more rapidly, and lingering longer over land.
 - This could be happening primarily because of warmer surface temperatures of the ocean — global mean sea surface temperature has gone up by close to 0.9 degree Celsius since 1850 and around 0.6 degree Celsius over the last four decades.
- Higher sea surface temperatures cause marine heat waves, an extreme weather event, which can also make storms like hurricanes and tropical cyclones more intense.
 - Warmer temperatures escalate the rate of evaporation along with the transfer of heat from the oceans to the air. When storms travel across hot oceans, they gather more water vapour and heat. This results in stronger winds, heavier rainfall and more flooding when storms reach the land.

Category 6 Cyclones have been in the News

Currently, the **Saffir-Simpson Hurricane Wind Scale**, the most widely used scale for classifying hurricanes, **only goes up to Category 5**, with winds exceeding 157 mph (252 km/h). A **Category 6 cyclone** would be a **hypothetical classification** for storms even stronger than this.

Why are they in the news?

- Increasing hurricane intensity:** Scientists have observed that **hurricanes are becoming more intense** due to climate change and warming ocean temperatures.
- Recent proposals:** In 2024, researchers proposed adding a Category 6 to the Saffir-Simpson scale, suggesting a minimum wind speed of 192 mph (309 km/h). This proposal was prompted by the observation of five tropical cyclones since 2013 exceeding this threshold.
- Hurricane Patricia (2015):** This hurricane, which devastated parts of Mexico, is cited as a prime example of why a Category 6 is needed. It had sustained winds of 215 mph (345 km/h), well beyond the current Category 5 threshold.





G. SOCIETY AND CULTURE

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1. Supreme Court Strengthens POCSO Act Against Child Exploitation

- In September 2024, the Supreme Court ruled that **watching or possessing sexually explicit material involving minors is illegal** under the **Protection of Children from Sexual Offences (POCSO) Act, 2012**.
 - This ruling makes it a **punishable offence**, even if the material is not shared or transmitted.
 - The judgement overturned an earlier **Madras High Court ruling** that viewing child pornography privately was not an offence unless distributed.

What was the Case Before the Supreme Court?

- In January 2023, the **Madras High Court** quashed criminal charges against a man accused of downloading and possessing child pornography.
- The High Court ruled that mere possession of child pornography does not violate Section 14, as the accused did not actively use children for pornographic purposes.
- Additionally, the court found no evidence that the material had been transmitted or published, meaning offenses under the POCSO Act were not applicable in this case.

What is the law in question?

- The Supreme Court expanded the interpretation of **Section 15 of the POCSO Act**, which addresses the **punishment for storing pornographic material involving children**.

What are the Key Highlights of the Supreme Court Ruling?

- Redefinition of Terminology:** The Supreme Court has urged the government to **replace the term “child pornography”** with **“child sexual exploitative and abuse material”** (CSEAM).

- This change reflects the **abusive and exploitative nature of the act**, unlike **“pornography,”** which implies consensual adult actions.
- Expansion of Section 15 of the POCSO Act, 2012:** The court **broadened the scope of Section 15**, which deals with storing child pornography. It identified three major offences:
 - Possession Without Reporting:** Anyone possessing child pornography must **either delete it or report it**. Failure to do so is punishable under **Section 15(1)**.
 - Intent to Transmit or Distribute:** Possession with the intent to share or display the material (except for reporting) is punishable under **Section 15(2)**.
 - Commercial Possession:** Storing child pornography for **commercial purposes** leads to the **most severe penalties** under **Section 15(3)**.
 - Concept of Inchoate Offences:** The offences under Section 15 are classified as **‘inchoate’ offence**, meaning they are **preparatory steps toward committing a crime**.
 - The court emphasized that the law targets **overt actions, not just thoughts**, related to committing a crime.
 - For instance, failing to delete, destroy, or report child pornography may imply the **intent to distribute or share** the material, as per **Section 15(1)**.
 - Redefinition of Possession:** Court expanded the definition of “possession” to include **“constructive possession,”** where an individual **may not physically hold the material but has control over it** and is aware of that control.
 - For example:** Watching child pornography without downloading it or closing a link to child pornography without reporting it can still be considered possession.



5. **Educational Reforms:** The court called for the **promotion of comprehensive sex education** in schools and society to address sexual health misconceptions.

a. Education should include topics such as **consent, healthy relationships, gender equality, and respect for diversity.**

6. **Awareness of POCSO Act, 2012: Sections 43 and 44** of the POCSO Act, 2012 mandate central and state governments, along with the **National Commission for Protection of Child Rights (NCPDR)**, to spread awareness of the Act.

7. **Formation of an Expert Committee:** An expert committee should develop **comprehensive health and sex education programs** and **increase awareness of the POCSO Act, 2012**, especially for children.

8. **Victim Support and Awareness:** The judgement emphasized **strong support systems for victims of CSEAM**, including **psychological counselling, therapeutic interventions, and educational support.**

a. Programs like **cognitive behavioural therapy (CBT)** can help address the cognitive distortions that contribute to such behaviour in offenders.

b. **Cognitive behavioral therapy (CBT)** is a type of psychotherapy that helps people manage mental health conditions by changing how they think and behave.

How will such cases be registered?

1. The court emphasized that the **intention of the accused** can be assessed by examining:

a. **How the material was stored or possessed**, and
b. **Why it was not deleted, destroyed, or reported.**

2. These factors will help determine the **'mens rea'** or intent behind the accused's actions.

3. The court also advised the **police and judiciary** to avoid limiting their investigations to only one sub-section of **Section 15.**

4. Even if one sub-section doesn't apply, the police should explore other sub-sections before **concluding that no offence has occurred.** This ensures a thorough examination of all possible violations.

What is the Protection of Children from Sexual Offences (POCSO) Act?

1. **Enacted in 2012**, the POCSO Act is India's **1st comprehensive law aimed at addressing sexual abuse of children.**

2. It is administered by the **Ministry of Women and Child Development.**

3. **Its primary objectives are to:**

a. Protect children from sexual assault, harassment, and pornography.

b. Establish Special Courts to handle such cases.

4. The Act was **amended in 2019 to strengthen penalties**, aiming to **deter offenders and ensure children's dignified upbringing.**

5. It is enacted after India ratified the **UN Convention on the Rights of the Child in 1992.**

Key Provisions:

1. **Gender-Neutral:** The Act applies equally to boys and girls as victims of sexual abuse, recognizing it as a crime regardless of gender. Defines a child as anyone **under 18 years.**

2. **Victim's Identity Confidentiality: Section 23** mandates that the identity of child victims, including name, address, and family details, must remain confidential in media reports unless the Special Courts allow disclosure.

3. **Mandatory reporting:** Failing to report sexual offences by anyone in charge of an institution (excluding children) is punishable under **Sections 19 to 22** of the act.

4. **No time limit:** Victims can report abuse **at any time**, even after many years.

Gaps in POCSO Act Implementation

1. **Lack of Support Persons:** In **96% of POCSO cases**, victims lacked the necessary **"support persons"** to assist them through the legal process, as noted by the Supreme Court.

a. A support person could be an individual or organization working in child rights or protection.

2. **Insufficient POCSO Courts:** As of 2022, only 408 POCSO courts were operational across 28 states under the Fast Track Special Court's Scheme, leaving many districts without designated courts.

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3. **Shortage of Special Public Prosecutors:** There is a lack of specialized public prosecutors trained to handle POCSO cases effectively.
4. **Increase in abuse:** Sexual abuse has risen, especially post-COVID-19, with the emergence of new cybercrimes.
5. **Lack of awareness:** Many minor girls, boys, parents, and society lack knowledge about the law and protection mechanisms.
4. Unpaid care work is often perceived as **low value** and is invisible in mainstream economics.
5. **Entrenched patriarchal institutions** and **national accounting systems** fail to factor in disproportionate women's work in to economy .



Key Dimensions Of Unpaid Work

1. Household Responsibilities:

- a. Popularly known as the **second shift** , Women often take on a significant share of unpaid domestic tasks, including cooking, cleaning, and managing household logistics.
- b. **International Labour Organization (ILO)** estimates that women perform 3-4 times more unpaid care work than men globally.
- c. In South Asia, women spend over 6 times as much time on unpaid work as men.
- d. **NSO data (2019)**, Indian women spend an **average of 5.5 hours per day** on unpaid household work, while men spend **only 52 minutes** on similar tasks.
- e. **Time Use Survey** by the **NSO Ministry of Statistics and Programme Implementation (2019)** indicates that 92% of women perform unpaid domestic work, compared to 27% of men.

2. Caregiving Duties

- a. Women frequently bear the **primary responsibility for caregiving**—caring for children, elderly family members, and those who are ill or disabled.
- b. A **UN Women report** indicates that **42% of women cannot take on paid work** because of caregiving responsibilities, compared to just 6% of men globally.
- c. In the United States, 60% of caregivers are women, and they spend an average of 20 hours per week on caregiving tasks, which can limit their workforce participation and personal time.
- d. The **International Labour Organization (ILO)** reports that **Indian women do three times more unpaid caregiving than men**. This includes caring for children, elderly family members, and those with illnesses.

Status of Crimes Against Children

1. **Rise in Crimes Against Children:** Crimes against children increased by 8.7% from 2021 to 2022, with over 162,000 reported cases. Major offenses included **kidnapping and abduction** (45.7%) and cases under POCSO Act (39.7%).
2. **Rising Market:** India leads the world in online child sexual abuse imagery, according to the **US-based National Centre for Missing and Exploited Children (NCMEC)**, followed by Thailand.
3. **Volume of Content:** Between April and August 2024, Indian users uploaded approximately 25,000 images or videos related to child sexual abuse.
4. **Geographical Distribution:** Delhi ranks highest in uploading child pornography, followed by Maharashtra, Gujarat, Uttar Pradesh, and West Bengal.
5. **Increased Circulation:** The **National Crime Records Bureau (NCRB) 2023 report** shows a rise in cases of child porn creation or storage, with 781 cases in 2018 compared to 331 in 2017.
 - a. By 2022, 1,171 cases of child-related inappropriate content dissemination were recorded.

2. Disproportionate Burden on Working Women

1. Women spend a disproportionate amount of their time carrying out three quarters of the **world's unpaid work 11 billion hours a day**.
2. Globally women undertake **three times more care and domestic work** than men.
3. Women in **low- and middle-income countries** devoting more time to unpaid work than women in high income countries



- e. A 2018 survey by the **Azim Premji University** found that 47% of Indian women cited caregiving responsibilities as the primary reason for not participating in the labor force.

3. Informal Labor

- a. Disproportionate burden of care work leads to women working in areas which are **unregulated, lacks job and social security, severely underpaid or home based work**.
- b. Globally, 61.2% of women work in informal employment, according to the ILO
- c. **National Commission for Enterprises in the Unorganised Sector (NCEUS)**, over **90% of India's female workforce** is employed in the **informal sector**.
- d. ILO reports that **the gender wage gap in India is 30%**, with women earning significantly less than men even in informal employment.
- e. **Leaky pipe** report by **Indian scientist Rohini Godbole** talk about women dropping out of research as career even after close to decade for obtaining PHDs.
- f. **Perception** that women have **double responsibilities** leads to biases against women in hiring, unequal career advancement opportunities, limited support during career breaks

4. Societal Expectations and Gender Norms:

- a. Cultural norms often dictate that women should prioritize family and household duties over personal or professional ambitions, leading to self-imposed restrictions and internalized pressure to fulfill these roles.
- b. Surveys by **Pew Research Center** found that over **50% of women in certain cultures** felt pressured to conform to **traditional gender roles**.
- c. **NITI Aayog's Gender Equality Index** reveals that societal expectations and traditional norms continue to influence **women's career choices**.
- d. **Pew Research Center (2021)** found that **40% of Indians** believe that **men should be prioritized** over women when jobs are scarce

5. Unpaid work, stress, and mental health

- a. The combined burden of work can take a toll on women's physical and mental health, as they often have **limited time for self-care, exercise, or rest**.
- b. The stress of balancing multiple roles may lead to **burnout, chronic stress, and other health issues**.
- c. **Higher earning women** in all countries are able to give more attention to and **spend more quality time with their children by outsourcing more onerous household tasks**—for example, by using care services and domestic help.
- d. By contrast, women who lack the financial means are often burdened by **repetitive, time consuming**, whereas the **relational component of unpaid work**, such as playing with children, may be **stress reducing and fulfilling**.
- e. The Lancet revealed that women with **significant unpaid labor duties** have an **increased risk of cardiovascular disease by 13%**, partly due to stress and limited time for health maintenance.
- f. The **contributions of drudgery and the physical demands of unpaid work** need to be considered.

Addressing the Disproportionate Work Burden

1. Promoting Equitable Domestic Responsibility

- a. **Awareness Campaigns:** Government and community campaigns to shift norms around gender roles, such as the **#ShareTheLoad** initiative.
- b. **Educational Programs:** Integrate gender equality discussions into school curricula to challenge traditional roles.
- c. **Incentives for Shared Labor:** Offer tax breaks or recognition programs to encourage men's involvement in domestic tasks.

2. Addressing Caregiving Burden

- a. **Subsidized Childcare:** Increase access to affordable childcare and eldercare facilities in urban and rural areas.
- b. **Paid Family Leave:** Implement policies for paid leave for both parents to distribute caregiving responsibilities.



- c. **Community Support Networks:** Establish local support groups for resource sharing and caregiving collaboration.

3. Formalizing Informal Labor

- a. **Social Security for Informal Workers:** Extend benefits like health insurance and maternity leave to informal workers.
- b. **Skill Development:** Provide programs to enhance skills for better-paying, secure jobs.
- c. **Financial Inclusion:** Increase access to financial services for women in the informal sector.

4. Reducing Workplace Inequality

- a. **Pay Parity Legislation:** Enforce laws and audits to ensure pay equity and address wage gaps.
- b. **Corporate Quotas:** Set targets for women's leadership representation and mentorship programs.
- c. **Flexible Work Policies:** Promote remote work and flexible hours to help balance work and home life.

5. Shifting Societal Expectations

- a. **Public Awareness Campaigns:** Use media campaigns to challenge traditional gender roles.
- b. **Empowering Local Leaders:** Involve community leaders and influencers to advocate for gender equality.
- c. **Legislative Support:** Strengthen laws on women's rights, property ownership, and inheritance.

6. Addressing Health Impacts

- a. **Mental Health Support:** Provide accessible counseling and stress management services for women.
- b. **Wellness Programs:** Implement workplace initiatives focusing on physical and mental health.
- c. **Health Insurance Accessibility:** Offer affordable healthcare policies targeting women's needs.

7. Building Supportive Infrastructure

- a. **Universal Childcare Services:** Expand Anganwadi services to include full daycare options.
- b. **Incentives for Private Sector:** Provide tax benefits to businesses offering childcare and flexible policies.

- c. **Public-Private Partnerships:** Collaborate with NGOs and private sectors to enhance childcare and skill development programs.

Addressing the disproportionate burden of work on women in India requires integrated solutions that **promote equitable domestic responsibilities, enhance access to childcare, and foster workplace equality**. These efforts will empower women, driving both social progress and economic development.

3. India's 1st Cancer Multi-Omics Data Portal Launched by ICGA

1. In September 2024, the **Indian Cancer Genome Atlas (ICGA)** has launched the **country's 1st comprehensive cancer multi-omics data portal**, providing open access to valuable data from Indian cancer patients.
 - a. This platform is set to transform cancer research and treatment in India.
2. **Shift Towards Indian-Specific Data:** Historically, cancer treatments in India have relied on Western data sets. However, molecular differences in cancers among Indian patients necessitate region-specific treatment protocols.
3. ICGA aims to create **Indian-centric datasets** that allow researchers and clinicians to develop **personalized treatments**.

About Indian Cancer Genome Atlas (ICGA)

1. The **Indian Cancer Genome Atlas (ICGA)** is a national initiative aimed at **understanding the genomic, transcriptomic, and proteomic profiles of cancers in India**.
 - a. **Transcriptomics** is the study of an organism's transcriptome, which is the collection of all RNA molecules present in a cell, tissue, or organ at a given time.
 - b. A **proteomic profile** is a collection of information about the proteins produced in a person's tissues, blood, or other bodily fluids at a specific time. It's also known as a protein signature or protein expression profile.
2. It operates as a **not-for-profit organization** registered under **Section 8 of the Companies Act, 2013** and known as the **ICGA Foundation**.



- 
3. **Public-private-philanthropic partnership:** The ICGA collaborates with various sectors to advance cancer research.
 4. **Expert involvement:** Over 50 clinicians, researchers, and data analysts contribute to its mission.
 5. **Focus on cancer diagnosis and treatment:** The initiative strives to improve cancer diagnosis and treatment for Indian patients.
 6. **Global contribution:** ICGA's work enhances global knowledge of cancer biology.
 7. **Current Projects:**
 - a. The foundation's 1st major effort is **multi-omics profiling of breast cancer**.
 - b. Plans are in place to expand research to other **types of cancer** in the future.

Key Features of the ICGA Multi-Omics Portal

1. **India's First Cancer Multi-Omics Portal:** This platform offers detailed data for **breast cancer patients**, including DNA, RNA, and protein profiles, linked with clinical outcomes.
2. **cBioPortal-Based Platform:** Built on the globally recognized cBioPortal, it ensures **integration with international cancer research efforts**.
3. **Initial Dataset from 50 Patients:** The portal contains Deoxyribonucleic Acid (DNA), Ribonucleic Acid (RNA), and protein profiles of 50 Indian breast cancer patients, with plans to expand to over 500 in the next year.
4. **Free Access Under PRIDE Guidelines:** Following India's **PRIDE** (Promotion of Research and Innovation through Data Exchange) guidelines, this portal **promotes ethical and responsible data-sharing**, freely accessible to researchers.
5. **Precision Oncology for Indian Patients:** This initiative is a significant step toward **personalized cancer treatments** tailored to the specific needs of Indian patients.
6. **Call for Global Collaboration:** ICGA invites researchers from around the world to contribute, expanding the platform and **promoting collaborative cancer research**.

About Multi-omics

Multi-omics is a comprehensive approach to studying biology by integrating data from different "omics" fields. This method helps us understand biological processes more fully. The key fields include:

- a. **Genomics:** Study of the entire set of DNA, including all genes.
- b. **Transcriptomics:** Analysis of the complete set of RNA molecules expressed in a cell, tissue, or organism.
- c. **Epigenomics:** Focus on epigenetic changes that influence gene expression without altering the DNA sequence.
- d. **Proteomics:** Examination of proteins, including their interactions, functions, structures, and roles in cellular activities.

Global and Indian Cancer Trends in 2022

1. Globally, in 2022 there were around **20 million new cancer cases** and **9.7 million deaths**. In 2022, the most common cancers were the trachea, bronchus, and lung, followed by breast, and then colorectum.
2. Globally, the risk of developing cancer before age **75** is **20%**, while the risk of dying from cancer is **9.6%**.
3. **In India:**
 - a. **New cancer cases:** Above **14 million new cases** recorded with a incidence rate of **100.4 per 100,000 people**. By **2025**, this number is expected to **rise by 12.8%**.
 - b. **Risk:** In India, the risk of developing cancer before age **75** is **10.6%**, and the risk of dying from cancer by this age is **7.2%**.
 - c. **Gender distribution:** A slight majority of the cases were among females.
 - d. **Breast cancer:** The most common, accounting for **13.6%** of all cancers and over **26%** in women.
 - e. **Other significant cancers:** **Lip and oral cavity cancers, cervical and uterine cancers, lung cancer, and esophageal cancers** were prevalent.



4. **Cancer Prevention:** According to the **World Health Organization (WHO)**, **30-50% of cancers** can be prevented by avoiding risk factors and applying prevention strategies.

a. The **World Cancer Research Fund** advises:

- Changing **dietary habits**
- Reducing **alcohol consumption**
- Increasing **physical activity**
- Maintaining a **healthy body weight**

5. **Cancer Data Collection in India**

- a. Collecting cancer data in India is difficult as it is not classified as a **nationally notable disease**.
- b. Data is collected from **hospitals, vital statistics departments, and diagnostic laboratories**, which often causes **delays** in reporting and publishing the latest statistics.

4. Ten Years of Swachh Bharat Mission (SBM):

1. Swachh Bharat Diwas 2024 marked the 10th anniversary of the Swachh Bharat Mission with the theme “Swabhav Swachhata, Sanskaar Swachhata.”
2. This theme highlighted the importance of public participation, comprehensive cleanliness drives, and the welfare of sanitation workers.

About the Swachh Bharat Mission

1. Launched on October 2nd, 2014, coinciding with Mahatma Gandhi’s birthday, SBM is a national movement aimed at achieving universal sanitation coverage.
2. **Structure:** SBM comprises two sub-missions:
 - a. Swachh Bharat Mission (Gramin) under the Ministry of Jal Shakti, currently in Phase-II (2020-21 to 2024-25).
 - b. Swachh Bharat Mission (Urban) under the Ministry of Housing and Urban Affairs (MoHUA), with SBM-U 2.0 Phase II running until 2026.
3. **Approach:** SBM adopts a “Whole of Government Approach,” ensuring collaboration across different sectors and levels of government.

Transformative Impact of SBM

SBM has led to significant improvements in Water, Sanitation, and Hygiene (WASH) across India, resulting in positive health, social, and environmental outcomes:

1. Improved Health:

- a. Reduced infant and under-five mortality rates.
- b. Fewer diarrheal deaths.
- c. Lower prevalence of wasting among children.

2. Social Progress:

- a. Increased student enrollment, particularly among girls.
- b. Enhanced safety for women.
- c. Reduced health expenditure for families.
- d. Created livelihood opportunities.

3. Environmental Benefits:

- a. Reduced groundwater contamination.

Reasons for SBM’s Success

SBM’s success can be attributed to its comprehensive approach, which combines:

1. **Toilet construction:** Providing access to sanitation facilities.
2. **Community engagement:** Fostering a sense of ownership and responsibility.
3. **IEC (Information, Education and Communication):** Driving behavioral change through awareness campaigns.
4. **Capacity building:** Training government officials, frontline workers, and communities.
5. **Waste management systems:** Establishing systems for waste segregation, collection, transportation, and disposal.
6. **Technology integration:** Utilizing mobile and web applications for citizen engagement and monitoring.
7. **Progress assessment:** Conducting the National Annual Rural Sanitation Survey (NARSS) to track progress.



Key Achievements of the Swachh Bharat Mission

This data highlights the significant achievements of the Swachh Bharat Mission (SBM) in both rural and urban areas:

SBM (Gramin - Rural)

1. **Household Toilets:** 11 crore household toilets constructed.
2. **Open Defecation Free (ODF) Plus Villages:** 5.5 lakh villages declared ODF Plus, signifying sustained sanitation improvements.

SBM-U (Urban)

1. **Household Latrines:** 63 lakh household latrines constructed.
2. **Water+ Cities:** 64 cities declared Water+, indicating adequate access to safe water and sanitation.
3. **ODF++ Cities:** 1429 cities declared ODF++, representing comprehensive sanitation with improved waste management practices.

Challenges and the Way Forward

Despite significant progress, SBM faces challenges that need to be addressed:

1. **Behavioral change:** Ensuring consistent use of toilets and promoting proper sanitation practices.
2. **Infrastructure gaps:** Addressing inadequate waste management systems and sewage treatment plants.
3. **Water availability:** Ensuring access to water in toilets to prevent open defecation.
4. **Funding constraints:** Securing adequate and consistent funding for SBM initiatives.
5. **Solid and Liquid Waste Management (SLWM):** Improving waste segregation and finding viable solutions for dispersed populations.

To overcome these challenges, the following measures are crucial:

1. **Strengthened IEC interventions:** Promoting behavioral change through extensive awareness campaigns.
2. **Quality infrastructure:** Ensuring the use of standard quality raw materials in toilet construction.
3. **Prioritizing water availability:** Providing water access alongside toilet construction.

4. **Reliable data collection:** Continuously monitoring and evaluating progress through accurate data collection.
5. **Efficient fund utilization:** Optimizing budget allocation and ensuring effective utilization of funds.
6. **State-specific action plans:** Addressing unique challenges faced by different states.

5. State Food Safety Index 2023-24

1. India's federal system of government works through the central authority and states for better administration on various subjects. Both the **national government and the states** have the power to make laws, and both have autonomy on certain subjects.
2. **Food is one of the important subject** on the **concurrent list** of the Indian federal system. The Food Safety and Standards Authority of India (FSSAI) is entrusted with ensuring public health by promoting food safety. The Food Authority at the centre and the State Food Safety Authorities jointly share this responsibility as delineated by the **Food Safety and Standards Act 2006**.
3. **To incentivize States and Union Territories (UTs)** to enhance food safety within their regions, FSSAI announces the **State Food Safety Index (SFSI) annually** for each financial year **since 2019**.

Context

1. In September 2024, **6th State Food Safety Index (SFSI) 2023-2024**, released by the **Food Safety and Standards Authority of India (FSSAI)**, evaluates the food safety performance of Indian states and union territories.
2. All 36 states and union territories have been evaluated and ranked in **SFSI index 2023-2024**.

SFSI's key parameters

The **SFSI 2023-24** ranks States and Union Territories (UTs) based on their performance across **following key parameters**:

- i. **Food Testing - Infrastructure and Surveillance (36%):** It carries the highest weight at 36%, emphasizing the importance of having robust food testing facilities and surveillance measures in place.



- ii. **Compliance (28%):** It is the second-most significant category with 28% of the total score.
- iii. **Improvement in Rank of States/UTs from State Food Safety Index 2022-2023 (10%):** Improvement over previous rankings is given a 10% weight, incentivizing states to enhance their food safety performance over time.
- iv. **Human Resources and Institutional Data (9%):** It accounts for 9% of the total score, highlighting the role of staffing and institutional data in food safety management.
- v. **Consumer Empowerment and FSSAI Initiatives (9%):** carrying 9% weight, focuses on efforts to educate and empower consumers regarding food safety and the initiatives undertaken by the Food Safety and Standards Authority of India (FSSAI).
- vi. **Training and Capacity Building (8%):** Carrying at 8%, indicating a need for continuous development of skilled personnel and capacity-building activities to maintain food safety standards.

- 7. **Fifteen states scored zero on improvement** in Rank of states from State Food Safety 2022-2023.
- 8. **Rajasthan** scored the most in Human resource and Institutional data .



Top 5 and Bottom 5 States/UTs based on total scores					
Top 5 Performer			Bottom 5 Performer		
Rank	States/UTs	Total Score	Rank	Total Score	
1.	Kerala	73.75	36.	Lakshadweep	9.5
2.	Tamil Nadu	67	35.	Mizoram	11
3.	Jammu & Kashmir	64.25	34.	Puducherry	12.5
4.	Gujarat	61.75	33.	Dadra NH & DD	19
5.	Punjab	56.75	32.	Ladakh	20.25

Central Initiatives for Food Safety	
1.	The Eat Right campaign and the Pradhan Mantri Garib Kalyan Yojana were highlighted as important national initiatives.
2.	Promotion of millets was also emphasized as part of efforts to ensure safe and nutritious food.

Key Findings of State Food Safety Index 2024

- 1. **Kerala** topped the Index again and achieved over **100% of its inspection targets** for FY24. It also:
 - a. Strengthened its **food-testing infrastructure**.
 - b. **Organized special drives** to increase the number of **license-holders** and **registrations**.
- 2. Kerala , Tamil Nadu , West Bengal, Haryana and Arunachal Pradesh scored the maximum score of 17 in compliance .
- 3. **Nagaland** received special recognition for making notable progress in improving its food safety ecosystem compared to the previous year.
- 4. **Goa** popular tourist destination for foreign and domestic tourist scored low in compliance just marginally better than Jharkhand which scored the lowest .
- 5. **Kerala , Jammu and Kashmir and West Bengal** scored the most in improvement in SFSI.
- 6. **No Union territory except Andaman and Nicobar** showed any improvement in SFSI from previous year.

Key Challenges

- 1. **Training and Capacity Building:** Proper training and capacity building for all stakeholders, from **farmers to food handlers and regulators**, is crucial.
 - a. It improves food safety standards and ensures the overall quality of the food supply chain.
- 2. **Enhancing Food Testing Capabilities:** Establishing advanced **food testing facilities** is essential for effective monitoring and enforcement of food safety standards.
 - a. Early detection of contaminants plays a key role in this process.
- 3. **Modernization and Integration of Infrastructure:** Modernizing **state-of-the-art infrastructure** for rapid detection of food contaminants, along with mechanisms for fast analysis, data sharing, and decision-making, is necessary.
 - a. This will positively impact ongoing national efforts for food system transformation.
- 4. **Strengthening Infrastructure:** Increasing investment in better infrastructure, such as **modern storage, transportation networks, and cold chain systems**, is particularly needed for handling perishable goods.



5. **Consumer Awareness and Education:** Educating consumers about proper **food handling, storage, and preparation** is critical to ensuring they can make informed choices

World Food Safety Day 2024

Observed: 7 June (Every year)

Theme for 2024: Food safety: prepare for the unexpected

Food Safety and Standards Authority of India (FSSAI)

1. The Food Safety and Standards Authority of India (FSSAI) is a **statutory body** established under the **Food Safety and Standards Act, 2006**. It functions as an **independent authority** with special status.
2. **Nodal Ministry:** The **Ministry of Health & Family Welfare** is the administrative ministry responsible for implementing the FSS Act.
3. **Headed By:** FSSAI is led by a **non-executive chairperson** appointed by the **Central Government**, typically someone who holds or has held a position not below the rank of Secretary.
4. **Objective:** To create a single reference point for all matters related to food safety and standards by transitioning from multi-level, multi-departmental control to a single line of command.
5. **Functions**
 - a. Framing regulations for food safety standards
 - b. Laying down guidelines for accrediting food testing laboratories
 - c. Providing scientific advice and technical support to the Central Government
 - d. Contributing to international technical standards on food safety
 - e. Collecting and analysing data on food consumption, contamination, and emerging risks
 - f. Spreading information and raising awareness about food safety and nutrition in India

6. Port Blair Renamed as Sri Vijaya Puram

1. In September 2024, Port Blair, the capital of the Andaman and Nicobar Islands, was officially renamed Sri Vijaya Puram.
2. This decision, aimed at freeing the nation from colonial imprints, reflects the significance of the Andaman and Nicobar Islands in India's freedom struggle.
3. While "Port Blair" carries a colonial legacy, "**Sri Vijaya Puram**" symbolizes India's victory in its fight for independence and acknowledges the islands' unique role in this struggle.

Sri Vijaya Puram and its Cultural Significance

1. **Srivijaya Empire:** Srivijaya was an ancient empire based in Sumatra that held influence across Southeast Asia. It played a key role in the expansion of Buddhism in the region. The empire declined around the 11th century AD following a series of naval raids by the Cholas on its ports.
2. **Chola Invasion:** The Chola invasion of Srivijaya marked a significant event in Indian history, contrasting with India's generally peaceful relations with Southeast Asian states that had been under its cultural influence for centuries.

Nationalist Movement at Cellular Jail

The Cellular Jail in Port Blair stands as a national memorial and museum, narrating the stories of incarcerated freedom fighters and their struggles.

1. **Saga of Heroic Freedom Struggle:** Prominent freedom fighters like Batukeshwar Dutt, Barindra Kumar Ghosh, Sachindra Nath Sanyal, and Vinayak Damodar Savarkar were imprisoned in the Cellular Jail. Vinayak Damodar Savarkar penned "The Indian War of Independence, 1857" within its walls.
 - In 1933, Mahavir Singh, Mohan Kishore Namadas, and Mohit Moitra led a hunger strike to protest against the harsh living conditions in the jail.



2. **Assassination of Lord Mayo:** Sher Ali assassinated Viceroy Lord Mayo in 1872 at the Cellular Jail and was subsequently hanged at the Viper Gallows.
3. **Hoisting of the National Tricolor by Netaji:** During World War II, the Japanese occupied Port Blair and handed it over to the Provisional Indian Government under Subhas Chandra Bose.
 - On December 30, 1943, Netaji Subhas Chandra Bose hoisted the Indian tricolor for the first time on Indian soil near the Cellular Jail, proclaiming India's independence.

Historical Background of Port Blair

1. **Origin of the Name:** Port Blair was named after Archibald Blair, a British naval surveyor and lieutenant in the Bombay Marine, who conducted the first detailed survey of the Andaman Islands in 1771.
2. **Archibald Blair's Career:** Blair's service spanned various regions, including India, Iran, and Arabia. His expertise in navigation and surveying led him to undertake important assignments, including the exploration of the Andaman Islands.

Chola Dynasty Connection

In the 11th century, Rajendra Chola I of the Chola dynasty led a naval expedition against the Sri Vijaya empire. This campaign, which included the conquest of parts of the Andaman and Nicobar Islands, highlights the strategic importance of the region in controlling trade and projecting power in Southeast Asia.

Andaman and Nicobar Islands:

The islands are home to Particularly Vulnerable Tribal Groups (PVTGs) such as the Great Andamanese, Onge, Jarawa, Sentinelese, Nicobarese, and Shompen.

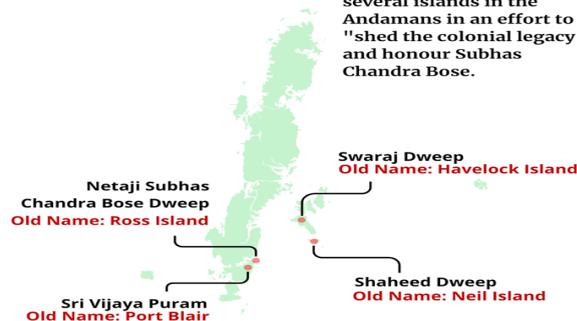
1. Evolution of its Name:

- a. **Handuman:** Malays, who captured aboriginals for the slave trade, named the islands "Handuman" after the Indian deity Hanuman.
- b. **Ma-Nakkavaram:** The Chola Dynasty, using the islands as a strategic naval base, called them "Ma-Nakkavaram," meaning "open land" in Tamil.

- c. **Necuverann:** 13th-century Venetian explorer Marco Polo referred to the islands as "Necuverann."
- d. **A&N Islands:** This name was given during British rule, who also used one island as a naval base.

Renaming Islands in Andaman

In recent years, the Narendra Modi government has renamed several islands in the Andamans in an effort to "shed the colonial legacy" and honour Subhas Chandra Bose.



2. **Renaming of Ross, Neil, and Havelock Islands:** In 2018, three islands were renamed: Ross Island to Netaji Subhas Chandra Bose Dweep, Neil Island to Shaheed Dweep, and Havelock Island to Swaraj Dweep.

7. Odisha Famine Of 1866

This famine severely affected people of Odisha (Killing Around one-third of Odisha's total population).

1. **Also known as 'Na-Anka Famine'** because it occurred during Gajapati Divyasinghadeva's ninth regnal year.
2. **Causes:** Carelessness of British administrators, natural and economic disasters.
3. Occurred during tenure of Thomas Edward Ravenshaw (Commissioner of Odisha division).
4. **Aftermath:**
 - a. Puri Canal or Coast Canal connecting Hooghly River (West Bengal) to River Matai (Odisha) was built after
5. **Famine.**
 - a. Thomas Edward Ravenshaw established number of **vernacular schools** in rural areas with an **emphasis on Odia language**, converted Cuttack Zilla School into **Ravenshaw College**.



8. The Mankidia Tribes of Odisha

The Mankidia are a Particularly Vulnerable Tribal Group (PVTG) residing in the state of Odisha, India. Their traditional way of life is deeply connected to the forest, and they have been granted habitat rights under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.

Key Characteristics:

- Semi-Nomadic:** The Mankidia are a semi-nomadic people, often considered a section of the larger Birhor tribe.
- Hunter-Gatherers:** They are renowned for their exceptional skills in hunting monkeys and trapping birds and small animals.
- Unique Dwellings:** Their homes are distinctive dome-shaped huts made of leaves, called “Kumbha.”
- Distinct Language:** The Mankidia speak their own language, which belongs to the Munda branch of the Austro-Asiatic language family.

This combination of unique cultural practices, language, and dependence on the forest makes them a particularly vulnerable group deserving of recognition and protection.

9. US returns 297 antiquities to India

On the occasion of the visit of PM Narendra Modi to the United States, the US side facilitated the return of **297 antiquities** that had been stolen or trafficked from India.

Antiquities Covering 4000 Years of Indian History

- Timeline:** The artifacts span nearly **4000 years**, dating from **2000 BCE to 1900 CE**, and originate from various regions across India.
- Materials and Regions:** Most items are **terracotta from Eastern India**, with others crafted in **stone, metal, wood, and ivory** from different parts of the country.

3. Notable Artifacts:

- Apsara in Sandstone:** From Central India, 10-11th century CE.
- Jain Tirthankar in Bronze:** Central India, 15-16th century CE.
- Terracotta Vase:** Eastern India, 3-4th century CE.
- Stone Sculpture:** South India, 1st century BCE-1st century CE.
- Lord Ganesh in Bronze:** South India, 17-18th century CE.
- Standing Lord Buddha in Sandstone:** North India, 15-16th century CE.
- Lord Vishnu in Bronze:** Eastern India, 17-18th century CE.
- Anthropomorphic Figure in Copper:** North India, 2000-1800 BCE.
- Lord Krishna in Bronze:** South India, 17-18th century CE.
- Lord Karthikeya in Granite:** South India, 13-14th century CE.

4. Past Returns:

Since 2016, the U.S. has facilitated the repatriation of **578 cultural artifacts** to India:

- June 2016:** 10 artifacts returned during PM Modi’s visit.
- September 2021:** 157 artifacts repatriated.
- June 2022:** Another 105 artifacts returned.

Significance: This is the **largest return of cultural artifacts to India by any country**, reflecting a strong commitment to preserving India’s cultural heritage.



H. ETHICS

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1. Gender-Based Violence (GBV) and Feminist Ethics

The rising cases of violence against women, like the terrible incident at **RG Kar Medical College**, have made **workplace safety** a big concern in India. This highlights the urgent need to understand the **ethical issues** related to **GBV** and find ways to create safe workspaces.

Ethical Issues from Workplace Violence

GBV creates many ethical problems that affect our basic values and human dignity:

- 1. Disrespecting Basic Human Value:** GBV disrespects the basic value and worth of a person. It violates their **human rights**, especially the right to **equal opportunity** at work. This raises ethical concerns about treating everyone fairly and protecting them from harm.
- 2. Right to Safety:** Everyone has the right to live without fear of violence. GBV takes away this right and causes physical, emotional, and mental harm.
- 3. Unequal Power:** GBV often happens because of unequal power between genders, especially in societies where men hold more power. This is ethically wrong because it allows **gender biases** to continue and puts women at risk.
- 4. Discrimination:** GBV reinforces discrimination against women and other marginalized genders, limiting their freedom and opportunities. This creates **inequality** and raises ethical questions about fairness and justice.
- 5. Blaming the Victim:** Instead of holding the person who committed the violence **accountable**, victims are often blamed for what happened to them. This is ethically wrong and shows how society fails to support and protect victims.
- 6. Social Stigma:** Victims of GBV often face social isolation, which adds to their trauma and makes them hesitant to seek help. This ethical dilemma shows the conflict between society's judgment and the victim's right to justice and recovery.
- 7. Problems with the Law:** Many victims struggle to get justice because of financial problems, social biases, or lack of resources. This raises the ethical question of whether everyone has equal access to justice, regardless of their gender.
- 8. Re-traumatizing Victims:** The legal system can sometimes **retraumatize victims** through insensitive questioning or delays in justice. This raises concerns about how legal procedures can cause more harm than good.
- 9. Cost to Society:** GBV not only affects individuals but also has wider impacts on communities and the economy. It limits opportunities for women and holds back social progress.
- 10. Our Responsibility:** When society or institutions ignore GBV, they indirectly contribute to the problem. This raises ethical concerns about our responsibility to prevent and address **gender-based violence**.
- 11. Duty to Care:** Governments and society have a duty to provide **support services** like shelters, legal aid, and counseling to survivors of GBV. Failure to do so raises ethical questions about our priorities as a society.

Creating a Safe Workplace

To make workplaces safe and respectful, we need to tackle the root causes of GBV and promote **equality**:

- 1. Respect and Equality:** Workplaces should foster a culture of respect for all individuals, regardless of gender. This can be done through training on **gender sensitivity**, promoting ethical behaviour, and encouraging employees to speak up against disrespectful behaviour.
- 2. Changing Stereotypes:** We need to challenge the traditional roles and stereotypes that contribute to GBV. This can be done through awareness programs, support systems for victims, and promoting **diversity** in the workplace.



- 3. Strong Policies Against GBV:** Organizations should have clear policies to prevent and address GBV. This includes easy ways to report violence, holding people accountable, and having leaders who understand gender issues.
- 4. Stronger Laws:** We need strong laws that clearly define and punish all forms of GBV. This includes making it mandatory to report GBV incidents and ensuring victims have access to legal help.

The Way Forward

Dealing with GBV requires a combined effort from everyone:

- Working Together:** Governments, organizations, and communities need to work together to address GBV through campaigns, partnerships, and shared initiatives.
- Empowering Women:** We need to empower women and marginalized groups by providing them with leadership training, ensuring **equal pay**, and creating **support programs**.
- Open Communication:** We need to encourage open conversations about GBV in workplaces to raise awareness and break the silence around this issue.
- Better Laws:** We need to ensure that people who commit GBV are punished, and victims get justice. This includes laws like the **Aparajita bill** in West Bengal and a potential central law to protect doctors.
- Changing Deeply Rooted Ideas:** We need to address the deep-rooted cultural and social norms that lead to violence through education and awareness programs.
- Using Technology:** We can use technology to provide safe ways for employees to report harassment and access support.

Understanding GBV through Different Feminist Views

Gender-based violence (GBV) is a pervasive issue, and feminist perspectives offer crucial insights into its causes and potential solutions.

How different feminist viewpoints approach GBV in the workplace:

1. Liberal Feminism

- Focus:** Legal equality and workplace reforms.
- Key Arguments:**
 - Women deserve equal legal protection from harassment and violence.
 - Stronger laws, policies, and complaint mechanisms are needed.
 - Workplace environments should be gender-sensitive.
- Examples:** Advocate for stricter anti-harassment legislation, improved reporting procedures, and training to prevent and address workplace harassment.

2. Radical Feminism

- Focus:** Patriarchy as the root cause of GBV.
- Key Arguments:**
 - Workplace violence is a manifestation of male power and control.
 - GBV reinforces societal structures that prioritize male dominance.
 - Catharine MacKinnon's work:** Highlights how sexual harassment is a systemic issue, not just individual misconduct, used to maintain male power.
- Examples:** Support efforts to challenge and dismantle patriarchal systems in the workplace and broader society.

3. Marxist and Socialist Feminism

- Focus:** The intersection of class and gender oppression.
- Key Arguments:**
 - GBV in the workplace is linked to capitalist exploitation of women.
 - Women's oppression is rooted in both their gender and their economic position.
- Examples:** Advocate for policies that address both gender inequality and economic disparities, such as equal pay, affordable childcare, and worker protections.



4. Cultural Feminism

- a. **Focus:** Valuing feminine qualities and challenging male-dominated work cultures.
- b. **Key Arguments:**
 - i. GBV stems from the devaluation of feminine traits in the workplace.
 - ii. A more inclusive and nurturing work environment is needed.
- c. **Examples:** Promote leadership styles that value empathy and collaboration, challenge aggressive or hyper-competitive workplace norms.

2. Organ Donation: A Moral Duty in a World of Shortage

1. Organ transplants can change lives, but they come with many **ethical challenges**. The worldwide **shortage** of organs makes these issues even more important.
2. In India, a positive development was reported in the **National Organ and Tissue Transplant Organisation (NOTTO)** annual report for **2023-24**, showing over **1,000 deceased organ donors** in one year for the first time, breaking previous records.
3. This discussion explores the ethical concerns surrounding organ donation.
4. It **looks at the balance between respecting life, personal choice, and community responsibilities**. Key issues include the value of the **human body** and how to fairly share limited resources.

Ethical Concerns About Organ Donation and Transplantation

1. **Presumed Consent vs. Explicit Consent:** One important question is whether a deceased person agreed or refused to donate their organs while alive. **Deciding without knowing their wishes raises ethical problems**. Countries like **Spain** have increased donation rates with presumed consent, but this can challenge personal choice and state involvement in private matters.
2. **Medical Ethics:** While many kidney donors live healthy lives, some research shows that some face health risks, like infections. **This situation conflicts with the medical principle of “primum non nocere”**

(**first, do no harm**), since one person may suffer to help another who is already sick.

3. **Organ Trafficking:** Organ donation can be affected by illegal practices, such as **organ trafficking**. The **World Health Organization** has raised alarms about the rise of commercial trafficking, especially involving living donors who are not related to the recipients.
4. **Emotional Pressure:** **Family connections can influence a donor’s decision to give an organ**. Donors often feel a **sense of obligation**, which can lead to ethical issues related to pressure and coercion.
5. **Fairness in Allocation:** Ensuring that organs are distributed fairly is a major ethical issue. Differences based on **wealth, social status, or location can raise serious questions about fairness in access to transplants**.
6. **Brain Death and Organ Retrieval:** The concept of **brain death, crucial for organ donation, is not universally accepted**. It’s essential to get informed and voluntary consent from donors or their families. Lack of transparency in this process can violate individual rights.
7. **Xenotransplantation:** Research into using **animal organs** for human transplants raises new ethical questions. Concerns about **animal rights** and the morality of using animals for human benefit must be addressed.

Indian Organ Donation Day (IODD):

1. **Indian Organ Donation Day is observed every year on August 3rd since 2010.**
2. It aims to raise awareness about brain death and organ donation.
3. In 2024, the “**Angdaan Jan Jagrukta Abhiyaan**” was launched to support these efforts, making **July Organ Donation Month**.
4. Through organ donation, one person can save up to **eight lives** and improve many more by donating tissues.

Perspectives on Organ Donation and Transplantation

1. **Religious Perspectives**
 - a. **Hinduism:** Values the body but does not prohibit organ donation. Selfless giving (**Daan**) is seen as compassionate.





- b. **Islam:** While traditional views stress body sanctity, many scholars support organ donation as a charitable act aligned with saving lives.
- c. **Christianity:** Encourages organ donation as a loving act, despite some concerns. It's seen as a noble way to extend life.
- d. **Buddhism:** Supports organ donation as an act of compassion without specific prohibitions, viewing it as a personal decision.

2. Philosophical Perspectives

- a. **Virtue Ethics:** Focuses on kindness and generosity, viewing organ donation as a good act.
- b. **Libertarianism:** Emphasizes individual freedom and control over one's body, supporting voluntary donation but opposing coercion.

Conclusion

The ethical issues surrounding organ donation are complex and important for solving the global organ shortage. Balancing presumed and explicit consent, medical ethics, and the challenges of trafficking are vital. Fairness in allocation and openness in the processes must be prioritized to maintain trust in the system.

As anthropologist **Margaret Mead** said, “Never doubt that a small group of thoughtful, committed citizens can change the world.” Addressing these ethical challenges with care and empathy is essential for creating a fairer and more effective organ donation system. By aligning practices with moral principles and community needs, we can better tackle the critical shortage of organs and improve lives.

3. Upholding Ethical Standards in Public Service Recruitment Process

The **integrity** of the **public service recruitment process** is essential for maintaining **trust** in governance. Recent controversies about the misuse of **reservation quotas** reveal important **ethical issues** that threaten the core values of **fairness**, **integrity**, and **accountability** in civil services.

Ethical Concerns in the Recruitment Process

1. **Integrity** is fundamental to good governance. It requires public servants to act **honestly** and uphold the **credibility** of the recruitment process. Misusing reservation quotas undermines this integrity, leading to **unqualified individuals** in important civil service roles.
2. Civil servants hold significant **power** and **responsibility**. Allegations of **fraudulent claims** about reservation policies break this trust and reduce public confidence in government institutions. Upholding **ethical standards** is crucial for maintaining this trust, which is vital for effective governance.
3. **Fairness and Equality of Opportunity: Reservation policies** aim to give equal chances to historically **marginalized groups**. However, fraudulent claims harm fairness, depriving truly deserving candidates of their rightful opportunities. This undermines the ethical foundation of these policies.
4. **Institutional Values** : When recruitment officials engage in **unethical practices**, it raises concerns about the integrity of the **institutions** themselves. If those responsible for enforcing ethical standards act dishonestly, it reflects poorly on the whole system.
5. **Accountability** means that individuals and institutions must be responsible for their actions. The alleged manipulation of certificates highlights serious weaknesses in the accountability measures within recruitment processes, calling for stronger **oversight** and **transparent investigations**.
6. **Transparency** is key to maintaining public confidence in the recruitment process. The lack of effective checks on eligibility and reservations has led to lapses in transparency, showing the need for better monitoring systems.
7. **Virtue Ethics:** The misuse of reservation quotas reveals serious **character flaws** in those involved. **Virtue ethics**, which focuses on the importance of **moral character**, suggests that those who engage in such actions are not fit for public service.
8. **Ethical Frameworks:** Looking at this issue from a **rights-based perspective** highlights the violation of the rights of genuine candidates. Misusing reservation



benefits infringes on the rights of those who truly need equal opportunities and calls for stronger **legal protections**. From a **deontological viewpoint**, the actions of those who misuse reservation quotas are wrong, regardless of the outcomes. According to **Kantian ethics**, honesty and fairness are **moral duties** that must be upheld at all times, indicating that manipulating the system is unethical.

9. **Utilitarianism Approach: Utilitarianism** evaluates actions based on their overall impact on society. While misuse of reservations may provide immediate unfair advantages, the long-term effects on public trust and institutional integrity are harmful. Thus, the negative consequences outweigh any short-term benefits.
10. **Social Contract Theory:** According to **social contract theory**, civil servants have a responsibility to uphold **fairness** and **transparency** in their actions. Manipulating reservation policies breaks this agreement, challenging the legitimacy of governance and eroding public trust.
11. **Social Justice and Affirmative Action:** The misuse of reservations indicates a failure to meet the goals of **social justice**. Effective **affirmative action** should enhance the capabilities of marginalized groups, and ensuring that benefits truly reach those in need is essential for fairness.

Recommendations for Upholding Ethical Standards

1. **Implement Rigorous Checks and Balances:** Develop stricter **verification processes** for eligibility documents, using technology to cross-check submissions. Introduce multiple levels of verification by **independent authorities** to ensure fairness. Create **oversight committees** to monitor recruitment processes and address complaints about reservation misuse, ensuring accountability.
2. **Conduct Regular Audits:** Implement regular checks of the recruitment system to identify weaknesses and maintain public confidence through transparency. Encourage ethical behavior within public service institutions by recognizing and rewarding **integrity**. Include ethical training in career development for public servants.

3. **Strengthen Legal Frameworks:** Review and update laws to close gaps that allow misuse, ensuring quick legal action to deter unethical behavior. Reinforce **codes of ethics** for public servants and promote a **zero-tolerance policy** for unethical practices, ensuring everyone follows ethical guidelines. Involve civil society and advocacy groups in discussions about ethical governance, incorporating feedback to improve policies related to reservations.

Conclusion

Upholding ethical standards in public service recruitment is vital for maintaining **integrity, trust, and accountability**. By implementing reforms, enhancing transparency, and fostering a culture of ethics, we can restore public confidence and ensure that reservation policies effectively promote **social justice**. As **Michelle Obama** said, success must be earned “fair and square,” emphasizing the need for ethical conduct in all areas of public service. Ensuring that public servants adhere to high ethical standards will ultimately enhance the **credibility and effectiveness** of civil services in India.

4. The Ethics of Nuclear Weapons

1. The **2024 Nobel Peace Prize** was awarded to **Nihon Hidankyo**, a group representing survivors of the **Hiroshima and Nagasaki** nuclear bombings.
2. This has sparked new conversations about the **ethical issues** related to **nuclear weapons**. The devastating effects of these bombings and the ongoing threat of nuclear conflict raise important ethical questions.
3. While some argue that having **nuclear weapons helps prevent war, others believe that possessing such destructive power is inherently wrong**.
4. This debate is relevant not just for powerful countries **but also for nations like India, which faces its own nuclear challenges**.

Ethical Concerns About Nuclear Weapons

1. **Unethical Nature of Nuclear Weapons**
Nuclear weapons are often seen as **unethical because of their terrible effects**, including immediate destruction and long-term harm to people



and the environment. **The bombings of Hiroshima and Nagasaki resulted in massive loss of life and ongoing suffering.** This shows that nuclear weapons violate ethical standards by causing suffering to innocent people for generations.

2. Humanitarian Consequences

The **humanitarian cost of nuclear weapons is immense. The immediate impact of these bombs killed tens of thousands of people,** and many more suffered long-term health issues. This reality raises serious moral questions about using such weapons.

3. Violation of Just War Theory

Critics argue that nuclear weapons go against the principles of **Just War Theory**, which guides when it is right to go to war and how to conduct it ethically. This theory includes two main parts:

- **Jus ad Bellum (When to Go to War):** Conditions for justly declaring war, like having a good reason and being a last resort.
- **Jus in Bello (Conduct in War):** Guidelines for how to fight fairly, ensuring that combatants are distinguished from civilians. **Nuclear weapons fail these tests, as they kill indiscriminately and cause excessive damage.**

4. Preemptive Strikes

The idea of using **nuclear weapons first if a country believes it might be attacked raises serious ethical questions.** How can a nation be sure it is under real threat? **Striking first out of fear could lead to innocent deaths, making it an unethical choice.**

Ethical Aspects of Nuclear Deterrence

1. **Morality of Threats:** Using the threat of nuclear weapons to prevent war raises ethical concerns. **Is it right to threaten destruction that could kill millions, even if the goal is to maintain peace?** The underlying willingness to cause such harm can be seen as morally wrong.
2. **Mutually Assured Destruction (MAD):** MAD suggests that any nuclear conflict would lead to total destruction, **questioning whether it is ethical to rely on such a system for global security.** This raises concerns about basing peace on the potential for mass annihilation.

3. Accidental Launches:

The risk of accidental or unauthorized **nuclear launches due to mistakes brings up ethical concerns. Who is responsible for the consequences of these errors?** This uncertainty challenges the moral justification for keeping nuclear weapons.

4. Security and Global Stability:

While nuclear deterrence may offer security to some countries, it can create instability for others. **This raises ethical questions about the fairness of allowing nuclear-armed states to dictate global security,** leaving non-nuclear states vulnerable.

5. Arms Race and Disarmament:

Many believe that countries have an ethical responsibility to work towards **disarmament** to avoid disaster. **The arms race driven by deterrence policies increases the threat of nuclear conflict.** There is a moral obligation to promote peace rather than escalate tensions.

6. Deterrence vs. Peaceful Coexistence:

Relying on nuclear deterrence for peace creates ethical dilemmas. **Is it sustainable to maintain peace through fear?** Many believe that diplomatic efforts and cooperation are better, more ethical approaches to ensuring global stability.

Philosophical Perspectives on Nuclear Governance

1. **Cosmopolitanism:** **Cosmopolitanism believes that we all belong to one global community, regardless of nationality.** From this view, nuclear weapons threaten everyone, not just certain countries. This perspective argues that we have a moral duty to eliminate nuclear weapons to protect all human life.
2. **Liberal Internationalism:** This view supports the idea that global security can be achieved through cooperation. It backs treaties like the **Nuclear Non-Proliferation Treaty (NPT)**, which limits the spread of nuclear weapons.
3. **Constructivism:** Constructivism looks at **how global norms shape attitudes toward nuclear weapons. In the past, having nuclear weapons was seen as a sign of strength.** Now, many view disarmament as a moral goal, showing how changing views can lead to better governance.

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4. **Global Justice Theories:** These theories argue for fairness in international relations. **Nuclear weapons create inequality, as some nations can protect themselves while others remain vulnerable.** Global justice calls for disarmament so that no country can dominate others through the threat of nuclear attack.

India's Nuclear Doctrine Policy

1. **Nuclear Doctrine Policy:** India's Nuclear Doctrine focuses on maintaining a **credible minimum deterrent** while emphasizing restraint. This was first officially **outlined in 1999 and adopted in 2003, aiming to balance security** with ethical responsibility.
2. **No First Use Policy:** India's **No First Use** policy states that nuclear weapons will only be used in retaliation, positioning the country as a responsible nuclear power. However, critics argue that this stance still carries moral risks.
3. **Credible Minimum Deterrence:** This doctrine ensures India maintains a minimal yet **effective nuclear arsenal**, balancing deterrence with the commitment to prevent conflict.
4. **Commitment to Global Disarmament:** India supports global nuclear disarmament through international forums and advocates for a phased reduction of arsenals, emphasizing that disarmament is the ultimate ethical solution.
5. **Perspectives on India's Nuclear Policy**
 - a. **Mahatma Gandhi:** Gandhi opposed nuclear weapons, viewing them as incompatible with **non-violence and human dignity**.
 - b. **K. Subrahmanyam:** He advocated for **nuclear deterrence as a necessary evil for national security while supporting the No First Use policy**.
 - c. **Homi Bhabha:** He justified nuclear development by emphasizing the need for India to protect itself in a world with other nuclear powers.

Way ahead:

1. **Strengthen International Legal Frameworks:** Create legally binding agreements for reducing nuclear arsenals, with clear timelines and accountability measures.
2. **Establish a Global Nuclear Restraint Regime:** Countries should work together to prioritize transparency and trust-building to reduce nuclear tensions.
3. **Promote Ethical Leadership:** Nuclear-armed nations should lead by encouraging diplomacy over deterrence, promoting global discussions on the humanitarian effects of nuclear weapons.
4. **Invest in Risk Reduction Technologies:** Develop safeguards to minimize accidental nuclear war, including better communication systems and regular risk assessments.
5. **Engage Civil Society:** Involve the public in discussions about nuclear disarmament, encouraging grassroots movements and NGO participation in treaty negotiations.
6. **Conduct Humanitarian Impact Assessments:** Study the long-term effects of nuclear weapons use to build a stronger ethical case for disarmament.
7. **Create Nuclear-Free Zones:** Advocate for more regions free of nuclear weapons, especially in areas with high tensions.
8. **Increase Accountability and Transparency:** Establish verification mechanisms to monitor compliance with disarmament agreements.

Conclusion

From an ethical standpoint, nuclear weapons violate principles of **human dignity** and **justice**. While they may serve as deterrents, the risk of mass destruction and potential loss of innocent lives make their existence morally indefensible. A secure future must prioritize disarmament based on cooperation and respect for life rather than fear and destruction. Achieving a world free from nuclear threats is not just a strategic need but an ethical obligation for humanity.





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I. ESSAY

The Self-Centered Nature of Social Media: How It Shapes Our Interactions

I Think There Should be Regulations on Social Media to the Degree that It Negatively Affects the Public Good.

-Elon Musk

Elon Musk's quote about needing **rules** for social media highlights an important issue: these platforms can harm the **common good**. **In our daily lives, social media plays a huge role, changing how we communicate, get information, and present ourselves.** While sites like Facebook, Instagram, Twitter, and TikTok have many benefits, they often encourage a culture of **self-promotion** and **selfishness**.

The Nature of Self-Presentation: Social media lets users carefully create and control their **online identities**. This process, called **impression management**, allows people to show off their **achievements**, looks, and **social status**. However, the desire to appear perfect often leads to actions that focus more on personal gain than on real connections. For example, users may share edited photos or highlight only their successes to get **attention**, rather than engaging authentically with others.

Validation and the Feedback Loop: The way social media platforms are set up—with **likes**, comments, and shares—creates a cycle of seeking **approval**. Users often chase likes and compliments, which can become **addictive**. This desire for **attention** can make users focus more on gaining recognition than on having meaningful conversations. The need for validation can take away from forming true relationships and connections, leading to a **shallow** online experience.

Research shows that heavy social media use is linked to increased narcissism. People who are **narcissistic are drawn to social media because it allows them to admire themselves publicly**. On the other hand, those with low self-esteem might use social media to seek approval from others, often resulting in feelings of **jealousy** and **comparison**. This situation promotes a focus on oneself and deepens the selfish nature of social media.

Cultural Influences on Individualism: In modern **Western cultures**, especially those influenced by **neoliberal** ideas, individual success is highly valued. Social media amplifies this trend by giving users a platform to share their **accomplishments** with a large audience. This focus on personal success can overshadow **community values**, leading to a mindset where self-promotion and personal interests come first.

Social media also creates an environment where constant **comparison** is common. Users frequently see idealized images of others' lives, which can cause feelings of inadequacy and envy. **This competitive atmosphere encourages individuals to try to outdo each other rather than build genuine connections.** As a result, a culture that values personal success over community well-being develops.

The Rise of Influencer Culture: The rise of **influencer culture** shows **how personal branding has become a product**. Influencers create personal brands and make money from their online presence, blurring the lines between personal expression and business interests. This trend highlights the selfish nature of social media, where individual identity is marketed and consumed. The quest for **followers, sponsorships, and money** can overshadow genuine self-expression and community involvement.

The Attention Economy: Social media platforms function in an **attention economy**, where user engagement translates into advertising dollars. **The way these platforms are built encourages behaviors that keep users online longer.** Algorithms often promote sensational or controversial content to keep users engaged, which encourages attention-seeking behaviors. This profit-driven approach aligns with and supports the selfish tendencies of users, leading to more superficial interactions.

Data Monetization and Surveillance Capitalism: Another aspect of social media's selfish nature is the collection and selling of user **data**, often called **surveillance capitalism**. Platforms track and analyze users' online activities to deliver targeted ads and



personalized content. This practice prioritizes profit over user **privacy**, reflecting a broader trend of self-interest in the industry. The use of personal data for profit highlights the selfish motivations behind social media platforms.

Consumerism and Materialism: Social media heavily influences **buying habits** and **lifestyle choices**, often promoting a culture of **materialism** and the desire for status. Influencers and targeted ads shape what users want, encouraging them to buy products that fit their online personas. This focus on consumerism reinforces the selfish nature of social media interactions, as users prioritize personal desires over community needs.

Quality of Relationships: The focus on self-presentation and seeking validation can harm the quality of **relationships** formed on social media. True connections require **vulnerability** and **empathy**—qualities that can be lost in the performative nature of online interactions. Users may care more about maintaining a perfect image than having genuine conversations, leading to **shallow relationships** and less emotional closeness.

Mental Health Consequences: The constant search for validation and comparison can negatively affect **mental health**. Studies link **excessive social media use to increased anxiety, depression, and loneliness**. The **pressure to fit idealized standards** and the fear of **missing out (FOMO)** add to these issues, showing the mental health costs of a selfish social media culture. Users may feel they need to keep up with others' perfect lives, leading to ongoing dissatisfaction.

Polarization and Division: Social media algorithms often promote **divisive content**, creating **echo chambers** where users see only information that confirms their existing beliefs. This can lead to a divided society, where constructive conversation and understanding are lost to self-serving behaviors. The selfish tendencies of users, combined with the profit-driven motives of social media platforms, increase societal divisions and make it harder to solve problems together.

Educating Users: To address these issues, it's crucial to educate users about the effects of social media. **Digital literacy programs** can teach critical thinking and ethical online behavior, helping people use social media more mindfully. By raising awareness about how social media impacts self-image and relationships, users can make better choices about their online activities.

Role of Social Media Companies: Social media companies also have a significant responsibility to address the selfishness present in their platforms. Designing **ethical social media** environments that prioritize user well-being and real connections can help reduce the negative effects of selfish behaviors. This might include adding features that encourage positive interactions and limit excessive use.

Promoting Community Engagement: Encouraging **community involvement** can help shift the focus from individualism to shared values on social media. Campaigns that motivate users to support social causes and engage in meaningful discussions can foster a sense of togetherness. By using social media for the common good, users can help counterbalance its selfish tendencies.

Successful examples of community-driven initiatives include the “Selfie With Daughter” campaign in India, which aimed to promote **gender equality** by encouraging people to share photos with their daughters. The **“Swachh Bharat Abhiyan” (Clean India) campaign also mobilized many citizens for cleanliness drives**, showing how social media can inspire collective action. The **“Digital India” initiative used social media to raise awareness about digital literacy**, emphasizing its potential for positive change.

In conclusion, **social media is a complex tool that reflects and amplifies the behaviors of its users. While it has many advantages, it often promotes self-promotion and individualism.** Understanding the psychological, social, and economic factors that contribute to the selfish nature of social media shows the need for a more thoughtful and ethical approach to its use. By promoting digital literacy, **creating user-friendly platforms, and encouraging community initiatives**, we can harness the positive aspects of social media while reducing its selfish nature. If we work together to create a more connected and caring online environment, social media can become a tool that **not only connects people but also strengthens communities and promotes collective well-being.**

As PM Narendra Modi said, **“Social media is reducing social barriers. It connects people on the strength of human values, not identities.”**





J. SCHEME

1. NPS Vatsalya Scheme: A Pension Plan for Minors

The National Pension System Vatsalya (NPS Vatsalya) scheme is a government-backed pension plan designed specifically for minors (children under 18 years old). This scheme aims to encourage financial planning and savings from a young age, ensuring a secure future for children.

Key Features of NPS Vatsalya:

- Eligibility:** Open to all citizens of India under the age of 18.
- Maturity:** Upon reaching 18 years of age, the minor can seamlessly transition the NPS Vatsalya account into a regular NPS account.
- Regulation:** The Pension Fund Regulatory and Development Authority (PFRDA) oversees and regulates the NPS Vatsalya scheme.
- Objective:** To instill the habit of saving, enabling long-term financial security and a dignified life during retirement.
- Contributions:**
 - Minimum annual contribution: ₹1,000
 - No maximum contribution limit.
- Investment Choices:** PFRDA offers a range of investment options for subscribers, including government securities, corporate bonds, and equity.

Benefits of NPS Vatsalya:

- Early Start to Savings:** Starting early allows the invested funds more time to grow, potentially leading to a larger retirement corpus.
- Disciplined Savings:** The scheme encourages regular contributions, developing a habit of saving from a young age.
- Flexibility:** Subscribers can choose from various investment options based on their risk appetite.
- Government Regulated:** The scheme is regulated by PFRDA, ensuring transparency and security.

How to Enroll:

Parents or guardians can open an NPS Vatsalya account on behalf of a minor child. Enrollment can be done online or offline through authorized Points of Presence (POPs).

Conclusion

The NPS Vatsalya scheme is a valuable tool for securing the financial future of children. By starting early, parents and guardians can help their children develop a strong foundation for a financially secure retirement.

2. Reset Programme

- On National Sports Day (NSD), the government launched the **Retired Sportsperson Empowerment Training (RESET) Programme**.
- National Sports Day (NSD) 2024** was celebrated on **29th August 2024** on the birth anniversary of **Major Dhyan Chand** to promote **sports and physical fitness** in India through various events and activities.

What are the Key Facts About NSD?

- About:** It is a special **occasion dedicated** to marking the **spirit of sports** in India.
 - It aims to inspire individuals of all ages to participate in **physical activities**, cultivate and promote a sports culture, and honour the achievements of athletes.
- Significance of National Sports Day:** It recognises the achievements of Indian athletes, celebrating their contributions to the **nation's pride and international stature**.
 - The government uses this day as a platform to launch various sports **schemes**, such as the **Khelo India movement** in 2018.
 - The President of India presents prestigious sports awards, one of them being, the **Major Dhyan Chand Khel Ratna Award**.



About RESET Programme:

- Aim:** To empower retired sports persons by empowering them with the necessary knowledge and skills and making them more employable.
- Eligibility:** Retired athletes aged 20-50 who have won international medals, participated in international events, or achieved national or state-level recognition.
- Structure:** It will be of two levels based on educational qualifications viz., Class 12th and above and Class 11th and below.
- Lead Institute to Implement the Programme:** Lakshmbai National Institute of Physical Education (LNIPE), Gwalior.

3. 5 years of Pradhan Mantri Kisan Maandhan Yojana**In September 2024, Pradhan Mantri Kisan Maandhan Yojana (PM-KMY) completed 5 successful years.**

- The Pradhan Mantri Kisan Maandhan Yojana (PM-KMY) was launched on September 12, 2019, to provide social security to Small and Marginal Farmers (SMFs) in India.
- It is a voluntary and contributory pension scheme aimed at providing a safety net for farmers in their old age.
- Eligible farmers receive a fixed monthly pension of ₹3,000 after reaching the age of 60.
- Farmers must contribute to the pension fund throughout their working years, and the Central Government matches these contributions.

Successful Implementation

- Under PM-KMY, farmers can enroll by paying a monthly subscription, which varies based on their age:
 - Farmers aged 18 to 40 contribute between ₹55 and ₹200 monthly until they turn 60.
- Upon reaching 60, they receive the pension, contingent upon meeting the scheme's exclusion criteria.

- The Life Insurance Corporation (LIC) manages the pension fund, while registration is facilitated through Common Service Centres (CSCs) and State Governments.
- Eligibility extends to farmers with cultivable land holdings of up to 2 hectares who were recorded in state/UT land records as of August 1, 2019.

Participation Statistics

- As of August 6, 2024, 23.38 lakh farmers have enrolled in the scheme.
- Key states with significant registrations include:
 - Bihar:** Over 3.4 lakh registrations
 - Jharkhand:** Over 2.5 lakh registrations
 - Uttar Pradesh:** Over 2.5 lakh registrations
 - Chhattisgarh:** Over 2 lakh registrations
 - Odisha:** Over 1.5 lakh registrations
- These figures show the scheme's reach and the increasing awareness among farmers about PM-KMY.

Key Benefits of PM-KMY

- Minimum Assured Pension:** Each subscriber receives a guaranteed pension of ₹3,000 per month after age 60.
- Family Pension:** If a subscriber passes away while receiving the pension, their spouse is entitled to a family pension of ₹1,500 per month (50% of the subscriber's pension), provided the spouse is not already a beneficiary.
- PM-KISAN Benefit Integration:** Farmers can utilize their benefits from the PM-KISAN scheme to make voluntary contributions to PM-KMY by submitting an enrollment-cum-auto-debit-mandate form.
- This allows automatic deduction from their PM-KISAN credited bank account.
- Equal Contribution by Government:** The Central Government contributes an equal amount to the pension fund matching what the eligible farmer contributes.
- Monthly Contribution Structure:** Contributions range from ₹55 to ₹200, based on the farmer's age at enrollment, according to a specified contribution chart.



Enrollment Process

1. To enroll, farmers must:
 - a. Visit the nearest **Common Service Center (CSC)** or contact the **Nodal Officer (PM-Kisan)** designated by the State or UT Government.
 - b. Registration can also be done online via the official website pmkmy.gov.in.
2. Required information for registration includes:
 - a. **Farmer's/Spouse's name and date of birth**
 - b. **Bank account number**
 - c. **IFSC/MICR Code**
 - d. **Mobile Number**
 - e. **Aadhaar Number**

Rules of Leaving the Pension Scheme:

1. Early Exit (Less than 10 years)

If a subscriber leaves the scheme before 10 years, they'll receive:

- a. Their contributions back.
- b. Interest earned at the savings bank rate.

2. Exit After 10 Years (But Before Age 60)

If a subscriber leaves after 10 years but before turning 60, they'll receive:

1. Their contributions back.
2. Accumulated interest, whichever is higher:
 - a. Interest earned by the Pension Fund.
 - b. Interest at the savings bank rate.

3. Death of Subscriber During Contribution Period

If a subscriber dies during the contribution period, their spouse has two options:

1. **Continue the Scheme:** The spouse can keep contributing to the scheme.
2. **Exit the Scheme:** The spouse can withdraw the:
 - a. Subscriber's contributions.
 - b. Accumulated interest, whichever is higher:
 - i. Interest earned by the Pension Fund.
 - ii. Interest at the savings bank rate.

4. Death of Subscriber and Spouse

If both the subscriber and spouse die, the remaining funds in the scheme are returned to the Pension Fund itself.

In conclusion, The PM-KMY has successfully operated for five years, providing significant financial support and social security to SMFs. By securing a monthly pension for farmers in their retirement years, the scheme addresses crucial gaps in social security and enhances the overall quality of life for rural populations. This initiative recognizes the vital role of farmers as the country's primary food providers and contributes to their financial stability in the face of agricultural challenges.

4. Continuation of PM-AASHA

1. On **September 18, 2024**, the Union Cabinet, chaired by Prime Minister **Narendra Modi**, approved the continuation of the **Pradhan Mantri Annadata Aay SanraksHan Abhiyan (PM-AASHA)**.
2. This initiative aims to provide **remunerative prices to farmers** and control price volatility of essential commodities for consumers.
3. The **total financial outlay** for the PM-AASHA program is set at **₹35,000 crore** during the **15th Finance Commission Cycle**, which **extends up to 2025-26**.

Key Components of PM-AASHA

1. The government has integrated 2 key schemes:
 - a. **Price Support Scheme (PSS)**
 - b. **Price Stabilization Fund (PSF)**
2. This integration is designed to enhance efficiency and effectiveness in **servicing both farmers and consumers**.
3. The PM-AASHA will now include the following components:
 - a. **Price Support Scheme (PSS)**
 - b. **Price Stabilization Fund (PSF)**
 - c. **Price Deficit Payment Scheme (PDPS)**
 - d. **Market Intervention Scheme (MIS)**

Price Support Scheme (PSS):

1. From the **2024-25** season, procurement of notified pulses, oilseeds, and copra at the **Minimum Support Price (MSP)** will be based on **25%** of national production of these crops.
2. This is **expected to enable states to procure more crops at MSP**, preventing distress sales.

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3. Notably, there will be **100% procurement** of **Tur, Urad, and Masur** during the 2024-25 season, as previously decided.

Government Guarantees and Support

1. The government has renewed its guarantee for the procurement of notified **pulses, oilseeds, and copra at MSP, increasing it to ₹45,000 crore.**
2. This will facilitate more procurement by the **Department of Agriculture and Farmers Welfare (DA&FW)** from farmers, including those registered on the **eSamridhi** portal of **NAFED** and **eSamyukti** portal of **NCCF**.
3. This support aims to motivate farmers to **cultivate more pulses** and oilseeds, contributing to **self-sufficiency** and **reducing import dependence.**

Price Stabilization Fund (PSF)

1. The **extension of the PSF scheme** will **protect consumers from extreme price volatility in agricultural commodities** by maintaining strategic buffer stocks of pulses and onions.
2. This will **help discourage hoarding and speculation**, ensuring affordable prices for consumers.
3. The procurement of pulses at market prices **will also include pre-registered farmers on the eSamridhi and eSamyukti portals** whenever market prices exceed MSP.

Price Deficit Payment Scheme (PDPS)

1. To encourage states to implement PDPS for notified oilseeds, the coverage has been increased from **25% to 40%** of state production.
2. The implementation period for this scheme has been extended from **3 months to 4 months** to better support farmers.
3. Compensation for the difference between MSP and sale price will be covered by the Central Government, limited to **15% of MSP.**

Market Intervention Scheme (MIS)

1. The **MIS has been extended with changes** aimed at supporting farmers growing perishable horticulture crops.
2. Coverage under the MIS has been increased from **20% to 25%** of production.

3. A new option allows for **differential payments** directly to farmers' accounts instead of physical procurement.
4. For **TOP (Tomato, Onion, Potato)** crops, the government will cover transportation and storage expenses to help manage price differences between producing and consuming states during peak harvest.

Conclusion

The continuation and enhancement of PM-AASHA represents a significant commitment by the government to ensure that farmers receive fair prices for their produce while protecting consumers from price fluctuations. This comprehensive approach aims to strengthen the agricultural sector, improve farmer livelihoods, and promote food security in India.

5. Vigyan Dhara Scheme

Union Cabinet has approved continuation of three umbrella schemes, into a unified scheme 'Vigyan Dhara' to enhance India's R&D ecosystem.

About Vigyan Dhara

1. **Nodal Ministry:** Ministry of Science and Technology
2. **Type:** Central Sector Scheme
3. **Tenure:** 2021-22 to 2025-26 (15th Finance Commission period)
4. **Key Objective:** To promote science and technology (S&T) capacity building, research, innovation, and technology development, ultimately strengthening the nation's Science, Technology, and Innovation (STI) ecosystem.

Potential Benefits

1. Develops a critical human resource pool to bolster the S&T landscape.
2. Expands the country's R&D base, increasing the Full-Time Equivalent (FTE) researcher count.
3. Enhances the participation of women in S&T to achieve gender parity.

Primary Components

Vigyan Dhara comprises three core components:

1. **Science and Technology Institutional and Human Capacity Building:** This component focuses on:
 - a. Strengthening existing scientific institutions.



- b. Establishing advanced research laboratories in academic institutions.
- c. Supporting faculty development and student research.
- d. Promoting international collaborations.

2. **Research and Development:** This component supports research activities in various fields, including:
 - a. Basic research with access to international research facilities.
 - b. Translational research to bridge the gap between research and commercialization.
 - c. Collaborative research with international partners.
3. **Innovation, Technology Development, and Deployment:** This component fosters innovation and new technologies through:
 - a. Support for startups and entrepreneurs.
 - b. Technology transfer and commercialization.
 - c. Development of indigenous technologies.

6. Electric cars excluded from PM E-DRIVE scheme

The **PM Electric Drive Revolution in Innovative Vehicle Enhancement (PM E-DRIVE) Scheme** excludes electric cars from direct subsidies, relying instead on lower GST and other measures to support the electric vehicle (EV) sector.

Overview of the PM E-DRIVE Scheme

1. **Financial Outlay:** ₹10,900 crore over two years, replacing the previous FAME II scheme.
2. **Scope:**
 - a. Provides fiscal incentives for:
 - i. 25 lakh electric two-wheelers
 - ii. 3 lakh electric three-wheelers
 - iii. 14,000 electric buses
 - b. Electric cars are not eligible for any subsidies.
3. **Additional Provisions:**
 - a. Establishment of public charging stations.
 - b. Modernization of testing agencies for green mobility technologies.

Background: The FAME Scheme

1. **FAME Policy:** Launched in 2015 to reduce vehicular emissions and promote sustainable transport under the National Electric Mobility Mission Plan.

2. Key Phases:

- a. **FAME I (2015-2019):** Focused on incentives for electric and hybrid vehicles, along with charging infrastructure.
- b. **FAME II (2019-2024):** Expanded funding to USD 1.19 billion, emphasizing public transport and emission reduction.

Key Facts About the Promotion of Electric Cars

1. Impact of Exclusion:

- Sales of electric cars declined by 9% from April to August 2024 compared to the months before FAME II ended.

2. Charging Infrastructure:

- Approximately 25,000 public charging stations for 46 lakh registered EVs, leading to a high ratio of 184 EVs per charging station.

Supporting Measures

1. **Production Linked Incentive (PLI) Schemes:** Aim to support the EV sector through incentives for auto components and advanced battery technology, which could lower production costs.
2. **Lower GST:** Electric cars benefit from a 5% GST, significantly lower than rates for hybrid and internal combustion engine vehicles (28% and 49%, respectively).

Current Context and Industry Response

1. The PM E-DRIVE scheme emphasizes support for two- and three-wheelers and buses, explicitly omitting electric cars. **This aligns with government views that current measures (lower GST, localization schemes, and charging station funding) are sufficient.**
2. The Minister of Road Transport and Highways indicated that subsidies are no longer necessary due to declining battery costs and economies of scale.

Sales Trends Post-FAME II

1. Following the end of FAME II, electric car sales declined significantly, averaging 7,456 registrations per month from April to August 2024, with a low of 6,300 in August, reflecting a 10% decline compared to the previous year.
2. The absence of fiscal incentives indicates that the electric car market still requires support to become self-sustaining.



Challenges

1. Inadequate Charging Infrastructure: The current charging station ratio is significantly higher than in other countries promoting e-mobility, complicating consumer adoption.
2. Many public charging stations are not equipped for electric cars or do not provide fast charging.

Conclusion

The exclusion of electric cars from the PM E-DRIVE scheme raises concerns about future sales and market sustainability. Enhanced infrastructure and supportive measures are crucial for promoting electric mobility and achieving the government's goal of 30% electric vehicle penetration by 2030.

7. AB PM-JAY: Expansion for Senior Citizens

1. On **September 11, 2024**, the Union Cabinet approved health coverage for all senior citizens aged **70 years and above**, regardless of income, under the **Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB PM-JAY)**.
2. This initiative aims to benefit approximately **4.5 crore families**, impacting around **6 crore senior citizens** with a **₹5 lakh** health insurance cover available on a family basis.

Eligibility and Coverage Details:

1. **All senior citizens aged 70** and above, irrespective of their **socio-economic status**, will now be eligible for AB PM-JAY benefits.
2. Eligible seniors will receive a new distinct **AB PM-JAY card**.
3. Those in families already covered by AB PM-JAY will receive an **additional top-up cover** of up to **₹5 lakh per year** specifically for themselves, without sharing this amount with younger family members.
4. **Other senior citizens aged 70** and above will receive the standard cover of **up to ₹5 lakh per year** on a family basis.

Existing Health Insurance Integration

1. Seniors already benefiting from other public health insurance schemes, such as:
 - a. **Central Government Health Scheme (CGHS)**
 - b. **Ex-Servicemen Contributory Health Scheme (ECHS)**

c. **Ayushman Central Armed Police Force (CAPF)**

2. These **individuals can choose to continue with their existing plans or opt for AB PM-JAY**.
3. Seniors with private health insurance or those under the **Employees' State Insurance scheme** are also eligible for AB PM-JAY benefits.

About AB PM-JAY:

1. **AB PM-JAY** is recognized as the **world's largest publicly funded health assurance scheme**, providing a health cover of **₹5 lakh per family per year** for secondary and tertiary care hospitalization.
2. The scheme serves **55 crore individuals**, corresponding to **12.34 crore families**.
3. It covers all family members, regardless of age, and has facilitated **7.37 crore hospital admissions**, with **49%** of beneficiaries being women.
4. The financial benefit to the public under this scheme has exceeded **₹1 lakh crore**.

Background and Expansion of AB PM-JAY:

1. The **expansion to include senior citizens aged 70 and above** was **first announced by Prime Minister Modi in April 2024**.
2. Initially, the scheme covered **10.74 crore** poor and vulnerable families, representing the bottom **40%** of India's population.
3. In **January 2022**, the government revised the coverage to **12 crore families**, accounting for India's population growth.
4. The scheme was also extended to cover **37 lakh ASHAs/AWWs/AWHs** and their families for free healthcare benefits.
5. Now, with this new approval, AB PM-JAY will provide free healthcare coverage of **₹5 lakh** to all citizens aged **70 years and above** across India.

In Conclusion

This significant expansion of AB PM-JAY marks a crucial step in ensuring that senior citizens, particularly those aged 70 and above, have access to necessary healthcare services without the burden of financial constraints. This initiative reinforces the government's commitment to improving healthcare accessibility and outcomes for the elderly population, contributing to the overall welfare of society.

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8. Bio-RIDE Scheme for Biotechnology

- On **September 18, 2024**, the Union Cabinet, approved the continuation of **2 umbrella schemes** from the **Department of Biotechnology (DBT)**, merging them into a single initiative called **Biotechnology Research Innovation and Entrepreneurship Development (Bio-RIDE)**.
 - Department of Biotechnology (DBT), under the **Ministry of Science and Technology**, focuses on **promoting excellence** in biotechnology through innovation-driven research and entrepreneurship.
- Bio-RIDE combines 2 existing schemes
 - Biotechnology Research and Development (R&D)**
 - Industrial and Entrepreneurship Development (I&ED)**
- The scheme introduces a new component focusing on **Biomanufacturing and Biofoundry**.

Financial Outlay:

- The total proposed outlay for the implementation of the unified Bio-RIDE scheme is **₹9,197 crore** for the period of the **15th Finance Commission**, from **2021-22 to 2025-26**.

Objectives of Bio-RIDE:

- The Bio-RIDE scheme is designed to:
 - Promote innovation and promote **bio-entrepreneurship**.
 - Strengthen India's position as a **global leader in biomanufacturing** and biotechnology.
 - Accelerate research and product development.
 - Bridge the gap between academic research and industrial applications.

Strategic Importance

- The scheme aligns with the **Government of India's mission to harness bio-innovation** for addressing national and global challenges, including:
 - Healthcare**
 - Agriculture**
 - Environmental sustainability**
 - Clean energy**

Implementation Goals The Bio-RIDE scheme aims to achieve the following:

- Promote Bio-Entrepreneurship:** Nurture a supportive ecosystem for startups through seed funding, incubation support, and mentorship for bio-entrepreneurs.

- Advance Innovation:** Provide grants and incentives for research in fields such as synthetic biology, biopharmaceuticals, bioenergy, and bioplastics.
- Facilitate Industry-Academia Collaboration:** Encourage synergies between academic institutions, research organizations, and industry to expedite the commercialization of bio-based products.
- Encourage Sustainable Biomanufacturing:** Focus on promoting environmentally sustainable practices in line with India's green objectives.
- Support Researchers:** Offer extramural funding to research institutions, universities, and individual researchers in critical biotechnology areas like agriculture, healthcare, and environmental sustainability.
- Nurture Human Resources:** Develop and support students, young researchers, and scientists in biotechnology, contributing to capacity building and skill development.

Circular Bioeconomy and Green Goals

- The introduction of the **Biomanufacturing and Biofoundry** component aligns with the **Lifestyle for the Environment (LiFE)** initiative launched by the Prime Minister, aimed at **promoting environmentally friendly solutions to combat climate change**.
- This component aspires to utilize **biomanufacturing to create indigenous solutions that improve healthcare**, enhance agricultural productivity, and foster the growth of the bioeconomy.

Vision for the Future

- The DBT aims to make India a **US\$300 billion bioeconomy by 2030**, leveraging biotechnology as a precision tool for national development.
- The **Bio-RIDE scheme is important** for realizing the vision of **'Viksit Bharat 2047'**, emphasizing the role of biotechnology in societal well-being and industrial growth.

In conclusion

The Bio-RIDE scheme represents a strategic investment in biotechnology that aims to drive innovation, enhance entrepreneurship, and ensure India's competitive edge in the global biotechnology landscape. This initiative will not only support economic growth but also address critical challenges in health, agriculture, and sustainability.





PLACES IN NEWS



National

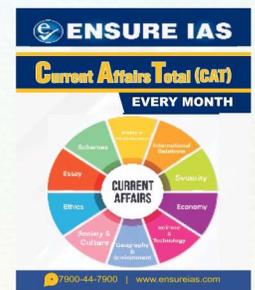
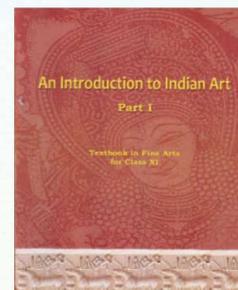
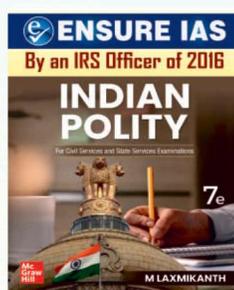
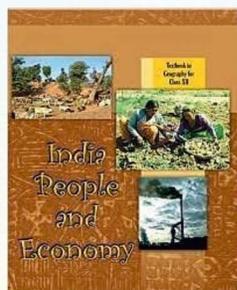
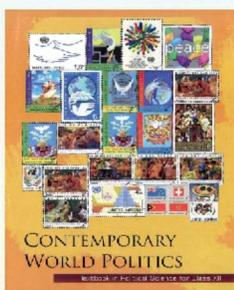
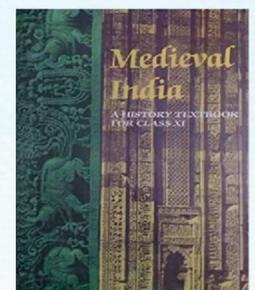
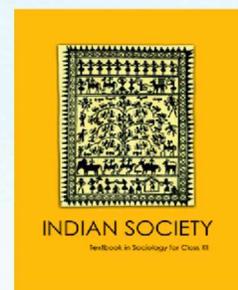
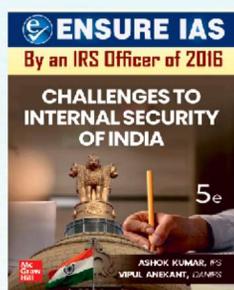
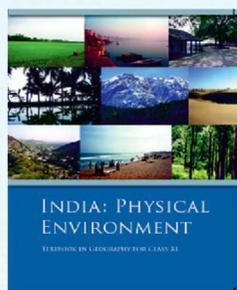
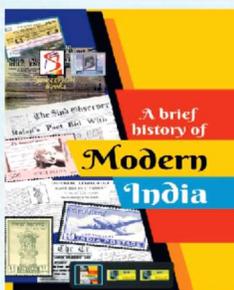
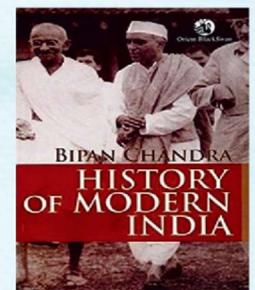
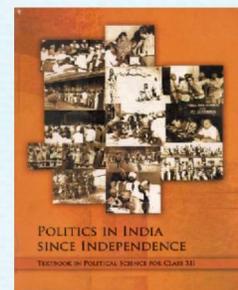
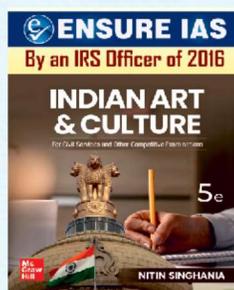
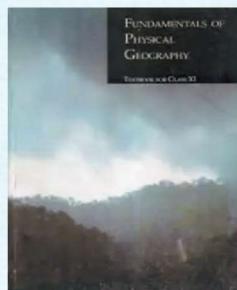
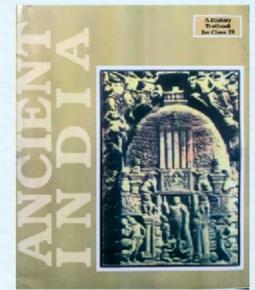
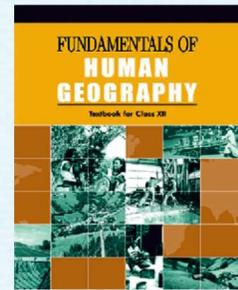
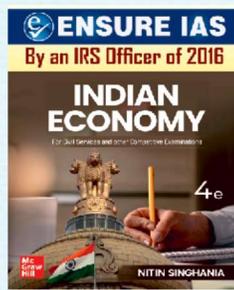
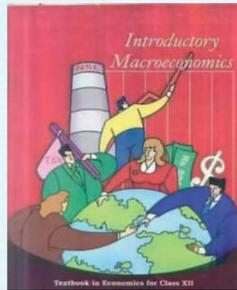
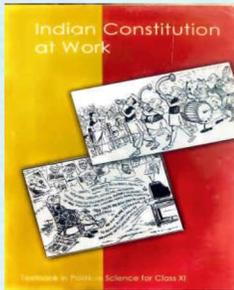
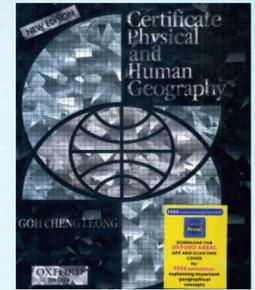
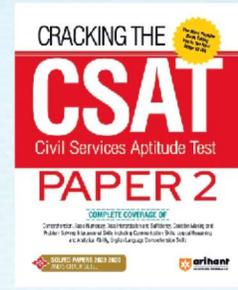
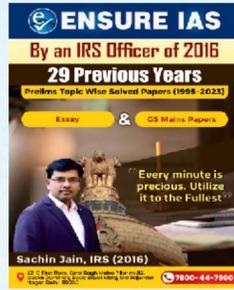
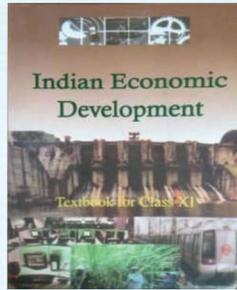
Bhadra Tiger Reserve (BTR), Karnataka	The BTR is a biodiversity hotspot in the Western Ghats. The reserve is facing a serious threat from an invasive weed called <i>Mikania micrantha</i> . This fast-growing vine smothers native vegetation, disrupting the food chain and habitat.
Tamil Nadu	Despite gaining global attention for extracting and selling snake venom , Irula tribe (a PVTG) are facing an uncertain future. The Irula are a Dravidian tribal group primarily residing in the Nilgiri Mountains and surrounding areas of Tamil Nadu, Kerala, and Karnataka .
Assam	<i>Phrynarachne decipiens</i> (also known as the bird-dropping spider) has been recorded for the first time in country from Assam's Kamrup district and Kokrajhar district. Previously known to exist only in Malaysia and Indonesia , this finding marks the first record of this species in India.
Manipur	Manipur's Tamenglong district imposes a ban on hunting Amur falcons . Amur falcons are small, long-distance migratory birds that breed in southeastern Siberia and Northern China.
Andaman and Nicobar	Galathea Bay , located in Great Nicobar Island, was recently declared India's 13th major port .

International

Mexico	By approving a judicial reform that allows citizens to elect judges at all levels, from local courts to the Supreme Court . This marks a world-first , aiming to increase judicial accountability and public trust.
Jordan	World Health Organization (WHO) declared Jordan the first country in the world to officially eliminate leprosy .
Nigeria	The collapse of the Alau Dam in Borno State, Nigeria, in September 2024 led to devastating floods in the region, particularly impacting Maiduguri, the state capital.
UAE	The United Arab Emirates has successfully completed the Arab world's first nuclear power plant. The Barakah Nuclear Energy Plant, located in the Al Dhafra region of Abu Dhabi, United Arab Emirates. The first reactor became operational in 2020, and the fourth and final reactor was completed in September 2024.
Thailand	Thailand has made history in Southeast Asia by becoming the first country in the region to legalize same-sex marriage . The law, endorsed by King Maha Vajiralongkorn in September 2024 , grants same-sex couples the same legal rights and protections as heterosexual couples, including marriage registration, inheritance, and adoption rights.



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