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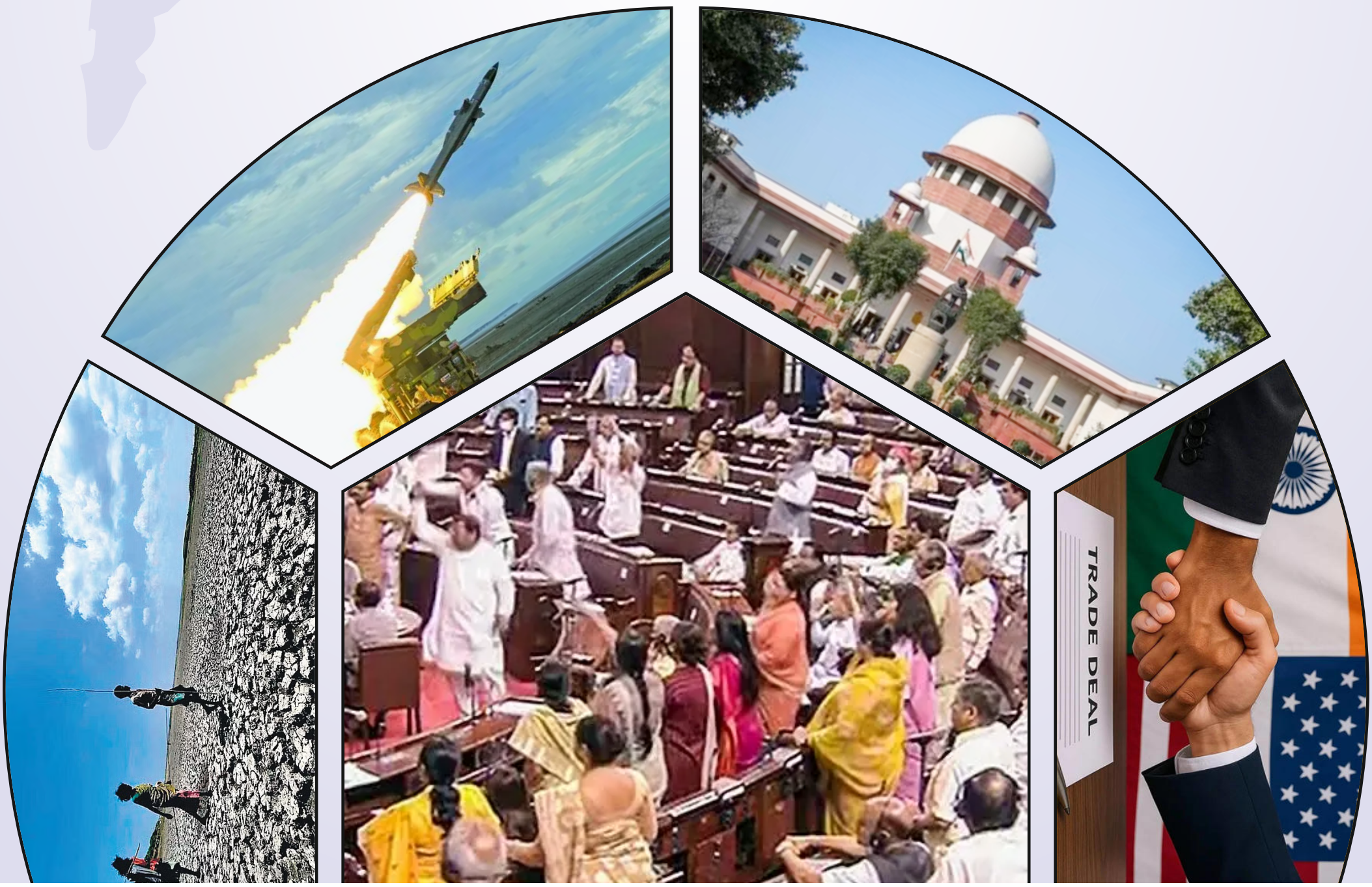
WEEKLY 14th July - 20th July (2025)



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WEEKLY UPDATES

DATE : 14th July- 20th July

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POLITY

Nominated Members of Rajya Sabha: Provisions & Appointments

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Constitutional Provisions and Governance: Nominated members of Rajya Sabha** and their role in **Indian democracy**.

✅ **GS Paper II – Polity and Governance**

- **Legislative Process:** Role of **Rajya Sabha** and the process of **nominating members** with expertise in various fields.

1. Introduction

- The **President of India** has recently nominated **four new members** to the **Rajya Sabha**, further enriching the chamber with **specialist knowledge** in key areas such as literature, science, art, and social service.

2. Constitutional Provision for Nominated Members

- **Article 80 of the Indian Constitution**:
  - According to **Article 80**, the **Rajya Sabha** (Council of States) shall have a **maximum of 238 elected members** and **12 nominated members**.
- **Article 80(3):**
  - The **President** of India has the authority to **nominate 12 members** to the **Rajya Sabha** who possess **special knowledge or experience** in **literature**, **science**, **art**, or **social service**.
  - The intention behind these nominations is to bring **expertise** from various fields to the **Rajya Sabha**, ensuring that the house represents a **diverse spectrum of knowledge** and **professional backgrounds**.

3. Role of the Ministry of Home Affairs (MHA)

- **MHA's Role**:
  - The **Ministry of Home Affairs (MHA)** is responsible for **handling the process of nominations** to the **Rajya Sabha** under the **Allocation of Business Rules, 1961**.
  - After the **President** makes the nominations, the **MHA notifies** these appointments, which adds **transparency**and ensures **compliance** with the prescribed rules.

4. Legal Precedent: Court Case on Nominations

- **2012 Delhi High Court Case**:
  - In the case of **Ram Gopal Singh Sisodia vs. Union of India** (2012), the **Delhi High Court** upheld the **nomination of Sachin Tendulkar** to the **Rajya Sabha** under **Article 80(3)**.
  - The court ruled in favor of the **President's discretion** in making nominations, asserting that the **President**has the authority to nominate individuals who contribute significantly to **Indian society** in **non-political fields**, such as **sports**, **arts**, and **social service**.
  - This judgment reinforced the importance of **diversifying** the Rajya Sabha by nominating members who bring **expertise** from various spheres, thereby contributing to more **informed debates** and **legislative decisions**.

5. Conclusion

- **Nominated members** play a **crucial role** in ensuring that the **Rajya Sabha** is not only a legislative body but also a **repository of expertise** in various **fields**. By **nominating** members with specialized knowledge, the Rajya Sabha can engage in **better-informed debates** and **policy discussions**, contributing to the overall **quality of governance**in India. The **Ministry of Home Affairs** handles the procedural aspects of these nominations, reflecting the **transparent** and **balanced nature** of India's **constitutional framework**.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the role and importance of **nominated members** in the **Rajya Sabha**. How do they contribute to the legislative process and the functioning of Parliament?

- **Q2.** Analyze the constitutional provisions regarding the **nomination of members** to the **Rajya Sabha** under **Article 80**. What is the role of the **President** and the **Ministry of Home Affairs** in the process?

General Studies Paper II (Governance):

- **Q3.** Critically examine the **2012 Delhi High Court case** that upheld the **nomination of Sachin Tendulkar** to the **Rajya Sabha**. What are the implications of the court's ruling on the process of **nominations**?

Protection of Civil Rights Act, 1955: Key Provisions and Recent Trends

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Social Justice and Legal Reforms:** The role of the **Protection of Civil Rights Act, 1955** in addressing **discrimination** and ensuring **equal rights** for marginalized communities.

✅ **GS Paper II – Social Justice**

- **Rights of Marginalized Groups:** The **Protection of Civil Rights Act, 1955** and its role in the **protection** of **Dalits**and ensuring the **abolition of untouchability**.

1. Introduction

- The **Protection of Civil Rights Act, 1955** (PCR Act) aims to combat **untouchability** in India, prescribing punishments for its practice and preaching. The **2022 Annual Report** by the Union Government highlights a **decline** in criminal cases registered under this Act.

2. About the Protection of Civil Rights Act, 1955

- **Origin and Name Change:**
  - Initially known as the **Untouchability (Offences) Act, 1955**, the Act was renamed as the **Protection of Civil Rights Act, 1955** through an amendment in **1976** to reflect its broader scope of protecting the **civil rights** of individuals against untouchability practices.
- **Objective:**
  - The **PCR Act** seeks to prescribe **punishment** for any form of **untouchability** practice or its **preaching**, a violation of the **fundamental rights** enshrined in the Constitution, particularly **Article 17** which abolished untouchability.
- **Manifestations of Untouchability:**
  - The Act defines **untouchability** in various forms, including **social** and **religious practices**, and addresses discriminatory practices that marginalize **Dalits** and other socially excluded communities.

3. Key Provisions of the PCR Act

- **Punishments for Violations:**
  - The Act lays down specific penalties for those found guilty of promoting or practicing untouchability in its various manifestations.
- **Annual Review Reports:**
  - The Act mandates an **annual review** report from the **States** and **Union Territories**, which includes information on **cases of untouchability**. This review covers details such as:
    - **Registration of cases**
    - **Pendency** of cases in police stations and courts
    - **Prosecution trends** and outcomes

4. Recent Trends and Decline in Cases

- The **2022 Annual Report** by the Union Government indicates that the number of **criminal cases** registered under the **Protection of Civil Rights Act, 1955** has declined in recent years.
- This decline raises questions about the **implementation and effectiveness** of the Act, especially in **rural** and **marginalized communities** where untouchability practices may still persist, albeit less overtly.

5. Conclusion:

- The **Protection of Civil Rights Act, 1955** remains a vital tool in **combating caste-based discrimination** in India. However, the recent **decline in cases** may point to **underreporting** or **improved social awareness**, but it also raises concerns about **effective enforcement** and **continuing social change** to ensure true equality for marginalized groups.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the objectives and key provisions of the **Protection of Civil Rights Act, 1955**. How effective has the Act been in addressing **untouchability** in India?
- **Q2.** Analyze the recent decline in the number of cases under the **Protection of Civil Rights Act, 1955**. What factors contribute to this trend, and what are the implications for **social justice**?

General Studies Paper II (Social Justice):

- **Q3.** The **Protection of Civil Rights Act, 1955** mandates an annual review of cases of **untouchability**. Discuss the importance of such reviews in ensuring **accountability** and **law enforcement**.

Centre Forms Panel for Polavaram-Banakacherla Water Dispute

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Inter-State Disputes and Governance:** The **Polavaram-Banakacherla Link Project** (PBLP) and the **role of the Centre** in resolving **inter-state water disputes** between **Telangana** and **Andhra Pradesh**.

✅ **GS Paper II – International Relations and Diplomacy**

- **Inter-State Agreements: Legal and constitutional mechanisms** for resolving disputes over **inter-state river water sharing**, as provided under the **ISRWD Act** and **Article 262**.

1. Introduction

- The **Centre** has decided to constitute a **high-level technical committee** to address concerns related to the **Polavaram-Banakacherla Link Project (PBLP)**, focusing on resolving **inter-state water disputes** between **Telangana** and **Andhra Pradesh**.

2. About the Polavaram-Banakacherla Link Project (PBLP)

- **Location and Overview:**
  - The **Polavaram Project** is situated on the **Godavari River** in **Polavaram Mandal**, Andhra Pradesh, and it aims to facilitate **irrigation**, **hydropower**, **drinking water supply**, and the **diversion of water** to the **Krishna River Basin**.
- **Objective of the Project:**
  - The primary goal of the project is to provide **relief to the drought-prone Rayalaseema region** by increasing irrigation capacity and enhancing water supply for **hydropower generation**.
- **Controversy:**
  - **Telangana** has raised concerns about **Andhra Pradesh's alleged violation** of the **inter-state river water sharing agreement** outlined in the **AP Reorganisation Act, 2014**, which led to the ongoing dispute over the project.

3. Mechanism for Inter-State River Water Disputes Resolution

- **Statutory Provisions:**
  - **Inter-State River Water Disputes (ISRWD) Act, 1956:**
    - This act allows the **Central Government** to form a **Water Disputes Tribunal** to resolve conflicts related to inter-state river water sharing, ensuring a legal framework for adjudicating such disputes.
  - **River Boards Act, 1956:**
    - This act enables the establishment of **River Boards** by the **Centre** to regulate and develop **inter-state rivers** and their **valleys**, which is key to managing water resources across state boundaries.
- **Constitutional Provisions:**
  - **Article 262:**
    - This article grants **Parliament the authority** to make laws for the adjudication of disputes concerning **inter-state river waters**, thus enabling the formation of water dispute tribunals.
  - **Exclusion of Court Jurisdiction:**
    - The article also **bars** the **Supreme Court** or any other court from exercising jurisdiction over any **water dispute** referred to a tribunal, ensuring that such disputes are resolved within the legal framework of the established tribunal.
  - **Entry 56 of the Union List:**
    - This entry gives the **Union Government** the responsibility to regulate and develop **inter-state rivers**and **river valleys**, which underscores the Centre's role in resolving inter-state water disputes.

4. Conclusion:

- The **Centre's formation of a high-level technical committee** to address the issues related to the **Polavaram-Banakacherla Link Project** reflects the importance of resolving **inter-state water disputes** in India through established legal and constitutional frameworks. The **ISRWD Act** and **Article 262** are key provisions that ensure effective adjudication of such conflicts, thereby helping to maintain **inter-state harmony** and ensuring **sustainable management** of **water resources**.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the role of the **Central Government** in resolving **inter-state river water disputes**. How does the **Polavaram-Banakacherla Link Project (PBLP)** highlight the challenges in managing water resources between **states**?
- **Q2.** Evaluate the significance of **Article 262** and the **Inter-State River Water Disputes Act, 1956** in resolving conflicts over **inter-state river waters**. How effective are these legal provisions in maintaining **equitable water distribution**?

General Studies Paper II – Governance:

- **Q3.** Analyze the **legal framework** established under the **River Boards Act, 1956**, and its role in regulating and developing **inter-state rivers**. How can this framework be strengthened to prevent future conflicts?

General Studies Paper III – Economic Development:

- **Q4.** What are the potential **economic impacts** of unresolved **inter-state water disputes** on **agriculture**, **hydropower generation**, and **regional development**? Discuss in the context of the **Polavaram project**.

Supreme Court Grants Equal Succession Rights to Tribal Women

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Constitutional Provisions and Gender Justice: Supreme Court verdict** on **tribal women's inheritance rights**and its alignment with **Articles 14**, **15**, and **38** of the **Constitution**.

✅ **GS Paper II – Polity**

- **Rights and Freedoms:** The court's interpretation of **tribal customs** vis-à-vis **gender equality** and **social justice**under the **Indian Constitution**.

1. Introduction

- The **Supreme Court of India** has delivered a landmark judgment in the case of **Ram Charan & Ors. vs. Sukhram & Ors.**, ruling that the exclusion of **tribal women** from **inheritance** based on **tribal customs** violates their constitutional rights to equality.

2. Key Highlights of the Judgment

- **Violation of Constitutional Rights:**
  - The Court held that the exclusion of **tribal women from inheritance** violates **Articles 14 (Right to Equality)** and **15 (Prohibition of discrimination on grounds of religion, race, caste, sex, or place of birth)** of the **Indian Constitution**.
- **Collective Ethos of the Constitution:**
  - The judgment draws upon **Articles 38 (Promotion of Welfare of People)** and **46 (Promotion of the Educational and Economic Interests of Scheduled Castes, Scheduled Tribes, and Other Weaker Sections)**, indicating the Constitution's commitment to ensuring **no discrimination against women**.
- **Hindu Succession Act, 1956:**
  - While the **Hindu Succession Act of 1956** does not directly apply to **Scheduled Tribes**, the Court clarified that this does not imply an automatic exclusion of **tribal women** from **succession**.
- **Principles of Justice, Equity, and Good Conscience:**
  - In the absence of a **proven customary bar** against inheritance for women, the Court emphasized that principles of **justice, equity, and good conscience** must guide the legal process.

Precedents Cited in the Judgment

Mst. Sarwango v. Mst. Urchamahin (2013)
In this case, the Court had directed inheritance rights to daughters based on the princides of equity and fairness, providing a precedent for female succession rights.

Tirith Kumar v. Daduram (2024)
The 2024 case upheld the inheritance rights of women in tribal property, reinforcing the Court's stance on gender justice.

3. Precedents Cited in the Judgment

- **Mst. Sarwango v. Mst. Urchamahin (2013):**
  - In this case, the Court had directed **inheritance rights to daughters** based on the principles of **equity** and fairness, providing a precedent for female succession rights.
- **Tirith Kumar v. Daduram (2024):**
  - The **2024** case upheld the **inheritance rights of women** in **tribal property**, reinforcing the Court's stance on **gender justice**.

4. Significance of the Verdict

- **Gender Justice in Tribal Communities:**
  - This judgment marks a significant step towards **gender justice** within **tribal communities**, and it challenges traditional **tribal customs** that may perpetuate **gender inequality**.
- **Shift from Cautious Stand:**
  - The ruling reflects a shift in the **Court's previous cautious approach** regarding **tribal women's inheritance rights**, signaling an evolving understanding of **gender equality** in **customary law**.

5. Custom as a Source of Law

- **Customs in Legal Framework:**
  - Customs are recognized as one of the **oldest sources of law**. While they regulate behavior, they must meet criteria of **reasonableness** and **morality** to be binding.
- **Challenges with Harmful Customs:**
  - Some customs, like **Sati**, **child marriage**, and **triple talaq**, have been harmful and discriminatory, and the Court has the authority to **challenge such practices** that suppress reason and perpetuate obscurantism.

6. Conclusion:

- The **Supreme Court's judgment** on **tribal women's inheritance rights** advances **gender justice**, providing a legal framework where **customs** that perpetuate **gender inequality** are subject to constitutional scrutiny. It highlights the importance of **equity** and **justice** in addressing **discriminatory practices** within tribal and traditional communities.

UPSC Mains Questions:

General Studies Paper II – Governance:

- **Q1.** Discuss the significance of the **Supreme Court's verdict** in **Ram Charan & Ors. vs. Sukhram & Ors.**, which grants **equal inheritance rights** to **tribal women**. How does this ruling align with the **constitutional principles** of **gender justice**?
- **Q2.** Evaluate the role of **customary law** in regulating inheritance practices within **tribal communities**. How can the **Indian legal system** balance respect for tradition with the promotion of **gender equality**?

General Studies Paper II – Polity:

- **Q3.** How do the **constitutional provisions**, especially **Articles 14**, **15**, **38**, and **46**, guide the **Supreme Court's interpretation** of **tribal women's rights** in the context of **inheritance**?

General Studies Paper II – Governance:

- **Q4.** Discuss the evolving role of the **Supreme Court** in shaping **gender equality** within **tribal communities**, particularly in relation to **inheritance rights** and **tribal customs**.

GOVERNANCE

Supreme Court on Fraternity & Self-Regulation in Social Media

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Freedom of Speech and Expression:** The **Supreme Court's observations** on **Article 19** and **self-regulation** in social media usage.

✅ **GS Paper II – Social Justice**

- **Social Media and Hate Speech:** The impact of **social media** on **citizens' rights** and the need for a balance between **freedom of speech** and **social harmony**.

✅ **GS Paper II – Governance**

- **Role of the State:** The state's responsibility in **regulating social media** and **curbing divisive tendencies** when **self-regulation fails**.

1. Introduction

- The **Supreme Court of India** has emphasized the importance of **fraternity** among citizens in reducing **hatred and divisive tendencies** on **social media** platforms.
- The Court called for **self-restraint** and **self-regulation** in the exercise of **freedom of speech**, especially in the context of **social media**.

2. Supreme Court's Observations

- **Abuse of Freedom of Speech:**
  - The Court noted that while expressing opinions is a fundamental right, doing so in a manner that leads to **hate speech**, **division**, or **litigation** constitutes an **abuse of freedom of speech**. This misuse is **overburdening law enforcement**.
- **Self-Regulation on Social Media:**
  - The Court stressed the need for **citizens to self-regulate** their social media conduct. However, if **self-regulation fails**, the **state** may have to intervene to prevent the **spread of divisive tendencies**.
- **Article 19 – Freedom of Speech and Expression:**
  - **Article 19** guarantees **freedom of speech** and **expression** to all citizens, but it also lays down reasonable restrictions for the **greater good** of society, including for **social harmony**.
  - The **horizontal application** of **fundamental rights** was highlighted by the Court in the **Kaushal Kishor Case (2023)**, recognizing that the **right to speech** applies **not only against the state** but also in interactions between **citizens**.

3. Impact of Social Media on Freedom of Speech

- **Positive Impacts:**
  - **Democratization of Voice:** Social media platforms provide a voice to **marginalized** and **underrepresented communities**, giving them a space to express opinions.
  - **Strengthening Participative Democracy:** Social media enables **citizens** to engage in **political** and **social discourse**, fostering a more inclusive democracy.
  - **Accountability and Transparency:** Citizens use social media to **hold authorities accountable** and raise issues of **public importance**, improving **government transparency**.
- **Negative Impacts:**
  - **Misinformation and Fake News:** Social media can spread **misinformation** and **fake news**, leading to **panic**, **riots**, and **defamation**.
  - **Hate Speech and Abuse: Online harassment**, **abuse**, and **trolling** have negative effects on individuals' **social** and **mental well-being**.
  - **Algorithmic Bias:** Social media **algorithms** can **limit exposure to diverse ideas**, while **amplifying** certain kinds of **content**, promoting **echo chambers**.

4. Conclusion:

- The **Supreme Court's emphasis** on fraternity and **self-regulation** highlights the delicate balance between **freedom of speech** and the need to **protect social harmony** in the digital space. If **self-regulation** does not work, the **state** may need to step in to ensure that **social media** remains a tool for **constructive discourse**, not division.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the **Supreme Court's observations** on **freedom of speech** and **social media regulation**. What is the role of **self-regulation** and **state intervention** in maintaining social harmony?
- **Q2.** How does the **horizontal application of fundamental rights** under **Article 19** impact the regulation of **hate speech** and **misinformation** on **social media**?

General Studies Paper II (Social Justice):

- **Q3.** Evaluate the **positive** and **negative impacts** of **social media** on **freedom of speech**. What measures can be adopted to minimize its harmful effects while promoting **democratic participation**?
- **Q4.** In light of the **Supreme Court's observations**, analyze the role of **technology** and **regulatory frameworks** in curbing **hate speech** and ensuring **accountability** on **social media** platforms.

Digital Colonialism: Protecting Sovereignty in the Digital Era

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Digital Sovereignty & Governance**: Impact of foreign digital infrastructure on national sovereignty.

✅ **GS Paper III – Technology, Economic Development, and Security**

- **Technology & Economic Growth**: Promoting digital self-reliance, data localization, and national security.

✅ **GS Paper II – International Relations**

- **Global Digital Influence**: Power dynamics between the **Global North** and **Global South** in the digital space.

1. Introduction

- **Vice President's Warning:** Sovereignty is increasingly at risk, not from military invasions, but from **dependence on foreign digital infrastructure**.
- The rise of **digital colonialism**, where control is exerted through **technology** and **data**, is especially concerning for the **Global South**.

2. What is Digital Colonialism?

Definition:

- **Digital Colonialism** refers to how **developed nations** and their **tech giants** dominate and control the digital economies of **developing nations**.
- It is a form of **neo-colonialism** where the **Global North** influences and profits from the **Global South**'s digital space.

Real-world Examples:

- **Google**, **Amazon**, and other US-based companies collect **data** from developing nations, reshaping industries, consumer behavior, and political trends.

3. Concerns Associated with Digital Colonialism:

- **Loss of Digital Sovereignty:**
  - Developed nations and tech companies set **global digital rules**, reducing autonomy of developing countries.
  - **Example: WhatsApp's threat** to exit **India** in 2024 over the **traceability clause** in the **2021 IT Rules**.
- **Cultural Imperialism:**
  - Social media and search engines push **values** and **worldviews** of developed countries, sidelining local cultures and traditions.
- **Surveillance Capitalism:**
  - Tech companies collect **vast user data** without consent, compromising **privacy** and violating **civil rights**.
  - Example: The widespread practice of **targeted advertising** and data harvesting.

4. Ways to Tackle Digital Colonialism:

- **Enhance Digital Sovereignty:**
  - Build **indigenous digital systems**, such as **ONDC (Open Network for Digital Commerce)** and **India Stack**, to reduce dependence on foreign platforms.
- **Enforce Data Localization:**
  - **India's Initiatives:** India has refused to sign the **Osaka Track on data flows** and enacted the **Digital Personal Data Protection Act (DPDP Act), 2023**, to protect national data.
- **Reduce Import Dependence:**
  - **Self-reliance in critical sectors** like **defence**, **space**, and **technology** through initiatives such as **Make in India** and the **Chips to Startup (C2S)** programme.
- **Update Policy Frameworks:**
  - **UNCTAD's 2021 Report** urges countries to **review data flow policies** regularly, balancing **economic growth** with **national interests** in a connected global digital ecosystem.

5. Conclusion:

- **Digital Colonialism** is a growing threat to sovereignty, requiring urgent action from nations to build self-reliant, secure, and culturally relevant digital ecosystems.
- **India**'s focus on **digital sovereignty**, **data localization**, and **self-reliance** is crucial for reducing dependence on foreign tech giants and ensuring a fair and balanced digital future.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the concept of **digital colonialism** and analyze its impact on the sovereignty of developing nations. What steps can countries take to ensure digital sovereignty?
- **Q2.** How can nations, particularly in the Global South, tackle the growing influence of foreign digital infrastructure and protect their digital sovereignty?

General Studies Paper III:

- **Q3.** Evaluate India's efforts in **digital self-reliance**, especially through initiatives like **ONDC** and the **DPDP Act**, to curb the risks of digital colonialism.
- **Q4.** What are the benefits and challenges of **data localization**? How does it help in protecting national sovereignty and promoting self-reliance in technology?

PMKVY: 10 Years of Skill Development in India

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Skill Development and Employment Policies:** Analysis of **PMKVY** and its role in promoting **skill development**in India.

✅ **GS Paper II – Social Justice**

- **Social Inclusion:** The role of **PMKVY** in targeting marginalized groups such as **women**, **SCs**, **STs**, and **OBCs** for **vocational training**.

✅ **GS Paper III – Economic Development**

- **Human Capital Development:** How **PMKVY** contributes to a **future-ready workforce** by integrating **emerging technologies** and traditional crafts.

1. Introduction

- **Pradhan Mantri Kaushal Vikas Yojana (PMKVY)**, launched in **2015** by the **Ministry of Skill Development and Entrepreneurship (MSDE)**, has completed **10 years** of implementation.
- PMKVY is focused on **skill development** in India, enhancing the employability of youth and promoting **vocational training**.

2. Current Phase of PMKVY

- **PMKVY 4.0**:
  - The scheme is currently in its **fourth phase (PMKVY 4.0)** and is a key component of the **Central Sector Scheme** of the **Skill India Programme**.
  - It is supported by two other major initiatives:
    - **Pradhan Mantri National Apprenticeship Promotion Scheme (PM-NAPS)**: Provides **financial support** for **apprentice stipends**.
    - **Jan Shikshan Sansthan (JSS) Scheme**: Focuses on providing **vocational skills** to **non-literates**, **neo-literates**, and **school dropouts**.

3. Types of Training Under PMKVY

- **Short-Term Training (STT):**
  - Provides **National Skills Qualification Framework (NSQF)** aligned courses and **on-job training**.
- **Recognition of Prior Learning (RPL):**
  - Offers **industry-recognized certifications** to acknowledge existing skills.
- **Special Projects:**
  - Tailored **skill training** for marginalized groups, remote areas, and emerging job roles.

4. Key Achievements of PMKVY

- **Access to Skill Training:**
  - Over **1.63 crore youths** have been trained since the scheme's inception in 2015.
- **Targeted Skilling Initiatives:**
  - Special focus on groups such as the **Bru-tribe** in **Tripura**, **prison inmates** in **Assam** and **Manipur**, and **70% women** under the **PANKH project**.
- **Social Equity and Inclusion:**
  - **45% women participation** and significant representation of **SCs**, **STs**, and **OBCs** in training programmes.
- **Emerging Technologies:**
  - Introduction of **AI**, **IoT**, **Robotics**, **5G Technology**, **Cybersecurity**, **Drones**, and **Green Hydrogen** into training modules to create a **future-ready workforce**.
- **Promotion of Traditional Crafts:**
  - **Upskilling projects** for **artisans** and **weavers** in regions like **Nagaland** and **Jammu & Kashmir**.

5. Conclusion:

- **PMKVY** has played a crucial role in **skilling India's youth** and improving their employability by providing training in both **traditional crafts** and **emerging technologies**.
- The scheme's inclusive approach, targeting marginalized groups and incorporating **new-age sectors**, will continue to contribute to India's **economic growth** and **human capital development** in the years ahead.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Analyze the role of **Pradhan Mantri Kaushal Vikas Yojana (PMKVY)** in addressing **unemployment** and **skill gaps** in India. How effective has the scheme been in achieving its goals?
- **Q2.** Discuss the **inclusive approach** of PMKVY in targeting **women**, **SCs**, **STs**, and **OBCs**. How does it contribute to **social equity** and **economic empowerment**?

General Studies Paper III:

- **Q3.** Evaluate the significance of **PMKVY 4.0** in the context of creating a **future-ready workforce** in India. How do **emerging technologies** like **AI**, **5G**, and **Cybersecurity** play a role in this?
- **Q4.** How has **PMKVY** contributed to the **promotion of traditional crafts** and **upskilling** artisans and weavers in **Nagaland** and **Jammu & Kashmir**?

Supreme Court's Directions on DNA Evidence Management

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Judiciary and Legal Reforms:** The **Supreme Court's role** in ensuring **uniform procedures** and **evidence management** in criminal cases, especially **DNA evidence**.

✅ **GS Paper II – Social Justice**

- **Forensic and Criminal Justice Systems:** The importance of **DNA evidence** in improving the **criminal justice system** and ensuring **fair trials**.

✅ **GS Paper III – Security**

- **Forensic Science and Criminal Investigation:** The role of **DNA technology** in enhancing **forensic capacity** and addressing **challenges in criminal investigations**.

1. Introduction

- In a significant ruling on a **criminal appeal**, the **Supreme Court of India** issued **directions for handling DNA evidence** to ensure **uniformity** in procedures and to **preserve the sanctity** of such evidence.
- These directions aim to address several **issues in the management of DNA evidence**, ensuring proper **collection**, **preservation**, and **admissibility** in court.

2. Issues with the Management of DNA Evidence in India

- **Collection and Preservation Challenges:**
  - Inadequate training of **investigating personnel** and breakdown of the **chain of custody** often compromise the integrity of DNA evidence.
- **Limited Forensic Capacity:**
  - There is a **shortage of DNA labs**, **regional disparities** in forensic facilities, and delays in **DNA analysis** due to **understaffing** and inefficiencies in the system.
- **Lack of Uniform Standard Operating Procedures (SOPs):**
  - Since **policing** and **public order** fall under **state jurisdiction**, there is no consistent application of **SOPs**across the country, which affects the management of DNA evidence.

3. Key Highlights of the Supreme Court Directions

- **Collection of DNA Samples:**
  - DNA samples must be **properly documented**, including relevant details such as the **section** and **statute**involved, **police station details**, and other specifics to ensure traceability.
- **Transportation:**
  - The **Investigating Officer** must ensure that DNA samples reach the **Forensic Lab** within **48 hours** of collection to preserve the quality and integrity of the evidence.
- **Chain of Custody Register:**
  - A **register** must be maintained, documenting the movement of evidence from **collection to conviction** or **acquittal**, ensuring **accountability** at each step of the process.

4. Admissibility of DNA Evidence in Indian Courts

- **Kunhiraman v. Manoj Case (1991):**
  - This case marked the first time **DNA technology** was used in India to resolve a **paternity dispute**.
- **Sharda v. Dharmpal Case (2003):**
  - The **Supreme Court** approved the use of **DNA technology** in **civil and matrimonial disputes**, ruling that such evidence would not violate the **right to personal liberty (Article 21)** or the **right against self-incrimination (Article 20(3))**.
- **Bharatiya Nagarik Surakhsha Sanhita, 2023:**
  - Section **51** of the law allows for **medical inspection** of apprehended individuals, including **DNA profiling**and other necessary tests.
- **Criminal Procedure (Identification) Act, 2022:**
  - This law empowers the **National Crime Records Bureau (NCRB)** to **collect and store measurements**, including **biological samples** from convicts.

5. Conclusion:

- The **Supreme Court's directions** on DNA evidence management aim to streamline processes, enhance forensic efficiency, and safeguard the **admissibility** of such evidence in **criminal trials**.

- By establishing **uniform procedures** and enhancing the forensic infrastructure, the **criminal justice system** can ensure that **DNA evidence** is used effectively, thus contributing to **fair and accurate outcomes** in legal proceedings.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the importance of **DNA evidence** in the **Indian criminal justice system**. How has the **Supreme Court's direction** contributed to improving the **handling** and **admissibility** of such evidence?
- **Q2.** Evaluate the challenges in the **collection and preservation** of DNA evidence in India. How can the **uniformity**in procedures across states address these challenges?

General Studies Paper III:

- **Q3.** Analyze the role of **forensic technology** such as **DNA profiling** in **criminal investigations**. How does the **Criminal Procedure (Identification) Act, 2022** and other related laws improve the **accuracy and reliability** of criminal justice procedures?

CSC Celebrates 10 Years of Digital India with Free AI Training

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Government Initiatives and Programs:** The role of **Common Service Centers (CSCs)** in promoting **digital inclusion** and their contributions to **public service delivery**.

✅ **GS Paper III – Economic Development**

- **Technology in Governance:** How **CSCs** leverage **ICT-based networks** to enhance **public service delivery** and promote **digital literacy**.

1. Introduction

- **Common Service Centers (CSCs)**, under the **Ministry of Electronics and Information Technology (MeitY)**, is celebrating its **10-year milestone** as part of the **Digital India initiative**. On this occasion, the **Minister** announced a significant initiative of offering **free AI training** to **10 lakh individuals**, prioritizing **Village Level Entrepreneurs (VLEs)**.

2. About Common Service Centers (CSC)

- **Establishment:** CSCs were established in **2006** under **MeitY** to bridge the **digital divide** by providing **digital services** to underserved and remote areas across **India**.
- **Vision:** The primary vision of CSCs is to **deliver digital services** to the **last mile** and create a **robust ICT-based network** that serves the **rural and semi-urban population**, ensuring equitable access to essential services.

3. Expansion of the CSC Network

- **Growth in Numbers:** The CSC network has seen exponential growth, expanding from just **83,000 CSCs in 2014** to over **5.5 lakh CSCs** today, covering nearly **90% of villages** across India.
- **Village Level Entrepreneurs (VLEs): VLEs** play a crucial role in delivering these digital services at the **grassroots level**. These entrepreneurs are the **backbone** of CSCs and have been instrumental in empowering **rural communities** through access to **government services** and digital literacy.

4. Key Services Offered at CSCs

- **Government and Administrative Services:**
  - CSCs provide essential services such as:
    - **Aadhaar enrollment** and **update**.
    - **PAN card processing**.
    - **Passport applications**.
    - **Banking** and **insurance services**.
- **Digital Literacy and Public Services:**
  - CSCs serve as a point of access for **digital literacy** programs, promoting **e-Governance** and helping citizens interact with government departments more effectively.

5. AI Training Initiative for 10 Lakh Individuals

- **AI Training Program:**
  - As part of the **Digital India** celebrations, the **Minister** announced the launch of **free Artificial Intelligence (AI) training** for **10 lakh individuals**, with a special focus on empowering **Village Level Entrepreneurs (VLEs)**.
- **Importance of the AI Initiative:**
  - This training program will **equip individuals** in **rural India** with **cutting-edge skills**, improving their ability to participate in the **digital economy** and enhance the services they provide through the **CSC network**.

6. Conclusion:

- The **Common Service Centers (CSCs)** have played a pivotal role in bridging the **digital divide** in India. By expanding the reach of **digital services**, improving access to **government services**, and promoting **digital literacy**, CSCs have significantly contributed to the **empowerment of rural populations**. The new **AI training initiative**further strengthens the role of CSCs in **shaping a digitally inclusive India**.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the role of **Common Service Centers (CSCs)** in promoting **digital inclusion** and **e-Governance** in India. How have **VLEs** contributed to the success of this initiative?
- **Q2.** Evaluate the significance of the **AI training program** announced by the **CSC** initiative in enhancing **digital literacy** in rural India. How does this align with the goals of **Digital India**?

General Studies Paper III – Economic Development:

- **Q3.** How do initiatives like **Common Service Centers (CSCs)** contribute to **economic development** in **rural India**? Discuss the challenges faced by **VLEs** and the potential for expanding **digital services**.

General Studies Paper II – Governance:

- **Q4.** Assess the impact of **digital services** delivered by **CSC** on the **efficiency** and **accessibility** of **government services** in rural and remote areas. How can this model be improved further?

President Confers Swachh Survekshan 2024-25 Awards

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Government Initiatives and Programs:** The **Swachh Survekshan** initiative under the **Swachh Bharat Mission**and its impact on urban cleanliness and governance.

✅ **GS Paper III – Economic Development**

- **Environmental and Urban Development:** The role of **Swachh Survekshan** in promoting sustainable urban development and waste management practices.

1. Introduction

- The **President of India** recently conferred the **Swachh Survekshan 2024-25 awards** as part of the 9th annual edition of the world's largest urban cleanliness survey, focusing on the theme of **Reduce, Reuse, Recycle**.

2. New Initiatives Launched at the Awards Ceremony

- **Swachh City Partnership:**
  - As part of the awards, the top **78 cities** will adopt and mentor one **poor-performing city** from their respective **states**, encouraging **peer learning** and **improvement** in cleanliness practices.
- **Accelerated Dumpsite Remediation Program:**
  - A **one-year special program** has been introduced to focus on **remediating legacy waste** and enhancing the **scientific waste processing capacity** of cities, aiming to tackle long-standing waste management challenges.

3. About Swachh Survekshan

- **Launch and Background:**
  - The **Swachh Survekshan** was launched in **2016** as part of the **Swachh Bharat Mission (Urban)** under the **Ministry of Housing and Urban Affairs (MoHUA)**.
- **Survey Methodology:**
  - The survey is conducted annually with **data provided by Urban Local Bodies (ULBs)**, which is then verified through **field assessments** conducted by a third-party agency.
- **Objective:**
  - The primary aim of **Swachh Survekshan** is to encourage **large-scale citizen participation** and raise awareness about the importance of making cities and towns **cleaner**, improving urban living conditions, and promoting better waste management practices.
- **Components of the Survey:**
  - The survey involves **data assessment** (provided by ULBs), **document assessment**, and **field assessments**.
  - Cities are awarded certifications such as **ODF+/ODF++/Water+**, with **80% weightage** given to data and field assessments, and **20% to documentation**.

4. Conclusion:

- The **Swachh Survekshan 2024-25** awards not only celebrate the achievements of cities in promoting **cleanliness**and **waste management** but also highlight the importance of **community involvement**, **innovation**, and **sustainable development** in urban areas. The new initiatives introduced in the awards ceremony will further strengthen the country's efforts in **transforming urban spaces** and contributing to **environmental sustainability**.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the significance of the **Swachh Survekshan initiative** in improving **urban cleanliness** and **waste management** in India. How does it contribute to **e-Governance** and **citizen participation**?
- **Q2.** What are the new initiatives introduced during the **Swachh Survekshan 2024-25** awards ceremony? Discuss their potential impact on **waste management** and **cleanliness** in Indian cities.

General Studies Paper III – Economic Development:

- **Q3.** Evaluate the role of **Swachh Survekshan** in promoting **sustainable urban development**. How do initiatives like **dumpsite remediation** and **Swachh City Partnerships** contribute to better **waste management** practices?

General Studies Paper II – Governance:

- **Q4.** Assess the role of the **Swachh Bharat Mission (Urban)** in achieving the objectives of **cleanliness** and **sanitation** in urban areas. How does it align with **India's broader environmental goals**?

MoSPI Urges Integration of Economic & Population Census

📌 **Syllabus Mapping:**

✅ **GS Paper III – Economic Development**

- **Census and Data Collection:** The significance of the **Economic Census** in providing a comprehensive picture of India's **entrepreneurial activities** and how it complements national **data collection frameworks** like the **Population Census**.

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

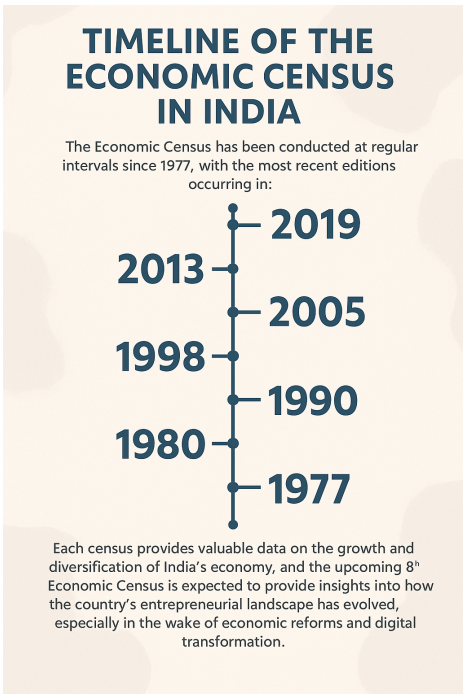
- **Government Schemes and Programs:** The role of the **Ministry of Statistics and Programme Implementation (MoSPI)** in conducting comprehensive **census surveys** and its impact on **policy-making** and **economic planning**.

1. Introduction

- The **Ministry of Statistics and Programme Implementation (MoSPI)** has emphasized the need to **integrate the 8th Economic Census** with the **16th Population Census** to create a more **robust and coherent dataset** for understanding **India's economic landscape**. This integration will streamline data collection and improve the **accuracy and comprehensiveness** of both censuses.

2. About the Economic Census

- **Objective and Scope:**
  - The **Economic Census** is designed to provide a **complete enumeration** of all **entrepreneurial activities**operating in India at a given point in time. The primary objective is to capture detailed information about the **ownership patterns**, **number of people engaged**, and the **geographical spread** of economic activities across the country.
- **Data Provided by the Economic Census:**
  - **Ownership Patterns:** Information about whether businesses are **privately owned**, **government-run**, or **joint ventures**.
  - **Number of Persons Engaged:** Data on the **labour force** involved in different entrepreneurial activities.
  - **Geographical Spread:** Insights into the **distribution** of economic activities across **urban** and **rural** areas.



3. Integration with the 16th Population Census

- **Why Integration is Important:**
  - By **integrating** the **Economic Census** with the **Population Census**, **MoSPI** aims to **reduce duplication**, improve **coordination**, and enhance the overall **efficiency** of data collection. The **Population Census**, which captures demographic information, can complement the **Economic Census** to provide a **holistic view** of **India's socio-economic fabric**.
- **Synergy Between Both Censuses:**
  - The integration of both censuses will allow for more **granular data** that connects **population characteristics**with **economic activities**, helping policymakers better understand how different segments of the population are involved in the **economy**. For example, insights into the **employment patterns**, **income distribution**, and **entrepreneurship** within specific **demographic groups** (such as age, gender, or region) can guide targeted economic policies.

4. Conclusion:

- The **8th Economic Census**, when integrated with the **16th Population Census**, will enhance **data accuracy** and provide critical insights into India's **economic development** and **entrepreneurial dynamics**. This initiative reflects **MoSPI's commitment** to improving data collection systems and fostering more **data-driven decision-making** in India's **economic planning**.

UPSC Mains Questions:

General Studies Paper III – Economic Development:

- **Q1.** Discuss the role of the **Economic Census** in assessing India's **entrepreneurial activities**. How does the integration with the **Population Census** improve **data collection** for better **economic policy formulation**?
- **Q2.** Explain the importance of conducting **regular economic censuses** and the role of **MoSPI** in strengthening India's **statistical infrastructure**. How can this data contribute to **economic growth** and **inclusive development**?

General Studies Paper II – Governance, Constitution, Polity, and International Relations:

- **Q3.** What are the challenges in **integrating economic and population censuses**? Discuss how such integration can enhance the **effectiveness** of **data-driven governance** in India.

General Studies Paper III – Economic Development:

- **Q4.** How can **entrepreneurial data** from the **Economic Census** guide **policy interventions** aimed at promoting **small businesses** and **self-employment** in rural areas?

New Chief Appointed to NFRA

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Regulatory Bodies and Governance:** The role of the **National Financial Reporting Authority (NFRA)** in ensuring **financial transparency** and **accounting standards** in India.

✅ **GS Paper II – Social Justice and Economic Development**

- **Corporate Governance:** Understanding **NFRA's functions** in promoting **corporate accountability** and **ethical financial reporting**.

1. Introduction

- The **Appointments Committee of the Cabinet** has appointed a new **chief** for the **National Financial Reporting Authority (NFRA)**, the key body tasked with overseeing financial reporting, accounting standards, and auditing practices in India.

2. About NFRA

- **Constitution and Purpose:**
  - **NFRA** was **constituted in 2018** under the **Companies Act, 2013**, with the objective of improving the quality of **financial reporting** and ensuring compliance with **accounting** and **auditing standards** in India.
- **Headquarters:**
  - The **NFRA** is based in **New Delhi**, the capital of India, which serves as the headquarters for its regulatory activities.
- **Primary Functions and Duties:**
  1. **Recommending Policies and Standards:**
     - **NFRA** is responsible for recommending the **accounting** and **auditing policies** and **standards** to be adopted by **companies** across India.
  2. **Monitoring and Compliance Enforcement:**
     - The authority is tasked with monitoring and **enforcing compliance** with the prescribed **accounting** and **auditing standards**, ensuring **transparency** and **accuracy** in financial reporting.
  3. **Overseeing the Professional Quality of Services:**
     - NFRA also oversees the **quality of service** provided by **accountants** and **auditors**, ensuring that **professional standards** are maintained across the industry.
  4. **Additional Functions:**
     - NFRA is empowered to carry out any other functions deemed necessary or incidental to the effective performance of its regulatory duties.

3. Significance of NFRA in India's Financial System

- **Promoting Transparency and Accountability:**
  - **NFRA** plays a critical role in ensuring that **corporate India** adheres to **internationally accepted accounting practices** and upholds **high standards of corporate governance**. This helps in maintaining the **integrity** of financial markets and **investor confidence**.
- **Regulating the Accounting Profession:**
  - As an autonomous regulatory body, NFRA ensures that **auditors and accountants** operate in compliance with national and international standards, safeguarding the **interests of shareholders** and **other stakeholders**in the corporate sector.

4. Conclusion:

- The appointment of a new chief to the **National Financial Reporting Authority (NFRA)** is a significant step towards **strengthening financial oversight** and **enhancing the quality of financial reporting** in India. By ensuring compliance with **auditing standards**, NFRA plays a pivotal role in upholding the **trust** and **credibility** of India's financial system.

UPSC Mains Questions:

General Studies Paper II – Governance:

- **Q1.** Discuss the role of the **National Financial Reporting Authority (NFRA)** in ensuring **accountability** and **transparency** in the **corporate sector** in India. How does it contribute to **corporate governance**?
- **Q2.** Evaluate the importance of **NFRA** in regulating **accounting** and **auditing standards** in India. How does its establishment under the **Companies Act, 2013** impact **financial reporting** in the country?

General Studies Paper II – Economic Development:

- **Q3.** How does **NFRA's monitoring and compliance enforcement** contribute to enhancing the **quality of financial services** in India? Discuss its role in promoting **financial integrity** in corporate India.

General Studies Paper II – Social Justice:

- **Q4.** Examine the role of **regulatory bodies** like **NFRA** in fostering **ethical business practices**. What impact do such institutions have on **investor protection** and **corporate accountability**?

Lok Sabha Speaker on Social Organizations in Nation Building

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Social Institutions and Governance:** The significance of **social organizations** in **nation-building** and **sustainable development**.

✅ **GS Paper II – Social Justice**

- **Role of Social Organizations:** The role of **formal and informal social organizations** in **shaping societal structures**, promoting **inclusivity**, and fostering **economic and cultural growth**.

1. Introduction

- The **Lok Sabha Speaker** emphasized the vital role of **social organizations** in the **development of nations and societies**. These organizations, whether **formal** or **informal**, help in shaping the lives of individuals and influencing the broader **social, economic**, and **cultural** landscape.

2. What Are Social Organizations?

- **Definition:**
  - **Social organizations** refer to the way individuals and groups are structured and interact within a society. They can be:
    - **Formal:** Such as **religious institutions**, **educational organizations**, and **labour unions**.
    - **Informal:** Including **family**, **peer groups**, and **friends**.
- **Nature of Social Organizations:**
  - These organizations exist to promote **cohesion**, **unity**, and **common goals** within a community. They can either be structured with formal rules and regulations or exist as informal networks.

3. Role of Social Organizations in Nation Building

- **Shaping Individuals and Communities:**
  - Social organizations play a crucial role in shaping the lives of individuals, influencing their **values**, **beliefs**, and **behavior**. They help integrate individuals into the larger **social fabric**, promoting **community development** and **social cohesion**.
- **Economic and Cultural Landscape:**
  - These organizations contribute significantly to the **economic development** by creating **job opportunities**, promoting **social welfare**, and enhancing **economic growth**. They also influence **cultural development**, preserving and promoting **traditions**, **customs**, and **values**.
- **Sustainable and Inclusive Societies:**
  - Recognizing the importance of social organizations is crucial for creating **resilient**, **inclusive**, and **sustainable societies**. These organizations are essential in **adapting to future challenges** such as **climate change**, **economic inequality**, and **social unrest**.
- **Catalysts for Positive Change:**
  - **Social organizations** are often at the forefront of **advocating for policy changes**, improving **education**, **healthcare**, and **social justice**. They mobilize communities and individuals to actively participate in **nation-building**, **social reform**, and **developmental activities**.

4. Conclusion:

- The **Lok Sabha Speaker's emphasis** on the role of **social organizations** highlights the critical importance of these institutions in fostering **social well-being**, **economic prosperity**, and **cultural advancement**. By understanding their role, societies can build **inclusive and resilient frameworks** capable of addressing future challenges.

UPSC Mains Questions:

General Studies Paper II – Governance, Constitution, Polity, and International Relations:

- **Q1.** Discuss the role of **social organizations** in **nation-building**. How do formal and informal social organizations contribute to **economic, cultural**, and **social development**?

- **Q2.** In the context of **nation-building**, what challenges do **social organizations** face in contributing to **inclusive**and **sustainable growth**? How can they address **social inequalities**?

General Studies Paper II – Social Justice:

- **Q3.** How do **social institutions** like **religious organizations**, **labour unions**, and **peer groups** contribute to fostering **social justice** and **inclusive societies**? Discuss with examples.

NSCSTI 2.0: Building Future-Ready Civil Services Institutes

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Civil Services Reforms:** The role of the **National Standards for Civil Service Training Institutes (NSCSTI 2.0)**in **transforming civil services training** and aligning it with modern demands.

✅ **GS Paper II – Social Justice**

- **Capacity Building for Governance:** Understanding the importance of **Mission Karmayogi** and its alignment with **NSCSTI 2.0** to **enhance civil services capacity** and build a **future-ready** workforce.

1. Introduction

- The **Union Minister** recently unveiled the **National Standards for Civil Service Training Institutes 2.0 (NSCSTI 2.0)** framework, aimed at **transforming** and **modernizing civil services training** to meet the evolving needs of the **Indian bureaucracy**.

2. About the NSCSTI 2.0 Framework

- **Developed By:**
  - The **Capacity Building Commission (CBC)** has developed the **NSCSTI 2.0 framework**, marking a **step forward** in building **future-ready civil services** training institutes.
- **Objective:**
  - The primary goal of **NSCSTI 2.0** is to **build and strengthen** the **capacity of civil services training institutes** in India to ensure they meet the demands of the **modern administrative landscape**. The framework seeks to ensure that training institutes are **well-equipped** to provide **effective learning** for **civil servants** at all levels of governance.

3. Key Features of NSCSTI 2.0

- **Streamlined Evaluation Metrics:**
  - The **framework** includes **evaluation metrics** that are designed to assess the **effectiveness** of training programs, ensuring that civil services institutes are continuously improving their content and methods of instruction.
- **Inclusive Design:**
  - **NSCSTI 2.0** places a strong emphasis on **inclusive design**, ensuring that training programs are accessible and cater to the diverse needs of civil servants across various departments and regions.
- **Digitally Aligned with Hybrid Learning Models:**
  - The framework incorporates **digital tools** and aligns training methodologies with **hybrid learning models**, combining **online learning** and **in-person sessions**. This approach aims to make training more **flexible**, **scalable**, and **accessible** to all civil servants.

4. About the Capacity Building Commission (CBC)

- **Establishment and Role:**
  - The **Capacity Building Commission (CBC)** was established in **2021** to oversee the implementation of the **National Programme for Civil Services Capacity Building (NPCSCB)**, also known as **Mission Karmayogi**.
- **Functioning:**
  - The **CBC** works as an **independent body** with full **executive powers**, directly contributing to the **capacity building** of civil servants by ensuring effective training, skill development, and the continuous improvement of governance.

5. Mission Karmayogi and NSCSTI 2.0

- **Mission Karmayogi:**
  - **Mission Karmayogi** aims to enhance the **capacity of civil services** in India by promoting continuous professional development, providing **career-long learning**, and enabling civil servants to be equipped for the future.
- **NSCSTI 2.0's Alignment with Mission Karmayogi:**

- The **NSCSTI 2.0 framework** aligns with the goals of **Mission Karmayogi** by providing a modern, adaptable, and digitally aligned training model for civil servants. This ensures that the **civil service training institutes** contribute to the **professional growth** and **performance enhancement** of government employees at all levels.

6. Conclusion:

- The **NSCSTI 2.0** framework is a crucial step toward modernizing civil service training in India. It not only aims to make the **training system more effective** and **inclusive** but also helps equip **civil servants** with the skills and knowledge required to meet the **challenges of the future**. This initiative, in tandem with **Mission Karmayogi**, is expected to build a more **efficient**, **agile**, and **resilient** civil service in India.

UPSC Mains Questions:

General Studies Paper II – Governance, Constitution, Polity, and International Relations:

- **Q1.** Discuss the significance of the **National Standards for Civil Service Training Institutes 2.0 (NSCSTI 2.0)** in strengthening the capacity of India's civil services. How does this framework align with **Mission Karmayogi**?
- **Q2.** Evaluate the role of **digital transformation** and **inclusive design** in enhancing the effectiveness of **civil services training** under the **NSCSTI 2.0** framework.

General Studies Paper II – Social Justice:

- **Q3.** How can the **NSCSTI 2.0** framework ensure **inclusive and equitable development** in civil services training? Discuss its role in addressing regional, gender, and other disparities in **government functioning**.

General Studies Paper III – Economic Development:

- **Q4.** Analyze how the **Capacity Building Commission (CBC)** and the **NSCSTI 2.0 framework** contribute to the **efficiency and governance of public administration** in India. Discuss its potential impact on **policy implementation** and **public sector performance**.

INTERNATIONAL RELATIONS

Australia and India Strengthen Ties with 2025 Maitri Grants

📌 **Syllabus Mapping:**

✅ **GS Paper II – International Relations**

- **Bilateral Relations:** The **Maitri Grants** and their role in **Australia-India relations**, focusing on **cultural exchange**, **education**, and **research collaboration**.

✅ **GS Paper III – Economic Development**

- **Partnerships in Research and Development:** The role of **Maitri Grants** in fostering **collaboration** in critical sectors like **education**, **culture**, and **research**.

1. Introduction

- **Australia** and **India** are set to strengthen their partnership with the **2025 Maitri Grants**, which are administered by the **Centre for Australia-India Relations**.
- The grants aim to promote **cultural exchange**, **education**, and **research** collaboration, enhancing ties between the two nations.

2. About Maitri Grants

- The **Maitri Grants** are designed to foster **greater cooperation** and **exchange** between **Australia** and **India** in several key sectors, specifically **cultural**, **education**, and **research purposes**.
- These grants provide a platform for both nations to engage in **joint projects** and **knowledge-sharing**, reinforcing the bilateral relationship.

3. Political Features of Australia

- **Location and Boundaries:**
  - Australia is located in the **Southern Hemisphere**, bordered by the **Indian Ocean** to the west and the **South Pacific Ocean** to the east.

  - It is the **smallest continent** and the **sixth largest country** in the world by land area.
- **Geographical Features:**
  - **Highest Point: Mount Kosciuszko**, part of the **Eastern Highlands** or the **Great Dividing Range**.
  - **The Great Barrier Reef:** Located off the east coast of **Queensland**, it is the world's largest coral reef system and was designated a **World Heritage Site** in 1981.
- **Major Natural Resources:**
  - Australia is rich in natural resources such as **gold**, **iron ore**, **lead**, **nickel**, **rutile**, **uranium**, **zinc**, and **zircon**, which are significant contributors to its economy.

4. Conclusion:

- The **Maitri Grants** represent a pivotal step in enhancing **Australia-India relations**, enabling deeper collaboration in crucial sectors. These grants are vital for expanding the scope of **mutual exchange**, fostering **innovation**, and building a more robust bilateral relationship.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the objectives of the **Maitri Grants** in strengthening the relationship between **Australia and India**. How can these grants contribute to the development of key sectors in both nations?
- **Q2.** Evaluate the significance of **Australia's natural resources** in shaping its economic relationship with **India**. What role does **resource-sharing** play in enhancing **bilateral trade**?

General Studies Paper III:

- **Q3.** How can the **Maitri Grants** encourage **cultural exchange** and **research collaboration** between **India** and **Australia**? What are the broader implications for **global partnerships**?

India's Growing Global Role in a Shifting Multipolar World Order

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **International Relations:** The emergence of a **multipolar world**, India's role, and its foreign policy strategy.

✅ **GS Paper II – International Relations**

- **Global Power Dynamics:** The rise of **Plurilateral Fora** like **BRICS**, **Quad**, and **SCO**, and their impact on global governance.

✅ **GS Paper II – International Relations**

- **India's Foreign Policy:** India's **shift from Non-alignment to Multi-alignment**, and balancing interests with different global powers.

1. Introduction

- The **Singapore Foreign Minister** recently acknowledged India's **growing global role** during a meeting with the **External Affairs Minister** of India.
- India's increasing influence comes at a time when the world is transitioning from a **bipolar** (US vs USSR) to a **multipolar world** order.

2. Understanding Multipolarity

- **Definition:**
  - **Multipolarity** refers to an international system where **multiple powers** exert significant influence, as opposed to **bipolarity** (two great powers) or **unipolarity** (one dominant power).
- **Key Characteristics:**
  - In a **multipolar world**, regions and countries have their own **interests**, **values**, and **agendas**, and they either cooperate or compete based on these differences.
  - **Global shifts** are challenging the post-World War II order dominated by **US** and **USSR**.

3. Emergence of a Multipolar World Order

- **Inexorable Transition:**
  - The present global structure, dominated by **US and USSR**, is increasingly questioned, especially in light of global institutions like the **UN**, **IMF**, and the **World Bank**.

  - **New Development Bank (NDB)**, established by BRICS nations, serves as an alternative to the **World Bank**.
- **Rise of Plurilateral Fora:**
  - These flexible groupings are challenging the rigid, Western-dominated security structures like **NATO** and the **Warsaw Pact**.
  - Forums such as **BRICS+**, **Quad**, and **SCO** highlight **flexible alignments**, replacing traditional, static blocs.

4. India's Central Role in the Multipolar World Order

- **Shift from Non-alignment to Multi-alignment:**
  - India's foreign policy strategy has evolved from **Non-alignment** to **Multi-alignment**, pragmatically engaging with both Western blocs like **Quad** and Eurasian groups like **SCO**.
- **Increasing Participation in Minilaterals:**
  - India is actively involved in regional, agenda-specific groupings like **Quad**, **IPEF**, and **I2U2**, promoting **multipolarity** in a **multipolar Asia**.
- **India's Role in a Multipolar Asia:**
  - India's foreign policy is increasingly focused on shaping a multipolar world that revolves around **Asia's centrality** in global geopolitics.

5. Challenges India Faces in Maintaining Multipolarity

- **Revival of Cold War-style Bloc Politics (Ukraine war):**
  - The **Ukraine war** has reignited **Cold War-style bloc politics**, pushing the world back towards a **bipolar framework**, with the **US and its allies** on one side and **Russia-China** on the other.
  - This **shrinks India's geopolitical space**, making it harder to pursue an independent, **multipolar strategy**.
- **Strategic Pressure to Choose Sides:**
  - India faces growing pressure to choose sides between the **West (QUAD, Indo-Pacific)** and **Russia (SCO, BRICS)**, which complicates its **balancing act**.
- **Weakening of Russia as a Strategic Partner:**
  - With **Russia heavily dependent on China**, India's ability to maneuver in **Eurasian geopolitics** is constrained, limiting its strategic flexibility.

6. Conclusion:

- India's role in the **multipolar world** is growing, but it faces significant challenges due to the current global geopolitical shifts. The revival of **bipolar blocs**, especially with the **Ukraine conflict**, is pushing India to navigate its foreign policy carefully.
- To maintain its **centrality** in a multipolar world, India must continue to **balance its engagements** with different global powers while adapting to changing global dynamics.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the emerging trend of **multipolarity** in global politics. How does India play a crucial role in this new world order?
- **Q2.** Analyze the shift in India's foreign policy from **Non-alignment to Multi-alignment**. What are the implications of this shift for India's global role?

General Studies Paper II (International Relations):

- **Q3.** Evaluate the significance of **Plurilateral Fora** like **BRICS**, **Quad**, and **SCO** in shaping global governance. How does India navigate these flexible alliances?
- **Q4.** How can India maintain its **multipolar strategy** in the face of growing **Cold War-style bloc politics** and the geopolitical pressures arising from the **Ukraine conflict**?

BIMSTEC Ports Conclave 2025: Strengthening Regional Cooperation

📌 **Syllabus Mapping:**

✅ **GS Paper II – International Relations**

- **Regional Cooperation and Multilateral Agreements:** The role of **BIMSTEC** in promoting **economic cooperation** and fostering **regional connectivity** between South Asia and South-East Asia.

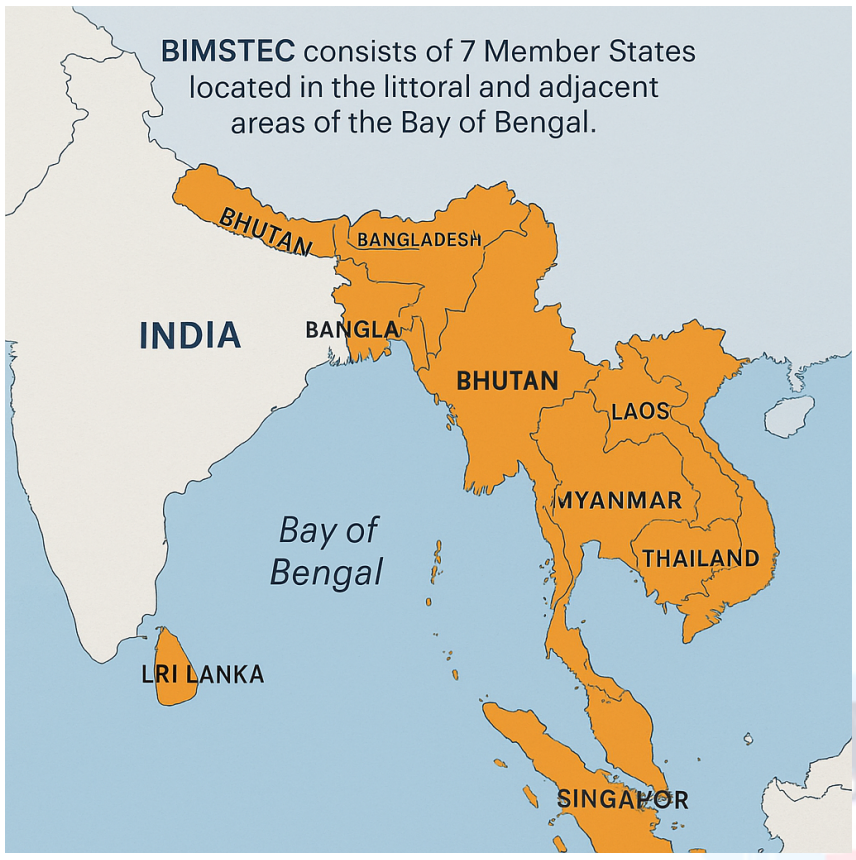
✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **India's Foreign Policy:** India's strategic interests in **BIMSTEC** and its role in **regional diplomacy** in the **Bay of Bengal region**.

1. Introduction

- The **Union Minister of Ports, Shipping & Waterways (MoPSW)** inaugurated the **2nd edition of the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) Ports Conclave**.
- The event focuses on enhancing **regional cooperation** and promoting sustainable growth in the **Bay of Bengal region**.

2. About BIMSTEC



- **Genesis and Establishment:**
  - **BIMSTEC** was established in **1997** with the signing of the **Bangkok Declaration**, aimed at promoting **economic cooperation** between countries bordering the **Bay of Bengal**.
- **Purpose:**
  - The primary goal of **BIMSTEC** is to promote **multi-sectoral technical and economic cooperation** among its member countries, contributing to regional stability and prosperity.
- **Member Countries:**
  - **BIMSTEC** consists of **7 Member States** located in the littoral and adjacent areas of the **Bay of Bengal**:
    - **Bangladesh**
    - **Bhutan**
    - **India**
    - **Nepal**
    - **Sri Lanka**
    - **Myanmar**
    - **Thailand**
- **Strategic Importance:**
  - **BIMSTEC** serves as a unique link connecting **South Asia** with **South-East Asia**, enhancing **economic** and **technical collaboration** between countries across the Bay of Bengal.
- **Secretariat:**
  - The **BIMSTEC Secretariat** is based in **Dhaka**, Bangladesh, where the administrative functions of the organization are coordinated.

3. Significance of BIMSTEC Ports Conclave

- **Purpose of the Conclave:**
  - The **Ports Conclave** is an important platform for **ports, shipping**, and **maritime leaders** from the **BIMSTEC region** to discuss strategies, share innovations, and enhance **connectivity** between member states.
- **Opportunities for Cooperation:**
  - The conclave highlights opportunities for **collaborative port development**, **regional maritime security**, and the creation of **efficient maritime infrastructure** across the **Bay of Bengal** region.
- **Role of India:**
  - **India** plays a crucial role in strengthening **BIMSTEC**'s regional influence, particularly in the areas of **ports development**, **logistics**, and **maritime trade**, aligning with its broader **Act East Policy**.

4. Conclusion:

- The **BIMSTEC Ports Conclave** stands as a key initiative to **foster regional cooperation** and **economic integration** in the **Bay of Bengal region**, with a focus on sustainable development in the maritime sector.
- **BIMSTEC** continues to serve as a strategic platform for enhancing **India's connectivity** with its **South-East Asian neighbors**, promoting regional trade, security, and growth.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the role of **BIMSTEC** in enhancing **regional cooperation** and connectivity between **South Asia** and **South-East Asia**. What is India's contribution to this regional forum?
- **Q2.** Analyze the significance of the **BIMSTEC Ports Conclave** in promoting **economic cooperation** and **maritime development**. How does it align with India's **Act East Policy**?

General Studies Paper III:

- **Q3.** Evaluate the potential of **BIMSTEC** as a platform for addressing **regional security challenges** and **infrastructure development**. How can it contribute to **sustainable economic growth** in the **Bay of Bengal region**?

Cabo Delgado: A Region of Strategic and Environmental Significance

📌 **Syllabus Mapping:**

✅ **GS Paper II – International Relations**

- **Geopolitical Issues:** Understanding the **Cabo Delgado region** in the context of **global energy markets**, **insurgency** impacts, and **Mozambique's geopolitical position**.

✅ **GS Paper III – Environment**

- **Environmental Impact and Sustainability:** The potential **environmental risks** associated with **Liquefied Natural Gas (LNG) projects** and their impact on the global **carbon budget**.

1. Introduction

- **Cabo Delgado**, a northern province of **Mozambique**, has attracted significant attention due to **proposed LNG projects** and its ongoing **insurgency** issues since **2017**. Recent studies have highlighted that the **four proposed LNG projects** in this region could account for up to **17% of the world's remaining carbon budget**, raising concerns about environmental sustainability.

2. About Cabo Delgado

- **Location:**
  - Cabo Delgado is located in **Northern Mozambique**, **East Africa**, and is bordered by **Tanzania** to the north (through the **Rovuma river**) and the **Indian Ocean** to the east.
- **Population:**
  - The province has a **population** where **women** make up **51%** of the total population, highlighting the region's demographic balance.
- **Cultural Composition:**
  - **Cabo Delgado** is home to the **Makonde ethnic group**, known for their exceptional skills in **wood and ivory carving**, contributing to the region's **rich cultural heritage**.
- **Historical and Natural Significance:**
  - The **Quirimba Archipelago** and the **Quirimbas National Park** are key natural attractions in the region. Historically, the area was also a significant center for **slave trafficking** during the colonial era.

3. Environmental Concerns: Impact of LNG Projects

- **LNG Projects and Carbon Budget:**
  - The proposed **LNG projects** in Cabo Delgado have raised **environmental concerns** due to their potential to use up to **17% of the world's remaining carbon budget**. These projects, part of global energy initiatives, could contribute significantly to **greenhouse gas emissions**, impacting the **global climate**.
- **Environmental Impact:**
  - The focus on **Liquefied Natural Gas (LNG)** extraction, which involves intensive energy consumption and emissions, comes at a time when the world is striving to meet **climate targets** and reduce the carbon footprint. The scale of **these energy projects** poses a serious risk to the **global environment** and future generations.

4. Insurgency in Cabo Delgado

- **Conflict Background:**
  - Since **2017**, the Cabo Delgado region has been **plagued by an insurgency** involving Islamist militant groups, which has led to significant displacement of people and **regional instability**.
- **Impact on Development:**
  - The ongoing **conflict** complicates efforts to develop the region's **natural resources**, including its **gas reserves**, and hinders the **implementation** of large-scale infrastructure projects like the **LNG facilities**.

5. Conclusion:

- **Cabo Delgado** is at the crossroads of **energy development** and **environmental sustainability**. While the proposed **LNG projects** have the potential to contribute to Mozambique's economic growth, they also pose significant **environmental risks**. Coupled with

the **insurgency** and **regional instability**, the future of Cabo Delgado remains uncertain, balancing the need for **economic growth** with the imperative to safeguard the environment.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the geopolitical and environmental challenges faced by **Cabo Delgado** in Mozambique. How do the **LNG projects** and **insurgency** impact the region's stability and development?
- **Q2.** Analyze the implications of **Cabo Delgado's LNG projects** on the **global carbon budget**. What are the **environmental trade-offs** involved in such large-scale energy projects?

General Studies Paper III:

- **Q3.** How can **Africa's natural resource-rich regions** like **Cabo Delgado** balance **economic development** with the need to address **environmental concerns**? What role do **sustainable energy solutions** play in mitigating such challenges?

India Reaffirms Commitment to Justice for UN Peacekeepers

📌 **Syllabus Mapping:**

✅ **GS Paper II – International Relations**

- **Global Initiatives and Diplomacy:** India's role in **Group of Friends (GoF)** and its commitment to promoting **accountability** for crimes against **UN peacekeepers**.

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **United Nations and Multilateral Cooperation:** India's engagement with the **United Nations Alliance of Civilizations (UNAOC)** and its strategic role in **global peacekeeping**.

1. Introduction

- **India** has reaffirmed its commitment to ensuring **justice** for **crimes committed against UN peacekeepers** at the recent meeting of the **Group of Friends (GoF)**. This follows India's continued advocacy for **accountability** in situations where **UN peacekeepers** are subjected to **violence** during their missions.

2. About the Group of Friends (GoF)

- **Formation and Leadership:**
  - The **Group of Friends (GoF)** is **Indian-led** and was established to facilitate the promotion of **accountability**for crimes committed against **UN peacekeepers**. India's leadership in this initiative underscores its strong commitment to **peacekeeping operations** and ensuring **justice** for personnel involved in these missions.
- **Launch Year:**
  - The **GoF** was launched in **2022**, signaling a renewed focus on **UN peacekeepers' protection** and **accountability** within the **United Nations (UN)** framework.
- **Purpose and Goals:**
  - The primary goal of the **Group of Friends (GoF)** is to ensure that those responsible for crimes against **UN peacekeepers** are held accountable and brought to justice. This initiative seeks to raise awareness and push for stronger measures within the **UN system** to protect the rights and dignity of peacekeeping personnel.

3. Role in the United Nations Alliance of Civilizations (UNAOC)

- **UNAOC's Strategic Role:**
  - The **GoF** is a key driving force within the **United Nations Alliance of Civilizations (UNAOC)**, an initiative launched by the **UN** to foster mutual understanding and respect among cultures, religions, and civilizations.
- **Strategic Planning and Implementation:**
  - As part of the UNAOC, the **GoF** plays an important role in **strategic planning** and **implementation**processes, aiming to improve peacekeeping efforts, prevent violence, and enhance **global security**.

4. India's Advocacy for UN Peacekeepers

- **Peacekeepers' Protection and Accountability:**

- India has been an active advocate for the safety and protection of **UN peacekeepers**, especially those who risk their lives in conflict zones to maintain **peace** and **security**. The **GoF** works to ensure that peacekeepers receive **justice** for any violence committed against them during missions.

- **Global Leadership in Peacekeeping:**
  - India's leadership in **GoF** reflects its broader role as a global **champion of peacekeeping operations**. India continues to contribute significantly to **UN peacekeeping missions** and supports the **international community's efforts** to ensure that peacekeepers are protected and their missions remain effective.

5. Conclusion:

- The **Group of Friends (GoF)** initiative underscores **India's commitment** to protecting the interests of **UN peacekeepers** and ensuring **accountability** for crimes committed against them. Through its leadership in this initiative, India continues to play a pivotal role in strengthening **global peacekeeping efforts** and fostering **international cooperation**.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the significance of the **Group of Friends (GoF)** initiative in promoting **accountability** for crimes committed against **UN peacekeepers**. How does India's leadership in this initiative contribute to **global peacekeeping efforts**?
- **Q2.** Analyze the role of the **United Nations Alliance of Civilizations (UNAOC)** in fostering **global peace** and **mutual understanding**. How does the **Group of Friends (GoF)** align with the UNAOC's objectives?

General Studies Paper II – International Relations:

- **Q3.** Evaluate the role of **India** in shaping the future of **UN peacekeeping missions**. What are the **key challenges** in ensuring the safety and protection of **UN peacekeepers** in conflict zones?

SECURITY & DEFENCE

West Bengal Delivers First Conviction in Digital Arrest Scam

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Cybersecurity and Crime Control:** The role of **Indian authorities** and **cybercrime coordination centers** like **I4C** in combating **cyber fraud** and **digital arrest scams**.

✅ **GS Paper II – Social Justice**

- **Cybercrime Prevention:** How **digital frauds** like **Digital Arrest scams** target vulnerable citizens and the measures taken by the **state and central authorities** to protect them.

1. Introduction

- **West Bengal** has successfully secured its **first conviction** in a **digital arrest scam**, where a gang had scammed over **₹100 crore** from more than **100 victims** through a **fraudulent scheme** involving **intimidation and fear tactics**.

2. What is Digital Arrest?

- **Digital Arrest Scam:**
  - The **Digital Arrest** scam is a form of **cyber fraud** designed to **extort money** from victims by **creating panic**. The scam works by scaring victims with fake claims that they are under investigation for serious **criminal activities** like **identity theft** or **money laundering**.
- **Method:**
  - The fraudsters reach out via **phone calls**, **emails**, or **text messages** claiming the victim is under **investigation**. They threaten **arrest** unless the victim transfers large sums of money to **fake accounts** to "clear their name" or pay **security deposits**.
- **Tactics Used:**
  - Scammers use **threats and pressure** to prevent victims from thinking logically and assessing the situation, leading them to transfer **large amounts of money** to criminals.

3. Administrative Aspects of Digital Fraud Control

- **Role of the State:**
  - As per the **Seventh Schedule of the Constitution of India**, **Police** and **Public Order** are state subjects, meaning **state governments** are primarily responsible for preventing and addressing such **cybercrimes**.
- **Role of the Centre:**
  - The **Central Government** supplements state efforts through **advisories**, **financial assistance**, and **capacity-building schemes** aimed at strengthening local law enforcement's ability to deal with cybercrimes.

4. Measures Taken to Combat Digital Arrest Scams

- **I4C (Indian Cyber Crime Coordination Centre):**
  - The **Ministry of Home Affairs** established **I4C** as the **central coordinating body** to tackle **cybercrimes**. It works in collaboration with other agencies to create a comprehensive **cybercrime control** framework.
- **Cyber Fraud Mitigation Centre (CFMC):**
  - Set up at **I4C**, this center facilitates collaboration between **banks**, **telecom providers**, and **law enforcement**to prevent and respond to **cyber fraud** incidents.
- **Samanvaya Platform:**
  - A **data repository** and **coordination system** for **interstate crime linkages**, this platform helps connect **cybercrime cases** across **states and union territories**, enhancing **interstate cooperation** in tackling digital frauds.
- **Suspect Registry:**
  - Launched in collaboration with **banks**, this registry tracks **cybercriminal identifiers** to monitor and prevent future crimes by known offenders.
- **New Reporting Features:**
  - A **new feature** on the official **cybercrime.gov.in** portal allows citizens to **search criminal databases**, and **report suspected cybercrimes** efficiently.

5. CERT-IN Guidelines for Citizens

- **Prevention Tips from CERT-IN:**
  1. **Verify the Caller's Identity:** Always **verify the identity** of the caller or sender, particularly when dealing with suspicious financial transactions.
  2. **Stay Calm:** Don't panic under pressure. Take time to assess the situation.
  3. **Avoid Sharing Personal Information:** Do not share **sensitive personal details** over the phone or through **messages**.
  4. **Do Not Share Devices:** Never allow strangers to access or control your **personal devices**.

6. Conclusion:

- The **conviction in West Bengal** is a significant step in addressing the growing threat of **digital arrest scams** in India. With increasing instances of **cybercrimes**, **cybersecurity frameworks** such as **I4C**, **Samanvaya**, and **CFMC** are playing crucial roles in **mitigating cyber frauds** and ensuring a safer digital environment for citizens.

UPSC Mains Questions:

General Studies Paper II – Governance, Constitution, Polity, and International Relations:

- **Q1.** Discuss the growing challenge of **digital arrest scams** in India. How have **Indian authorities** responded to this new form of **cybercrime** through initiatives like **I4C**, **CFMC**, and **Samanvaya**?
- **Q2.** Explain the **role of the central and state governments** in combating **cyber fraud**. How does the **Seventh Schedule of the Constitution** delineate responsibilities in the **prevention of cybercrimes**?

General Studies Paper III – Security:

- **Q3.** With increasing instances of **cybercrime**, how effective are the **CERT-IN guidelines** in preventing **cyber frauds**? Discuss the importance of **cyber awareness** and **self-protection** in the digital age.

General Studies Paper II – Social Justice:

- **Q4.** In light of the recent **conviction in the Digital Arrest scam**, discuss the socio-economic implications of **cyber frauds** on vulnerable populations. How can **cybercrime prevention** mechanisms help in **protecting vulnerable citizens**?

India to Participate in 32nd SIMBEX Exercise with Singapore Navy

📌 **Syllabus Mapping:**

✅ **GS Paper II – International Relations**

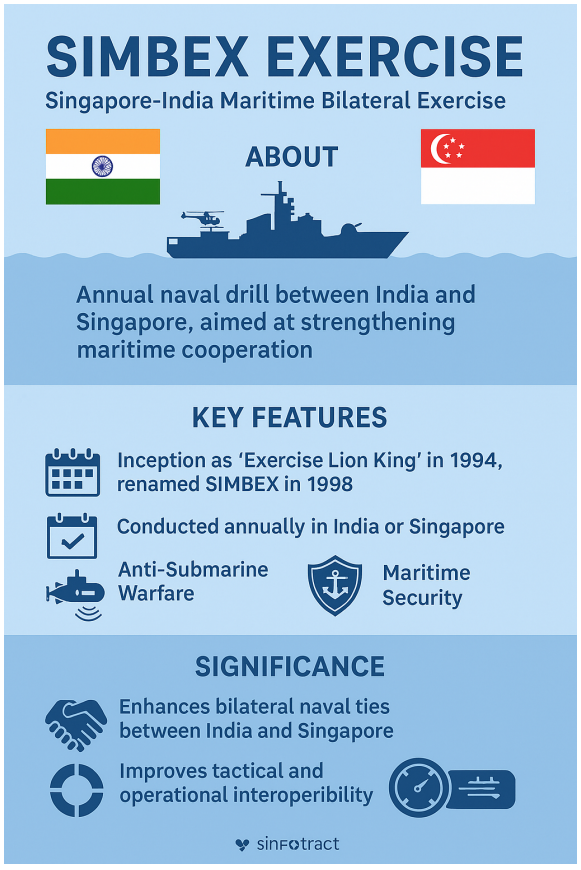
- **Bilateral Exercises and Maritime Diplomacy:** The **SIMBEX Exercise** as an important component of **India-Singapore naval cooperation** and **India's Act East Policy**.

✅ **GS Paper III – Security**

- **Maritime Security:** The role of **SIMBEX** in strengthening **maritime security** in the **Indian Ocean Region** and its alignment with **India's Vision SAGAR**.

1. Introduction

- The **Indian Navy** is set to participate in the **32nd Singapore-India Maritime Bilateral Exercise (SIMBEX)**, scheduled to take place in **Singapore**. The exercise is part of a long-standing annual partnership between the **Indian Navy** and the **Republic of Singapore Navy**.



2. About the SIMBEX Exercise

- **Genesis and History:**
  - The exercise, initially called **Exercise Lion King**, began in **1994** as a bilateral maritime drill between the **Indian Navy** and the **Republic of Singapore Navy**. It has evolved into one of the longest uninterrupted maritime drills for India, fostering greater naval cooperation and strategic alignment between the two nations.
- **Nature of the Exercise:**
  - SIMBEX is an **annual** and **comprehensive maritime exercise** designed to strengthen naval cooperation, improve interoperability, and enhance maritime security. The exercise involves **complex naval drills**, including **anti-submarine warfare**, **surface warfare**, and **air defence** exercises, with a focus on promoting **cooperation** and **trust** between the two navies.
- **Key Features of SIMBEX:**
  - **Comprehensive Maritime Drills:** The exercise covers a wide range of **maritime operations**, including **anti-submarine warfare**, **surface warfare**, and **air defence** operations.
  - **Interoperability:** It aims to improve the **interoperability** of both the **Indian Navy** and **Republic of Singapore Navy**, ensuring coordinated action in regional security scenarios.
  - **Regular Engagement:** SIMBEX serves as an enduring symbol of the **strong naval partnership** between India and Singapore, and is one of the **longest uninterrupted maritime exercises** conducted by India.

3. Alignment with India's Strategic Vision

- **Vision SAGAR:**
  - The exercise aligns with India's **Vision SAGAR (Security and Growth for All in the Region)**, which emphasizes **maritime security** and the promotion of **peace and stability** in the **Indian Ocean Region (IOR)**.
- **Act East Policy:**
  - SIMBEX reflects India's commitment to its **Act East Policy**, which aims to strengthen ties with **East and Southeast Asian countries**. By enhancing naval cooperation with Singapore, India not only strengthens bilateral relations but also ensures its strategic presence in the Indo-Pacific region.

4. Significance of SIMBEX for India-Singapore Relations

- **Strengthening Bilateral Relations:**
  - The **32nd SIMBEX exercise** reinforces the deepening **defence cooperation** between India and Singapore, supporting both countries' shared goals of **regional peace** and **stability**. The long-standing exercise serves as a testament to the **enduring partnership** between the two nations, both of which are vital players in the **Indo-Pacific**.
- **Regional Maritime Security:**
  - By participating in SIMBEX, India and Singapore further enhance their joint efforts in **maritime security** in the **Indian Ocean Region**. The exercise plays a critical role in **deterrence against maritime threats** and ensures **freedom of navigation** in the region.

5. Conclusion:

- The **32nd SIMBEX Exercise** marks another milestone in the growing **maritime cooperation** between India and Singapore. Through this annual exercise, both navies strengthen their ability to operate together in the face of evolving maritime challenges and underscore their commitment to promoting **security**, **growth**, and **peace** in the **Indo-Pacific** region.

UPSC Mains Questions:

General Studies Paper II – International Relations:

- **Q1.** Discuss the significance of the **SIMBEX exercise** between India and Singapore in enhancing **maritime security** and promoting **strategic cooperation**. How does it align with India's **Act East Policy** and **Vision SAGAR**?
- **Q2.** How does the **SIMBEX exercise** contribute to **India's naval diplomacy** in the **Indo-Pacific region**? What role do such bilateral exercises play in ensuring **regional stability**?

General Studies Paper III – Security:

- **Q3.** What is the strategic importance of **maritime exercises** like **SIMBEX** for **India's national security**? Discuss the implications of such exercises for **interoperability** and **joint operations** between **Indian Navy** and **foreign naval forces**.

India Receives Second GE-F404 Engine for LCA Mark-1A

📌 **Syllabus Mapping:**

✅ **GS Paper III – Science and Technology**

- **Defense Technology and Development:** The role of **LCA Mark-1A** in advancing **India's indigenous fighter aircraft capabilities** and the significance of the **GE-F404 engine**.

✅ **GS Paper III – Economic Development**

- **Defense and Aerospace Industry:** The impact of **LCA Tejas** and **LCA Mark-1A** on **India's defense self-reliance**and **military modernization**.

1. Introduction

- India has received the **second GE-F404 engine** from the **United States** for the **Light Combat Aircraft (LCA) Mark-1A** fighter jet programme.
- The LCA Mark-1A is the most **advanced version** of the indigenous **LCA Tejas**, marking a major step in strengthening **India's air combat capabilities**.

2. About LCA Mark-1A

- **Development and Upgrades:**
  - The **LCA Tejas** is a **4.5 generation** multirole, **all-weather fighter aircraft**, which has been designed and developed by **Hindustan Aeronautics Limited (HAL)**.
  - The **Mark-1A** variant is an **advanced version** with improved **combat effectiveness**, making it a highly capable asset for the **Indian Air Force**.
- **Key Features of LCA Mark-1A:**
  - **Multi-Role Capability:**
    - LCA Tejas is designed for a wide range of operations including **offensive air support**, **close combat**, **ground attack**, and **ground maritime operations**.
  - **Advanced Technology Integration:**
    - The **LCA Mark-1A** is equipped with state-of-the-art technologies, such as:
      - **AESA Radar** (Active Electronically Scanned Array Radar) for enhanced detection and tracking capabilities.
      - **Electronic Warfare (EW) Suite**, including radar warning and self-protection jamming systems.
      - **Digital Map Generator (DMG)** for effective navigation and mission planning.
      - **Smart Multi-function Displays (SMFD)** that enhance situational awareness for the pilot.
- **Engine and Power:**
  - The **GE-F404 engine** is a critical component of the **LCA Mark-1A**, providing the necessary power for superior performance in combat scenarios.
  - The engine is produced in collaboration with **General Electric** and is crucial for improving the aircraft's overall efficiency and reliability.

3. Significance of the LCA Mark-1A for India's Defense

- **Indigenous Development:**
  - The **LCA Mark-1A** is a significant step towards **self-reliance** in defense technology for India, as it enhances **India's capability** to produce **advanced fighter aircraft** in-house.
- **Enhanced Combat Capability:**
  - The inclusion of **modern technologies**, like **AESA radar** and **EW systems**, significantly boosts the **operational effectiveness** of the aircraft, enabling it to perform a wide range of **combat missions** with greater precision and safety.
- **Strategic Importance:**

- The **LCA Mark-1A** will strengthen India's **aerial defense capabilities** and provide the Indian Air Force with an advanced and versatile fighter jet to face emerging security challenges.

4. Conclusion:

- The delivery of the **second GE-F404 engine** marks a milestone in the **LCA Mark-1A** fighter jet programme, taking India a step closer to **indigenous defense capabilities**. The continued development and deployment of this **advanced fighter aircraft** will significantly enhance India's **air superiority** and **military self-reliance**.

UPSC Mains Questions:

General Studies Paper III:

- **Q1.** Discuss the significance of the **LCA Mark-1A** in strengthening India's **air defense capabilities**. How does it contribute to India's **military self-reliance** and **defense modernization**?
- **Q2.** Evaluate the technological advancements in the **LCA Mark-1A**, such as the **AESA Radar** and **Electronic Warfare (EW) suite**. How do these features enhance the **operational effectiveness** of the aircraft?

General Studies Paper III – Technology:

- **Q3.** Explain the role of **GE-F404 engine** in the **LCA Mark-1A** programme. How does it contribute to the aircraft's **performance** and **efficiency** in combat scenarios?

India Tests Akash Prime in Ladakh at High Altitudes

📌 **Syllabus Mapping:**

✅ **GS Paper III – Science and Technology**

- **Defence Technologies:** The development of **Akash Prime**, an advanced **Surface-to-Air Missile (SAM)** system, and its strategic importance in India's defence capabilities.

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **National Security and Defence Policies:** The role of **indigenous missile systems** in strengthening **India's security infrastructure**, especially in **high-altitude regions** like **Ladakh**.

1. Introduction

- **India's Defence Research and Development Organisation (DRDO)** has successfully tested the **Akash Prime**missile system, destroying two **Aerial High-Speed Unmanned Targets** at a **high-altitude** location in **Ladakh**. This test highlights the missile's capability to operate in **extreme conditions** and **defend India's borders** in challenging terrains.

2. About Akash Prime

- **Development and Purpose:**
  - **Akash Prime** is an enhanced version of the **indigenous Akash Surface-to-Air Missile (SAM)** system, developed by **DRDO** to meet the **high-altitude** and **rugged terrain** needs of India's defence forces.
- **Capabilities:**
  - The **Akash Prime** missile is designed to target and destroy enemy **aerial threats**, including **high-speed unmanned aerial vehicles (UAVs)**, **fighter jets**, and **missile threats**.
- **Unique Features of Akash Prime:**
  - **High-Altitude Operation:** The missile system is specifically designed to perform in **extreme weather conditions**, particularly in **cold areas** like **Ladakh**. It can operate efficiently at altitudes above **4500 meters**, where **oxygen levels are low**, making it ideal for **mountainous regions**.
  - **Rugged Design:** The system is built to endure the **tough environmental conditions**, including **cold weather**, **high-altitude**, and **low-oxygen environments**, making it suitable for deployment in regions like **Ladakh** and **other border areas**.

3. Strategic Importance of Akash Prime

- **Enhanced Defence Capabilities:**
  - The successful test of **Akash Prime** in **Ladakh** demonstrates India's growing ability to defend its **northern borders**, especially in regions prone to security threats. The **Ladakh** region, which shares borders with **China**, is strategically important, and **Akash Prime** enhances **India's air defence** capabilities in this sensitive area.
- **Boost to Indigenous Defence Systems:**

- The **Akash Prime** missile is part of India's **Make in India** initiative, which aims to reduce reliance on foreign military hardware. Its successful test showcases India's growing indigenous capabilities in **advanced missile technology**, contributing to **self-reliance** in defence.

4. Conclusion:

- The successful destruction of **two aerial targets** at high altitudes in **Ladakh** underscores the **strategic significance**of **Akash Prime** in India's defence architecture. Its ability to function in extreme environments and defend against fast-moving aerial threats positions it as a critical component of India's **air defence** systems.

UPSC Mains Questions:

General Studies Paper III – Science and Technology:

- **Q1.** Discuss the development and strategic importance of the **Akash Prime** missile system in enhancing India's **air defence** capabilities. How does it improve the country's ability to protect its borders, especially in **high-altitude**regions?
- **Q2.** Evaluate the role of **indigenous defence systems** like **Akash Prime** in promoting **self-reliance** in India's **military capabilities**. What are the advantages of reducing dependence on foreign weaponry?

General Studies Paper II – Governance, Constitution, Polity, and International Relations:

- **Q3.** How do indigenous **missile systems** like **Akash Prime** strengthen India's **national security**? Discuss the importance of **defence cooperation** and the role of **DRDO** in enhancing India's technological and strategic edge.

General Studies Paper III – Economic Development:

- **Q4.** How can the development of **indigenous technologies** in the **defence sector** like **Akash Prime** contribute to **economic growth**? Discuss the **economic benefits** of investing in **indigenous defence R&D**.

India Approves Production of Next-Gen Netra MkII AWACS

📌 **Syllabus Mapping:**

✅ **GS Paper III – Technology, Economic Development, and Security**

- **Defense and Security:** The development and implications of the **Netra MkII** airborne early warning and control system (AWACS) in enhancing **national security** and **surveillance capabilities**.

✅ **GS Paper II – International Relations**

- **Military Technology and Diplomacy:** The role of advanced **airborne surveillance systems** like **Netra MkII** in **strengthening defense alliances** and ensuring **strategic security** in **India's defense policy**.

1. Introduction

- The **Government of India** has approved the production of the **Netra MkII**, the next-generation **Airborne Early Warning and Control System (AWACS)**. This system is a key component of India's defense modernization plan, designed to significantly enhance the country's **air surveillance** and **vigilance** capabilities.

2. About Netra MkII

- **Platform:**
  - The **Netra MkII** will be mounted on the **Airbus A321** platform, an effective and versatile base aircraft that allows for a larger and more capable radar system.
- **Features and Capabilities:**
  - **Threat Detection:** The system is equipped to **detect, track, and monitor threats** over vast distances, improving **early-warning capabilities** and **situational awareness**.
  - **Flying Command Centre:** The **Netra MkII** is much more than an aircraft; it serves as a **flying command center** that can manage operations from the air, extending **national vigilance** far beyond terrestrial limitations.
  - **Active Electronically Scanned Array (AESA) Radar:** The **AESA radar** is one of the core components of the **Netra MkII**, providing superior capabilities in detecting and tracking multiple targets in all weather conditions.
  - **Mission Control Systems:** The mission control systems on board the aircraft will allow for efficient coordination, decision-making, and execution of operations, making it a **highly integrated system** for command and control.

3. Strategic Significance of Netra MkII

- **Enhanced Surveillance and National Security:**
  - The **Netra MkII** will significantly improve India's ability to monitor **airspace** and **border regions**, providing critical early warnings about potential threats. This includes the detection of **hostile aircraft**, **missiles**, and other airborne threats, particularly in **strategically sensitive areas**.
- **Capability to Manage Complex Operations:**
  - The **Netra MkII** will act as a **command center**, capable of **coordinating operations** across multiple units, such as **fighter jets**, **drones**, and **ground forces**. This makes it a key asset in **military operations**, particularly in **high-intensity conflicts**.
- **Operational Flexibility and Reach:**
  - Mounted on the **Airbus A321**, the system benefits from a **large and flexible platform** that provides ample space for additional mission equipment, ensuring operational flexibility and greater **coverage area**.

4. Key Technologies in Netra MkII

- **Active Electronically Scanned Array (AESA) Radar:**
  - The **AESA radar** is a cutting-edge technology that improves the system's **target detection** capabilities, providing better **range**, **resolution**, and the ability to track multiple targets simultaneously.
- **Mission Control Systems:**
  - The mission control systems allow the aircraft to not only detect and track threats but also to **respond effectively** to multiple threats simultaneously, acting as a **nerve center** for national defense operations.

5. Conclusion:

- The **Netra MkII AWACS** is a significant leap forward in enhancing **India's defense capabilities**. By providing a comprehensive **surveillance platform** and improving **national vigilance**, it strengthens India's ability to protect its airspace and respond to potential threats quickly and effectively.

UPSC Mains Questions:

General Studies Paper III – Technology, Economic Development, and Security:

- **Q1.** Discuss the significance of the **Netra MkII** Airborne Early Warning and Control System (AWACS) in enhancing **India's defense capabilities**. How does it contribute to **national security** and **strategic surveillance**?
- **Q2.** Explain the role of **Active Electronically Scanned Array (AESA) radar** in modern **airborne surveillance systems**. What are the operational advantages it offers over traditional radar systems?

General Studies Paper II – International Relations:

- **Q3.** How does the development of advanced **military technologies** like the **Netra MkII AWACS** help in strengthening **India's defense alliances** and improving **strategic security** in the region?

General Studies Paper II – Governance, Constitution, Polity, and International Relations:

- **Q4.** Discuss the implications of **modernization in defense technology**, such as the **Netra MkII**, for **India's defense policy** and its role in **regional security**.

ECONOMY

NITI Aayog Report on US Tariffs and India's Trade

📌 **Syllabus Mapping:**

✅ **GS Paper III – Economic Development**

- **Trade and Commerce:** The implications of the **US tariff regime** on **India's trade** and strategies for boosting **export competitiveness**.

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Trade Policy and International Relations:** Policy measures for enhancing **merchandise trade** and **service trade**with the **US** and other global partners.

1. Introduction

- **NITI Aayog** has released a **report** analyzing the implications of the **US tariff regime** on **India's trade**. The report outlines both the **challenges** and **opportunities** India faces in light of these tariffs and offers policy recommendations to enhance India's **export competitiveness**.

2. Implications of Current US Tariff Regime on India

- **Market Share Expansion:**
  - India is positioned to **gain market share** in **61% of its trade value** with the US. This gives India a **competitive edge** in sectors that are critical to the global supply chain.
- **Competitive Advantage:**
  - India gains a **tariff edge** over countries like **China**, **Mexico**, and **Canada** in key sectors such as:
    - **Nuclear reactors**
    - **Iron and steel**
    - **Textiles**
    - **Electricals**
    - **Vehicles**
- **Disadvantage:**
  - India faces a **slightly higher tariff** in some areas, with an **average tariff disadvantage** of around **1%** in certain sectors, putting India at a slight disadvantage in specific markets.
- **Opportunities:**
  - In high-value sectors like **electronics** and **nuclear reactors**, India has considerable opportunities to expand.
  - Labor-intensive sectors, such as **apparel** and **textiles**, also present significant growth potential.

3. Policy Measures to Boost India's Trade Competitiveness

- **For Merchandise Trade:**
  - **Enhancing Export Competitiveness:**
    - **Expand the PLI (Production-Linked Incentive)** Scheme to cover **labor-intensive sectors**, which could help India tap into sectors like textiles and apparel.
    - **Rationalize electricity tariffs** by reducing cross-subsidization, which will lower the production costs for exporters.
  - **Trade Facilitation and Market Access:**
    - Improve the **Authorized Economic Operator (AEO) Program**, which streamlines customs processes and enhances market access for Indian exporters.
    - Launch **targeted schemes under the Export Promotion Mission** to support specific sectors.
  - **Diversify Trade Partners and Agreements:**
    - **Become part of larger supply chains** by engaging in international **trade agreements** like the **India-EU FTA**.
    - **Jan Vishwas 2.0** aims to further liberalize trade, particularly in sectors that are crucial for export growth.
- **For Service Trade:**
  - **Negotiate Services-Focused FTAs:**
    - India should build on the **India-UK FTA model**, focusing on **service exports** such as IT and healthcare.
  - **Broaden Mutual Recognition Agreements (MRAs):**
    - These agreements will help expand **professional opportunities** in sectors like education, healthcare, and finance.
  - **Simplify Licensing and Regulatory Compliance:**
    - Resolve issues like **inconsistent data compliance** and **intellectual property concerns** to make it easier for service exports to thrive.
  - **Promote Innovation and Skill Development:**

- Invest in **upskilling** and **technology** to promote sectors like **digital health**, **fintech**, **cloud computing**, and **ed-tech**, which are crucial for future trade.

4. Conclusion:

- The **NITI Aayog report** provides a comprehensive framework for enhancing **India's export competitiveness** in both **merchandise and service trade**. While **US tariffs** present certain challenges, they also create substantial opportunities for India to expand its market share in critical sectors. Policy measures focusing on **export competitiveness**, **diversification of trade agreements**, and **innovation in services** will be key in achieving long-term growth.

UPSC Mains Questions:

General Studies Paper III:

- **Q1.** Analyze the implications of the **US tariff regime** on **India's trade**. What opportunities and challenges does India face in light of these tariffs?
- **Q2.** Discuss the policy measures recommended in the **NITI Aayog report** to enhance **India's export competitiveness**. How can these measures help India in diversifying its trade partners?

General Studies Paper II (International Relations):

- **Q3.** How can India use **free trade agreements (FTAs)**, such as the **India-EU FTA**, to improve its **trade relationships** and **market access**? What role does international cooperation play in boosting India's **service exports**?

India Achieves 50% of Electricity Capacity from Non-Fossil Fuels

📌 **Syllabus Mapping:**

✅ **GS Paper III – Economic Development**

- **Energy and Environment:** The shift towards **renewable energy** and its contribution to **India's energy security**and **climate goals**.

✅ **GS Paper III – Technology, Economic Development, and Security**

- **Renewable Energy Initiatives:** The role of government schemes like **PM Surya Ghar**, **PM-KUSUM**, and **PLI** in scaling up India's **renewable energy** capacity.

✅ **GS Paper II – International Relations**

- **Global Climate Leadership:** India's commitment to **Paris Agreement** and its role in **leading global clean energy transitions**.

1. Introduction

- **India** has achieved a significant milestone by reaching **50.08%** of its total **installed electricity capacity** from **non-fossil fuel sources**.
- With a total installed capacity of **484.82 GW**, India has met the target set under the **Paris Agreement**'s **Nationally Determined Contributions (NDCs)—five years ahead** of schedule.

2. Key Initiatives Behind India's Renewable Energy Growth

- **PM Surya Ghar Scheme:**
  - This initiative facilitated **7 lakh rooftop solar installations**, contributing to the growth of **solar energy capacity** in India.
- **PM-KUSUM Scheme:**
  - Solar-powered pumps have been provided to **farmers**, enabling **energy-secure agriculture** and contributing to rural electrification.
- **Manufacturing Expansion:**
  - The government has scaled up domestic production of **solar photovoltaic (PV)** and **wind turbine** systems through the **Production Linked Incentive (PLI)** schemes, encouraging **self-sufficiency** in renewable energy manufacturing.
- **Transmission Infrastructure Enhancement:**
  - Investments in **inter-state transmission systems** have facilitated the evacuation of renewable energy from **renewable-rich states** to other regions.
- **Green Energy Open Access Rules 2022:**
  - These rules promote **renewable energy access** for consumers, allowing them to source clean energy directly.
- **Foreign Direct Investment (FDI) Policy:**
  - India has allowed **100% FDI** under the **automatic route** in the **renewable energy sector**, boosting investments.
- **Viability Gap Funding (VGF):**
  - The **VGF scheme** supports the implementation of **offshore wind energy projects**, further diversifying India's renewable energy mix.

3. Significance of the Achievement

- **Global Climate Leadership:**
  - India has shown that **developing countries** can lead the transition to **clean energy** without sacrificing economic growth, fulfilling **Paris Agreement targets** ahead of time.
- **Reduced Import Dependence:**
  - India's growing renewable energy capacity reduces its dependence on imported fossil fuels, thus enhancing **energy sovereignty** and protecting against **global fuel price volatility**.
- **Diversified Energy Portfolio:**
  - The achievement contributes to a **resilient energy mix**, ensuring that India's energy supply is not solely reliant on **fossil fuels**, but diversified across **multiple renewable sources**.
- **Job Creation and Industrial Growth:**
  - The renewable energy sector has become a **massive source of employment**, with **industrial growth** across the value chain—from manufacturing to installation and maintenance.

4. Conclusion:

- India's achievement of **50% non-fossil fuel-based electricity capacity** is a testament to its commitment to **sustainable development** and **climate action**.
- The country's **renewable energy revolution**, driven by key initiatives and policies, is crucial not only for **energy security** but also for global leadership in **clean energy transition**.

UPSC Mains Questions:

General Studies Paper III:

- **Q1.** Discuss the significance of India's achievement of **50% electricity capacity** from **non-fossil fuel sources**. What role have government schemes like **PM Surya Ghar** and **PM-KUSUM** played in this success?
- **Q2.** Evaluate the economic, environmental, and strategic benefits of India's growing **renewable energy capacity**. How does this enhance **India's energy security** and **reduce dependence on fossil fuel imports**?

General Studies Paper II (International Relations):

- **Q3.** How does India's achievement in **renewable energy** contribute to its leadership role in **global climate negotiations** and its commitment to the **Paris Agreement**?
- **Q4.** Discuss the role of **Foreign Direct Investment (FDI)** and **Viability Gap Funding (VGF)** in accelerating India's transition to a **clean energy economy**.

ADEETIE Scheme Launched for Energy Efficiency in MSMEs

📌 **Syllabus Mapping:**

✅ **GS Paper III – Economic Development**

- **Energy Efficiency and Sustainability:** The role of the **ADEETIE scheme** in promoting **energy-efficient technologies** in **Micro, Small, and Medium Enterprises (MSMEs)**.

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Government Schemes:** The role of the **Ministry of Power** and **Bureau of Energy Efficiency (BEE)** in implementing **energy efficiency initiatives**.

1. Introduction

- The **Assistance in Deploying Energy Efficient Technologies in Industries & Establishments (ADEETIE) Scheme** has been launched by the **Ministry of Power**.
- The scheme aims to help **Micro, Small, and Medium Enterprises (MSMEs)** in India reduce their **energy consumption** by **30-50%**, improve their **power-to-product ratio**, and support the creation of **green energy corridors**.

2. About ADEETIE

- **Ministry**: The scheme is administered by the **Ministry of Power**, with implementation carried out by the **Bureau of Energy Efficiency (BEE)**.
- **Eligible Enterprises**:
  - **MSMEs** with **Udhyam ID** are eligible for the scheme.
  - These enterprises must demonstrate **10% energy savings** from the implemented technologies to qualify.

- **Scheme Duration**:
  - The scheme will run from **FY 2025-26 to FY 2027-28** (a 3-year duration).
- **Budgetary Outlay**:
  - The total funding allocated to the scheme is **₹1000 crore**.
- **Target Sectors**:
  - The scheme covers **14 energy-intensive sectors**, including **Brass**, **Bricks**, **Ceramics**, **Chemicals**, **Fishery**, and **Food Processing**.
- **Implementation Approach**:
  - The implementation will follow a **phased roll-out**:
    - **First Phase**: 60 industrial clusters will be covered.
    - **Second Phase**: An additional 100 clusters will be included.

3. Scheme Components

- **Interest Subvention**:
  - **Micro and Small Enterprises** will receive **5% interest subvention** on loans, and **Medium Enterprises** will receive **3% subvention.
- **Streamlined Project Implementation**:
  - The scheme will support **investment-grade energy audits** and the preparation of **Detailed Project Reports (DPRs)** for MSMEs.
- **Support Provided**:
  - **Technical handholding**, **financial incentives**, and **assistance in conducting energy audits** will be provided to MSMEs under the scheme.

4. About Bureau of Energy Efficiency (BEE)

- **Legislative Framework**:
  - The **Energy Conservation Act, 2001** provides the **legislative foundation** for BEE's operations.
- **Objective**:
  - The primary aim of **BEE** is to **reduce the energy intensity** of India's economy and promote energy efficiency across industries.
- **Other Initiatives for MSMEs**:
  - **BEE-SME Program**: Aimed at enhancing energy efficiency in MSMEs.
  - **National Programme on Energy Efficiency**: Focusing on technology upgradation in MSMEs.
  - **SIDHIEE Portal**: A **digital platform** providing information on energy efficiency to MSMEs.

5. Conclusion:

- The **ADEETIE Scheme** represents a significant step in improving the **energy efficiency** of **MSMEs** in India, offering financial and technical support to **reduce energy consumption**, improve productivity, and align with **sustainable development goals**. This initiative also supports **India's green energy transition** and enhances its economic competitiveness.

UPSC Mains Questions:

General Studies Paper III:

- **Q1.** Discuss the objectives and key components of the **ADEETIE scheme** launched by the **Ministry of Power**. How does it support **energy efficiency** in **MSMEs**?
- **Q2.** Evaluate the role of **Bureau of Energy Efficiency (BEE)** in promoting **sustainable industrial practices**. How do schemes like ADEETIE contribute to India's **energy conservation goals**?

General Studies Paper II (Governance):

- **Q3.** How does the **ADEETIE scheme** align with India's broader goals of **promoting green energy** and **reducing energy intensity**? Discuss its impact on **economic growth** and **environmental sustainability**.

CAFE Norms: Towards Sustainable Automobile Emissions

📌 **Syllabus Mapping:**

✅ **GS Paper III – Economic Development**

- **Environment and Sustainable Development:** The role of **CAFE norms** in **mitigating fuel consumption**, **reducing CO_2 emissions**, and promoting **sustainable energy use** in the **automobile industry**.

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Policies for Environmental Protection:** How the **Energy Conservation Act, 2001** and **CAFE norms** contribute to **India's climate action goals** and align with **global commitments** to **reduce air pollution**.

1. Introduction

- **Corporate Average Fuel Efficiency (CAFE)** norms have been established to regulate fuel consumption and emissions from the **automobile sector**. These norms aim to promote energy efficiency and environmental sustainability by reducing **CO_2 emissions** and **oil dependency**.

2. Overview of CAFE Norms

- **Initial Notification:**
  - **CAFE norms** were first notified in **2017**, under the **Energy Conservation Act, 2001**. The purpose of these norms is to create a standardized system for assessing fuel efficiency across vehicle categories.
- **Objective of CAFE Norms:**
  - The main aim is to reduce **fuel consumption** and **CO_2 emissions** from automobiles, contributing to reduced **oil dependency** and **air pollution**. The norms are designed to help achieve **environmental sustainability**and **energy security** for India.
- **How It Works:**
  - **CAFE norms** estimate fuel efficiency by averaging the **standard fuel consumption** of all vehicles sold in a given year. This **average efficiency** determines how well the manufacturers comply with the set standards.

3. Applicability of CAFE Norms

- **Vehicle Types Covered:**
  - The CAFE norms apply to **passenger vehicles** powered by various fuels, including **petrol**, **diesel**, **LPG**, **CNG**, **hybrids**, and **electric** vehicles.
  - The norms are applicable to **vehicles with gross vehicle weight (GVW) less than 3500kgs**.
- **Fuel Types Considered:**
  - The standards are not limited to traditional fuel-powered vehicles but also include **hybrids** and **electric vehicles**, making the CAFE norms inclusive of **emerging green technologies** in the automobile sector.

4. CAFE – III Norms for 2027-2032

- **CAFE III Norms:**
  - The **CAFE III** norms have been notified for the period **2027-2032**, which will be more stringent than previous norms, setting new targets for fuel efficiency and emission reductions in the automobile industry.
- **Impact on Manufacturers:**
  - These new norms have led to concerns from **automobile manufacturers**, some of whom argue that the **emission limits** prescribed under **CAFE III** could be too stringent, and they are advocating for **more relaxed limits**.

5. Conclusion:

- The **CAFE norms** are a crucial step in **reducing India's carbon footprint** and contributing to **global efforts to combat climate change**. While the automobile industry may face challenges in meeting the new targets, the move towards **greener and more fuel-efficient vehicles** is in line with **India's sustainable development goals**.

UPSC Mains Questions:

General Studies Paper III:

- **Q1.** Discuss the significance of **CAFE norms** in reducing **CO_2 emissions** and promoting **fuel efficiency** in India's **automobile sector**. How do these norms contribute to **environmental sustainability**?
- **Q2.** Evaluate the impact of **CAFE III norms** on the **automobile industry** in India. What challenges do manufacturers face in adhering to stricter **emission and fuel efficiency standards**?

General Studies Paper II (Governance):

- **Q3.** How do the **CAFE norms** align with **India's broader environmental goals** and **climate action commitments**? Discuss the **policy framework** needed to balance **industry interests** with **environmental objectives**.

Global Findex 2025: Digital & Financial Inclusion Achievements

📌 **Syllabus Mapping:**

✅ **GS Paper III – Economic Development**

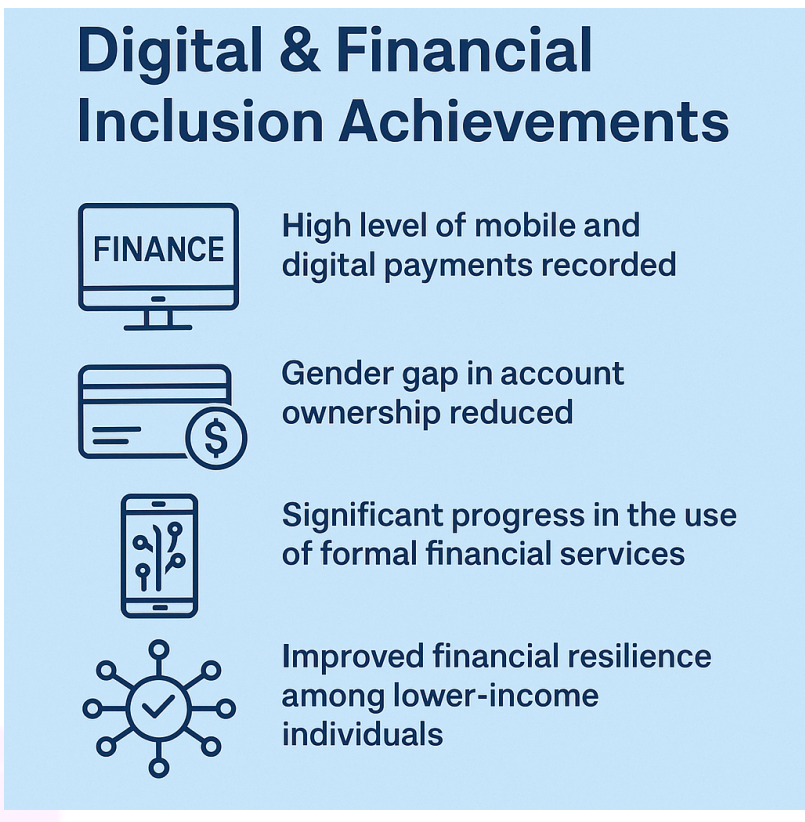
- **Financial Inclusion and Digital Economy:** India's progress in **financial inclusion** and the growing role of **digital financial services** as highlighted in the **Global Findex 2025** report.

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Digital Governance and Inclusion:** The role of **India's government policies** in enhancing **financial inclusion**, and addressing barriers such as **mobile ownership** and **network coverage**.

1. Introduction

- The **World Bank's Global Findex 2025** report has provided valuable insights into the state of **global financial and digital inclusion**. For India, the report reveals significant progress in the **access to financial accounts** and **digital services**, although some challenges persist.



2. India-Specific Highlights from Global Findex 2025

- **Account Ownership:**
  - India has achieved **account ownership** close to **90%**, reflecting a significant increase in the number of individuals who have access to formal financial accounts.
- **Inactive Accounts:**
  - The report highlights that **16% of account owners** in India do not have an **active account**, which is notably higher than the **4% average** for other **low- and middle-income economies**. This suggests a challenge in ensuring that accounts are **actively used** for **financial transactions**.
- **Gender Disparity in Account Use:**
  - The **share of both women and men** with only **inactive accounts** has decreased between **2021 and 2024**, indicating progress in **gender parity** and greater **active participation** in financial services.

3. Barriers to Mobile Phone Ownership and Financial Inclusion

- **Primary Barriers:**
  - Despite significant progress, there are still barriers to **mobile phone ownership**, which remains crucial for **digital financial inclusion**. The two key challenges highlighted in the report are:
    - **Cost of mobile devices**: A significant number of individuals, particularly in rural areas, face challenges in affording smartphones, which are essential for accessing digital financial services.
    - **Lack of reliable mobile network coverage**: In many regions, particularly remote areas, there is a lack of **reliable mobile network infrastructure**, which hinders the widespread use of **mobile banking** and **digital payments**.

4. Conclusion:

- The **Global Findex 2025** report underscores India's **remarkable progress** in **financial inclusion** and **digital access**, with nearly **90% account ownership**. However, the challenges of **inactive accounts**, **mobile ownership costs**, and **network coverage** still need attention to ensure broader, active participation in **digital financial systems**across the country.

UPSC Mains Questions:

General Studies Paper III – Economic Development:

- **Q1.** Discuss the key findings of the **Global Findex 2025** report with regard to **India's financial inclusion** and **digital economy**. How does it reflect the progress made and the challenges still faced?
- **Q2.** Evaluate the role of **digital financial services** in promoting **financial inclusion** in India. What are the barriers to **mobile phone ownership** and **network coverage** that affect **digital financial inclusion**?

General Studies Paper II – Governance, Constitution, Polity, and International Relations:

- **Q3.** How do **government initiatives** in India address the challenges of **inactive accounts** and **mobile phone ownership**? Discuss the role of **financial literacy** and **accessibility** in overcoming these barriers.

General Studies Paper II – Social Justice:

- **Q4.** What steps can be taken to address the **gender disparity** in financial inclusion in India, as highlighted by the **Global Findex 2025** report? Discuss the role of **women empowerment** in enhancing **digital financial participation**.

US Enacts Genius Act to Regulate Stablecoins

📌 **Syllabus Mapping:**

✅ **GS Paper III – Economic Development**

- **Cryptocurrency and Stablecoins:** The significance of stablecoins in the digital economy and the need for a **regulatory framework** to govern them.

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Regulation of Digital Assets:** Understanding how **stablecoins** fit into the global financial system and their regulation, both in the **US** and **India**.

1. Introduction

- The **Genius Act** has been enacted in the **United States** to establish a **regulatory framework** for the use of **stablecoins**, marking an important step toward regulating **digital currencies**. Stablecoins are a form of **cryptocurrency** whose value is linked to another asset, such as a **currency**, **commodity**, or **financial instrument**.

2. What Are Stablecoins?

- **Stablecoins Definition:**
  - Stablecoins are digital currencies designed to maintain a stable value, typically by being **pegged** to a **fiat currency** (like the **US dollar**) or another asset. For example, **Tether (USDT)** is a stablecoin whose value is linked to the **US dollar**.
- **Role of Stablecoins:**
  - They offer the **efficiency** of cryptocurrencies while maintaining **stability** in value, making them more reliable for **payments** and **transactions** than more volatile cryptocurrencies like **Bitcoin**.

3. How Do Cryptocurrencies Work?

- **Blockchain Technology:**
  - Cryptocurrencies are based on **blockchain**, a **distributed public ledger** that records all transactions made with a cryptocurrency. This ledger is updated and maintained by all **currency holders**.
- **Mining and Creation of Coins:**
  - Cryptocurrencies are created through **mining**, where computer power is used to solve complex **mathematical problems**, which **generate coins**. These coins can also be **purchased** from **brokers** and stored in **cryptographic wallets**.

4. Why Has the Use of Stablecoins Increased?

- **Stability Linked to Underlying Assets:**
  - The value of stablecoins is tied to an **underlying asset**, which allows them to maintain **steady value**. This makes stablecoins a more **reliable medium of exchange** compared to the **volatility** observed in other cryptocurrencies like **Bitcoin**.
- **Backing by Identifiable Issuers:**
  - Unlike many **unbacked cryptocurrencies**, stablecoins are **backed by identifiable issuers** such as **banks**, **nonbank financial entities**, or large **technology firms**, providing more security and confidence to users.
- **Governance and Regulation:**
  - Stablecoin **issuers** typically have a **governance body** that makes decisions regarding the operation and regulation of the stablecoin arrangements.

5. Regulation of Cryptocurrency in India

- **Unregulated Status in India:**
  - **Cryptocurrency** and **crypto assets** are currently **unregulated** in India. However, the **Indian government**has introduced measures to regulate the **taxation** of **Virtual Digital Assets (VDAs)**, including **stablecoins**and **cryptocurrencies**.
- **Taxation Framework:**
  - In 2022, the **Finance Act** introduced a **30% tax** on capital gains from **VDAs**. The **Income Tax Act, 1961**defines **VDAs** as any **code, token, or number** generated via **cryptographic means** and traded electronically.
- **Money Laundering Regulation:**
  - In 2023, **Virtual Digital Assets** were brought under the purview of the **Prevention of Money-Laundering Act (PMLA), 2002**, requiring cryptocurrency exchanges to follow anti-money laundering (AML) procedures.

6. Conclusion:

- The **Genius Act** is a significant step in regulating the **use** and **issuance** of **stablecoins** in the **US**, which aims to bring more **transparency** and **security** to digital financial transactions. In India, while cryptocurrency regulation is still in the works, efforts like taxation and AML regulations are helping lay the foundation for future frameworks to manage **cryptocurrencies** and **stablecoins** effectively.

UPSC Mains Questions:

General Studies Paper III – Economic Development:

- **Q1.** What are **stablecoins**, and how do they differ from traditional cryptocurrencies like **Bitcoin**? Discuss the potential benefits and risks of **stablecoins** in the context of the **digital economy**.
- **Q2.** Explain the significance of the **Genius Act** in regulating **stablecoins**. How can a **regulated framework** for stablecoins improve **financial stability** and **payments efficiency**?

General Studies Paper II – Governance, Constitution, Polity, and International Relations:

- **Q3.** Analyze the role of **governments and regulatory bodies** in managing **cryptocurrencies** and **stablecoins**. Discuss the **regulatory framework** of digital assets in **India** and the **United States**.

General Studies Paper III – Security:

- **Q4.** With the increasing use of **stablecoins** and **cryptocurrencies**, what measures should be taken to ensure **cybersecurity** and **protect against fraud** in the **digital financial market**?

Labour Bureau Revises CPI Base Year for Agricultural Labourers

📌 **Syllabus Mapping:**

✅ **GS Paper III – Economic Development**

- **Inflation and Price Indices:** The role of **Consumer Price Index (CPI)** in measuring **price fluctuations** and understanding the **economic condition** of agricultural and rural labourers.

✅ **GS Paper II – Social Justice**

- **Labour Welfare and Economic Justice:** How the revision of the **CPI-AL & RL** base year contributes to **labour welfare**, and the impact on **rural development** and **inflation management**.

1. Introduction

- The **Labour Bureau** has revised the **base year** for the **Consumer Price Index Numbers for Agricultural Labourers and Rural Labourers (CPI-AL & RL)** to **2019=100**. This revision replaces the earlier **CPI-AL/RL**base year of **1986-87=100**, marking a significant step toward aligning the index with current economic realities.

2. What is the CPI-AL & RL?

- **Consumer Price Index (CPI)** measures the **changes in the general level of prices** of goods and services over time that households acquire for consumption.
- **CPI-AL & RL** specifically focuses on the **price level changes** for agricultural and rural labourers. It tracks the changes in prices of the essential goods and services consumed by these workers, providing insights into their **purchasing power** and overall **economic well-being**.

3. Definitions:

- **Agricultural Labourer:**
  - A person who is employed in **agricultural occupations** on a **hire** basis (paid either in cash or kind, or partly in both). Agricultural labourers often perform tasks such as **ploughing**, **harvesting**, and **irrigation**.
- **Rural Labourer:**
  - A rural labourer is someone engaged in **manual work** in **rural areas**, either in **agricultural** or **non-agricultural** occupations, and receives **wages** in **cash**, **kind**, or a combination of both. This includes work such as **construction**, **transportation**, and **craftsmanship**.

4. Revision of Base Year

- **Why the Revision?**
  - The **revised base year (2019=100)** reflects **current market conditions** and consumption patterns, providing more accurate data on price changes and cost of living for agricultural and rural labourers. The **previous base year** of **1986-87** was outdated and did not accurately represent current economic dynamics.
- **Implications of the Revision:**
  - This change will make the **CPI-AL & RL** more relevant and reflective of today's economic realities, helping policymakers, economists, and researchers analyze the **economic conditions** of these **vulnerable worker groups** more effectively.

5. Significance of CPI-AL & RL

- **Tracking Inflation:**
  - The **CPI-AL & RL** is a key tool in measuring **inflation** that affects the **purchasing power** of rural and agricultural labourers. A rise in CPI indicates that the prices of essential goods have gone up, leading to increased living costs for these workers.
- **Policy Formulation:**
  - The revised index helps the government make **informed decisions** related to **welfare schemes**, **minimum wage policies**, and **rural development programs**. It also aids in **monitoring economic growth** and determining the **impact of inflation** on the poorest sections of society.
- **Improving Labour Welfare:**
  - The data provided by the **CPI-AL & RL** will be used to enhance **labour welfare schemes** such as those targeting **poverty alleviation**, **healthcare**, and **education** for rural workers.

6. Conclusion:

- The revision of the **CPI-AL & RL** base year is an essential step towards better **economic monitoring** and **policy intervention**. By providing a more accurate reflection of the economic conditions of agricultural and rural labourers, this change will support the government's efforts in promoting **economic justice** and **rural development**.

UPSC Mains Questions:

General Studies Paper III – Economic Development:

- **Q1.** Explain the significance of the **Consumer Price Index (CPI)** for **Agricultural Labourers** and **Rural Labourers (CPI-AL & RL)** in measuring the economic conditions of rural workers. How does the **revision of base year** to **2019** improve its accuracy?
- **Q2.** Discuss the role of the **CPI-AL & RL** in shaping **rural welfare policies** and **minimum wage regulations**. How can it be used as a tool for **monitoring inflation** in rural economies?

General Studies Paper II – Social Justice:

- **Q3.** Evaluate the impact of **inflation** on **agricultural and rural labourers** in India. How does **CPI-AL & RL** help in understanding the **economic vulnerabilities** of these workers?

General Studies Paper III – Economic Development:

- **Q4.** What are the challenges and opportunities in **revising the base year** for **CPI-AL & RL**? Discuss how this revision can aid in **economic policy formulation** for rural development.

AGRICULTURE

India to Launch Weather Derivatives for Agricultural Risk Mitigation

📌 **Syllabus Mapping:**

✅ **GS Paper III – Technology, Economic Development, and Security**

- **Agriculture and Technology:** Weather derivatives as a **tool for risk management** in agriculture.

✅ **GS Paper III – Economic Development**

- **Financial Instruments and Market Development:** Introduction of **weather derivatives** in India and their potential impact on **economic development**.

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Policy and Governance in Agriculture:** Role of **India Meteorological Department (IMD)** and **National Commodity and Derivatives Exchange Ltd (NCDEX)** in facilitating **weather-based financial products**.

1. Introduction

- **India** is set to launch its **first weather derivatives**, in partnership with the **National Commodity and Derivatives Exchange Ltd (NCDEX)** and the **India Meteorological Department (IMD)**.
- These **rainfall-based derivative products** will help **farmers** and other sectors hedge against **climatic risks** such as **irregular rainfall**, **heatwaves**, and **unseasonal weather patterns**.

2. Objective and Benefits of Weather Derivatives

- **Risk Mitigation for Farmers:**
  - These financial instruments are designed to **reduce risk** for farmers who face **uncertainty in weather patterns**, especially in relation to **rainfall** and **temperature**.
- **Backed by Data:**
  - The derivatives will be **location-specific** and **seasonal**, using **historical** and **real-time weather data** from the IMD. These data-driven contracts will be supported by **statistically verified datasets**.
- **Hedging for Allied Sectors:**
  - In addition to farmers, other sectors such as **farming-related industries** can also use these products to **hedge against weather-related financial risks**.

3. About Weather Derivatives

- **Definition and Mechanism:**
  - Unlike traditional financial derivatives that are based on **assets** (stocks, commodities, etc.), **weather derivatives** are based on **meteorological parameters** such as **rainfall** and **temperature**. These parameters form the underlying asset and are tied to a **predefined weather index**.
- **Market Characteristics:**
  - Weather derivatives do not have **inherent market value**. As such, they are considered a **part of an incomplete market**, and their pricing is influenced by **weather-related uncertainties**.
- **Global Precedent:**
  - **Over-the-counter trading** in weather derivatives began in the **1990s** globally. India's move marks its first significant step in introducing these **innovative financial products**.

4. Conclusion:

- The launch of **weather derivatives** in India is a significant step towards introducing **innovative risk management tools** in the agricultural sector.
- These financial products will not only help **farmers** but also bolster the resilience of other weather-sensitive sectors, providing a **mechanism for hedging against climatic uncertainties**.

UPSC Mains Questions:

General Studies Paper III:

- **Q1.** Explain the concept of **weather derivatives**. How can they be used to **mitigate risks** in the **agricultural sector**? Discuss their potential impact on India's **agricultural economy**.
- **Q2.** Analyze the role of **NCDEX** and **IMD** in the development of **weather-based financial products**. What are the **challenges** and **benefits** of introducing weather derivatives in India?

General Studies Paper III (Economic Development):

- **Q3.** Weather derivatives are an innovative financial tool for managing **climatic risks**. Discuss the advantages and limitations of using such **financial instruments** in **India's agricultural sector**.

India Signs DAP Fertiliser Agreement with Saudi Arabia

📌 **Syllabus Mapping:**

✅ **GS Paper III – Economic Development**

- **Agriculture and Food Security:** Importance of **fertilizer supply agreements** and **DAP** in supporting **India's agriculture**.

✅ **GS Paper III – Technology, Economic Development, and Security**

- **Fertilizer Technology and Agricultural Sustainability:** The role of **DAP** in enhancing agricultural productivity and its usage in **India**.

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Bilateral Agreements:** Significance of the **fertilizer supply agreement** between **India** and **Saudi Arabia** for **agricultural development**.

1. Introduction

- **Indian fertilizer companies** have signed an agreement with **Saudi Arabia** for the supply of **3.1 million metric tons (MT)** of **Diammonium Phosphate (DAP)** fertiliser annually for a period of **five years**.

2. About Diammonium Phosphate (DAP)

- **Composition and Function:**
  - **DAP** is a highly soluble fertiliser made of two essential macronutrients: **Phosphorus** and **Nitrogen**.
  - It plays a crucial role in the **development of new plant tissues** and in the **regulation of protein synthesis** in crops.
- **Widespread Use:**
  - **DAP** is the world's most widely used **phosphorus fertilizer** because of its **high solubility**, which allows it to dissolve quickly in the soil, making nutrients readily available to plants.
- **India's Role:**
  - India is the **largest agricultural consumer** of **DAP** in the world, underlining its importance in India's **agriculture sector**.

3. DAP Under the Nutrient-Based Subsidy (NBS) Scheme

- **Subsidy Mechanism:** Under the **Nutrient-Based Subsidy (NBS)** scheme, a **fixed yearly subsidy** is provided for **Phosphorus and Potassium (P&K) fertilizers** like **DAP**, which is based on the **nutrient content** in the fertiliser.

4. Additional Uses of DAP

- **Beyond Fertilisation: DAP** has various **other applications** beyond agriculture, such as being used as a **fire retardant** and in **metal finishing processes**.

5. Conclusion:

- The **agreement between India** and **Saudi Arabia** for the supply of **DAP** is significant for ensuring a steady supply of this essential fertiliser to meet India's agricultural needs.
- This collaboration also highlights India's **dependency on global trade** for key agricultural inputs, contributing to the **long-term sustainability** of the country's agriculture.

UPSC Mains Questions:

General Studies Paper III:

- **Q1.** Discuss the importance of **Diammonium Phosphate (DAP)** in Indian agriculture. How does the **India-Saudi Arabia agreement** support India's agricultural growth?
- **Q2.** Explain the role of **DAP** in crop development and its contribution to **soil fertility**. How does the **Nutrient-Based Subsidy (NBS)** scheme impact the use of such fertilizers in India?

General Studies Paper II:

- **Q3.** Evaluate the significance of **India's fertilizer supply agreements** with global partners like **Saudi Arabia**. What role do these agreements play in strengthening **India's agricultural sector**?

India Seeks to Regulate Nano-Fertilizers & Biostimulants

📌 **Syllabus Mapping:**

✅ **GS Paper III – Technology, Economic Development, and Security**

- **Agricultural Technology and Sustainability:** The role of **nano-fertilizers** and **biostimulants** in modern farming practices and their potential impact on **sustainable agriculture**.

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Agriculture Policy and Regulations:** The regulation of **nano-fertilizers** and **biostimulants** in India and the role of the **Union Ministry of Agriculture** in overseeing agricultural practices.

1. Introduction

- The **Union Minister of Agriculture** has instructed **Chief Ministers (CMs)** to immediately stop the **forced sale** of **nano-fertilizers** and **biostimulants** to farmers.
- This move follows concerns about the **mandatory sale** of these products and their impact on **farmers** and **sustainable farming practices**.

2. About Nano-Fertilizers and Biostimulants

- **Nano-Fertilizers:**
  - **Definition:** Nano-fertilizers are **nutrients encapsulated** or **coated** within nanomaterials that measure **100 nanometers** or less.
  - **Mechanism:** The use of **nanoparticles** helps control the **release of nutrients**, making them more **efficient**and potentially reducing the environmental impact of fertilizers.
- **Biostimulants:**
  - **Definition:** Biostimulants are substances and/or **microorganisms** that, when applied to plants or the **rhizosphere**, stimulate natural processes to improve **crop quality**, independently of their nutrient content.
  - **Popular Biostimulants:**
    - **Humic acids**
    - **Seaweed extracts**
    - **Liquid manure composting**
    - **Beneficial bacteria and fungi**

3. Concerns and Regulation

- The recent government directive emphasizes the need for **proper regulation** of these products, especially since their forced sale to farmers has raised concerns about **effectiveness**, **cost**, and **long-term impacts** on farming practices.
- While **nano-fertilizers** and **biostimulants** hold promise for **increasing efficiency** and improving **soil health**, **unregulated use** could lead to adverse effects, both on **crops** and the **environment**.

4. Conclusion:

- The **regulation** of **nano-fertilizers** and **biostimulants** is a significant step towards **sustainable agricultural practices**. Ensuring that these products are used correctly will enhance **crop productivity** while minimizing any negative environmental impact. The government's intervention in halting the forced sale ensures that farmers make informed decisions regarding their use.

UPSC Mains Questions:

General Studies Paper III:

- **Q1.** Discuss the benefits and challenges associated with the use of **nano-fertilizers** and **biostimulants** in Indian agriculture. How can proper regulation enhance **agricultural sustainability**?
- **Q2.** Evaluate the role of **biostimulants** in improving **crop quality** and **soil health**. What regulatory measures should be implemented to ensure their safe and effective use?

General Studies Paper II:

- **Q3.** Analyze the government's decision to stop the **forced sale** of **nano-fertilizers** and **biostimulants** to farmers. What are the potential **economic and social implications** of such a decision?

Cabinet Approves PMDDKY to Boost Agricultural Sectors

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Government Initiatives and Policies:** The role of **PMDDKY** in enhancing **agriculture** and **rural development**.

✅ **GS Paper III – Economic Development**

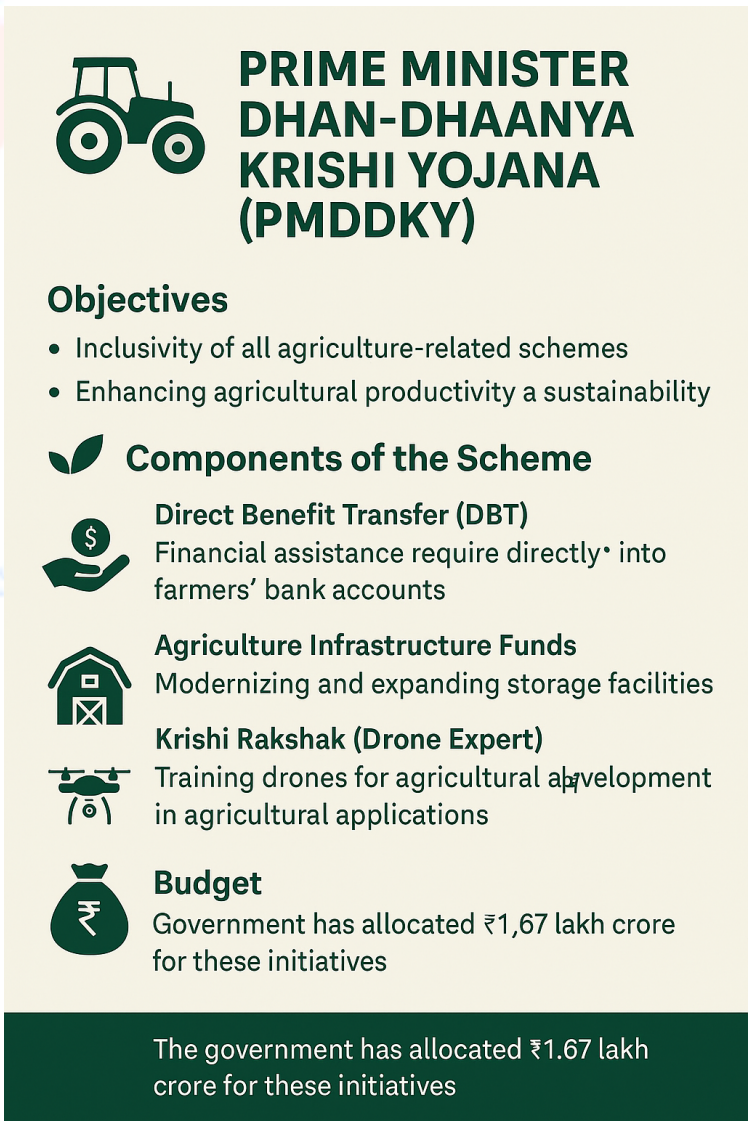
- **Agricultural and Rural Development:** The focus on **low-productivity districts** and the integration of **existing schemes** to improve **agricultural output**.

1. Introduction

- The **Cabinet** has approved the launch of the **Prime Minister Dhan-Dhaanya Krishi Yojana (PMDDKY)**, which is inspired by the **NITI Aayog's Aspirational District Programme (ADP)**.
- The scheme aims to boost agricultural and allied sectors in **underperforming districts**, with a special focus on improving productivity, credit disbursement, and agricultural infrastructure.

2. Key Features of the PMDDKY

- **Duration:** The scheme will be implemented for **six years**, starting from **2025-26**.
- **Coverage:** The scheme will target **100 districts**, primarily focusing on those with the lowest agricultural productivity and minimal credit access.
- **Sector Focus:** PMDDKY is exclusively designed to enhance the **agricultural and allied sectors**, such as **horticulture**, **livestock**, **fisheries**, and **food processing**, particularly in districts with low agricultural performance.



3. Implementation Strategy

- **Convergence of Schemes:**
  - The scheme will integrate **36 existing schemes** across **11 government departments**, along with state schemes and **private sector partnerships** to create a comprehensive development plan.
- **District Selection:**
  - Districts will be selected based on key factors like **low productivity**, **low cropping intensity**, and **less credit disbursement**.
  - A minimum of **one district** will be selected from each **state/UT**, with the number of districts in each state determined by the share of **Net Cropped Area** and **operational holdings**.

4. Governance and Monitoring

- **District, State, and National Committees:**
  - Committees will be formed at the **district**, **state**, and **national levels** to ensure effective **planning**, **implementation**, and **monitoring** of the scheme.
- **District Plans:**

  - Each district will have a dedicated **plan** developed by the **District Dhan-Dhaanya Samiti**, which will include inputs from **progressive farmers**. These plans will align with national goals like **crop diversification**, **soil and water conservation**, **self-sufficiency in agriculture**, and the promotion of **natural & organic farming**.
- **Monitoring:**
  - The progress of the scheme will be tracked through **117 key performance indicators**.
  - The **NITI Aayog** will review and guide the district-level plans to ensure they align with national agricultural development goals.

5. Conclusion:

- The **PMDDKY** aims to revolutionize agricultural practices in **underperforming districts**, enhancing the livelihood of **farmers**, improving productivity, and creating a **sustainable agricultural ecosystem**.
- By leveraging existing government initiatives and collaborating with the **private sector**, the scheme is expected to bring about **long-term improvements** in India's **agricultural landscape**.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the objectives and features of the **Prime Minister Dhan-Dhaanya Krishi Yojana (PMDDKY)**. How does it aim to transform **underperforming districts** in terms of **agriculture** and **rural development**?
- **Q2.** Analyze the role of **convergence of schemes** under **PMDDKY**. How does the integration of **existing schemes** with **private sector partnerships** contribute to **inclusive development** in rural areas?

General Studies Paper III:

- **Q3.** Evaluate the significance of **monitoring and governance** structures in the **PMDDKY**. How do the **District Dhan-Dhaanya Samitis** and **NITI Aayog** play a role in ensuring the success of this scheme?
- **Q4.** How can **crop diversification**, **soil and water conservation**, and **organic farming** contribute to **sustainable agriculture** in India? Discuss in the context of the **PMDDKY**.

University of Southampton Opens Campus in Gurugram

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Education and Foreign Collaborations:** The significance of the **UGC regulations** in facilitating the entry of **foreign higher educational institutions (FHEIs)** into India.

✅ **GS Paper II – Social Justice**

- **Impact of Educational Reforms:** The role of **foreign campuses** in improving **higher education access** and fostering **international collaboration** in India.

1. Introduction

- **University of Southampton** has become the **first global university** to open a campus in **India** under the **University Grants Commission's (UGC) regulations (2023)**.
- The **campus** has been opened in **Gurugram**, marking a significant milestone in **India's higher education landscape**.

2. About UGC Regulations (2023)

- **Objective:**
  - The new UGC regulations aim to **facilitate** the entry of **Foreign Higher Educational Institutions (FHEIs)** into India, aligning with the **National Education Policy (NEP) 2020** to **globalize** the education system.
- **Eligibility:**
  - The regulations apply to the **top 500 global universities** (in either **overall ranking** or **subject-wise rankings**) or those with **outstanding expertise** in a particular field.
- **Mode of Instruction:**
  - **Online and distance learning** are not allowed, except for **10% of the course lectures**, which can be conducted online.

3. Previous Examples of Foreign Campuses in India

- **Australia's Deakin and Wollongong Universities** have also opened campuses in the **GIFT City** (Gujarat International Finance Tec-City).
- These institutions were approved by the **International Financial Services Centres Authority (IFSCA)** to promote **global education** in India.

4. Benefits of Foreign Campuses in India

- **International Exposure:**
  - Foreign universities bring international standards of education, offering **global exposure** to Indian students.
- **Improved Quality of Education:**
  - The establishment of **foreign campuses** in India is expected to **raise the bar** for **educational standards** and increase **international collaboration**.
- **Better Job Opportunities:**
  - Graduates from **international institutions** often enjoy **better job prospects** due to the global recognition of their degrees.

5. Challenges of Foreign Campuses in India

- **Regulatory Barriers:**
  - Foreign universities face **regulatory challenges** when trying to comply with India's laws and accreditation standards.
- **Cultural and Curriculum Adaptation:**
  - Integrating **foreign curriculum** with India's diverse educational needs and **cultural contexts** can be challenging.
- **Cost of Education:**
  - Foreign institutions may bring **high tuition fees**, potentially making higher education less accessible for **domestic students**.

6. Conclusion:

- The opening of **foreign campuses** like the **University of Southampton** in India under the **UGC Regulations 2023**is a major step toward the **globalization of Indian education**. It also enhances the **quality of higher education** and offers new opportunities for students, but it must be handled carefully to address **challenges** like **regulatory barriers** and **affordability**.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the significance of the **UGC (2023) regulations** in the context of **foreign higher educational institutions** opening campuses in India. How do these regulations align with the **National Education Policy 2020**?
- **Q2.** What are the **benefits and challenges** of allowing **foreign universities** to set up campuses in India? How can India leverage this opportunity to improve its **higher education system**?

General Studies Paper II – Social Justice:

- **Q3.** How can the establishment of **foreign campuses** in India promote **equitable access to quality education**? What are the implications for **students from marginalized backgrounds**?

General Studies Paper II – International Relations:

- **Q4.** Evaluate the role of **globalization in education** through **foreign universities** setting up campuses in India. How does it enhance **India's global educational standing**?

SOCIETY, SOCIAL JUSTICE AND SOCIAL ISSUES

CARA Directs Strengthening Counseling in Child Adoption

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Child Protection and Welfare Policies:** The role of the **Central Adoption Resource Authority (CARA)** and **State Adoption Resource Agencies (SARAs)** in ensuring a **transparent adoption process** in India.

✅ **GS Paper II – Social Justice**

- **Welfare Schemes and Legislation:** Examining the **psychosocial support framework** and **legal provisions** for **child adoption** under the **Juvenile Justice Act (2015)** and the **Adoption Regulations (2022)**.

1. Introduction

- The **Central Adoption Resource Authority (CARA)** has issued new **directions** to **State Adoption Resource Agencies (SARAs)**, urging them to strengthen **counseling support** throughout the **child adoption process**. These directions aim to reinforce the **psychosocial support framework** for **prospective adoptive parents (PAPs)**, **adopted children**, and **biological parents**.

2. Key Directions Given to SARAs

- **Psychosocial Support Framework:**
  - SARAs are instructed to **reinforce psychosocial support** at all stages of adoption, ensuring **mental health and emotional well-being** of **all stakeholders** involved, including the **adoptive parents**, **children**, and the **biological parents**.
- **Qualified Counsellors:**
  - States have been directed to **designate** or **empanel qualified counsellors** at the **District** and **State Levels** to provide **professional counseling services** to individuals involved in the adoption process.
- **Provisions for Psychosocial Intervention:**
  - Counseling and psychosocial support should also be provided in cases where there is a need, as assessed by **Specialised Adoption Agencies (SAAs)** or **District Child Protection Units (DCPUs)**. This will ensure the well-being of the child and family members at critical stages of the adoption process.

3. Child Adoption in India

- **Legislation Governing Adoption:**
  - Adoption in India is governed by the **Hindu Adoption and Maintenance Act of 1956** for Hindus, and the **Juvenile Justice (Care and Protection of Children) Act (JJ Act)** of 2000, which was amended in 2021 to ensure better protection and streamlined adoption procedures.
- **Nodal Ministry:**
  - The **Ministry of Women and Child Development** is responsible for the implementation of adoption policies and ensuring the **welfare of children**.
- **Central Adoption Resource Authority (CARA):**
  - CARA, a **statutory body** under the Ministry of Women and Child Development, regulates both **domestic** and **inter-country adoptions**. It serves as the **central authority** for **inter-country adoption** in accordance with the **Hague Convention** (1993) on **Protection of Children and Cooperation in Respect of Intercountry Adoption**.
- **Role of States/UTs:**
  - The implementation of the **JJ Act** and adoption procedures are carried out by **State Adoption Resource Agencies (SARAs)**, **local Child Welfare Committees**, and **District Child Protection Units (DCPUs)**. These bodies play a crucial role in the **monitoring** and **facilitation** of both **in-country** and **inter-country adoptions**.

4. The Hague Convention on Inter-Country Adoption

- **Ethical Adoption Practices:**
  - India ratified the **Hague Convention on Intercountry Adoption** in **2003**. The Convention ensures that international adoptions are **ethical**, **legal**, and **transparent**, preventing **child trafficking** and safeguarding the rights of the child.

- **Central Authority for International Adoptions:**
  - CARA is designated as the **Central Authority** for **inter-country adoptions** under the Hague Convention, ensuring **compliance** with international norms and promoting **ethical adoption practices**.

5. Conclusion:

- The **new CARA guidelines** for strengthening **counseling support** are a critical step towards enhancing the **adoption experience** in India, ensuring that **adoptive families** and **children** receive the necessary support. By embedding professional counseling in the adoption process, the authorities aim to improve the overall adoption ecosystem in India and provide **emotional stability** for children in transition.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the role of the **Central Adoption Resource Authority (CARA)** in regulating **child adoption** in India. How does it ensure **transparency and ethical practices** in **inter-country adoption**?
- **Q2.** Explain the **key provisions** of the **Juvenile Justice (Care and Protection of Children) Act, 2015** and the **Adoption Regulations, 2022**. How do these provisions impact **child adoption** and **children's welfare** in India?

General Studies Paper II – Social Justice:

- **Q3.** Analyze the importance of **psychosocial support** in the **adoption process**. How can **qualified counseling** help in resolving challenges faced by **adoptive families**, **adopted children**, and **biological parents**?

General Studies Paper II – Governance:

- **Q4.** What steps should be taken to improve the **interstate and international adoption process** in India to ensure **better welfare** of children? Discuss the role of **state agencies** and **CARA** in this regard.

NPPA Fixes Prices for 71 Key Drug Formulations

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Regulatory Institutions:** The role and function of the **National Pharmaceutical Pricing Authority (NPPA)** in regulating **drug prices** and ensuring **affordability** of medicines.

✅ **GS Paper II – Social Justice**

- **Public Health Policy:** NPPA's role in making medicines accessible and affordable to the **Indian population**, ensuring **social equity** in healthcare.

✅ **GS Paper III – Economic Development**

- **Health Sector Regulation:** The importance of **drug price control** and **regulatory bodies** like NPPA in promoting **economic development** and **public welfare**.

1. Introduction

- The **Centre** has fixed the prices of **71 key drug formulations** through the **National Pharmaceutical Pricing Authority (NPPA)**.
- This is an essential measure to regulate the cost of crucial medicines, making healthcare more **affordable** for the population.

2. About NPPA

- **Establishment:**
  - The **NPPA** was established in **1997** through a Government of India Resolution. It is an **attached office** of the **Department of Pharmaceuticals (DoP)**, which falls under the **Ministry of Chemicals and Fertilizers**.
- **Objective:**
  - The primary objective of NPPA is to act as an **independent regulator** for **drug pricing**, ensuring that medicines are **available** and **accessible** to the public at **affordable prices**.

3. Functions of NPPA

- **Drug Price Control:** The NPPA is responsible for **fixing and revising drug prices** in accordance with the provisions of the **Drugs Prices Control Order (DPCO)**, which is issued by the **Department of Pharmaceuticals**.
- **Ensuring Affordability:** The NPPA's role is critical in keeping the prices of essential drugs in check, so they remain affordable to the common people, particularly in sectors like **healthcare** and **medicine**.

4. Significance of NPPA's Role

- **Affordable Healthcare:**
  - Through its regulation of drug prices, NPPA plays a crucial role in ensuring **access to medicines** for all segments of society, thereby contributing to **public health** and **social welfare**.
- **Market Regulation:**
  - The NPPA helps maintain a **balance between profit-making** and **public health** by curbing the prices of essential medicines, preventing **exploitation** of consumers, and ensuring a **fair drug market**.

5. Conclusion:

- The **National Pharmaceutical Pricing Authority (NPPA)** continues to play an essential role in **regulating drug prices** and ensuring **medicines** are within the reach of all, especially in a country with diverse healthcare needs like **India**.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the role and significance of the **National Pharmaceutical Pricing Authority (NPPA)** in regulating drug prices in India. How does it ensure the **affordability** of essential medicines?
- **Q2.** Evaluate the impact of **drug price control** measures under the **Drugs Prices Control Order (DPCO)**. How do such measures contribute to **public health** and **social equity**?

General Studies Paper III:

- **Q3.** How does the **National Pharmaceutical Pricing Authority (NPPA)** contribute to the **economic development** of India's healthcare system? Discuss its role in **ensuring access** to **affordable medicines**.
- **Q4.** With reference to **NPPA**, discuss the challenges and strategies to balance **drug pricing regulation** with the need to promote **innovation** and the **sustainability** of the pharmaceutical industry.

PM VIKAS Scheme Launched for Skill Training & Women Entrepreneurship

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Government Policies and Schemes:** The **Pradhan Mantri Virasat Ka Samvardhan (PM VIKAS)** scheme and its role in **uplifting minority communities** through **skill development**, **entrepreneurship**, and **education**.

✅ **GS Paper II – Social Justice**

- **Inclusive Growth and Welfare Schemes:** The **PM VIKAS** initiative's focus on empowering **minority communities** and **women entrepreneurship**, especially among the **six notified minority communities**.

1. Introduction

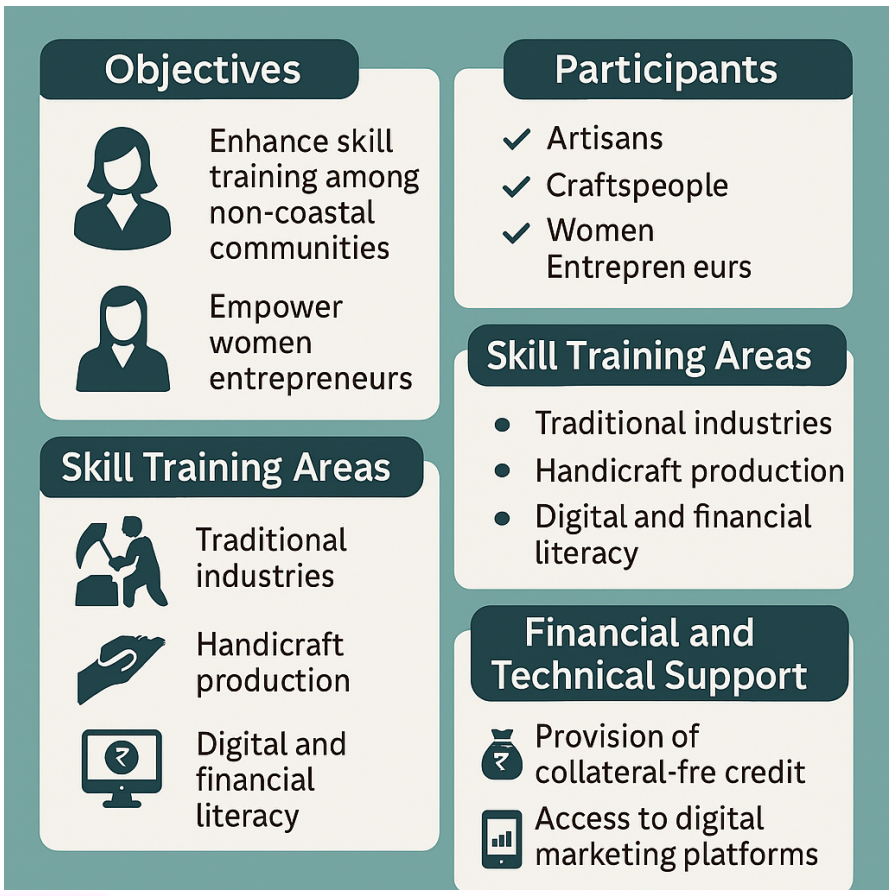
- The **Pradhan Mantri Virasat Ka Samvardhan (PM VIKAS)** scheme has been launched by the **Ministry of Minority Affairs** with a special focus on **skill training** and **women entrepreneurship development**. This initiative aims to uplift **minority communities** by offering training, education, and leadership development, particularly for **minority women**.

2. Key Features of PM VIKAS

- **Ministry and Implementation:**
  - The scheme is being implemented by the **Ministry of Minority Affairs** under the **Central Sector Scheme** category. It integrates and converges **five former schemes** aimed at the empowerment and welfare of **minority communities**:

1. **Seekho Aur Kamao** (Skill Development)
2. **Nai Manzil** (Education and Support for School Dropouts)
3. **Nai Roshni** (Leadership Development for Women)
4. **USTTAD** (Upgrading Skills of Youth)
5. **Hamari Dharohar** (Cultural Heritage Preservation)

- **Objective:**
  - The primary objective of **PM VIKAS** is to **uplift six notified minority communities** through:
    - **Skill development** and **entrepreneurship** training.
    - **Empowerment of minority women**, enhancing their leadership roles.
    - **Education support** for **school dropouts**, particularly to reintegrate them into mainstream education or skill programs.



3. Focus on Minority Communities

- **Target Groups:**
  - The scheme specifically targets the **six officially recognized minority communities** in India:
    1. **Muslims**
    2. **Christians**
    3. **Sikhs**
    4. **Buddhists**
    5. **Jains**
    6. **Zoroastrians (Parsis)**
- **Support to Minority Women:**
  - A key component of the scheme is **women entrepreneurship**, focusing on equipping women from these minority communities with **skills**, **leadership training**, and **business development support** to promote their economic empowerment and self-sufficiency.

4. Implementation in Convergence with Skill India Mission

- **Skill Development Integration:**
  - **PM VIKAS** is being implemented in conjunction with the **Skill India Mission**, which aims to increase the employability of India's youth through training in various skills relevant to modern industry needs.
  - It focuses on equipping minority candidates with the skills needed to **enter the workforce** and **start their own businesses**, enhancing **self-reliance** and contributing to **inclusive economic growth**.

5. Projects Launched at IIIT Kottayam

- **Skill Training for Minority Candidates:**
  - **IIIT Kottayam** has been selected as a key venue for providing **skill training** to **minority candidates**, particularly to **enhance their employability** in sectors like technology, craftsmanship, and entrepreneurship.
- **Women Entrepreneurship Development:**
  - The project also focuses on developing **women entrepreneurs** through **leadership development programs**and support to help them set up and grow their businesses. This initiative specifically targets the **empowerment of women** from **minority communities**, offering them the tools to break social barriers and become leaders in their respective fields.

6. Conclusion:

- The **PM VIKAS** scheme offers a comprehensive approach to the **empowerment** and **upliftment** of **minority communities** in India, focusing on **skill development**, **entrepreneurship**, and **leadership**. By converging previous initiatives and expanding their reach, the scheme aims to ensure that India's minority communities are not left behind in the country's **economic progress**.

UPSC Mains Questions:

General Studies Paper II – Governance:

- **Q1.** Discuss the role of the **Pradhan Mantri Virasat Ka Samvardhan (PM VIKAS)** scheme in **empowering minority communities** in India. How does it contribute to **skill development** and **women entrepreneurship**?
- **Q2.** How does the **PM VIKAS scheme** converge with other government initiatives like the **Skill India Mission**? What are the potential **synergies** between these initiatives to foster **inclusive growth**?

General Studies Paper II – Social Justice:

- **Q3.** Evaluate the impact of **PM VIKAS** on **women entrepreneurship** in **minority communities**. What challenges do **minority women** face in accessing **entrepreneurial opportunities**, and how does this scheme address them?

General Studies Paper II – Social Justice:

- **Q4.** What are the key challenges faced by **minority communities** in India, and how does the **PM VIKAS scheme**contribute to **mitigating** these challenges? Discuss the significance of **skills development** and **leadership training**for **minority women**.

Concerns Over Transparency in NMMS Implementation

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Accountability and Transparency in Government Schemes:** The role of **NMMS** in ensuring **transparency** and **accountability** in the **MGNREGA scheme**, and the challenges faced in its implementation.

✅ **GS Paper II – Social Justice**

- **Social Welfare Schemes:** Understanding how **digital monitoring systems** like **NMMS** can impact the **effectiveness** of welfare programs like **MGNREGA**.

1. Introduction

- The **Ministry of Rural Development (MoRD)** has raised concerns regarding the **misuse** and **manipulation** of the **National Mobile Monitoring System (NMMS)**, which is designed to bring **transparency** and **accountability** to the **Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)** program.

2. About the National Mobile Monitoring System (NMMS)

- **Launch and Purpose:**
  - The **NMMS** was launched by the **Ministry of Rural Development (MoRD)** to monitor **attendance** of **MGNREGA workers**. The app uses **geo-tagged, time-stamped photographs** to capture the attendance of workers on-site, helping to ensure **transparency** and reduce instances of **ghost beneficiaries** and **fake attendance**.
- **Languages:**
  - The app is currently available in multiple languages, including **English**, **Hindi**, **Tamil**, **Telugu**, and **Malayalam**, making it accessible to workers across different states and regions.
- **Objective:**
  - The main goal of the app is to enhance **accountability** and **reduce corruption** by verifying the actual presence of workers at the worksite and preventing fraudulent activities within the **MGNREGA** system.

3. Concerns Raised

- **Accountability and Financial Irregularities:**
  - **Misuse of the System:** Concerns have been raised about the **manipulation of photographs**, such as **irrelevant photo uploads** or **repeated photos of workers** to mark attendance, without the workers actually being present at the worksite. This leads to **financial irregularities** where payments are made to **ghost beneficiaries** who do not actually work.
- **Internet Connectivity Issues:**
  - **Exclusion of Workers:** In rural areas with poor **internet connectivity**, **software glitches** and issues with the **app's functionality** can result in **genuine workers** being excluded from the attendance process, which can affect their wages and participation in the program.

4. Challenges in Implementing NMMS

- **Technological Barriers:**
  - Despite the potential of **NMMS** to streamline monitoring, **internet connectivity issues** in rural areas and **software malfunctions** are hindering its full potential. This is especially problematic in **remote** or **underdeveloped regions**, where workers may face difficulties uploading photographs or accessing the app due to **limited technological infrastructure**.
- **Transparency and Accountability Issues:**
  - **Fake Attendance:** The **manipulation of attendance** through the **uploading of irrelevant photos**undermines the objectives of the **MGNREGA** program, which aims to provide **employment** and **wages** to rural households. It results in **wasteful expenditure** and **undermines the integrity** of the scheme.

5. Conclusion:

- While the **NMMS app** is a significant step in improving **transparency** and **reducing fraud** within the **MGNREGA program**, the issues of **accountability**, **software glitches**, and **internet connectivity** must be addressed to ensure that the system works effectively and that **genuine workers** are not left out or exploited.

UPSC Mains Questions:

General Studies Paper II – Governance, Constitution, Polity, and International Relations:

- **Q1.** Discuss the role of **technological interventions** like the **National Mobile Monitoring System (NMMS)** in enhancing **transparency** and **accountability** in government schemes. How does it help in curbing **fraudulent practices** in **MGNREGA**?
- **Q2.** Analyze the challenges faced in the **implementation of digital monitoring systems** in rural welfare programs. How can issues like **internet connectivity** and **software glitches** be addressed to ensure **effective governance**?

General Studies Paper II – Social Justice:

- **Q3.** What are the **social implications** of **misuse** and **manipulation** of attendance in government programs like **MGNREGA**? Discuss the role of **digital technology** in ensuring **welfare distribution** reaches the **intended beneficiaries**.

General Studies Paper III – Economic Development:

- **Q4.** How does the **MGNREGA scheme** contribute to **rural development** and **economic empowerment**? Discuss the impact of **technological tools** like **NMMS** in **reducing fraud** and ensuring **effective implementation**.

GEOGRAPHY AND DISASTER

The Pacific Ring of Fire: A Hotbed of Earthquakes and Volcanoes

📌 **Syllabus Mapping:**

✅ **GS Paper I – Geography**

- **Natural Hazards and Disasters:** Understanding the **Pacific Ring of Fire** and its impact on **seismic activity** and **volcanic eruptions** around the Pacific Ocean.

✅ **GS Paper III – Environment**

- **Disaster Management and Geophysical Events:** The role of **plate tectonics** in the formation of the **Ring of Fire**and its associated risks.

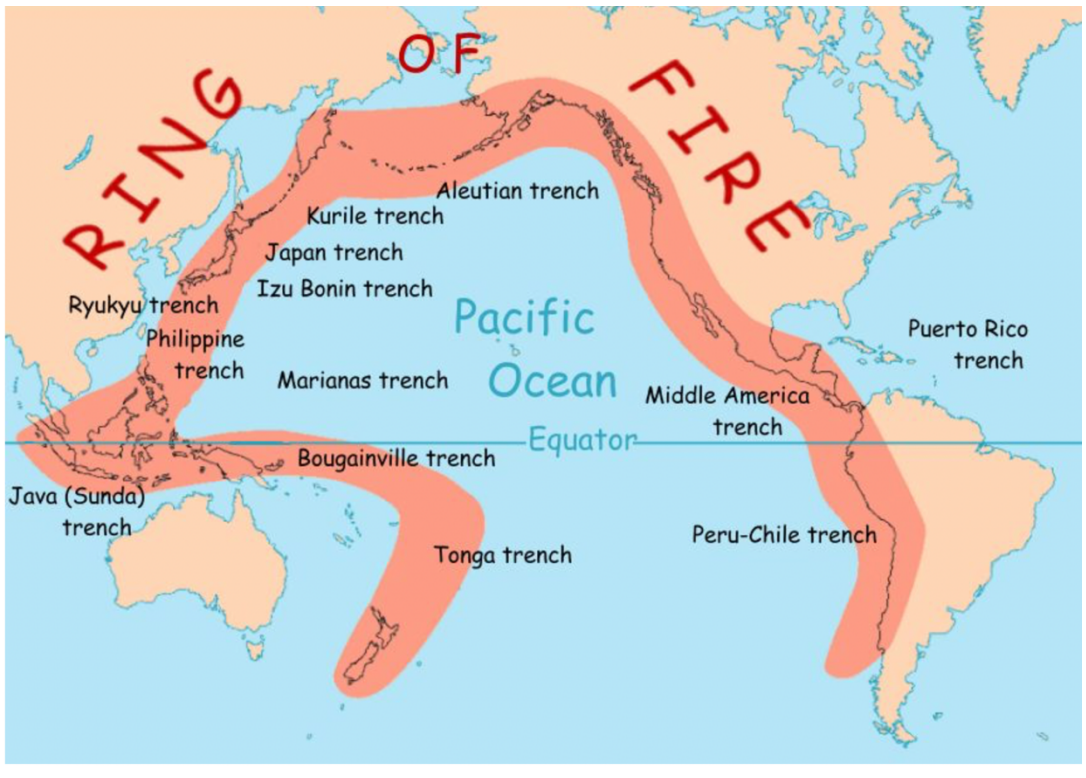
IQRA
Wisdom leads to success

1. Introduction

- A **7.3-magnitude earthquake** recently struck **Alaska**, an area part of the **seismically active Pacific Ring of Fire**. This earthquake is a reminder of the **geological activity** prevalent in the region.

2. About the Pacific Ring of Fire

- **Definition:**
  - The **Pacific Ring of Fire** is a **string of volcanoes** and **seismic activity zones**, where **earthquakes** and **volcanic eruptions** are frequent, surrounding the edges of the **Pacific Ocean**.
- **Geographical Extent:**
  - The Ring of Fire spans **over 15 countries**, including:
    - **Western Americas** (North and South America)
    - **Alaska** (USA)
    - **Russia**
    - **Japan**
    - **Philippines**
    - **Indonesia**



    - **Papua New Guinea**
    - **New Zealand**
    - **Antarctica**
- **Seismic and Volcanic Activity:**
    - Roughly **90% of all earthquakes** occur along the **Ring of Fire**.
    - It is also home to **75% of the world's active volcanoes**, making it one of the most seismically and volcanically active areas on Earth.

3. Geological Causes

- **Plate Tectonics:**
    - The Pacific Ring of Fire is the result of **plate tectonics**, where several **tectonic plates** interact, resulting in frequent earthquakes and volcanic eruptions.
    - The region is home to a series of **subduction zones**, where one tectonic plate is forced under another, often leading to the creation of **volcanoes** and **earthquakes**.
- **Underwater Trenches:**
    - The tectonic activity in the Ring of Fire has also led to the formation of **deep underwater trenches**, such as the **Mariana Trench**, which is the **world's deepest point**.

4. Impact of the Pacific Ring of Fire

- **Earthquakes:**
    - Earthquakes in this region can cause significant **tsunamis**, **landslides**, and damage to infrastructure. Alaska, for instance, frequently experiences **earthquake activity** due to its location on the Ring of Fire.
- **Volcanic Eruptions:**
    - The **volcanoes** along the Ring of Fire are some of the world's most active. Eruptions can cause **lava flows**, **ash clouds**, and **lahars** (mudflows), significantly impacting both **human populations** and **ecosystems**.
- **Tsunamis:**
    - Earthquakes and volcanic eruptions along the Ring of Fire often trigger **tsunamis** that affect coastal regions. The **tsunami** risk is particularly high in areas like **Japan**, **Indonesia**, and the **Philippines**.

5. Conclusion:

- The **Pacific Ring of Fire** is a highly active and volatile region, with **earthquakes** and **volcanic eruptions** shaping the landscape and posing significant risks to the people living along the Pacific Ocean's edges. Understanding the **geological processes** driving this activity is crucial for **disaster preparedness** and **mitigation strategies**.

UPSC Mains Questions:

General Studies Paper I:

- **Q1.** Explain the concept of the **Pacific Ring of Fire**. Discuss the geological processes that contribute to the **seismic activity** and **volcanic eruptions** in this region.
- **Q2.** The **Ring of Fire** is home to both **earthquakes** and **active volcanoes**. How do these geophysical hazards impact the countries along the Pacific Ocean? Discuss the preparedness and response strategies in such regions.

General Studies Paper III:

- **Q3.** The **Mariana Trench** is a significant geological feature within the **Pacific Ring of Fire**. Discuss its formation and importance in the context of **plate tectonics**.
- **Q4.** Evaluate the impact of the **Ring of Fire** on the **global climate** and **local economies**. How can countries in this region improve their **disaster resilience**?

Earthquake Swarm Triggers Lava Eruption in Iceland

📌 **Syllabus Mapping:**

✅ **GS Paper I – Geography**

- **Natural Hazards and Disasters:** Understanding the **Earthquake Swarm** phenomenon and its relation to **volcanic activity** in **Iceland**.

✅ **GS Paper III – Environment**

- **Geophysical Events and Volcanic Activity:** The causes and consequences of **earthquake swarms** and **lava eruptions** in **tectonically active regions** like **Iceland**.

1. Introduction

- A series of **powerful earthquake swarms** in **Iceland** recently led to the eruption of **lava** from a massive fissure, highlighting the connection between **seismic activity** and **volcanic eruptions** in **tectonically active** regions.

2. What is an Earthquake Swarm?

- **Definition:**
  - An **earthquake swarm** refers to a sequence of **many earthquakes** that occur in a relatively **short period**without a specific **main shock**. Unlike typical earthquakes, which are triggered by a **single shock**, swarms can last for **weeks** and may produce **thousands of earthquakes**.
- **Characteristics of Earthquake Swarms:**
  - Earthquake swarms are often observed in regions with **volcanic activity**, **hydrothermal systems**, or **active geothermal areas**.
  - These swarms may be caused by the movement of **magma** beneath the Earth's surface or changes in **geothermal activity**.

3. Why is Iceland Prone to Earthquakes?

- **Tectonic and Mantle Plume Activity:**
  - **Iceland** is particularly prone to **seismic activity** due to its unique position on the **Mid-Atlantic Ridge**, where the **North American** and **Eurasian tectonic plates** are separating. This creates a highly active **tectonic boundary** that produces frequent earthquakes.
- **Volcanic Activity and Mantle Plume:**
  - In addition to tectonic activity, Iceland also sits above a **mantle plume**, which is a column of hot rock rising from deep within the Earth's mantle. This **mantle plume** further contributes to the region's **volcanic activity**, making Iceland one of the most active volcanic regions in the world.

4. Consequences of the Earthquake Swarm in Iceland

- **Lava Eruption:**
  - The earthquake swarm in Iceland triggered a **lava eruption** from a large **fissure**, demonstrating the close relationship between **earthquakes** and **volcanic eruptions** in such active regions. The lava flow can cause widespread damage to infrastructure, property, and the environment.
- **Geological Significance:**
  - The eruption of lava from this fissure emphasizes the role of **earthquake swarms** as **precursors** to **volcanic eruptions**, highlighting the complex **geophysical dynamics** of Iceland's **volcanic landscape**.

5. Conclusion:

- Iceland's **seismic activity** and **volcanic eruptions** are largely influenced by its location on both the **Mid-Atlantic Ridge** and the presence of a **mantle plume**. The recent **earthquake swarm** and subsequent **lava eruption** serve as reminders of the dynamic and **active geophysical processes** occurring in this region. Understanding these phenomena is crucial for **disaster preparedness** and **mitigation efforts** in seismically active areas.

UPSC Mains Questions:

General Studies Paper I:

- **Q1.** Explain the phenomenon of **earthquake swarms**. How do **tectonic activity** and **volcanic eruptions** contribute to this occurrence, particularly in regions like **Iceland**?
- **Q2.** Discuss the geological factors that make **Iceland** prone to frequent **earthquakes** and **volcanic eruptions**. How does the combination of **tectonic ridge** and **mantle plume** contribute to the country's seismic and volcanic activity?

General Studies Paper III:

- **Q3.** What are the environmental and economic impacts of **earthquake swarms** and **volcanic eruptions** in regions like **Iceland**? How can such events be better monitored and managed?
- **Q4.** Analyze the relationship between **earthquakes** and **lava eruptions** in the context of **Iceland's volcanic activity**. What are the challenges in predicting such events and mitigating their impact?

HISTORY, ART & CULTURE

Remembering K Kamaraj: Eminent Freedom Fighter

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Historical Leaders and Movements:** K. Kamaraj's role in India's **Independence movement** and his contributions to the **Indian National Congress** and **political reforms**.

✅ **GS Paper I – History**

- **Indian Freedom Struggle:** Kamaraj's involvement in significant **freedom movements** like **Salt Satyagraha**, **Quit India Movement**, and his role in shaping post-independence **India**.

1. Introduction

- **Kumaraswami Kamaraj** (1903-1975), an **eminent freedom fighter** and leader, is remembered on his **birth anniversary** (July 15).
- Kamaraj was a prominent figure in India's **Independence movement** and a key leader of the **Indian National Congress** (INC), later becoming the **Chief Minister of Madras** (now Tamil Nadu).

2. Early Life and Political Beginnings

- **Birth and Background:**
  - Kamaraj was born in **Virudhunagar**, Tamil Nadu, into a **Nadar caste**, considered a **depressed caste** during that time.
- **Inspiration to Join the Freedom Struggle:**
  - He was deeply inspired to join the **Indian freedom struggle** after the tragic **Jallianwala Bagh massacre**.

3. Contributions to India's Independence Movement

- **Member of Indian National Congress (INC):**
  - Kamaraj became an active member of the **Indian National Congress**, leading various protests and participating in significant events in the struggle for independence.
- **Participation in Key Movements:**
  - **Salt Satyagraha**, **Nagpur Flag Satyagraha**, **Sword Satyagraha**, and **Neil Statue Satyagraha** were some of the major movements he was part of.
- **Imprisonment:**
  - In **1942**, Kamaraj was **jailed for three years** due to his involvement in the **Quit India Movement**, which was a pivotal moment in India's struggle for independence.
- **Constituent Assembly:**
  - He was elected to the **Constituent Assembly** from the **Madras constituency**, contributing to the framing of India's **Constitution**.

4. Kamaraj's Role in Post-Independence Politics

- **Chief Minister of Madras:**
  - Kamaraj served as the **Chief Minister of Madras Province** from **1954**, playing a pivotal role in the political landscape of Tamil Nadu and in the development of the state.
- **Kamaraj Plan (1963):**
  - After the **Indo-China war**, Kamaraj introduced the **Kamaraj Plan** in **1963**, which sought to rebuild and reorganize the **Congress Party** in the wake of the challenges posed by the war and the political instability in the country.

5. Conclusion:

- Kamaraj's legacy as a **freedom fighter** and **political leader** remains significant in India's history. His contributions to **India's independence** and **post-independence political stability** through initiatives like the **Kamaraj Plan**continue to be remembered and celebrated.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the role of **Kumaraswami Kamaraj** in India's **freedom movement** and his contributions to the **Indian National Congress** during the **post-independence era**.
- **Q2.** Analyze the significance of the **Kamaraj Plan (1963)** in rebuilding the **Congress Party** after the **Indo-China war**. What were its key features and implications for **Indian politics**?

General Studies Paper I (History):

- **Q3.** How did **Kamaraj's leadership** in Tamil Nadu influence the political landscape during the **Independence movement**? Discuss his role in major **freedom struggles** like **Salt Satyagraha** and **Quit India Movement**.

Behdienkhlam Festival: A Symbol of Spiritual Cleansing

📌 **Syllabus Mapping:**

✅ **GS Paper I – Culture**

- **Indian Festivals and Traditions:** The cultural and spiritual significance of the **Behdienkhlam Festival** and its celebration by the **Pnar community** in **Meghalaya**.

✅ **GS Paper II – Social Justice**

- **Social Cohesion and Community Resilience:** The role of festivals like **Behdienkhlam** in fostering **community solidarity** and **resilience**.

1. Introduction

- The **Behdienkhlam Festival**, one of the most significant **cultural festivals** of the **Pnar (Jaintia) community**, was celebrated in **Meghalaya**.
- The festival, which takes place annually in **July**, follows the sowing period and symbolizes **spiritual cleansing** and **community resilience**.

2. Significance of Behdienkhlam Festival

- **Meaning:**
  - The word **Behdienkhlam** translates to "**driving away the plague**," which signifies the community's ritualistic efforts to **eliminate evil spirits**, **plagues**, and **diseases**.
- **Cultural Importance:**
  - This is the **most important dance festival** of the **Pnars (Jaintias)** and is deeply embedded in their spiritual practices and community life.

3. Rituals and Celebrations

- **Driving Away Evil Spirits:**
  - During the festival, young men perform a symbolic ritual of **driving away evil spirits** by **beating the roofs of houses with bamboo poles**. This act represents the removal of **plague** and **disease** from the community.
- **Traditional Games:**
  - Several traditional games are played during the festival, including:
    - **Dat-lawakor**: A football-like sport played with a **wooden ball**.
    - **Iatan-Bhang**: A traditional **tug of war** game, symbolizing strength and unity.

4. Conclusion:

- The **Behdienkhlam Festival** is a celebration of not only **spiritual cleansing** but also **community unity**, **cultural preservation**, and **resilience**. It reflects the deep **traditional values** of the **Pnars (Jaintia)** people and their connection to nature and spirituality.

UPSC Mains Questions:

General Studies Paper I:

- **Q1.** Discuss the cultural and spiritual significance of the **Behdienkhlam Festival** celebrated by the **Pnars (Jaintia) community** in **Meghalaya**. How does it symbolize **community resilience**?
- **Q2.** Analyze the role of festivals like **Behdienkhlam** in fostering **social cohesion** and preserving **cultural identity**in tribal communities in India.

ENVIRONMENT & ECOLOGY

CWC Reports Rising Water Spread in Glacial Lakes, Highlights GLOF Risks

📌 **Syllabus Mapping:**

✅ **GS Paper III – Environment**

- **Disaster Management and Mitigation:** The significance of **Glacial Lake Outburst Floods (GLOFs)** in the context of **climate change**, **environmental hazards**, and the **National GLOF Risk Mitigation Program**.

✅ **GS Paper II – Governance**

- **Government Schemes and Programs:** The role of **CWC** and the **National GLOF Risk Mitigation Program** in addressing **glacial flood risks** and improving **disaster preparedness**.

1. Introduction

- The **Central Water Commission (CWC)** has informed the **National Green Tribunal (NGT)** about the increasing **water spread** in **glacial lakes** across India. The report highlights that out of 100 glacial lakes larger than 10 hectares, 34 are experiencing an **increase** in water spread area, while 20 are seeing a **decrease** and 44 show **no change**.

2. Glacial Lakes and GLOFs

- **Glacial Lakes:**
  - Glacial lakes are formed by the **melting of glaciers**, typically found at or near the glacier's base. These lakes store large volumes of water, and their size can change significantly due to **climate change** and **glacial melting**.
- **GLOFs (Glacial Lake Outburst Floods):**
  - GLOFs occur when water from a glacial lake is suddenly and rapidly released, often due to the **failure of a moraine dam** or an **ice dam**. These floods can result in catastrophic downstream impacts, including **flooding**, **infrastructure damage**, and even **loss of life**.
- **Geographical Distribution:**
  - Glacial lakes and GLOFs are common in regions with significant **glacial activity**, such as the **Himalayas**, **Andes**, and **Alps**. In India, states like **Arunachal Pradesh**, **Himachal Pradesh**, **Sikkim**, and **Uttarakhand**are particularly vulnerable.

3. Monitoring of Glacial Lakes

- **Remote Sensing:**
  - The **CWC** monitors **902 glacial lakes** and water bodies across various states, including **transboundary regions**, using **remote sensing technology**. This monitoring is essential for tracking changes in water spread and identifying potential threats related to GLOFs.
- **National GLOF Risk Mitigation Program (2021-2026):**
  - The government has approved **90 studies** under the **National GLOF Risk Mitigation Program**, aiming to address risks posed by glacial lakes and mitigate potential floods in **four high-risk states**: **Arunachal Pradesh**, **Himachal Pradesh**, **Sikkim**, and **Uttarakhand**.

4. Causes and Risks of GLOFs

- **Glacial Surging:**
  - **Glacial surging** refers to the **rapid, short-term advance** of a glacier, which can destabilize the lake's moraine dam and trigger a flood. This phenomenon has been observed in **glaciers like the Gilkey Glacier in Alaska**.
- **Moraine Dam Failure:**
  - The **collapse of moraine dams**, such as the incident in **South Lhonak Lake, Sikkim**, is a primary cause of GLOFs. These dams, composed of loose debris, can be easily destabilized by **climate change** or seismic activity.
- **Seismic Activity and Human Impact:**
  - Earthquakes and **human activities**, such as **unplanned development**, **mining**, **deforestation**, and emissions, further exacerbate the vulnerability of glacial structures, increasing the risk of a breach and GLOF.

5. Conclusion:

- The increasing water spread in glacial lakes across India, as reported by the **CWC**, underscores the growing threat of **GLOFs** due to **climate change** and **glacial melting**. The **National GLOF Risk Mitigation Program** plays a crucial role in reducing risks and enhancing preparedness in vulnerable areas, especially in the **Himalayan region**.

UPSC Mains Questions:

General Studies Paper III:

- **Q1.** Discuss the significance of the **CWC report on glacial lakes** in India. How do the findings of increasing water spread impact **disaster preparedness** and **climate change mitigation** efforts?
- **Q2.** Analyze the role of the **National GLOF Risk Mitigation Program** in addressing the risks posed by **glacial lake outburst floods (GLOFs)**. How can **remote sensing technologies** aid in **monitoring** and **mitigating these risks**?

General Studies Paper II – Governance:

- **Q3.** Evaluate the governance framework and **inter-agency cooperation** involved in the management of **glacial lake outburst flood (GLOF)** risks. How effective is the collaboration between the **CWC**, **state governments**, and **NGOs** in mitigating the impact of GLOFs?

General Studies Paper III – Environment:

- **Q4.** How do **glacial surging**, **moraine dam failures**, and **human-induced activities** contribute to the occurrence of **GLOFs**? Discuss their environmental impacts on **ecosystems** and **human settlements** in vulnerable regions.

Environment Ministry Eases FGD Norms for Thermal Power Plants

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Environmental Governance:** Policies related to environmental regulations and air quality standards.

✅ **GS Paper III – Technology, Economic Development, and Security**

- **Environmental Technology & Policy:** Impact of **Flue Gas Desulphurisation (FGD)** systems in reducing air pollution and technological advancements in power generation.

✅ **GS Paper II – International Relations**

- **Global Environmental Cooperation:** India's environmental policies in the context of **climate change** and **global environmental initiatives**.

1. Introduction

- The **Environment Ministry** has updated the norms for **Flue Gas Desulphurisation (FGD)** systems in **thermal power plants** in India.
- This move aligns with the recommendations from an **expert committee** constituted by the **Principal Scientific Adviser** to the Government.

2. Rationale for Easing the FGD Systems Norms

- **Ambient SO_2 Levels in India:**
  - India's **ambient SO_2 levels** (10-20 µg/m^3) are **well below** the national standard of 80 µg/m^3, which has influenced the decision to ease FGD requirements.
- **Coal's Sulphur Content:**
  - Indian **coal** has naturally **low sulphur content**, reducing the need for stringent SO_2 controls.
- **Potential Benefits of Sulphates:**
  - **Sulphates** produced by burning coal may help **reduce global warming** by reflecting solar radiation, though their beneficial effects come with **downside risks**, as noted by the **IPCC**.
- **Other Considerations:**
  - High **installation costs** of FGD systems and **limited qualified vendors** have made it difficult to implement FGD widely.
  - The fear of **electricity tariff hikes** due to the added costs of FGD implementation also played a role in easing the norms.

3. About Flue Gas Desulphurisation (FGD) Systems

- **Definition:**
  - **FGD systems** use an **alkaline reagent** (e.g., sodium or calcium-based) to **remove SO_2** from **flue gas** emitted during the combustion of fossil fuels.
- **Flue Gas:**
  - Flue gas is a byproduct of burning **fossil fuels**, containing pollutants like **carbon dioxide (CO_2)**, **sulphur dioxide (SO_2)**, **nitrogen oxides**, and **particulate matter**.
- **FGD Systems Types:**
  - **Dry Sorbent Injection**

  - **Wet Limestone Treatment**
  - **Seawater Treatment**

4. About Sulphur Dioxide (SO_2) as a Pollutant

- **Health Effects:**
  - **SO_2** causes **respiratory problems**, such as **bronchitis** and can aggravate other lung conditions.
- **Environmental Effects:**
  - **SO_2** leads to **acid rain**, which damages ecosystems and buildings.
- **Largest Source of SO_2:**
  - **Power plants** burning **fossil fuels** are the **largest sources** of **SO_2 emissions**.
- **Smaller Sources:**
  - **Industrial processes**, such as extracting metals from ore, and **natural sources**, such as **volcanic activity**, also contribute to SO_2 emissions.

5. Conclusion:

- While **FGD systems** are essential in reducing harmful emissions like **SO_2**, the decision to ease their implementation reflects a balanced approach to India's unique circumstances, including **low ambient SO_2 levels**, the **nature of Indian coal**, and **economic considerations**.
- The move highlights India's **pragmatic approach** to addressing environmental challenges while ensuring **economic feasibility**.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the rationale behind the **Environment Ministry's decision** to ease the norms for **Flue Gas Desulphurisation (FGD)** systems in India. How does this align with India's environmental priorities?
- **Q2.** Explain the significance of **Flue Gas Desulphurisation (FGD)** systems in reducing **air pollution**. What challenges does India face in their widespread implementation?

General Studies Paper III:

- **Q3.** How do **Flue Gas Desulphurisation (FGD)** systems contribute to **environmental sustainability** in India's power sector? Discuss the potential **health and environmental impacts** of sulphur dioxide emissions.
- **Q4.** Evaluate the **economic and technological** challenges associated with the installation of **FGD systems** in India. How can these be mitigated to achieve **effective air quality management**?

Gujarat's Banni Grasslands Set for Cheetah Translocation

📌 **Syllabus Mapping:**

✅ **GS Paper III – Environment**

- **Conservation and Biodiversity:** The **translocation of cheetahs** to India as part of **Project Cheetah**, and its significance in wildlife conservation.

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Government Initiatives:** The role of **National Tiger Conservation Authority (NTCA)** in the implementation of the **Cheetah Translocation Project** and its oversight mechanisms.

1. Introduction

- **Banni grasslands** in **Gujarat's Kutch district** are set to be the next destination for **cheetah translocation** by the end of **2025**, under **Project Cheetah**. The area has seen preparations, including an **increased prey base** and the establishment of an **enclosure** for the cheetahs.

2. About Banni Grasslands

- **Location and Ecosystem:**
  - The **Banni Grasslands** are located in **Kutch district**, **Gujarat**. They are known for being **salt-tolerant** and are **Asia's largest tropical grassland**. This grassland ecosystem has formed due to **tectonic activities** and is unique in its composition and biodiversity.
- **Inhabitation and Communities:**

- The grasslands are home to several **pastoral communities**, including the **Maldharis**, **Rabaris**, **Mutwas**, and **Meghwals**, who traditionally rely on livestock herding in this area.

3. Background: Project Cheetah

- **Objective of Project Cheetah:**
  - **Project Cheetah** was launched in **2022** with the goal of **reintroducing African cheetahs** into India. This marks the **first intercontinental reintroduction** of a **wild large carnivore species**.
- **Implementation by NTCA:**
  - The project is being implemented by the **National Tiger Conservation Authority (NTCA)**, a statutory body under the **Ministry of Environment, Forests, and Climate Change**, which was established under the **Wildlife (Protection) Act, 1972**.
- **Cheetah Translocation Locations:**
  - **Kuno National Park** in **Madhya Pradesh** is the first site to receive cheetahs, followed by future translocations to sites like **Guru Ghasidas National Park** in **Chhattisgarh**, **Desert National Park** in **Rajasthan**, and **Kaimur Wildlife Sanctuary** in **Uttar Pradesh**.

4. Cheetah Characteristics and Conservation Status

- **The Cheetah:**
  - The **cheetah** is the **world's fastest mammal**, capable of reaching speeds over **100 km/h** in short bursts. It is unique among large cats as it **does not roar**, unlike lions, tigers, leopards, and jaguars.
- **Extinction in India:**
  - The cheetah was the **only large carnivore** species to have become extinct in **India** in **1952**.
- **Two Species of Cheetahs:**
  - **African Cheetah (IUCN Status – Vulnerable)**
  - **Asiatic Cheetah (IUCN Status – Critically Endangered)**
  - The **African cheetah** has been reintroduced into India, whereas the **Asiatic cheetah** is confined to **eastern Iran**.

5. Conclusion:

- The successful translocation of **cheetahs to Banni grasslands** will significantly contribute to India's **biodiversity conservation efforts**, restoring an important predator species to the ecosystem and helping to **revive India's grassland ecosystems**. The initiative also aligns with **India's long-term wildlife conservation goals** and provides an important step in addressing the challenges of **species extinction**.

UPSC Mains Questions:

General Studies Paper III:

- **Q1.** Discuss the objectives and significance of **Project Cheetah** in India. How does the **reintroduction of cheetahs**contribute to **biodiversity conservation** and **grassland ecosystem restoration**?
- **Q2.** Analyze the challenges involved in the **translocation of cheetahs** to India. How can the government ensure the **success** of this project while addressing issues like **habitat conservation** and **community involvement**?

General Studies Paper II – Governance:

- **Q3.** What is the role of the **National Tiger Conservation Authority (NTCA)** in managing conservation projects like **Project Cheetah**? Discuss the governance structure required for **wildlife conservation** in India.

General Studies Paper III – Environment:

- **Q4.** How do initiatives like **Project Cheetah** align with India's **conservation priorities**? What are the potential **environmental and ecological benefits** of the **cheetah reintroduction** in grassland ecosystems?

Global Wetland Outlook 2025 Urges Wetland Conservation

📌 **Syllabus Mapping:**

✅ **GS Paper III – Environment**

- **Conservation and Biodiversity:** The role of **wetlands** in the **global ecosystem**, their degradation, and the need for **conservation** through initiatives like the **Ramsar Convention**.

✅ **GS Paper II – International Relations**

- **International Conventions and Agreements:** The role of the **Ramsar Convention** in **wetland conservation** and its alignment with **global biodiversity frameworks** like the **Kunming-Montreal Global Biodiversity Framework (KM-GBF)**.

1. Introduction

- The **Global Wetland Outlook 2025**, released by the **Secretariat of the Ramsar Convention**, provides a comprehensive assessment of the state of **wetlands** worldwide, covering **inland freshwater**, **coastal**, and **marine wetland areas** that span over **1,800 million hectares**.

2. Wetland Degradation and Loss

- **Loss of Wetlands:**
  - Since **1970**, approximately **22%** of the world's wetlands have been **lost**, highlighting the alarming rate of **wetland degradation** globally.
- **Wetland Condition in Low-Income Countries:**
  - **Wetlands** in **low-income** and **lower-middle-income countries (LICs/LMICs)** are more likely to be in **poor condition**, with **Africa** reported as having some of the **most degraded wetlands**.

3. Threats to Wetlands

- **Unplanned Urbanization and Development:**
  - Wetlands face significant threats from **unplanned urbanization**, **rapid industrialization**, and **infrastructure development**, all of which lead to the **destruction** or **deterioration** of these essential ecosystems.

4. Best Case Studies in Wetland Conservation

- **Regional Flyway Initiative:**
  - A **US$3 billion** partnership across **Asia** aimed at restoring over **140 wetlands** that are crucial for migratory birds, benefitting nearly **200 million people**. This initiative is a model for large-scale, multi-stakeholder efforts in wetland restoration.
- **Seychelles Blue Bond:**
  - **Seychelles** issued the world's first **sovereign "blue bond"**, a financial instrument aimed at protecting the **marine ecosystem** and supporting the conservation of **wetlands**.

5. Way Forward for Wetland Conservation

- **Integrating Wetlands into National Planning:**
  - There is a need to embed **wetlands** into **national planning**, especially through **natural capital accounting**, ensuring their role in the **global hydrological cycle** is recognized and prioritized.
- **Innovative Financial Solutions:**
  - The development of **financial solutions** such as **green bonds**, **blue bonds**, and **results-based financing instruments** could provide essential funding for wetland conservation and restoration efforts.

6. Ramsar Convention: A Framework for Wetland Conservation

- **About Ramsar Convention:**
  - The **Ramsar Convention**, established in **1971**, is an intergovernmental treaty that provides a framework for the **conservation** and **wise use** of **wetlands**. India ratified this treaty in **1982**, reaffirming its commitment to wetland conservation.

7. Conclusion:

- The **Global Wetland Outlook 2025** emphasizes the urgent need for global efforts to **conserve wetlands** and integrate their protection into **environmental policy** and **financial mechanisms**. The efforts outlined by the **Ramsar Convention** and case studies of successful conservation initiatives show that through **international cooperation**, **innovation**, and **financial instruments**, wetland degradation can be reversed.

UPSC Mains Questions:

General Studies Paper III:

- **Q1.** Discuss the significance of **wetlands** in the global ecosystem. What are the primary threats they face, and how can **international frameworks like the Ramsar Convention** aid in their **conservation**?
- **Q2.** Evaluate the role of **innovative financial solutions**, such as **green bonds** and **blue bonds**, in promoting the conservation of **wetlands**. How can these financial instruments contribute to global **biodiversity goals**?

General Studies Paper II – International Relations:

- **Q3.** How does the **Ramsar Convention** align with the **Kunming-Montreal Global Biodiversity Framework (KM-GBF)**? Discuss the potential for **global cooperation** in addressing **wetland degradation** and protecting **biodiversity**.

General Studies Paper III – Environment:

- **Q4.** Assess the impacts of **unplanned urbanization** and **industrial development** on **wetland ecosystems**. What steps should be taken to mitigate these threats and ensure sustainable development in **wetland regions**?

Urban Wind Stilling Effect Creates Clean Aerosol Islands

📌 **Syllabus Mapping:**

✅ **GS Paper III – Environment**

- **Urbanization and Environmental Impact:** Understanding the **Urban Wind Stilling Effect** and its influence on **air quality** and **aerosol dispersion** in **urban** and **rural areas**.

✅ **GS Paper II – Social Justice and Environmental Governance**

- **Urban Environmental Management:** The role of **urban planning** in mitigating **pollution** and promoting **clean air** in growing cities.

1. Introduction

- A recent study has revealed that certain cities in **North India** experience a phenomenon known as the **Urban Wind Stilling Effect**, where urban areas, specifically in the **northwest** and **northern Indo-Gangetic Plain**, have **lower aerosol levels** compared to surrounding **rural areas**. These cities are being referred to as **Urban Aerosol Clean Islands** due to their ability to create relatively **cleaner air pockets** within heavily urbanized regions.

2. What are Aerosols?

- **Definition:**
  - **Aerosols** are tiny particles or droplets, either liquid or solid, suspended in a **gaseous medium** (usually air). Common examples include **fog**, **clouds**, **smoke**, and **dust**.
- **Role in the Environment:**
  - Aerosols play a significant role in **climate change** and **air quality**, as they can reflect sunlight, contribute to cloud formation, and impact **human health** when present in high concentrations.

3. The Urban Wind Stilling Effect

- **Cause of the Effect:**
  - The **Urban Wind Stilling Effect** occurs due to the presence of **urban structures** such as **buildings**, **roads**, and **infrastructure**, which weaken surface winds. These **weakened winds** act as **barriers**, reducing the ability of **dust and pollutants** to travel over long distances into urban areas.
- **Impact on Aerosols:**
  - As a result of this effect, cities in the **northwest** and **northern Indo-Gangetic Plain** see **lower aerosol concentrations** than the surrounding **rural areas**, which are often exposed to more long-range **pollutants**and **dust** carried by stronger winds.

4. The Concept of Urban Aerosol Clean Islands

- **Formation of Clean Islands:**
  - The **Urban Wind Stilling Effect** essentially creates **urban pockets** where the levels of harmful **aerosols** are reduced, leading to the phenomenon referred to as **Urban Aerosol Clean Islands**. This occurs because the urban areas' built structures reduce the influx of **pollutants** that are commonly found in rural or agricultural regions.
- **Geographical Distribution:**
  - According to the study, **43%** of cities in the **northwest** and **northern Indo-Gangetic Plain** are experiencing this effect, with **lower aerosol levels** than the **nearby rural areas**, creating **cleaner air pockets** in the midst of highly populated urban spaces.

5. Implications of the Urban Wind Stilling Effect

- **Air Quality in Urban Areas:**
  - While the **Urban Wind Stilling Effect** might provide some temporary relief in terms of lower aerosol levels, it also highlights the complexities of **air quality** management in **urban environments**. Urban areas still face significant challenges regarding **air pollution**, particularly from sources like **vehicular emissions**, **industrial activity**, and **construction dust**.
- **Potential for Future Studies:**
  - This effect presents new opportunities for **environmental research**, focusing on how **urban planning**, **infrastructure**, and **wind patterns** can influence **air quality**. Understanding this phenomenon could help in designing **better urban spaces** that mitigate air pollution.

6. Conclusion:

- The **Urban Wind Stilling Effect** in cities of **North India** demonstrates a unique aspect of how **urbanization** can inadvertently influence **air quality**. While creating **Urban Aerosol Clean Islands**, these cities also underline the ongoing challenge of managing **pollutants** in rapidly growing urban environments. Future urban development should take this effect into account, alongside other pollution control measures, to ensure healthier, cleaner cities.

UPSC Mains Questions:

General Studies Paper III – Environment:

- **Q1.** Discuss the concept of **Urban Wind Stilling Effect** and how it contributes to the creation of **Urban Aerosol Clean Islands** in India. What are the implications of this effect for **urban air quality management**?
- **Q2.** How does the phenomenon of **aerosol concentration** in urban areas differ from **rural areas**? Explain the role of **urban structures** in mitigating **pollutants** and improving **air quality**.

General Studies Paper II – Governance, Constitution, Polity, and International Relations:

- **Q3.** Evaluate the role of **urban planning** and **environmental policies** in mitigating **air pollution** in **Indian cities**. How can cities benefit from understanding the **Urban Wind Stilling Effect** for future urban design?

General Studies Paper III – Economic Development:

- **Q4.** Explain how **environmental management** in urban areas can contribute to **sustainable development**. How does reducing **aerosol levels** in cities benefit **public health** and **economic productivity**?

Offshore Areas Atomic Minerals Operating Right Rules, 2025 Notified

📌 **Syllabus Mapping:**

✅ **GS Paper III – Environment and Ecology**

- **Mineral Resources and Regulations:** Understanding the **Offshore Areas Atomic Minerals Operating Right Rules, 2025**, and their significance in regulating **mining and exploration** of **atomic minerals** like **uranium** and **thorium** in **offshore areas**.

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Regulation of Natural Resources:** The role of **government regulations** in controlling the extraction of sensitive resources like **atomic minerals** and ensuring **sustainable development** and **security**.

1. Introduction

- The **Offshore Areas Atomic Minerals Operating Right Rules, 2025** have been notified under the **Offshore Areas Mineral (Development and Regulation) Act, 2002**. These rules govern the **exploration** and **mining** of critical **atomic minerals** like **uranium** and **thorium** found in **offshore areas** of India.

2. Objectives of the Rules

- **Regulating Atomic Mineral Exploration:**
  - The primary aim of these rules is to **regulate** the exploration and **mining of atomic minerals** in **offshore areas** of India, ensuring that such activities are carried out in a structured, sustainable, and secure manner.
- **Minimum Concentration Requirement:**
  - The rules specify that the regulations will only apply if the concentration of atomic minerals in the offshore area is above a certain **minimum threshold**.
- **Licensing and Leasing:**
  - Under these rules, entities nominated by the government will be granted **exploration licenses** or **production leases** to engage in the extraction of **atomic minerals**.
  - For **foreign entities** involved in exploration operations, **prior approval** must be obtained from the relevant **government authorities**.

3. Key Atomic Minerals in India

- **Uranium:**
  - **Uranium** is one of the most critical atomic minerals, used primarily in **nuclear energy generation**.
  - **Key Reserves in India:**
    - **Jharkhand**, **Andhra Pradesh**, **Meghalaya**, **Rajasthan**, and other states house significant **uranium deposits**.

  - **Notable Mines:**
    - **Jaduguda** (Jharkhand): India's first commercial **uranium mine**.
    - **Lambapur-Peddagattu** (Andhra Pradesh), **Bagjata Mine** (Jharkhand) are other key mines.
  - **Challenges:**
    - Most of the **uranium deposits** in India are **small** and of **lower grade** compared to other leading **uranium-producing countries**, posing challenges to large-scale mining operations.
- **Thorium:**
  - **Thorium** is another important atomic mineral that India has in large quantities. While **uranium** reserves are limited in India, the country possesses **substantial thorium resources**.
  - **Monazite:**
    - A key source of **thorium**, **monazite** sands are found in abundance in regions such as the **beaches of Kerala** and **Orissa**. **Monazite** contains about **8-10% thorium**.
  - **Strategic Importance:**
    - **Thorium** is seen as an important alternative for **nuclear energy** production, with India focusing on **thorium-based nuclear reactors** in its long-term energy strategy.

4. Conclusion:

- The **Offshore Areas Atomic Minerals Operating Right Rules, 2025** are a significant step towards regulating the extraction of **atomic minerals** like **uranium** and **thorium** in India. By specifying licensing procedures and setting clear rules for domestic and foreign entities, the government is ensuring the responsible and efficient management of these crucial resources for India's **energy security**.

UPSC Mains Questions:

General Studies Paper III – Economic Development:

- **Q1.** Discuss the importance of **offshore mining** in India's pursuit of **atomic minerals** like **uranium** and **thorium**. How do the newly notified **Offshore Areas Atomic Minerals Operating Right Rules, 2025** contribute to **India's energy security**?
- **Q2.** Analyze the role of **thorium** in India's future **nuclear energy** strategy. How does India's resource advantage in **thorium** affect its **long-term energy policies**?

General Studies Paper II – Governance, Constitution, Polity, and International Relations:

- **Q3.** Evaluate the significance of the **Offshore Areas Atomic Minerals Operating Right Rules, 2025** in promoting **sustainable and secure extraction** of atomic minerals in India. What are the governance challenges in managing these resources?

General Studies Paper III – Environment:

- **Q4.** Discuss the environmental and regulatory challenges associated with **offshore mining** for **atomic minerals**. How can India balance resource extraction with **environmental sustainability**?

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BIOTECHNOLOGY & HEALTH

WHO Releases Guidelines for Managing Arboviral Diseases

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Global Health Policy:** WHO guidelines and international cooperation in managing **arboviral diseases**.

✅ **GS Paper II – Social Justice and Health**

- **Public Health Issues:** Managing the rise of **arboviral diseases** such as **Dengue**, **Chikungunya**, **Zika**, and **Yellow Fever**.

✅ **GS Paper III – Technology, Economic Development, and Security**

- **Health and Environment:** Impact of **climate change**, **urbanization**, and **global mobility** on the spread of **arboviral diseases**.

1. Introduction

- The **World Health Organization (WHO)** has released its **first integrated guidelines** for managing **arboviral diseases** such as **Dengue**, **Chikungunya**, **Zika**, and **Yellow fever**.
- These guidelines aim to address the increasing **frequency**, **severity**, and **widespread** nature of these diseases.

2. About Arboviral Diseases

- **Definition:**
  - **Arboviral diseases** are caused by viruses that are transmitted by **arthropods**, primarily **mosquitoes**. These diseases include:
    - **Dengue**
    - **Chikungunya**
    - **Zika**
    - **Yellow Fever**
- **Transmission:**
  - These illnesses are mainly spread by **Aedes mosquitoes**, particularly **Aedes aegypti** and **Aedes albopictus**.
- **Global Risk:**
  - Over **5.6 billion people** globally are at risk of contracting these diseases due to various factors like **climate change**, **urbanization**, and **increased human movement**.

3. Challenges in Diagnosis and Clinical Management

- **Similar Symptoms:**
  - Arboviral diseases often share similar early symptoms, such as **fever**, **headaches**, **joint pain**, and **rash**.
  - This makes **clinical diagnosis** challenging, especially during simultaneous outbreaks of multiple diseases in a region.
- **Need for Unified Approach:**
  - WHO emphasizes the importance of a **unified clinical approach** to effectively manage outbreaks and prevent misdiagnosis.

4. WHO Guidelines for Managing Arboviral Diseases

- **Integrated Guidelines:**
  - The **WHO guidelines** aim to provide a **coordinated approach** to the prevention, diagnosis, and treatment of **arboviral diseases**, particularly in regions where these diseases are becoming more frequent.
- **Rising Threats:**
  - The guidelines come at a time when **arboviral outbreaks** are becoming **more frequent, severe, and widespread**, making it essential for health systems to be equipped with the tools and strategies to manage these diseases effectively.

5. Conclusion:

- The rise of **arboviral diseases** underscores the **global health challenges** posed by climate change, urbanization, and mobility.
- The **WHO's integrated guidelines** are a step towards tackling these challenges through **better diagnosis**, **treatment**, and **prevention** strategies.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the global health challenges posed by **arboviral diseases** such as **Dengue**, **Chikungunya**, **Zika**, and **Yellow Fever**. How can international organizations like the **WHO** help manage these challenges?
- **Q2.** Analyze the reasons behind the rise of **arboviral diseases**. How can **climate change**, **urbanization**, and **increased human movement** contribute to the spread of these diseases?

General Studies Paper III:

- **Q3.** Evaluate the significance of the **WHO's integrated guidelines** for managing **arboviral diseases**. How will these guidelines help in improving **healthcare responses** to frequent outbreaks?
- **Q4.** Discuss the challenges in diagnosing **arboviral diseases** and the need for a **unified clinical approach** in managing outbreaks. What measures can be taken to enhance **early diagnosis** and **treatment**?

India Faces Silent Salt Consumption Epidemic

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Public Health Initiatives:** Government's role in addressing public health challenges like excessive salt consumption and its effects on health.

✅ **GS Paper III – Technology, Economic Development, and Security**

- **Healthcare and Nutrition:** The impact of **salt consumption** on public health and the role of **low-sodium substitutes** in tackling dietary issues.

✅ **GS Paper II – Social Justice**

- **Health and Social Campaigns:** The role of **ICMR** and **social media campaigns** like #PinchForAChange in raising awareness about **salt reduction**.

1. Introduction

- **India** is grappling with a **silent epidemic** of **excessive salt consumption**, as reported by the **ICMR's National Institute of Epidemiology**.
- The growing levels of **salt consumption** in India have led to increased risks of chronic health issues like **hypertension**, **stroke**, **heart disease**, and **kidney disorders**.

2. Salt Consumption Trends in India

- **Urban vs Rural Consumption:**
  - **Urban Indians** consume approximately **9.2 grams** of salt per day, while **rural Indians** consume around **5.6 grams** per day.
  - Both of these figures are well above the **World Health Organization's (WHO)** recommendation of **less than 5 grams per person per day**.
- **Health Implications:**
  - **Excessive salt consumption** is a key factor contributing to the rising incidences of **hypertension** and other cardiovascular diseases in the country.

3. The Silent Epidemic

- **Hypertension and Cardiovascular Diseases:**
  - The excessive intake of salt is increasingly linked to **high blood pressure**, which can lead to **stroke**, **heart disease**, and **kidney disorders**.
  - This growing trend is often referred to as a **silent epidemic** due to its gradual, unnoticed impact on public health.

4. Possible Solution: Low-Sodium Salt Substitutes

- **Low-Sodium Salt:**
  - One promising solution to this issue is the use of **low-sodium salt substitutes**, where a portion of **sodium chloride** is replaced with **potassium** or **magnesium**.
  - These substitutes can help reduce the **sodium intake** while maintaining the taste and texture of salt.

5. Government and Social Initiatives

- **ICMR's Community-Led Salt Reduction Initiative:**
  - The **Indian Council of Medical Research (ICMR)** has launched a **Community-Led Salt Reduction**initiative, aimed at raising awareness about the harmful effects of excessive salt consumption.
- **Social Media Campaigns:**
  - The **#PinchForAChange** social media campaign is being used to encourage people to reduce their salt intake and adopt healthier dietary habits.

6. Conclusion:

- Addressing the **silent salt consumption epidemic** is crucial for improving **public health** in India. Government initiatives, along with **low-sodium salt substitutes**, can play a significant role in reducing the health risks associated with excessive salt intake.
- Through continued awareness efforts and community-led campaigns, India can combat this growing issue and promote healthier lifestyles.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the public health challenges posed by **excessive salt consumption** in India. How can initiatives like **ICMR's Community-Led Salt Reduction** help mitigate this issue?
- **Q2.** Explain the health risks associated with **high salt consumption** and suggest potential solutions to reduce its intake in India. How effective are **low-sodium salt substitutes** in this regard?

General Studies Paper III:

- **Q3.** Analyze the role of **social media campaigns** like **#PinchForAChange** in promoting public health awareness. How can such campaigns be effective in addressing lifestyle-related diseases?
- **Q4.** Evaluate the impact of **salt consumption** on **cardiovascular health** in India. What measures can the government and health organizations take to reduce **salt intake** at the national level?

WHO/UNICEF 2024 Estimates Show Progress on Immunization in India

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Public Health and Immunization Programs:** The role of **India's Universal Immunization Programme (UIP)**and other health initiatives in improving **immunization coverage** and **public health outcomes**.

✅ **GS Paper II – Social Justice**

- **Health and Welfare Schemes:** The **progress in immunization** and its contribution to **social equity** and **healthcare accessibility** in India.

✅ **GS Paper III – Economic Development**

- **Health Sector and Infrastructure:** How **immunization progress** in India supports **economic development** by reducing the disease burden and improving public health.

1. Introduction

- According to the **WHO/UNICEF 2024 estimates**, there has been **significant progress** in **immunization** in **India**, as evidenced by the **reduction in zero-dose children** and an increase in global vaccination coverage.

2. Key Findings from the Report

- **Global Immunization Trends (2024):**
  - In **2024**, **89%** of infants globally received at least **one dose** of the **diphtheria, tetanus, and pertussis (DTP)**containing vaccine.
- **India's Progress:**
  - **India** has reduced its number of **zero-dose children** (children who have not received a single vaccine) by **43%** in 2024, dropping from **1.6 million in 2023** to **0.9 million in 2024**.
  - This reflects **significant improvement** in coverage and access to **vaccines** across the country.

3. Universal Immunization Programme (UIP) of India

- **Genesis of UIP:**
  - Initially launched in **1978** as the **Expanded Programme on Immunization**, the program was rebranded as the **Universal Immunization Programme (UIP)** in **1985**.
- **Immunization Coverage:**
  - The UIP provides **free immunization** against **12 diseases**, with **nationwide coverage** for **9 diseases** and **region-specific coverage** for **3 diseases**:
    - **Nationwide (9):** Diphtheria, Pertussis, Tetanus, Polio, Measles, Rubella, Childhood Tuberculosis, Hepatitis B, Meningitis & Pneumonia.
    - **Region-specific (3):** Rotavirus Diarrhoea, Pneumococcal Pneumonia, and Japanese Encephalitis.
- **Fully Immunized Child Definition:**
  - Under the UIP, a child is considered **fully immunized** after receiving all vaccines as per the **national schedule** within the **first year** of life.
- **Achievements of UIP:**
  - **Polio-Free India** (2014).
  - **Neonatal Tetanus Elimination** (2015).

4. Key Initiatives to Improve Immunization Coverage

- **Intensified Mission Indradhanush (IMI 5.0):**
  - This campaign focuses on **improving Measles and Rubella vaccination coverage**, especially in **hard-to-reach areas**.
- **U-WIN Portal:**
  - The **U-WIN Portal** has been introduced to **digitize** immunization data, making it easier for both **health workers** and **parents** to track immunization status and **improve coverage**.

5. Conclusion:

- The **WHO/UNICEF 2024 report** demonstrates that India is making **significant strides** towards improving **immunization coverage**, with marked reductions in **zero-dose children** and the successful implementation of various vaccination initiatives such as **IMI 5.0** and **U-WIN**.
- These improvements contribute to **India's overall health progress**, paving the way for a healthier future generation and helping meet **global health targets**.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the significance of India's **Universal Immunization Programme (UIP)** in improving **public health**outcomes. How does it contribute to the achievement of **global immunization goals**?
- **Q2.** Evaluate the role of initiatives like the **Mission Indradhanush 5.0** campaign and the **U-WIN Portal** in addressing the **challenges** in **immunization coverage** in India.

General Studies Paper III:

- **Q3.** How does improving **immunization coverage** in India impact **economic development** and **public health systems**? Discuss the economic benefits of **reducing disease burden** through vaccination programs.

SCIENCE & TECHNOLOGY

WHO Recognizes India's Role in AI-Integrated Traditional Medicine

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Healthcare Governance**: Integration of AI with traditional medicine and governance of emerging healthcare technologies.

✅ **GS Paper III – Technology, Economic Development, and Security**

- **Artificial Intelligence & Technology**: Role of AI in healthcare, traditional medicine, and the challenges in digital adoption.

✅ **GS Paper II – International Relations**

1. Introduction

- The **World Health Organization (WHO)** has recognized **India's leadership** in integrating **Artificial Intelligence (AI)** with the **Traditional Medicine (TM)** system, particularly in **AYUSH** (Ayurveda, Siddha, Unani, Sowa Rigpa, and Homoeopathy).
- This recognition comes through WHO's **first-ever technical brief** titled "Mapping the Application of Artificial Intelligence in Traditional Medicine," following **India's proposal** to incorporate AI in TM.

2. WHO's Global Initiative on AI for Health (GI-AI4H)

- The **Global Initiative on AI for Health (GI-AI4H)** was launched by WHO, the **International Telecommunication Union (ITU)**, and the **World Intellectual Property Organization (WIPO)**.
- **WHO's Technical Brief** maps the **application of AI** in TM and recognizes India's role in pushing for the **integration of AI** in traditional health systems.

3. AI Applications in Indian Traditional Medicine (TM)

- **Smarter Diagnosis:**
  - AI is being used to enhance traditional diagnostic methods like **pulse reading**, **tongue analysis**, and **Prakriti assessment** with **machine learning** and **deep learning**.
- **Ayurgenomics:**
  - The merging of **genomics** with **Ayurvedic principles** allows AI to help identify disease **risk markers** and provide tailored health advice based on an individual's **Ayurvedic constitution**.
- **Drug Action Pathways:**
  - AI helps in the development of **chemical sensors** that assess Ayurvedic concepts like **Rasa**, **Guna**, and **Virya**to understand **drug action** in traditional medicine.

4. Key Challenges in Using AI for Traditional Medicine

- **Biopiracy Risk:**
  - There is a potential risk of **indigenous knowledge** being misused for profit without **consent** from local communities.
- **Digital Gaps:**
  - Lack of **infrastructure** and **digital literacy** in many regions limits the access to and usage of AI tools in traditional medicine.
- **Lack of Quality Data:**
  - AI requires large, reliable datasets, which are often **missing** in traditional medicine, making it challenging to integrate AI effectively.
- **Localization vs. Integration:**
  - Balancing **local relevance** of AI tools with the need for **global integration** and **standardization** remains a complex challenge.

5. Indian Initiatives to Facilitate AI in Traditional Medicine

- **Traditional Knowledge Digital Library (TKDL):**
  - Digitization of **Traditional Medicine practices** from Ayurveda, Siddha, Sowa Rigpa, and Yoga to preserve indigenous knowledge.
- **Ayush Grid:**
  - Launched in 2018, **Ayush Grid** is a **central digital platform** for traditional medicine. It supports key initiatives such as:
    - **AYUSH Health Management Information System (AHMIS)**: Cloud-based system used by clinical establishments.
    - **SAHI Portal**: For standardizing **Ayurveda Health Information**.
    - **NAMASTE Portal**: For traditional medicine services.

    - **Ayush Research Portal**: A **centralized research access** platform.
    - **Ayush Sanjivani & Yoga Locator Apps**: Digital tools to aid in healthcare and wellness.
- **Global Partnership on Artificial Intelligence (GPAI) Summit, 2023:**
    - A **multi-stakeholder initiative** aimed at bridging the gap between AI theory and practice, fostering global cooperation in AI applications.

6. Conclusion:

- India's recognition by the **WHO** highlights the country's efforts to **modernize and globalize** its **traditional medicine systems** through AI.
- The **integration of AI** with **AYUSH** opens new possibilities for advancing **healthcare** while preserving and promoting **indigenous knowledge**.
- Overcoming the challenges like **biopiracy** and **data gaps** will be crucial for ensuring the responsible use of AI in traditional medicine, while promoting **global collaboration** in health innovation.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss India's leadership in integrating **Artificial Intelligence** with **Traditional Medicine**. How does this recognition by WHO impact India's position in global health initiatives?
- **Q2.** What are the **challenges** and **opportunities** in incorporating **Artificial Intelligence** into traditional medicine systems like **AYUSH**? How can India address these challenges?

General Studies Paper III:

- **Q3.** Evaluate the role of **AI** in enhancing **healthcare systems**. How can **AI in Traditional Medicine** contribute to **health outcomes** and **economic development** in India?
- **Q4.** Discuss the importance of **data governance frameworks** in the context of using **AI** in **Traditional Medicine**. What steps should India take to ensure **ethical use** of indigenous knowledge?

NASA Discovers Super-Earth TOI-1846: Advancing Exoplanet Understanding

📌 **Syllabus Mapping:**

✅ **GS Paper III – Science and Technology**

- **Space Technology & Exploration:** Discovery of **Super-Earth** exoplanets and advancements in **astronomical research** using NASA's **TESS** satellite.

✅ **GS Paper III – Environment and Ecology**

- **Planetary Science:** Exploration of new exoplanets, such as **TOI-1846**, and their potential for **habitability** and **water presence**.

1. Introduction

- **NASA's Transiting Exoplanet Survey Satellite (TESS)** has recently discovered a **new super-Earth** named **TOI-1846**.
- This **exoplanet** is about **twice the size of Earth** and orbits a **red dwarf star** located **154 light-years away** from our solar system.
- There are indications that **TOI-1846** may be **rich in water**, offering exciting possibilities for further exploration.

2. About Super-Earths

- **Definition:**
    - **Super-Earths** are a class of **exoplanets** (planets outside our solar system). The term refers specifically to their **size and mass** and not necessarily to Earth-like features.
- **Size and Mass:**
    - Super-Earths are generally **larger** than Earth (up to **twice its size**) and **more massive** (up to **10 times Earth's mass**), but they are still **lighter** than planets like **Neptune**.
- **Uncertain Nature:**
    - The true **composition** of super-Earths remains uncertain, and they are unlike any planets in our solar system, making them a subject of intense study in **planetary science**.
- **Also Known As:**
    - Larger super-Earths are sometimes referred to as **sub-Neptunes** or **mini-Neptunes**, due to their similar characteristics to **Neptune** in terms of size and mass.

3. Characteristics of TOI-1846

- **Size & Orbit:**

  - **TOI-1846** is roughly **twice the size** of Earth and orbits a **red dwarf star**.
- **Potential for Water:**
  - The exoplanet may be **rich in water**, which raises questions about the possibility of liquid water on its surface and the potential for **habitability**.
- **Location:**
  - TOI-1846 is located about **154 light-years away** from Earth, a considerable distance but still relatively close in astronomical terms.

4. Conclusion:

- The discovery of **TOI-1846** highlights the continuous progress in **astronomical research** and the hunt for **exoplanets** with **Earth-like characteristics**.
- While the planet's **true composition** and potential for supporting life remain unclear, it adds to the growing number of **super-Earths** that astronomers are studying to understand more about the **diversity of planetary systems** in the universe.

UPSC Mains Questions:

General Studies Paper III:

- **Q1.** Discuss the significance of the discovery of **TOI-1846** as a **super-Earth**. How does it contribute to our understanding of **exoplanets** and the search for **habitable planets**?
- **Q2.** Explain the concept of **super-Earths**. How do they differ from **Earth-like planets**? What challenges do astronomers face in studying the **composition** and **habitability** of such exoplanets?

General Studies Paper III (Science and Technology):

- **Q3.** What are the key features of the **NASA TESS mission**, and how does it aid in the discovery of **exoplanets** such as **TOI-1846**?

India and Japan Introduce Next-Gen E10 Shinkansen Trains

📌 **Syllabus Mapping:**

✅ **GS Paper III – Science and Technology**

- **Transport and Technology:** The introduction of **Shinkansen technology** in India through the **Mumbai-Ahmedabad Bullet Train project** and its **high-speed rail capabilities**.

✅ **GS Paper II – International Relations**

- **Bilateral Cooperation:** India-Japan collaboration on the **Shinkansen project** and the shared technology for **infrastructure development**.

✅ **GS Paper III – Economic Development**

- **Infrastructure Development:** The role of **Shinkansen technology** in improving **India's transport infrastructure**and its impact on **economic growth**.

1. Introduction

- The **next-generation E10 Shinkansen trains** will be introduced simultaneously in **India** and **Japan**, as part of the **Mumbai-Ahmedabad Bullet Train Project** (508 km).
- This marks a significant milestone in **India's infrastructure development** with the adoption of **Japanese high-speed rail technology**.

2. About Shinkansen Technology

- **Shinkansen:**
  - Known as Japan's **high-speed bullet train**, the **Shinkansen** is the world's **safest** and **most reliable** high-speed transport system.
  - It has a reputation for **high-frequency, high-volume, and efficient** operations.
- **Key Features of Shinkansen Technology:**
  - **Crash Avoidance Systems:**
    - **Dedicated tracks** for high-speed rail ensure **no level crossings**, reducing collision risks.
    - The **Automatic Train Control (ATC) System** prevents crashes by automatically controlling the train's speed.
  - **Aerodynamic Optimization:**
    - The **leading shape** of the train is designed to reduce air resistance, improving both **speed** and **fuel efficiency**.
  - **Energy-Efficient Systems:**
    - The **traction systems** are optimized for **energy efficiency**, minimizing environmental impact and operational costs.
  - **Noise Reduction:**

- The train is designed to minimize **vehicle noise**, ensuring a smooth and quiet ride, contributing to **ride comfort**.

3. Shinkansen Technology in India

- **Mumbai-Ahmedabad Bullet Train:**
  - The **Mumbai-Ahmedabad corridor** is set to become India's first **high-speed rail line**, integrating **Shinkansen technology** to provide **faster** and **safer** travel options for passengers.
- **Impact on Infrastructure and Economic Growth:**
  - The introduction of **Shinkansen technology** is expected to **revolutionize India's transport sector**, offering faster and more efficient travel, reducing travel times between major cities, and stimulating **economic growth**through improved connectivity.

4. Conclusion:

- The **Shinkansen technology** partnership between **India** and **Japan** marks a major leap in the evolution of **India's transport infrastructure**, bringing world-class, **safe, efficient**, and **sustainable transportation** to India. It will play a crucial role in shaping the future of **high-speed rail** in the country.

UPSC Mains Questions:

General Studies Paper III:

- **Q1.** Discuss the significance of the **Shinkansen technology** in improving **high-speed rail** transportation in India. What are its **key features** and how does it contribute to **sustainable infrastructure development**?
- **Q2.** Evaluate the **economic impact** of the **Mumbai-Ahmedabad Bullet Train project** in terms of **connectivity**, **job creation**, and **regional economic growth**.

General Studies Paper II (International Relations):

- **Q3.** Analyze the role of **India-Japan cooperation** in the **Shinkansen technology** project. How does this collaboration strengthen bilateral ties and contribute to **infrastructure development** in India?

Scientists Detect Largest Ever Merger of Two Black Holes

📌 **Syllabus Mapping:**

✅ **GS Paper III – Science and Technology**

- **Astronomy and Astrophysics:** The discovery of the **merger of two black holes** and the detection of **gravitational waves**.

✅ **GS Paper III – Technology**

- **Space Technology and Research:** The role of **LIGO**, **Virgo**, and **KAGRA** in **gravitational wave detection**.

1. Introduction

- **Gravitational Waves (GW)** from the **merger of two massive black holes** were detected by the **LVK Network** of observatories, involving **LIGO** in the **United States**, **Virgo** in **Italy**, and **KAGRA** in **Japan**.
- The event, identified as **GW231123**, is considered the **biggest ever merger** of black holes detected, signaling a breakthrough in **astrophysics**.

2. Key Highlights of the Event

- **The Event - GW231123:**
  - The event occurred **billions of years ago**, but the **gravitational waves** from the merger were detected recently, allowing scientists to observe the **violent cosmic event**.
- **Gravitational Waves:**
  - These are **ripples in space-time**, caused by some of the most **violent and energetic processes** in the universe, such as the **merger of black holes**.
  - Albert **Einstein** predicted the existence of gravitational waves in his **General Theory of Relativity** in **1916**.
- **Heaviest Black Hole Merger:**
  - The merger involved two **black holes** with masses of about **100 times** and **140 times the mass of the Sun**.
  - The final black hole formed after the merger weighs approximately **225 solar masses**.

3. About Black Holes

- **What Are Black Holes?**
  - **Black holes** are **astronomical objects** with an extremely strong **gravitational pull**, such that not even **light**can escape from them.
- **Types of Black Holes:**
  - **Stellar-mass Black Holes:** Typically have masses around **20 times** the Sun's mass or more.
  - **Intermediate-mass Black Holes:** Have masses ranging from **hundreds** to **hundreds of thousands** of times the Sun's mass.
  - **Supermassive Black Holes:** Have masses ranging from **hundreds of thousands** to **billions of times** the Sun's mass.

4. Gravitational Wave Detection Network

- **Laser Interferometer Gravitational-Wave Observatory (LIGO):**
  - Supported by the **U.S. National Science Foundation (NSF)**, LIGO is the world's largest **gravitational wave observatory**. It has **two detectors** located in **Hanford**, Washington, and **Livingston**, Louisiana.
  - The upcoming **LIGO-India** facility, to be set up in **Hingoli, Maharashtra**, will be a collaboration between **NSF** and India.
- **Virgo (Italy):**
  - Hosted by the **European Gravitational Observatory (EGO)**, **Virgo** is a **collaboration** between Italy and France, playing a key role in detecting gravitational waves.
- **KAGRA (Japan):**
  - Located in the **Kamioka mine** in Japan, **KAGRA** is another crucial component of the **gravitational wave detection network**, contributing to the global understanding of these cosmic phenomena.

5. Conclusion:

- The **detection of the merger of two massive black holes** is a groundbreaking achievement in **astrophysics**, providing deeper insights into the **nature of black holes** and the **universe's most energetic events**.
- The collaboration of **global observatories** such as **LIGO**, **Virgo**, and **KAGRA** underscores the importance of international cooperation in advancing our understanding of the universe.

UPSC Mains Questions:

General Studies Paper III:

- **Q1.** Discuss the significance of the recent detection of the **merger of two massive black holes** through **gravitational waves**. How does it contribute to our understanding of **astrophysics** and the **universe**?
- **Q2.** Explain the working and role of **LIGO**, **Virgo**, and **KAGRA** in the detection of **gravitational waves**. How do these technologies advance our understanding of **space-time phenomena**?

General Studies Paper III – Technology:

- **Q3.** Evaluate the importance of **gravitational wave research** in the field of **astrophysics**. How does the detection of gravitational waves from black hole mergers aid in **scientific discovery**?

DRDO Delivers Indigenous Radiation Monitoring Systems to Navy

📌 **Syllabus Mapping:**

✅ **GS Paper III – Science and Technology**

- **Defense Technology and Applications:** The role of **Radiation Monitoring Systems (RMS)** in **national security**and **defense technology**.

✅ **GS Paper III – Technology**

- **Emerging Technologies in Environmental Monitoring:** The applications of **radiation monitoring systems** in **nuclear safety**, **medical facilities**, and **environmental surveillance**.

1. Introduction

- The **Defence Research and Development Organisation (DRDO)** has recently handed over **6 indigenous Radiation Monitoring Systems (RMS)** to the **Indian Navy**.
- The systems include critical instruments such as the **Gamma Radiation Aerial Surveillance System**, **Environmental Surveillance Vehicle**, and the **Vehicle Radiological Contamination Monitoring System**.

2. About Radiation Monitoring Systems (RMS)

- **Purpose and Functionality:**
  - **RMS** are used to measure **radiation fields** in the vicinity of radiation sources, including the **measurement of surface contamination** and **airborne radioactivity**.
  - These systems are essential for **nuclear safety**, **environmental monitoring**, and ensuring **radiation safety** in various sectors.
- **Instruments Used:**
  - **Radiation Survey Meters**: These are also known as **Geiger counters** or **Geiger-Mueller meters**. They measure **gamma radiation** but **cannot detect alpha or beta radiations**.
  - Newer, more **portable and compact radiation monitors** are equipped with **digital readouts and alarm systems**, which can measure **alpha**, **beta**, and **gamma radiation**, providing a more comprehensive radiation monitoring solution.

3. Key Applications of RMS

- **Nuclear Power Plants:**
  - RMS plays a vital role in **monitoring radiation levels** around nuclear power plants to ensure safety and compliance with **radiation protection standards**.
- **Medical Facilities:**
  - These systems are crucial for the **safe use** of **radiation in medical treatments** such as **radiotherapy** and in **nuclear medicine** facilities.
- **Environmental Monitoring:**
  - RMS assists in **environmental surveillance** to detect and monitor the presence of **radiation contamination**in the environment, particularly following nuclear accidents or other sources of radiation release.
- **National Security:**
  - RMS are also critical for **national security**, helping to monitor radiation levels in areas potentially impacted by **nuclear threats** or incidents, including border surveillance and defense preparedness.

4. Conclusion:

- The **indigenous development and delivery of Radiation Monitoring Systems (RMS)** to the **Indian Navy** mark a significant step in strengthening India's **defense capabilities**, **radiation safety**, and **environmental monitoring**. These systems not only serve military and national security purposes but also have vital applications in **civilian sectors**, particularly in **nuclear safety** and **medical radiation management**.

UPSC Mains Questions:

General Studies Paper III:

- **Q1.** Discuss the significance of the **Radiation Monitoring Systems (RMS)** developed by **DRDO** for the **Indian Navy**. How do these systems contribute to **nuclear safety** and **national security**?
- **Q2.** Explain the importance of **radiation monitoring** in the **environmental** and **medical sectors**. What role do **portable RMS** play in ensuring **radiation safety** in these sectors?

General Studies Paper III – Technology:

- **Q3.** How does **advancement in radiation monitoring technologies**, such as **Geiger-Mueller meters** and **digital portable systems**, contribute to **nuclear safety** and **environmental protection**?

Prime Minister Professorships to Strengthen Research in India

📌 **Syllabus Mapping:**

✅ **GS Paper II – Governance, Constitution, Polity, and International Relations**

- **Government Initiatives and Schemes:** The **PM Professorships** program under the **Anusandhan National Research Foundation (ANRF)** and its role in advancing **scientific research** and **innovation** in India.

✅ **GS Paper III – Science and Technology**

- **Research and Development (R&D):** How initiatives like **PM Professorships** contribute to fostering **advanced research** in **engineering, science**, and **technology**.

1. Introduction

- The **Anusandhan National Research Foundation (ANRF)** has announced the **Prime Minister Professorships (PM Professorships)** to leverage the expertise of **eminent and retired scientists** in the fields of **engineering, science**, and **technology**. This initiative is part of India's effort to strengthen its **research ecosystem** and foster **innovation**.

2. About PM Professorships

- **Objective:**
  - The PM Professorships aim to **harness the expertise** of **active** and **retired scientists** (including those from overseas) to contribute to India's **scientific and technological advancements**. The focus is on **building a strong foundation** for **research** in various **fields** like **engineering**, **science**, and **technology**.
- **Eligibility:**
  - The program is open to **retired scientists**, including **overseas scientists**, **Non-Resident Indians (NRIs)**, **Persons of Indian Origin (PIOs)**, and **Overseas Citizens of India (OCIs)**. This broad eligibility ensures that **global talent** contributes to India's **scientific progress**.
- **Host Institutions:**
  - Eligible host institutions for the program are **state universities** that have been classified as **spoke institutions** in **Category A** of the **Partnerships for Accelerated Innovation and Research (PAIR)** program of **ANRF**. These universities are equipped to support advanced research and innovation.

3. Funding and Support

- **Financial Assistance:**
  - The PM Professorships offer an annual **fellowship of ₹30 lakh**, along with **₹24 lakh** for **research grants** and an additional **overhead of ₹1 lakh**. This funding is aimed at ensuring that researchers have the necessary resources to conduct high-quality research.
- **Duration:**
  - The program will have a **5-year** duration, allowing the scientists and researchers ample time to establish and advance their research initiatives.

4. Expected Impact

- **Scientific Excellence:**
  - The program is designed to foster **collaborative research** and **knowledge sharing** between seasoned experts and emerging scientists, promoting a culture of **scientific excellence** in India.
- **Innovation and Technological Growth:**
  - By involving **retired** and **overseas scientists**, the initiative encourages the transfer of **global knowledge** and promotes **innovation**, ensuring India remains at the forefront of **scientific research** and **technological development**.

5. Conclusion:

- The **PM Professorships** initiative is a key step in utilizing the vast **experience** and **knowledge** of **eminent scientists** to accelerate research and innovation in India. By offering funding and institutional support, the initiative will help address pressing challenges in **engineering, science**, and **technology**, contributing to India's development as a **global leader in research and innovation**.

UPSC Mains Questions:

General Studies Paper II:

- **Q1.** Discuss the significance of the **PM Professorships** program under the **Anusandhan National Research Foundation (ANRF)** in promoting **scientific research** and **technological development** in India.
- **Q2.** How does the involvement of **overseas scientists** and **retired professionals** in India's **research ecosystem** contribute to **global collaboration** and **innovation** in the field of **engineering and science**?

General Studies Paper III:

- **Q3.** Evaluate the role of the **PM Professorships** in enhancing **India's scientific capabilities**. How do initiatives like these foster a culture of **innovation** and **research excellence**?

IIT Kanpur Discovers Ancient Structures Using Ground Penetrating Radar

📌 **Syllabus Mapping:**

✅ **GS Paper III – Science and Technology**

- **Emerging Technologies:** The application of **Ground Penetrating Radar (GPR)** in **archaeological surveys** and **subsurface exploration**.

✅ **GS Paper I – Geography**

- **Technology in Geophysical Surveys:** The role of **GPR technology** in detecting **subsurface features** and enhancing the understanding of **geological formations**.

1. Introduction

- A team from **IIT Kanpur** has successfully used **Ground Penetrating Radar (GPR)** technology to detect ancient **Buddhist stupas** and **buried structures** in **Yamuna Nagar** district of **Haryana**, showcasing the potential of **GPR**for **archaeological exploration** and **subsurface investigations**.

2. About Ground Penetrating Radar (GPR) Technology

- **Definition and Working Principle:**
  - **Ground Penetrating Radar (GPR)** is a high-resolution **geophysical method** that uses **high-frequency electromagnetic waves** to investigate subsurface features. The radar sends out electromagnetic waves, which then reflect, refract, or scatter depending on the material they encounter, such as **soil**, **rock**, or **buried objects**.
- **How It Works:**
  - The **electromagnetic waves** penetrate the ground and interact with **underground materials**. These waves are reflected back to the radar when they encounter different types of materials, providing **valuable data**about the **subsurface composition** and the presence of **buried structures**.
- **Depth Range and Limitations:**
  - **GPR** typically works effectively at depths of up to **10 meters**, depending on soil conditions and the material being scanned. The **depth range** can vary, with some materials providing clearer images than others.

3. Applications of GPR Technology

- **Detecting Subsurface Features:**
  - GPR is particularly useful for detecting features such as:
    - **Depth to bedrock**
    - **Water tables**
    - **Soil layers**
    - **Buried stream channels**
    - **Cavities** and **fractures**
- **Archaeological Investigations:**
  - In the field of **archaeology**, **GPR** has been used to locate and map **ancient structures**, including **buried temples**, **tombs**, and **historical artefacts** without needing to excavate the area, which can be destructive.

4. Recent Use of GPR by IIT Kanpur

- **Discovering Ancient Buddhist Stupas:**
  - The IIT Kanpur team's successful use of **GPR** in **Yamuna Nagar** has led to the discovery of **ancient Buddhist stupas** and **buried structures**, opening new avenues for **non-invasive archaeological exploration**in **India**.
- **Significance of the Discovery:**
  - This use of **GPR technology** allows for the identification of **historical sites** and artefacts while preserving the integrity of the **archaeological site**, offering new insights into **India's rich history** and cultural heritage.

5. Conclusion:

- **Ground Penetrating Radar (GPR)** is revolutionizing the way we explore the **subsurface**, offering a **non-invasive**, **high-resolution method** for detecting underground features, including **ancient structures**. The recent success in **Yamuna Nagar** demonstrates its effectiveness in uncovering **historical treasures**, making it an invaluable tool for both **archaeologists** and **geophysicists**.

UPSC Mains Questions:

General Studies Paper III:

- **Q1.** Explain the principle of **Ground Penetrating Radar (GPR)** technology. How can GPR be used effectively in **archaeological** and **geophysical surveys**?
- **Q2.** Discuss the role of **GPR technology** in enhancing **archaeological research** in India. What are the potential benefits and limitations of using this technology in **subsurface exploration**?

General Studies Paper I – Geography:

- **Q3.** How does **GPR technology** contribute to our understanding of **subsurface geological formations**? Discuss its potential applications in **environmental studies** and **disaster management**.

Coronal Mass Ejections Spark Northern Lights in Ladakh

📌 **Syllabus Mapping:**

✅ **GS Paper III – Science and Technology**

- **Astronomy and Space Science:** The significance of **Coronal Mass Ejections (CMEs)** and their impact on **Earth's geomagnetic systems**.

✅ **GS Paper II – International Relations**

- **Environmental Cooperation and Global Risks:** The impact of solar activity like **CMEs** on global infrastructure, including **satellite communication** and **power grids**.

1. Introduction

- A recent **Coronal Mass Ejection (CME)** from the **Sun** sparked **rare northern lights** over **Ladakh**, India, in May 2024. This phenomenon is part of a larger study into the behavior of **CMEs** and their effects on **Earth's magnetic environment**.

2. What are Coronal Mass Ejections (CMEs)?

- **Definition and Nature of CMEs:**
  - **CMEs** are massive expulsions of **plasma** and **magnetic field** from the **Sun's corona**. These **solar blasts** can release **billions of tons of coronal material** into space, carrying a strong **embedded magnetic field** that interacts with **Earth's magnetosphere**.
- **Thermal Behaviour of CMEs:**
  - **CMEs** exhibit a unique behavior during their journey towards Earth. Initially, they release heat, but as they travel through space, they enter a state where they **absorb** and **hold on to heat**, changing their **thermal properties** mid-journey.

3. Impact on Earth

- **Arrival Time and Speed:**
  - The **fastest Earth-directed CMEs** can reach our planet in as little as **15-18 hours**. **Slower CMEs** can take **several days** to arrive, depending on their speed and the conditions of the solar wind.
- **Geomagnetic Storms:**
  - When these **solar blasts** are directed toward Earth, they can trigger **geomagnetic storms**. These storms disrupt the **Earth's magnetic field**, affecting several systems, including:
    - **Satellite operations:** Can damage or interfere with **satellite communication** and navigation systems.
    - **Power grids:** Geomagnetic storms can induce **currents** that affect the functioning of **power grids**, potentially causing widespread power outages.
    - **Communication systems:** Can affect **radio communications** and **GPS systems**, disrupting operations, particularly in high-latitude regions.

4. The Ladakh Phenomenon

- **Northern Lights Over Ladakh:**
  - The recent CME event led to the spectacular display of **northern lights** (aurora borealis) over **Ladakh**, an area usually not known for frequent aurora sightings. This rare occurrence was a direct result of the solar activity and the **geomagnetic storm** that followed.

5. Conclusion:

- **CMEs** are powerful solar phenomena that play a significant role in shaping the **Earth's geomagnetic environment**. Their ability to disrupt technological infrastructure, particularly satellites and power grids, makes them an important area of study. Understanding CMEs and their effects can help in mitigating the impact of **solar storms** and enhancing **global disaster preparedness**.

UPSC Mains Questions:

General Studies Paper III:

- **Q1.** Discuss the phenomenon of **Coronal Mass Ejections (CMEs)**. How do they affect Earth's **geomagnetic environment** and technological infrastructure?
- **Q2.** Analyze the **impact of CMEs** on **satellite operations**, **power grids**, and **communication systems**. What measures can be taken to **mitigate** these effects?

General Studies Paper II – International Relations:

- **Q3.** How can international cooperation be strengthened to address the **risks posed by solar activities** like **CMEs**? Discuss in the context of **space cooperation** and **global infrastructure protection**.

General Studies Paper I – Geography:

- **Q4.** Explain the occurrence of **aurora borealis** and how **solar activity** like **CMEs** triggers such phenomena. Discuss the relationship between **geomagnetic storms** and **solar wind**.

CERN Observes CP Violation in Baryons: Unveiling Matter-Antimatter Asymmetry

📌 **Syllabus Mapping:**

✅ **GS Paper III – Science and Technology**

- **Physics and Theoretical Concepts:** The significance of **CP violation** and its role in understanding **matter-antimatter asymmetry** in the **universe**.

✅ **GS Paper I – General Science**

- **Astronomy and Cosmology: Matter-antimatter asymmetry** and its implications in the **Big Bang Theory** and the **observable universe**.

1. Introduction

- **CERN's scientists** have achieved a significant milestone by observing **CP violation** in **baryons** for the first time. This discovery could offer insights into the long-standing **matter-antimatter asymmetry** problem in the universe.

2. About Matter–Antimatter Asymmetry

- **Definition:**
  - **Matter-antimatter asymmetry** refers to the **imbalance** between **matter** and **antimatter** in the universe. According to modern physics, the **Big Bang** should have produced **equal amounts** of matter and antimatter. However, the observable universe consists almost entirely of **matter**, with **antimatter** being nearly absent.
- **The Cosmic Puzzle:**
  - The absence of antimatter despite equal production in the early universe remains one of the **unsolved mysteries** in **cosmology** and **particle physics**. This **imbalance** suggests that there may have been some mechanisms after the Big Bang that favored the creation of matter over antimatter.

3. About CP Violation

- **CP Symmetry:**
  - **C** stands for **Charge conjugation**, which involves swapping particles with their corresponding **antiparticles**.
  - **P** stands for **Parity**, which refers to flipping spatial coordinates (mirror image).
  - **CP symmetry** implies that the laws of physics should remain unchanged if particles are swapped with their antiparticles and viewed in a mirror.
- **CP Violation:**

- **CP violation** occurs when **matter** and **antimatter** behave differently, meaning the **CP symmetry** does not hold in certain processes. This suggests that the laws governing the interaction of particles and antiparticles are not symmetrical, which could help explain why **matter** predominates in the universe.

4. The Importance of the Discovery

- **CP Violation in Baryons:**
  - For the first time, scientists at **CERN** have observed **CP violation** in **baryons** (particles composed of three quarks, such as protons and neutrons). This is a significant step in understanding why the **universe** is made mostly of **matter**, despite the expectation from the **Big Bang** theory that matter and antimatter should have been created in equal amounts.
- **Potential Implications:**
  - The **violation of CP symmetry** could provide the necessary clues to understand the **matter-antimatter imbalance**. It might lead to new theories in **particle physics** that explain the observed dominance of matter in the **observable universe**.

5. Conclusion:

- The observation of **CP violation** in **baryons** by **CERN** is a groundbreaking development in our understanding of **matter-antimatter asymmetry**. This discovery opens new avenues for research into the early universe's conditions and the fundamental forces that may have led to the **prevalence of matter**. It also challenges existing theories and may redefine our understanding of the **laws of physics** governing the universe.

UPSC Mains Questions:

General Studies Paper III:

- **Q1.** Explain the concept of **matter-antimatter asymmetry** in the universe. How does the recent observation of **CP violation** in baryons by **CERN** help in understanding this phenomenon?
- **Q2.** Discuss the significance of **CP violation** in **particle physics**. What implications does it have for our understanding of the **universe's composition**?

General Studies Paper I – General Science:

- **Q3.** What is **CP symmetry** and how does **CP violation** provide insights into the **fundamental laws of nature**? Discuss the potential role of **CP violation** in the development of theories related to **matter-antimatter imbalance**.

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