

CURRENT AFFAIRS

WEEKLY 21st July - 27th July (2025)



WEEKLY UPDATES

DATE :21st July- 27th July

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IQRA

Wisdom leads to success

POLITY

President's Rule Extended in Manipur

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Provisions related to President's Rule and Emergency in India
- Role of President and Governors in State Governance

✓ GS Paper II – Social Justice

- Issues of Governance and Crisis Management

Introduction:

The **President's Rule in Manipur** has been extended for another six months, amidst ongoing challenges in the state. **President's Rule**, under Article 356 of the **Indian Constitution**, is a provision that allows the **central government** to assume control over a state when there is a **breakdown of constitutional machinery** or failure of governance. This extension, therefore, highlights the complexities of governance in Manipur and the legal mechanism available to restore order and ensure the state's adherence to constitutional provisions.

About President's Rule (Part XVIII: Emergency Provisions):

1. Grounds for Imposition:

- **Article 356: Breakdown of Constitutional Machinery**
President's Rule can be imposed if the **President** receives a report from the **Governor** of the state or is otherwise convinced that the **state government** cannot function according to the provisions of the Constitution. This typically happens when there is a **failure of the state government** to maintain law and order, implement constitutional directives, or perform its constitutional functions.
- **Article 365: Failure to Comply with Union Directions**
If a state fails to comply with **directions** given by the Union government on matters where it has the authority, the President's Rule can be invoked. These directions are often related to policies or mandates that the Union government deems crucial for national interest.

2. Duration of President's Rule:

- Initially, President's Rule is imposed for a period of **six months**.
- It can be extended for **additional periods of six months**, but each extension requires **parliamentary approval**.
- The **maximum duration** for which President's Rule can be imposed is **three years**, with each extension being subject to **parliamentary approval**. This ensures that the state's governance remains under the central control only when absolutely necessary.

Key Features of President's Rule:

1. Centralized Control:

- During President's Rule, the **central government** takes over the governance of the state, and the **state legislature** is either dissolved or suspended.
- The **Governor** acts as the **central representative**, and **central government officers** replace the state's cabinet ministers.

2. Impact on State Governance:

- **Democratic institutions** in the state are temporarily suspended.
- The **executive authority** is transferred from the state government to the President, bypassing local democratic representation.

3. Restoration of Normalcy:

- President's Rule is seen as a **temporary measure**. The ultimate aim is to restore constitutional governance in the state, either through the **formation of a new government** or **fresh elections**.

Recent Context: Extension in Manipur:

1. Background of the Extension:

- The extension of **President's Rule in Manipur** comes amidst ongoing **instability** and challenges in governance. The region has faced internal conflicts, affecting **law and order** and **administrative functioning**.
- The **central government** believes that the situation has not yet returned to a level where normal **state governance** can resume without oversight from the Centre.

2. Impact on Citizens and Governance:

- The extension reflects the continued **disruption** in governance in Manipur, and the inability of the **state government** to restore order.
- While **central rule** allows for **more direct control**, it may also result in a **loss of local accountability** and delay the **democratic processes** of governance.

Conclusion:

The extension of **President's Rule** in Manipur highlights the challenges of governance in states facing internal conflicts or administrative breakdowns. While **President's Rule** is a powerful constitutional tool for restoring order, it also raises questions about the **balance between federal autonomy and central oversight**. Ultimately, the goal remains to **restore democratic governance** and ensure that the **constitutional framework** is upheld in every state, ensuring stability and fairness in the nation.

Mains Questions for UPSC:

1. Discuss the provisions under Article 356 and Article 365 of the Indian Constitution that allow the imposition of President's Rule in a state. How does this mechanism ensure the stability of the Indian polity?
2. Examine the implications of President's Rule on federal governance in India. What are the challenges and benefits of such a provision in maintaining law and order during times of crisis?
3. Critically analyze the extension of President's Rule in Manipur. What does it indicate about the state's governance, and how does it affect the state's political autonomy?
4. Assess the role of the President and the Governor in the imposition of President's Rule. What checks and balances exist to prevent its misuse?
5. In your opinion, how can India's federal structure be strengthened to avoid frequent recourse to President's Rule in states? What alternative mechanisms can be put in place for addressing governance issues at the state level?

Vice President of India Resigns

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Constitutional Bodies and their Functions
- Roles and Powers of the Vice President of India



Introduction:

In a significant development, the **Vice President of India** has submitted his **resignation**, making him only the third Vice President in India's history to resign before completing his full term. The resignation has triggered discussions regarding the **vacancy** in the Vice President's office and the **constitutional provisions** that govern the filling of such vacancies.

Constitutional Provisions Relating to the Vice President:

1. **Article 64 – The Vice President of India:**
 - o According to Article 64 of the Indian Constitution, the **Vice President** is the **ex-officio Chairman** of the **Rajya Sabha** (Council of States).
 - o The Vice President's term is **five years**, and the office-holder can continue in office even after the term ends until a successor is elected.
2. **Article 65 – Vacation of Office:**
 - o Article 65 outlines the reasons for the vacation of the Vice President's office, which include:
 - **Death**
 - **Resignation** (as in this case)
 - **Removal** (through impeachment)
3. **Article 67 – Filling a Vacancy:**
 - o If a vacancy arises due to **death, resignation, or removal** of the Vice President, a **new election** to fill the vacancy is held **as soon as possible** after the occurrence.
 - o The newly elected Vice President assumes office for a full **five-year term**, starting from the **date of assuming office**.
4. **Article 68 – Time Frame for Election:**
 - o According to Article 68, the election to fill the vacant office of the Vice President must be held within **six months** from the date of the vacancy. The election is conducted by the **Election Commission of India**.

Implications of the Resignation:

1. **Filling the Vacancy:**
 - o With the resignation of the Vice President, a **vacancy** in the office is created. As per the **Constitutional provisions**, a **new election** will be scheduled as soon as possible.
 - o The newly elected Vice President will hold office for the full **five-year term**, starting from the date they assume office.
2. **Temporary Arrangements:**
 - o In the interim period, the **Chairman of Rajya Sabha** (usually the Vice President) will be temporarily handled by the **Deputy Chairman of Rajya Sabha** until a new Vice President is elected.
3. **Political Significance:**
 - o The resignation of the Vice President has significant **political implications**, as the role holds both **ceremonial** and **constitutional powers**, particularly as the **Chairman of Rajya Sabha**.

Conclusion:

The resignation of the **Vice President of India** is a rare event in the nation's political history. With only two other instances of a Vice President resigning before completing their term, this move has sparked constitutional discussions. The **vacancy** created will be filled through a **constitutional process** outlined in Articles 64, 65, 67, and 68, ensuring a smooth transition in the office.

Mains Questions for UPSC:

1. Discuss the constitutional provisions regarding the office of the Vice President of India. What are the procedures for filling a vacancy in this office?
2. Examine the significance of the Vice President's role as the Chairman of the Rajya Sabha. How does the resignation of the Vice President affect the functioning of the Rajya Sabha?
3. Evaluate the impact of the resignation of the Vice President on the political landscape. What are the constitutional and procedural steps for electing a new Vice President?
4. In the event of the resignation, death, or removal of the Vice President, how does the Indian Constitution ensure the smooth functioning of the office? Discuss the relevant constitutional provisions.

Lakshadweep's Bitra Island Acquisition Proposal

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Administration of Union Territories
- Security and Defence Policies



✓ GS Paper I – Geography

- Physical Geography
- Climate and Ecosystems
- Geographical Features of India

Introduction:

The **Lakshadweep administration** is considering the **acquisition of Bitra Island for defence purposes**. Bitra is the **smallest inhabited island** in the Lakshadweep archipelago, and its strategic location in the **Arabian Sea** makes it an ideal site for enhancing **India's maritime security**.

About Bitra Island:

1. **Size and Location:**
 - Bitra Island is located near Agatti Island in the Arabian Sea, part of the **Lakshadweep** Union Territory.
 - It has a **land area of only 0.105 sq km**, making it the smallest inhabited island in Lakshadweep.
2. **Climate:**
 - The island falls under the 'Aw' climate category according to the **Köppen-Geiger climate classification**, which indicates a **tropical savannah** climate.
 - **Annual rainfall** is around **1600 mm**, which is typical for regions with a tropical savannah climate, supporting diverse vegetation and ecosystems.

About Lakshadweep:

1. **Geographical Features:**
 - Lakshadweep is India's **smallest Union Territory**.
 - The territory consists of **36 coral islands** scattered across the **Arabian Sea**.
 - The islands are characterized by **atolls, lagoons, and reefs**, providing a unique ecological and geographical landscape.
2. **Strategic Location:**
 - The islands are positioned strategically in the **Arabian Sea**, making them important for **maritime security** and **defence purposes**.
 - The Lakshadweep archipelago lies between India and the **Middle East**, which adds to its **strategic importance** in the context of **international maritime routes**.

Defence Considerations for Bitra Island:

1. **Strategic Location:**
 - The potential acquisition of Bitra Island aims to bolster **India's maritime security**, especially given its proximity to vital **shipping lanes** in the Arabian Sea.

- With growing concerns about **international security** in the region, including **piracy** and **maritime terrorism**, the island's strategic position could prove valuable for **defence operations**.

2. Integration with Defence Infrastructure:

- The Lakshadweep administration's plans for **Bitra Island** may include the establishment of **defence facilities**, such as **naval bases**, surveillance systems, or **coastal radar stations**, which would strengthen **India's defence capabilities** in the region.

3. Ecological and Environmental Considerations:

- While the acquisition may enhance **India's maritime security**, careful **environmental assessments** will be needed to ensure the island's **delicate ecosystem** is not harmed by overdevelopment or military activities.

Conclusion:

The proposal to acquire **Bitra Island** for **defence purposes** marks a significant move by the **Lakshadweep administration** to enhance **India's maritime security**. While its strategic location makes it an attractive site for **defence infrastructure**, balancing security needs with environmental concerns will be crucial in the decision-making process.

Mains Questions for UPSC:

- Discuss the strategic importance of the Lakshadweep islands in India's maritime security. How can the acquisition of Bitra Island contribute to strengthening India's defence capabilities?
- Evaluate the potential environmental impacts of establishing defence infrastructure on islands like Bitra in the Lakshadweep archipelago. How can these be mitigated?
- Lakshadweep, with its unique geographical features, has great strategic value for India. Discuss its role in India's overall defence and security strategy.
- Explain the role of islands in maritime security. What are the challenges and opportunities associated with enhancing India's defence capabilities in the Arabian Sea?
- How does the climate and geographical setup of islands like Bitra influence their usability for defence purposes and sustainable development?

Role and Authority of the Election Commission under Article 324

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Electoral Processes and Constitutional Provisions
- Election Commission and its Powers

Introduction:

The **Election Commission of India (ECI)** holds significant powers under **Article 324** of the **Indian Constitution**, enabling it to exercise plenary authority over all aspects of elections in India. This includes the supervision, direction, and control over the preparation of **electoral rolls** and the overall conduct of elections for the **Parliament, State Legislatures**, and the **President and Vice-President**. Article 324 thus plays a central role in ensuring that elections in India are conducted in a **fair, transparent, and efficient manner**.

Understanding Article 324:

1. Article 324(1) – Powers of the Election Commission:

- Article 324 grants the **Election Commission** the **superintendence, direction, and control** of the preparation of electoral rolls for all elections in India.
- This includes elections for:
 - The **Parliament** (Lok Sabha and Rajya Sabha)
 - The **Legislature of every State** (State Assemblies)
 - Presidential and Vice-Presidential elections**
- The ECI is vested with the authority to take necessary actions to ensure that elections are conducted smoothly and effectively, and that all electoral processes are transparent and unbiased.

2. Article 324(2) – Plenary Powers of the Election Commission:

- The powers under Article 324 are **plenary**, meaning that the Election Commission has full discretion and authority to oversee the **entire electoral process**. This includes framing rules, issuing directions, and resolving disputes regarding the election process.
- The **Election Commission** also has the power to issue necessary instructions for the **preparation of electoral rolls**, voter registration, and conducting elections, ensuring the integrity of the process.

3. Article 326 – Right to Vote:

- Article 326 prescribes that **Indian citizens aged 18 or above** (adult franchise) are eligible to vote in elections, unless they are **disqualified** by the **Constitution** or any **other law**.
- This Article establishes the **universal suffrage** principle, granting every adult Indian citizen the **right to vote**.
- However, the **citizenship requirement** under Article 326 ensures that only **Indian citizens** can vote, and non-citizens are disqualified from electoral participation.

4. Connection Between Article 324 and Article 326:

- Article 324 and Article 326 work in tandem to establish the framework for **fair and free elections**:
 - Article 324 ensures that the **Election Commission** has the power to oversee all aspects of the election process, including voter registration and the maintenance of electoral rolls.
 - Article 326 guarantees the **right to vote** for all eligible Indian citizens, subject to disqualifications, ensuring that the electoral process is inclusive and democratic.

Significance of Article 324:

1. Supervision and Control of Electoral Rolls:

- The **Election Commission**'s supervision and control of the **preparation of electoral rolls** is a critical function to ensure that only eligible **Indian citizens** are registered to vote and that no fraudulent or ineligible entries are made.
- The ECI's role in this area ensures **accuracy** and **fairness** in the election process, preventing errors or bias in voter registration.

2. Independent Authority:

- The **plenary powers** granted under Article 324 give the **Election Commission** significant independence in its functioning, ensuring that elections are held impartially, without undue interference from the **executive, legislative, or judicial** branches of government.
- The **Election Commission**'s independence strengthens the credibility of the electoral system and reinforces **democratic values** in India.

3. Ensuring Universal Suffrage:

- By making voting rights available to every **Indian citizen** aged 18 or above, Article 326 ensures that elections are truly representative and that all adult citizens, regardless of gender, religion, or social status, have an equal voice in the electoral process.
- Article 326 upholds the **principle of equality** in the electoral system, ensuring inclusivity in India's democracy.

4. Voter Integrity and Prevention of Fraud:

- The **Election Commission's oversight** ensures that the process of **voter registration** and the maintenance of **electoral rolls** is free from **fraud or manipulation**.
- This protects the **integrity** of the electoral process and prevents individuals from being wrongly registered or denied their right to vote.

Conclusion:

The powers conferred on the **Election Commission of India** by Article 324 of the **Constitution** are vital to the functioning of India's **democratic system**. By ensuring the **fairness, transparency, and integrity** of the election process, including the preparation of electoral rolls, the **Election Commission** plays a pivotal role in maintaining India's democratic principles. Article 324, in conjunction with Article 326, guarantees that every **Indian citizen** has an equal right to participate in elections, contributing to a more inclusive and effective electoral system.

Mains Questions for UPSC:

1. Discuss the significance of Article 324 in the functioning of the Election Commission of India. How does it ensure the transparency and fairness of the electoral process?
2. Analyze the role of the Election Commission in overseeing the preparation of electoral rolls under Article 324. Why is this function crucial to the integrity of the electoral system?
3. Evaluate the connection between Articles 324 and 326 in ensuring universal suffrage in India. How do these provisions contribute to the democratic framework of the country?
4. In the context of Article 324, explain the powers and responsibilities of the Election Commission. How do these powers help in maintaining the credibility of the electoral process?
5. What are the challenges the Election Commission faces in maintaining accurate electoral rolls? How can these challenges be overcome to ensure the integrity of elections?

Motion to Remove Justice Yashwant Varma

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Judicial Reforms and Independence
- Provisions for Removal of Judges

Introduction:

A significant motion has been submitted in both the **Lok Sabha** and **Rajya Sabha** calling for the **removal of Justice Yashwant Varma**, with the support of members across party lines. **145 Lok Sabha members** and **more than 50 Rajya Sabha members** have signed the motion under **Articles 124, 217, and 218** of the Constitution. The motion has raised important constitutional questions regarding the **removal of judges** and the procedures that must be followed in such cases.

Constitutional Provisions Regarding Removal of Judges:

1. **Article 124(4) – Removal of Supreme Court Judges:**
 - o Article 124(4) provides the procedure for the **removal of judges** from the **Supreme Court**. A judge can be removed **on the grounds of proven misbehavior or incapacity**.
 - o The process requires **Parliament** to pass an address for removal by a **majority** of members in both **Houses of Parliament**, followed by the **President's approval**.
2. **Article 124(5) – Procedure for Removal:**
 - o Article 124(5) grants Parliament the power to regulate the **procedure** for presenting the **motion of address** for the removal of a judge and the **investigation and proof of misbehavior or incapacity**.
 - o This procedure is specifically regulated by the **Judges Inquiry Act, 1968**, which outlines the steps for **investigation and proof** of a judge's misconduct.
3. **Article 217(1)(b) – Removal of High Court Judges:**
 - o Article 217(1)(b) deals with the **removal of High Court judges**. It aligns with Article 124(4) in providing that a **High Court judge** may be removed from office by the **President** in the manner prescribed in Article 124 for Supreme Court judges.
 - o This ensures uniformity in the removal process for judges across the **Supreme Court and High Courts**.
4. **Article 218 – Applicability to High Court Judges:**
 - o Article 218 extends the applicability of Article 124(4) and 124(5) to **High Court judges**, thus ensuring that the procedures for the removal of **Supreme Court judges** are mirrored for **High Court judges** as well.

Significance of the Motion:

1. **Parliament's Role in Judicial Accountability:**
 - o The motion for the removal of **Justice Yashwant Varma** highlights **Parliament's constitutional power** in holding judges accountable for **misbehavior or incapacity**.
 - o This process ensures that the judiciary, like other branches of government, remains **accountable** to the people through their elected representatives.
2. **Judicial Independence vs Accountability:**
 - o While judicial independence is a cornerstone of the Indian legal system, ensuring **judicial accountability** through proper mechanisms is equally essential. The motion to remove a judge emphasizes the need for **balance** between **independence** and **accountability** within the judiciary.
3. **Political and Legal Implications:**
 - o The submission of the motion across party lines indicates that the issue is not confined to a single political perspective but is a **bipartisan concern**.
 - o The legal process triggered by the motion will likely draw attention to how the **Judges Inquiry Act, 1968** operates and whether the existing **removal procedure** is efficient and effective in upholding the integrity of the judiciary.

Conclusion:

The **motion to remove Justice Yashwant Varma** reflects a serious concern raised by members of both the **Lok Sabha and Rajya Sabha** about the conduct of a sitting judge. This process, guided by **constitutional provisions**, emphasizes the **importance of judicial accountability** while maintaining the sanctity of judicial independence. As the procedure unfolds, it will likely bring greater clarity to the mechanisms governing the **removal of judges** and the relationship between the **executive, legislature, and judiciary**.

Mains Questions for UPSC:

1. **Discuss the constitutional provisions related to the removal of judges in India. How do these provisions ensure judicial accountability while protecting judicial independence?**
2. **Examine the role of Parliament in the removal of judges under Articles 124, 217, and 218 of the Constitution. What are the safeguards in place to prevent misuse of this power?**
3. **What is the significance of the motion to remove Justice Yashwant Varma? Analyze the political and legal implications of such motions in the Indian context.**
4. **Critically evaluate the Judges Inquiry Act, 1968, in ensuring the proper functioning of the judicial removal process. Are there any reforms required in the current process?**
5. **How does the balance between judicial independence and accountability impact the functioning of the judiciary? Discuss in light of recent developments in the removal process of judges.**

Bills of Lading Bill 2025: Modernizing Shipping Laws

📌 Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Government Policies and Legal Reforms
- Trade and Commerce Regulations

✓ GS Paper III – Economic Development

- Shipping and Maritime Trade
- Legal Reforms in International Trade

Introduction:

The **Bills of Lading Bill 2025** has been passed by the **Indian Parliament** to modernize the legal framework surrounding **shipping documents**, specifically the **Bills of Lading**. The Bill seeks to **replace the Indian Bills of Lading Act, 1856**, which had become outdated in the context of contemporary shipping practices. By updating and simplifying this framework, the Bill aims to facilitate smoother **international trade** and improve the **legal certainty** in shipping transactions.

About the Bills of Lading Bill 2025:

1. Purpose:

- The **Bills of Lading Bill 2025** is designed to update and **simplify** the legal processes associated with **shipping documents**, specifically the **Bills of Lading**.
- The Bill aims to provide a **modernized framework** for the **documentation** of goods being shipped, ensuring **greater transparency, efficiency, and legal certainty** in maritime trade.

2. Key Provisions:

- The Bill seeks to **replace the Indian Bills of Lading Act, 1856**, which has not kept up with advancements in the **shipping industry** over the last century and a half.
- It **addresses current shipping practices** and offers **clarity** regarding the roles of the **shipper, carrier, and consignee** in the **shipping process**.
- The **Bill of Lading** will continue to serve as a **contract of carriage** and a **receipt of goods**, but the Bill updates its provisions to match modern business practices, such as **electronic Bills of Lading**.

3. What is a Bill of Lading?

- A **Bill of Lading (B/L)** is a legal document issued by a **freight carrier** to a **shipper**, acknowledging the receipt of goods for transportation.
- The Bill typically contains essential details such as:
 - **Type of goods** being shipped.
 - **Quantity and condition** of the goods.
 - **Destination** of the goods.
 - The **terms of transport**, which govern the shipping process.
- Bills of Lading are crucial in international trade as they serve multiple functions, including acting as:
 - **Proof of contract** between the shipper and carrier.
 - **Receipt of goods** by the carrier.
 - **Document of title** to the goods, facilitating the transfer of ownership during transit.

Significance of the Bills of Lading Bill 2025:

1. Modernizing Shipping Law:

- The Bill replaces the **Indian Bills of Lading Act, 1856**, which had become increasingly irrelevant in the face of technological advancements and the rise of **electronic documentation**.
- With the **digitalization of the shipping industry**, the Bill incorporates provisions for **electronic Bills of Lading**, ensuring that India stays aligned with international standards and **facilitates smoother global trade**.

2. Facilitating International Trade:

- By **simplifying and updating** the legal framework for Bills of Lading, the Bill will **boost India's position in global maritime trade**.
- The clarity provided by the Bill will help **reduce disputes** related to the shipping process, making it easier for **Indian exporters and importers** to engage in international transactions with confidence.

3. Enhancing Legal Certainty:

- The Bill will provide **legal certainty** regarding the **rights and obligations** of **ship owners, carriers, and cargo owners** in the shipping process, ensuring that all parties involved have a **clear understanding** of their contractual responsibilities.
- This is particularly important in cases of **loss, damage, or delay** during transit, where the Bill can help **resolve disputes** quickly and fairly.

4. Impact on Shipping Industry:

- The **shipping industry** in India will benefit from a **modern legal framework** that facilitates smoother operations and greater **predictability** in business transactions.

- The Bill's emphasis on **electronic Bills of Lading** is especially relevant in the era of **digital transformation**, as it will reduce paperwork and streamline procedures, leading to **cost savings** and **increased efficiency**.

Conclusion:

The **Bills of Lading Bill 2025** marks a significant step in modernizing India's **shipping laws**, replacing the outdated **Bills of Lading Act, 1856**. By incorporating **digital advancements** and simplifying the legal framework for shipping documentation, the Bill will help **boost international trade** and enhance **India's competitiveness** in the global maritime industry. With **legal clarity** and **electronic solutions**, the Bill paves the way for smoother, more efficient shipping practices that benefit both businesses and consumers.

Mains Questions for UPSC:

1. Discuss the significance of the Bills of Lading Bill 2025 in modernizing India's shipping law and its potential impact on international trade.
2. Analyze the role of Bills of Lading in the shipping industry and explain how the introduction of electronic Bills of Lading can transform global maritime trade.
3. Examine the importance of updating the legal framework for shipping documents, particularly Bills of Lading, in the context of India's growing role in global trade.
4. What are the implications of replacing the Indian Bills of Lading Act, 1856 with the Bills of Lading Bill 2025 for the Indian shipping and logistics sectors?
5. How does the Bills of Lading Bill 2025 align with international shipping standards, and what are its expected benefits for Ind

Supreme Court on Stray Dogs and Citizens' Safety

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Animal Welfare and Rights
- Urban Governance and Law Enforcement

✓ GS Paper III – Economic Development

- Environment and Ecology
- Public Health and Safety

Introduction:

In recent **Supreme Court observations**, the issue of **stray dog welfare** and **citizens' safety** has come to the forefront. The court acknowledged the **ethical divide** over the presence of stray dogs on streets and the **compassion** citizens show towards them, while also addressing concerns about public safety. The court suggested that **feeding stray dogs** should be done within the confines of **private homes**, emphasizing the need for **balancing animal protection with public order**. This judgment reflects the complex challenges of maintaining **compassion** for animals while ensuring **safety** and **hygiene** for people.

Key Observations by the Supreme Court:

1. Balancing Compassion and Public Order:

- The Supreme Court highlighted the **ethical dilemma** between **compassion for animals** and **public order**. While citizens have the right to **feed stray dogs**, it was observed that this **compassion** could inadvertently lead to **territorial aggression** and **public nuisance**, which affects the general public's **safety** and **comfort**.
- The Court suggested that people who want to feed stray dogs should do so **inside their own homes** to avoid creating **public disturbances**.

2. Animal Welfare vs Public Safety:

- The **right to life and dignity of animals** is recognized, but the **right to safety** for humans is also paramount. The court acknowledged the **ethical responsibility** towards animals but emphasized the need for the **protection of citizens** from dog bites and the **spread of diseases** like rabies.
- In 2024, the **National Centre for Disease Control (NCDC)** reported **over 37 lakh dog bite cases**, underlining the health risks associated with stray dog populations.

3. Ecological Carrying Capacity vs Population Control:

- The Court recognized that **human activities**, such as **feeding stray dogs**, can **increase the population** of stray dogs in urban areas. This, in turn, could lead to the **overburdening of municipal resources** and create long-term challenges for urban management.
- At the same time, **inhumane control methods** (such as poisoning or unregulated culling) are not acceptable. The challenge lies in ensuring **ethical population control** through **sterilization and vaccination**, rather than relying on unethical methods.

4. Utilitarianism vs Deontological Ethics:

- The **utilitarian perspective** (which emphasizes the greatest good for the greatest number) on the issue of stray dogs has weakened over time, as more people abandon their pets, exacerbating the stray dog population. This has led to an increase in the **abandonment of pets** and a **lack of responsibility** towards animal welfare.
- On the other hand, the **deontological approach**, which emphasizes duties and responsibilities, calls for humans to **fulfill their obligations** towards stray dogs, such as **ensuring their welfare** and providing **humane treatment** through **sterilization** and **vaccination**.

Legal Provisions Regarding Stray Dogs in India:

1. Constitutional Provisions:

- **Article 243(W)** mandates municipalities to regulate and control the stray dog population, providing a legal framework for urban governance related to animal control.
- **Article 51A(g)** of the **Indian Constitution** places a **fundamental duty on citizens** to have **compassion for living creatures**, which includes stray dogs. This aligns with the **moral obligation** towards animal welfare.

2. Regulatory Framework:

- **Animal Birth Control (ABC) Rules, 2023** under the **Prevention of Cruelty to Animals Act, 1960**, aim to control the stray dog population by promoting **sterilization** programs and vaccinating dogs to curb the spread of **rabies**.
- The rules also address the issue of **feeding community animals**, assigning responsibility to **Resident Welfare Associations (RWAs)** and **local bodies** to manage feeding, care, and population control efforts.

3. Court Judgments on Animal Welfare:

- In the **2014 Jallikattu case**, the **Supreme Court** interpreted **Article 21 (Right to Life and Liberty)** as extending to animals as well, recognizing that they are entitled to life and dignity.
- This **judgment** underscores the **constitutional responsibility** of the state to protect the welfare of both animals and humans, fostering a balance between **compassion for animals** and the **rights of citizens**.

Ethical Issues Concerning Stray Dogs:

1. Compassion vs Public Order:

- The conflict between **human compassion** and **public order** is one of the most significant ethical issues. While feeding stray dogs can be seen as an act of kindness, it can also encourage aggressive territorial behavior and contribute to public nuisance.

2. Animal Welfare vs Public Safety:

- The right to life and dignity for stray dogs must be balanced with the **need for public safety**, especially in densely populated urban areas. Ensuring humane treatment of stray dogs without compromising public health remains a key challenge.

3. Ecological and Population Control:

- The feeding of stray dogs in urban areas can contribute to the increase in their population, but addressing this issue requires **ethical population control** measures like **sterilization** and **vaccination**, rather than harmful or inhumane practices.

Conclusion:

The **Supreme Court's observations** on the issue of **stray dogs** underscore the need for a **balance** between **animal welfare** and **public safety**. While citizens have the moral right to care for stray dogs, their actions must be carried out in a way that does not **compromise the safety** and well-being of the community. The government has provided legal frameworks, such as the **ABC Rules**, to ensure **ethical treatment** of stray animals, while municipalities are tasked with controlling populations through **humane methods**. Moving forward, a more **coordinated approach** between citizens, local bodies, and the government will be essential to manage stray dog populations while maintaining the **rights of both animals and people**.

Mains Questions for UPSC:

1. Discuss the ethical and legal challenges associated with the protection of stray dogs in India. How can the balance between animal welfare and public safety be maintained?
2. Examine the role of the Supreme Court in shaping policies related to animal welfare. What are the implications of its judgment on stray dogs for urban governance in India?
3. Analyze the impact of human activities, such as feeding stray dogs, on the population dynamics of stray animals in India. What ethical considerations should guide urban policies regarding stray dog control?
4. What are the key provisions under the Animal Birth Control (ABC) Rules, 2023, and how do they address the challenges of stray dog population control in India?
5. Evaluate the ethical dilemma between compassion for stray animals and the safety concerns of the public. How can municipalities and Resident Welfare Associations contribute to addressing these issues?

Cooling-Off Period in Matrimonial Cruelty Cases (498A IPC)

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Legal Framework for Women's Rights
- Role of Judiciary in Safeguarding Rights

✓ GS Paper II – Social Justice

- Protection of Women and Children
- Laws for Domestic Violence and Matrimonial Disputes

Introduction:

The Supreme Court of India has recently ordered the implementation of the Allahabad High Court's 2022 guidelines in matrimonial cruelty cases under Section 498A of the Indian Penal Code (IPC). These guidelines restrict the police from taking any action, including arresting the accused, during a cooling-off period of two months following the filing of a complaint. This decision aims to provide a fairer investigation process, allowing time for mediation and resolution before legal actions are initiated.

About Section 498A of the IPC:

1. Objective and Purpose:

- Section 498A of the Indian Penal Code was enacted to protect women from cruelty by their husbands or their relatives. It addresses the issue of domestic violence and ensures that women subjected to cruelty have legal recourse.
- The law aims to prevent mental and physical cruelty, which can include emotional abuse, economic abuse, and physical violence within the matrimonial home.

2. Key Provisions:

- Punishment: If a woman is subjected to cruelty by her husband or his relatives, they can be punished with up to three years in jail and a fine.
- Cognizable and Non-Bailable Offense: Section 498A is a cognizable offense, meaning the police can arrest the accused without a warrant. However, it is non-bailable, meaning the accused cannot automatically secure bail.

3. Implementation and Criticism:

- Section 498A has faced criticism for being misused in some cases, where false accusations of cruelty are made, leading to unfair arrests and legal complications.
- The Supreme Court and various lower courts have tried to address the concerns of misuse while ensuring that genuine cases of cruelty are protected.

4. Bharatiya Nyaya Sanhita, 2023:

- The Bharatiya Nyaya Sanhita, 2023, which is a proposed new criminal code, contains provisions similar to Section 498A, continuing the focus on women's protection from domestic violence and cruelty.

Supreme Court's Directive on Cooling-Off Period:

1. Guidelines from Allahabad High Court (2022):

- In 2022, the Allahabad High Court issued guidelines stating that a two-month cooling-off period should be observed after the registration of a Section 498A complaint. During this period, the police should refrain from taking any coercive action, including arrests.
- The goal of this cooling-off period is to allow for mediation and reconciliation between the parties, particularly in cases where the accusations may have arisen due to domestic tensions rather than serious cruelty.

2. Supreme Court's Endorsement:

- The Supreme Court has now endorsed these guidelines, making them binding for police action in matrimonial cruelty cases under Section 498A.
- The cooling-off period is intended to prevent premature and hasty decisions and arrests that may hinder potential reconciliation or mediation efforts.

3. Rationale Behind the Cooling-Off Period:

- The cooling-off period provides both parties time to resolve their issues amicably, with the help of counseling or mediation, before legal proceedings escalate.
- It is aimed at reducing the misuse of Section 498A by giving enough time to assess the genuineness of the accusations, and it emphasizes the importance of reconciliation in marital disputes.

Impact of the Supreme Court's Decision:

1. Ensuring Fairer Process:

- The decision emphasizes a **balanced approach** to handling **matrimonial disputes**, ensuring that women's **rights are protected** while also preventing undue harassment of the accused during the initial stages of the complaint process.
- It offers a **chance for cooling off** before jumping into arrest or legal actions, making the process **less adversarial** and more focused on **restoration of relationships** where possible.

2. Preventing Misuse of Law:

- The cooling-off period aims to reduce the **misuse of Section 498A**, where false allegations may lead to **unnecessary arrests and prolonged legal battles**.
- It helps to **filter out** cases where disputes are based on **personal conflicts** or misunderstandings, ensuring that genuine cases of **matrimonial cruelty** are properly addressed.

3. Strengthening the Legal Framework:

- The Court's decision reflects the ongoing efforts to **strengthen the legal framework** by introducing **procedural reforms** and guidelines that ensure a **just and fair process** for both victims and accused.
- It aligns with the broader goal of creating a more **balanced judicial system** that recognizes **women's rights** while safeguarding the **due process** for accused individuals.

4. Mediation and Reconciliation:

- The emphasis on **mediation** and **conciliation** suggests that the Court wants to explore non-litigious solutions before resorting to punitive actions, aiming for a **restorative approach** to matrimonial disputes.

Conclusion:

The **Supreme Court's endorsement** of the **Allahabad High Court's guidelines** represents a nuanced approach to handling **matrimonial cruelty cases** under **Section 498A** of the **IPC**. By introducing a **cooling-off period**, the Court seeks to balance **women's protection** with the need for **fairness and due process**, allowing time for **reconciliation and mediation**. This decision highlights the importance of providing a **just and thoughtful approach** to matrimonial disputes, ensuring that the legal system is fair to all parties involved.

Mains Questions for UPSC:

1. Discuss the Supreme Court's recent directive on the implementation of the cooling-off period in matrimonial cruelty cases under Section 498A. How does it balance the protection of women with the rights of the accused?
2. Examine the challenges in the implementation of Section 498A of the IPC. How can the law be reformed to prevent its misuse while ensuring the protection of genuine victims of matrimonial cruelty?
3. Evaluate the role of the judiciary in handling matrimonial disputes. How does the concept of mediation and cooling-off periods impact the resolution of family-related conflicts?
4. How does the cooling-off period in Section 498A align with the principles of natural justice? What are the implications of this guideline for the broader legal system in India?
5. Discuss the ethical and legal considerations in balancing women's rights to protection from domestic cruelty with the need to avoid misuse of laws such as Section 498A. What measures can be taken to ensure that the law serves its intended purpose?

Presidential Reference on President and Governor's Powers

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Constitutional Provisions and Amendments
- The Role of the President and Governors in the Indian Political System

✓ GS Paper II – Social Justice

- Dispute Resolution Mechanisms in Constitutional Framework
- Relationship between Union and State Governments

Introduction:

The **Supreme Court of India** has issued notices to both the **Union and State Governments** on a **Presidential Reference** under **Article 143** of the **Indian Constitution**. The reference concerns the **powers of the President** and the **Governor** in dealing with **state bills**. This legal matter seeks clarity on the constitutional roles and authority of these key figures in the context of **state legislation**, particularly when it comes to **approving or withholding state bills**.

About Article 143 of the Indian Constitution:

1. Article 143(1) – Advisory Jurisdiction of the Supreme Court:

- Article 143 of the Indian Constitution empowers the President of India to refer any question of law or fact of public importance to the Supreme Court for an advisory opinion.
- This provision allows the President to seek guidance from the Supreme Court when there is uncertainty or ambiguity over important constitutional or legal matters.

2. Procedure for Presidential Reference:

- A Presidential Reference can only be made after the Union Council of Ministers' advice. The President makes such a reference in accordance with the advice provided by the Council of Ministers, ensuring that the decision aligns with the government's stance.
- The Supreme Court provides its opinion based on the reference, which is intended to guide the President in making an informed decision on the matter in question.

3. Non-Binding Opinion:

- It is important to note that the opinion of the Supreme Court given in response to a Presidential Reference is advisory in nature. While the Court's opinion is sought for clarity, it is not binding on the President or the Union Government.
- This allows for a consultative approach in resolving constitutional matters but leaves the final decision-making to the President or the Union Government.

Context of the Current Presidential Reference:

1. Issue at Hand - Powers of the President and Governor:

- The current Presidential Reference pertains to the powers of the President and the Governor concerning state bills passed by state legislatures.
- The key question raised is about the extent of power vested in the President and Governor when it comes to withholding assent to bills passed by the state legislatures or seeking recommendations before they are returned.

2. Governor's Role in the Legislative Process:

- The Governor is the constitutional head of the state, and his role in approving or withholding assent to state bills is of significant importance. The Governor's discretion in this regard has been a subject of debate, particularly when it comes to disputes between the state and the Union.
- The Governor can, in some instances, ask for reconsideration or recommend amendments to a bill before it becomes law, raising concerns about the balance of power between the Union and State governments, as well as the autonomy of states.

3. President's Role in Assent and Withholding Assent:

- Similarly, the President plays a vital role in giving assent to state bills under Article 200 of the Constitution. However, in certain cases, the President may withhold assent to a bill and ask for reconsideration. The President's discretion in this matter and the advice of the Union Cabinet can lead to delays or complications in the legislative process.

Significance of the Supreme Court's Opinion:

1. Clarification of Powers:

- The Supreme Court's advisory opinion will provide much-needed clarity on the roles and discretionary powers of the President and Governor in the context of state legislation. The Court's opinion could also set a precedent for handling similar constitutional disputes in the future.

2. Impact on State Autonomy:

- The decision may have a profound impact on the autonomy of state governments. It could either reinforce or limit the powers of state governments in terms of legislative authority and ensuring timely implementation of state laws.
- The balance between state autonomy and central oversight is a crucial aspect of India's federal structure, and this advisory opinion will provide insights into the evolving nature of this balance.

3. Resolving Legal Ambiguities:

- The question of whether the President and Governor can withhold assent to state bills and the extent of their discretion has been a matter of legal ambiguity. The Supreme Court's opinion will help resolve any confusion and provide legal certainty in such matters.

Conclusion:

The Presidential Reference under Article 143 has significant implications for the relationship between state governments and the Union Government, particularly in matters relating to legislation. The Supreme Court's advisory opinion will shed light on the constitutional roles of the President and the Governor in handling state bills, potentially clarifying the discretionary powers involved and ensuring a more transparent and balanced legislative process. The Court's decision will be crucial in maintaining the federal balance and ensuring the proper functioning of India's democratic institutions.

Mains Questions for UPSC:

1. Discuss the role of the President and the Governor in the legislative process, particularly in the assent of state bills. How does Article 143 of the Indian Constitution facilitate resolution of constitutional disputes between the Union and State Governments?
2. Examine the significance of Presidential Reference under Article 143 in resolving legal uncertainties in the Indian Constitution. What are its implications for federal governance in India?
3. Analyze the balance of power between the Union and State governments in the context of legislative autonomy. How can the roles of the President and Governor influence this balance?
4. Evaluate the impact of the Supreme Court's advisory opinion on matters relating to state bills. How does it contribute to the federal structure of India?

5. What are the constitutional provisions that govern the withholding of assent to state bills by the President and Governor? Discuss the implications of these powers in the functioning of Indian federalism.

Monsoon Session Disrupted in Parliament

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Parliamentary Reforms
- Role of Parliament in a Democracy

✓ GS Paper II – Social Justice

- Accountability and Transparency in Governance

Introduction:

The **first week of the Monsoon session of Parliament** has been **washed out** due to continuous disruptions. According to reports, during the **17th Lok Sabha session**, the **Lok Sabha** worked for **88%** of its scheduled time, while the **Rajya Sabha** operated for **73%**. Historically, India's Parliament used to meet for **120-140 days** annually in the **1950s**, but this has drastically reduced to **60-70 days** in recent years. The session's disruptions reflect the challenges facing **Indian democracy**, especially in terms of **democratic accountability** and **effective governance**.

Issues with Parliamentary Disruptions:

1. Weakening Democratic Accountability:

- Parliamentary debates serve as a platform for **elected leaders** to **question the government**, scrutinize policies, and hold the executive accountable. **Disruptions** hinder this crucial democratic process, diminishing the **role of Parliament** as a space for dialogue and decision-making.
- When the **session is disrupted**, **legislative scrutiny** is reduced, leaving **important issues unresolved** and giving way to **ineffective governance**.

2. Monetary Cost:

- The cost of running **Parliament** is substantial, amounting to **Rs 2.5 lakh per minute**. Disruptions lead to a **wastage of public funds**, as Parliament does not function at its optimal capacity.
- Given the **high cost** of parliamentary operations, the frequent **interruptions** not only waste time but also **squander resources**, affecting the efficiency of the **democratic system**.

3. Eroding Public Trust in Parliament:

- Frequent disruptions often shift the **focus of MPs** from addressing **important national issues** to stopping **parliamentary proceedings**. This creates a negative perception among the public about the **functionality of Parliament** and its ability to **serve the people's needs**.
- The resulting **lack of productivity** erodes **public trust** in **legislative institutions**, which are central to a **functioning democracy**.

Measures to Address Parliamentary Disruptions:

1. Ensuring Dedicated Time for the Opposition:

- Dedicated time for opposition parties to decide the agenda is crucial for ensuring that all voices in the Parliament are heard. For instance, the **British Parliament** sets aside **20 days** each year for the opposition to manage its own agenda.
- This ensures that the **opposition** is given an active role in parliamentary proceedings, helping to balance the **agenda-setting power** between the ruling party and opposition.

2. Strengthening Ethics Committees:

- Ethics committees should be empowered to **monitor and report disruptions** in the functioning of Parliament. These committees would be responsible for holding **MPs accountable** for any **unruly behavior** that leads to disruptions and **hindering the legislative process**.
- Stronger ethical oversight will help foster a **sense of responsibility** among parliamentarians, encouraging them to focus on their duties rather than engaging in obstructive tactics.

3. Annual Parliamentary Calendar:

- An **annual calendar** for Parliament should be announced at the **beginning of each year**, setting the **schedule** for sittings, holidays, and breaks. This would reduce the **uncertainty** surrounding the functioning of Parliament and allow members to plan their work in advance.
- The calendar should provide for **limited flexibility** to accommodate **urgent matters** but with clear guidelines to avoid arbitrary disruptions.

Conclusion:

The ongoing **disruptions in Parliament** highlight the need for **structural reforms** to ensure that the legislative body functions effectively. While disruptions may be a **legitimate form of protest** for the opposition, they must not undermine the fundamental role of Parliament in upholding **democratic processes**. Measures such as **dedicated time for the opposition**, strengthening **ethics committees**, and setting an **annual parliamentary calendar** can address the current **inefficiencies** and help restore **trust** in India's legislative system.

Mains Questions for UPSC:

1. What are the reasons behind the frequent disruptions in India's Parliament, and how do these disruptions impact the functioning of the democratic system?
2. Discuss the importance of parliamentary debates and scrutiny in a democracy. How can the current disruptions in the Parliament be mitigated to ensure effective governance and accountability?
3. Examine the role of ethics committees in addressing the issue of parliamentary disruptions. How can these committees help restore discipline and accountability in the legislative process?
4. What measures can be taken to ensure that the opposition has a meaningful role in the legislative process? Discuss the potential benefits of setting aside dedicated time for the opposition in the parliamentary calendar.
5. Analyze the monetary and social costs of disrupted parliamentary sessions. How can reforms in the functioning of Parliament lead to better governance and public trust?

GOVERNANCE

Kashi Declaration for a Drug-Free India

Syllabus Mapping:

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

- Government Policies and Interventions
- Youth Development Programs

GS Paper II – Social Justice

- Health and Welfare
- Issues Related to Drugs and Addiction

GS Paper II – Health and Well-being

- Public Health Initiatives



Introduction:

The Youth Spiritual Summit has adopted the **Kashi Declaration** as part of the broader **Mera Yuva (MY) Bharat** initiative, laying the foundation for a national **youth-led anti-drug campaign**. This summit highlighted India's commitment to addressing **substance abuse** through a **holistic approach** that integrates various societal, cultural, spiritual, and technological aspects. **MY Bharat**, an autonomous body, was established by the Government of India to foster **youth development** and **youth-led initiatives** using modern technology.

Key Features of the Kashi Declaration:

1. **Five-Year Roadmap:**
 - The **Kashi Declaration** sets a **five-year roadmap** aimed at promoting **de-addiction** and a **drug-free India**.
 - The roadmap will focus on **reducing drug abuse** and providing **comprehensive support** to affected individuals.
2. **National Consensus:**
 - It emphasizes a **national consensus** to treat **substance abuse** as a **multi-faceted public health and societal issue** that requires coordinated efforts across various sectors.
 - The initiative seeks to change the narrative from drug abuse being just an individual issue to one that requires collective societal action.
3. **Proposed Approach:**
 - The **de-addiction movement** will be **multi-pronged**, incorporating **institutional mechanisms** for **multi-ministerial coordination**, including the formation of a **Joint National Committee**.
 - **Annual progress reporting** and a **national platform** for connecting **affected individuals** to various **support services** are central to the initiative.
 - The approach will integrate **spiritual, cultural, educational, and technological** strategies for effective **prevention** and **rehabilitation**.

Government Initiatives to Combat Drug Abuse:

1. **Narcotic Drugs and Psychotropic Substances Act, 1985:**
 - o Provides the legal framework for regulating and controlling the use of **narcotic drugs** and **psychotropic substances** in India.
2. **Prevention of Illicit Traffic in Narcotic Drugs and Psychotropic Substances Act, 1988:**
 - o Aimed at curbing **drug trafficking** and illicit production and distribution of **narcotics**.
3. **National Action Plan for Drug Demand Reduction (NAPDDR), 2018-25:**
 - o A comprehensive **policy framework** for reducing **drug demand** through prevention, treatment, and rehabilitation initiatives.
4. **Nasha Mukt Bharat Abhiyaan (NMBA), 2020:**
 - o A government-led campaign that aims to make India free of substance abuse by creating awareness, promoting **prevention** and **rehabilitation**, and ensuring **access to treatment**.

Status of Drug Abuse in India (As per National Survey on Substance Use, 2019):

1. **Prevalence of Alcohol Use:**
 - o Around **14.6%** of individuals between the ages of **10 and 75 years** in India are current **alcohol users**.
2. **Cannabis and Opioids:**
 - o **Cannabis** and **opioids** (such as **heroin**) are the next most commonly used substances in India, contributing to a growing public health concern.
3. **Geographical Distribution:**
 - o Drug use is **prevalent across various regions**, with an increased concentration in certain parts of the country.

Conclusion:

The **Kashi Declaration**, with its **five-year roadmap**, represents a significant step towards creating a **drug-free India**. By focusing on **multi-sectoral coordination, spiritual and cultural integration, and technological innovation**, the initiative aims to reduce drug abuse and **rehabilitate affected individuals**. Government measures like the **Nasha Mukt Bharat Abhiyaan**, along with the **National Action Plan for Drug Demand Reduction**, provide a supportive framework for this movement. As the nation steps forward, it is essential to continue building momentum through **community involvement, youth engagement, and support services**.

Mains Questions for UPSC:

1. Evaluate the significance of the Kashi Declaration and its role in India's anti-drug efforts. How does it integrate youth development and public health?
2. Discuss the impact of the National Action Plan for Drug Demand Reduction (NAPDDR) on addressing substance abuse in India. How effective have the existing policies been in curbing drug abuse?
3. Examine the role of multi-sectoral coordination in combating drug abuse. How does the Kashi Declaration propose to achieve this?
4. Substance abuse remains a major health challenge in India. How can cultural, spiritual, and technological approaches be integrated into the fight against drug addiction?
5. India's efforts to reduce drug abuse through campaigns like Nasha Mukt Bharat Abhiyaan have been gaining momentum. Critically analyze the potential challenges and solutions in achieving a drug-free India.

National Sample Survey Marks 75 Years

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Government Policies and Initiatives
- Social and Economic Surveys

✓ GS Paper III – Technology, Economic Development, and Security

- Economic Growth and Development
- Government Data and Surveys

Introduction:

The **National Sample Survey (NSS)**, established in **1950** by **P.C. Mahalanobis**, has completed **75 years** of collecting vital **economic and social data** across India. It plays a crucial role in gathering information based on **random sampling** to represent the entire country's demographic and socio-economic status. Managed by the **Ministry of Statistics and Programme Implementation (MoSPI)**, the NSS provides essential data that informs public policy, economic planning, and research.

Key Features of NSS:

1. **Establishment and Purpose:**
 - o Founded in 1950 by P.C. Mahalanobis, the NSS was aimed at providing comprehensive statistical information for the **economic and social planning** of India.
 - o The surveys are conducted on the basis of **random sampling** to ensure that the data reflects the socio-economic conditions of **all regions** of the country.
2. **Ministry and Leadership:**
 - o The NSS is overseen by the **Ministry of Statistics and Programme Implementation (MoSPI)**.
 - o It is headed by a **Director General**, who is responsible for the conduct of large-scale surveys across the nation.
3. **Coverage of NSS:**
 - o **Household Surveys:** The NSS collects data on various socio-economic subjects like **population, birth rates, death rates, migration, fertility, family planning**, etc.
 - o **Agricultural Surveys:** It covers topics related to **land holdings, livestock, and agriculture**.
 - o **Establishment Surveys:** This includes data on **non-agricultural enterprises** in the **unorganized sector** and **rural retail prices**.
 - o **Village Surveys:** It includes information on the **availability of infrastructure** in Indian villages.

Structure and Divisions of NSS:

1. **Survey Design and Research Division (SDRD):**
 - o Located in **Kolkata**, responsible for the **technical planning** of surveys, developing concepts, definitions, and **sampling designs**.
2. **Field Operations Division (FOD):**
 - o Located in **Delhi/Faridabad**, it is in charge of **data collection** from the field, ensuring that the surveys are properly executed across the country.
3. **Data Processing Division (DPD):**
 - o Also based in **Kolkata**, this division is responsible for **sample selection**, developing **software**, and processing the data through validation and tabulation.
4. **Survey Coordination Division (SCD):**
 - o Located in **New Delhi**, this division coordinates the activities of all other divisions and ensures that surveys are efficiently conducted.

Major Surveys Conducted by NSS:

1. **Urban Frame Survey (Phase 2022-27):**
 - o This survey focuses on establishing and updating a **reliable sampling frame for urban areas**. It plays a critical role in conducting accurate socio-economic surveys for urban settings.
2. **Annual Survey of Industries (ASI):**
 - o This survey assesses and evaluates the **growth, composition, and structure** of the **organized manufacturing sector** in India, providing insights into industrial development.
3. **Periodic Labour Force Survey (PLFS):**
 - o Conducted since **2017**, the PLFS serves as the **primary source of data** on **labour force** in India, tracking employment, unemployment, and other labour-related metrics.
4. **Price Surveys:**
 - o These surveys track **Consumer Price Index (CPI)** for both **Urban** and **Rural** areas, along with indices such as **Wholesale Price Index (WPI)**, providing essential data for **inflation measurement** and **economic policy**.

Conclusion:

The **National Sample Survey** has played a pivotal role in **data-driven decision-making** in India over the past **75 years**. Its surveys provide the **foundation** for government policies related to **economics, health, and social issues**, influencing planning at all levels. Through its comprehensive and systematic approach to data collection, the NSS continues to be an essential tool for India's **economic growth** and **development**.

Mains Questions for UPSC:

1. **Discuss the role of the National Sample Survey (NSS) in shaping India's public policy and economic planning. How has it contributed to the country's development over the last 75 years?**
2. **Analyze the structure and divisions of the National Sample Survey (NSS). How do these divisions ensure efficient data collection and processing?**
3. **Evaluate the significance of major NSS surveys like the Periodic Labour Force Survey (PLFS) and Annual Survey of Industries (ASI) in understanding India's economic landscape.**
4. **What challenges does the National Sample Survey (NSS) face in ensuring data accuracy and representativeness, particularly in rural and remote areas of India?**
5. **How does the National Sample Survey (NSS) contribute to measuring India's socio-economic progress? Discuss its importance in framing policies for poverty reduction, employment, and industrial growth.**

World Bank Calls for Investment in Green Urban Infrastructure

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Government Policies on Urban Development
- Climate Change and Disaster Management

✓ GS Paper III – Economic Development

- Infrastructure Development
- Sustainable Development and Climate Change

Introduction:

A recent **World Bank report**, titled '**Towards Resilient and Prosperous Cities in India**', underscores the urgent need for enhanced investment in **resilient and green urban infrastructure** to accommodate the rapidly growing urban population and mitigate the **climate risks** faced by Indian cities. The report estimates that **\$2.4 trillion** will be required by **2050** for developing new resilient urban infrastructure and services. As urban areas continue to expand, addressing the challenges of **climate change** and building **sustainable cities** has become an imperative for India's future.

Key Findings from the World Bank Report:

1. India's Growing Urban Landscape:

- **Urban Population:** As of 2020, cities hosted over **one-third** of India's population, or around **480 million** people.
- **Expansion in Risky Areas:** Between 1985 and 2015, settlements in **high flood-risk areas** grew by **102%**, increasing vulnerability to climate-induced disasters.
- **Future Projections:** By **2050**, India's urban population is expected to **double** to **951 million** people, further intensifying the need for resilient urban planning.
- **Economic Growth:** By **2030**, cities will generate **70% of all new employment** and contribute **75%** to the country's **GDP** by 2050, making urban infrastructure a critical pillar for economic growth.

2. Climate Risks to Indian Cities:

- **Flooding:** The risk of **pluvial flooding** (surface water flooding) is expected to increase **3.6 to 7 times** by 2070 due to **intensified rainfall** caused by climate change, coupled with an increase in **impervious surfaces** (urban areas with no water absorption, like concrete).
- **Extreme Heat:** By **2050**, it is projected that **1/5th** of the working hours in major Indian cities could be spent under **high heat stress conditions**, significantly affecting the **livelihoods** and **health** of urban populations.

Recommendations for Climate-Resilient Urban Development:

1. Climate and Disaster Risk Assessment:

- Cities need to **develop local hazard-specific investment plans** that integrate **disaster risk** information into land use planning and urban infrastructure development.
- Risk assessments should include both **climate risks** and **disaster vulnerabilities**, helping cities prioritize **resilience building**.

2. Prioritize Vulnerable Populations:

- Special attention should be given to the **urban poor** and **informal settlements**, which are most affected by climate change.
- Local programs must be strengthened to **support informal settlements**, and high-risk **residents** should be identified based on **climate and disaster risk mapping**.
- **Affordable housing** and access to **basic services** in vulnerable urban areas must be prioritized to ensure equity in resilience efforts.

3. Invest in Green City Expansion:

- Promoting **compact cities** through **transit-oriented development (TOD)** and encouraging the use of **green technologies** like **LED street lighting** and **energy-efficient building designs** will help reduce the carbon footprint of cities.
- **Construction in risk-prone areas** should be **forbidden**, and **eco-friendly urban expansion** must be prioritized to protect cities from environmental threats.

4. Efficient, Resilient, and Green Municipal Services:

- **Water sector management** needs a **city-level analysis** to improve **energy efficiency** and sustainability, especially considering water scarcity and increased demand due to urban growth.
- Investment in **efficient and low-carbon solid waste management (SWM)** systems will reduce **pollution** and contribute to sustainable urban living.
- The integration of **green infrastructure** such as **parks**, **green roofs**, and **urban forests** will help mitigate heat stress and improve the overall urban environment.

5. Facilitating Private Sector Participation:

- The role of the **private sector** should be encouraged in **risk transfer** and **resilience-building** activities, allowing for investments in **infrastructure** that can adapt to climate risks.

- o **Public-private partnerships (PPPs)** can help bridge the financing gap for large-scale urban resilience projects.

Conclusion:

The **World Bank report** emphasizes the need for **strategic investments in resilient and green urban infrastructure** to prepare India's cities for the future. With India's urban population expected to grow rapidly in the coming decades, the challenges of **climate change, extreme weather events, and urban expansion** demand immediate and focused attention. The recommendations put forth by the report will not only help mitigate the impacts of climate risks but also promote **sustainable urban development** that fosters economic growth, social equity, and environmental health.

Mains Questions for UPSC:

1. Discuss the key findings of the World Bank's report 'Towards Resilient and Prosperous Cities in India'. How can India address the challenges of urbanization and climate change through sustainable infrastructure development?
2. Examine the impact of climate risks like flooding and extreme heat on Indian cities. What measures can be implemented to build climate-resilient urban infrastructure in India?
3. What role does private sector participation play in building climate-resilient urban infrastructure? Discuss the potential for public-private partnerships in this regard.
4. Evaluate the importance of prioritizing vulnerable populations, particularly informal settlements, in urban climate action plans. How can India ensure inclusive urban resilience?
5. What are the main challenges associated with implementing green and resilient urban infrastructure in India? How can the government overcome these challenges to meet future urbanization needs?

Atal Pension Yojana Surpasses 8 Crore Enrollments

Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Government Policies for Welfare and Financial Inclusion

✓ GS Paper II – Social Justice

- Issues Related to Financial Security and Poverty

Introduction:

The **Atal Pension Yojana (APY)**, a flagship social security scheme, has reached a significant milestone by surpassing **8 crore total gross enrollments**. This initiative, launched by the **Government of India** in 2015, aims to provide a **secure retirement to the unorganised workforce**, who often lack access to traditional pension schemes. The APY is a key part of India's strategy to address the **longevity risks** and **retirement security** challenges faced by millions of citizens, especially in the informal sector.

About Atal Pension Yojana (APY):

1. **Aim:**
 - o The primary goal of APY is to provide **financial security** to India's vast **unorganised workforce** by offering a **guaranteed monthly pension** upon retirement. This scheme directly addresses the challenges related to **longevity risks** (the risk of outliving one's savings) and the **lack of retirement security** among those who are not covered by formal pension systems.
2. **Ministry and Implementing Agency:**
 - o The **Ministry of Finance** is the nodal ministry for implementing the scheme.
 - o The **Pension Fund Regulatory and Development Authority (PFRDA)** is the implementing agency responsible for the smooth functioning of the **Atal Pension Yojana**.
3. **Eligibility Criteria:**
 - o The scheme is **open to all Indian citizens** who:
 - Are **bank account holders** between the ages of **18 to 40 years**.
 - **Not income taxpayers** (individuals who do not fall under the taxable income bracket).
 - o This makes it **inclusive** and accessible to a large portion of the population, particularly those working in the **informal sector** who may not have access to regular pension schemes.
4. **Benefits of APY:**
 - o **Guaranteed Monthly Pension:** The APY guarantees a **monthly pension** ranging between **₹1,000 to ₹5,000**, depending on the contributions made by the individual. The pension amount will be provided **lifelong** from the age of **60**.

Atal Pension Yojana Surpasses 8 Crore Enrollments



8
CRORE
ENROLLMENTS

AIM

To provide financial security in retirement to India's unorganised workforce



Indian citizens aged 18 to 40
Must have a bank account

ELIGIBILITY



Guaranteed monthly pension of ₹1,000 to ₹5,000 from age 60



Guaranteed monthly pension of ₹1,000 to ₹5,000 from age 60



- The **pension amount** is based on the contribution made by the subscriber, and a **fixed pension** is guaranteed after reaching the specified age of **60 years**.
- The scheme is designed to **provide financial stability** to individuals post-retirement, thereby ensuring a basic level of income for the elderly, particularly those who were not previously covered under any pension system.

Milestone and Impact of APY:

1. Significant Growth:

- The milestone of **8 crore enrollments** in **Atal Pension Yojana** is a testament to the **success** of the scheme in reaching a vast number of people, especially in the **unorganised sector**. With increasing awareness and government initiatives, the program has gained traction across the country.

2. Impact on Financial Inclusion:

- By targeting the **unorganised workforce**, the APY is contributing to **financial inclusion** in India. Many people working in the informal sector do not have access to formal pension plans, and APY is bridging this gap by offering an affordable and accessible pension option.

3. Long-Term Sustainability:

- As the scheme matures, it is expected to play a crucial role in addressing the growing need for **retirement security** in India, especially with the country's aging population. This will also reduce the dependency on family members for post-retirement support, ensuring **greater social stability**.

Challenges and Way Forward:

1. Awareness and Accessibility:

- While the scheme has seen significant uptake, further efforts are needed to **increase awareness** among the population, particularly in rural areas. **Financial literacy programs** can play a crucial role in informing citizens about the benefits of APY and how to enroll.

2. Expanding Coverage:

- Although the APY has had significant enrollments, there is still a need to target **marginalised communities** and workers in the informal sector to ensure full coverage. The government must continue its **outreach efforts** to ensure that the scheme reaches its full potential.

3. Sustainability of Contributions:

- Ensuring that individuals can **sustain their contributions** over the long term is crucial. Measures to incentivise continued participation, as well as improving the **financial literacy** of participants, will help maintain the effectiveness of the scheme.

Conclusion:

The **Atal Pension Yojana (APY)** has proven to be a **pioneering initiative** in addressing the **retirement security** of India's unorganised workforce. With the milestone of **8 crore enrollments**, the scheme is steadily becoming a **critical pillar** in the nation's **social security infrastructure**. While significant progress has been made, continuous efforts are required to ensure its long-term **sustainability**, especially in terms of **increasing awareness** and **ensuring financial inclusivity**.

Mains Questions for UPSC:

1. Discuss the objectives and benefits of the Atal Pension Yojana (APY) in providing social security to India's unorganised workforce. How does the scheme contribute to financial inclusion?
2. What are the challenges facing the successful implementation of Atal Pension Yojana (APY)? How can the government overcome these challenges to ensure broader coverage and sustainability of the scheme?
3. Analyze the role of the Pension Fund Regulatory and Development Authority (PFRDA) in the implementation of Atal Pension Yojana (APY). What reforms are necessary to further improve the functioning of APY?
4. Evaluate the impact of Atal Pension Yojana (APY) on reducing the dependency of the elderly on family members for financial support. How does it contribute to the broader goals of social security in India?
5. What measures can be taken to improve the awareness and accessibility of the Atal Pension Yojana (APY) among rural and informal sector workers?

Parliament Passes the Bills of Lading Bill 2025: Modernizing Shipping Law

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Government Policies and Legal Reforms
- Trade and Commerce Regulations

✓ GS Paper III – Economic Development

- Shipping and Maritime Trade
- Legal Reforms in International Trade

Introduction:

The **Bills of Lading Bill 2025** has been passed by the **Indian Parliament** to modernize the legal framework surrounding **shipping documents**, specifically the **Bills of Lading**. The Bill seeks to **replace the Indian Bills of Lading Act, 1856**, which had become outdated in the context of contemporary shipping practices. By updating and simplifying this framework, the Bill aims to facilitate smoother **international trade** and improve the **legal certainty** in shipping transactions.

About the Bills of Lading Bill 2025:

1. Purpose:

- The **Bills of Lading Bill 2025** is designed to update and **simplify** the legal processes associated with **shipping documents**, specifically the **Bills of Lading**.
- The Bill aims to provide a **modernized framework** for the **documentation** of goods being shipped, ensuring **greater transparency, efficiency, and legal certainty** in **maritime trade**.

2. Key Provisions:

- The Bill seeks to **replace the Indian Bills of Lading Act, 1856**, which has not kept up with advancements in the **shipping industry** over the last century and a half.
- It **addresses current shipping practices** and offers **clarity** regarding the roles of the **shipper, carrier, and consignee** in the **shipping process**.
- The **Bill of Lading** will continue to serve as a **contract of carriage** and a **receipt of goods**, but the Bill updates its provisions to match modern business practices, such as **electronic Bills of Lading**.

3. What is a Bill of Lading?

- A **Bill of Lading (B/L)** is a legal document issued by a **freight carrier** to a **shipper**, acknowledging the receipt of goods for transportation.
- The Bill typically contains essential details such as:
 - **Type** of goods being shipped.
 - **Quantity and condition** of the goods.
 - **Destination** of the goods.
 - The **terms of transport**, which govern the shipping process.
- Bills of Lading are crucial in international trade as they serve multiple functions, including acting as:
 - **Proof of contract** between the shipper and carrier.
 - **Receipt of goods** by the carrier.
 - **Document of title** to the goods, facilitating the transfer of ownership during transit.

Significance of the Bills of Lading Bill 2025:

1. Modernizing Shipping Law:

- The Bill replaces the **Indian Bills of Lading Act, 1856**, which had become increasingly irrelevant in the face of technological advancements and the rise of **electronic documentation**.
- With the **digitalization of the shipping industry**, the Bill incorporates provisions for **electronic Bills of Lading**, ensuring that India stays aligned with international standards and **facilitates smoother global trade**.

2. Facilitating International Trade:

- By **simplifying and updating** the legal framework for Bills of Lading, the Bill will **boost India's position in global maritime trade**.
- The clarity provided by the Bill will help **reduce disputes** related to the shipping process, making it easier for **Indian exporters and importers** to engage in international transactions with confidence.

3. Enhancing Legal Certainty:

- The Bill will provide **legal certainty** regarding the **rights and obligations** of **ship owners, carriers, and cargo owners** in the shipping process, ensuring that all parties involved have a **clear understanding** of their contractual responsibilities.
- This is particularly important in cases of **loss, damage, or delay** during transit, where the Bill can help **resolve disputes** quickly and fairly.

4. Impact on Shipping Industry:

- The **shipping industry** in India will benefit from a **modern legal framework** that facilitates smoother operations and greater **predictability** in business transactions.
- The Bill's emphasis on **electronic Bills of Lading** is especially relevant in the era of **digital transformation**, as it will reduce paperwork and streamline procedures, leading to **cost savings** and **increased efficiency**.

Conclusion:

The **Bills of Lading Bill 2025** marks a significant step in modernizing India's **shipping laws**, replacing the outdated **Bills of Lading Act, 1856**. By incorporating **digital advancements** and simplifying the legal framework for shipping documentation, the Bill will help **boost international trade** and enhance **India's competitiveness** in the global maritime industry. With **legal clarity** and **electronic solutions**, the Bill paves the way for smoother, more efficient shipping practices that benefit both businesses and consumers.

Mains Questions for UPSC:

1. Discuss the significance of the Bills of Lading Bill 2025 in modernizing India's shipping law and its potential impact on international trade.
2. Analyze the role of Bills of Lading in the shipping industry and explain how the introduction of electronic Bills of Lading can transform global maritime trade.
3. Examine the importance of updating the legal framework for shipping documents, particularly Bills of Lading, in the context of India's growing role in global trade.
4. What are the implications of replacing the Indian Bills of Lading Act, 1856 with the Bills of Lading Bill 2025 for the Indian shipping and logistics sectors?
5. How does the Bills of Lading Bill 2025 align with international shipping standards, and what are its expected benefits for India?

Supreme Court Ruling on India-UAE DTAA Permanent Establishment

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Bilateral Agreements
- International Taxation and Economic Agreements

✓ GS Paper II – International Relations

- India's Economic Diplomacy and International Agreements

Introduction:

The Supreme Court of India has recently ruled that **exclusive possession** is not a requirement for a **Permanent Establishment (PE)** under the **India-UAE Double Taxation Avoidance Agreement (DTAA)**. Even **temporary or shared use** of a location can qualify as a PE, which has important implications for **cross-border taxation** between India and the UAE. This ruling clarifies the interpretation of PE under the **India-UAE DTAA**, highlighting how businesses and individuals may be taxed when they have a **presence** in both countries.

About Double Taxation Avoidance Agreement (DTAA):

1. **Definition:**
 - A **Double Taxation Avoidance Agreement (DTAA)** is an international treaty between two or more countries designed to **prevent the same income from being taxed** in both jurisdictions.
 - The primary aim of a DTAA is to avoid **double taxation**, ensuring that taxpayers are not taxed on the same income in both the **source country** and the **residence country**.
2. **Importance of DTAA:**
 - **Tax Relief:** DTAA provides mechanisms such as **tax credits, tax exemptions, and deductions** to help prevent the **excessive tax burden** on individuals and entities engaged in cross-border business.
 - **NRIs and PIOs:** The agreement ensures that **Non-Resident Indians (NRIs)**, **Persons of Indian Origin (PIOs)**, and **Overseas Citizens of India (OCIs)** do not face undue **international tax burdens or cash outflows**.
 - **Encourages Investment:** By reducing the risk of double taxation, DTAAAs encourage **foreign investment** and promote economic cooperation between countries.
3. **India's DTAA Network:**
 - India has signed **94 DTAAAs** with various countries including **Albania, Armenia, Australia, Austria, and others**. These agreements aim to promote cross-border economic activity and provide clarity on tax obligations.

Supreme Court Ruling on Permanent Establishment under India-UAE DTAA:

1. **What is a Permanent Establishment (PE)?**
 - A **Permanent Establishment (PE)** refers to a fixed place of business where a foreign enterprise can carry out its business activities in another country. If a PE exists, the foreign enterprise becomes subject to tax in the host country on the income derived from the business activities carried out through that PE.
 - **Key factors for determining PE** include factors like the **duration of stay, nature of the activities**, and the **degree of control** the foreign enterprise exercises over the location.
2. **Supreme Court's Ruling:**
 - In this case, the **Supreme Court of India** held that **exclusive possession** of a location is not a mandatory condition for a **PE** under the **India-UAE DTAA**.
 - The ruling clarified that even **temporary or shared use** of a location by a business could be enough to establish a **PE** if the business is engaged in significant activities at the location, even if it does not have full **exclusive possession**.
 - This **expands the scope** of what constitutes a **PE**, meaning that companies or individuals with a **temporary or shared presence** in India or the UAE may be subject to **taxation** under the respective DTAA provisions.
3. **Implications of the Ruling:**

- The judgment impacts **multinational corporations (MNCs)** and **businesses** operating in both India and the UAE. It suggests that a **temporary presence** in either country could trigger tax liabilities if the activities conducted through that presence meet the criteria for a **PE**.
- This ruling will affect **tax planning strategies**, especially for entities relying on **short-term contracts, temporary offices, or shared workspaces** in both countries.

Significance of DTAA for Businesses and Individuals:

1. Avoidance of Double Taxation:

- DTAs help **avoid the risk of double taxation**, where individuals or businesses are taxed twice on the same income—once in the source country and again in the country of residence.
- This is particularly relevant for **multinational corporations** with operations in multiple countries, as it allows them to reduce their **overall tax burden**.

2. Clarity on Taxation of Income:

- The **DTAA** provides a **clear framework** for determining how income should be taxed, especially for **cross-border transactions** involving services, business profits, and royalties.
- This clarity reduces the potential for **tax disputes** and **litigation**, as businesses and individuals know their **tax obligations** in both countries.

3. Investment and Economic Cooperation:

- By providing **tax relief**, DTAs encourage **foreign direct investment (FDI)** and strengthen **economic ties** between countries.
- Countries with a **strong network of DTAs** tend to be **attractive destinations** for international businesses, as these treaties reduce **taxation-related risks** and provide a stable **legal environment** for cross-border investments.

Conclusion:

The **Supreme Court's ruling** on the interpretation of **Permanent Establishment (PE)** under the **India-UAE DTAA** clarifies the criteria for taxation of foreign entities with a **temporary or shared presence** in either country. This decision impacts multinational businesses operating across borders and underscores the growing complexity of **cross-border taxation**. DTAs, such as the one between India and the UAE, remain critical for promoting **international trade, investment, and economic cooperation**, while ensuring fairness and transparency in the tax obligations of individuals and businesses.

Mains Questions for UPSC:

1. Explain the concept of Permanent Establishment (PE) under international tax law. Discuss the significance of the Supreme Court's ruling on PE under the India-UAE Double Taxation Avoidance Agreement.
2. Evaluate the role of Double Taxation Avoidance Agreements (DTAs) in promoting cross-border trade and investment. How does the India-UAE DTAA benefit both countries?
3. What are the implications of the Supreme Court's ruling on PE for multinational corporations operating in India? How does this ruling impact tax planning strategies?
4. Discuss the advantages and challenges of having a network of Double Taxation Avoidance Agreements (DTAs) for countries. How does this network contribute to global economic integration?
5. Analyze the importance of Double Taxation Avoidance Agreements (DTAs) in reducing international tax burdens for Non-Resident Indians (NRIs) and Overseas Citizens of India (OCIs).

INTERNATIONAL RELATIONS

PM of India's Visit to Maldives Marks 60th Anniversary of Diplomatic Relations

❖ Syllabus Mapping:

✓ GS Paper II – International Relations

- India's Foreign Policy
- Bilateral Relations and Diplomacy

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- India's Geopolitical and Economic Strategy

Introduction:

The Prime Minister of India recently visited the Maldives to mark the **60th anniversary of India-Maldives diplomatic relations**. This visit is particularly significant as it comes after a period of tension in bilateral ties, primarily due to the "**India Out**" campaign, which had strained the relationship between the two nations. The visit aimed to strengthen the ties and reassert India's commitment to the Maldives as a key partner in the **Indian Ocean Region (IOR)**. The outcomes of the visit focused on strengthening economic, security, and cultural ties between the two countries.

Key Outcomes of the Visit:

1. Signing of Agreements:

- **Line of Credit (LoC):** A ₹4,850 crore Line of Credit was signed to support the Maldives' infrastructure development, energy sector, and other critical projects.
- **Debt Reduction:** The agreement also includes measures to reduce the annual debt repayment burden on the Maldives for loans previously provided by the Indian government, which is crucial for the economic stability of the Maldives.
- **UPI Implementation:** The agreement also aims at enabling the Unified Payments Interface (UPI) in the Maldives, which will ease financial transactions and digital payments between the two nations.
- **Free Trade Agreement (FTA):** The Terms of Reference for a proposed Free Trade Agreement (FTA) between India and the Maldives were discussed. This would deepen the economic and trade relationship between the two countries.

2. Memoranda of Understanding (MOUs):

- **6 MOUs** were exchanged in several key areas:
 - **Fisheries and Aquaculture:** Strengthening cooperation in these sectors will ensure sustainable marine resources.
 - **Meteorology:** Collaborative efforts in weather forecasting and disaster management.
 - **Digital Public Infrastructure & UPI:** Enhancement of digital governance and infrastructure.
 - **Indian Pharmacopoeia:** Promotion of the Indian Pharmacopoeia in the Maldives for better health standards.

3. Inaugurations and Handing-over of Projects:

- **3,300 Social Housing Units:** In Hulhumale, part of India's **Buyers' Credit facilities**, aimed at improving housing and living conditions.
- **Roads and Drainage Systems Project:** In Addu City, improving the infrastructure and urban planning in the Maldives.
- **Two Aarogya Maitri Health Cube (BHISHM) Sets:** The health initiative supports healthcare and well-being in the Maldives through technology-driven solutions.

Significance of Maldives for India:

1. Geopolitical Importance:

- The Maldives is crucial for India's '**Neighborhood First**' policy and its **Vision MAHASAGR**, which focuses on the **Indian Ocean** as a strategic and economic space.
- The Maldives serves as a key player in regional geopolitics, especially in the context of maritime security and Indian Ocean trade routes.

2. Strategic Location:

- The Maldives is positioned strategically as a '**toll gate**' between the **western Indian Ocean chokepoints** (Gulf of Aden and Strait of Hormuz) and the **eastern Indian Ocean chokepoint** (Strait of Malacca). This is crucial for the global maritime trade routes.



- As a result, **50% of India's external trade and 80% of its energy imports** transit through these **sea lines of communication (SLOCs)**, highlighting the importance of a **secure and stable maritime route**.

3. Geo-Economics:

- The Maldives' location along **major commercial shipping routes** makes it strategically valuable for **economic and geopolitical cooperation**.
- India's economic relationship with the Maldives is also enhanced through **trade and investment** in maritime infrastructure, tourism, and other sectors.

4. Security and Counter-Terrorism:

- The Maldives plays a vital role in **regional security**, especially in **counter-terrorism** efforts and **maritime security**. India has a vested interest in ensuring the Maldives' stability, as its strategic location makes it a key partner in the **Indian Ocean Region**.
- The Maldives is also a **critical participant** in the **Colombo Security Conclave**, a multilateral framework for maritime security in the region, which includes India, Sri Lanka, and the Maldives.

5. Countering China's Influence:

- The Maldives is strategically important for India in its **geopolitical competition** with China in the Indian Ocean. China's growing presence in the region, particularly through its **String of Pearls** strategy, has prompted India to **strengthen ties** with island nations like the Maldives to counterbalance China's influence.

Conclusion:

The visit of the **Prime Minister of India** to the **Maldives** is a significant step in strengthening the bilateral ties between the two countries. Through agreements and **infrastructure support**, India has reaffirmed its role as a key partner in the **development** and **security** of the **Maldives**. The ongoing cooperation in areas such as **trade**, **maritime security**, and **digital infrastructure** highlights the growing importance of this relationship, which is crucial for India's broader strategy in the **Indian Ocean Region**.

Mains Questions for UPSC:

1. Discuss the significance of India-Maldives bilateral relations, particularly in the context of India's strategic interests in the Indian Ocean Region. How does the Maldives' location impact India's geopolitical and economic strategies?
2. Evaluate the outcomes of the Prime Minister's recent visit to the Maldives. How do the agreements signed during the visit enhance India's role in the Indian Ocean and its neighborhood-first policy?
3. Analyze the geopolitical and security implications of the Maldives' location between crucial maritime chokepoints. How can India strengthen its influence in the Indian Ocean Region through its relationship with the Maldives?
4. What are the potential benefits and challenges of establishing a Free Trade Agreement (FTA) between India and the Maldives? How will this impact the economic ties between the two countries?
5. Discuss the role of multilateral frameworks like the Colombo Security Conclave in promoting regional security. What role does the Maldives play in these efforts, and how does it benefit India?

India's Leadership in Millets Standards at CAC

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- International Relations and Cooperation
- Global Organizations and their Role

✓ GS Paper III – Science and Technology

- Biotechnology and Food Technology
- International Food Standards

Introduction:

India's leadership in the development of standards for **millets** has been acknowledged at the **88th session of the Executive Committee of the Codex Alimentarius Commission (CAC)**, held at the **Food and Agriculture Organization (FAO) Headquarters in Rome, Italy**. This recognition highlights India's growing influence in **global food standards** and its commitment to promoting **millets** as a sustainable and nutritious food source.

About Codex Alimentarius Commission (CAC):

1. Establishment and Purpose:

- The **Codex Alimentarius Commission (CAC)** was established jointly by the **Food and Agriculture Organization (FAO)** and the **World Health Organization (WHO)** in 1963.
- It was created to implement the **Joint FAO/WHO Food Standards Programme**, which aims to promote **safe, nutritious, and fair food trade** globally.

2. Codex Alimentarius:

- The **Codex Alimentarius** refers to a collection of **international food standards**, guidelines, and codes of practice that ensure the safety, quality, and fairness of international food trade.
- These standards cover a wide range of food items, from **nutritional content** to **labeling requirements**, contributing to consumer protection and the facilitation of **fair global trade**.

3. Role in Global Food Trade:

- The **Codex Alimentarius** plays a crucial role in harmonizing food standards across different countries, ensuring that food products meet internationally accepted safety criteria, and thereby promoting **public health** and **international trade**.
- The commission works to balance the interests of **food producers**, **consumers**, and **governments**, helping to maintain **food security** and **food safety** worldwide.

India's Leadership in Millets Standards:

1. Promotion of Millets:

- India has been at the forefront of promoting **millets** as a sustainable and nutritious food option. Millets are **climate-resilient crops**, requiring less water and fewer pesticides, making them ideal for **sustainable agriculture**.
- Millets are rich in **fiber**, **proteins**, and **micronutrients**, and their nutritional benefits are recognized globally, particularly as a food source for addressing **malnutrition** and **food security**.

2. India's Role at CAC:

- At the **88th session** of the **Codex Alimentarius Commission (CAC)**, India's contributions to **setting international standards for millets** were formally recognized.
- India has played a critical role in advocating for the inclusion of **millets** in **global food standards**, particularly as part of the **International Year of Millets** (2023), which has brought global attention to the importance of millets in **combating malnutrition** and **promoting food diversity**.

3. Recognition at FAO:

- India's **leadership in millets standards development** underscores its position as a key player in the global food system, working to ensure that **millets** are included in international **food trade** standards, and are recognized for their role in **sustainable development**.
- This recognition at the **FAO headquarters** also provides India with the opportunity to further advocate for the **promotion of millets** and **diverse crops** in global food policies.

Members of CAC:

1. Membership Composition:

- The **Codex Alimentarius Commission** currently has **189 members**, comprising **188 member countries** and **1 organization (the European Union (EU))**.
- The membership includes **developed and developing nations**, giving the Commission a global outlook and enabling it to set standards that reflect the **diversity of food systems** around the world.

2. Global Impact:

- The commission's decisions directly influence **food safety regulations**, **import/export restrictions**, and **consumer protection** laws in member countries, making it a key body in shaping **global food systems** and policies.
- The participation of **189 members** ensures that the standards set by the CAC are applicable in most of the world's food markets, helping facilitate safe and fair trade while promoting **food security** worldwide.

Conclusion:

Wisdom leads to success

India's **leadership in the development of millets standards** has been officially recognized at the **Codex Alimentarius Commission's 88th session**, showcasing the country's **commitment to promoting nutritious and sustainable food options**. With millets playing a crucial role in addressing **global challenges like malnutrition and climate change**, India's advocacy for their inclusion in international food standards will help foster **global food security** and **sustainability**.

Mains Questions for UPSC:

1. Discuss the role of the Codex Alimentarius Commission in promoting food safety and international trade. How has India contributed to its initiatives on millets?
2. India has been a leader in advocating for millets in global food standards. Discuss the importance of millets in addressing issues like food security, malnutrition, and sustainable agriculture.
3. Examine the impact of the Codex Alimentarius Commission on global food systems. How do international food standards shape global trade and consumer protection?
4. How can India's leadership in the development of food standards for millets contribute to global efforts in combating malnutrition and promoting sustainability?
5. Evaluate the role of international organizations like FAO and WHO in shaping global food policies. How does India's participation in these platforms enhance its position in global food governance?

India-EFTA Trade and Economic Partnership Agreement (TEPA) to Take Effect from October 2025

📌 Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- International Relations
- Trade Agreements and Economic Diplomacy

✓ GS Paper III – Technology, Economic Development, and Security

- Economic Growth and Development
- Trade Policies and International Trade Agreements

Key Provisions of the India-EFTA Trade and Economic Partnership Agreement (TEPA):

- **Effective Date:**
 - The India-EFTA TEPA will come into effect on **October 1, 2025**.
 - This Free Trade Agreement (FTA) was signed in **March 2024**.
- **Member States of EFTA:**
 - The European Free Trade Association (EFTA) consists of four countries: **Switzerland, Iceland, Norway, and Liechtenstein**. These countries are **not part of the European Union (EU)**.

Main Objectives and Key Features of the TEPA:

1. **Market Access and Tariff Reductions:**
 - **EFTA's Offer:** Provides **100% market access** for non-agricultural products from India.
 - **India's Offer:** India will reduce tariffs on **95.3% of EFTA's exports**.
 - **Exclusions:** Sensitive sectors such as **dairy, soya, coal**, and some **agricultural products** are **excluded** from the tariff reductions.
2. **Investment Commitments:**
 - **FDI Commitment:** The agreement includes a **binding commitment** for **\$100 billion in Foreign Direct Investment (FDI)** into India over the next **15 years**.
 - **Job Creation:** The agreement aims to **create 1 million direct jobs** in India as a result of increased trade and investment.
3. **Tariff Reduction:**
 - **EFTA Commitment:** EFTA countries will eliminate or reduce tariffs on **99.6% of India's exports** to their markets.
 - **India's Commitment:** India will provide similar tariff reductions on a significant portion of **EFTA exports**.
4. **Intellectual Property and Professional Services:**
 - The agreement includes provisions for **Intellectual Property Rights (IPR)**, ensuring stronger protections for Indian businesses.
 - **Professional Services: Mutual Recognition Agreements (MRAs)** will be signed for services like **nursing**, allowing professionals to move more freely between India and EFTA nations.

Analysis of the TEPA:

1. **Impact on Trade Balance:**
 - India's **trade deficit** with EFTA countries, particularly **Switzerland** (due to **gold imports**), is a key challenge.
 - While tariff reductions benefit India's exports, managing the trade imbalance will remain a significant task for India.
2. **FDI and Job Creation:**
 - The **\$100 billion FDI commitment** is expected to **boost India's manufacturing, infrastructure, and services sectors**.
 - The **creation of 1 million jobs** will be a significant contributor to India's **employment generation**, but careful monitoring will be needed to ensure these jobs benefit various sections of society.
3. **Agricultural Exports:**
 - **Processed Agricultural Products (PAP)** will benefit from tariff concessions, but the **exclusion of sensitive products** like **dairy** may limit the agreement's impact on India's agriculture sector.
4. **Intellectual Property and Services:**
 - Enhanced **IPR protections** and **Mutual Recognition Agreements** will improve the competitiveness of Indian professionals and businesses in EFTA countries.
 - This can foster stronger economic linkages in **services** such as **healthcare and IT**.

India-EFTA Trade Relations:

- In **2024-25**, trade between **India and EFTA** was valued at **\$24.4 billion**, with a **trade deficit** for India, largely due to **gold imports from Switzerland**.
- **Switzerland** is India's **largest trading partner** among the EFTA countries, followed by **Norway**.

Conclusion:

- The India-EFTA TEPA aims to strengthen trade and economic ties between India and EFTA nations by focusing on **market access, tariff reductions, and investment commitments**.
- While the **FDI and job creation** aspects hold significant promise for India, managing the **trade deficit** and **sensitive sectors** such as agriculture will require careful strategy.
- IPR and **professional services** provisions will also provide long-term benefits, particularly in the **services sector**, but India will need to ensure equitable growth across sectors.

Mains Questions for UPSC:

- Examine the key provisions of the India-EFTA Trade and Economic Partnership Agreement (TEPA) and its potential impact on India's economy.
- India faces a significant trade deficit with EFTA countries, particularly due to imports of gold. What measures can India take to balance this deficit and make the most of the India-EFTA TEPA?
- How does the India-EFTA TEPA promote job creation and Foreign Direct Investment (FDI) in India? Analyze its potential long-term impact on India's economic growth.
- Evaluate the challenges India faces in its agricultural exports under the India-EFTA TEPA, especially concerning sensitive products like dairy and coal.
- Discuss the significance of intellectual property rights and mutual recognition agreements in the India-EFTA TEPA. How will these provisions benefit India's services sector?

E3 Countries and Snapback Sanctions: A Look at the Nuclear Dynamics with Iran

❖ Syllabus Mapping:

✓ GS Paper II – International Relations

- International Treaties and Agreements
- Diplomacy and Cooperation Among Nations

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Impact of Multilateral Agreements and Bilateral Relations

Introduction:

The E3 countries (the United Kingdom, Germany, and France) have recently threatened Iran with **snapback sanctions** amidst the derailed U.S.-Iran nuclear talks. This comes after Iran's actions that appear to breach its **nuclear commitments** under the **2015 Joint Comprehensive Plan of Action (JCPOA)**. The **snapback sanctions** mechanism, which allows the **reimposition of sanctions**, is a crucial aspect of the JCPOA, designed to ensure compliance by all parties involved, particularly Iran. This article will explore the **E3's role** in the Iran nuclear talks, the **snapback sanctions**, and their broader implications for international diplomacy.

About E3 Countries:

1. Formation and Purpose:

- The E3 refers to an informal group of three European nations: **United Kingdom (UK), Germany, and France**.
- The E3 was formed to address **foreign policy challenges and security concerns**, particularly related to **nuclear proliferation** and **regional stability**.

2. Origin of E3:

- The E3 countries first came together following the **2003 U.S. invasion of Iraq**, primarily to **coordinate a trilateral strategy** towards **Iraq** and to deal with the nuclear risks emanating from **Iran**.
- Over the years, the group has focused on **nuclear non-proliferation** in the Middle East, most notably concerning **Iran's nuclear program**.

3. Diplomatic Role of E3:

- The E3 countries have been central in brokering **negotiations** between **Iran** and the **international community**, particularly in the context of the **JCPOA (2015)**, a deal designed to **curb Iran's nuclear capabilities** in exchange for the lifting of sanctions.
- Their role involves **representing European interests** while **balancing relations** with both **Iran** and the **United States**, which has historically had a contentious relationship with Iran.

Snapback Sanctions under the JCPOA:

ABOUT E3 COUNTRIES

FORMATION AND PURPOSE

The E3 refers to an informal group of three European nations: United Kingdom (UK), Germany, and France



ORIGIN OF E3

The E3 countries first came together following the 2003 U.S. invasion of Iraq, primarily to deal with the nuclear risks emanating from Iran

following the 2003 U.S. invasion of Iraq, primarily to deal with the nuclear risks emanating from Iran

DIPLOMATIC ROLE OF E3

The E3 countries as being central in brokering negotiations between Iran and the international community

1. What are Snapback Sanctions?

- **Snapback sanctions** refer to a provision in the **2015 Joint Comprehensive Plan of Action (JCPOA)** that allows the **automatic reimposition of sanctions** on Iran if it violates its nuclear commitments under the agreement.
- The **snapback mechanism** is designed to act as a **safeguard** to ensure that **Iran** complies with the terms of the **nuclear deal**. If Iran breaches the agreement, sanctions can be re-enforced, restoring the pressure that existed before the JCPOA.

2. Mechanism of Snapback Sanctions:

- The **snapback sanctions** provision is triggered if **any party** (E3, US, Russia, China, or Iran) **notifies the UN Security Council** of a breach of the agreement by Iran. The UN Security Council then has 30 days to either extend or reimpose the sanctions. If no consensus is reached, the sanctions automatically "snap back" into effect.
- These sanctions primarily target **Iran's economy**, especially its **oil exports** and **financial transactions**, and are intended to put significant **economic pressure** on Iran to ensure compliance with the **nuclear non-proliferation treaty**.

3. E3's Role in Snapback Sanctions:

- The **E3 countries** (UK, Germany, and France) have been vocal proponents of the **JCPOA**, and in the event of **non-compliance** by **Iran**, they are responsible for **triggering the snapback sanctions**.
- As part of the **E3's diplomatic engagement** with Iran, these sanctions are a way to enforce accountability and **mitigate nuclear proliferation risks**. The **E3 countries** have increasingly used these provisions as a means to **pressure Iran** when the country steps back from its commitments.

Impact of the US-Iran Nuclear Talks Breakdown:

1. Relevance of the JCPOA in US-Iran Relations:

- The **breakdown of US-Iran nuclear talks** has been a significant point of tension, particularly following the **US withdrawal from the JCPOA** in 2018 under the **Trump administration**. The move has left Iran increasingly frustrated, leading to violations of the nuclear agreement.
- In 2021, **US President Joe Biden** expressed an interest in **rejoining the JCPOA**, but talks have stalled due to differences between **Iran** and the **US** over compliance and sanctions relief.

2. E3's Role Amidst US Withdrawal:

- After the **US withdrawal** from the **JCPOA**, the **E3 countries** took on a more prominent role in **diplomatic efforts** to keep the **nuclear deal** alive, engaging directly with Iran and urging it to comply with the **JCPOA's terms**.
- The **E3 countries** continue to balance their **relations with Iran** and the **US**, often acting as intermediaries in negotiations and attempting to find a way forward that ensures **global nuclear security**.

3. Threat of Snapback Sanctions in 2023:

- The **threat of snapback sanctions** came into focus again as **Iran** failed to comply with **certain terms** of the **JCPOA**, leading the **E3 countries** to **reaffirm their commitment** to the agreement and **escalate their demands** for Iran's full compliance.
- As Iran continues to **enrich uranium** beyond the agreed limits, the **E3** is likely to take a firm stance, using **snapback sanctions** as a tool to rein in any further violations.

Conclusion:

The **E3 countries** (UK, Germany, and France) have long played a central role in diplomatic efforts surrounding Iran's nuclear program. The **snapback sanctions** provision in the **JCPOA** is a critical mechanism to ensure **Iran's compliance** with the nuclear deal. With the **derailed US-Iran nuclear talks**, the role of the **E3** becomes even more important, as they work to maintain pressure on Iran while attempting to mediate between the parties. The international community remains watchful of these developments, with the potential for **reimposed sanctions** marking a significant step in efforts to curb **nuclear proliferation** and ensure regional stability.

Mains Questions for UPSC:

1. Discuss the role of the E3 countries in the Iran nuclear deal. How do the E3 countries contribute to the JCPOA and the broader issue of nuclear non-proliferation?
2. What are snapback sanctions under the JCPOA? How do they function to enforce compliance, and what implications do they have for international diplomacy?
3. Analyze the impact of the US withdrawal from the JCPOA and the subsequent role of the E3 countries in managing the Iran nuclear crisis. What diplomatic challenges arise from this scenario?
4. What is the significance of the snapback sanctions mechanism in the JCPOA? How does it contribute to maintaining accountability among signatories and preventing nuclear proliferation?
5. Examine the geopolitical implications of the ongoing US-Iran nuclear negotiations. How do the actions of the E3 countries influence the broader security architecture of the Middle East?

India-Lesotho Strengthen Bilateral Ties During Minister's Visit

📌 Syllabus Mapping:

✓ GS Paper II – International Relations

- Bilateral Relations
- India's Foreign Policy and Diplomacy

✓ GS Paper I – Geography

- Geographical Features of Countries
- International Boundaries and Relations

Introduction:

During the visit of India's **Minister of State for External Affairs**, both **India** and **Lesotho** are set to **deepen bilateral cooperation**. As **Lesotho** is a **landlocked** nation entirely encircled by **South Africa**, the visit aims to enhance India's engagement with this unique country, located in the **Southern Hemisphere**, and is expected to focus on areas such as **trade, water management, and developmental cooperation**.

About Lesotho:

1. Political Features:

- **Lesotho** is a **landlocked** country, entirely surrounded by **South Africa**, making it one of the few nations in the world that is completely encircled by another country.
- Despite its small size, Lesotho holds a significant political position in the Southern African region due to its **geographical location** and **political stability**.

2. Geographical Features:

- Lesotho is famously known as the "**Kingdom in the Sky**" due to its **high elevation**. It is the **only country in the world** that is entirely **above 1,000 meters** in elevation, with the majority of its land situated in the **mountainous** region of Southern Africa.
- **Mountains** cover approximately **two-thirds of the country's territory**, making it an important part of the **Southern African Highlands**.

3. Major Mountain Ranges:

- **Drakensberg Mountains**: Located on the **eastern boundary** of Lesotho, the **Drakensberg** is one of the most prominent mountain ranges in Southern Africa.
- **Maloti Mountains**: These **north-south spurs** are located within the heart of Lesotho and contribute to the country's unique topography.

4. Highest Peak:

- The **highest peak** in Lesotho is **Thabana Ntlenyana**, standing at **3,482 meters** above sea level. It is the **highest mountain** in Southern Africa outside of the **Drakensberg Range**.

5. Natural Resource - "White Gold":

- **Water** is the most significant natural resource in Lesotho, often referred to as '**white gold**'. The country has abundant **water resources**, including rivers, lakes, and reservoirs.
- Lesotho's water is crucial for the **southern African region**, as the country is a key **water supplier** to South Africa, particularly for the **Vaal River** system, which serves a large portion of the South African population.

Bilateral Cooperation Between India and Lesotho:

1. Historical Ties:

- India and Lesotho share **friendly diplomatic relations** based on mutual respect, cooperation, and shared goals of **development** and **peace** in the region.
- India has provided **technical assistance**, particularly in areas like **agriculture, health, and education** to Lesotho, contributing to its socio-economic growth.

2. Areas of Cooperation:

- **Water Management**: With **Lesotho's abundance of water resources**, there is great potential for India to collaborate in areas such as **water management, irrigation, and hydroelectric power generation**, leveraging India's expertise in **water conservation technologies**.
- **Trade and Economy**: India is keen to enhance trade and economic exchanges with Lesotho, focusing on sectors like **pharmaceuticals, education, infrastructure, and technology transfer**.
- **Capacity Building**: India's role in **capacity building** and **technical training** in various sectors, especially for **youth development** and **skill enhancement**, can be pivotal for Lesotho's long-term growth.

3. Cultural and Educational Cooperation:

- **Cultural exchange** and **academic partnerships** between India and Lesotho have the potential to strengthen bilateral ties. India's vast **educational infrastructure** can provide opportunities for students from Lesotho to engage in **scholarships and research collaborations**.
- India's soft power, including **Indian culture, media, and entertainment**, can also foster people-to-people ties.

Strategic Location

- Lesotho's geographical position, entirely surrounded by South Africa, makes it an important regional partner in Southern Africa. Its role in regional water distribution and potential cooperation in energy projects can bolster its geopolitical importance.
- India's engagement with Lesotho can help strengthen its presence and influence in the Southern African Development Community (SADC).



Economic Growth in Southern Africa

- As the only landlocked country in Southern Africa with high altitudes and natural resources, Lesotho provides a unique opportunity for India to engage in resource-sharing agreements and economic partnerships, particularly in water management and hydropower generation.

Geopolitical Significance of Lesotho:

1. Strategic Location:

- Lesotho's **geographical position**, entirely surrounded by **South Africa**, makes it an important **regional partner** in Southern Africa. Its role in regional **water distribution** and potential cooperation in **energy projects** can bolster its geopolitical importance.
- India's engagement with Lesotho can help strengthen its presence and influence in the **Southern African Development Community (SADC)**.

2. Economic Growth in Southern Africa:

- As the **only landlocked country** in Southern Africa with high **altitudes** and natural resources, Lesotho provides a unique opportunity for India to engage in **resource-sharing agreements** and **economic partnerships**, particularly in **water management** and **hydropower generation**.

Conclusion:

India's engagement with **Lesotho** offers numerous opportunities for collaboration in sectors such as **water management**, **education**, and **trade**. Through the visit of the **Indian Minister of State for External Affairs**, the two countries aim to strengthen **bilateral ties** and create pathways for mutual **growth and development**. As India continues to expand its global footprint, Lesotho's **strategic location** and abundant **natural resources** offer significant potential for deepening cooperation in the region.

Mains Questions for UPSC:

1. Discuss the significance of Lesotho's geographical and natural resources, particularly water, in its bilateral relations with India. How can India leverage this relationship for regional cooperation?
2. Examine the potential areas of cooperation between India and Lesotho. How can India's expertise in water management and technology benefit Lesotho's economic and social development?
3. Analyze the role of Lesotho in the Southern African region. How does India's diplomatic engagement with Lesotho contribute to India's broader foreign policy objectives in Africa?
4. How can India's soft power in cultural and educational exchange enhance bilateral relations with smaller countries like Lesotho? Discuss the potential benefits.
5. What is the geopolitical significance of Lesotho's location in Southern Africa? How can its water resources be utilized for regional cooperation, especially with South Africa?

US Withdraws from UNESCO: A Step Back from Multilateralism

❖ Syllabus Mapping:

✓ GS Paper II – International Relations

- Bilateral Relations and Geopolitical Impacts
- Multilateral Organizations and their Role

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- United Nations and its Agencies
- Global Cooperation and the Role of the US in Multilateralism

Introduction:

In a significant move, the **United States** has announced its **withdrawal from the United Nations Educational, Scientific and Cultural Organization (UNESCO)**, citing the organization's support for what it describes as "woke" and divisive causes and its perceived anti-Israel bias. This marks the **third time** the US has exited UNESCO and the **second time under the current administration**. The withdrawal comes amidst a broader shift in the US's stance on **multilateral institutions**, as it has also scaled back its engagement with other UN bodies such as the **World Health Organization (WHO)** and reduced funding to the **United Nations Relief and Works Agency for Palestine (UNRWA)**.

Impact of the US Withdrawal from UNESCO:

1. Budgetary Impact:

- The United States has traditionally been one of the **largest contributors** to UNESCO, accounting for approximately **8% of its total budget**.
- The withdrawal could result in a **significant financial shortfall** for UNESCO, affecting its ability to implement programs related to **education, cultural heritage, and scientific cooperation** globally. The financial gap may force the organization to seek alternative funding sources or reduce the scope of its initiatives.

2. Geopolitical Impact:

- The US withdrawal may create a **vacuum** in UNESCO's influence, which could be filled by other **global powers**, particularly **China**, which has increasingly sought to expand its influence in multilateral organizations.
- China, a growing financial contributor to UNESCO, may have the opportunity to further shape the agency's priorities, especially in the realms of **education, science, and cultural exchange**, aligning it with its geopolitical interests.

3. Impact on Multilateralism:

- The US's decision to exit UNESCO sends a **worrying signal** about its commitment to **multilateralism and global cooperation**. The move could **undermine trust in international institutions**, as countries may perceive this as a retreat from the principles of **global governance and collaboration**.
- This withdrawal may also set a **precedent** for other countries to question their participation in UN bodies and agencies, leading to further fragmentation in the international system.

About UNESCO:

1. Mission and Purpose:

- UNESCO is a **specialized agency** of the **United Nations**, founded in **1945**, and aims to contribute to **peace and security** by fostering **collaboration** among nations in the fields of **education, science, and culture**.
- UNESCO's activities include promoting **quality education**, protecting **cultural heritage**, advancing **scientific cooperation**, and advocating for **freedom of expression** globally.

2. Key Reports and Initiatives:

- **Global Education Monitoring Report**: This report tracks progress in **education** globally and assesses the status of educational equity and access across countries.
- **World Trends in Freedom of Expression and Media Development**: This initiative monitors global trends in **freedom of the press** and **media development**, and raises awareness about the importance of media independence.
- **UNESCO World Heritage Sites**: UNESCO plays a leading role in the **protection and preservation of World Heritage Sites**, which are considered invaluable to humanity's shared cultural and natural heritage.
- **Man and the Biosphere (MAB) Programme**: This initiative aims to improve the relationship between **humans** and the **environment**, promoting **sustainable development** through the conservation of **biodiversity**.

3. Organizational Structure:

- UNESCO is headquartered in **Paris** and has **194 member countries** and **12 associate members**. It operates through a network of **regional offices** and **national commissions**.
- The organization works in close partnership with other UN agencies, national governments, non-governmental organizations (NGOs), and civil society to achieve its goals.

Significance of the US Withdrawal:

1. Diminished Influence on Global Education and Culture:

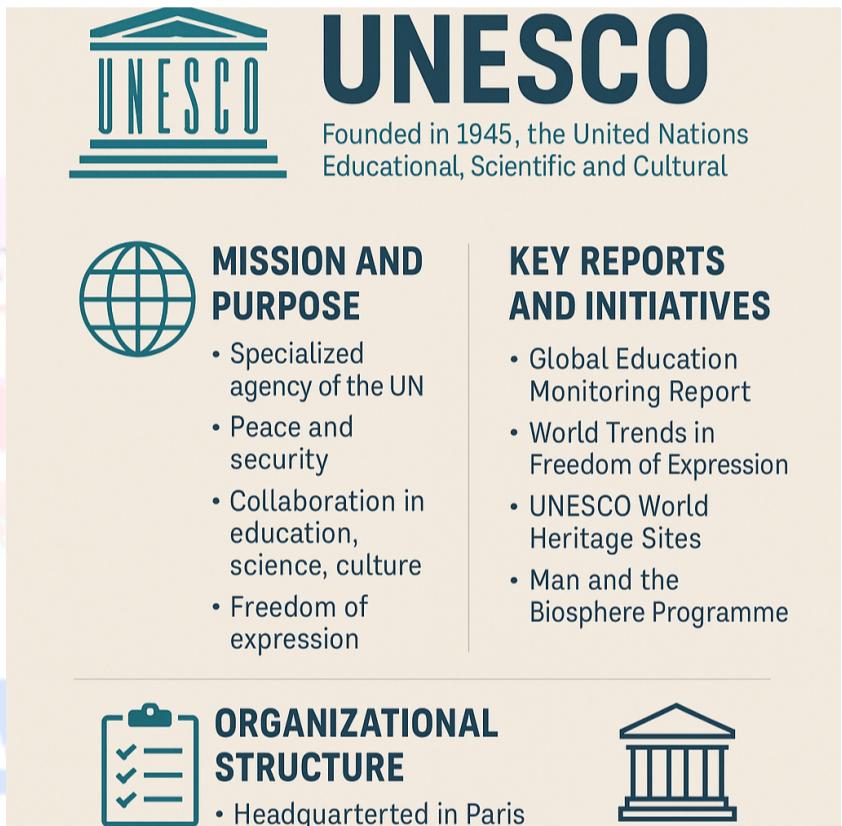
- The US has historically been a key player in shaping UNESCO's **global educational and cultural programs**. Its exit will likely reduce its influence in shaping **international norms and standards** for **education** and **scientific cooperation**.
- The loss of US participation may also affect **global initiatives** related to **sustainable development**, such as UNESCO's **Education for Sustainable Development** goals.

2. Shifting Dynamics in International Organizations:

- The US withdrawal could lead to a **shift in power dynamics** within UNESCO, particularly as **China** and **Russia** look to increase their influence in multilateral platforms.
- Other global powers may either align with or counterbalance this growing influence, further intensifying **geopolitical competition** in international organizations.

3. Long-Term Effects on Multilateral Institutions:

- The trend of **retreating from multilateral institutions** could weaken the **global governance system**, which has relied on **cooperation and shared responsibility**. The US's **isolationist stance** could encourage other countries to **withdraw from global partnerships**, undermining the effectiveness of **international institutions**.
- This could ultimately affect the ability of organizations like UNESCO to implement large-scale, **global initiatives** that require broad cooperation.



Conclusion:

The US's withdrawal from UNESCO marks a critical turning point in the dynamics of **global governance** and **multilateralism**. While the immediate impact may be felt in UNESCO's **finances** and **influence**, the long-term effects may reverberate through the entire **UN system**, signaling a growing **trend of disengagement** from international bodies. As global powers reassess their roles in multilateral institutions, the future of organizations like UNESCO will depend on their ability to adapt to changing geopolitical realities while maintaining their core missions of **promoting peace, education, and cultural exchange**.

Mains Questions for UPSC:

1. Discuss the implications of the US withdrawal from UNESCO on the future of multilateralism. How might this decision affect the role of international organizations in global governance?
2. Evaluate the impact of the US exit on UNESCO's financial and geopolitical standing. What does this signal about the changing dynamics of global cooperation?
3. What are the core functions of UNESCO, and how does its work contribute to global peace and security? Discuss the potential consequences of the US withdrawal for global educational and cultural initiatives.
4. Analyze the significance of the US's growing disengagement from multilateral institutions. How might this affect global efforts to address challenges like climate change, health crises, and sustainable development?
5. Examine the role of China in filling the vacuum left by the US in UNESCO and other international organizations. How might this shift influence global geopolitics?

India-UK Vision 2035: Strengthening Bilateral Ties Across Key Sectors

📌 Syllabus Mapping:

✓ GS Paper II – International Relations

- Bilateral Relations and Agreements
- Economic Diplomacy, Trade, and Investment

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Multilateral Cooperation
- Strategic and Defence Partnerships

Introduction:

India and the **United Kingdom** have unveiled a long-term strategic partnership roadmap, **India-UK Vision 2035**, aimed at deepening their cooperation across critical sectors. Replacing the **Roadmap 2030**, this document outlines a comprehensive framework for collaboration in **business, research, innovation, science and technology, and knowledge**. The Vision 2035 aims to create a **BRISK partnership**, focusing on **Business, Research, Innovation, Science, Technology, and Knowledge**, with a target to enhance bilateral relations in key areas such as **trade, defence, climate action, education, and multilateral cooperation**.

Pillars of Cooperation in Vision 2035:

1. **Trade and Economic Growth:**
 - The **India-UK Comprehensive Economic and Trade Agreement (CETA)**, signed as part of this vision, is expected to **double bilateral trade** by 2030. The agreement will facilitate **tariff reductions**, better **market access**, and strengthen economic cooperation.
 - The countries are also committed to working towards a **Bilateral Investment Treaty (BIT)**, which will encourage **greater UK investment** in India's rapidly growing economy, particularly in the **manufacturing, technology, and infrastructure sectors**.
2. **Technology and Innovation:**
 - The **UK-India Research & Innovation Corridor** will be established to boost **collaborative research and technological innovation** between the two countries. The focus will be on **cutting-edge areas** such as **artificial intelligence (AI), digital technologies, and renewable energy**.
 - **Technology transfer and joint innovation initiatives** will play a crucial role in driving **economic growth and job creation** in both countries, particularly in sectors like **fintech, healthcare, and manufacturing**.
3. **Defence and Security:**
 - A major highlight of the Vision 2035 is the **co-development of advanced technologies** such as the **Jet Engine Advanced Core Technologies (JEACT)** and **electric propulsion** systems, which will enhance the **defence capabilities** of both nations.
 - The **Indo-Pacific and Indian Ocean Region** will remain key areas of **strategic convergence**, with the UK and India working together to promote **regional stability, security, and maritime cooperation**.
4. **Climate and Clean Energy:**
 - **India and the UK** will collaborate on the development of **energy storage technologies, grid transformation**, and the expansion of **offshore wind energy**. The focus will be on **sustainable energy solutions**, which will help both nations meet their **climate goals** and transition to **low-carbon economies**.

- This partnership aligns with global efforts to combat **climate change** and promote **clean energy technologies**.

5. Education and People-to-People Ties:

- One of the key goals under Vision 2035 is to **strengthen educational ties** by establishing **UK university campuses** in India. This will promote **cross-cultural exchanges, academic partnerships**, and create opportunities for **Indian students** to gain access to **global educational resources**.
- People-to-people ties will be further nurtured through **educational exchanges, joint research programs**, and **collaboration in skills development**.

6. Multilateral Cooperation:

- Both India and the UK are committed to **joint advocacy** for the **reform of international organizations** such as the **United Nations Security Council (UNSC)**, **World Trade Organization (WTO)**, **World Health Organization (WHO)**, **International Monetary Fund (IMF)**, and the **World Bank**.
- The aim is to create a more **inclusive and equitable international system** that reflects the **changing global dynamics** and addresses global challenges more effectively.

India-UK Relations: Key Facts and Statistics:

1. Trade and Investment:

- India's total **bilateral trade** with the UK stands at **£39.7 billion**, with **Indian exports** reaching **£23.1 billion**. This **trade surplus** signifies the strong commercial ties between the two nations.
- The UK is the **6th largest source of FDI** for India, contributing significantly to sectors such as **technology, automotive, and financial services**.

2. Institutional Mechanisms:

- The **Joint Economic and Trade Committee (JETCO)** handles matters related to **trade and investment**, facilitating smoother bilateral transactions.
- The **Economic and Financial Dialogue** steers **cooperation** in **finance and macroeconomic policies**, ensuring that both countries align their economic policies for mutual benefit.

3. Defence Cooperation:

- **Joint Defence Exercises** have been a regular feature of India-UK relations. Notable exercises include:
 - **Exercise Konkan 2023** (Navy)
 - **Exercise Cobra Warrior 2023** (Air Force)
 - **Exercise Ajeya Warrior 2023** (Army)
- These exercises promote **strategic cooperation**, enhance **defence capabilities**, and strengthen **military-to-military ties** between India and the UK.

Conclusion:

The **India-UK Vision 2035** represents a forward-looking and strategic framework that aims to deepen the bilateral relationship between the two countries. By focusing on key sectors such as **trade, innovation, defence, climate action, and education**, the vision paves the way for a robust partnership that addresses both **national interests** and **global challenges**. With a shared commitment to **multilateralism** and **economic growth**, the India-UK relationship is poised to set new benchmarks for **global cooperation** and **sustainable development**.

Mains Questions for UPSC:

1. **Discuss the key pillars of the India-UK Vision 2035 and explain how the partnership will impact trade, defence, and climate cooperation between the two countries.**
2. **Evaluate the potential benefits of establishing UK university campuses in India under the India-UK Vision 2035. How will this enhance educational and cultural ties?**
3. **Analyze the role of multilateral cooperation in the India-UK Vision 2035, particularly with regard to reforms in the UNSC, WTO, WHO, IMF, and World Bank.**
4. **Examine the strategic importance of India-UK defence cooperation, particularly the joint exercises and the co-development of advanced defence technologies under Vision 2035.**
5. **How will the India-UK Vision 2035 contribute to both nations' climate goals? Discuss the potential outcomes of collaboration in clean energy, grid transformation, and offshore wind energy.**

INDIA-UK RELATIONS: KEY FACTS AND STATISTICS



TRADE AND INVESTMENT

- Bilateral trade: £39.7 billion
- Indian exports ↑ 23.1 billion
- 6th largest source of FDI in India



INSTITUTIONAL MECHANISMS

- Joint Economic and Trade Committee
- Economic and Financial Dialogue



DEFENCE COOPERATION

- Joint defence exercises:
- Exercise Konkan 2023 (Navy)
- Exercise Cobra Warrior 2023 (Air Force)
- Exercise Ajeya Warrior 2023 (Army)



Supreme Court Ruling on India-UAE DTAA Permanent Establishment

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Bilateral Agreements
- International Taxation and Economic Agreements

✓ GS Paper II – International Relations

- India's Economic Diplomacy and International Agreements

Introduction:

The **Supreme Court of India** has recently ruled that **exclusive possession** is not a requirement for a **Permanent Establishment (PE)** under the **India-UAE Double Taxation Avoidance Agreement (DTAA)**. Even **temporary or shared use** of a location can qualify as a **PE**, which has important implications for **cross-border taxation** between India and the UAE. This ruling clarifies the interpretation of **PE** under the **India-UAE DTAA**, highlighting how businesses and individuals may be taxed when they have a **presence** in both countries.

About Double Taxation Avoidance Agreement (DTAA):

1. Definition:

- A **Double Taxation Avoidance Agreement (DTAA)** is an international treaty between two or more countries designed to **prevent the same income from being taxed** in both jurisdictions.
- The primary aim of a DTAA is to avoid **double taxation**, ensuring that taxpayers are not taxed on the same income in both the **source country** and the **residence country**.

2. Importance of DTAA:

- **Tax Relief:** DTAA provides mechanisms such as **tax credits**, **tax exemptions**, and **deductions** to help prevent the **excessive tax burden** on individuals and entities engaged in cross-border business.
- **NRIs and PIOs:** The agreement ensures that **Non-Resident Indians (NRIs)**, **Persons of Indian Origin (PIOs)**, and **Overseas Citizens of India (OCIs)** do not face undue **international tax burdens** or **cash outflows**.
- **Encourages Investment:** By reducing the risk of double taxation, DTAAAs encourage **foreign investment** and promote economic cooperation between countries.

3. India's DTAA Network:

- India has signed **94 DTAAAs** with various countries including **Albania, Armenia, Australia, Austria**, and others. These agreements aim to promote cross-border economic activity and provide clarity on tax obligations.

Supreme Court Ruling on Permanent Establishment under India-UAE DTAA:

1. What is a Permanent Establishment (PE)?

- A **Permanent Establishment (PE)** refers to a fixed place of business where a foreign enterprise can carry out its business activities in another country. If a PE exists, the foreign enterprise becomes subject to tax in the host country on the income derived from the business activities carried out through that PE.
- **Key factors for determining PE** include factors like the **duration of stay**, **nature of the activities**, and the **degree of control** the foreign enterprise exercises over the location.

2. Supreme Court's Ruling:

- In this case, the **Supreme Court of India** held that **exclusive possession** of a location is not a mandatory condition for a **PE** under the **India-UAE DTAA**.
- The ruling clarified that even **temporary or shared use** of a location by a business could be enough to establish a **PE** if the business is engaged in significant activities at the location, even if it does not have full **exclusive possession**.
- This **expands the scope** of what constitutes a **PE**, meaning that companies or individuals with a **temporary or shared presence** in India or the UAE may be subject to **taxation** under the respective DTAA provisions.

3. Implications of the Ruling:

- The judgment impacts **multinational corporations (MNCs)** and **businesses** operating in both India and the UAE. It suggests that a **temporary presence** in either country could trigger tax liabilities if the activities conducted through that presence meet the criteria for a **PE**.
- This ruling will affect **tax planning strategies**, especially for entities relying on **short-term contracts**, **temporary offices**, or **shared workspaces** in both countries.

Significance of DTAA for Businesses and Individuals:

1. Avoidance of Double Taxation:

- DTAAAs help **avoid the risk of double taxation**, where individuals or businesses are taxed twice on the same income—once in the source country and again in the country of residence.

- This is particularly relevant for **multinational corporations** with operations in multiple countries, as it allows them to reduce their **overall tax burden**.

2. Clarity on Taxation of Income:

- The DTAAs provide a **clear framework** for determining how income should be taxed, especially for **cross-border transactions** involving services, business profits, and royalties.
- This clarity reduces the potential for **tax disputes** and **litigation**, as businesses and individuals know their **tax obligations** in both countries.

3. Investment and Economic Cooperation:

- By providing **tax relief**, DTAAs encourage **foreign direct investment (FDI)** and strengthen **economic ties** between countries.
- Countries with a **strong network of DTAAs** tend to be **attractive destinations** for international businesses, as these treaties reduce **taxation-related risks** and provide a stable **legal environment** for cross-border investments.

Conclusion:

The **Supreme Court's ruling** on the interpretation of **Permanent Establishment (PE)** under the **India-UAE DTAAs** clarifies the criteria for taxation of foreign entities with a **temporary or shared presence** in either country. This decision impacts multinational businesses operating across borders and underscores the growing complexity of **cross-border taxation**. DTAAs, such as the one between India and the UAE, remain critical for promoting **international trade, investment, and economic cooperation**, while ensuring fairness and transparency in the tax obligations of individuals and businesses.

Mains Questions for UPSC:

1. Explain the concept of Permanent Establishment (PE) under international tax law. Discuss the significance of the Supreme Court's ruling on PE under the India-UAE Double Taxation Avoidance Agreement.
2. Evaluate the role of Double Taxation Avoidance Agreements (DTAAs) in promoting cross-border trade and investment. How does the India-UAE DTAAs benefit both countries?
3. What are the implications of the Supreme Court's ruling on PE for multinational corporations operating in India? How does this ruling impact tax planning strategies?
4. Discuss the advantages and challenges of having a network of Double Taxation Avoidance Agreements (DTAAs) for countries. How does this network contribute to global economic integration?
5. Analyze the importance of Double Taxation Avoidance Agreements (DTAAs) in reducing international tax burdens for Non-Resident Indians (NRIs) and Overseas Citizens of India (OCIs).

Democratic Republic of the Congo: Geopolitical Overview

❖ Syllabus Mapping:

✓ GS Paper II – International Relations

- India's Diplomatic Relations
- International Conflict Resolution and Peacebuilding



✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Geopolitics and Regional Dynamics

Introduction:

The **Democratic Republic of the Congo (DRC)**, located in **Central Africa**, is home to vast natural resources and strategic geopolitical significance. Recently, the DRC government and the **M23 rebel group** signed a **Declaration of Principles** in Doha, mediated by **Qatar**, to work towards **peace** in the **North Kivu, South Kivu, and Ituri** regions, which are deeply affected by conflict. This agreement is part of the broader **Congo River Alliance** aimed at achieving stability in the region. Despite the progress made through these diplomatic efforts, the country continues to face significant **political instability, conflicts**, and challenges linked to its **natural resources**.

Political Features of DRC:

1. Location:

- The **Democratic Republic of the Congo (DRC)** is a country in **Central Africa**, situated at the crossroads of several African regions. It is geographically strategic, bordering multiple countries, which positions it as a critical player in **African geopolitics**.

2. Bordering Nations:

- **Angola**
- **Republic of the Congo**
- **Central African Republic**
- **South Sudan**
- **Uganda**

- **Rwanda**
- **Burundi**
- **Tanzania**
- **Zambia**

The DRC's central location in Africa places it at the heart of **regional conflicts** and **diplomatic challenges** due to its shared borders with **10 countries**.

3. Bordering Water Bodies:

- The **Atlantic Ocean** to the west provides the DRC with a **narrow coastline**, which is significant for maritime trade and logistics.
- The country's rich network of rivers, including the **Congo River**, plays a vital role in both transportation and the economy.

4. Conflict Region:

- The DRC faces ongoing **conflicts** in its **North Kivu**, **South Kivu**, and **Ituri** regions, which have been **hotbeds of rebel activity**, particularly involving groups like **M23**. These areas are marked by instability due to ethnic tensions, competition for resources, and historical grievances.

Geographical Features of DRC:

1. Major Rivers:

- The **Congo River**, the second-longest river in Africa, flows through the heart of the country. It has a basin that crosses the **Equator twice**, making it a key feature of both the **hydrology** and **economy** of the region.
- The Congo River basin is crucial for **transportation**, **agriculture**, and **energy generation**.

2. Important Plateaus:

- The **Katanga Plateau**, located in the southeast, is an economically important region due to its **mineral wealth**, including vast deposits of **cobalt**, **copper**, and other minerals.

3. Notable Lakes:

- **Lake Tanganyika**, **Lake Albert**, **Lake Edward**, and **Lake Kivu** are significant not only for their **geological** and **ecological importance** but also for their role in the **economy** and **regional trade**.
- **Lake Tanganyika** is the second-largest freshwater lake in the world by volume.

4. Volcanoes:

- The **Virunga Mountains**, home to the **active volcano Mount Nyiragongo**, are an important geographical feature. These volcanoes are closely monitored due to the risks they pose to nearby populations, including the city of **Goma** in **North Kivu**.

5. Natural Regions:

- The **Congo Basin** is the world's **second-largest tropical rainforest**, providing a critical habitat for **biodiversity** and playing a significant role in the **global climate system**. It is vital for **carbon sequestration** and is a key ecological region for conservation efforts.
- The **savanna** regions to the southeast contrast with the dense **rainforests** in the central and northern parts, offering diverse ecosystems and natural resources.

Economic Significance:

1. Cobalt Production:

- The DRC is home to approximately **three-fourths of the world's cobalt reserves**. This makes the country a **critical supplier** for industries related to **electric vehicles**, **smartphones**, and **battery storage technologies**, which depend heavily on cobalt as a key component.

2. Mineral Wealth:

- In addition to cobalt, the DRC is rich in **copper**, **diamonds**, **gold**, and other minerals. These resources have the potential to significantly contribute to the **country's economic development**, but **conflict** and **mismanagement** often hinder the realization of this potential.

3. Challenges:

- The DRC faces significant **governance issues**, including **corruption**, **poor infrastructure**, and **human rights abuses**. Despite its immense **natural wealth**, these challenges have led to **economic stagnation** and **poverty** for large segments of the population.

Conclusion:

The **Democratic Republic of the Congo** is a country of **immense geopolitical and economic significance** due to its **strategic location**, **natural resources**, and **ecological wealth**. However, the country faces ongoing challenges related to **conflict**, **governance**, and **economic instability**. The **Congo River Alliance** and other **peace initiatives**, such as the **Doha Declaration** between the DRC government and M23 rebels, represent a crucial effort towards **regional stability**. The DRC's future, particularly in terms of **regional integration**, **economic development**, and **mineral resource management**, will depend on addressing these critical challenges while leveraging its **geostrategic advantages** and **natural resources**.

Mains Questions for UPSC:

1. Discuss the geopolitical significance of the Democratic Republic of the Congo (DRC) in Central Africa. How does its strategic location impact regional and global affairs?
2. Examine the role of natural resources, particularly cobalt, in shaping the economic and political dynamics of the Democratic Republic of the Congo. How can the country leverage these resources for sustainable development?
3. Evaluate the challenges faced by the DRC in its efforts towards peace and regional stability. How effective are international peace initiatives such as the Congo River Alliance in addressing these issues?

4. Analyze the environmental and economic importance of the Congo Basin in the context of global climate change. What steps should be taken to preserve this vital ecosystem?
5. How can the DRC overcome its governance and infrastructure challenges to unlock the full potential of its mineral wealth and achieve sustainable economic growth?

CYBERSECURITY & DEFENCE

DRDO Conducts Flight Trials of UAV Launched Precision Guided Missile (ULPGM)-V3

Syllabus Mapping:

GS Paper III – Science and Technology

- Developments in Defense Technology and Innovations
- Role of DRDO in Enhancing India's Defense Capabilities

Introduction:

The Defence Research and Development Organisation (DRDO) has successfully conducted flight trials of the Advanced Unmanned Aerial Vehicle (UAV) Launched Precision Guided Missile (ULPGM)-V3. This marks a significant milestone in India's defense technology, enhancing the country's ability to carry out precision strikes in plain and high-altitude areas. The ULPGM-V3 represents a crucial step in improving the capabilities of UAVs for modern warfare, offering high accuracy, flexibility, and advanced targeting options for Indian defense forces.

About ULPGM-V3:

1. **Development:**
 - The ULPGM-V3 has been developed by the Defence Research and Development Organisation (DRDO), a key player in India's defense research and innovation sector. The missile is a part of India's ongoing efforts to enhance the precision strike capabilities of its defense forces, particularly in **unmanned** systems.
2. **High-Definition Dual-Channel Seeker:**
 - One of the key features of the ULPGM-V3 is its **high-definition dual-channel seeker**. This seeker enables the missile to lock on to and strike a **wide variety of targets**, ensuring **high accuracy** even in challenging environments. The dual-channel seeker improves the missile's **targeting and guidance** systems, making it a versatile asset for **modern warfare**.
3. **Significance of ULPGM-V3:**
 - **Multi-Terrain Compatibility:** The ULPGM-V3 can be deployed in both **plain and high-altitude areas**, making it versatile for a **wide range of operational conditions**. This capability is especially important in regions like **Jammu & Kashmir, Sikkim, and Ladakh**, where India faces strategic challenges at higher altitudes.
 - **Day-and-Night Capability:** The missile is designed to be effective in both **day and night operations**, allowing for **round-the-clock strikes**. This feature enhances its operational flexibility and ensures that the missile can be deployed in any **combat scenario**.
 - **Two-Way Data Link:** The ULPGM-V3 is equipped with a **two-way data link**, which allows for **post-launch updates** to the missile's **target/aim-point**, providing **greater flexibility and precision** in dynamic combat situations. This feature allows the missile to adjust its path during flight, ensuring **greater accuracy and better target acquisition**.

Significance and Implications for India's Defense Strategy:

1. **Enhanced Precision Strikes:**
 - The ULPGM-V3 greatly enhances India's capability for **precision strikes** in both **conventional warfare** and **counter-terrorism operations**. By incorporating **advanced targeting systems**, India can now carry out **high-precision strikes** with minimal collateral damage, particularly in **sensitive regions**.
2. **Flexibility in Operations:**
 - The ability to fire the ULPGM-V3 in **high-altitude areas** provides a significant **strategic advantage**. India's border regions, including the **Himalayas**, have complex **terrain challenges**, and the missile's flexibility in such regions makes it a valuable asset in any conflict scenario, particularly with **China and Pakistan**.
3. **Technological Advancements in UAVs:**
 - The **UAV-based launch system** represents a shift towards **unmanned systems** in modern warfare, reducing the risk to human life while enhancing operational efficiency. The integration of advanced **targeting systems** with **UAVs** will likely lead to more **autonomous** and **stealthy** operations, adding a layer of **strategic depth** to India's defense capabilities.
4. **Support for India's Defense Modernization:**

- The successful flight trials of the **ULPGM-V3** underscore **India's progress in indigenous defense technologies**. This missile is part of India's broader defense modernization program, which aims to enhance the country's **self-reliance** in defense technology and reduce dependency on foreign arms suppliers.

Challenges and Future Prospects:

1. Integration with UAVs:

- While the **ULPGM-V3** is an important step in modernizing India's defense arsenal, its integration with **existing UAVs** will be crucial for its operational success. Ensuring that **UAVs** can effectively launch and guide the missile in all types of **combat scenarios** will require continuous development and testing.

2. Further Development of UAV Technology:

- The success of the **ULPGM-V3** demonstrates the potential of **UAVs** in modern warfare. Continued research in **UAV technologies** and **precision-guided missiles** will be essential for India to maintain a technological edge over potential adversaries in the region.

3. Strategic Deployment:

- The **deployment** of such missiles should be part of a **larger strategy** that includes both **defensive** and **offensive capabilities**. As the missile system is designed for **high-altitude** and **multi-terrain environments**, it must be strategically deployed in areas of **vital importance**, such as the **Indo-China border** and **Pakistan's western front**.

Conclusion:

The successful flight trials of the **UAV Launched Precision Guided Missile (ULPGM)-V3** mark a **significant milestone** in **India's defense capabilities**, enhancing its ability to carry out **high-precision strikes** across diverse terrains. With advanced features like **dual-channel seekers**, **two-way data links**, and **day-and-night operational capabilities**, the missile system holds the potential to revolutionize **India's defense strategy**, particularly in sensitive regions. Moving forward, the integration of such advanced technologies with India's **UAVs** will play a critical role in shaping the future of **autonomous warfare**.

Mains Questions for UPSC:

1. Discuss the significance of the UAV Launched Precision Guided Missile (ULPGM)-V3 in India's defense strategy. How does it enhance India's capability for precision strikes in diverse terrains?
2. Examine the role of unmanned systems in modern warfare. What advantages do UAV-launched missiles, like the ULPGM-V3, offer over traditional missile systems?
3. What challenges are involved in the integration of precision-guided missile systems with UAVs? How can India overcome these challenges to enhance its defense capabilities?
4. Analyze the impact of the successful development of the ULPGM-V3 on India's defense self-reliance. How does it align with India's broader defense modernization goals?
5. Evaluate the strategic importance of the ULPGM-V3 in enhancing India's military preparedness in high-altitude and border regions. How can this technology be deployed effectively in such areas?

IQRA
Wisdom leads to success

ECONOMY

Parliamentary Report on Income Tax Bill, 2025

Syllabus Mapping:

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

- Government Policies and Reforms
- Taxation Policies and Administration

GS Paper III – Economic Development

- Taxation and Economic Reforms
- Business and Startup Ecosystem

Introduction:

The **Parliamentary Select Committee** has presented its report on the **Income Tax Bill, 2025**, which aims to modernize India's tax code. The Bill seeks to **replace the Income Tax Act of 1961**, introducing provisions that emphasize **fairness, transparency, and reduced disputes**. The committee's recommendations highlight the need for simplifying and updating India's **taxation framework**, particularly focusing on the digital economy, business support, and streamlining procedures.

Key Recommendations of the Committee:

1. Upholding Powers of Tax Officials:

- The committee **upheld the powers** of tax officials under the new bill, which include provisions for **accessing private information**, such as **social media accounts** and **private emails**, during **search and seizure operations**.
- This provision aims to improve the enforcement of tax laws but has raised concerns regarding **privacy** and **data protection**.

2. Updating Definitions:

- The committee recommended updating critical definitions to align with current realities and business structures:
 - **Capital asset:** Revised definition to better reflect contemporary economic conditions.
 - **Infrastructure capital company:** Adjustments to account for changes in infrastructure development models.
 - **Micro and small enterprises:** Updating criteria to keep pace with evolving business landscapes and inflation.

3. Business and Startup Support:

- The bill introduces **clearer rules for research and development (R&D) deductions**, which will benefit innovation-driven businesses.
- **Tax breaks** for companies involved in **biodegradable waste handling** have been proposed to promote **eco-friendly businesses**.
- The definitions of "**parent company**" and "**status**" in tax appeals have been clarified to enhance **transparency** and reduce confusion in tax matters involving corporate structures.

About the Income-Tax Bill, 2025:

1. Modernizing the Tax Code:

- The **Income Tax Bill, 2025** aims to **replace the Income Tax Act of 1961**, which has become outdated and increasingly complex due to numerous amendments and addendums over the years.
- The Bill's primary objectives are to **simplify** the language of the tax code and **remove redundant provisions** that have accumulated over the years.

2. Key Provisions:

- **Reduction in Volume:** The new Bill removes **283 sections** and **24 chapters** from the existing **1961 Act**, reducing its size and complexity.
- **Language Simplification:** The Bill introduces the term "**tax year**" in place of the old terminology such as "**financial year**" and "**assessment year**", streamlining the language to make it more understandable for taxpayers.
- **Virtual Digital Assets:** The Bill defines "**virtual digital assets**" and "**electronic mode**" for the first time, establishing a framework for their **taxation**.
- **No Major Tax Policy Changes:** While the Bill modernizes the tax code, there are **no significant changes in tax rates**, ensuring **predictability** for taxpayers. This is particularly important for businesses and individuals planning their finances.
- **Consolidation of Amendments:** The Bill consolidates all the previous amendments made to the **1961 Act** into a coherent framework, eliminating inconsistencies and redundant provisions.

3. Taxation of Digital Assets:

- The Bill's inclusion of **virtual digital assets** recognizes the growing role of the **digital economy** and ensures that digital currencies, cryptocurrencies, and other assets are taxed appropriately, reflecting the evolving nature of modern finance.

Significance and Impact:

1. Simplification and Transparency:

- One of the key goals of the Income Tax Bill, 2025, is to **simplify the language** and processes involved in **taxation**, making it easier for **individuals, businesses, and corporations** to comply with tax obligations.
- The Bill also aims to **reduce disputes** by providing **clearer guidelines** for tax deductions, appeals, and other procedures.

2. Support for Innovation and Business:

- The Bill's provisions for **R&D tax deductions** and **tax breaks for eco-friendly businesses** demonstrate the government's focus on encouraging **innovation** and supporting businesses involved in **sustainability**.
- Startups and small enterprises** stand to benefit from the updates in definitions and tax breaks, helping them thrive in a competitive and dynamic market.

3. Digital Economy Adaptation:

- The recognition of **virtual digital assets** under the Bill signifies India's proactive approach towards **regulating the digital economy**, setting the stage for **clearer tax regulations** on **cryptocurrencies** and **blockchain technologies**.

Conclusion:

The **Income Tax Bill, 2025** represents a major step forward in modernizing India's tax system. By simplifying language, updating definitions, and addressing emerging sectors like **virtual digital assets**, the Bill seeks to create a more **transparent, fair, and efficient tax environment**. While there are no major changes in tax rates, the provisions for **business support** and **digital economy regulation** demonstrate the government's focus on **innovation, sustainability, and economic growth**. The report by the **Parliamentary Select Committee** has paved the way for a tax code that is better suited to meet the challenges of the 21st century.

Mains Questions for UPSC:

- Discuss the key provisions of the Income Tax Bill, 2025, and evaluate its impact on simplifying the tax system in India.
- How does the Income Tax Bill, 2025 address the taxation of virtual digital assets, and what does this signify for India's digital economy?
- Examine the recommendations made by the Parliamentary Select Committee on the Income Tax Bill, 2025. How do these recommendations aim to promote fairness and transparency in India's tax system?
- What role do clearer tax deduction rules and tax breaks for biodegradable waste handling businesses play in supporting innovation and sustainability in India?
- Analyze the significance of the Income Tax Bill, 2025 in the context of India's evolving business and startup ecosystem. How does it aim to support startups and small businesses?

India Achieves 20% Ethanol Blending in Petrol

❖ Syllabus Mapping:

✓ GS Paper III – Economic Development

- Renewable Energy and Sustainable Development
- Biofuels and Environmental Sustainability

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Government Policies and Initiatives
- Environmental Policies and Their Impact



Introduction:

India has achieved a significant milestone by reaching **20% ethanol blending in petrol, five years ahead of schedule**. This achievement is part of the **Ethanol Blended Petrol (EBP) Programme**, which was initially targeted for completion by **2030** under the **National Policy on Biofuels (2018)**. However, with concerted efforts and various policy reforms, the country has met this goal by **2025**, playing a crucial role in reducing its dependence on imported fossil fuels, cutting **carbon emissions**, and boosting **farmers' income**.

About Ethanol and Its Role in the EBP Programme:

1. What is Ethanol?

- Ethanol (C₂H₅OH), also known as **ethyl alcohol**, is a **renewable fuel** produced from **biomass** materials such as **sugarcane, maize, wheat**, and other crops with high starch content.
- Ethanol is naturally produced through the **fermentation of sugars by yeasts** or via **petrochemical processes** like **ethylene hydration**.

2. Ethanol in Petrol:

- Ethanol Blended Petrol (EBP)** is a mixture of **ethanol** and **petrol**. The **EBP Programme** was launched in **2003** with the aim of increasing the **blend percentage** of ethanol in petrol to reduce **dependence on imported oil** and promote **renewable energy** sources.
- Ethanol blending** helps in reducing **carbon emissions** from vehicles, contributing to **cleaner air** and environmental sustainability.

Ethanol Blended Petrol (EBP) Programme:

1. Genesis of the Programme:

- Launched in 2003, the programme aimed to gradually blend **ethanol** with **petrol** to reduce dependence on **imported crude oil**, support **farmers**, and reduce **greenhouse gas emissions**.
- The **National Policy on Biofuels (2018)**, and its amendments in 2022, advanced the **target of 20% ethanol blending** from 2030 to 2025-26.

2. Key Policy Changes:

- The policy permits the use of **surplus food grains**, such as **damaged grains, rotten potatoes**, and **unfit food items**, for ethanol production. This not only supports **farmers** but also contributes to **food security** by ensuring fair prices during surplus phases.
- The policy also emphasizes **diversifying feedstocks** for ethanol production, including **sugarcane juice, sugar beet**, and **cassava**, in order to ensure **sustainability** and **efficiency** in the program.

Achievements of the EBP Programme:

1. Surge in Ethanol Production:

- Ethanol production** has surged from **38 crore litres** in **2014** to **660 crore litres** in **2025**, reflecting the growing capacity and efficiency of the ethanol production infrastructure.

2. Economic Impact:

- Forex Savings**: India saved approximately **₹1.36 lakh crore** in **foreign exchange** by reducing the import of fossil fuels.
- Farmers' Income**: The program has **paid approximately ₹1.2 lakh crore** to farmers for ethanol production, providing them with a **steady income** during surplus phases.

3. Environmental Benefits:

- The blending of **ethanol** with petrol has led to a reduction of approximately **700 lakh tonnes** of **CO₂ emissions**, making a substantial contribution to India's **climate action** goals.

Measures Taken to Boost the EBP Programme:

1. Interest Subvention Scheme (2018):

- The government introduced the **Interest Subvention Scheme** to **boost ethanol production capacity** in India, making it financially attractive for companies to invest in infrastructure for large-scale ethanol production.

2. GST Reduction (2018):

- The **GST on ethanol** was reduced from **18% to 5%** to encourage ethanol production and use, making the fuel more affordable and accessible to consumers and the ethanol industry.

3. New Feedstocks for Ethanol Production (2019):

- New sources like **sugar syrup** and **sugar** were introduced for ethanol production, offering **fixed remunerative prices** for producers, thus ensuring **sustainability** and **incentives** for expanding ethanol production.

4. Amendment to the IDR Act (2016):

- The **Industries (Development and Regulation) Act** was amended to clarify the roles of the **Central and State governments** in ensuring the **continuous supply of ethanol** for blending with petrol.

5. Approval of National Biofuels Coordination Committee (NBCC) (2020):

- The government also approved the **NBCC** to explore the use of **maize** as an additional feedstock for **ethanol production**, enhancing the feedstock diversity and reducing reliance on sugarcane.

Conclusion:

India's achievement of **20% ethanol blending** in petrol, **five years ahead of schedule**, is a monumental step towards **reducing dependency on imported fossil fuels**, **enhancing environmental sustainability**, and **supporting farmers**. The **Ethanol Blended Petrol (EBP) Programme** has not only contributed to India's energy security but has also shown significant **economic and environmental benefits**. Continued policy support, including **favorable pricing, interest subvention, and tax incentives**, will ensure that India remains on track to meet its **biofuel and renewable energy goals**.

Mains Questions for UPSC:

- Discuss the key achievements of the Ethanol Blended Petrol (EBP) Programme in India. How does this program contribute to India's energy security and environmental sustainability?
- Examine the economic and environmental impact of the ethanol blending initiative in India. How can the policy be further strengthened to meet future energy and climate goals?
- Analyze the role of ethanol blending in reducing India's dependency on imported crude oil. What are the key challenges and opportunities associated with scaling up ethanol production in India?
- Evaluate the significance of the National Policy on Biofuels in promoting sustainable energy solutions in India. What impact has it had on farmers' income and India's energy landscape?
- How can India balance the need for biofuels like ethanol with food security concerns, especially in times of surplus food grain production? Discuss the strategies to achieve this balance.

RBI Proposes Financial Conditions Index (FCI) to Track Market Trends

📌 Syllabus Mapping:

✓ GS Paper III – Economic Development

- Financial Markets and Indicators
- Government and RBI Initiatives in Economic Monitoring

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Role of Financial Institutions in Economic Regulation
- Regulatory Mechanisms in Financial Markets

Introduction:

A recent study by the **Reserve Bank of India (RBI)** has proposed the construction of a **Financial Conditions Index (FCI)** for India. The FCI aims to **track market trends** with **daily frequency**, providing a **comprehensive snapshot** of the **overall financial conditions** in the country. This index will serve as a key tool for policymakers and financial institutions to **assess the tightness or easiness** of financial markets and help in making informed decisions regarding economic policies, interest rates, and market regulations.

About the Financial Conditions Index (FCI):

1. Definition and Purpose:

- The **Financial Conditions Index (FCI)** is designed to measure the **degree of tight or easy financial market conditions** in comparison to its **historical average** since 2012. The FCI will provide a **dynamic, real-time measure** of financial conditions in India, enabling policymakers to understand **market sentiment** and **financial stress** more effectively.
- The **FCI** will be based on a **composite of key financial indicators**, reflecting the overall state of the financial system and helping to assess whether **credit conditions** are supportive of economic growth or restrictive.

2. Market Segments Represented:

- The FCI will be constructed using indicators from **five major market segments**, each contributing a different aspect of financial conditions:
 - **Money Market:** Measures liquidity and short-term borrowing costs in the market.
 - **Government Securities (G-Sec) Market:** Tracks the **interest rate environment** and government borrowing conditions.
 - **Corporate Bond Market:** Reflects **corporate borrowing conditions** and credit spreads.
 - **Forex Market:** Represents the **exchange rate stability** and foreign currency availability.
 - **Equity Market:** Provides insights into **stock market volatility**, investor sentiment, and capital market access.

3. How It Works:

- The FCI will aggregate data from these five financial market segments into a **single composite index**.
- A **higher positive value** of the FCI indicates **tighter financial conditions**, which suggests that it is more difficult or expensive for borrowers to access credit.
- Conversely, a **lower or negative value** of the FCI signals **easier financial conditions**, indicating that credit is more accessible and borrowing costs are lower.

4. Use and Utility of FCI:

- The **FCI will provide daily readings** and help track financial market conditions in real-time. By monitoring this index, policymakers can make more **timely decisions** related to **monetary policy**, such as **interest rate adjustments** or **liquidity management**.
- It also provides insight into the **financial stability** of the economy, alerting authorities to any **emerging stress** in financial markets, which can act as an early warning system.
- **Financial institutions** and **investors** can also use the FCI to gauge the **overall health of the financial system** and adjust their investment strategies or lending decisions accordingly.

Implications and Benefits of FCI:

1. Better Monitoring of Financial System Health:

- The FCI allows for **real-time monitoring** of financial conditions, which will help in identifying **stress points** within the economy. For example, if the FCI suggests **tightening** conditions, it could indicate rising borrowing costs or liquidity issues, which could negatively impact **economic growth**.
- It also helps **track economic trends**, such as the effect of **monetary policy changes**, **global market fluctuations**, or **domestic financial shocks**.

2. Policy Guidance for RBI and Government:

- The FCI can be used by the **Reserve Bank of India (RBI)** and the **government** to **adjust policies** to manage **financial stability** and **economic growth**. For example, if the index indicates **tighter conditions**, it could signal the need for **easing monetary policy** or providing additional **liquidity support**.
- The index could be particularly useful in **times of economic uncertainty** or **global financial shocks**, where quick adjustments may be required to maintain **market stability**.

3. Impact on Business and Investment Decision-Making:

- Businesses, investors, and financial institutions can use the FCI as a tool to gauge market sentiment and investment risk. A sudden tightening of financial conditions can signal difficulties in credit access or an increase in borrowing costs, affecting corporate investment and consumer spending.
- Conversely, easier financial conditions might signal growth opportunities and lower capital costs, encouraging investment in infrastructure or business expansion.

4. Informed Policymaking:

- The index will aid in data-driven decision-making by policymakers, helping them tailor fiscal and monetary responses that are more responsive to real-time economic conditions.
- It will also be a useful tool in international discussions on India's economic policy and financial stability, aligning India's economic policies with global financial standards.

Conclusion:

The **Financial Conditions Index (FCI)**, as proposed by the **RBI**, is a groundbreaking initiative that will enhance **real-time monitoring of India's financial markets**. By integrating key indicators from various sectors, the FCI will help track financial conditions, provide early warnings of financial stress, and guide **policy adjustments** to ensure economic stability. The FCI will serve as a crucial tool for the **Indian government, RBI, financial institutions, and investors** to navigate the complexities of India's evolving financial landscape and **safeguard economic growth**.

Mains Questions for UPSC:

- Discuss the proposed Financial Conditions Index (FCI) by the RBI and explain its significance in tracking financial market conditions. How will it aid in policymaking?
- Analyze the role of the Financial Conditions Index in ensuring financial stability in India. What challenges might arise in its implementation and how can they be addressed?
- Examine the impact of financial market conditions on economic growth and inflation. How can tools like the FCI help policymakers manage these impacts effectively?
- Evaluate the benefits and limitations of tracking real-time financial conditions using indices like the FCI. How can such data improve financial regulation and decision-making in India?
- How does the Financial Conditions Index contribute to strengthening India's financial market? Discuss its potential role in crisis management and economic forecasting.

Power Market Coupling to Begin with Day-Ahead Market in 2026

📌 Syllabus Mapping:

✓ GS Paper III – Economic Development

- Energy Sector and Policy
- Electricity Markets and Pricing

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Regulatory Frameworks and Implementation
- Energy Regulation in India

Introduction:

The **Central Electricity Regulatory Commission (CERC)** has announced that **Power Market Coupling** will begin in **India** with the **Day-Ahead Market (DAM)** starting from **January 2026**. The implementation of **market coupling** will help in achieving **price convergence** between different electricity markets, providing a more **efficient** and **transparent trading mechanism**. The Day-Ahead Market (DAM) is a crucial part of India's electricity trading landscape, allowing market participants to **buy and sell electricity** for the next day.

About Power Market Coupling:

1. Definition and Concept:

- Power market coupling** refers to the process of aggregating **orders** from **all power exchanges** and matching them to determine a **uniform market-clearing price**.
- This mechanism helps to optimize electricity prices across different regions or exchanges, contributing to **price convergence** and **efficient resource allocation** in the electricity market.
- Essentially, market coupling is designed to **integrate electricity markets** to improve **market efficiency** and **price transparency** across borders and different exchanges.

2. Market Coupling and Price Convergence:

- One of the primary objectives of market coupling is to achieve **price convergence** across different electricity markets. This means that electricity prices will tend to align across regions or exchanges, reducing disparities caused by **geographical bottlenecks** or **market inefficiencies**.

- It allows electricity to be traded more freely between regions, ensuring that the **supply and demand** dynamics are better balanced across the national grid.

3. Role of Day-Ahead Market (DAM):

- The **Day-Ahead Market (DAM)** is a physical electricity trading market where participants can **buy and sell electricity** for the **next day**. The market clears based on **supply and demand** dynamics, ensuring that electricity is traded at **market-driven prices**.
- DAM will be the **first market** to implement **market coupling** in India, allowing a more **efficient** pricing mechanism for electricity. Participants can place their **bids** and the market will clear based on matching buy and sell orders.

4. Implementation Timeline:

- The introduction of **market coupling** will begin with the **DAM** starting from **January 2026**. This phased approach will give market participants and stakeholders the time needed to adapt to the new pricing mechanisms and systems.

Benefits of Power Market Coupling:

1. Improved Market Efficiency:

- **Market coupling** will improve the efficiency of electricity markets by ensuring that electricity is traded at the **right price** according to **supply and demand** across different regions. This removes **arbitrary price distortions** and reduces inefficiencies caused by fragmented market structures.

2. Price Convergence Across Regions:

- One of the main advantages of power market coupling is its ability to bring about **price convergence** between regions, ensuring that electricity prices are **harmonized**. This will reduce **price fluctuations** that are often caused by the **isolation of regional electricity markets**.
- Price convergence benefits consumers by providing **more stable pricing**, while producers will be able to optimize their production based on a unified market clearing price.

3. Enhanced Cross-Border Electricity Trading:

- Market coupling allows **greater integration** of India's electricity markets with those of **neighboring countries**, fostering more efficient **cross-border electricity trading**.
- This will help in better utilizing **regional generation resources**, improve grid **stability**, and reduce **electricity shortages** in certain areas while ensuring **reliable supply** across the country.

4. Increased Market Liquidity:

- The implementation of **market coupling** is expected to increase **market liquidity** by facilitating **greater participation** in the electricity market. The aggregation of buy and sell orders from multiple exchanges enhances market depth and provides participants with **greater flexibility** in terms of **trading opportunities**.

5. Facilitating Investment in Clean Energy:

- With the integration of electricity markets, there will be better access to **clean energy** sources, as **renewable energy** is highly **intermittent**. Coupled markets will enable a more **flexible response** to the variability of renewable energy production, helping to balance supply and demand in a way that encourages further investment in **green energy**.

Challenges and Considerations:

1. Infrastructure and Technological Requirements:

- Market coupling requires robust **infrastructure** and **technology** for efficient **data exchange**, market clearing, and **system coordination**. The implementation of such systems in a large, complex market like India's will require **significant investments** in both **hardware** and **software** systems to ensure smooth functioning.

2. Integration of Regional Markets:

- While market coupling is expected to benefit the entire country, the integration of **regional markets** into a single, unified pricing mechanism could pose **challenges**. For example, some regions may have excess capacity, while others may face **shortages**, leading to potential issues with balancing **grid stability**.

3. Regulatory Coordination:

- Since power market coupling involves multiple stakeholders, including **central** and **state regulators**, there will need to be strong **coordination** between various entities to ensure that the mechanisms work in **harmony** across all regions and exchanges.

4. Impact on Consumers and Producers:

- While market coupling will provide **price stability**, there may be **adjustments** to the current price levels in some regions. Some consumers may face **higher electricity costs**, while producers in regions with **lower costs** might face **marginal price reductions**.

Conclusion:

The introduction of **power market coupling** starting with the **Day-Ahead Market (DAM)** in January 2026 represents a crucial step towards **modernizing India's electricity market**. It is set to enhance **market efficiency**, **price transparency**, and **regional integration**, while also promoting **sustainable energy** solutions. However, the success of the initiative will depend on effective **technological infrastructure**, **regulatory coordination**, and careful management of the **regional market dynamics**.

Mains Questions for UPSC:

1. Explain the concept of Power Market Coupling and discuss its potential benefits for India's electricity market. How will the introduction of market coupling help in price convergence?
2. What challenges can India face in implementing Power Market Coupling for its Day-Ahead Market? Discuss how these challenges can be addressed through technological and regulatory measures.

3. Evaluate the role of Power Market Coupling in improving cross-border electricity trading. How will it contribute to India's energy security and promote renewable energy integration?
4. Discuss the significance of the Day-Ahead Market (DAM) in India's power sector. How will the coupling of DAM with other exchanges help improve efficiency and stability in the electricity market?
5. Analyze the impact of Power Market Coupling on consumers and producers in the electricity market. What measures should be taken to ensure that the implementation is fair and equitable for all stakeholders?

NCP-2025: Empowering India's Cooperative Sector

Syllabus Mapping:

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

- Government Policies and Initiatives
- Role of Cooperatives in Rural Development

GS Paper III – Economic Development

- Economic and Sectoral Policies
- Rural Development and Empowerment

Introduction:

The **Union Minister of Cooperation** unveiled the **National Cooperation Policy (NCP)-2025**, marking a pivotal step in strengthening the **cooperative sector** in India. This is the **second policy** for cooperatives after the **2002 policy**, with a renewed vision of '**Sahkar Se Samriddhi**' (Prosperity through Cooperation). The NCP-2025 aims to empower **cooperative units** by promoting professional, transparent, and technology-enabled practices, thus enhancing their contribution to **India's development**.

Key Features of NCP-2025:

1. **Vision and Mission:**
 - The **vision** of NCP-2025 is to establish **cooperation** as an essential instrument for national development, benefiting **future generations**.
 - The **mission** includes creating **professional, transparent, technology-driven**, and **self-reliant** cooperative units that are accountable and successful in various sectors of the economy.
2. **Objectives of NCP-2025:**
 - **Establishment of Cooperative Units:**
 - The policy aims to ensure that **at least one cooperative unit** is established in every **village** to foster **local economic development**.
 - The target is to create **five Model Cooperative Villages** in every **tehsil** across India, setting examples for effective cooperation and rural prosperity.
 - **Tripling the Cooperative Sector's Contribution:**
 - A major goal of NCP-2025 is to **triple the cooperative sector's contribution** to India's **GDP by 2034**. This will enhance the role of cooperatives in driving economic growth, particularly in **rural and semi-urban areas**.
 - **Expansion of Cooperative Societies:**
 - The policy seeks to **increase the number of cooperative societies by 30%** from the current 8.3 lakh, expanding cooperatives in various sectors like **agriculture, housing, credit, and services**.
 - **Diversification into New Sectors:**
 - Cooperatives will be encouraged to expand into new and emerging sectors such as **tourism, insurance, taxi services, and green energy**, which will not only boost the sector's growth but also provide **sustainable employment opportunities**.
3. **Legal Reforms:**
 - To keep the policy **relevant and adaptive** to future needs, **legal reforms** will be conducted every **10 years**, ensuring that the cooperative sector remains **dynamic and responsive** to evolving economic and social challenges.
4. **Cluster and Monitoring System:**
 - The policy includes the establishment of a **cluster and monitoring system** to assess the performance of cooperative units, ensure transparency, and promote continuous improvement in their operations.

Significance of the Cooperative Sector in India:

1. **Rural Development:**
 - The cooperative sector plays a crucial role in **rural development**, particularly in the **operation and maintenance of rural water supply systems**. It helps improve **infrastructure and livelihoods** in rural India, thereby supporting **sustainable development**.
2. **Farmer's Development:**
 - Cooperatives are critical in supporting **farmers' welfare** through initiatives like the **Pradhan Mantri Kisan Samriddhi Kendras (PMKSK)**, which aim to improve **farmers' incomes** and provide them with better access to agricultural resources, technology, and **market linkages**.
3. **Social and Economic Welfare:**

- Cooperatives are also involved in **women's welfare**, providing platforms for **financial inclusion, credit access, and social security**. They operate as **Janaushadhi Kendras** (for affordable medicines), **Common Service Centres (CSCs)** (for digital services), and contribute to **housing and credit services**.
- Convergence with PM-KUSUM** (for solar power projects) and other government schemes will help integrate cooperatives with national initiatives aimed at improving **sustainability and energy access**.

Conclusion:

The **National Cooperation Policy (NCP)-2025** envisions a **dynamic future** for the **cooperative sector**, positioning it as a key driver of economic growth, especially in **rural areas**. By focusing on **universal coverage, sectoral diversification, job creation, and sustainability**, the policy aims to establish cooperatives as **professional, self-reliant, and inclusive units**. It seeks to create a more **resilient agricultural and service sector**, improve the **livelihoods of rural communities**, and contribute significantly to **India's economic development** in the coming decades.

Mains Questions for UPSC:

- Discuss the objectives of the National Cooperation Policy (NCP)-2025 and its potential to transform India's cooperative sector. How does it aim to contribute to rural development and economic growth?
- Examine the role of cooperatives in promoting rural welfare and sustainable development. How does NCP-2025 plan to expand the sector into new and emerging areas?
- Analyze the challenges that may arise in implementing the National Cooperation Policy (NCP)-2025, particularly in terms of legal reforms, financial support, and institutional capacity.
- How does the National Cooperation Policy (NCP)-2025 address the needs of the agricultural sector, particularly in terms of improving farmers' incomes and providing access to credit, market linkages, and technology?
- Evaluate the potential impact of cooperative sector reforms under NCP-2025 on India's GDP growth, employment creation, and environmental sustainability. What measures should be taken to ensure the success of this policy?

NIPFP Study: GST Regime Progressive for Income Distribution

❖ Syllabus Mapping:

✓ GS Paper III – Economic Development

- Economic Reforms and Taxation Policies
- Goods and Services Tax (GST) in India

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Policy Evaluation and Impact Assessment

Introduction:

A recent study by the **National Institute of Public Finance and Policy (NIPFP)** has concluded that the **Goods and Services Tax (GST)** regime in India is **progressive**, with higher-income groups bearing a larger share of the tax burden. The study highlights the importance of **understanding the distributional effects** of GST, as consumption taxes in India make up a significant portion of total tax revenue. The NIPFP findings challenge some of the concerns raised by previous reports, such as the 2023 **Oxfam report**, which had suggested that the poor bear a disproportionate burden of GST.

Key Findings from the NIPFP Study:

- GST is Progressive:**
 - The study finds that **GST is progressive**, meaning **higher-income groups** pay a **larger share** of the tax, which contributes to **reducing post-tax inequality**.
 - This progressive nature of GST is crucial as it helps in achieving a **more equitable distribution of tax burden** across different income groups.
- GST Burden by Income Group:**
 - The study analyzed the tax burden across **rural** and **urban** areas, breaking it down for different income brackets:
 - Rural Areas:**
 - The **bottom 50%** of income earners in rural areas contribute **31%** of the GST burden.
 - The **top 20%** of income earners contribute **37%** of the GST burden.
 - Urban Areas:**
 - The **bottom 50%** in urban areas pay **29%** of the GST burden.
 - The **top 20%** in urban areas pay **41%** of the GST burden.
 - These findings contradict the **Oxfam 2023 report**, which claimed that the **poor** paid **two-thirds** of the GST burden.

- Impact of Multiple Slabs:**
 - The **multiple tax slabs** in the GST system help to make it **fairer**. Essential goods and services, such as **healthcare, education, and food**, are either taxed at **lower rates** or **exempted** entirely.

- This structure ensures that the burden on **basic necessities** remains low, benefiting lower-income groups.
- 4. **Concerns Over GST Rate Increases:**
 - The NIPFP study warns that **increasing the tax rate** on items in the **5-12% GST slab** could disproportionately affect lower-income groups, as they tend to consume more basic goods within this range.
 - Therefore, any policy changes, such as shifting goods from **12% to 18%**, could **raise the tax burden on lower consumption classes**.
- 5. **Proposals for Simplification:**
 - The study suggests that simplifying the **GST rate structure** could help **reduce disparities** in the tax burden. A proposal is being considered to **remove the 12% GST rate** by shifting items to either the **5% slab** or the **18% slab**.
 - Policymakers need to carefully assess the **distributional effects** of such changes, ensuring that they do not unduly affect the **lower-income groups**.

Policy Implications and Recommendations:

1. **Focus on Progressive Taxation:**
 - The study emphasizes the need for **progressive taxation** through GST, where **wealthier sections** of society contribute a larger proportion of the tax burden, helping to **reduce income inequality**.
 - **Targeted tax relief** for low-income groups can be incorporated by maintaining or reducing rates on essential goods.
2. **Careful Consideration of Tax Rate Adjustments:**
 - Any changes to the **GST rate structure**, such as moving items from the **12% slab** to the **5% slab** or **18% slab**, should take into account the **consumption patterns** of various income groups.
 - Policymakers should ensure that such changes do not inadvertently increase the burden on those who are already struggling with basic living costs.
3. **Improving Public Awareness:**
 - It is important for the government to ensure **greater transparency** and **awareness** regarding the progressive nature of GST, especially as it pertains to **rural populations** and the **poorer sections** of society.
 - Public campaigns can help explain the **benefits of the multiple slabs** and **exemptions** for essential goods.
4. **Evaluation of GST Impact on the Economy:**
 - The NIPFP's findings call for continued **evaluation** of the **economic impact of GST** on different sectors of society. Regular monitoring will allow for **timely adjustments** to ensure that the tax system remains equitable and efficient.

Conclusion:

The NIPFP study provides a comprehensive analysis of the **GST regime** in India, showing that it is relatively **progressive**, with higher-income groups contributing more to the overall tax burden. The study also underscores the importance of maintaining a **fair tax structure**, with multiple slabs for different goods, to ensure that **basic necessities** remain affordable for the lower-income groups. Moving forward, careful policy adjustments and simplification of the GST rate structure could further enhance its efficiency while minimizing the tax burden on vulnerable populations.

Mains Questions for UPSC:

1. Discuss the findings of the NIPFP study on GST in India. How does the study argue that GST is a progressive tax? What are the implications of the findings for future tax reforms in India?
2. Evaluate the impact of the Goods and Services Tax (GST) on different income groups in India. How does the multiple-slabs system make GST fairer, particularly for essential goods?
3. What are the challenges in simplifying the GST rate structure? Discuss the potential effects of such changes on lower-income groups.
4. How does the current GST regime contribute to reducing post-tax inequality in India? What measures can the government take to make GST more equitable for all income groups?
5. Analyze the concerns raised by the NIPFP study regarding the increase in GST rates on the 5-12% slab. How can policymakers address these concerns without exacerbating the tax burden on lower-income groups?

Power Market Coupling to Launch in India with Day-Ahead Market in 2026

❖ Syllabus Mapping:

✓ GS Paper III – Economic Development

- Energy Sector and Policy
- Electricity Markets and Pricing

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Regulatory Frameworks and Implementation
- Energy Regulation in India

Introduction:

The **Central Electricity Regulatory Commission (CERC)** has announced that **Power Market Coupling** will begin in **India** with the **Day-Ahead Market (DAM)** starting from **January 2026**. The implementation of **market coupling** will help in achieving **price convergence** between different electricity markets, providing a more **efficient** and **transparent** trading mechanism. The Day-Ahead Market (DAM) is a crucial part of India's electricity trading landscape, allowing market participants to **buy and sell electricity** for the next day.

About Power Market Coupling:

1. Definition and Concept:

- **Power market coupling** refers to the process of aggregating **orders** from **all power exchanges** and matching them to determine a **uniform market-clearing price**.
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- Essentially, market coupling is designed to **integrate electricity markets** to improve **market efficiency** and **price transparency** across borders and different exchanges.

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- One of the primary objectives of market coupling is to achieve **price convergence** across different electricity markets. This means that electricity prices will tend to align across regions or exchanges, reducing disparities caused by **geographical bottlenecks** or **market inefficiencies**.
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- The **Day-Ahead Market (DAM)** is a physical electricity trading market where participants can **buy and sell electricity** for the **next day**. The market clears based on **supply and demand** dynamics, ensuring that electricity is traded at **market-driven prices**.
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4. Implementation Timeline:

- The introduction of **market coupling** will begin with the **DAM** starting from **January 2026**. This phased approach will give market participants and stakeholders the time needed to adapt to the new pricing mechanisms and systems.

Benefits of Power Market Coupling:

1. Improved Market Efficiency:

- **Market coupling** will improve the efficiency of electricity markets by ensuring that electricity is traded at the **right price** according to **supply and demand** across different regions. This removes **arbitrary price distortions** and reduces inefficiencies caused by fragmented market structures.

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- One of the main advantages of power market coupling is its ability to bring about **price convergence** between regions, ensuring that electricity prices are **harmonized**. This will reduce **price fluctuations** that are often caused by the **isolation of regional electricity markets**.
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- Market coupling allows **greater integration** of India's electricity markets with those of **neighboring countries**, fostering more efficient **cross-border electricity trading**.
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- With the integration of electricity markets, there will be better access to **clean energy** sources, as **renewable energy** is highly **intermittent**. Coupled markets will enable a more **flexible response** to the variability of renewable energy production, helping to balance supply and demand in a way that encourages further investment in **green energy**.

Challenges and Considerations:

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- Market coupling requires robust **infrastructure** and **technology** for efficient **data exchange**, market clearing, and **system coordination**. The implementation of such systems in a large, complex market like India's will require **significant investments** in both **hardware** and **software** systems to ensure smooth functioning.

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- Since power market coupling involves multiple stakeholders, including **central** and **state regulators**, there will need to be strong **coordination** between various entities to ensure that the mechanisms work in **harmony** across all regions and exchanges.

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- While market coupling will provide **price stability**, there may be **adjustments** to the current price levels in some regions. Some consumers may face **higher electricity costs**, while producers in regions with **lower costs** might face **marginal price reductions**.

Conclusion:

The introduction of **power market coupling** starting with the **Day-Ahead Market (DAM)** in January 2026 represents a crucial step towards **modernizing India's electricity market**. It is set to enhance **market efficiency**, **price transparency**, and **regional integration**, while also promoting **sustainable energy** solutions. However, the success of the initiative will depend on effective **technological infrastructure**, **regulatory coordination**, and careful management of the **regional market dynamics**.

Mains Questions for UPSC:

- Explain the concept of Power Market Coupling and discuss its potential benefits for India's electricity market. How will the introduction of market coupling help in price convergence?
- What challenges can India face in implementing Power Market Coupling for its Day-Ahead Market? Discuss how these challenges can be addressed through technological and regulatory measures.
- Evaluate the role of Power Market Coupling in improving cross-border electricity trading. How will it contribute to India's energy security and promote renewable energy integration?
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- Analyze the impact of Power Market Coupling on consumers and producers in the electricity market. What measures should be taken to ensure that the implementation is fair and equitable for all stakeholders?

AGRICULTURE

MOVCDNER Extension for Assam

❖ Syllabus Mapping:

✓ GS Paper III – Economic Development

- Agriculture and Rural Development
- Government Policies and Initiatives for Sustainable Agriculture

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Government Policies and Implementation Programs
- Regional Development and Environmental Sustainability

Introduction:

The **Mission Organic Value Chain Development for North Eastern Region (MOVCDNER)** has been extended for an additional year in **Assam**. Launched in **2015-16**, this initiative aims to leverage the **immense potential** of organic farming in the **North Eastern states of India**. The extension highlights the importance of organic agriculture in the region, focusing on developing a sustainable **organic value chain** that benefits both farmers and consumers.

About MOVCDNER:

1. Launch and Implementation:

- MOVCDNER** was launched in the **2015-16** fiscal year with the objective of promoting **organic farming** and establishing a **value chain** for organic products across the **North Eastern states** of India.
- The program is implemented in the states of **Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura**, with a focus on **sustainable agriculture** and **eco-friendly farming practices**.

2. Aim and Objectives:

- Main Aim:** To harness the **potential of organic farming** in the North East, a region known for its diverse agro-climatic conditions that are ideal for growing organic produce.
- Objective:** The core aim is to establish **certified organic production** in a **value chain mode**. This ensures that **organic growers** are directly connected to **consumers**, making the entire supply chain seamless and efficient.

- The program emphasizes **organic certification, marketing, and processing** of organic products, helping farmers meet the growing demand for certified organic produce.

3. Key Components of MOVCDNER:

- **Providing Organic Inputs:** The program ensures that **organic seeds** and other **inputs** are made available to farmers, enabling them to adopt organic farming practices without facing additional financial burdens.
- **Organic Certification:** One of the key goals of the program is to help farmers obtain **organic certification** for their produce, which opens up access to both domestic and international organic markets.
- **Infrastructure Support:** MOVCDNER focuses on building **infrastructure** for the collection, processing, and **marketing of organic products**, thus enhancing the supply chain and ensuring that organic produce reaches consumers efficiently.
- **Training and Capacity Building:** The program provides **training** to farmers and other stakeholders to enhance their knowledge about organic farming techniques, certification processes, and marketing strategies.

4. Coverage and Scope:

- The program covers the **entire value chain**, from **production** and **certification** to **marketing** and **distribution**, ensuring that farmers in the North Eastern states have access to all the resources they need to succeed in organic farming.
- It also focuses on creating **market linkages** and promoting **fair trade** by connecting farmers with buyers, both in India and globally.

Significance of MOVCDNER:

1. Boosting the North Eastern Economy:

- The program is crucial for enhancing the **economic development** of the North Eastern region. By promoting **organic farming**, the initiative supports the livelihoods of **local farmers**, helping them access new markets and earn higher incomes.
- The region's diverse climate is ideal for organic farming, and MOVCDNER seeks to tap into this potential to enhance the region's agricultural output.

2. Promoting Sustainable Agriculture:

- **Sustainability** is a key focus of the program. By promoting **organic farming**, MOVCDNER ensures that agricultural practices are environmentally friendly, reduce **chemical pesticide use**, and promote **soil health**.
- The shift towards organic farming can also help address environmental concerns related to conventional agricultural practices.

3. Empowering Local Farmers:

- The initiative provides the **necessary support** for farmers to transition to **organic farming** by providing **financial incentives, technical assistance, and market access**.
- This can improve farmers' **income levels** and make them more resilient to the fluctuating prices and pressures of conventional agriculture.

4. Enhancing Regional Connectivity:

- The program also aims to improve **regional connectivity** by integrating **remote North Eastern states** into the national and global organic market. By enhancing **infrastructure** for collecting and processing organic produce, the region's agricultural products can gain access to wider markets.

Extension of MOVCDNER in Assam:

1. Reason for Extension:

- The extension of the **MOVCDNER** for another year in **Assam** is indicative of the success of the program in **fostering organic farming** in the state. Assam, with its favorable climatic conditions and agricultural diversity, has the potential to become a leader in **organic production**.
- The extension allows for the **expansion of the program** and ensures that more farmers in Assam can benefit from the **training, resources, and market linkages** provided by MOVCDNER.

2. Focus Areas for Assam:

- The extension will focus on **increasing organic production**, improving **certification processes**, and strengthening the **organic supply chain** in Assam.
- It will also emphasize building **capacity** among farmers to meet the growing domestic and international demand for **organic tea, rice, vegetables**, and other organic produce from the region.

Conclusion:

The **Mission Organic Value Chain Development for North Eastern Region (MOVCDNER)** has been a crucial initiative in promoting **sustainable agriculture** and **organic farming** in India, especially in the North Eastern states. By providing **holistic support**—from **organic seeds** and **certification** to **market access**—the program helps enhance the **economic resilience** of farmers while ensuring that India plays a leading role in **global organic markets**. The extension of MOVCDNER for Assam ensures that the state continues to **develop its organic sector**, contributing to both **environmental sustainability** and **economic growth**.

Mains Questions for UPSC:

1. Discuss the key objectives and features of the Mission Organic Value Chain Development for North Eastern Region (MOVCDNER). How has it contributed to the promotion of organic farming in North Eastern India?
2. Evaluate the significance of MOVCDNER in terms of environmental sustainability and economic development in the North Eastern states of India. What challenges does the program face in its implementation?
3. What are the benefits of organic farming in India's North Eastern region? How does MOVCDNER aim to harness the potential of organic farming in these states?

4. Analyze the role of government policies like MOVCDNER in addressing the challenges faced by farmers in the North Eastern region. How can such initiatives help achieve India's agricultural and environmental goals?
5. The extension of MOVCDNER for Assam marks a continued focus on organic farming. Discuss the potential impact of this extension on Assam's agricultural sector.

SC Issues Notice on Presidential Reference under Article 143

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Constitutional Provisions and Amendments
- The Role of the President and Governors in the Indian Political System

✓ GS Paper II – Social Justice

- Dispute Resolution Mechanisms in Constitutional Framework
- Relationship between Union and State Governments

Introduction:

The **Supreme Court of India** has issued notices to both the **Union and State Governments** on a **Presidential Reference** under **Article 143** of the **Indian Constitution**. The reference concerns the **powers of the President** and the **Governor** in dealing with **state bills**. This legal matter seeks clarity on the constitutional roles and authority of these key figures in the context of **state legislation**, particularly when it comes to **approving or withholding** state bills.

About Article 143 of the Indian Constitution:

1. Article 143(1) – Advisory Jurisdiction of the Supreme Court:

- Article 143 of the Indian Constitution empowers the President of India to refer any **question of law or fact of public importance** to the **Supreme Court** for an **advisory opinion**.
- This provision allows the President to seek **guidance** from the Supreme Court when there is uncertainty or ambiguity over important constitutional or legal matters.

2. Procedure for Presidential Reference:

- A **Presidential Reference** can only be made after the **Union Council of Ministers' advice**. The **President** makes such a reference in accordance with the advice provided by the **Council of Ministers**, ensuring that the decision aligns with the government's stance.
- The Supreme Court provides its **opinion** based on the reference, which is intended to guide the President in making an informed decision on the matter in question.

3. Non-Binding Opinion:

- It is important to note that the **opinion of the Supreme Court** given in response to a Presidential Reference is **advisory** in nature. While the Court's opinion is sought for clarity, it is not **binding** on the **President** or the **Union Government**.
- This allows for a consultative approach in resolving constitutional matters but leaves the final decision-making to the President or the Union Government.

Context of the Current Presidential Reference:

1. Issue at Hand – Powers of the President and Governor:

- The current Presidential Reference pertains to the **powers of the President** and the **Governor** concerning **state bills** passed by state legislatures.
- The key question raised is about the **extent of power** vested in the **President and Governor** when it comes to **withholding assent** to bills passed by the state legislatures or seeking **recommendations** before they are returned.

2. Governor's Role in the Legislative Process:

- The **Governor** is the **constitutional head** of the state, and his role in **approving or withholding assent** to state bills is of significant importance. The **Governor's discretion** in this regard has been a subject of **debate**, particularly when it comes to **disputes between the state and the Union**.
- The Governor can, in some instances, ask for **reconsideration** or **recommend amendments** to a bill before it becomes law, raising concerns about the **balance of power** between the Union and State governments, as well as the **autonomy** of states.

3. President's Role in Assent and Withholding Assent:

- Similarly, the **President** plays a vital role in giving **assent** to state bills under **Article 200** of the Constitution. However, in certain cases, the President may **withhold assent** to a bill and **ask for reconsideration**. The **President's discretion** in this matter and the **advice of the Union Cabinet** can lead to delays or complications in the legislative process.

Significance of the Supreme Court's Opinion:

1. **Clarification of Powers:**
 - o The Supreme Court's advisory opinion will provide much-needed **clarity** on the roles and **discretionary powers** of the President and Governor in the context of **state legislation**. The Court's opinion could also set a precedent for handling similar **constitutional disputes** in the future.
2. **Impact on State Autonomy:**
 - o The decision may have a profound **impact on the autonomy of state governments**. It could either **reinforce or limit** the powers of state governments in terms of legislative authority and **ensuring timely implementation of state laws**.
 - o The balance between **state autonomy** and **central oversight** is a crucial aspect of India's federal structure, and this advisory opinion will provide insights into the evolving nature of this balance.
3. **Resolving Legal Ambiguities:**
 - o The question of **whether the President and Governor can withhold assent to state bills** and the **extent of their discretion** has been a matter of legal ambiguity. The Supreme Court's opinion will help resolve any confusion and provide **legal certainty** in such matters.

Conclusion:

The **Presidential Reference under Article 143** has significant implications for the relationship between **state governments** and the **Union Government**, particularly in matters relating to **legislation**. The **Supreme Court's advisory opinion** will shed light on the constitutional roles of the **President** and the **Governor** in handling state bills, potentially clarifying the **discretionary powers** involved and ensuring a more **transparent and balanced** legislative process. The Court's decision will be crucial in maintaining the **federal balance** and **ensuring the proper functioning of India's democratic institutions**.

Mains Questions for UPSC:

1. **Discuss the role of the President and the Governor in the legislative process, particularly in the assent of state bills. How does Article 143 of the Indian Constitution facilitate resolution of constitutional disputes between the Union and State Governments?**
2. **Examine the significance of Presidential Reference under Article 143 in resolving legal uncertainties in the Indian Constitution. What are its implications for federal governance in India?**
3. **Analyze the balance of power between the Union and State governments in the context of legislative autonomy. How can the roles of the President and Governor influence this balance?**
4. **Evaluate the impact of the Supreme Court's advisory opinion on matters relating to state bills. How does it contribute to the federal structure of India?**
5. **What are the constitutional provisions that govern the withholding of assent to state bills by the President and Governor? Discuss the implications of these powers in the functioning of Indian federalism.**

CROPIC: Digital Innovation in Agricultural Insurance

❖ Syllabus Mapping:

✓ GS Paper III – Agriculture

- Technological Innovations in Agriculture
- Government Schemes for Agricultural Sustainability

✓ GS Paper II – Governance

- Government Initiatives and their Impact on Socio-Economic Development

Introduction:

The **CROPIC (Collection of Real-Time Observations & Photos of Crops)** initiative, launched by the **Ministry of Agriculture**, is a significant step towards leveraging **digital technologies** in the agricultural sector. A part of the **Pradhan Mantri Fasal Bima Yojana (PMFBY)**, this mobile application aims to **enhance financial resilience** for farmers by integrating **AI-based photo analysis** into crop insurance processes. Through **geotagged photos** and **real-time observations**, the initiative aims to **improve the efficiency and transparency** of agricultural insurance assessments, particularly for farmers who are underinsured or face difficulties in proving crop damage.

About CROPIC (Collection of Real-Time Observations & Photos of Crops):

1. **Objective:**
 - o The primary objective of **CROPIC** is to provide a **digital platform** that helps in monitoring crop health throughout the **growing season**. By using **geotagged photographs** of crops, the initiative aims to collect accurate, real-time data on crop conditions to ensure that **farmers receive timely insurance compensation** under the **PMFBY scheme**.
2. **How It Works:**

- The **mobile app** allows farmers or field agents to capture **geotagged photos** of their crops at **regular intervals** (four to five times during the crop cycle). This enables the **real-time collection of data** about crop health and growth stages.
- The **AI-based cloud platform** analyzes the photos to **extract useful information** about the crops, such as their condition, growth, and potential signs of damage due to **pests, disease, or weather events**.
- The data collected is visualized on a **web-based dashboard**, which is accessible by **insurance providers, farmers, and government authorities** for real-time monitoring and decision-making.

3. Role in PMFBY (Pradhan Mantri Fasal Bima Yojana):

- **CROPIC** integrates with **PMFBY**, India's flagship crop insurance scheme, by providing a **transparent, data-driven system** to assess crop damage and insurance claims.
- Under **PMFBY**, farmers can receive **insurance compensation** for crop damage caused by natural calamities. However, assessing crop damage in a fair and accurate manner has traditionally been a **challenge**. **CROPIC** helps overcome this by providing **objective, photographic evidence** of the crop's health and damage, improving the **accuracy and fairness** of the claims process.

4. Key Features of CROPIC:

- **Geotagging:** Each photograph is **geotagged**, meaning the exact location where the photo is taken is recorded. This ensures that the data is **location-specific**, providing accurate information about the state of crops in different regions.
- **AI-Driven Photo Analysis:** The **AI-based platform** processes the photos, **extracting valuable insights** regarding crop health, growth patterns, and possible damage. This reduces the reliance on manual inspections and improves the efficiency of crop insurance.
- **Web-Based Dashboard:** The data collected through the app is presented on a **visual dashboard**, accessible by stakeholders involved in the crop insurance process, including **farmers, insurance companies, and government officials**. This helps in **real-time decision-making and claim settlement**.
- **Multiple Observations:** The app ensures that photographs are taken **multiple times** throughout the crop cycle, giving a **comprehensive view** of the crop's development and health.

5. Funding and Implementation:

- The **CROPIC initiative** is funded through the **Fund for Innovation and Technology (FIAT)** under **PMFBY**, ensuring that the program is financially supported to develop and scale.
- The **technology and app development** are aimed at increasing **efficiency, transparency, and accountability** within the **PMFBY framework**, and helping the government **modernize agricultural insurance** in India.

Impact of CROPIC:

1. Enhanced Accuracy in Crop Insurance:

- One of the main benefits of **CROPIC** is its ability to provide **objective evidence** of crop damage, reducing the chances of **disputes** between farmers and insurers. The use of **AI** to analyze photos ensures that the assessments are **consistent** and **data-driven**, leading to fairer compensation for farmers.

2. Improved Financial Resilience:

- By ensuring **timely payouts** for crop damage, **CROPIC** enhances the financial security of farmers. This helps them recover faster from **adverse weather conditions**, reducing the financial burden caused by crop losses.

3. Boost to Digital Agriculture:

- The **CROPIC app** exemplifies the growing role of **digital tools** in transforming the agricultural sector. It also **empowers farmers** by giving them access to advanced technologies, improving their **capacity** to assess and protect their crops.
- The initiative ties into the **Digital India** vision by enabling the use of **mobile apps** and **AI-driven analytics** for improving **agricultural practices** and outcomes.

4. Increased Efficiency in PMFBY:

- **CROPIC** streamlines the entire process of **crop insurance**, from **data collection** to **claim settlements**, improving the **efficiency and transparency** of the PMFBY system. It eliminates the need for **manual interventions** and ensures **faster, more accurate claim settlements**.

5. Support for Vulnerable Farmers:

- The **timely and transparent compensation** system enabled by **CROPIC** helps **vulnerable farmers**, particularly those in **remote or rural areas**, who often face challenges in accessing **insurance claims** due to **inaccurate assessments or delayed settlements**.

Conclusion:

The **CROPIC initiative** represents a crucial step in modernizing **agricultural insurance** in India, harnessing the power of **AI** and **geotagging** to improve the **accuracy, transparency, and speed** of crop damage assessments under the **PMFBY scheme**. By integrating **real-time data collection** with **AI-based analysis**, **CROPIC** enhances farmers' ability to navigate crop insurance processes, increasing their **financial resilience** and supporting **sustainable agriculture** in India.

Mains Questions for UPSC:

1. Discuss the role of **CROPIC** in transforming India's agricultural insurance sector. How does the integration of **AI** and **geotagging** improve the efficiency of **PMFBY**?
2. Examine the challenges faced by farmers in accessing crop insurance under schemes like **PMFBY**. How can digital innovations like **CROPIC** help address these challenges?
3. What are the potential benefits and limitations of using **AI-based platforms** for crop monitoring and insurance assessments in agriculture? How can the government further scale up such initiatives?
4. Critically assess the significance of **CROPIC** and similar digital innovations in the context of financial resilience for farmers. How does technology play a role in improving agricultural security?

Parliamentary Panel Recommends Measures for Organic Farming

📌 Syllabus Mapping:

✓ GS Paper III – Economic Development

- Agriculture and Agricultural Policies
- Climate Resilient and Sustainable Farming

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Government Initiatives in Agriculture
- Institutional Framework for Agriculture Development

Introduction:

The **Parliamentary Estimates Committee** of the **Ministry of Agriculture and Farmers Welfare** has tabled a report in the **Lok Sabha** that emphasizes the promotion of **natural and organic farming**. The report focuses on addressing **climate-resilient agricultural practices** through initiatives like the **Krishi Vigyan Kendras (KVKs)**. It highlights the significant barriers to the adoption of **natural farming**, particularly **financial security challenges, implementation gaps, and staff shortages**, which hinder the widespread adoption of these sustainable farming techniques.

Key Observations from the Parliamentary Estimates Committee Report:

1. Financial Security Barrier:

- One of the primary challenges identified in the report is the lack of **financial security** for farmers, which impedes their ability to transition to **natural and organic farming** methods. Farmers are often hesitant to adopt these methods due to initial investment costs and the lack of immediate returns, as compared to conventional farming practices.

2. Farmer Income Concerns:

- The committee also observed that **farmer income** remains a significant concern. Despite the long-term benefits of **climate-resilient agriculture**, farmers often face **low and uncertain incomes** when transitioning to **organic farming**. This issue is compounded by the absence of stable income sources during the **transition period**.

3. Implementation Gaps and Staff Shortages:

- The report highlighted the **implementation gaps** in **natural farming** programs, including the inadequate presence of **trained personnel** to provide necessary support and guidance to farmers.
- **Staff shortages** in the **Krishi Vigyan Kendras (KVKs)**, which are responsible for **providing training and extension services**, are undermining the **effectiveness** of government initiatives aimed at promoting sustainable and **organic farming practices**.

Recommendations for Promoting Natural and Organic Farming:

1. Address Financial Security:

- The committee recommends the need to establish **financial support mechanisms**, such as subsidies or **low-interest loans**, to help farmers **transition to organic farming**. This financial backing will make it easier for farmers to invest in organic inputs and techniques without bearing the financial burden upfront.

2. Enhance Farmer Income:

- The committee suggests creating **market linkages** and **value chain development** for organic products. By strengthening the market for **organic produce**, farmers will be able to receive better **prices** for their products, making organic farming more **economically viable**.
- Support should be extended through **branding and certification** of organic produce, helping farmers command a **premium price** for their products.

3. Improving Training and Extension Services:

- A key recommendation is the **strengthening of KVKs** with more **trained staff** to provide necessary support to farmers on **natural farming techniques**. This will involve **capacity building** of KVK staff, facilitating workshops and **training sessions** to help farmers make the transition.
- Additionally, the committee suggests **digitizing the training programs** and creating **online platforms** for wider access to information on organic farming.

4. Sustainability and Climate Resilience:

- The promotion of **climate-resilient agricultural practices** through organic farming will reduce dependency on chemical inputs and improve soil health. The report suggests that **agroecological practices** should be incorporated into mainstream farming to improve **biodiversity** and **sustainability**.

Conclusion:

The **Parliamentary Estimates Committee's** report underscores the importance of addressing financial, institutional, and technical barriers to promote **natural and organic farming** in India. By strengthening **financial security**, improving **farmer income**, and enhancing the capabilities of **Krishi Vigyan Kendras**, India can foster a more **sustainable and climate-resilient** agricultural sector. The adoption of **organic farming** practices will not only improve the health of the land but also enhance the economic stability of farmers, contributing to long-term agricultural sustainability.

Mains Questions for UPSC:

1. Discuss the challenges in promoting natural and organic farming in India as outlined in the Parliamentary Estimates Committee's report. What measures can be taken to address these challenges?
2. How can financial security be improved for farmers adopting natural farming practices? Discuss the role of government interventions in facilitating this transition.
3. Examine the role of Krishi Vigyan Kendras (KVKs) in promoting climate-resilient agriculture. What improvements can be made to enhance their effectiveness in supporting farmers?
4. What is the significance of enhancing farmer incomes in the transition to organic farming? How can market linkages and value chains be developed to support organic agriculture?
5. Analyze the impact of natural and organic farming on India's agricultural sustainability and climate resilience. How can these practices contribute to the country's overall environmental and economic goals?

SOCIETY AND SOCIAL JUSTICE

PM VIKAS Scheme: Empowering Minorities Through Skill Development

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Government Schemes and Policies
- Social Justice and Empowerment



✓ GS Paper II – Social Justice

- Welfare Schemes for Minorities
- Socio-Economic Development Initiatives

Introduction:

The **Pradhan Mantri Virasat Ka Samvardhan (PM VIKAS)** scheme is a significant **Central Sector Scheme** launched by the **Ministry of Minority Affairs**. The scheme aims to provide socio-economic empowerment to **six notified minority communities** in India, focusing on their **upliftment** through skill development, education, and cultural preservation. Recently, the **3rd Empowered Committee (EC) meeting** for PM VIKAS was convened to review the progress and implementation of the scheme. It merges the efforts of **five previous schemes**, streamlining and focusing them into one robust initiative for **minority welfare**.

About the PM VIKAS Scheme:

1. Type and Ministry:

- **Central Sector Scheme:** The PM VIKAS scheme is implemented by the **Ministry of Minority Affairs**, aiming to cater to the development of specific communities and improve their socio-economic standing through a combination of skill-building, education, and cultural enrichment.

2. Objective:

- The scheme aims to **uplift** and **empower** **six notified minority communities** through **education, vocational training**, and promoting their **heritage**. The scheme aims to foster **economic empowerment** and **social integration** by addressing gaps in skills, education, and income levels.
- It combines various initiatives to provide **sustained support** for marginalized sections of these communities.

3. Convergence of Previous Schemes:

- The PM VIKAS scheme brings together **five former schemes** to create a **comprehensive framework** for minority empowerment:
 - **Seekho Aur Kamao:** Skill development for the youth of minorities, providing training in various vocational sectors.
 - **Nai Manzil:** Education and skill development program for **non-formal education** dropouts from minority communities.
 - **Nai Roshni:** Leadership development program for **women from minority communities**, empowering them to take leadership roles in their communities.

PM VIKAS Scheme

TYPE AND MINISTRY



Central Sector Scheme by
Ministry of Minority Affairs

OBJECTIVE



To uplift and empower six notified minority communities through education, skill development, and heritage promotion

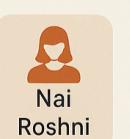
CONVERGENCE OF PREVIOUS SCHEMES



Seekho
Aur Kamao



Nai
Manzil



Nai
Roshni



USTTAD

TARGETED COMMUNITIES



Muslims



Christians



Sikhs



Buddhists



Jains

Zoroastrians
(Parsis)

- **USTTAD:** Aims to **preserve and promote traditional arts and crafts** among minority communities.
- **Hamari Dharohar:** Focuses on preserving the **cultural heritage** of minority communities, particularly in the areas of **art, culture, and craftsmanship**.

4. Targeted Communities:

- The PM VIKAS scheme focuses on the **upliftment of six notified minority communities**, which include:
 - **Muslims**
 - **Christians**
 - **Sikhs**
 - **Buddhists**
 - **Jains**
 - **Zoroastrians (Parsis)**

Key Features of the PM VIKAS Scheme:

1. Skill Development and Economic Empowerment:

- The scheme seeks to enhance the **vocational skills** of individuals from minority communities, preparing them for **employment** in various sectors, and promoting **self-employment** initiatives.
- It provides **training programs** in fields like **tailoring, carpentry, plumbing, computer literacy, handicrafts**, and other **skill-oriented courses**.

2. Educational Support:

- Through the **Nai Manzil** component, PM VIKAS focuses on bringing **dropout children** back to school and provides **non-formal education** to make them eligible for employment and higher education.
- The scheme also offers **scholarships, mentorship, and study materials** for better access to quality education for **minority students**.

3. Women Empowerment:

- Under the **Nai Roshni** program, PM VIKAS focuses on **empowering women** by developing **leadership skills**, providing training for **economic independence**, and raising awareness about **legal rights** and **social responsibilities**.
- It encourages **women from minority communities** to engage in **self-help groups (SHGs)**, which helps them achieve **financial independence**.

4. Preservation of Cultural Heritage:

- **Hamari Dharohar** aims at promoting the **cultural identity** of minorities by supporting their **traditional crafts, arts, and heritage**. This helps preserve India's rich **cultural diversity** while simultaneously enhancing their economic status through **craftsmanship and tourism**.
- The **USTTAD** initiative focuses on **skilling artisans** in traditional arts and crafts, enhancing their skills for the modern market, and ensuring that the rich cultural heritage of the minorities is **preserved and celebrated**.

5. Collaborative Effort for Sustainable Development:

- PM VIKAS encourages collaboration with **state governments, NGOs, community organizations, and local stakeholders** to ensure that the schemes are implemented efficiently and that the benefits reach the **targeted beneficiaries**.
- Monitoring and regular feedback are integral to improving the effectiveness of these interventions.

Benefits of the PM VIKAS Scheme:

1. Improved Livelihoods:

- By enhancing the **skills and education** of minority communities, the scheme aims to boost their **employment opportunities** and income potential. The combination of **education, skill training, and leadership development** creates a more empowered and economically independent population.

2. Gender Equality:

- Special emphasis is placed on **women's empowerment**, ensuring that they have access to the same opportunities as men, particularly through the **Nai Roshni** program. Empowering women also brings positive changes in **family dynamics, community health, and overall economic progress**.

3. Preservation of Heritage:

- The **Hamari Dharohar** and **USTTAD** schemes aim to preserve the **arts and crafts** of India's diverse minority communities, contributing to the nation's **cultural richness** while creating **economic opportunities** for artisans.

4. Strengthening National Integration:

- By focusing on **inclusive growth** and providing **equal opportunities** for **minority communities**, PM VIKAS fosters **social harmony** and **national integration**, which are essential for long-term peace and stability in a diverse nation like India.

Conclusion:

The **PM VIKAS scheme** is a comprehensive initiative aimed at the **holistic development** of India's **minority communities**. By converging several existing programs, the scheme offers **inclusive growth**, focusing on **education, skills development, empowerment of women**, and the **preservation of cultural heritage**. Through these initiatives, the scheme aims to create a more **equitable society**, where every individual has the opportunity to lead a **dignified and prosperous life**.

Mains Questions for UPSC:

1. Explain the objectives and key features of the Pradhan Mantri Virasat Ka Samvardhan (PM VIKAS) scheme. How does it aim to empower minority communities in India?
2. Evaluate the impact of PM VIKAS on the socio-economic development of the six notified minority communities. How does the scheme address the needs of women and youth in these communities?
3. Discuss the convergence of the five former schemes under PM VIKAS. How does this integration enhance the overall effectiveness of the initiative?
4. What role does the PM VIKAS scheme play in preserving the cultural heritage of minority communities in India? How does it contribute to economic empowerment?
5. Assess the importance of skill development and education in the socio-economic upliftment of minority communities. How does PM VIKAS promote these aspects?

Hatti Tribe and Traditional Polyandry System 'Jajda'

Syllabus Mapping:

GS Paper I - Geography

- Social and Cultural Geography
- Tribes and Tribal Communities in India

GS Paper II - Governance, Constitution, Polity, and International Relations

- Social Justice and Welfare Schemes for Tribes

Introduction:

The **Hatti Tribe**, located in the **Trans-Giri region** of **Himachal Pradesh (HP)** and **Uttarakhand**, practices a traditional **Polyandrous marriage system** known as '**Jajda**'. This system has recently gained attention due to its inclusion in local revenue laws under the term '**Jodidara**'. In a polyandrous marriage, a woman marries more than one man simultaneously. The practice is deeply rooted in the tribe's cultural and social norms, and has been followed for generations for various **social and economic reasons**.

About the Hatti Tribe:

1. Location and Community:

- The **Hatti Tribe** is primarily found in the **Trans-Giri region** of Himachal Pradesh and Uttarakhand, near the **Giri** and **Tons** rivers.
- The tribe is a **close-knit community**, which reflects in their social practices, familial structures, and traditional customs.

2. Traditional Occupation:

- The tribe is named after their traditional occupation of selling **homegrown produce**, **meat**, and other goods at small **markets** called **Haats**.
- These markets are vital for their **economic survival**, allowing them to trade goods within their community and with neighboring areas.

The Jajda System (Polyandry) Among the Hatti Tribe:

1. Polyandrous Marriage:

- **Polyandry** refers to a marriage system where a woman has more than one husband at the same time.
- In the case of the Hatti Tribe, this is known as '**Jajda**', which ensures the preservation of family land and resources by preventing land division among multiple heirs.

2. Reasons for Polyandry:

- **Ancestral Land Preservation**: One of the main reasons for the practice of polyandry in the Hatti Tribe is to ensure that **ancestral land** is not divided among several heirs. The system helps maintain the family's **landholding** intact across generations.
- **Brotherhood and Joint Family Structure**: The practice promotes a **stronger brotherhood** and **joint family living**. Multiple husbands often live together as one family, promoting cohesion and shared responsibilities.
- **Economic Considerations**: Polyandry also serves as a means to **consolidate resources**. A single woman marrying multiple men ensures that the family's economic interests remain united, thereby fostering collective responsibility and reducing familial conflict.

3. Revenue Laws Recognition:

- The practice of '**Jodidara**', which is recognized in the local revenue laws, acknowledges the polyandrous marriage system and its role in the **social structure** of the Hatti Tribe.

4. Cultural Significance:

- The **Jajda system** holds significant cultural value within the Hatti Tribe, as it has been practiced for centuries and remains an important part of their social identity.
- It reflects the **tribal approach** to land management, resource sharing, and family unity.

Social and Economic Implications:

1. Preservation of Land and Resources:

- By consolidating family land through polyandry, the Hatti tribe has avoided fragmentation, ensuring that **ancestral property** is passed down in a unified manner. This is especially important in **tribal communities** where land is a primary source of livelihood.

2. Promotion of Unity:

- Polyandry strengthens the **joint family system**, where multiple men, often brothers, live together under one roof. This promotes a sense of **brotherhood** and reduces the chances of familial disputes over inheritance.
- The practice ensures a **strong familial support system**, where each member shares responsibilities related to **agriculture, animal husbandry, and community welfare**.

3. Cultural Diversity and Acceptance:

- While polyandry is rare, the Hatti tribe's practice provides an interesting example of **cultural diversity** in India's social fabric. The **cultural acceptance** of this practice has been crucial in maintaining its continuity across generations.

Challenges and Modern Perspectives:

1. Changing Social Norms:

- As modernity and **urbanization** spread, there may be challenges to maintaining traditional practices like **polyandry**. Young members of the tribe might prefer **monogamous relationships** as they are influenced by broader national and global societal norms.

2. Legal and Social Recognition:

- The recognition of '**Jodidara**' in revenue laws could face challenges in the future, particularly with the evolving landscape of **personal law and women's rights**.
- Legal reforms may require adaptation to such traditional practices, particularly when viewed through the lens of **gender equality**.

Conclusion:

The **Jajda system** of the **Hatti Tribe** is a unique cultural practice that reflects the tribe's historical focus on **land preservation, economic unity, and social cohesion**. While it serves practical purposes within their community, it also provides insights into the diversity of **tribal practices** in India. As the tribe navigates modern challenges, such practices may evolve, but their legacy remains a testament to the complex relationship between **culture, family structure, and land management** in tribal India.

Mains Questions for UPSC:

1. Discuss the practice of polyandry among the Hatti tribe in Himachal Pradesh. How does this system reflect the tribe's social, economic, and cultural needs?
2. Examine the socio-economic reasons behind the practice of polyandry in tribal communities, with specific reference to the Hatti tribe in Himachal Pradesh. What are the benefits and challenges of such practices?
3. How do traditional practices like polyandry among the Hatti tribe contribute to the preservation of ancestral land and resources? Analyze its role in maintaining social cohesion within the community.
4. Evaluate the recognition of polyandry under local revenue laws in tribal areas like Himachal Pradesh. How does this reflect the intersection of traditional practices and modern governance?
5. Polyandry is a rare practice in India. Discuss the social and legal implications of such practices in contemporary India, particularly in relation to gender equality and women's rights.

Ministry Directs Blocking of 25 Obscene Websites

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Protection of Vulnerable Sections
- Laws Related to Freedom of Speech and Expression

✓ GS Paper II – Social Justice

- Issues related to Women, Children, and Gender Equality

Introduction:

In a significant move, the **Ministry of Information and Broadcasting** has directed intermediaries to **block 25 websites** that were hosting **obscene content**. This directive falls under the provisions of the **Information Technology Act, 2000 (IT Act)** and the **Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021**. These websites were found violating **Indian laws**, specifically concerning **obscenity**, and the government has acted to **curb the spread** of such harmful content online.

About the Laws Violated by the Websites:

- Section 67 and 67A of the IT Act, 2000:**
 - Section 67: Prohibits the **publishing or transmission** of obscene material in electronic form.
 - Section 67A: Specifically addresses the **transmission of sexually explicit content** and prescribes penalties for offenders, including imprisonment and fines.
- Section 294 of the Bharatiya Nyaya Sahita (BNS), 2023:**
 - This section criminalizes **obscenity in public** and includes penalties for **publicly displaying obscene materials**, which is particularly relevant for content shared on the internet.
- Section 4 of The Indecent Representation of Women (Prohibition) Act, 1986:**
 - This section prohibits the **indecent representation of women** in any form of **advertisement or publications** and is aimed at preventing the objectification of women.

What Constitutes Obscenity?

- Obscenity** refers to content that is **morally degrading, offensive, or disgusting** based on society's **accepted standards of decency and morality**.
- Obscene content includes, but is not limited to, **explicit sexual content, violent or abusive material**, and anything that violates societal norms of **good taste**.

Why is There a Need to Ban Obscene Content?

- Protection Under Article 19(2) of the Indian Constitution:**
 - Article 19(1)(a) guarantees the **freedom of speech and expression**. However, this right is subject to **reasonable restrictions** under Article 19(2), particularly when speech or expression **harms decency and morality**.
 - The state has the **right** to impose these restrictions in the interests of **social well-being** and to maintain **public order**.
- Case Law: Ranjit D. Udeshi v. State of Maharashtra:**
 - The **Supreme Court** in this landmark case upheld the conviction under **Section 292 of the IPC**, which deals with **obscenity** in printed publications.
 - The judgment reinforced that **obscenity** does not fall under the **protection of free speech**, emphasizing that content that **offends morality and decency** is not protected by **freedom of expression**.
- Protection of Women and Children:**
 - Obscene content** can have **devastating effects on children** and **women**. Early exposure to explicit material can distort children's understanding of **healthy relationships and gender roles**, leading to **objectification** of women and perpetuating **gender inequality**.
 - This content also **normalizes violence**, which may increase the risk of **gender-based violence and abuse**.
- Erosion of Cultural and Moral Values:**
 - Obscenity** threatens the **cultural and moral fabric** of society, which is why restricting such content is justified under **John Stuart Mill's Harm Principle**.
 - Mill's Harm Principle**, as articulated in his 1859 work '**On Liberty**', suggests that individual liberty can be limited when it causes **harm to others or degrades societal well-being**.
 - The proliferation of harmful content undermines **social harmony**, promotes **negative stereotypes**, and damages the **mental health** of vulnerable groups, especially women and children.

Government's Action and Future Directions:

- Strict Enforcement of IT Act:**
 - The government has shown its commitment to **curbing online obscenity** by directing intermediaries (such as **web hosting platforms, social media sites, and streaming services**) to comply with **existing laws** and remove unlawful content from their platforms.
 - The **Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021** empower the government to **take action** against websites and platforms that host or disseminate **obscene content**.
- Focus on Digital Safety and Regulation:**
 - This action aligns with the broader efforts to create a **safe and regulated digital space**. The government continues to promote **digital literacy and safety** to ensure that citizens are **protected from harmful online content**.
 - Additionally, stricter regulations and guidelines are likely to be implemented to curb the spread of illegal and harmful content across digital platforms.
- Collaborative Effort:**
 - The government is encouraging **collaboration** between law enforcement agencies, tech companies, and **civil society** to prevent the **spread of obscene content** online and create a more **secure online ecosystem**.

Conclusion:

The Ministry of Information and Broadcasting's decision to **block 25 websites** hosting **obscene content** is a proactive step towards ensuring a **safe, secure, and morally responsible digital environment** in India. By enforcing **legal frameworks** such as the **IT Act, 2000, BNS 2023**, and the **Indecent Representation of Women Act**, the government aims to protect **society's moral values**, especially the **well-being of women and children**.

children. The **restriction of obscene content** aligns with India's commitment to **human dignity** and **social order**, reinforcing the importance of reasonable limits on free speech in the interest of **public morality**.

Mains Questions for UPSC:

1. Discuss the rationale behind the government's action to block websites hosting obscene content. How do laws like the Information Technology Act, 2000, and the Indecent Representation of Women Act, 1986, protect society from online obscenity?
2. Evaluate the ethical implications of restricting obscene content under the framework of freedom of speech in India. How do restrictions on obscene content align with the principles of public morality and societal well-being?
3. What role do digital intermediaries play in preventing the spread of unlawful content? How should the government collaborate with them to ensure compliance with ethical standards in the digital space?
4. Critically analyze the impact of obscene content on the social fabric of India, especially with respect to the protection of women and children. How can the government and society work together to mitigate its harmful effects?
5. Examine the legal and social challenges posed by the spread of obscene content on the internet. How can India's legal framework evolve to address these challenges while balancing freedom of expression?

SC Issues Guidelines on Student Suicides and Mental Health

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Government Initiatives and Policies for Mental Health
- Educational Reforms and Welfare

✓ GS Paper II – Social Justice

- Vulnerable Groups and Protection Mechanisms

Introduction:

In response to the alarming rise in **student suicides** and mental health issues in India, the **Supreme Court of India** issued **15 interim guidelines** in the case **Sukdeb Saha vs. State of Andhra Pradesh** under **Article 32** and **Article 141**. The Court recognized that the growing crisis of student suicides points to a **deeper structural malaise** within the educational system. These guidelines aim to address the immediate need for **mental health support** in educational institutions, while also pushing for long-term reforms.

Key Judicial Guidelines Issued by the Supreme Court:

1. **Mandatory Mental Health Policy in Educational Institutions:**
 - Educational institutions are now required to implement a **Mental Health Policy**, in alignment with national frameworks such as **UMMEED**, **MANODARPAN**, and the **National Suicide Prevention Strategy**.
 - The policy must include mechanisms for **mental health assessment, counseling, and prevention** of student suicides.
2. **Appointment of Mental Health Counsellors:**
 - Institutions with **100 or more students** must appoint at least one **qualified mental health counselor** to provide **support** and guidance to students facing emotional distress and mental health challenges.
3. **Prohibition of Unhealthy Practices:**
 - The guidelines explicitly **prohibit batch segregation** based on academic performance, **public shaming**, and setting **unrealistically high academic targets**, all of which contribute to **student stress**.
4. **Prominent Display of Helpline Numbers:**
 - Institutions must display **helpline numbers** (including **Tele-MANAS**) prominently in **campuses and hostels**. These helplines will provide **immediate support** for students in **crisis situations**.
5. **Mandatory Mental Health Training for Staff:**
 - All staff members in educational institutions must undergo **biannual mental health training**. This training will focus on **crisis response, identifying warning signs** of mental health issues, and how to support students in distress.
6. **Inclusive Mental Health Practices:**
 - Institutions are required to adopt **inclusive and non-discriminatory** mental health practices for students from **SC/ST, OBC, EWS, LGBTQ+, and disabled** communities. This ensures that mental health services are **accessible** to all, irrespective of their background or identity.
7. **Confidential Reporting Systems:**
 - Institutions must establish **confidential reporting systems** for **sexual assault, ragging, and identity-based discrimination**, and provide **immediate psychosocial support** for affected students.
8. **Reducing Exam-Centric Stress:**
 - Institutions are encouraged to reduce **exam-centric stress** by promoting **interest-based career counseling** and offering **extracurricular activities** that foster **holistic development**. This approach helps students manage academic pressure and find their true interests and talents.

Legal Framework Supporting Mental Health in India:

1. **Mental Healthcare Act, 2017:**
 - o The **Mental Healthcare Act, 2017**, guarantees the **right to access mental healthcare** services for all citizens. This act decriminalized **attempted suicide**, treating it as a **mental health issue** rather than a crime. The act also emphasizes the importance of **dignity** and **autonomy** in mental health care.
2. **Rights of Persons with Disabilities Act, 2016:**
 - o This Act expanded the definition of **disability** to include **mental illness**, ensuring that individuals with **psychosocial disabilities** receive **legal protection, equality, and non-discrimination**.
3. **Right to Life under Article 21 of the Constitution:**
 - o The **Right to Life** under **Article 21** is not merely about **existence** but about **dignity, autonomy, and well-being**. The Supreme Court's emphasis on mental health aligns with this principle, reinforcing that a **life of dignity** requires **mental well-being**.
4. **Case Law: Shatrughan Chauhan v. Union of India:**
 - o In this landmark judgment, the Supreme Court reaffirmed that **mental health** is an integral part of the **right to life**. The Court held that **adequate mental health care** is a fundamental **human right**, ensuring that the government takes proactive steps to provide access to mental health services for all.

Conclusion:

The **Supreme Court's guidelines** for addressing **student suicides** and **mental health concerns** in educational institutions mark a significant step towards **mental well-being** and **emotional support** in the country's educational ecosystem. These measures aim to reduce the **mental health crisis** among students by providing **access to care, training for staff, and inclusive practices**. It is imperative that these interim guidelines are effectively implemented and lead to long-term policy changes to ensure the **emotional and psychological safety** of India's youth.

Mains Questions for UPSC:

1. Explain the Supreme Court's guidelines issued to address student suicides and mental health issues in educational institutions. How do these guidelines align with India's legal and constitutional framework on mental health?
2. Evaluate the role of educational institutions in promoting mental health awareness and preventing suicides. How can they adopt inclusive, non-discriminatory practices to support vulnerable students?
3. Discuss the significance of the Mental Healthcare Act, 2017, and the Rights of Persons with Disabilities Act, 2016, in addressing mental health concerns in India. How do they provide legal protection for individuals with mental illnesses?
4. What are the key reasons behind the rising incidence of student suicides in India? How can the government, institutions, and society work together to address these challenges effectively?
5. Critically assess the implications of the Supreme Court's ruling on the importance of mental health under Article 21 of the Constitution. How does this case contribute to the understanding of mental health as a fundamental right?

PM VIKAS Scheme: Uplifting Minorities through Skill Development

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Government Schemes and Policies
- Social Justice and Empowerment

✓ GS Paper II – Social Justice

- Welfare Schemes for Minorities
- Socio-Economic Development Initiatives

Introduction:

The **Pradhan Mantri Virasat Ka Samvardhan (PM VIKAS)** scheme is a significant **Central Sector Scheme** launched by the **Ministry of Minority Affairs**. The scheme aims to provide socio-economic empowerment to **six notified minority communities** in India, focusing on their **upliftment** through skill development, education, and cultural preservation. Recently, the **3rd Empowered Committee (EC)** meeting for PM VIKAS was convened to review the progress and implementation of the scheme. It merges the efforts of **five previous schemes**, streamlining and focusing them into one robust initiative for **minority welfare**.

About the PM VIKAS Scheme:

1. **Type and Ministry:**
 - o **Central Sector Scheme:** The PM VIKAS scheme is implemented by the **Ministry of Minority Affairs**, aiming to cater to the development of specific communities and improve their socio-economic standing through a combination of skill-building, education, and cultural enrichment.

2. Objective:

- The scheme aims to **uplift** and **empower** **six notified minority communities** through **education**, **vocational training**, and promoting their **heritage**. The scheme aims to foster **economic empowerment** and **social integration** by addressing gaps in skills, education, and income levels.
- It combines various initiatives to provide **sustained support** for marginalized sections of these communities.

3. Convergence of Previous Schemes:

- The PM VIKAS scheme brings together **five former schemes** to create a **comprehensive framework** for minority empowerment:
 - **Seekho Aur Kamaao**: Skill development for the youth of minorities, providing training in various vocational sectors.
 - **Nai Manzil**: Education and skill development program for **non-formal education** dropouts from minority communities.
 - **Nai Roshni**: Leadership development program for **women from minority communities**, empowering them to take leadership roles in their communities.
 - **USTTAD**: Aims to **preserve and promote traditional arts and crafts** among minority communities.
 - **Hamari Dharohar**: Focuses on preserving the **cultural heritage** of minority communities, particularly in the areas of **art, culture, and craftsmanship**.

4. Targeted Communities:

- The PM VIKAS scheme focuses on the **upliftment of six notified minority communities**, which include:
 - **Muslims**
 - **Christians**
 - **Sikhs**
 - **Buddhists**
 - **Jains**
 - **Zoroastrians (Parsis)**

Key Features of the PM VIKAS Scheme:

1. Skill Development and Economic Empowerment:

- The scheme seeks to enhance the **vocational skills** of individuals from minority communities, preparing them for **employment** in various sectors, and promoting **self-employment** initiatives.
- It provides **training programs** in fields like **tailoring, carpentry, plumbing, computer literacy, handicrafts**, and other **skill-oriented courses**.

2. Educational Support:

- Through the **Nai Manzil** component, PM VIKAS focuses on bringing **dropout children** back to school and provides **non-formal education** to make them eligible for employment and higher education.
- The scheme also offers **scholarships, mentorship, and study materials** for better access to quality education for **minority students**.

3. Women Empowerment:

- Under the **Nai Roshni** program, PM VIKAS focuses on **empowering women** by **developing leadership skills**, providing training for **economic independence**, and raising awareness about **legal rights and social responsibilities**.
- It encourages **women from minority communities** to engage in **self-help groups (SHGs)**, which helps them achieve **financial independence**.

4. Preservation of Cultural Heritage:

- **Hamari Dharohar** aims at promoting the **cultural identity** of minorities by supporting their **traditional crafts, arts, and heritage**. This helps preserve India's rich **cultural diversity** while simultaneously enhancing their economic status through **craftsmanship and tourism**.
- The **USTTAD** initiative focuses on **skilling artisans** in traditional arts and crafts, enhancing their skills for the modern market, and ensuring that the rich cultural heritage of the minorities is **preserved and celebrated**.

5. Collaborative Effort for Sustainable Development:

- PM VIKAS encourages collaboration with **state governments, NGOs, community organizations**, and **local stakeholders** to ensure that the schemes are implemented efficiently and that the benefits reach the **targeted beneficiaries**.
- Monitoring and regular feedback are integral to improving the effectiveness of these interventions.

Benefits of the PM VIKAS Scheme:

1. Improved Livelihoods:

- By enhancing the **skills** and **education** of minority communities, the scheme aims to boost their **employment opportunities** and income potential. The combination of **education, skill training, and leadership development** creates a more empowered and economically independent population.

2. Gender Equality:

- Special emphasis is placed on **women's empowerment**, ensuring that they have access to the same opportunities as men, particularly through the **Nai Roshni** program. Empowering women also brings positive changes in **family dynamics, community health**, and overall **economic progress**.

3. Preservation of Heritage:

- The **Hamari Dharohar** and **USTTAD** schemes aim to preserve the **arts and crafts** of India's diverse minority communities, contributing to the nation's **cultural richness** while creating **economic opportunities** for artisans.

4. Strengthening National Integration:

- By focusing on **inclusive growth** and providing **equal opportunities** for **minority communities**, PM VIKAS fosters **social harmony** and **national integration**, which are essential for long-term peace and stability in a diverse nation like India.

Conclusion:

The **PM VIKAS scheme** is a comprehensive initiative aimed at the **holistic development** of India's **minority communities**. By converging several existing programs, the scheme offers **inclusive growth**, focusing on **education, skills development, empowerment of women**, and the **preservation of cultural heritage**. Through these initiatives, the scheme aims to create a more **equitable society**, where every individual has the opportunity to lead a **dignified and prosperous life**.

Mains Questions for UPSC:

1. Explain the objectives and key features of the **Pradhan Mantri Virasat Ka Samvardhan (PM VIKAS) scheme**. How does it aim to empower minority communities in India?
2. Evaluate the impact of PM VIKAS on the socio-economic development of the six notified minority communities. How does the scheme address the needs of women and youth in these communities?
3. Discuss the convergence of the five former schemes under PM VIKAS. How does this integration enhance the overall effectiveness of the initiative?
4. What role does the PM VIKAS scheme play in preserving the cultural heritage of minority communities in India? How does it contribute to economic empowerment?
5. Assess the importance of skill development and education in the socio-economic upliftment of minority communities. How does PM VIKAS promote these aspects?

GEOGRAPHY AND DISASTER

Tamil Nadu to Develop Chola Gangam Lake

Syllabus Mapping:

GS Paper I - Geography

- Water Resources and Management
- Ancient Indian Water Bodies and Infrastructure

GS Paper II - Governance, Constitution, Polity, and International Relations

- Government Policies on Water Management
- Cultural Heritage and Preservation

Introduction:

The **Tamil Nadu government** has announced plans to develop the **Chola Gangam Lake**, also known as **Ponneri (Golden) Lake**, which has significant historical and cultural importance. Built by the **Chola King Rajendra Chola I**, the lake is a key monument commemorating his victorious **northern campaign** and the conquest of the **Gangetic plains**. The development of this ancient water body reflects a broader effort by the state to **preserve and promote** its rich cultural heritage while improving local infrastructure and water management systems.

About Chola Gangam Lake:

1. Historical Significance:

- The **Chola Gangam Lake**, also referred to as **Ponneri Lake**, was constructed by **Rajendra Chola I**, one of the most prominent rulers of the **Chola Dynasty**. It was built during the **11th century CE** at **Gangaikondacholapuram**, the capital city established by Rajendra Chola I.
- The lake **commemorates Rajendra Chola I's victory** over the **Gangetic plains**, which marked a significant achievement in the Chola Empire's expansion. The lake symbolizes the **victory and power** of the Chola kings during their northern campaigns.

2. Location and Construction:

- The lake is situated in **Gangaikondacholapuram**, a city that was built by Rajendra Chola I to mark his conquest of the northern regions. The lake was constructed to symbolize his **military success** and is one of the largest and most prominent water bodies in the region.
- The lake is referred to as the **liquid pillar of victory** in the **Tiruvalangadu Copper Plates**, ancient inscriptions that describe the historical context of the lake's creation and its cultural significance.

3. Cultural and Religious Importance:

- **Ponneri (Golden) Lake** holds a prominent place in the **cultural heritage** of Tamil Nadu, reflecting the **Chola dynasty's legacy** of engineering and resource management. It has been a part of the local ecosystem and religious practices, as water bodies were often linked with **rituals and festivals** in ancient India.
- The lake also represents **royal patronage** of infrastructure that not only served **military purposes** but also promoted **agriculture, irrigation, and local trade**.

4. Engineering and Design:

- The lake was designed with **advanced hydraulic engineering**, which was a hallmark of the Chola dynasty's achievements. The construction techniques used in the lake's creation are a testament to the Chola Empire's **expertise in water management and land reclamation**.

Development Plans for Chola Gangam Lake:

1. Government's Vision for the Lake:

- The Tamil Nadu government's decision to **develop** Chola Gangam Lake aims to **revive** the lake's historical significance and enhance its role in **local water management** and **ecological balance**.
- The development plan includes the **restoration** of the lake's **water quality**, **revitalization of ecosystems**, and **improvement of surrounding infrastructure** to ensure its sustainable use in the future.

2. Preserving Cultural Heritage:

- The government intends to **preserve the historical and cultural importance** of the lake while **integrating modern water management techniques**. This would involve making the lake a part of the state's broader strategy for **cultural tourism** and **heritage conservation**.
- Efforts will be made to create **awareness** about the lake's historical background, particularly its connection to the **Chola Empire** and **Rajendra Chola I's northern campaigns**.

3. Ecological and Environmental Benefits:

- The development project is expected to help improve the **local water supply** and **agricultural productivity**, benefiting the communities around the lake. The **restoration of ecosystems** around the lake would also contribute to the preservation of **biodiversity** in the region.
- In addition to **agriculture**, the lake's development could support **fisheries**, **recreational activities**, and **tourism**.

4. Potential Impact on the Local Economy:

- The revitalization of the lake could spur **economic growth** in the region through **tourism**, **agriculture**, and **water-based industries**. It would also serve as a **model of sustainable development**, combining **heritage conservation** with **modern environmental practices**.
- The development of the lake would also increase the **visibility** of Gangaikondacholapuram as a **heritage site**, attracting visitors and researchers interested in the rich history of the **Chola Empire**.

Conclusion:

The Tamil Nadu government's initiative to **develop Chola Gangam Lake** is a promising step toward preserving the state's **rich cultural heritage** while addressing **modern environmental and economic needs**. By revitalizing this ancient water body, the government aims to strike a balance between **heritage conservation** and **sustainable development**. The lake's historical significance as a symbol of **Rajendra Chola I's victory** is an invaluable part of India's medieval history, and its restoration will help future generations connect with the **Chola dynasty's legacy**.

Mains Questions for UPSC:

1. Discuss the historical significance of Chola Gangam Lake and its role in the Chola Empire. How can the development of such historical water bodies contribute to sustainable development in modern India?
2. Examine the environmental, economic, and cultural benefits of revitalizing ancient water bodies like Chola Gangam Lake in Tamil Nadu. How does this fit into the broader strategy of heritage conservation and water management?
3. Analyze the importance of water management in the Chola dynasty's engineering accomplishments. What lessons can modern-day India learn from the Chola's approach to water resources?
4. What steps can the Tamil Nadu government take to ensure that the development of Chola Gangam Lake aligns with both heritage conservation and ecological sustainability?
5. Evaluate the potential economic impact of developing heritage water bodies like Chola Gangam Lake on local communities, agriculture, and tourism. How can such initiatives boost regional development?

NCMC: Strengthening India's Disaster Management Framework

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Disaster Management and Government Policies
- Institutional Framework for National Crisis Management

✓ GS Paper II – Social Justice

- National Response to Natural Disasters and Humanitarian Efforts

Introduction:

The **Ministry of Home Affairs** has notified the **Disaster Management National Crisis Management Committee (Procedure) Rules, 2025**, enhancing India's framework for **disaster response and management**. This development follows the **Disaster Management Act (Amendment) Act, 2025**,

which granted **statutory status** to the **National Crisis Management Committee (NCMC)**, enabling it to play a critical role in **coordinating** national disaster response efforts. The **NCMC** will be responsible for managing **major national-level crises** and ensuring **preparedness** and **rapid response** to emergencies.

About the National Crisis Management Committee (NCMC):

1. Background:

- The NCMC was established under the **Disaster Management Act** to provide a **centralized coordination body** for managing **national crises**. The **Disaster Management Act (Amendment) Act, 2025** formalized the role of the NCMC by granting it **statutory authority** and defining its **powers and functions**.
- This formal recognition allows the NCMC to function more effectively as the **nodal body** for disaster response and preparedness at the national level.

2. Composition of the NCMC:

- The NCMC is headed by the **Cabinet Secretary**, who acts as the **chief coordinator** during **national crises**.
- Key members of the committee include:
 - **Home Secretary**: Responsible for the overall coordination of disaster management efforts at the national level.
 - **Defence Secretary**: To provide assistance during **military support** in case of emergencies, such as **natural disasters** requiring **military deployment**.
 - Other senior officials from ministries such as **Finance, Civil Aviation, Transport, and Environment** are also part of the committee to ensure **comprehensive response**.

Powers and Functions of the NCMC:

1. Nodal Body for National Crises:

- The NCMC will act as the **central coordinating body** for managing **major disasters** that have **serious national ramifications**. It will have the **authority** to:
 - Mobilize resources across various sectors (government, private, NGOs).
 - Coordinate the **response efforts** of state governments, central agencies, and international bodies.
- The committee will ensure that disaster responses are **coherent, timely, and effective** by maintaining close communication and coordination with **relevant stakeholders**.

2. Evaluation of Preparedness:

- The NCMC is authorized to **evaluate the preparedness** of **state and central agencies** for any **disaster or emergency situation**. It will assess whether the necessary infrastructure, resources, and personnel are available to handle major crises.
- The evaluation also involves ensuring that **disaster management plans** are in place at various levels, including at the **local, state, and national** levels.

3. Coordination and Monitoring:

- The NCMC will **coordinate** and **monitor** the **national disaster response** efforts, ensuring that relief operations are initiated without delays. This includes:
 - **Rapid mobilization** of relief resources (food, medical supplies, equipment).
 - Ensuring **inter-agency cooperation** during crises (e.g., coordination between **Home Ministry, Defence Ministry, and NGOs**).
- The committee will work with **state authorities** to ensure that **local communities** are equipped to handle disasters through **training and resource mobilization**.

4. Real-time Crisis Management:

- In case of **national disasters**, the NCMC will act in **real-time** to coordinate responses across the country. The committee will utilize technology, including **satellite imagery, drones, and digital platforms**, to assess the scale of disasters and mobilize **relief and recovery efforts** efficiently.

Role of the NCMC in National Disaster Management:

1. Unified Response to Major Crises:

- The NCMC ensures that disaster response is **unified** and **coordinated**. It reduces the chances of duplication of efforts and ensures **efficiency** in the use of resources.
- By having all critical ministries and agencies under one **coordinating umbrella**, the NCMC ensures a **centralized approach** to managing national crises.

2. Rapid Deployment of Resources:

- One of the most significant functions of the NCMC is the **rapid deployment** of resources to disaster-affected areas. This includes the **mobilization of the armed forces, civil services, and humanitarian organizations** for **immediate relief and rescue operations**.
- The committee's **statutory status** ensures **quick decision-making** and **immediate action** during critical periods.

3. Long-term Recovery and Reconstruction:

- The NCMC's role is not just limited to **immediate disaster response** but extends to **long-term recovery and reconstruction**. This includes:
 - Ensuring that affected communities receive **financial aid, infrastructure support, and reconstruction assistance**.
 - Facilitating **post-disaster rehabilitation** and ensuring that **sustainable** measures are taken for long-term development and **resilience-building**.

Conclusion:

The establishment of the **National Crisis Management Committee (NCMC)** with statutory status, as outlined in the **Disaster Management Act (Amendment) Act, 2025**, strengthens India's disaster management framework. With its **comprehensive mandate**, the NCMC will play a crucial role in ensuring that India is better equipped to handle **major national crises** effectively. Its **coordinated efforts**, real-time crisis management capabilities, and focus on both **immediate relief** and **long-term recovery** will significantly enhance India's capacity to respond to **natural disasters** and **humanitarian emergencies**.

Mains Questions for UPSC:

1. Discuss the powers and functions of the National Crisis Management Committee (NCMC) under the Disaster Management Act. How does it strengthen India's disaster response framework?
2. Examine the role of the National Crisis Management Committee (NCMC) in addressing national crises. How does it enhance coordination between various stakeholders in disaster management?
3. Evaluate the importance of a centralized coordinating body like the NCMC in managing large-scale disasters. How can it improve the preparedness and response mechanisms in India?
4. How does the establishment of statutory bodies like the NCMC contribute to India's overall disaster management strategy? Discuss its long-term implications for national crisis management.
5. Critically assess the role of the National Crisis Management Committee (NCMC) in promoting resilience and post-disaster recovery. What measures can be taken to improve its functioning?

HISTORY, ART & CULTURE

1,000 Years of Rajendra Chola's Maritime Expedition

Syllabus Mapping:

GS Paper I - History

- Ancient Indian History and the Chola Empire
- Contributions of Chola Dynasty to Indian Culture and Governance

GS Paper II - Governance, Constitution, Polity, and International Relations

- Historical Influence of Indian Kingdoms in Southeast Asia
- India's Maritime Traditions and Diplomacy

Introduction:

The **Ministry of Culture** is celebrating the **Aadi Thiruvathirai Festival** to mark the **1,000th anniversary of Rajendra Chola I**'s historic **maritime expedition** to Southeast Asia. This festival not only commemorates his naval achievements but also honors the **Tamil Shaiva Bhakti traditions**, especially the **63 Nayanmars**, the saint-poets who were supported by the Chola dynasty. Rajendra Chola I's **expansionist campaigns** reshaped Southeast Asia and solidified the Chola Empire's place as a formidable maritime power in Indian history.

About Rajendra Chola I (1014 to 1044 CE):

1. Early Life and Rise to Power:

- Rajendra Chola I was the **son of Rajaraja Chola I**, one of the most powerful rulers of the Chola dynasty, who ascended the throne in **985 CE**.
- Rajendra Chola I continued his father's legacy of **military expansion** and **territorial consolidation**, becoming one of the greatest monarchs of medieval India.

2. Conquests and Maritime Expeditions:

- **Conquering the Ganga Valley:** Rajendra Chola I earned the title "**Gangaikonda Chola**" ("The Chola who conquered the Ganges") after successfully defeating the kingdoms in the **Ganga Valley**, particularly the **Pala Dynasty**.
- **Founding Gangaikonda Cholapuram:** To commemorate his victory, he founded the city of **Gangaikonda Cholapuram** as his new capital and constructed a **temple dedicated to Lord Shiva** in the city, marking the significance of this victory.
- **Naval Expeditions:** Rajendra Chola I is especially remembered for his **successful naval expeditions** to **Sri Lanka** and the **Srivijaya Empire** in Southeast Asia. His naval campaigns were pivotal in establishing **Chola dominance** over **maritime trade routes** in the region.
- **Sri Vijaya Puram:** The **Andaman and Nicobar Islands' capital** is named **Sri Vijaya Puram**, inspired by the Chola victory over the **Srivijaya Empire**, a dominant maritime power in Southeast Asia during the 7th century.

3. Legacy and Cultural Contributions:

- **Cultural Renaissance:** Rajendra Chola I's reign was marked by **patronage of the arts**, especially in the fields of **literature, architecture, and religious traditions**. He played a significant role in **propagating Shaiva Bhakti** across his empire and ensured the establishment of temples dedicated to Lord Shiva.
- **Support for Nayanmars:** Rajendra Chola I was a great supporter of the **63 Nayanmars**, the revered Shaiva saint-poets, whose devotional songs and poetry helped spread the Shaiva Bhakti movement throughout South India.

About the Chola Empire:

1. Origins and Rise to Power:

- The **Chola Empire** began as a minor chiefdom in **Uraiur**, under the **Pallava Dynasty**. The Cholas rose to prominence in the **9th century** under **Vijayalaya Chola**, and by the time of **Rajaraja Chola I** and **Rajendra Chola I**, the Chola Empire had expanded across **South India, Southeast Asia, and the Indian Ocean**.
- **Local Governance:** The Chola system of governance was highly **efficient**. It relied on the prosperity of **irrigated settlements (ur)**, and **nadu**—groups of villages that handled **justice and taxation**.
- **Tax System:** The Chola Empire had a well-organized tax system, with common taxes like **Vetti** (forced labor) and **Kadama** (land revenue), which were essential to maintaining the empire's vast administrative and military apparatus.

2. Key Administrative Inscriptions:

- The **Uttaramerur inscriptions** provide detailed accounts of the **Chola administrative system**, including the **election processes** within local councils (sabhas), highlighting the **advanced nature of Chola governance**.

Cultural Marvels of the Chola Empire:

1. Temples and Architecture:

- The Chola dynasty is renowned for its **architectural marvels**, especially the **Great Living Chola Temples**, including the **Brihadeeswara Temple, Gangaikonda Cholapuram, and Airavatesvara Temple**, all of which are now designated as **UNESCO World Heritage Sites**.
- These temples not only reflect the **artistic brilliance** of the Chola period but also served as **centers of culture, education, and religious practice**.

2. Chola Bronzes:

- The Cholas are also famous for their **exquisite bronze sculptures**, particularly the iconic **Nataraja** statue, which depicts Lord Shiva as the cosmic dancer. These bronzes are regarded as some of the finest works of **Indian art**.

3. Literature and Shaiva Bhakti:

- The Chola period was a **golden age** for **Tamil literature**, especially the **Shaiva Bhakti** tradition. **Nayanmars** (the 63 saint-poets) played an important role in spreading Shaiva devotion, and their works were **patronized** by the Chola kings, including Rajendra Chola I.

Conclusion:

The **celebration of Rajendra Chola I's 1,000th anniversary** marks not only the **military and cultural achievements** of the Chola Empire but also serves as a reminder of the empire's vast maritime influence and its enduring legacy in **Indian and Southeast Asian history**. The **Aadi Thiruvathirai Festival** honors this **legendary maritime expedition** and acknowledges the **Shaiva Bhakti tradition**, an essential part of the Chola cultural renaissance. As India celebrates this milestone, it highlights the empire's significant role in shaping **Indian civilization** and its far-reaching influence across **Southeast Asia**.

Mains Questions for UPSC:

1. Discuss the contributions of Rajendra Chola I to the cultural and military expansion of the Chola Empire. How did his maritime expeditions influence the geopolitical landscape of Southeast Asia?
2. Analyze the role of the Chola Empire in the development of Shaiva Bhakti and Tamil literature. How did the Chola rulers support religious and cultural movements?
3. Evaluate the significance of the Chola maritime power in Southeast Asia. How did Rajendra Chola I's naval expeditions affect the regional balance of power in the 11th century?
4. The Chola Empire is known for its architectural and artistic achievements. Discuss the legacy of Chola architecture and bronzes, particularly in the context of their cultural and religious significance.
5. What role did the Chola dynasty play in the spread of Indian culture and influence in Southeast Asia? Discuss their impact on trade, culture, and religion in the region.

National Sample Survey (NSS) Completes 75 Years of Data Collection

📌 Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Government Policies and Initiatives
- Social and Economic Surveys

✓ GS Paper III – Technology, Economic Development, and Security

- Economic Growth and Development
- Government Data and Surveys

Introduction:

The **National Sample Survey (NSS)**, established in **1950** by **P.C. Mahalanobis**, has completed **75 years** of collecting vital **economic and social data** across India. It plays a crucial role in gathering information based on **random sampling** to represent the entire country's demographic and socio-economic status. Managed by the **Ministry of Statistics and Programme Implementation (MoSPI)**, the NSS provides essential data that informs public policy, economic planning, and research.

Key Features of NSS:

1. Establishment and Purpose:

- **Founded in 1950** by **P.C. Mahalanobis**, the NSS was aimed at providing comprehensive statistical information for the **economic and social planning** of India.
- The surveys are conducted on the basis of **random sampling** to ensure that the data reflects the socio-economic conditions of **all regions** of the country.

2. Ministry and Leadership:

- The NSS is overseen by the **Ministry of Statistics and Programme Implementation (MoSPI)**.
- It is headed by a **Director General**, who is responsible for the conduct of large-scale surveys across the nation.

3. Coverage of NSS:

- **Household Surveys:** The NSS collects data on various socio-economic subjects like **population, birth rates, death rates, migration, fertility, family planning**, etc.
- **Agricultural Surveys:** It covers topics related to **land holdings, livestock, and agriculture**.
- **Establishment Surveys:** This includes data on **non-agricultural enterprises** in the **unorganized sector** and **rural retail prices**.
- **Village Surveys:** It includes information on the **availability of infrastructure** in Indian villages.

Structure and Divisions of NSS:

1. Survey Design and Research Division (SDRD):

- Located in **Kolkata**, responsible for the **technical planning** of surveys, developing concepts, definitions, and **sampling designs**.

2. Field Operations Division (FOD):

- Located in **Delhi/Faridabad**, it is in charge of **data collection** from the field, ensuring that the surveys are properly executed across the country.

3. Data Processing Division (DPD):

- Also based in **Kolkata**, this division is responsible for **sample selection**, developing **software**, and processing the data through validation and tabulation.

4. Survey Coordination Division (SCD):

- Located in **New Delhi**, this division coordinates the activities of all other divisions and ensures that surveys are efficiently conducted.

Major Surveys Conducted by NSS:

1. Urban Frame Survey (Phase 2022-27):

- This survey focuses on establishing and updating a **reliable sampling frame for urban areas**. It plays a critical role in conducting accurate socio-economic surveys for urban settings.

2. Annual Survey of Industries (ASI):

- This survey assesses and evaluates the **growth, composition, and structure** of the **organized manufacturing sector** in India, providing insights into industrial development.

3. Periodic Labour Force Survey (PLFS):

- Conducted since **2017**, the PLFS serves as the **primary source of data** on **labour force** in India, tracking employment, unemployment, and other labour-related metrics.

4. Price Surveys:

- These surveys track **Consumer Price Index (CPI)** for both **Urban** and **Rural** areas, along with indices such as **Wholesale Price Index (WPI)**, providing essential data for **inflation measurement** and **economic policy**.

Conclusion:

The **National Sample Survey** has played a pivotal role in **data-driven decision-making** in India over the past **75 years**. Its surveys provide the **foundation** for government policies related to **economics, health, and social issues**, influencing planning at all levels. Through its comprehensive and systematic approach to data collection, the NSS continues to be an essential tool for India's **economic growth and development**.

Mains Questions for UPSC:

1. Discuss the role of the National Sample Survey (NSS) in shaping India's public policy and economic planning. How has it contributed to the country's development over the last 75 years?
2. Analyze the structure and divisions of the National Sample Survey (NSS). How do these divisions ensure efficient data collection and processing?
3. Evaluate the significance of major NSS surveys like the Periodic Labour Force Survey (PLFS) and Annual Survey of Industries (ASI) in understanding India's economic landscape.
4. What challenges does the National Sample Survey (NSS) face in ensuring data accuracy and representativeness, particularly in rural and remote areas of India?
5. How does the National Sample Survey (NSS) contribute to measuring India's socio-economic progress? Discuss its importance in framing policies for poverty reduction, employment, and industrial growth.

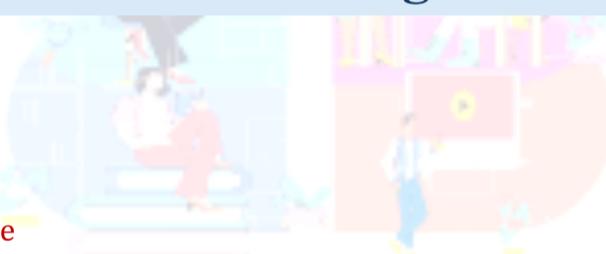
ENVIRONMENT & ECOLOGY

Arctic Faces Unprecedented Winter Warming

📌 Syllabus Mapping:

✓ GS Paper III – Economic Development

- Environmental Challenges and Climate Change
- Agriculture, Disaster Management, and Climate Risks



✓ GS Paper I – Geography

- Climate Change and Its Impact
- Regional Environmental Issues



Introduction:

In **February 2025**, the Arctic region experienced **unprecedented winter warming**, marked by **exceptionally high air temperatures** and **rainfall** over **Svalbard**, an archipelago in the Arctic. This triggered widespread **snowmelt** and the pooling of **meltwater**, contributing to further **environmental changes**. **Human-caused global warming**, particularly in the Arctic, is amplified in this region, causing the climate here to warm much more quickly than the rest of the world. This phenomenon is called **Arctic Amplification**. The consequences of this dramatic change are far-reaching, affecting not only the Arctic ecosystem but also contributing to **global climate change** and having specific impacts on regions such as **India**.

Factors Contributing to Arctic Amplification:

1. **Reduced Albedo:**
 - **Albedo** refers to the reflectivity of the Earth's surface. In the Arctic, the **ice and snow cover** is being replaced by **darker ocean water and land**, both of which absorb more solar energy.
 - As a result, the region warms up even further, creating a **feedback loop**—more heat absorption leads to additional ice and snow loss, which accelerates warming in the region.
2. **Lapse Rate Feedback:**
 - In the Arctic, the **warming effect of greenhouse gases** is more pronounced near the surface, as opposed to in the Tropics, where heat is distributed more evenly due to **convection**.
 - This **localized warming** near the surface leads to **greater temperature differences** between the Arctic surface and higher altitudes, intensifying the overall warming.
3. **Water Vapour Triple Effect:**
 - **Water vapour** in the atmosphere has a **triple effect**:
 1. It creates **more cloud cover**, which traps heat.
 2. It **releases heat during condensation** (when water vapour turns into liquid), further warming the atmosphere.
 3. As a **greenhouse gas**, water vapour itself contributes to **further warming**.
4. **Atmospheric Heat Transport:**

- The warming of the **tropical regions** results in an increase in moisture levels, which leads to an increase in the **rate of heat transport** from the **Tropics** to the **Arctic**.
- This movement of heat further accelerates warming in the Arctic, creating a direct link between global temperature changes and the rapid warming observed in this region.

Impact of Arctic Amplification:

1. Accelerating Global Warming:

- One of the most significant impacts of Arctic amplification is the **thawing of permafrost**, which has been storing **organic carbon** for millennia. As permafrost thaws, it **releases carbon dioxide (CO₂)** and **methane (CH₄)**, both potent **greenhouse gases**.
- This release contributes to a **positive feedback loop**, where more greenhouse gases are emitted, accelerating **global warming** and climate change.

2. Ecological Change:

- The **winter warming** and **rain** in the Arctic are disrupting the **insulating snow cover**, exposing the **tundra** and **microbes** to more extreme temperature fluctuations.
- This change in temperature conditions can harm Arctic wildlife and ecosystems, further destabilizing the region's fragile environmental balance.

3. Impacts on India:

- **Disruption of Indian Monsoon:** The **decline in Arctic sea ice** is linked to **stronger monsoons** in India, leading to **extreme rainfall events**. This can cause **flooding**, **soil erosion**, and **agricultural losses**, particularly in regions already vulnerable to extreme weather patterns.
- **Sea-Level Rise:** Arctic warming contributes to **melting ice sheets**, which raises **global sea levels**. For **India**, this poses a threat to **coastal cities**, increasing the risk of **flooding**, **salinization of agricultural areas**, and **displacement of communities** living near the coast.
- **Economic and Social Risks:** The **economic impact** of Arctic warming on India includes **agricultural losses** due to changing rainfall patterns and **health impacts** caused by **heat stress** and **vector-borne diseases**. Additionally, **infrastructure** in coastal and flood-prone areas may face increased risk of **damage** due to rising sea levels and extreme weather events.

Conclusion:

The phenomenon of **Arctic Amplification** is reshaping the **global climate system**, with profound consequences for ecosystems, weather patterns, and economies. As the Arctic warms at an unprecedented rate, the effects are being felt far beyond the region, influencing global weather systems and contributing to challenges such as **sea-level rise**, **extreme weather**, and **agricultural disruptions**. For countries like **India**, the cascading impacts of Arctic warming—through **monsoon disruptions**, **flooding**, and **sea-level rise**—underscore the urgent need for **global action** to mitigate **climate change** and strengthen **climate resilience**.

Mains Questions for UPSC:

1. Discuss the phenomenon of Arctic Amplification and explain how it accelerates global warming. What are the potential implications for India?
2. Examine the role of permafrost thawing in the Arctic and its contribution to global climate change. How can countries like India prepare for its impacts?
3. Evaluate the link between declining Arctic sea ice and changes in the Indian monsoon system. What steps should India take to mitigate the effects of these changes on its agriculture and infrastructure?
4. How does Arctic warming contribute to rising sea levels, and what are the potential risks for coastal cities in India? Discuss the economic, social, and environmental impacts.
5. Analyze the environmental and economic consequences of Arctic warming on global ecosystems. How should countries, especially those like India, respond to the challenges posed by these changes?

50% Coral Cover Loss in Lakshadweep Over 24 Years

❖ Syllabus Mapping:

✓ GS Paper III – Economic Development

- Environmental Sustainability
- Conservation and Ecological Balance

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Environmental Governance and Policy
- Climate Change Impact on Marine Ecosystems

Introduction:

A recent study has raised concerns about the **decline of coral cover** in the **Lakshadweep archipelago**, revealing a **50% reduction in coral cover over the past 24 years**. The **coral reefs** in **Agatti, Kadmat, and Kavaratti** have suffered significantly, primarily due to climate change-induced factors such as **marine heatwaves, pollution, and bleaching events**. The study highlights the **vulnerability of coral ecosystems** and the challenges posed by **climate change** on the long-term sustainability of these vital ecosystems.

Key Highlights of the Study:

1. Reduction in Coral Cover:

- The study reports a **50% reduction in coral cover** across **Lakshadweep** over the past **24 years**, which is a significant concern for the region's marine biodiversity.
- The reduction in coral cover is attributed to the **reduced recovery rates** after each **bleaching event**, which are becoming increasingly frequent and severe due to **climate change**.

2. Impact of El Niño Events:

- The **coral decline** and recovery have been notably influenced by three major **El Niño Southern Oscillation (ENSO)** events that caused widespread **coral bleaching** in **1998, 2010, and 2016**.
- The coral reefs have faced significant stress during these **El Niño events**, which are characterized by higher **ocean temperatures**, leading to the **expulsion of symbiotic algae** from corals, resulting in **bleaching** and **coral death**.

Reasons for Coral Depletion:

1. Marine Heatwaves:

- **Marine heatwaves**, which have increased in frequency and intensity due to **climate change**, are one of the **primary causes of coral depletion**. These heatwaves raise the **sea surface temperatures**, which are harmful to coral health, leading to **coral bleaching** and **mortality**.

2. Runoff and Pollution:

- **Storm-generated precipitation** and **runoff** can **dilute ocean water**, introducing pollutants that harm the health of near-shore corals. The accumulation of **nutrients**, chemicals, and **sediments** from **urban runoff** can lead to **eutrophication**, further stressing coral ecosystems.

3. Extreme Low Tides:

- **Extreme low tides** that expose **shallow corals** to the air can cause **bleaching** and **dehydration**, making corals more vulnerable to damage.

4. Other Contributing Factors:

- **Excessive exposure to sunlight**, changes in **ocean currents**, **sedimentation**, and **overfishing** are also contributing factors to the depletion of coral reefs in Lakshadweep and other coastal regions.

Importance of Coral Reefs:

1. Habitat for Marine Life:

- Coral reefs, though covering only **1% of the world's oceans**, are home to at least **25% of the world's marine species**. They provide a vital habitat for a wide range of marine life, including **fish**, **sponges**, and other filter feeders that help maintain marine ecosystem balance.

2. Ecosystem Services:

- Coral reefs play a significant role in maintaining the health of marine ecosystems by filtering **toxins** and **contaminants** out of the oceans. They also support **diverse marine ecosystems**, which are essential for the stability of the ocean food web.

3. Economic and Cultural Importance:

- **Tourism** and **recreation** around coral reefs contribute significantly to the **local economy**, especially in regions like **Lakshadweep**.
- Coral reefs also support **fishing industries** by providing a habitat for commercially important species, contributing to the **livelihoods** of local communities.
- Additionally, coral reefs are a source of **oxygen** and have been linked to **drug development** due to the **medicinal properties** of some marine organisms found in coral ecosystems.

4. Climate Regulation:

- Coral reefs play an important role in **carbon sequestration** and help mitigate **climate change impacts** by absorbing and storing carbon dioxide in marine ecosystems.

Coral Reefs in India:

1. Four Major Coral Reef Areas in India:

- **Andaman and Nicobar Islands**: Home to the largest **coral reefs** in India, supporting a rich diversity of marine life.
- **Lakshadweep**: Known for its atolls and relatively undisturbed coral reefs, though facing increasing threats from **climate change**.
- **Gulf of Kachchh**: Located in **Gujarat**, this region hosts unique coral species.
- **Gulf of Mannar**: Situated between **India and Sri Lanka**, it is home to significant coral species and marine biodiversity.

2. Other Smaller Reefs:

- **Malvan** (Maharashtra) also has **smaller coral reefs**, contributing to India's overall marine biodiversity.

Conclusion:

The alarming **50% reduction** in coral cover across **Lakshadweep** over the last **24 years** signals the growing threat of **climate change** and **human activities** on vital marine ecosystems. Immediate action is required to protect and **restore coral reefs**, including **reducing marine heatwaves**, controlling **pollution**, and promoting **sustainable fishing practices**. As coral reefs provide critical **ecosystem services**, their preservation is vital not just for marine life but also for the **economy** and **livelihoods** of coastal communities. Strengthening **climate adaptation strategies** and **marine conservation efforts** is crucial to safeguarding these invaluable ecosystems for future generations.

Mains Questions for UPSC:

1. Examine the impact of climate change on coral reefs in India, particularly in Lakshadweep. What measures should be taken to protect coral ecosystems from further degradation?
2. Discuss the significance of coral reefs for marine ecosystems and human livelihoods. How can India enhance its efforts in conserving coral reefs amidst rising climate change risks?
3. Analyze the role of marine heatwaves, pollution, and extreme low tides in the depletion of coral reefs. What are the potential solutions to mitigate these threats?
4. Coral reefs are essential to biodiversity and ecosystem services. Discuss the economic and environmental importance of coral reefs in India. How can their conservation contribute to sustainable development?
5. Assess the effectiveness of existing conservation efforts for coral reefs in India. How can government and local communities collaborate to protect these vital ecosystems?

IRENA RPGC Report: Global Growth in Renewable Energy

📌 Syllabus Mapping:

✓ GS Paper III – Economic Development

- Renewable Energy, Environment, and Sustainable Development
- Energy Security and Policy



✓ GS Paper II – International Relations

- International Organizations and Cooperation in Energy Transition

Introduction:

The International Renewable Energy Agency (IRENA) has released its **Renewable Power Generation Costs (RPGC) Report**, showcasing significant growth in global renewable energy capacity. In 2024, **global renewable power capacity** additions reached an impressive **582 gigawatts (GW)**, with **solar photovoltaics (PV)** leading the charge. The report highlights the growing economic advantages of renewables, with **wind power** emerging as the **cheapest source** of electricity among renewables, and emphasizes the ongoing challenges posed by **geopolitical tensions** and **supply chain disruptions**.

Key Highlights of the RPGC Report:

1. **Global Renewable Power Capacity Additions:**
 - **Total global renewable power capacity** additions in 2024 reached **582 GW**, marking a **significant milestone** in the global energy transition.
 - **Solar PV** accounted for **452.1 GW** (77.8%) of the total additions, underscoring its dominant role in the renewable energy market.
 - **Wind energy** followed with **114.3 GW**, continuing its steady growth as a major contributor to the renewable energy mix.
2. **Cost Competitiveness of Renewables:**
 - The report emphasizes that **renewables** have become **cheaper** than **fossil fuel-based alternatives**, making them the preferred choice for new electricity generation worldwide.
 - **Wind energy**, in particular, remains the **cheapest source** of renewable electricity, further consolidating its role in the global energy transition.
3. **Economic Gains from Renewables:**
 - In **2024**, **renewables** helped avoid approximately **USD 467 billion** in **fossil fuel costs**, highlighting the growing economic benefits of transitioning to **clean energy sources**.
 - These **savings** from avoided fossil fuel costs are crucial in reducing global dependence on volatile and expensive fossil fuel markets, offering **stability** and **security** to energy systems.
4. **Short-Term Risks:**
 - Despite the overall positive trend, **short-term risks** to the renewable energy sector include **geopolitical tensions**, **supply chain bottlenecks**, and **trade-related barriers**.
 - These factors can disrupt the flow of **critical materials** (such as **rare earth metals** for wind turbines and solar panels) and delay the deployment of renewable energy projects, especially in regions that are heavily dependent on international trade for energy infrastructure.

Impact of Geopolitical Tensions on Renewable Energy:

1. Geopolitical Tensions:

- Ongoing **geopolitical tensions**, particularly in regions with significant **energy reserves**, can complicate the renewable energy transition. For instance, **trade wars** or **sanctions** may restrict access to **critical resources** required for manufacturing **solar panels** and **wind turbines**.
- Energy security** concerns are leading countries to rethink **energy supply chains**, with a focus on diversifying sources and reducing reliance on unstable regions.

2. Supply Chain Bottlenecks:

- The renewable energy industry is facing **supply chain bottlenecks**, particularly in the procurement of **raw materials**. The rising demand for materials like **lithium**, **cobalt**, and **silicon** for **solar PV** and **battery storage** systems has led to **competition** for these essential components.
- Supply chain resilience** will be crucial for ensuring the uninterrupted growth of renewable energy technologies. Investment in **domestic production** and **recycling technologies** will help address these challenges in the long term.

3. Trade-Related Barriers:

- Trade-related barriers**, such as **tariffs** on solar panels and wind turbine components, may hinder the global **renewable energy expansion** by raising the cost of **technological imports**.
- Removing these barriers and promoting **free trade** in **clean energy technologies** will help **accelerate** the global transition to renewable energy and encourage international cooperation.

Conclusion:

The **IRENA RPGC Report 2024** highlights the impressive growth in **global renewable power capacity**, with **solar PV** and **wind energy** leading the way. The continued decline in renewable energy costs presents a **significant opportunity** for countries to achieve **energy security** and reduce reliance on fossil fuels, thereby contributing to **climate goals**. However, the sector faces **short-term risks**, particularly due to **geopolitical tensions**, **supply chain disruptions**, and **trade barriers**, which could potentially slow down the transition. To ensure long-term success, countries need to focus on building resilient energy supply chains and fostering **global cooperation** for **clean energy** development.

Mains Questions for UPSC:

- Discuss the key findings of the IRENA Renewable Power Generation Costs (RPGC) Report 2024. How does the report highlight the economic advantages of renewable energy?
- Analyze the role of renewable energy in reducing global dependence on fossil fuels. What are the economic and environmental benefits of increasing renewable energy capacity, as indicated by the RPGC report?
- Evaluate the short-term risks identified in the RPGC report, particularly in relation to geopolitical tensions, supply chain bottlenecks, and trade barriers. How can these challenges be mitigated?
- Explain the significance of wind and solar energy in the global renewable energy market. How does the cost competitiveness of these energy sources impact the transition to a cleaner energy future?
- Assess the implications of the RPGC report for India's energy policy and its transition to renewable energy. What steps should India take to ensure a sustainable and resilient renewable energy sector?

Conservation of Mycorrhizal Fungi for Plant Nutrition and Carbon Sequestration

❖ Syllabus Mapping:

✓ GS Paper III – Environment and Ecology

- Conservation of Biodiversity
- Role of Microorganisms in Ecosystem Functioning

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- International Cooperation in Environmental Protection

Introduction:

The recent report by the **Society for the Protection of Underground Networks (SPUN)**, titled *Underground Atlas*, has drawn attention to the critical role of **mycorrhizal fungi** and the urgent need for their conservation. Over **90% of mycorrhizal fungi hotspots** are reportedly located outside **protected areas**, highlighting a significant gap in biodiversity conservation. These fungi, while largely unseen, play a fundamental role in supporting **plant growth** and **soil health**. As we advance in the fight against **climate change**, understanding the role of such **underground organisms** in **carbon sequestration** and **plant nutrition** becomes essential.

About Mycorrhizal Fungi:

1. Definition and Symbiotic Relationship:

- **Mycorrhizal fungi** are a group of **fungi** that form **symbiotic relationships** with more than **80% of plant species** on Earth. These fungi grow in and around the roots of plants, creating a mutually beneficial connection.
- The term "mycorrhiza" is derived from the Greek words "mycos" (fungus) and "rhiza" (root), which reflects the **fungus-root partnership**. The fungi connect to the plant's root system and extend their **hyphal networks** into the soil.

2. Role in Nutrient Absorption:

- **Mycorrhizal fungi** enhance the plant's ability to absorb vital nutrients, especially **phosphorus**, from the soil. In exchange for this service, the plants provide the fungi with **sugars** produced through **photosynthesis**.
- This nutrient exchange is especially important in **nutrient-poor soils**, where mycorrhizal fungi become crucial for plant growth, often enabling plants to thrive in challenging soil conditions.

3. Contribution to Soil Health:

- Mycorrhizal fungi contribute to soil health by promoting soil structure and enhancing water retention. The **hyphal networks** of fungi help bind soil particles together, which improves the **aeration** and **water retention** capacity of the soil, preventing erosion and improving soil fertility.
- These networks also help in **decomposing organic matter**, releasing essential nutrients back into the soil, which benefits the entire ecosystem.

4. Carbon Sequestration Role:

- **Mycorrhizal fungi** play a significant role in **carbon sequestration**. They capture **carbon dioxide (CO₂)** released by plant roots and help store it in the soil, thereby contributing to the process of **carbon cycling**.
- As these fungi store **carbon** in the form of organic compounds in the soil, they become an integral part of the **carbon sink**, helping mitigate the impact of **climate change** by reducing the amount of **CO₂** in the atmosphere.

Importance of Mycorrhizal Fungi:

1. Ecosystem Services:

- The relationship between mycorrhizal fungi and plants is a cornerstone of **ecosystem health**. By enabling plants to access critical nutrients, these fungi enhance **biodiversity**, **ecosystem stability**, and **agricultural productivity**. Their role in improving plant health helps stabilize ecosystems, especially in forests, grasslands, and wetlands.

2. Agricultural Benefits:

- Farmers and agricultural practitioners also benefit from mycorrhizal fungi, as they reduce the need for chemical fertilizers and pesticides. By promoting plant health naturally, these fungi improve crop yields and soil sustainability, making them a vital resource for sustainable **agriculture**.

3. Climate Change Mitigation:

- The ability of mycorrhizal fungi to store **carbon in the soil** plays a direct role in **combating climate change**. Their **carbon sequestration capabilities** help offset **carbon emissions** from human activities and promote long-term soil health.
- As **climate change** worsens, understanding and leveraging the role of mycorrhizal fungi in soil carbon storage can be a critical tool for **global climate mitigation strategies**.

4. Threats to Mycorrhizal Fungi:

- Despite their crucial role, mycorrhizal fungi are threatened by **deforestation**, **land-use changes**, **soil degradation**, and **pollution**. Climate change is also exacerbating their decline, as changing weather patterns and extreme conditions can disrupt the delicate balance required for these fungi to thrive.
- Furthermore, agricultural practices that involve **heavy tillage**, **monoculture farming**, and the excessive use of **chemical fertilizers** harm the fungal networks in the soil, reducing their effectiveness in **nutrient cycling** and **carbon storage**.

Conservation of Mycorrhizal Fungi:

1. Protected Areas and Conservation Efforts:

- The **SPUN's Underground Atlas** highlights that most **mycorrhizal hotspots** exist outside **protected areas**, which leaves these ecosystems vulnerable to human activities. Therefore, it is essential to integrate the **conservation of these fungi** into broader **biodiversity conservation** efforts.
- Identifying key **fungal hotspots** and establishing **protected zones** where **soil health** is maintained would help safeguard these **microorganisms**. A focus on **restoring degraded lands** and protecting **forests** can also support the growth of mycorrhizal fungi.

2. Promoting Sustainable Land Use Practices:

- **Sustainable farming** techniques, such as **no-till farming**, **cover cropping**, and **crop rotation**, help preserve mycorrhizal populations in the soil. These methods maintain soil structure and provide an environment conducive to fungal growth.
- Furthermore, reducing the use of **chemical fertilizers** and promoting **organic farming** methods can allow **mycorrhizal fungi** to thrive, benefiting both the **soil** and **plants**.

3. Research and Awareness:

- Ongoing **scientific research** on mycorrhizal fungi is essential for understanding their role in the ecosystem and how to protect them. Public and policy-maker awareness regarding the ecological importance of these fungi will lead to **better conservation policies**.
- Collaboration between environmentalists, farmers, and researchers can help implement strategies for **sustainable land management**, **agricultural reforms**, and **forest protection** to support fungal populations.

Conclusion:

The **conservation of mycorrhizal fungi** is critical to maintaining soil health, promoting agricultural sustainability, and mitigating **climate change**. These underground powerhouses play an indispensable role in **plant nutrition, carbon sequestration**, and overall **ecosystem health**. As **human activities** continue to encroach on natural habitats, it is essential to recognize the value of these organisms and implement conservation measures to protect them for future generations.

Mains Questions for UPSC:

1. Discuss the role of mycorrhizal fungi in maintaining soil health and supporting plant growth. How do they contribute to carbon sequestration and climate change mitigation?
2. Examine the challenges faced by mycorrhizal fungi due to modern agricultural practices and climate change. What conservation strategies can be adopted to protect these crucial organisms?
3. What is the significance of the SPUN's *Underground Atlas* in promoting the conservation of mycorrhizal fungi? How can this be integrated into India's broader biodiversity conservation efforts?
4. Evaluate the potential benefits of using mycorrhizal fungi in sustainable agricultural practices. How can their use enhance productivity while reducing the reliance on chemical fertilizers?

Indian Railways Tests Hydrogen-Powered Coach at Integral Coach Factory

❖ Syllabus Mapping:

✓ GS Paper III – Economic Development

- Infrastructure Development
- Environment and Sustainability



✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Government Initiatives in Transport and Clean Energy

Introduction:

In a significant development towards **sustainable transportation**, **Indian Railways** has successfully tested the **nation's first hydrogen-powered coach** at the **Integral Coach Factory (ICF)**. This initiative is a key part of **Indian Railways' broader vision** to deploy **hydrogen-powered trains** on **heritage and hill routes** under the "**Hydrogen for Heritage**" initiative launched in **2023**. The hydrogen-powered coach marks a crucial step in India's **National Green Hydrogen Mission**, setting the foundation for future advancements in **clean energy** in the rail transport sector.

Key Features of the Hydrogen-Powered Coach:

1. **Hydrogen-Powered Trains:**
 - The **hydrogen-powered trains** feature a **1,200 HP engine**, making it the **world's most powerful hydrogen propulsion system** developed for rail transport. This makes India a pioneer in using **hydrogen** for high-power applications in the rail sector.
2. **Hydrogen for Heritage Initiative:**
 - Under the "**Hydrogen for Heritage**" initiative, Indian Railways plans to deploy **35 hydrogen-powered trains** on **heritage and hill routes**, areas where **electric infrastructure** is often not feasible. The initiative aligns with India's commitment to reduce **carbon emissions** and transition to **green energy** solutions in the transportation sector.
3. **Significance in National Green Hydrogen Mission:**
 - The successful test of the hydrogen-powered coach aligns with India's **National Green Hydrogen Mission**, which focuses on **green hydrogen production** and **fuel-cell technologies** for cleaner alternatives in transport and industrial sectors.

Benefits of Hydrogen as an Alternative Fuel:

1. **Higher Energy Density:**
 - **Green hydrogen** has a higher **energy density** compared to **batteries**, making it an ideal solution for long-distance and heavy-duty transport such as **railways**. It can also be stored and transported in **large quantities**, ensuring its availability for long-duration travel.
2. **Zero Emissions:**
 - One of the most significant advantages of **hydrogen fuel-cell trains** is that they emit **only water vapor**, making them a **zero-emission** alternative to conventional diesel-powered trains. Replacing a single **diesel train** with a hydrogen-powered one can reduce **CO₂ emissions** equivalent to the annual output of **400 cars**, significantly cutting down the carbon footprint of the railway sector.
3. **Lower Infrastructure Requirements:**
 - Hydrogen-powered locomotives can run on **existing railway tracks** with **lower infrastructure requirements** compared to **electrification projects**. This makes **hydrogen technology** a cost-effective solution for **remote or less-frequented routes** where building electric rail infrastructure may be economically unviable.

Challenges in Adopting Hydrogen as an Alternate Fuel:

1. **Limitations in Green Hydrogen Production:**
 - o The current production of green hydrogen in India is limited. Most of the hydrogen produced in the country comes from steam methane reforming (known as Grey Hydrogen), which is not environmentally friendly.
 - o India lacks high-capacity proton exchange membrane-based electrolysis plants, which are required to produce green hydrogen from renewable energy sources such as solar and wind.
2. **Uncertainty in Demand:**
 - o There is no clear roadmap for the extent of hydrogen adoption in Indian Railways. The lack of a definite strategy regarding the scalability of hydrogen-powered trains poses a challenge to the long-term sustainability of this technology.
3. **Supply Chain and Infrastructure Challenges:**
 - o Building a reliable supply chain for hydrogen, including storage, transport, and refueling stations along selected routes, is another challenge that Indian Railways will need to overcome to make hydrogen technology more widespread.

Strategic Steps for Advancing Hydrogen Technology in Indian Railways:

1. **Expanding Pilot Projects:**
 - o Indian Railways can expand pilot projects beyond heritage routes to test the feasibility of hydrogen-powered trains on mainstream routes. This will help gather insights into the efficiency and cost-effectiveness of the technology.
2. **Building Hydrogen Infrastructure:**
 - o Establishing a supply chain for hydrogen production and refueling stations on key routes is essential to make hydrogen-powered trains operational. This would involve developing storage facilities and refueling stations at strategic locations across the railway network.
3. **Focusing on Remote Routes:**
 - o For cost-effective adoption, Indian Railways should prioritize low-frequency, remote routes that are difficult to electrify. These routes are ideal for hydrogen-powered trains due to their limited passenger traffic and the high cost of electrification.
4. **Collaboration for Green Hydrogen Production:**
 - o Indian Railways should collaborate with ministries and public sector undertakings (PSUs) to scale up green hydrogen production. These collaborations could include the use of renewable energy sources for large-scale hydrogen production, making it environmentally sustainable.

Conclusion:

The successful test of the hydrogen-powered coach by Indian Railways represents a significant milestone in the country's efforts to reduce its carbon footprint and transition to cleaner energy alternatives in the transport sector. While challenges such as green hydrogen production and infrastructure development remain, the Hydrogen for Heritage initiative and Indian Railways' efforts to scale up hydrogen-powered trains show promising potential for sustainable rail transport. As the nation moves forward with this innovative technology, it aligns with India's broader goals of green energy and climate change mitigation.

Mains Questions for UPSC:

1. Discuss the potential of hydrogen-powered trains in India. How can this technology contribute to the country's goals of sustainable transportation and reducing carbon emissions?
2. What are the challenges in the adoption of hydrogen as an alternative fuel for rail transport in India? How can Indian Railways overcome these challenges to scale up hydrogen technology?
3. Explain the role of green hydrogen in India's energy transition. How can India scale its hydrogen production infrastructure to meet the growing demand for clean energy in sectors like transport and industry?
4. Evaluate the feasibility of hydrogen-powered trains in India's railway network. How can pilot projects on heritage routes be expanded to mainstream railway routes?
5. What strategic steps can Indian Railways take to ensure the effective implementation of hydrogen-powered trains on a large scale? Discuss the role of public-private collaboration in scaling hydrogen technology

BIOTECHNOLOGY & HEALTH

Chinese Researchers Develop In Vitro Biotransformation System for Sucrose from Methanol

📌 Syllabus Mapping:

✓ GS Paper III – Science and Technology

- Biotechnology and Innovations
- Environmental Science and Technology

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Environmental and Ecological Challenges

Introduction:

Chinese researchers have developed an innovative **in vitro biotransformation (ivBT)** system capable of synthesizing **sucrose** from **methanol**. The methanol used in this process is derived from **industrial waste** or **carbon dioxide (CO2)**, providing a solution to both **environmental** and **population-related challenges**. The **artificial conversion of CO2 into food and chemicals** represents a significant step in sustainable biotechnology, offering potential solutions to global issues like climate change and food security.

About In Vitro Biotransformation (ivBT):

1. Biotransformation Process:

- **Biotransformation** refers to the process by which a substance is **chemically altered** by the metabolic activity of **biological agents**, such as **enzymes** or **isolated cells**.
- This process usually occurs inside the body (*in vivo*), but when carried out outside the body, it is termed **in vitro biotransformation (ivBT)**.
- In ivBT, biological agents like **enzymes** or **microorganisms** are used in laboratory settings to convert substrates (such as **methanol**) into more complex compounds (like **sucrose**).

2. In Vitro Biotransformation (ivBT) System:

- The **ivBT system** developed by the Chinese researchers uses **isolated enzymes** or **cells** to convert **methanol**, which is a byproduct of **industrial waste** or **CO2**, into **sucrose**.
- **Methanol**, an industrial waste product, is utilized efficiently in this process, turning a **pollutant** into a **useful chemical**.
- This system represents a **biological approach** to **sustainably produce** **food and chemicals** from **CO2**, offering significant environmental benefits.

Significance of ivBT System:

1. Environmental Impact:

- The ivBT system can help **reduce CO2 levels** by utilizing it as a substrate to produce useful products like **sucrose**.
- By converting **methanol**, which is often a byproduct of **industrial processes**, into valuable compounds, this system also contributes to **waste reduction** and **resource recycling**.
- This **artificial conversion of CO2 into food and chemicals** holds the potential to **address environmental concerns**, especially **global warming** and **climate change**.

2. Population and Food Security:

- The ability to **synthesize sucrose** through this process can contribute to **food security** by offering a **sustainable source of sugar** without relying on traditional agricultural methods.
- As the world faces growing **population pressures**, this system could provide an **alternative method of food production**, reducing reliance on agricultural land and resources.

3. Sustainability and Circular Economy:

- This ivBT system is aligned with the principles of **sustainability** and the **circular economy**, where waste products like CO2 and methanol are converted into valuable resources.
- This process can potentially support **eco-friendly industrial practices** by reducing the need for raw materials while utilizing waste products.

Applications and Future Prospects:

1. Food Production:

- The ivBT system could revolutionize food production, particularly in regions with limited agricultural capacity, by enabling the production of **sucrose** and other carbohydrates from waste products.
- This could help in **increasing food supply** and ensuring that **resources are used efficiently**.

2. Chemical Industry:

- Beyond food, ivBT could also have applications in the **chemical industry**, where the process could be used to produce a range of **bio-based chemicals** from **industrial waste or CO₂**.
- This can lead to more **environmentally-friendly manufacturing** processes and support the transition to a **bio-based economy**.

3. Addressing Climate Change:

- The ability to use **CO₂** as a feedstock for useful products presents a potential tool for **mitigating climate change**, as it helps reduce the overall **carbon footprint** of industrial processes.

Conclusion:

The development of the **in vitro biotransformation (ivBT) system** marks a **significant breakthrough** in sustainable biotechnology. By converting **methanol** (derived from **industrial waste or CO₂**) into **sucrose**, this system offers solutions to pressing **environmental challenges** like **climate change** and **waste management**. Moreover, it provides a **sustainable avenue** for **food production** and **chemical synthesis**, addressing the growing global demands for both. As the technology matures, it could play a pivotal role in fostering a **more sustainable and circular economy**.

Mains Questions for UPSC:

1. Discuss the role of biotechnology in addressing environmental challenges, particularly through processes like in vitro biotransformation (ivBT). How can the ivBT system contribute to reducing CO₂ levels and promoting sustainability?
2. Examine the potential impact of converting industrial waste and CO₂ into useful products like sucrose. What are the implications for food security and climate change mitigation?
3. What are the advantages and challenges of using in vitro biotransformation (ivBT) for large-scale production of food and chemicals? Discuss its potential in fostering a circular economy.
4. How can in vitro biotransformation (ivBT) support the transition to a bio-based economy? Analyze its applications in the chemical and food industries.
5. Evaluate the significance of sustainable biotechnological processes like ivBT in meeting the needs of a growing global population while addressing environmental concerns.

BioEmu: A New Deep Learning System for Accurate Protein Structure Prediction

❖ Syllabus Mapping:

✓ GS Paper III – Science and Technology

- Biotechnology and Innovations
- Artificial Intelligence (AI) in Healthcare and Biotechnology

Introduction:



Wisdom leads to success

The new **BioEmu-1** system, developed through a collaboration between **Microsoft**, **Rice University** (USA), and **Freie Universität** (Germany), represents a significant breakthrough in **protein structure prediction**. Utilizing **deep learning**, BioEmu-1 can accurately predict not only the **static structure** of proteins but also their **dynamic conformations**, simulating the **full range of shapes** proteins naturally adopt under **biological conditions**.

About BioEmu:

1. **Development and Collaboration:**
 - BioEmu-1 was developed by Microsoft in partnership with Rice University and Freie Universität, leveraging cutting-edge research in **deep learning and biotechnology**.
 - It is based on the understanding of protein structure dynamics and how they function under **biological conditions**.
2. **Key Capabilities:**
 - **Dynamic Conformations:** Unlike traditional models that predict only the **static structure** of proteins, BioEmu-1 can predict the **dynamic conformations** that proteins explore within **biological environments**.
 - It helps in **high-resolution protein flexibility modelling**, which is crucial for understanding **protein folding** and their interactions in living organisms.
3. **Training with AlphaFold Database:**
 - AlphaFold, an AI model developed by Google DeepMind, revolutionized protein structure prediction by achieving unprecedented accuracy.
 - BioEmu-1 was trained using the **AlphaFold database**, which contains a comprehensive set of protein structures predicted by AlphaFold, ensuring that BioEmu-1 can achieve **high accuracy** in its predictions.

Benefits of BioEmu-1:

1. **Faster and Cheaper:**
 - o BioEmu-1 is designed to be **faster** and **more cost-effective** than other existing systems.
 - o It enables the prediction of **thousands of protein structures per hour** on a **single graphics processing unit (GPU)**, making it an ideal tool for **large-scale protein prediction**.
2. **Scalability:**
 - o Its ability to process **large volumes** of protein structures quickly makes it a valuable tool in **biomedical research** and **drug discovery**, where large-scale predictions are often required.
3. **Open-Source Model:**
 - o BioEmu-1 is an **open-source model**, which means that researchers worldwide can access and use it to enhance their own studies or contribute to its improvement.
 - o This openness encourages **collaborative innovation** and **advancements** in **biotechnology and AI**.

Applications and Impact:

1. **Protein Folding and Drug Discovery:**
 - o Understanding **protein folding** is crucial for drug design, as misfolded proteins are involved in a variety of diseases, including **Alzheimer's, Parkinson's, and cancer**.
 - o **BioEmu-1's** ability to predict dynamic protein conformations will assist in **drug discovery** by enabling the development of **targeted therapies** based on **protein interactions**.
2. **Biological Research:**
 - o The system is expected to be a valuable tool for **biological research**, helping scientists understand **protein behaviors** in real-time and under various environmental conditions.
 - o It can be used to explore how proteins interact with **other molecules**, providing insights into **biological pathways** and **disease mechanisms**.
3. **Environmental and Healthcare Implications:**
 - o The ability to model protein flexibility can improve the **design of enzymes** for **bioremediation** (e.g., breaking down pollutants), opening avenues for **environmental biotechnology**.
 - o In **healthcare**, accurate predictions of protein structures and functions will enhance our ability to diagnose and treat **genetic diseases** and **protein-related disorders**.

Conclusion:

BioEmu-1 is a revolutionary **deep learning** system that enhances our understanding of **protein structure and dynamics**. With its ability to predict **dynamic protein conformations** under biological conditions, BioEmu-1 has the potential to accelerate advancements in **biomedical research, drug discovery, and protein engineering**. The system's **speed, cost-effectiveness, and open-source nature** make it a valuable tool for researchers globally, paving the way for breakthroughs in **healthcare** and **environmental science**.

Mains Questions for UPSC:

1. Discuss the significance of deep learning systems like BioEmu-1 in advancing the field of protein structure prediction. How can such advancements benefit biomedical research and drug discovery?
2. Evaluate the role of open-source models like BioEmu-1 in accelerating global collaboration in scientific research. What are the potential challenges and benefits of such systems in healthcare and biotechnology?
3. How does BioEmu-1's ability to model protein flexibility and dynamic conformations enhance the understanding of diseases caused by protein misfolding? Discuss its applications in healthcare.
4. What are the environmental implications of advancements like BioEmu-1 in biotechnology, particularly in terms of designing enzymes for bioremediation and sustainable solutions?
5. Explain the potential impact of AI models, such as BioEmu-1, on the future of biotechnology. How do these advancements align with India's goals in health and technology?

ICMR Developing Indigenous Multi-Stage Malaria Vaccine 'AdFalcivax'

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Health and Welfare
- Biotechnology and Public Health Policies

✓ GS Paper III – Technology, Economic Development, and Security

- Biotechnology and Innovations
- Health & Disease Management

Introduction:

The **Indian Council of Medical Research (ICMR)** is in the process of developing an **indigenous multi-stage malaria vaccine**, named **AdFalcivax**, which is aimed at combating the deadliest form of malaria, caused by **Plasmodium falciparum**. This innovative vaccine is being developed through a collaborative effort between the **ICMR's Regional Medical Research Centre in Bhubaneswar**, **National Institute of Malaria Research (NIMR)**, and the **Department of Biotechnology-National Institute of Immunology (NII)**.

Key Features of the AdFalcivax Vaccine:

1. Dual-Stage Targeting:

- AdFalcivax targets two critical stages of the **Plasmodium falciparum** lifecycle:
 - Pre-erythrocytic stage (Liver Stage):** This stage is where the parasite first infects the liver before it enters the bloodstream.
 - Transmission (sexual) stage:** This stage involves the gametocyte stage of the parasite that is required for transmission via mosquito bites.

2. Chimeric Vaccine Technology:

- The vaccine uses a **recombinant chimeric** design, which means it combines **antigens** from different life stages of the parasite into a single immunogen.
- Recombinant DNA technology** is used to create this vaccine, where DNA from different sources is combined to form a new sequence.

3. Indigenous Development:

- The vaccine marks **India's entry into the global league** of advanced malaria vaccine **research and development (R&D)**.
- The vaccine is being developed and produced within India, making it a significant milestone in **self-reliance in healthcare**.

4. Advantages over Existing Malaria Vaccines:

- Dual-stage protection:** Unlike the **WHO-recommended vaccines** like **RTS,S/AS01 (Mosquirix)** and **R21/Matrix-M**, which target a single stage of the parasite, **AdFalcivax** offers **broader protection** by targeting both the liver and sexual stages.
- Lower risk of immune evasion:** Due to its dual-stage targeting, it is less likely for the parasite to evade the immune system compared to single-stage vaccines.
- Better long-term immunity:** The dual-stage action can provide **better long-term immunity** and protection.
- Extended thermal stability:** The vaccine can maintain its effectiveness for **over nine months at room temperature**, which makes it **cost-effective** and easier to store, especially in tropical regions.
- Scalable and cost-effective manufacturing:** It is produced in a safe bacterial system (**Lactococcus lactis**), which is scalable and more affordable compared to traditional methods.

Malaria Overview:

1. Malaria Disease:

- Malaria** is a **life-threatening disease** caused by **Plasmodium** parasites, which are transmitted through the bites of infected **female Anopheles mosquitoes**.
- It is not a **person-to-person** disease but is spread via mosquito bites.

2. Plasmodium Species:

- There are five species of **Plasmodium** that cause malaria in humans:
 - P. falciparum** (most deadly)
 - P. vivax**
 - P. malariae**
 - P. ovale**
 - P. knowlesi**

3. Geographical Prevalence:

- Malaria is most common in **tropical and subtropical regions**, including parts of **Africa, Asia, and Latin America**.

Significance and Potential Impact:

1. Health Impact:

- Malaria remains one of the **leading causes of death** in many tropical countries, particularly in **Sub-Saharan Africa, India, and Southeast Asia**.
- AdFalcivax**, with its **dual-stage protection**, could significantly reduce the burden of malaria by targeting critical stages in the parasite's lifecycle, offering a more comprehensive solution than existing vaccines.

2. Strategic Importance:

- India's **indigenous vaccine development** plays a key role in strengthening **healthcare infrastructure** and ensuring **accessibility and affordability** of life-saving vaccines.
- The **thermal stability** of the vaccine makes it an attractive option for **countries with limited cold-chain infrastructure**, which is crucial for broader distribution and use.

3. Global Recognition and Leadership:

- The development of **AdFalcivax** positions India as a **leader in malaria vaccine research**, contributing to **global health** and the fight against malaria.

Conclusion:

AdFalcivax is a significant step forward in India's efforts to combat malaria through **innovative vaccine technology**. The dual-stage targeting mechanism, along with its **thermal stability** and **cost-effectiveness**, provides a promising tool for malaria control, especially in **tropical regions**. By focusing on **indigenous development**, this vaccine not only strengthens India's self-reliance in **healthcare** but also promises a broader impact on the **global fight against malaria**.

Mains Questions for UPSC:

1. Discuss the potential impact of India's indigenous malaria vaccine, AdFalcivax, on the global fight against malaria. How does it compare with existing malaria vaccines?
2. Examine the technological innovations involved in the development of AdFalcivax. What are the advantages of a dual-stage malaria vaccine over single-stage vaccines?
3. Evaluate the significance of India's entry into malaria vaccine research and development. What are the potential benefits for India and other malaria-endemic countries?
4. How can indigenous vaccine development, like AdFalcivax, contribute to self-reliance in healthcare? Discuss its role in addressing global health challenges.
5. Malaria remains a major public health challenge in tropical regions. How can vaccines like AdFalcivax help in achieving malaria eradication goals globally?

ICMR Updates National List of Essential Diagnostics (NLED)

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Health Policies and Programs
- Government Initiatives in Healthcare and Public Health

✓ GS Paper II – Social Justice

- Health and Welfare Programs for Vulnerable Groups
- Disease Prevention and Management

Introduction:

The **Indian Council of Medical Research (ICMR)** has recently updated the **National List of Essential Diagnostics (NLED)**, a comprehensive list of diagnostic tests deemed essential for **healthcare delivery** at various levels of healthcare facilities in India. The **NLED**, first released in **2019**, plays a pivotal role in ensuring that diagnostic services are accessible, affordable, and available across **different health facilities**—from the **village level** to **primary health centers (PHCs)**. The updated list aims to enhance the capacity of healthcare systems to diagnose **common health conditions** and improve **disease management** at the grassroots level.

About National Essential Diagnostics List (NEDL):

1. **Purpose of NEDL:**
 - The NEDL enumerates the **minimum essential diagnostic tests** that should be available at various levels of health facilities, ensuring equitable access to **quality healthcare** across India.
 - It supports **health systems strengthening** by specifying diagnostic requirements at different healthcare delivery points, such as:
 - **Village level**
 - **Sub-Health Centres**
 - **Primary Health Centres (PHCs)**
 - **Ayushman Arogya Mandirs**
 - The NEDL emphasizes the need for **diagnostic equity**, where even **remote areas** can access **basic diagnostic services** to manage health conditions effectively.
2. **Key Features:**
 - The NEDL focuses on **essential diagnostics** for **common diseases** that require immediate detection and treatment, particularly in rural and underserved areas.
 - The list outlines tests related to **infectious diseases**, **non-communicable diseases**, and **reproductive health**.

Updates in the Revised NEDL:

1. **Inclusion of New Tests:**
 - The revised NEDL includes **rapid diagnostic tests** for critical conditions such as:
 - **Sickle cell anaemia**
 - **Thalassaemia**

- Hepatitis B
- Syphilis

○ These tests are now recommended to be available at the **sub-center level**, which is the **lowest healthcare facility** in India, enabling easier access for populations in rural and remote areas.

2. Dengue Testing:

○ The revised NEDL also includes a recommendation for **collecting samples for dengue testing** at the **sub-centre level**. This makes **early detection of vector-borne diseases** like **dengue** more efficient, improving the management of such outbreaks.

3. Focus on Rapid Diagnostics:

○ The updated list emphasizes **rapid diagnostic tests** for diseases that often require **quick action** for effective treatment. These rapid tests enable **early diagnosis** and facilitate timely intervention, which is crucial for preventing complications and reducing mortality.

4. Targeting the Rural and Remote Areas:

○ By bringing diagnostic tests like **Hepatitis B**, **sickle cell anaemia**, and **syphilis** closer to the **grassroots level**, the **revised NEDL** aims to bridge the diagnostic gap in rural and underserved areas.

○ This ensures that even those in **remote villages** can have access to life-saving diagnostics without needing to travel long distances.

Significance of NEDL Updates:

1. Strengthening Primary Healthcare:

○ The updates to the **NEDL** are aligned with the government's **primary healthcare reforms**, enhancing the diagnostic capabilities at the **primary health level**. This supports **early diagnosis**, **prevention**, and **management** of health conditions.

○ By including **basic diagnostic tests** at the sub-center level, India is taking a significant step towards **universal health coverage** and **health equity**.

2. Improving Disease Management:

○ Early detection of conditions like **sickle cell anaemia**, **thalassaemia**, and **Hepatitis B** can significantly improve **disease outcomes** and reduce the burden on tertiary healthcare facilities.

○ The inclusion of **dengue testing** at the grassroots level is particularly crucial during outbreaks, enabling **quicker response** and **preventative measures**.

3. Accessibility and Affordability:

○ The **availability of essential diagnostic tests** at lower levels of healthcare facilities ensures **affordable and accessible healthcare** for a larger section of the population, especially in **rural areas** where healthcare access is limited.

○ These updates also align with India's **commitment to sustainable development goals (SDGs)**, particularly **SDG 3**, which focuses on **good health and well-being**.

4. Public Health Implications:

○ By ensuring that basic diagnostics are available at lower levels, the government is **empowering local health workers** and **improving disease surveillance**, which is vital for **preventing outbreaks** and managing **communicable diseases** effectively.

Conclusion:

The update to the **National Essential Diagnostics List (NEDL)** is a crucial step towards improving **healthcare accessibility** and **quality** in India, especially in **rural and remote areas**. By integrating essential diagnostic tests at the **sub-centre level**, India is advancing its healthcare system and addressing gaps in **early disease detection**. This initiative aligns with the country's broader goals of improving public health infrastructure and ensuring **equitable access to health services** for all.

Mains Questions for UPSC:

1. Discuss the objectives of the National Essential Diagnostics List (NEDL) and its role in strengthening India's healthcare system. How does the revised NEDL improve healthcare accessibility in rural areas?
2. Analyze the significance of including rapid diagnostic tests for conditions like sickle cell anaemia, thalassaemia, and Hepatitis B at the sub-centre level in the revised NEDL. What impact will this have on public health?
3. Evaluate the role of the National Essential Diagnostics List (NEDL) in achieving universal health coverage in India. How can it contribute to improving disease management in remote and underserved areas?
4. What are the challenges in implementing the National Essential Diagnostics List in rural areas? Suggest measures to overcome these challenges and ensure its success.
5. Discuss the importance of early diagnosis in managing infectious diseases like dengue and its inclusion in the revised NEDL. How does it contribute to better public health outcomes in India?

WHO Warns of Potential Global Chikungunya Epidemic

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Health Initiatives and Government Policies
- Disease Control Programs and Public Health

✓ GS Paper III – Economic Development

- Health and Disease Control
- Public Health Challenges and Responses

Introduction:

The **World Health Organization (WHO)** has issued a **warning** about the **global risk** of a major **chikungunya virus epidemic**, stressing the need for **urgent action** to prevent the outbreak from spreading further. Chikungunya, a **mosquito-borne viral disease**, is transmitted primarily by the **Aedes mosquitoes**, which are also responsible for spreading **dengue** and **Zika viruses**. As the **global climate** changes and urbanization increases, the spread of such vector-borne diseases is becoming a growing concern, with more regions at risk of outbreaks.

About Chikungunya:

1. Nature of the Disease:

- **Chikungunya** is a viral disease that causes **fever** and **severe joint pain**, which can last for days or even weeks. The disease is typically **self-limiting**, but its **joint pain** can persist for a long time in some cases, affecting a person's ability to work or perform daily activities.
- **Chikungunya virus** belongs to the **Alphavirus** genus and is primarily transmitted by **Aedes mosquitoes**, which bite during the day, especially in urban areas.

2. Transmission Mechanism:

- The disease is transmitted by **infected female mosquitoes**, most commonly **Aedes aegypti** and **Aedes albopictus**. These mosquitoes are capable of transmitting not only **chikungunya**, but also **dengue** and **Zika viruses**.
- **Mosquitoes become infected** when they bite a person already infected with the chikungunya virus. After an incubation period, the mosquito becomes capable of transmitting the virus to others through their bites.

3. Symptoms and Diagnosis:

- **Chikungunya** symptoms typically begin **3-7 days** after being bitten by an infected mosquito and include:
 - High fever
 - **Severe joint pain** (especially in hands, wrists, and ankles)
 - Headache
 - Muscle pain
 - Rash
- **Diagnosis** is usually based on symptoms and can be confirmed with blood tests detecting the virus or **serologic tests**.

4. Treatment:

- There is **no specific antiviral treatment** for chikungunya. **Supportive care** such as **pain relief** (analgesics and anti-inflammatory drugs) and **fluid replenishment** is typically used to alleviate symptoms. The **joint pain** can sometimes persist even after the infection resolves.
- **Prevention** is the most effective method for controlling chikungunya outbreaks, focusing primarily on **mosquito control** and **preventing mosquito bites**.

WHO's Warning and Global Implications:

1. Increased Risk of Epidemics:

- The **WHO** warns that **climate change, urbanization**, and the spread of **Aedes mosquitoes** into new regions are contributing to an **increased risk** of chikungunya epidemics globally. The **changing climate** creates more favorable conditions for the breeding of mosquitoes, particularly in areas with inadequate **public health infrastructure** and **vector control measures**.
- As **international travel** increases, the risk of **chikungunya spreading across borders** has grown, with several countries in **Africa, Asia, and the Americas** already experiencing outbreaks.

2. Urgent Action Required:

- WHO has called for **urgent action** to combat the spread of the virus, including strengthening **vector control measures**, improving **surveillance systems**, and **raising awareness** about preventive measures.
- **Preventive measures** include **eliminating mosquito breeding sites**, **using insecticide-treated nets**, and **wearing protective clothing** to prevent mosquito bites. Community engagement is crucial in tackling the **spread** of the disease and reducing its burden on health systems.

Indian Government Initiatives:

1. National Vector Borne Disease Control Programme (NVBDCP):

- In India, the **Ministry of Health and Family Welfare** runs the **National Vector Borne Disease Control Programme (NVBDCP)**, which aims to prevent and control vector-borne diseases like **Dengue, Chikungunya, and Malaria**.
- **NVBDCP's strategies** include:
 - **Mosquito control:** Implementation of measures such as **fogging, spraying insecticides**, and **source reduction** (eliminating mosquito breeding sites).
 - **Surveillance:** Regular monitoring of **vector populations**, and **rapid detection** of outbreaks.
 - **Community awareness programs** to inform people about preventive measures.

2. State-level Initiatives:

- Various states in India have adopted **state-specific strategies** to combat chikungunya outbreaks, including:
 - **Awareness campaigns** on using **mosquito nets** and **repellents**.
 - **Health camps** to provide **treatment** to affected individuals.

- Coordinated efforts between the **health departments, local governments, and community organizations** to implement vector control and awareness activities.

Conclusion:

The global rise of **chikungunya outbreaks**, as warned by the **World Health Organization (WHO)**, highlights the urgent need for **global cooperation, stronger surveillance, and enhanced vector control measures** to prevent the spread of the disease. In India, the **National Vector Borne Disease Control Programme (NVBDCP)** is a critical initiative in controlling diseases like **chikungunya**, but sustained **community engagement and government action** will be essential to minimize the **impact** of such epidemics.

Mains Questions for UPSC:

1. **What is the chikungunya virus, and how does it affect public health? Discuss the measures taken by the Indian government to control vector-borne diseases like chikungunya.**
2. **Examine the role of climate change and urbanization in the spread of vector-borne diseases like chikungunya. What global strategies can be adopted to address these challenges?**
3. **Evaluate the effectiveness of the National Vector Borne Disease Control Programme (NVBDCP) in controlling diseases like dengue and chikungunya in India. What improvements can be made in this program?**
4. **Discuss the role of international organizations like WHO in addressing the global challenges posed by vector-borne diseases. How can India contribute to international efforts in combating such diseases?**
5. **Critically assess the public health strategies that can be employed to prevent the spread of chikungunya in urban and rural areas. How can awareness programs play a role in combating this disease?**

SCIENCE & TECHNOLOGY

IIT Guwahati Develops Eco-Friendly Bamboo Composite for Autos

❖ Syllabus Mapping:

✓ GS Paper III – Economic Development

- Environmental Conservation and Sustainable Development
- Innovations in Eco-Friendly Technologies

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Government Initiatives for Promoting Innovation

Introduction:

Researchers at IIT Guwahati have developed a **sustainable, eco-friendly bamboo composite** using **Bambusa tulda** in combination with **biodegradable polymers**. This innovative material is designed to be used in the **automobile industry**, offering a **sustainable alternative** to conventional materials used in car manufacturing. The use of **Bambusa tulda**, a species of bamboo, reflects the growing trend of using **natural, biodegradable resources** for industrial applications, contributing to **environmentally friendly practices**.

About Bambusa tulda:

1. **Type and Growth Characteristics:**
 - **Bambusa tulda** is a **clump-forming evergreen/deciduous bamboo** species known for its **fast growth**. This makes it a sustainable and renewable resource for various industries.
 - **Growth Rate:** The species is known for its **rapid growth**, reaching heights of up to **30 meters** within a few years, making it an excellent source for sustainable raw materials.
 - **Cultivation:** Found in several countries across South and Southeast Asia, including **India, Bangladesh, Myanmar, and Thailand**, **Bambusa tulda** thrives in **moist lowland tropics** and can grow at elevations of up to **1500 meters**.
2. **Monocarpic Nature:**
 - **Bambusa tulda** is **monocarpic**, meaning it flowers only once in **25–40 years**, after which the plant dies. This unique reproductive cycle has implications for **harvesting practices** and the longevity of bamboo plantations.
3. **Local Names:**
 - In **Assam**, it is locally known as **Jati Bahn**; in **Tripura**, it is called **mriringa**; and it is sometimes referred to as **spineless Indian bamboo**.

Uses of Bambusa tulda:

1. **Edible Shoots:**
 - o The young shoots of Bambusa tulda are **edible** but have a **slightly bitter taste**. These shoots are often **pickled** and consumed as a **delicacy** in various regions, contributing to **local cuisine**.
2. **Medicinal Value:**
 - o The bamboo's **siliceous secretion** is used in traditional medicine as an **aphrodisiac** and **tonic**, reflecting the plant's **therapeutic properties**.
3. **Industrial and Commercial Uses:**
 - o Bambusa tulda is also used to make a variety of products, including:
 - **Agarbatti sticks** (incense sticks)
 - **Lumber** for construction and furniture
 - **Paper products**
 - **Handicrafts**, which are popular in local artisanal markets
4. **Sustainability in Manufacturing:**
 - o As an eco-friendly resource, Bambusa tulda serves as a **sustainable alternative** for industrial applications, particularly in the **automobile industry**, where it is now being combined with **biodegradable polymers** to create an **eco-friendly composite** material.

Innovative Use of Bambusa tulda in Automobiles:

1. **Eco-Friendly Composite for Automobiles:**
 - o The researchers at IIT Guwahati have developed a composite material by combining **Bambusa tulda** with **biodegradable polymers** for use in **automobile manufacturing**. This innovative approach reduces the reliance on traditional, environmentally harmful materials, such as **plastics** and **metals**, which have significant carbon footprints.
2. **Benefits of the Composite Material:**
 - o **Lightweight**: Bamboo composites are significantly **lighter** than metal, which can reduce the overall weight of vehicles, improving **fuel efficiency**.
 - o **Sustainability**: The use of **biodegradable polymers** and bamboo contributes to a **reduction in carbon emissions** and promotes **sustainability** in the automotive industry.
 - o **Renewable Resource**: Bambusa tulda's **fast growth** and renewability make it a sustainable resource compared to non-renewable materials traditionally used in automotive parts.
3. **Applications in Automotive Industry:**
 - o This bamboo composite can be used in **interior panels**, **dashboard components**, and **exterior parts** of vehicles, offering an eco-friendly solution for the growing demand for **sustainable automotive materials**.

Environmental Impact and Future Prospects:

1. **Reduction in Environmental Footprint:**
 - o By using **Bambusa tulda** in **automobile manufacturing**, India can significantly reduce the **environmental impact** of car production, which is traditionally resource-intensive. This move aligns with India's **commitment to sustainability** and **climate action**.
2. **Scalability and Global Application:**
 - o As **sustainability** becomes a key focus in the global automobile industry, the use of **natural, biodegradable materials** like Bambusa tulda will likely gain traction worldwide, making this development an important **exportable innovation** for India's **manufacturing sector**.
3. **Encouraging Local Industries:**
 - o The use of Bambusa tulda in industrial applications can also support **local bamboo industries** in India, creating economic opportunities in **rural areas** and boosting the **green economy**.

Conclusion:

The development of an **eco-friendly bamboo composite** using **Bambusa tulda** for automobiles is a significant step towards **sustainable manufacturing** and **environmentally friendly practices** in India. This innovation, combining fast-growing bamboo with biodegradable polymers, provides a solution to the **environmental challenges** faced by industries like **automotive manufacturing**, while promoting **local resources** and contributing to **socio-economic development**. As **global demand for green technologies** rises, this eco-friendly alternative may pave the way for **greener industrial practices** and **sustainable growth**.

Mains Questions for UPSC:

1. Explain the potential of using sustainable materials like Bambusa tulda in the automobile industry. How can it contribute to reducing the environmental impact of manufacturing?
2. Discuss the significance of eco-friendly innovations, such as bamboo composites, in achieving India's environmental and sustainability goals. How can India further promote the use of indigenous resources for industrial applications?
3. Evaluate the socio-economic benefits of using bamboo-based materials in manufacturing, particularly in rural areas. How can this innovation contribute to local economies and sustainable development?
4. What are the challenges and opportunities in the widespread adoption of biodegradable and renewable materials in industrial sectors like automobiles? How can India overcome these challenges?

Indian Railways Tests First Hydrogen-Powered Coach

📌 Syllabus Mapping:

✓ GS Paper III – Economic Development

- Infrastructure Development
- Environment and Sustainability

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Government Initiatives in Transport and Clean Energy

Introduction:

In a significant development towards **sustainable transportation**, Indian Railways has successfully tested the **nation's first hydrogen-powered coach** at the **Integral Coach Factory (ICF)**. This initiative is a key part of **Indian Railways' broader vision** to deploy **hydrogen-powered trains** on **heritage and hill routes** under the "**Hydrogen for Heritage**" initiative launched in **2023**. The hydrogen-powered coach marks a crucial step in India's **National Green Hydrogen Mission**, setting the foundation for future advancements in **clean energy** in the rail transport sector.

Key Features of the Hydrogen-Powered Coach:

1. Hydrogen-Powered Trains:

- The **hydrogen-powered trains** feature a **1,200 HP engine**, making it the **world's most powerful hydrogen propulsion system** developed for rail transport. This makes India a pioneer in using **hydrogen** for high-power applications in the rail sector.

2. Hydrogen for Heritage Initiative:

- Under the "**Hydrogen for Heritage**" initiative, Indian Railways plans to deploy **35 hydrogen-powered trains** on heritage and **hill routes**, areas where **electric infrastructure** is often not feasible. The initiative aligns with India's commitment to reduce **carbon emissions** and transition to **green energy** solutions in the transportation sector.

3. Significance in National Green Hydrogen Mission:

- The successful test of the hydrogen-powered coach aligns with India's **National Green Hydrogen Mission**, which focuses on **green hydrogen production** and **fuel-cell technologies** for cleaner alternatives in transport and industrial sectors.

Benefits of Hydrogen as an Alternative Fuel:

1. Higher Energy Density:

- **Green hydrogen** has a higher **energy density** compared to **batteries**, making it an ideal solution for long-distance and heavy-duty transport such as **railways**. It can also be stored and transported in **large quantities**, ensuring its availability for long-duration travel.

2. Zero Emissions:

- One of the most significant advantages of **hydrogen fuel-cell trains** is that they emit **only water vapor**, making them a **zero-emission** alternative to conventional diesel-powered trains. Replacing a single **diesel train** with a hydrogen-powered one can reduce **CO₂ emissions** equivalent to the annual output of **400 cars**, significantly cutting down the carbon footprint of the railway sector.

3. Lower Infrastructure Requirements:

- Hydrogen-powered locomotives can run on **existing railway tracks** with **lower infrastructure requirements** compared to **electrification projects**. This makes **hydrogen technology** a cost-effective solution for **remote or less-frequented routes** where building electric rail infrastructure may be economically unviable.

Challenges in Adopting Hydrogen as an Alternate Fuel:

1. Limitations in Green Hydrogen Production:

- The **current production of green hydrogen** in India is limited. Most of the **hydrogen** produced in the country comes from **steam methane reforming** (known as **Grey Hydrogen**), which is not environmentally friendly.
- India lacks **high-capacity proton exchange membrane-based electrolysis plants**, which are required to produce **green hydrogen** from **renewable energy sources** such as **solar and wind**.

2. Uncertainty in Demand:

- There is no clear **roadmap** for the **extent of hydrogen adoption** in Indian Railways. The lack of a definite strategy regarding the **scalability** of hydrogen-powered trains poses a challenge to the **long-term sustainability** of this technology.

3. Supply Chain and Infrastructure Challenges:

- Building a **reliable supply chain** for hydrogen, including **storage, transport**, and **refueling stations** along selected routes, is another challenge that Indian Railways will need to overcome to make hydrogen technology more widespread.

Strategic Steps for Advancing Hydrogen Technology in Indian Railways:

1. Expanding Pilot Projects:

- Indian Railways can expand **pilot projects** beyond heritage routes to test the **feasibility** of hydrogen-powered trains on **mainstream routes**. This will help gather insights into the **efficiency** and **cost-effectiveness** of the technology.

2. Building Hydrogen Infrastructure:

- Establishing a **supply chain** for hydrogen production and refueling stations on key routes is essential to make hydrogen-powered trains operational. This would involve developing **storage facilities** and **refueling stations** at strategic locations across the railway network.

3. Focusing on Remote Routes:

- For **cost-effective adoption**, Indian Railways should prioritize **low-frequency, remote routes** that are difficult to electrify. These routes are ideal for **hydrogen-powered trains** due to their limited passenger traffic and the high cost of electrification.

4. Collaboration for Green Hydrogen Production:

- Indian Railways should collaborate with **ministries** and **public sector undertakings (PSUs)** to scale up **green hydrogen production**. These collaborations could include the use of **renewable energy sources** for large-scale hydrogen production, making it **environmentally sustainable**.

Conclusion:

The successful **test of the hydrogen-powered coach** by Indian Railways represents a **significant milestone** in the country's efforts to reduce its carbon footprint and transition to **cleaner energy alternatives** in the transport sector. While challenges such as **green hydrogen production and infrastructure development** remain, the **Hydrogen for Heritage initiative** and Indian Railways' efforts to scale up **hydrogen-powered trains** show promising potential for **sustainable rail transport**. As the nation moves forward with this innovative technology, it aligns with India's broader goals of **green energy** and **climate change mitigation**.

Mains Questions for UPSC:

1. Discuss the potential of hydrogen-powered trains in India. How can this technology contribute to the country's goals of sustainable transportation and reducing carbon emissions?
2. What are the challenges in the adoption of hydrogen as an alternative fuel for rail transport in India? How can Indian Railways overcome these challenges to scale up hydrogen technology?
3. Explain the role of green hydrogen in India's energy transition. How can India scale its hydrogen production infrastructure to meet the growing demand for clean energy in sectors like transport and industry?
4. Evaluate the feasibility of hydrogen-powered trains in India's railway network. How can pilot projects on heritage routes be expanded to mainstream railway routes?
5. What strategic steps can Indian Railways take to ensure the effective implementation of hydrogen-powered trains on a large scale? Discuss the role of public-private collaboration in scaling hydrogen technology.

AI for India 2.0: Empowering Youth in Vernacular Languages

❖ Syllabus Mapping:

✓ GS Paper II – Governance, Constitution, Polity, and International Relations

- Government Policies on Education and Skill Development
- Use of Technology in Empowering Citizens

✓ GS Paper III – Economic Development

- Technological Advancements in the Economy
- AI and Machine Learning in Economic Growth

Introduction:

The **Ministry of Skill Development and Entrepreneurship (MSDE)** has launched the **AI for India 2.0 Programme**, aimed at making **tech skills** like **Artificial Intelligence (AI)** and **Machine Learning (ML)** accessible to India's youth. The initiative, which enables **tech learning in 9 vernacular languages** (including **Hindi, Telugu, and Kannada**), seeks to empower **college students, fresh graduates, and early-career professionals**, particularly from **rural and non-English-speaking backgrounds**. By providing **free online training**, the program ensures that AI skills are not limited to **English-speaking urban youth** but are extended to all corners of India.

About the AI for India 2.0 Programme:

1. Purpose and Objective:

- The primary purpose of the **AI for India 2.0 Programme** is to make **tech skills** like **AI** and **ML** accessible to the youth across India, ensuring that no segment of society is left behind in the country's push towards **technological advancement**.
- The program is particularly focused on addressing the challenges faced by **youth in rural areas** or from **non-English-speaking backgrounds**, making advanced **tech education** more **inclusive** and **affordable**.

2. Target Group:

- The program specifically targets **college students, fresh graduates, and early-career professionals** who are interested in developing **AI and ML** skills.
- **Special focus** is placed on youth from **rural areas**, as well as those who are **non-English speakers**, providing them with the resources to enhance their career prospects in the **technology sector**.

3. Free Online Training:

- The **AI for India 2.0 Programme** offers **free online training** in **Artificial Intelligence (AI)** and **Machine Learning (ML)**.
- The courses are designed to **equip learners** with the necessary **skills and knowledge** to **pursue careers** in the rapidly evolving **tech industry**.
- The training is structured to ensure that **every learner**, regardless of their **geographical location or linguistic background**, can access **high-quality content**.

4. Vernacular Language Support:

- One of the key features of the program is its **support for 9 vernacular languages** like **Hindi, Telugu, Kannada**, and others, ensuring that language is not a barrier to **learning AI and ML**.
- By breaking the language barrier, the program ensures that **learners** from various parts of India, including **rural regions**, can easily **understand** and **engage** with the course material.

5. Skill Development and Employment Opportunities:

- The **AI for India 2.0 Programme** aims to equip India's youth with skills that are critical in the **AI and ML fields**, opening doors to **global employment opportunities** in industries such as **tech, healthcare, and finance**.
- By providing access to **cutting-edge tech education**, the program helps to bridge the **skills gap** in India's **technology workforce** and enables youth to be **industry-ready**.

Impact and Benefits:

1. Promoting Inclusivity in Tech Education:

- The **AI for India 2.0 Programme** makes **AI and ML training** available to a much broader demographic, including **marginalized communities**, ensuring **inclusivity** in a sector that has traditionally been dominated by those with access to **English-language education** and **urban resources**.
- It contributes to creating a **level playing field**, offering opportunities to individuals who previously may have faced **barriers** in accessing such training.

2. Enhancing Career Opportunities:

- By enabling access to **high-demand skills** like **AI and ML**, the program ensures that **youth** have the tools to build successful careers in industries that are central to **India's future growth**.
- It also **aligns with India's vision** of becoming a **global leader in technology**, fostering a skilled **tech workforce** that can drive **innovation** and **economic growth**.

3. Regional Empowerment:

- The **vernacular language** support allows the program to cater to learners in **remote and underserved areas**, where **English-medium education** may not be as accessible.
- This approach ensures that **young people** from all corners of India have access to **world-class technology education**, promoting **regional empowerment** and reducing **regional inequalities**.

4. Aligning with National Skill Development Initiatives:

- The AI for India 2.0 Programme is in line with India's broader **National Skill Development Mission**, which aims to equip a significant portion of the Indian population with **skills relevant to the 21st-century job market**.
- This initiative helps **support India's youth** as they transition into the **future job market**, where **digital skills** and **AI proficiency** are increasingly essential.

Conclusion:

The **AI for India 2.0 Programme** is a transformative initiative that offers **free access to AI and ML training**, with special emphasis on youth from **rural and non-English-speaking backgrounds**. By **removing language barriers**, it empowers the **next generation of tech leaders**, equipping them with the skills needed for **career growth** in the **global digital economy**. The program also strengthens India's **commitment to inclusive education** and its goal of **creating a skilled workforce** to meet the demands of **emerging industries**.

Mains Questions for UPSC:

1. Discuss the objectives and impact of the 'AI for India 2.0 Programme' launched by the Ministry of Skill Development and Entrepreneurship. How does it address the skills gap in India's tech sector?
2. How can the AI for India 2.0 initiative help bridge the digital divide in India, especially in rural areas and among non-English speaking communities?
3. Evaluate the role of vernacular language support in promoting skill development in India. How can initiatives like AI for India 2.0 contribute to more inclusive growth in the tech sector?
4. Examine the significance of AI and ML skills for India's workforce in the context of emerging industries. How can government initiatives like the AI for India 2.0 Programme contribute to enhancing India's competitiveness in global tech markets?
5. What challenges might arise in the implementation of AI training initiatives in vernacular languages, and how can these challenges be addressed to ensure effective reach and impact?