IQRA IAS

An Institute for Civil Services

WEEKLY UPDATES

DATE : 30th Dec- 5th Jan

Table of Contents

POLITY & GOVERNANCE

Judicial Accountability

Syllabus: Polity (UPSC Mains GS-II)

1. Context:

Judicial Misconduct: Recent incidents of bias and misconduct among Indian judges have reignited debates on judicial accountability. For example, Justice Shekhar Kumar Yadav's speech reflecting biases against a community highlighted challenges in holding the higher judiciary accountable.

2. What is Judicial Accountability?

Definition: Judicial accountability ensures that judges are responsible for their actions and decisions. It emphasizes **transparency, ethical conduct, and adherence to the law**, safeguarding public trust in the judiciary.

3. Provisions for Judicial Accountability

a. Constitutional Provisions:

1. **Article 124(4) & 124(5)**: Impeachment of Supreme Court judges for proven misconduct or incapacity.
2. **Article 217**: Impeachment of High Court judges on similar grounds.
3. **Article 235**: High Courts empowered to control and supervise subordinate courts.
4. **Restatement of Judicial Values (1997)**: Code of conduct for higher judiciary members.

b. Legal Provisions:

1. **Judges (Inquiry) Act, 1968**: Establishes mechanisms to investigate judicial misconduct via a three-member panel.
2. **Contempt of Courts Act, 1971**: Protects judiciary from undue influence, ensuring independence.
3. **Judicial Standards and Accountability Bill (Pending)**: Proposes enhanced transparency and oversight mechanisms.

4. Need for Judicial Accountability

1. **Public Trust**: Critical for maintaining citizens' confidence in the judiciary.
2. **Misconduct Prevention**: Ensures ethical adherence and compliance with constitutional norms.
3. **Transparency**: Judicial decisions must be open to scrutiny for fairness and impartiality.
4. **Balancing Independence**: Avoids misuse of judicial independence for personal or political motives.
5. **Rule of Law**: Guarantees decisions are unbiased and aligned with constitutional principles.

5. Examples of Judicial Accountability

1. **Justice Soumitra Sen's Impeachment (2011)**: Found guilty of financial misconduct as a court-appointed receiver.
2. **Justice P.D. Dinakaran's Resignation (2011)**: Resigned amid allegations of corruption and land grabbing.
3. **RTI and Judiciary (2020)**: Supreme Court upheld RTI's applicability, enhancing transparency in judicial appointments.

6. Challenges to Judicial Accountability

1. **Impeachment Complexity**: The process requires a cumbersome two-thirds majority in Parliament.
2. **Limited Oversight**: Lack of robust mechanisms to externally monitor judicial conduct.
3. **Independence Concerns**: Over-accountability may threaten judicial independence.
4. **Resignation Avoidance**: Judges often resign to evade inquiries.
5. **Lack of Transparency**: Closed-door deliberations reduce public confidence.

7. Way Ahead

1. **Legislative Reforms**: Expedite passage of the **Judicial Standards and Accountability Bill** for a structured oversight framework.
2. **Internal Oversight**: Develop **independent judicial review bodies** to monitor judicial conduct.
3. **Codified Guidelines**: Strengthen the enforcement of the **Restatement of Judicial Values**.
4. **Public Scrutiny**: Publish judgments and judicial activities regularly to enhance transparency.
5. **Ethical Training**: Conduct routine ethical training for judges, ensuring adherence to democratic and constitutional principles.

8. Conclusion

Judicial accountability is indispensable for preserving the **integrity and independence** of the judiciary. Institutional reforms, **transparent mechanisms**, and adherence to constitutional principles are essential to uphold public trust and promote democratic governance.

Dissent in Judiciary

Syllabus: Polity and Governance – Judiciary (UPSC Mains GS-II)

1. Context

Dissent in Constitutional Courts: Judicial dissent is vital for **democracy**, fostering alternate perspectives and enhancing **constitutional discourse**. While dissent is influential in both **India's Supreme Court** and the **U.S. Supreme Court**, their contexts and impacts differ.

2. What is Dissent in Judiciary?

1. **Definition**: Judicial dissent occurs when **one or more judges disagree** with the **majority opinion** in a decision.
2. **Significance**:
   - Reflects **alternate legal interpretations**.
   - Strengthens **democratic dialogue**.
   - Shapes **future legal developments** and constitutional thought.

3. Types of Judicial Dissents

1. **Intellectual Dissent**:
   - Based on **logical or textual differences** in law interpretation.
   - **Example**: Justice B.V. Nagarathna's dissent in **Lalta Prasad Vaish (2024)** on taxing industrial alcohol under "intoxicating liquor."
2. **Political Dissent**:
   - Arises from resistance to **political influences**.
   - **Example**: Justice H.R. Khanna's dissent in **ADM Jabalpur (1976)** upheld **Article 21's sanctity** during the Emergency.
3. **Social Dissent**:
   - Contrasting views on **societal or cultural issues**.
   - **Example**: Justices Khehar and Nazeer's dissent in **Shayara Bano (2017)**, upholding **triple talaq** as integral to Sunni personal law.

4. Differences Between Indian and U.S. Judicial Dissents

Aspect	India	USA
Appointment Process	Judges appointed through **collegium system**, independent of politics.	Judges appointed by **President** and confirmed by **Senate**, reflecting political leanings.
Basis of Dissent	Focuses on **legal interpretation, societal issues**, and intellectual critique.	Often influenced by **political ideologies** (liberal vs. conservative).
Political Impact	Judgments are generally **apolitical**, reflecting institutional independence.	Often align with **partisan leanings** (e.g., Republican or Democrat).
Judicial Philosophy	Emphasizes **constitutional morality** and **evolving societal norms**.	Reflects **originalist** or **progressive constitutional interpretations**.
Examples	Justice Khanna's dissent in **ADM Jabalpur**upheld rights over politics.	Justice Alito's dissent in **Obergefell v. Hodges** opposed same-sex marriage.

5. Recent Indian Examples of Dissent

1. **Sita Soren (2023)**: Overruled **parliamentary privilege** for bribes, dissenting against **P.V. Narasimha Rao (1998)**.
2. **Hijab Case (2022)**: Justice Dhulia emphasized **diversity over secularism** in State-run schools.
3. **Lalta Prasad Vaish (2024)**: Justice Nagarathna dissented on **States' inability to tax industrial alcohol**.

6. Consequences of Political Dissents

1. **Democratic Strengthening**: Upholds judicial **independence**, ensuring courts act as checks on **executive and legislative powers**.
2. **Catalyst for Reform**: Influences **constitutional amendments** and future legislation by exposing flaws in majority opinions.

3. **Public Perception**: Shapes understanding of **judicial impartiality**, but politically charged dissents may raise **bias concerns**.
4. **Judicial Integrity Risks**: Perceived **partisanship** in dissenting opinions may undermine judicial neutrality.
5. **Professional Repercussions**: Dissenting judges in sensitive cases may face **criticism** or isolation.

7. Way Ahead

1. **Fostering Judicial Independence**: Strengthen judiciary's **autonomy** to resist political and executive pressures.
2. **Encouraging Open Discourse**: Promote constructive **debates** within judicial forums to enrich legal interpretations.
3. **Training and Awareness**: Expose judges to **global judicial practices**, balancing individual rights and societal needs.
4. **Institutional Safeguards**: Shield dissenting judges from **external criticism** and professional isolation.
5. **Leveraging Technology**: Make dissenting opinions **accessible** to educate citizens about **alternative legal interpretations**.

8. Conclusion

Judicial dissent is the **cornerstone of democracy**, allowing diverse legal perspectives to **refine jurisprudence** and safeguard constitutional principles. In India, dissents have shaped **constitutional interpretation**, enhancing public trust in the judiciary and ensuring its role as the **guardian of democracy**.

Overseas Voters in India

Syllabus: Polity – Electoral Reforms and Participation (UPSC Mains GS-II)

1. Context

Low NRI Voter Turnout: Despite rising registrations, overseas Indian voter participation in the **2024 Lok Sabha elections** remains low, emphasizing the need for voting reforms for **Non-Resident Indians (NRIs)**.

2. About Overseas Voters

1. **Definition**: Overseas voters, or **overseas electors**, are **Indian citizens residing abroad** but registered to vote in their respective Indian constituencies.
2. **Eligibility**: Must hold an **Indian passport** and register in their **home constituency's electoral roll**.
3. **Data (Source: Election Commission of India)**:
    - **2024 Registrations**:
        - **1,19,374** overseas electors.
        - Kerala accounts for the highest registrations (**89,839**).
    - **2019 Registrations**:
        - **99,844 registered voters**, marking an increase in 2024.
    - **Turnout in 2019**:
        - Only **2,958 overseas voters** participated.
        - **2,670** of these were from Kerala.

3. Significance of Overseas Voter Participation

1. **Global Representation**: NRIs symbolize **India's global footprint**, connecting the diaspora with their homeland.
2. **Democratic Inclusivity**: Ensures **universal franchise**, strengthening India's democratic fabric.
3. **Economic and Social Contribution**: NRIs are vital contributors to India's **economy** and act as **cultural ambassadors** globally.

4. Challenges in Participation

1. **Travel Costs**: High expenses involved in traveling to India deter voter participation.
2. **Employment Constraints**: Many NRIs cannot take time off work to travel and vote.
3. **Legal Restrictions**: Current laws mandate **in-person voting**, making it restrictive for overseas electors.

5. Proposed Reforms

1. **Electronically Transmitted Postal Ballot System (ETPBS)**: Enables overseas voters to cast their vote through **postal ballots** electronically transmitted to their location.
2. **Proxy Voting**: Proposed in **2018**, this system allows NRIs to authorize a representative in their home constituency to vote on their behalf.
3. **Facilitation of Remote Voting**: Explore **secure online voting mechanisms** to increase accessibility for NRIs.

6. Way Ahead

1. **Policy Implementation**: Expedite the adoption of **ETPBS** and reconsider **proxy voting proposals** to reduce logistical barriers.
2. **Awareness Campaigns**: Educate NRIs about **registration and voting options**, encouraging greater participation.
3. **International Coordination**: Work with Indian embassies to create **voting facilitation centers** for NRIs.
4. **Technological Integration**: Leverage secure technology for **remote voting**, ensuring transparency and credibility.

Private Members' Bills

Syllabus: Polity – Parliament and Legislative Processes (UPSC Mains GS-II)

1. Context

Limited Discussion: During the **17th Lok Sabha (2019–2024)**, only **9.08 hours** were spent discussing **Private Members' Bills** in the **Lok Sabha** and **27.01 hours** in the **Rajya Sabha**, highlighting their marginal role in legislative processes.

2. What is a Private Member's Bill?

1. **Definition**: A **legislative proposal** introduced by **Members of Parliament (MPs)** who are **not part of the government**.
2. **Purpose**: Represents individual MPs' **legislative priorities** or public issues outside the **official government agenda**.
3. **Introduced by**: MPs from both **ruling and opposition parties**.

3. Features of Private Members' Bills

1. **Non-Binding**: Rejection does not affect the government's **confidence** or **stability**.
2. **Legislative Independence**: Reflects the **independent voice** of parliamentarians.
3. **Historical Significance**: Only **14 Private Members' Bills** have become law, the last in **1970**.
4. **Scheduling**: Reserved for discussion on **Fridays**, limiting time and priority.

4. Procedure in the House

1. **Drafting and Notice**: The member drafts the Bill and gives a **one-month notice** before introduction.
2. **Introduction**: The Bill is introduced in the House, followed by **initial discussion** and potential referral to a **committee**.
3. **Debate**: If selected, the Bill is debated during the allotted **Friday session**.
4. **Decision**: The member may withdraw it at the request of a minister or proceed to **voting**.

5. Challenges in Private Members' Bills

1. **Limited Time**: Reserved only for **Fridays**, reducing the chance for thorough discussions.
2. **Low Success Rate**: Rarely become laws, with only 14 Bills passed since **1952**.
3. **Marginal Priority**: Often overshadowed by the government's legislative agenda.
4. **Political Constraints**: Bills introduced by opposition MPs often face resistance from the ruling majority.

6. Significance of Private Members' Bills

1. **Democratic Representation**: Enables MPs to raise **issues of public concern** and contribute to policymaking.
2. **Legislative Innovation**: Brings **fresh ideas** and **diverse perspectives** to the legislature.
3. **Accountability Mechanism**: Keeps the government aware of **public priorities** and challenges.
4. **Historical Contributions**: Notable laws like the **Muslim Wakf Act (1954)** originated as Private Members' Bills.

7. Way Ahead

1. **Increased Time Allocation**: Dedicate more time for discussions on **Private Members' Bills** in both Houses.
2. **Awareness and Support**: Educate MPs about the significance of such Bills and encourage their active participation.
3. **Strengthening Committees**: Refer Bills to **committees** for detailed examination and bipartisan input.
4. **Enhancing Legislative Opportunities**: Introduce mechanisms to ensure **meritorious Private Members' Bills** receive due consideration.

8. Conclusion

Private Members' Bills are an essential aspect of parliamentary democracy, offering MPs an avenue to **independently voice public concerns**. Enhanced discussion and prioritization of these Bills can strengthen **legislative inclusivity** and ensure a more robust **democratic framework**.

Google Willow Chip

Syllabus: Science and Technology – Quantum Computing (UPSC Mains GS-III)

1. Context

Google Unveils Willow Quantum Processor: Google introduced **Willow**, its latest quantum processor, showcasing advancements in **quantum error correction** and computational scalability.

2. About Willow Quantum AI

1. **Specifications**: Equipped with **105 physical qubits** to enhance **error correction** and ensure scalability.
2. **Key Features**:
    - **Error Correction Protocols** Uses **surface code** with **data qubits** and **measurement qubits** to detect and mitigate errors while maintaining qubit states.
    - **Superconducting Qubits**: Operates at temperatures near **absolute zero (-273.15°C)** for optimal stability.
    - **Improved Coherence Time**: Achieves **100 microseconds**, allowing qubits to retain information longer during computations.
    - **Leakage Error Management**: Incorporates additional **measurement qubits** to manage **leakage errors** effectively.

3. Significance of Willow

1. **Computational Breakthrough**: Completed the **Random Circuit Sampling (RCS) task** in **minutes**, a task that would take classical computers **10 septillion years**.
2. **Error Reduction Below Threshold**: Demonstrates a decline in error rates with increased qubits, addressing a major hurdle for **practical quantum computing**.
3. **Applications in Complex Problems**: Potential to tackle challenges in:
    - **Drug discovery**.
    - **Climate modelling**.
    - **Materials science**.
    - **Optimization problems**.
4. **Foundation for Scalability**: Solves key issues in **scaling quantum computers**, ensuring reliability as systems grow larger.
5. **Societal Impact**: Could revolutionize industries and provide solutions to **global challenges**, including **sustainability**, **healthcare**, and **energy**.

4. Way Ahead

1. **Enhancing Error Correction**: Focus on reducing error rates further for increased reliability in **quantum computations**.
2. **Application Development**: Expand the use of quantum systems in **real-world scenarios** across industries.
3. **Collaboration and Accessibility**: Foster partnerships with academia, governments, and industry to accelerate the adoption of quantum technology.
4. **Policy Frameworks**: Establish **global standards** and policies for responsible quantum computing use.

Open Data Kit (ODK) Platform: CAG Toolkit

Syllabus: Governance, Accountability, and e-Governance (UPSC Mains GS-II)

1. Context

The **Comptroller and Auditor General (CAG) of India** has introduced a **toolkit** based on the **Open Data Kit (ODK) platform** to ensure **transparency in public spending** and evaluate the **effectiveness of government schemes**.

2. About the CAG Toolkit

1. **What it is**: A **digital platform** leveraging **Open Data Kit (ODK)** technology for:
    - Designing.
    - Collecting.
    - Managing **audit-related data**.
2. **Launched by**: The **Comptroller and Auditor General (CAG) of India**.

3. Objectives of the Toolkit

1. **Transparency in Public Spending**: Tracks the utilization of government funds efficiently.
2. **Accountability**: Enhances the delivery of **government schemes** through real-time feedback.
3. **Informed Audit Planning**: Collects **beneficiary feedback** to tailor audits based on ground realities.

4. Key Features

1. **Integration with OIOS** Linked to CAG's **Operating System (OIOS)** for seamless data processing.
2. **Secure Data Management**: Provides **end-to-end encryption** to safeguard sensitive information.
3. **Multi-Language Support**: Facilitates **beneficiary surveys** in multiple languages for inclusivity.
4. **User-Friendly Interface**: Simplifies the process of designing and managing **data collection surveys**.

5. How It Works

1. **Survey Design**: Surveys are created on the **ODK platform** tailored to specific schemes or audits.
2. **Real-Time Data Collection**: Beneficiaries provide feedback using smartphones or tablets.

3. **Data Analysis**: Collected information is analyzed through **OIOS** to generate audit evidence.
4. **Feedback Utilization**: Beneficiary feedback identifies **problem areas** and informs **scheme improvements**.

6. Significance of the CAG Toolkit

1. **Data-Driven Decision-Making**: Promotes **evidence-based audits** and policy corrections.
2. **Citizen-Centric Approach**: Focuses on **real beneficiaries' feedback** for better evaluation of schemes.
3. **Improved Service Delivery**: Helps institutions like **AIIMS** enhance their performance and public service quality.
4. **Efficiency in Governance**: Reduces delays and ensures **accountability** in public spending.
5. **Scalability**: Can be extended to monitor multiple government schemes across sectors.

7. Way Ahead

1. **Wider Adoption**: Extend the platform to other auditing bodies and government departments.
2. **Capacity Building**: Train auditors and field officers in using the ODK platform effectively.
3. **Public Awareness**: Inform beneficiaries about the tool to encourage honest and widespread participation.
4. **Technological Upgrades**: Incorporate **AI and machine learning** to analyze trends and patterns in feedback.
5. **Monitoring and Feedback**: Continuously evaluate the toolkit's effectiveness and make necessary adjustments.

BAANKNET Portal

Syllabus: Governance – Financial Inclusion, e-Governance (UPSC Mains GS-II & GS-III)

1. Context

The Government of India has launched the revamped **'BAANKNET' portal**, a centralized platform for **e-auctions of properties** held by **Public Sector Banks (PSBs)**. This initiative aims to improve **transparency, efficiency, and recovery processes** for distressed assets.

2. About BAANKNET Portal

1. **What is BAANKNET?**
   - A **centralized platform** designed to facilitate the **e-auction of properties** held by PSBs to recover bad loans.
   - Managed by the **Department of Financial Services (DFS)** under the **Ministry of Finance**.
2. **Key Objectives**:
   - **Streamline Recovery**: Assist PSBs in recovering **bad loans** and strengthening **balance sheets**.
   - **Unlock Value**: Maximize the value of **distressed assets** and enhance investor confidence.
   - **Ease of Access**: Create a **user-friendly** platform for buyers and investors to explore and bid on properties.

3. Features of BAANKNET Portal

1. **Consolidated Listings**:
   - Hosts over **122,500 properties**, including:
     - **Residential, commercial, and industrial properties**.
     - **Agricultural land, vehicles**, and **machinery**.
2. **Technology-Driven Platform**:
   - Built on **microservices architecture** for seamless operations.
   - Integrated with an **automated payment gateway** and **KYC tools** for secure transactions.
3. **End-to-End Processes**:
   - Covers all stages:
     - **Pre-auction**: Property listings and bidder registration.
     - **Auction**: Transparent bidding process.
     - **Post-auction**: Finalizing sales and property handovers.
4. **Support System**:
   - **Helpdesk and Call Center**: Offers callback options for resolving queries.
5. **Training Programs**:
   - DFS-trained PSB executives and **Debt Recovery Tribunal (DRT)** officers for effective usage.

4. Significance of the BAANKNET Portal

1. **Enhanced Transparency**: Reduces **irregularities** in asset disposal by providing a **centralized and transparent** bidding process.
2. **Efficient Recovery Mechanism**: Boosts **PSB recovery rates** by maximizing returns on **distressed properties**.
3. **Investor-Friendly Environment**: Simplifies access to **verified properties**, increasing confidence among buyers and investors.
4. **Ease of Doing Business**: Facilitates a streamlined, tech-enabled approach, aligning with India's **Digital India** goals.
5. **Support for PSBs**: Empowers banks to focus on **core banking activities** by improving the recovery of non-performing assets (NPAs).

5. Way Ahead

1. **Awareness Campaigns**: Conduct campaigns to educate stakeholders, including buyers, about the portal's features and benefits.
2. **Regular Updates**: Ensure continuous updating of property listings and technological enhancements.
3. **Integration with Judiciary**: Collaborate with judicial bodies like **DRTs** for efficient resolution of asset-related disputes.
4. **Expansion to Private Banks**: Extend the platform to include properties held by **private sector banks** for wider applicability.
5. **Feedback Mechanism**: Introduce a robust feedback system to address user concerns and improve platform efficiency.

Draft Digital Personal Data Protection Rules, 2025

Syllabus: Governance – Privacy and Data Protection, e-Governance (UPSC Mains GS-II)

1. Context

The **Ministry of Electronics and Information Technology (MeitY)** has released the **Draft Digital Personal Data Protection Rules, 2025** for public consultation. These rules will implement the **Digital Personal Data Protection (DPDP) Act, 2023** to establish a robust framework for **data protection and privacy** in India.

2. About Digital Personal Data Protection (DPDP) Act, 2023

a. Background

1. **Justice AP Shah Committee (2011)**: Recommended privacy legislation in India.
2. **Supreme Court Ruling (2017)**: In **Justice KS Puttaswamy (Retd) vs Union of India**, privacy was recognized as a **fundamental right**.

b. Scope

- Covers **digital personal data processing** in India, whether data is:
  - **Collected online**.
  - **Collected offline** and subsequently **digitized**.

3. Key Features of DPDP Act, 2023

a. Data Protection Framework

1. **Obligations for Data Fiduciaries**:
   - **Data Fiduciary**: Entity determining the purpose and method of data processing.
   - Ensure **compliance with user consent** and safeguard personal data.
2. **User Consent**:
   - **Personal Data Processing**: Requires **user consent**, except for **legitimate uses** such as:
     - Data provided **voluntarily**.
     - **Government services or benefits**.
     - **Medical emergencies**.
3. **Children and Persons with Disabilities**:
   - Mandatory **verifiable consent** from a **parent or lawful guardian**.
4. **Data Protection Officer (DPO)**:
   - Significant Data Fiduciaries must appoint a **DPO** residing in India.
   - DPO acts as the **point of contact** for grievance redressal.

b. User Rights

1. **Transparency**:
   - Right to request a **summary of data processing activities** from Data Fiduciaries.
   - Right to know **which entities** have access to their data.
2. **Grievance Redressal**: DPO serves as the primary point of contact for addressing user grievances.

c. Enforcement Mechanisms

1. **Data Protection Board (DPB)**:
   - Authority to adjudicate complaints related to personal data breaches.
   - **Civil court powers** to enforce compliance.
2. **Penalties**:
   - Provisions for fines and penalties in case of **non-compliance** or breaches.

4. Draft Digital Personal Data Protection Rules, 2025 – Key Highlights

1. **Implementation Framework**: Provides a **detailed procedure** for operationalizing the DPDP Act, 2023.
2. **Stakeholder Consultation**: Open for **public and industry feedback** to refine the rules.
3. **Clarity on Data Processing**: Specifies categories for **legitimate use** and obligations of data fiduciaries.
4. **Focus on Rights and Accountability**: Strengthens **user rights**, including grievance mechanisms and accountability measures for data fiduciaries.

5. Significance

1. **Strengthening Privacy**: Aligns with global data protection standards like **GDPR**, ensuring **citizen privacy**.
2. **Digital Economy Boost**: Builds trust in **digital transactions**, boosting India's **digital economy**.
3. **Global Confidence**: Enhances India's reputation as a **secure destination** for data storage and processing.
4. **Balanced Approach**: Protects user rights while accommodating legitimate data use for governance and innovation.

6. Challenges and Way Ahead

Challenges

1. **Compliance Burden**: Smaller businesses may struggle to meet compliance requirements.
2. **Capacity Building**: Establishing the **Data Protection Board (DPB)** and DPO network requires resources and training.
3. **Data Localization**: Potential conflicts with global businesses due to **local storage mandates**.

Way Ahead

1. **Public Awareness Campaigns**: Educate users about their rights and responsibilities.
2. **Capacity Building**: Train DPOs and regulators to handle data protection issues efficiently.
3. **Simplify Compliance**: Provide tools and templates for **small businesses** to ensure adherence.
4. **Periodic Reviews**: Regularly update rules to address emerging challenges in the **data ecosystem**.

INTERNATIONAL RELATIONS

India's Refugee Policy on Rohingya

Syllabus: International Relations (UPSC Mains GS-II)

1. Context

Critical Gaps Highlighted: A report by **The Azadi Project** and **Refugees International** emphasizes the shortcomings in India's **refugee policies** regarding the **Rohingya community**, underlining challenges in legal status and human rights protection.

2. Rohingya Issue

1. **Background**: The **Rohingya** are an **ethnic Muslim minority** from Myanmar, considered the **world's largest stateless population** as Myanmar denies them **citizenship**.
2. **Persecution**: Endured **decades of violence**, including **genocidal campaigns**, forcing them to flee to neighboring countries.
3. **Global Refuge**: Approximately **2.8 million Rohingyas** are spread across nations like **Bangladesh, Malaysia, India, and Indonesia**.
4. **In India**:
    - Around **22,500 Rohingyas**, as per **UNHCR**, reside in India facing:
        - **Lack of legal status**.
        - **Arbitrary detention**.
        - **Human rights violations**.

3. India's Refugee Policy on Rohingyas

1. **Legal Framework**: India lacks a **domestic refugee law** and is not a signatory to the **1951 Refugee Convention** or the **1967 Protocol**.
2. **Governance**:
    - Rohingyas are managed under:
        - **Foreigners Act, 1946**.
        - **Passport Act, 1967**, categorizing them as **illegal migrants**.
3. **Judicial Stance**:
    - **Mohammad Salimullah v. Union of India (2021)**: Supreme Court ruled deportation requires **due process**, balancing this with **national security concerns**.

   - **Non-refoulement** under **Article 21** (Right to Life) has been upheld in judgments like **Ktaer Abbas Habib Al Qutaifi v. Union of India**.
4. **Exclusionary Policies**:
   - The **Citizenship Amendment Act (CAA), 2019** excludes **persecuted Muslim minorities**, including **Rohingyas**, from its purview.

4. International Conventions on Refugees

1. **1951 Refugee Convention and 1967 Protocol**:
   - Enshrine the principle of **non-refoulement**, prohibiting return of refugees to places of persecution.
2. **Other Treaties**:
   - **ICCPR (International Covenant on Civil and Political Rights)**: Safeguards against **torture or inhuman treatment**.
   - **CRC (Convention on the Rights of the Child)**: Promotes welfare of **refugee children**.

5. Challenges in India's Refugee Policy

1. **Legal Vacuum**:
   - Absence of a unified **refugee law** results in **inconsistent treatment**.
2. **Detention Conditions**:
   - Rohingyas in detention camps, such as **Matia in Assam**, endure **inhumane conditions**.
3. **National Security Concerns**:
   - Rohingyas are often perceived as **security threats**, influencing policies and judicial decisions.
4. **Civil Society Constraints**:
   - Revocation of **FCRA licenses** hampers NGOs' ability to deliver **legal and humanitarian aid**.
5. **Exclusionary Policies**:
   - The **exclusion of Muslim refugees** in CAA undermines India's **secular constitutional framework**.

6. Way Ahead

1. **Legislative Framework**:
   - Enact a comprehensive **domestic refugee law**, aligned with international conventions.
2. **Judicial Oversight**:
   - Reinforce judiciary's role in upholding **non-refoulement** under **Article 21**.
3. **Improved Living Conditions**:
   - Establish **humane detention centers** with provisions for **food, healthcare, and education**.
4. **Community Involvement**:
   - Empower **local communities** and **NGOs** to assist in refugee rehabilitation.
5. **International Collaboration**:
   - Work with global organizations like **UNHCR** to craft sustainable solutions for the Rohingya crisis.

India-Australia Economic Cooperation and Trade Agreement (Ind-Aus ECTA)

Syllabus: International Relations, Economic Development (UPSC Mains GS-II & GS-III)

1. Context

Two-Year Milestone: The **India-Australia Economic Cooperation and Trade Agreement (Ind-Aus ECTA)** has completed two years, marking a significant step in strengthening bilateral trade and fostering economic growth between the two nations.

2. About Ind-Aus ECTA

1. **Established**:
   - Signed in **2022** to enhance economic and trade ties between **India** and **Australia**.
2. **Key Features**:
   - **Trade Preferences**:
     - Offers **preferential market access** for Indian goods like **textiles**, **chemicals**, and **agriculture products**.
   - **Diversification**:
     - Promotes trade in **new sectors**, including **gold-studded diamonds** and **turbojets**.
   - **Raw Material Imports**:
     - Facilitates import of **metalliferous ores**, **cotton**, and **wood products** for industrial growth.
   - **MSMEs Focus**:
     - Prioritizes **empowering MSMEs**, aiming to foster **employment generation**.
   - **Bilateral Trade Target**:
     - Sets a goal of achieving **USD 100 billion trade** by **2030**.

3. Recent Trends in India-Australia Trade

1. **Trade Growth**:

- Bilateral merchandise trade grew from **USD 12.2 billion in 2020-21** to **USD 26 billion in 2022-23**.

2. **Utilization Rates**:
   - Export utilization: **79%**.
   - Import utilization: **84%** in 2023.
3. **Moderation in 2023-24**:
   - Total trade stood at **USD 24 billion**, with **India's exports growing by 14%**.

4. Significance of Ind-Aus ECTA

1. **Boost to Bilateral Relations**:
   - Strengthens the **economic partnership** between India and Australia, fostering **mutual growth**.
2. **Economic Diversification**:
   - Encourages trade in **non-traditional sectors**, enhancing economic opportunities.
3. **Support for MSMEs**:
   - Empowers **micro, small, and medium enterprises**, fostering employment and contributing to **inclusive growth**.
4. **Raw Material Security**:
   - Facilitates access to critical raw materials like **cotton** and **ores**, supporting India's industrial needs.
5. **Global Trade Integration**:
   - Positions both nations as key players in **global trade frameworks** by leveraging their complementarities.

5. Challenges and Concerns

1. **Trade Moderation**:
   - Recent moderation in total trade at **USD 24 billion** in 2023-24.
2. **Utilization Issues**:
   - Despite high utilization rates, further room for improvement exists in fully leveraging trade agreements.
3. **Geopolitical Risks**:
   - Global uncertainties may impact bilateral trade volumes and market stability.

6. Way Ahead

1. **Strengthening Supply Chains**:
   - Build **resilient supply chains** for critical raw materials.
2. **Promoting MSME Trade**:
   - Encourage **export-oriented growth** among MSMEs to enhance their global competitiveness.
3. **Sectoral Focus**:
   - Expand focus on **emerging industries** like renewable energy and technology.
4. **Bilateral Dialogues**:
   - Conduct **regular trade dialogues** to address challenges and maximize trade potential.

India's Foreign Policy Tools for the 21st Century

Syllabus: International Relations (UPSC Mains GS-II)

1. Context

India's **foreign policy** has evolved to address modern global challenges while drawing from its **civilizational ethos**. The country's approach emphasizes **strategic autonomy**, **soft power**, and **humanitarian values**.

2. Key Foreign Policy Ideas

a. Viswamitra Model

1. **Concept**:
   - Envisions India as a **global leader** by balancing **strategic alliances** with **independent decision-making**.
2. **Approach**:
   - **Civilizational Ethos**: Draws inspiration from India's rich cultural and historical legacy.
   - **Economic Growth**: Strengthens trade and investment ties to enhance economic power.
   - **Technological Innovation**: Focuses on emerging areas like **AI, renewable energy**, and **space exploration**.
   - **Military Modernization**: Builds defense capabilities to support a stronger global role.

b. Tightrope Balance

1. **Concept**:
   - Maintains **strategic autonomy** while balancing relations with major global powers like the **U.S., Russia, and China**.
2. **Approach**:

- **Non-Alignment 2.0**: Avoids rigid alliances, enabling flexibility in policymaking.
- **Regional Stability**: Addresses regional conflicts like border disputes with **China** and balancing partnerships in **South Asia**.
- **Global Competition**: Engages with multiple blocs while prioritizing national interests.

c. Soft Power Diplomacy

1. **Concept**:
   - Leverages India's **cultural and spiritual heritage** to build goodwill internationally.
2. **Approach**:
   - **Cultural Promotion**: Highlights **yoga**, **Ayurveda**, **Bollywood**, and **Indian languages** as global assets.
   - **Diaspora Engagement**: Strengthens ties with the **Indian diaspora** to enhance India's global influence.
   - **Institutional Outreach**: Collaborates with organizations like the **UNESCO** to promote cultural and spiritual practices globally.

d. Humanitarian Diplomacy

1. **Concept**:
   - Positions India as a **responsible global leader** in addressing humanitarian crises and developmental challenges.
2. **Approach**:
   - **Disaster Relief**: Provides **medical aid, food supplies**, and logistical support during crises.
   - **Capacity Building**: Offers **developmental aid** and **technical training programs** to developing nations.
   - **Global Initiatives**: Contributes to multilateral efforts like **COVAX**, emphasizing equitable vaccine distribution.

3. Significance of Evolving Foreign Policy Tools

1. **Strategic Autonomy**:
   - Helps India maintain independence in **global decision-making**, ensuring alignment with national interests.
2. **Global Leadership**:
   - Positions India as a **leading voice** in multilateral forums like **G20** and **BRICS**.
3. **Soft Power Capital**:
   - Builds a **positive global image** through cultural diplomacy and humanitarian efforts.
4. **Economic Influence**:
   - Enhances trade and technology partnerships, boosting India's **economic clout**.

4. Way Ahead

1. **Strengthen Institutions**:
   - Expand the role of institutions like the **Ministry of External Affairs** and **ICCR** in advancing diplomatic goals.
2. **Expand Regional Leadership**:
   - Take a proactive approach in **South Asia**, ensuring stability and economic integration.
3. **Adapt to Global Trends**:
   - Leverage emerging fields like **digital governance**, **climate diplomacy**, and **space cooperation**.
4. **Bolster Public Diplomacy**:
   - Use technology and media platforms to effectively communicate India's foreign policy achievements.
5. **Collaborate with Allies**:
   - Strengthen partnerships with nations sharing common goals in areas like **sustainability**, **security**, and **global health**.

Torrijos-Carter Treaties

Syllabus: International Relations – Global Trade and Diplomacy (UPSC Mains GS-II)

1. Context

The **Panama Canal**, a vital global trade route, has come under scrutiny following criticism of the **Torrijos-Carter Treaties** by U.S. President-elect **Donald Trump**, reigniting debates on U.S.-Panama relations.

2. About Torrijos-Carter Treaties

1. **Nations Involved**:
   - Signed between the **United States** and **Panama**.
2. **Signed On**:
   - **September 7, 1977**, by U.S. President **Jimmy Carter** and Panama's General **Omar Torrijos**.
3. **Objectives**:

a. Panama Canal Treaty

- **Transfer of Control**: Shifted control of the canal from the U.S. to **Panama** by **December 31, 1999**.

- **Sovereignty**: Ensured Panamanian sovereignty over the canal.

b. Permanent Neutrality Treaty

- **Neutral Waterway**: Declared the canal open to vessels of all nations.
- **U.S. Role**: Allowed the U.S. to defend the canal's neutrality and ensured **priority passage** during military emergencies.

3. Significance of the Treaties

1. **Panama's Sovereignty**:
   - Symbolized Panama's regained control over its territory after decades of U.S. dominance.
2. **Global Trade**:
   - Ensured the canal's role as a **neutral waterway**, critical for global commerce and maritime trade.
3. **U.S.-Latin America Relations**:
   - Marked a shift in U.S. foreign policy by addressing **long-standing tensions** over territorial control.
   - Strengthened diplomatic ties with Panama and the broader **Latin American region**.
4. **Strategic Importance**:
   - Maintained U.S. influence in the canal's operation, ensuring continued security and accessibility for international shipping.

4. Criticisms of the Treaties

1. **U.S. Security Concerns**:
   - Critics argue that transferring control compromised U.S. strategic interests in the region.
2. **Economic Implications**:
   - Concerns over reduced U.S. influence in a key global trade route.
3. **Military Access**:
   - Debate over the adequacy of U.S. rights to defend the canal in emergencies.

5. Relevance of the Panama Canal Today

1. **Global Trade Hub**:
   - Handles approximately **5% of global maritime trade**, making it indispensable for international commerce.
2. **Geopolitical Significance**:
   - Located at the crossroads of **North and South America**, the canal remains a focal point in global power dynamics.
3. **Modern Challenges**:
   - Increasing **congestion** and **climate-related risks** like droughts affecting canal operations.
   - Rising competition from alternative routes like the **Arctic sea lanes**.

6. Way Ahead

1. **Collaborative Management**:
   - Strengthen U.S.-Panama cooperation to address emerging challenges in canal operations.
2. **Infrastructure Modernization**:
   - Invest in expanding and upgrading the canal to accommodate larger vessels and increasing trade volumes.
3. **Regional Stability**:
   - Enhance diplomatic engagement with Latin American nations to maintain the canal's neutrality and security.
4. **Sustainable Practices**:
   - Implement strategies to mitigate **climate risks** affecting the canal's functionality.

Hotan Prefecture

Syllabus: International Relations – India-China Border Dispute (UPSC Mains GS-II)

1. Context

India has protested against China's establishment of two new counties, **He'an** and **Hekang**, within **Hotan Prefecture**, which includes parts of the **disputed Aksai Chin region**. Aksai Chin is administered by **China** but claimed by **India** as part of **Ladakh**.

2. About Hotan Prefecture

1. **What it is**:
   - An **administrative division** in southwestern **Xinjiang, China**, encompassing parts of the disputed **Aksai Chin**.
2. **Location**:
   - Situated in the **Tarim Basin**, bordered by:
     - **Tibet** to the south.
     - **Ladakh** and **Gilgit-Baltistan** to the west.

- Characterized by **deserts**, **mountainous terrains**, and oases.

3. Historical Background

1. **Sino-Indian War (1962)**:
   - Aksai Chin was occupied by **China** during the war, intensifying disputes over its control.
2. **Prefecture Designation (1971)**:
   - Hotan Prefecture was formally established as part of Xinjiang by **China**.
3. **Border Dispute**:
   - The area remains a critical point in the larger **India-China border dispute**, particularly along the **Line of Actual Control (LAC)**.

4. Geographical Features

1. **Taklamakan Desert**:
   - Covers the **northern part** of Hotan, one of the largest sandy deserts globally.
2. **Kunlun Mountains**:
   - **Southern border** of the prefecture, forming a natural divide from Tibet.
3. **Oases**:
   - Settlements like **Hotan city** thrive on oases, supporting **agriculture**, **trade**, and habitation.

5. Demographics

1. **Predominantly Uyghur Population**:
   - The region is home to **Muslim Uyghurs**, an ethnic minority in China.
   - Most live in oases situated between the **Taklamakan Desert** and the **Kunlun Mountains**.

6. Strategic Significance of Hotan Prefecture

1. **Control of Aksai Chin**:
   - **Aksai Chin's proximity** to Tibet and Ladakh makes it crucial for both India and China.
2. **Infrastructure Development**:
   - China has built extensive road networks, such as the **China National Highway 219**, to integrate the region.
3. **Gateway to Xinjiang**:
   - Hotan serves as a link between Xinjiang and Tibet, enhancing **China's strategic reach**.
4. **India-China Relations**:
   - Activities in the region, such as the creation of new counties, escalate **tensions over sovereignty** and territorial claims.

7. India's Stand and Way Ahead

India's Stand:

- Considers **Aksai Chin** part of **Ladakh**, asserting it is an integral part of Indian territory.
- Protests China's actions, viewing them as attempts to **strengthen its claims** over disputed territories.

Way Ahead:

1. **Diplomatic Engagement**:
   - Strengthen **bilateral mechanisms**, such as the **Special Representatives Dialogue**, to address territorial disputes.
2. **International Advocacy**:
   - Leverage international forums to highlight **China's unilateral actions** in disputed regions.
3. **Infrastructure Development**:
   - Enhance connectivity and infrastructure on the **Indian side of the LAC**, particularly in **Ladakh**.
4. **Strategic Partnerships**:
   - Deepen ties with global allies to counterbalance Chinese influence in the region.
5. **Local Integration**:
   - Foster development in **border areas**, ensuring local communities remain aligned with India.

WTO Celebrates 30th Anniversary

Syllabus: International Institutions – Structure, Mandates, and Role (UPSC Mains GS-II)

1. Context

The **World Trade Organization (WTO)** marked its **30th anniversary** in 2025, commemorating its establishment in 1995 after the **Marrakesh Agreement** that concluded the **Uruguay Round negotiations (1986-94)** of the **General Agreement on Tariffs and Trade (GATT)**.

2. About WTO

1. **What it is**:
   - The WTO is the only **global organization** dealing with the rules of trade between nations, aimed at fostering **smooth, predictable, and free trade**.
2. **Historical Evolution**:
   - Succeeded the **GATT**, which had regulated world trade since **1948**.
3. **Headquarters**:
   - **Geneva, Switzerland**.
4. **Members**:
   - **166 members**, representing **98% of world trade**.

3. Key Institutional Mechanisms

1. **Ministerial Conference (MC)**:
   - The **highest decision-making body** of the WTO, held biennially.
2. **Dispute Settlement Body (DSB)**:
   - Handles **trade disputes** between members, ensuring compliance with WTO agreements.

4. Key Agreements of WTO

1. **Agreement on Trade-Related Investment Measures (TRIMS)**:
   - Prohibits measures that **discriminate against foreign products** or impose **quantitative restrictions**.
   - Example: Local content requirements.
2. **Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)**:
   - Governs the protection and enforcement of **intellectual property rights (IPR)**.
   - Resolves disputes over **IPR** in international trade.
3. **Agreement on Agriculture (AoA)**:
   - Focuses on **agricultural trade liberalization**.
   - Covers:
     - **Market access**.
     - **Domestic support** for agricultural producers.
4. **Other Agreements**:
   - **Agreement on Sanitary and Phytosanitary Measures (SPS)**: Sets standards for **food safety** and **animal/plant health**.
   - **General Agreement on Trade in Services (GATS)**: Promotes trade in **services**.
   - **General Agreement on Tariffs and Trade (GATT)**: Governs trade in **goods**.

5. Key Principles of WTO

- **Non-Discrimination**:
  - Principles of **Most-Favoured-Nation (MFN)** and **National Treatment**.
- **Free Trade**:
  - Reduction of **trade barriers** like tariffs and quotas.
- **Predictability**:
  - Ensures **transparency** and reliability in trade policies.
- **Competition**:
  - Discourages practices like **dumping** and **subsidies** that distort trade.
- **Special and Differential Treatment**:
  - Provides **flexibility** for **developing and least-developed countries (LDCs)**.

6. Significance of WTO

1. **Global Trade Governance**:
   - Provides a structured framework for **multilateral trade negotiations**.
2. **Dispute Resolution**:
   - Offers a neutral mechanism to resolve disputes, ensuring **fair trade practices**.
3. **Economic Growth**:
   - Facilitates trade liberalization, boosting **global economic integration**.
4. **Support for Developing Nations**:
   - Assists developing countries in **capacity building** and improving their trade competitiveness.

7. Challenges Faced by WTO

1. **Stalled Negotiations**:
   - The **Doha Development Round** has seen limited progress.
2. **Geopolitical Tensions**:
   - Rising protectionism and trade wars, especially between major economies like the **US and China**.

3. **Ineffective Dispute Mechanism**:
    - The **Appellate Body** has been non-functional since 2019 due to lack of consensus.
4. **Digital Trade**:
    - Limited progress in regulating **e-commerce** and **digital trade frameworks**.

8. Way Ahead

1. **Reform Dispute Mechanisms**:
    - Revive and strengthen the **Appellate Body** for effective resolution of disputes.
2. **Address Emerging Issues**:
    - Develop rules for **digital trade**, **climate-related trade barriers**, and **data flows**.
3. **Strengthen Development Agenda**:
    - Ensure developing countries and LDCs gain equitable benefits from trade agreements.
4. **Enhance Inclusivity**:
    - Engage **smaller economies** more effectively in negotiations and decision-making processes.

INTERNAL SECURITY & DEFENCE

Army Promotion Policy

Syllabus: Internal Security, Governance – Military Reforms (UPSC Mains GS-III)

1. Context

India's efforts to establish **tri-Service theatre commands** necessitate the alignment of **promotion policies** across the **Army, Navy, and Air Force**. The revamped **Army promotion policy** aims to ensure **merit-based appointments** for apex-level roles to meet the requirements of integrated operations.

2. Old Promotion Policy

1. **Procedure**:
    - Promotions were based on **seniority**, **date of birth**, and **vacancy availability**.
2. **Applicability**:
    - Applied to **Lieutenant Generals** for appointments as **Commanders-in-Chief (C-in-C)**.
3. **Criteria**:
    - Officers needed at least **18 months of service** remaining before retirement to be eligible for apex roles.

3. New Promotion Policy

1. **Procedure**:
    - **Quantified Annual Confidential Report (ACR)** system introduced:
        - Officers graded on a **1–9 scale** for specific attributes.
    - **Merit-based promotions** take precedence over seniority.
    - Aligns Army practices with **Navy** and **Air Force**, where quantified appraisals for equivalent ranks already exist.
2. **Applicability**:
    - Applies to **Lieutenant Generals**, excluding:
        - **Vice Chief of Army Staff**.
        - Seven **Commanders-in-Chief** of operational and training commands.
3. **Key Changes**:
    - Merit becomes the **primary criterion** for apex-level roles.

4. Significance of the New Promotion Policy

a. Merit-Based Selection

1. **Excellence and Accountability**:
    - Encourages **high performance** and ensures the best officers are selected for leadership roles.
2. **Fairness**:
    - Reduces subjectivity and **bias in promotions**.

b. Uniformity Across Services

1. **Tri-Service Synergy**:
   - Aligns Army promotion practices with the **Air Force** and **Navy** to enable smooth integration under theatre commands.
2. **Standardization**:
   - Ensures consistency in evaluating officers across the three services.

c. Preparedness for Theatre Commands

1. **Qualified Leadership**:
   - Provides highly competent officers for **integrated commands** managing threats from:
     - **China**, **Pakistan**, and the **Indian Ocean Region (IOR)**.
2. **Strategic Vision**:
   - Strengthens leadership for the evolving **joint warfare structure**.

d. Transparency and Objectivity

1. **Quantified System**:
   - Reduces **subjectivity** in appraisals by relying on **measurable criteria**.
2. **Boosts Morale**:
   - Encourages officers to excel based on clear and fair evaluation parameters.

5. Challenges and Way Ahead

Challenges

1. **Resistance to Change**:
   - Senior officers accustomed to the old system may initially resist the merit-based structure.
2. **Evaluation Biases**:
   - Ensuring fairness in **grading attributes** in ACRs may require robust monitoring.
3. **Implementation in Transition**:
   - Managing promotions during the shift to theatre commands could pose logistical hurdles.

Way Ahead

1. **Training and Orientation**:
   - Train officers and evaluators on the **quantified ACR system** to ensure objective implementation.
2. **Feedback Mechanism**:
   - Introduce systems for officers to raise concerns or appeal appraisal results.
3. **Monitoring**:
   - Establish oversight to ensure **uniform application** across commands.
4. **Gradual Expansion**:
   - Apply similar quantified criteria to other ranks over time for comprehensive reform.

ECONOMY

Ramesh Chand Committee and Price Indices in India

Syllabus: Economy – Inflation and Indices (UPSC Mains GS-III)

1. Context

The Indian government has formed an **18-member expert panel**, led by **NITI Aayog member Ramesh Chand**, to revise the **Wholesale Price Index (WPI)** and explore transitioning to a **Producer Price Index (PPI)** for improved inflation measurement.

2. About Wholesale Price Index (WPI)

1. **What it is**:
   - Measures changes in the prices of **goods sold and traded in bulk** at the wholesale level.
   - Serves as a key indicator of **inflationary trends** in the economy.
2. **Released by**:
   - **Office of Economic Advisor**, under the **Ministry of Commerce and Industry**.
3. **Aim**:

- Track **supply-demand dynamics** in industries.
- Provide a measure of **wholesale inflation**.
- Align with macroeconomic indicators like **GDP**.

4. **Key Features**:
   - **Base Year**: Currently **2011-12**, proposed revision to **2022-23**.
   - **Coverage**: Tracks **697 items**, including:
     - **Primary items**: 117.
     - **Fuel and power items**: 16.
     - **Manufactured products**: 564.
   - **Exclusions**: Does not include the **services sector**, unlike the **Consumer Price Index (CPI)**.

3. About Producer Price Index (PPI)

1. **What it is**:
   - Measures the average change in prices received by **producers for goods and services**, either domestically sold or exported.
2. **Types**:
   - **Output PPI**: Tracks prices of goods and services as they leave the production site.
   - **Input PPI**: Monitors prices of inputs entering production processes.
3. **Advantages of PPI over WPI**:
   - **Industry-Centric Inflation**: Captures price changes from the **producers' perspective**, offering early signals of inflation trends.
   - **Focus on Production Stages**: Reflects price shifts **before reaching consumers**, aiding **policy decisions**.
   - **International Alignment**: Adheres to the **System of National Accounts (SNA)**, enabling better **global comparisons**.
   - **Broader Scope**: Includes **services**, unlike WPI, which is restricted to goods.
   - **Global Adoption**: Widely used as a more **precise economic tool** than WPI.

4. Significance of the Transition from WPI to PPI

1. **Better Inflation Insights**:
   - Offers a more **holistic view** of inflation by including both **goods and services**.
2. **Policy Effectiveness**:
   - Improves **monetary and fiscal policy** responses by capturing **input costs** and production dynamics.
3. **Alignment with Global Standards**:
   - Brings India's inflation measurement in line with **international practices**, enhancing credibility.
4. **Enhanced Economic Analysis**:
   - Helps businesses and policymakers **understand production-level trends**, aiding strategic decisions.

5. Challenges in Implementing PPI

1. **Data Collection**:
   - Requires comprehensive data from **varied sectors**, including the **unorganized services sector**.
2. **Methodology Overhaul**:
   - Significant changes in **calculation and analysis** methods compared to WPI.
3. **Awareness and Adoption**:
   - Requires stakeholders, including businesses, to familiarize themselves with **PPI metrics**.
4. **Infrastructure and Costs**:
   - Needs robust **infrastructure** and **investment** to operationalize PPI effectively.

6. Way Ahead

1. **Strengthening Data Systems**:
   - Build a robust **data collection framework** for goods and services prices.
2. **Phased Transition**:
   - Gradually introduce **PPI** while maintaining WPI for a **transitional period**.
3. **Capacity Building**:
   - Train statistical personnel in **PPI methodologies** and raise awareness among stakeholders.
4. **Global Partnerships**:
   - Collaborate with international agencies like the **IMF** or **World Bank** to refine PPI implementation.
5. **Periodic Updates**:
   - Ensure regular **revision of base years** and basket items to reflect **current economic realities**.

India Logistics Movement

Syllabus: Economics (UPSC Mains GS-III)

1. Context

Transforming Logistics Sector: India's logistics sector is evolving through initiatives like the **National Logistics Policy (NLP)** and **PM Gati Shakti**, aiming to cut costs, enhance efficiency, and improve connectivity. With a **14% contribution to GDP**, the sector is pivotal to achieving the **$5 trillion economy goal**.

2. Logistics Movement Data in India

1. **Logistics Cost Reduction**: Costs dropped by **0.8-0.9 percentage points of GDP** between FY14-FY22.
2. **GDP Contribution**: Logistics contributes **14% to GDP** and is valued at **$250 billion**.
3. **Transportation Efficiency**: **Truck travel distance** increased from **225 km/day to 300-325 km/day** post-GST implementation.
4. **Trade Facilitation**: The **Unified Logistics Interface Platform (ULIP)** processed **382 automation cases** to streamline trade.
5. **Mode Share**:
    - **Road**: 66% of freight movement.
    - **Rail**: 31%.
    - **Waterways**: 3%.
    - **Air**: 1%.

3. Modes of Logistics Movements in India

1. **Road**:
    - **Share**: 66%.
    - **Key Role**: Short-haul and last-mile delivery.
2. **Rail**:
    - **Share**: 31%.
    - **Key Role**: Bulk goods and long-haul transportation.
    - **Expansion**: Dedicated freight corridors in development.
3. **Waterways**:
    - **Share**: 3%.
    - **Key Role**: Heavy goods transportation; focus on **coastal and inland navigation**.
4. **Air**:
    - **Share**: 1%.
    - **Key Role**: High-value and time-sensitive goods.

4. Importance of a Strong Supply Chain

1. **Cost Reduction**: Efficient logistics cut production costs and enhance profitability.
2. **Global Competitiveness**: Boosts India's **export potential** and market position globally.
3. **Economic Growth**: Drives investments and supports **MSMEs** by reducing inefficiencies.
4. **Sustainability**: Encourages eco-friendly practices like rail and waterway use, reducing emissions.
5. **Employment Generation**: Creates jobs in transportation, warehousing, and tech-driven sectors.

5. Recent Government Initiatives (2024)

1. **PM Gati Shakti**: Integrates multi-modal transportation infrastructure for seamless connectivity.
2. **ULIP**: Promotes **data-driven logistics** through digitization and automation.
3. **NLP Marine Policy**: Focuses on **port logistics** and enhancing coastal shipping.
4. **Capital Expenditure**: **11.1% rise in infrastructure spending** to support logistics.
5. **FAME II Scheme**: Pushes adoption of **electric vehicles** for sustainable logistics.

6. Challenges Faced by Logistics Movement

1. **High Costs**: At **14% of GDP**, logistics costs in India exceed global averages.
2. **Infrastructure Gaps**: Lack of **last-mile connectivity** and warehousing facilities.
3. **Modal Imbalance**: Over-dependence on road transport, underutilization of rail and waterways.
4. **Skilling Deficiency**: Insufficient trained workforce for advanced logistics management.
5. **Environmental Concerns**: High emissions due to reliance on **diesel-powered trucks**.

7. Way Ahead

1. **Modal Diversification**: Increase rail and waterway usage through infrastructure investment.
2. **Technology Adoption**: Expand digital platforms like **ULIP** for better tracking and operations.

3. **Sustainable Practices**: Promote electric vehicles and alternative fuels in logistics.
4. **Policy Alignment**: Streamline regulations and focus on implementing logistics-oriented policies.
5. **Skill Development**: Invest in workforce training for efficient logistics management.

Siang Upper Multipurpose Project

Syllabus: Infrastructure and Energy Resources (UPSC Mains GS-III)

1. Context

Significance of Siang Upper Project: Arunachal Pradesh's **Siang Upper Multipurpose Project**, with an investment of **₹1.13 lakh crore**, aims to generate electricity, ensure **year-round river flow**, and reduce **flood risks** caused by excess water releases from upstream China.

2. About Upper Siang Multipurpose Project

1. **Definition**:
   - A **hydroelectric project** designed for multiple purposes, including:
     - **Flood mitigation**.
     - Maintaining **natural river flow**.
     - Generating **11,000 MW** of electricity.
2. **Location**:
   - **Upper Siang District**, Arunachal Pradesh, near the **Siang River** (Brahmaputra's tributary).
3. **River**:
   - Built on the **Siang River**, a key tributary of the Brahmaputra.
4. **States Involved**:
   - **Arunachal Pradesh** and **Assam** (for infrastructure and approach road development).

3. Key Features

1. **Reservoir Capacity**:
   - Can store **9 billion cubic meters (BCM)** of water.
2. **Power Capacity**:
   - **Installed capacity** of **11,000 MW**, contributing significantly to India's renewable energy goals.
3. **Development**:
   - Jointly undertaken by **NHPC** (National Hydroelectric Power Corporation) and **NEEPCO** (North Eastern Electric Power Corporation).
4. **Strategic Importance**:
   - **Flood Control**: Reduces flooding risks caused by upstream releases of water from China.
   - **River Flow Regulation**: Maintains consistent flow during lean seasons, ensuring water availability.

4. Significance of the Project

1. **Energy Security**:
   - Adds **11,000 MW** of renewable energy to the grid, supporting India's **sustainable energy targets**.
2. **Flood Mitigation**:
   - Protects downstream regions from **seasonal flooding**, particularly in Assam and Arunachal Pradesh.
3. **River Ecology**:
   - Maintains the **natural flow** of the Siang River, ensuring ecological balance.
4. **Economic Development**:
   - Boosts regional infrastructure and creates opportunities for **employment** and **investment**.
5. **Geopolitical Significance**:
   - Strengthens India's capacity to manage river water releases from **upstream China**.

5. Challenges and Concerns

1. **Environmental Impact**:
   - Potential displacement and ecological disruption due to reservoir construction.
2. **Geopolitical Tensions**:
   - Water-sharing issues with **China**, given the river originates in Tibet.
3. **Cost and Implementation**:
   - High project cost (**₹1.13 lakh crore**) and logistical challenges in a remote location.
4. **Local Opposition**:
   - Concerns from local communities about environmental degradation and displacement.

Cash Transfers

Syllabus: Economics – Social Justice and Welfare (UPSC Mains GS-II & GS-III)

1. Context

Cash transfer schemes, like **Mahila Samman Yojana** in Delhi, have sparked debates on their **efficacy and sustainability**. While critics view them as **populist measures**, proponents argue they **empower marginalized communities**, especially women.

2. What Are Cash Transfers?

Cash transfers involve **direct payments** from governments to individuals or households for:

- **Social protection**.
- **Incentivizing specific actions** (e.g., school attendance, vaccinations).

3. Types of Cash Transfers

1. **Unconditional Transfers**:
   - No conditions; recipients can use funds freely.
   - **Example**: **PM-KISAN**.
2. **Conditional Transfers**:
   - Linked to specific actions like **school attendance** or **vaccinations**.
   - **Example**: **Maternity Benefit Program**.
3. **Universal Transfers**:
   - Provided to all citizens, regardless of income or status.
4. **Targeted Transfers**:
   - Focused on specific groups like the elderly or disabled.
   - **Example**: Pensions under **National Social Assistance Programme (NSAP)**.

4. Arguments Against Cash Transfers

1. **Fiscal Burden**:
   - Diverts funds from critical sectors like **health**, **education**, and **infrastructure**.
2. **Populist Measure**:
   - Often announced for **electoral gains**, failing to tackle systemic issues.
3. **Risk of Dependency**:
   - Recipients may rely on transfers, reducing motivation for **employment**.
4. **Limited Impact**:
   - Inconclusive outcomes, especially in areas like **women empowerment** and **farm income**.
5. **Competitive Populism**:
   - Political parties compete to offer larger schemes, straining **state finances**.

5. Arguments Favouring Cash Transfers

1. **Empowering Women**:
   - Enhances **autonomy** and supports **access to education and jobs**.
2. **Direct Benefit Delivery**:
   - Avoids bureaucratic inefficiencies and ensures benefits reach recipients directly.
3. **Poverty Alleviation**:
   - Offers immediate financial relief, improving quality of life for the poor.
4. **Economic Stimulus**:
   - Boosts **local demand** and supports economies by increasing purchasing power.
5. **Social Equity**:
   - Bridges **socio-economic disparities** by targeting marginalized groups.

6. Alternatives to Cash Transfers

1. **Strengthening Public Services**:
   - Improve **health, education**, and **nutrition infrastructure**.
2. **Universal Basic Services (UBS)**:
   - Provide **essential services** at low or no cost, reducing dependency on cash.
3. **Job Creation Programs**:
   - Expand initiatives like **MGNREGA** and **skill-based schemes**.
4. **Skill Development**:
   - Equip individuals with **vocational skills** to increase employability.

5. **Community-Based Programs**:
    - Tailor interventions to **localized needs**, fostering sustainable community growth.

7. Way Ahead

1. **Balanced Approach**:
    - Integrate cash transfers with **long-term public investments** for holistic development.
2. **Evidence-Based Policies**:
    - Design schemes based on **data-driven assessments** and measurable outcomes.
3. **Targeted Implementation**:
    - Prioritize vulnerable populations to maximize impact and efficiency.
4. **Monitor and Evaluate**:
    - Regularly review program performance to identify and address gaps.
5. **Fiscal Prudence**:
    - Ensure transfers align with **developmental goals** and maintain **fiscal sustainability**.

India's Economic Surge

Syllabus: Economics – Growth, Development, and Inclusive Policies (UPSC Mains GS-III)

1. Context

India's economy has undergone a transformative journey over the past decade, marked by **policy-driven growth**, **global integration**, and robust **economic progress**, solidifying its position as a **key player in the global economy**.

2. Data Insights on India's Economic Dominance

1. **GDP Growth**:
    - **Nominal GDP**: Grew from **$2.04 trillion (2014)** to **$3.57 trillion (2023)**. (*Source: World Bank*)
    - **Per Capita Income**: Increased from **$1,554** to **$2,481** over the same period.
    - **Future Projections**:
        - **$5 trillion economy** by **2027**.
        - **$30 trillion economy** by **2047**.
2. **FDI Inflows**:
    - **2014–24**: Total FDI inflows of **$709.84 billion**, a **69% increase** over the previous decade. (*Source: Ministry of Commerce & Industry*)
3. **Global Rankings**:
    - **Ease of Doing Business**: Improved from **142 (2014)** to **63 (2019)**. (*Source: World Bank*)
    - **Global Competitiveness Index**: Climbed from **71st (2015)** to **40th (2024)**. (*Source: WEF*)
4. **Capital Market Growth**:
    - **BSE Sensex**: Increased from **27,507 points (2015)** to **78,507 points (2025)**, reflecting **185% growth**.
    - **Market Capitalization**: Surged to **$5 trillion (2024)**.

3. Government Initiatives Driving Economic Growth

1. **Make in India**:
    - Boosted **domestic manufacturing**, making India the **second-largest mobile phone producer** globally.
2. **Startup India**:
    - Fostered over **100 unicorns** and **1.5 lakh startups**, with a combined valuation of **$349.67 billion**.
3. **PLI Scheme**:
    - **Incentivized production**, enhancing sectoral competitiveness and attracting **foreign investments**.
4. **Gati Shakti Master Plan**:
    - Strengthened **infrastructure connectivity**, accelerating regional industrial growth.
5. **Digital India**:
    - Promoted **digital payments** and **financial inclusion**, formalizing more of the economy.

4. Positives of India's Economic Growth

1. **Job Creation**:
    - Expanded **employment opportunities** in manufacturing and services.
2. **Innovation Hub**:
    - Improved rank on the **Global Innovation Index** from **76th (2014)** to **39th (2024)**.
3. **Financial Stability**:
    - Reduced **Gross NPAs** to **2.6% (2024)**, reflecting a healthier banking system.
4. **Global Economic Presence**:
    - Ranked as the **third-largest economy** in PPP terms, strengthening global influence.

5. Limitations of India's Economic Growth

1. **Inequitable Distribution**:
   - Marginalized groups often fail to benefit proportionally from economic growth.
2. **High Inflation**:
   - Persistent **food inflation** impacts affordability and purchasing power.
3. **Unemployment**:
   - Rising joblessness with insufficient creation of **high-quality jobs**.
4. **Governance Issues**:
   - Weak regulatory frameworks and allegations of **favoritism** hinder equitable progress.

6. Way Ahead

1. **Inclusive Growth**:
   - Develop policies addressing **income inequality** and ensuring equitable distribution of benefits.
2. **Green Economy**:
   - Invest in **renewable energy** and sustainable practices for long-term growth.
3. **Focus on MSMEs**:
   - Strengthen **micro, small, and medium enterprises** to create localized employment.
4. **Skilling Initiatives**:
   - Train youth in **emerging global skills** to tackle mismatches in the workforce.
5. **Regional Balance**:
   - Reduce regional disparities by targeting **backward areas** for investment.

LEADS 2024 Report: Logistics Efficiency Across Indian States

Syllabus: Economy – Infrastructure Development (UPSC Mains GS-III)

1. Context

The **Union Minister for Commerce and Industry** launched the **Logistics Ease Across Different States (LEADS) 2024 Report**, highlighting the performance of Indian states and union territories in **logistics efficiency**.

2. About LEADS

1. **Full Form**:
   - **Logistics Ease Across Different States**.
2. **Launched In**:
   - **2018** by the **Department for Promotion of Industry and Internal Trade (DPIIT)** under the **Ministry of Commerce and Industry**.
3. **Aim**:
   - Assess **logistics infrastructure and services** across states/UTs.
   - Provide **actionable insights** for improving logistics performance.
   - Foster **competitive federalism** to enhance logistics efficiency.
4. **Parameters Evaluated**:
   - **Logistics Infrastructure**: Availability and quality of physical logistics assets.
   - **Logistics Services**: Efficiency of service providers, including transportation and warehousing.
   - **Operating and Regulatory Environment**: Ease of business operations, regulatory support, and policies.

3. Methodology

1. **Survey-Based**:
   - Conducted across India with **7,300+ responses** from stakeholders.
   - Includes inputs from **750+ consultations** with industry associations and experts.
2. **Categorization**:
   - States and UTs categorized based on their logistics performance into **Achievers**, **Fast Movers**, and **Aspirers**.

4. LEADS Report 2024 Highlights

a. Coastal States

CATEGORY	STATES
ACHIEVERS	Gujarat, Karnataka, Maharashtra, Odisha, Tamil Nadu
FAST MOVERS	Andhra Pradesh, Goa
ASPIRERS	Kerala, West Bengal

b. Landlocked States

CATEGORY	STATES
ACHIEVERS	Haryana, Telangana, Uttar Pradesh, Uttarakhand
FAST MOVERS	Bihar, Himachal Pradesh, Madhya Pradesh, Punjab, Rajasthan
ASPIRERS	Chhattisgarh, Jharkhand

c. North-Eastern States

CATEGORY	STATES
ACHIEVERS	Assam, Arunachal Pradesh
FAST MOVERS	Meghalaya, Mizoram, Nagaland, Sikkim, Tripura
ASPIRERS	Manipur

d. Union Territories

CATEGORY	TERRITORIES
ACHIEVERS	Chandigarh, Delhi
FAST MOVERS	Dadra and Nagar Haveli & Daman and Diu, Jammu and Kashmir, Lakshadweep, Puducherry
ASPIRERS	Andaman and Nicobar Islands, Ladakh

5. Significance of the LEADS Report

1. **Enhancing Competitiveness**:
   - Encourages **states and UTs** to improve logistics performance for better business environments.
2. **Boosting Trade and Economy**:
   - Strengthens **supply chain efficiency**, aiding **domestic and international trade**.
3. **Policy Reforms**:
   - Guides policymakers to identify **gaps** and implement **targeted interventions**.
4. **Stakeholder Engagement**:
   - Provides a platform for industries and governments to align logistics policies with ground-level needs.
5. **Infrastructure Development**:
   - Accelerates investments in **multi-modal transport** and **warehousing facilities**.

6. Way Ahead

1. **Focus on Aspirers**:
   - Prioritize improvements in states and UTs categorized as **Aspirers**, especially in the **Northeast**.
2. **Integrated Logistics**:
   - Promote **multi-modal logistics parks** and **digital solutions** for seamless operations.
3. **Capacity Building**:
   - Train local authorities and stakeholders to implement logistics-friendly practices.
4. **Policy Harmonization**:
   - Develop **state-specific logistics policies** aligned with national objectives like the **National Logistics Policy (NLP)**.
5. **Sustainability**:
   - Adopt **green logistics** practices to minimize environmental impacts.

Amendment in Foreign Trade Policy (FTP), 2023

Syllabus: Economic Development – Trade Policies and Frameworks (UPSC Mains GS-III)

1. Context

The **Directorate General of Foreign Trade (DGFT)** has notified an amendment in the **Foreign Trade Policy (FTP), 2023**, making **stakeholder consultations mandatory** for formulating or amending the policy. This amendment aligns with the **Foreign Trade (Development & Regulation) Act, 1992**.

2. Key Features of the Amendment

1. **Legal Backing**:
   - The amendment mandates **consultation with stakeholders**, including **importers**, **exporters**, and **industry experts**, before any policy changes or formulation.
2. **Empowerment Under Law**:
   - Changes implemented under the **Foreign Trade (Development & Regulation) Act, 1992**, ensuring robust legal authority.

3. Foreign Trade Policy (FTP), 2023

Objective

- Focuses on **process re-engineering** and **automation** to improve the **ease of doing business** for exporters.

- Aims to achieve **$2 trillion exports** by **2030**.

4. Key Initiatives Under FTP, 2023

1. **Districts as Export Hubs Initiative**:
   - Promotes the development of **logistics**, **testing facilities**, and **connectivity** to encourage exports at the **district level**.
2. **Expanded Export Promotion of Capital Goods (EPCG) Scheme**:
   - Includes new initiatives like the **Prime Minister Mega Integrated Textile Region and Apparel Parks (PM MITRA)** to boost **textile exports**.
3. **Promoting Cross-Border Digital Economy**:
   - Establishes **E-Commerce Export Hubs (ECEHs)** to facilitate **digital trade** and support small exporters.
4. **Recognition of Exporters**:
   - Recognizes exporter firms with a **'status' tag** based on performance.
   - Engages these firms as **partners in capacity-building initiatives**.
5. **Streamlining SCOMET Policy**:
   - Simplifies access to **dual-use high-end goods and technologies**.
   - Enhances exports of controlled items/technologies under the **Special Chemicals, Organisms, Materials, Equipment, and Technologies (SCOMET)** framework.

5. Significance of the Amendment and FTP, 2023

1. **Inclusivity and Transparency**:
   - Mandatory consultations ensure that **stakeholder voices** are considered in policy-making, improving **trust and efficiency**.
2. **Boost to Exports**:
   - Supports achieving the ambitious target of **$2 trillion exports by 2030**, enhancing **India's global trade competitiveness**.
3. **Ease of Doing Business**:
   - Automation and process re-engineering reduce delays and bureaucratic hurdles, making it easier for exporters.
4. **Localized Export Promotion**:
   - The **district hub initiative** decentralizes export growth, leveraging local resources and capabilities.
5. **Digital Economy and High-Tech Exports**:
   - Encourages **e-commerce and technology-based trade**, aligning India with global trade trends.

6. Way Ahead

1. **Implementation Efficiency**:
   - Ensure timely rollout of initiatives like **ECEHs** and streamlined **SCOMET policies**.
2. **Capacity Building**:
   - Engage exporters through **training and awareness programs** to maximize policy benefits.
3. **Monitoring and Feedback**:
   - Establish mechanisms to monitor progress toward the **$2 trillion export target**.
4. **Global Collaboration**:
   - Strengthen ties with trading partners to enhance **market access** and reduce trade barriers.
5. **Support for MSMEs**:
   - Provide targeted support to **MSMEs**, enabling them to compete in global markets.

NPCIL Opens Nuclear Sector to Private Participation

Syllabus: Economy – Infrastructure, Energy, and Science & Technology (UPSC Mains GS-III)

1. Context

The **Nuclear Power Corporation of India Limited (NPCIL)** has invited Requests for Proposals (RFPs) from Indian private sector entities for the establishment of **220MWe Pressurized Heavy Water Reactor (PHWR) Bharat Small Reactors (BSRs)** in **brownfield and greenfield sites**, marking a significant step in private sector participation in India's nuclear energy sector.

2. About Bharat Small Reactors (BSRs)

1. **What are BSRs?**
   - Compact **nuclear reactors** with a capacity of up to **220 MWe**, based on India's **PHWR technology**.
2. **Global Alignment**:
   - BSRs are part of the global trend of **Small Modular Reactors (SMRs)**, which range in capacity from **less than 30 MWe to over 300 MWe**.
3. **Significance of BSRs**:
   - Smaller size and modular design make them suitable for deployment in **remote areas** and **industrial hubs**.
   - Enhanced safety features and flexibility compared to traditional large reactors.

3. Significance of Private Sector Participation

1. **Resource Mobilization**:
   - Can attract substantial investments in India's **nuclear infrastructure**.
   - Pooling of resources provides **economies of scale**, supporting India's aim to attract **$26 billion** for nuclear energy projects.
2. **Technological Advancements**:
   - Private investment can spur **cutting-edge research** and bring innovations like:
     - **Small Modular Reactors (SMRs)**.
     - **Advanced cooling technologies**.
3. **Energy Transition Goals**:
   - Private sector involvement can contribute to India's:
     - **500 GW non-fossil fuel energy target by 2030**.
     - **Net-zero emissions by 2070**.
4. **Global Competitiveness**:
   - Positions India as a leader in **nuclear energy innovation** and export of **nuclear technology**.

4. Challenges to Private Sector Participation

1. **Legal Constraints**:
   - **Atomic Energy Act, 1962** restricts private sector involvement in **nuclear plant licensing**.
2. **Liability Concerns**:
   - **Civil Liability for Nuclear Damage Act, 2010** creates uncertainty for private players due to potential liability risks.
3. **High Initial Costs**:
   - Nuclear projects are **capital-intensive**, deterring private investment.
4. **Public Trust**:
   - Ensuring transparency and consistent performance is critical to gain public trust in private nuclear operations.
5. **Regulatory Hurdles**:
   - Complex regulatory framework adds to delays and costs.

5. Way Ahead

1. **Legislative Amendments**:
   - Amend the **Atomic Energy Act, 1962** to allow greater private sector involvement.
   - Clarify liability norms under the **Civil Liability for Nuclear Damage Act, 2010**.
2. **Public-Private Partnerships (PPP)**:
   - Encourage PPP models for resource sharing, risk mitigation, and efficient project execution.
3. **Financial Incentives**:
   - Provide **subsidies** or **tax benefits** for private investments in nuclear energy.
4. **Capacity Building**:
   - Develop specialized skill sets in the private sector for nuclear project management and operation.
5. **Awareness Campaigns**:
   - Build public trust through campaigns on the **safety standards** and benefits of nuclear energy.
6. **Global Collaborations**:
   - Partner with international nuclear bodies for **technology transfer** and best practices.

India Achieves Record 14.3% Share of Global Remittances in 2024

Syllabus: Indian Economy – External Sector, Migration, and Remittances (UPSC Mains GS-III)

1. Context

India received **$129 billion** in **global remittances** in 2024, accounting for **14.3% of global remittance flows**, the **highest-ever share** recorded for the country.

2. Trends in Global Remittance Flows

1. **Top Five Recipients (2024)**:
   - **India**: $129 billion.
   - Followed by **Mexico**, **China**, **Philippines**, and **Pakistan**.
2. **Global Growth**:
   - Remittances to **Low- and Middle-Income Countries (LMICs)** surged to **$685 billion** in 2024, with a **5.8% growth rate**.
3. **China's Decline**:
   - **China's share** dropped to **5.3%**, the lowest in two decades, due to reduced **low-skilled emigration** and an aging population.

3. Factors Responsible for High Remittances in India

1. **Scale of Migration**:

- India has the world's **largest diaspora** with over **18 million Indians living abroad** (UN World Migration Report 2024).

2. **Shift in Destination Trends**:
   - More Indian migrants are relocating to **high-income economies** like the **US**, **UK**, and **Australia**, which offer better job opportunities and higher wages.
3. **Skilled and Unskilled Labor**:
   - Indian migrants span across:
     - **Highly Skilled Professionals**: IT, healthcare, and engineering sectors.
     - **Semi-Skilled and Unskilled Laborers**: Construction, domestic work, and other services.
4. **Recovery in Global Job Markets**:
   - Growth in employment in **high-income OECD countries** contributed to increased remittances.

4. Significance of High Remittances

a. For Recipient Households:

1. **Improved Living Standards**:
   - Supports essential expenses like **food**, **healthcare**, and **education**.
2. **Financial Security**:
   - Acts as a safety net for families, especially during economic downturns.

b. For the Macro-Economy:

1. **Foreign Exchange Reserves**:
   - Helps boost India's **foreign exchange reserves**, reducing dependence on external borrowing.
2. **Economic Stability**:
   - Supports funding for **current account deficits** and **fiscal shortfalls**.
3. **Reduced Dependence on Aid**:
   - Less reliance on **foreign aid**, enhancing economic sovereignty.
4. **Rural and Regional Development**:
   - Significant inflow to rural areas, supporting local economies and reducing income inequality.

5. Challenges and Concerns

1. **Dependency Risk**:
   - Over-reliance on remittances can lead to economic vulnerabilities during global downturns.
2. **Brain Drain**:
   - Migration of highly skilled professionals may lead to **loss of talent** in critical sectors like healthcare and IT.
3. **Economic Inequality**:
   - Remittance benefits may remain concentrated in regions with high migration rates, widening inequalities elsewhere.

6. Way Ahead

1. **Policy Support for Diaspora**:
   - Strengthen engagement with the Indian diaspora through:
     - **Consular support**.
     - **Skill-matching programs**.
     - Incentives for investments in India.
2. **Skilled Workforce Development**:
   - Expand training programs for migrants to enhance their earning potential abroad.
3. **Channel Remittances Productively**:
   - Encourage the use of remittances for investments in:
     - **Entrepreneurship**.
     - **Education**.
     - **Infrastructure** in rural areas.
4. **Boost Domestic Opportunities**:
   - Address **push factors** like unemployment by creating better job prospects within India.

SOCIETY AND SOCIAL JUSTICE

UDISE+ 2023-24 Report

Syllabus: Education, Governance, and Social Justice (UPSC Mains GS-II)

1. Context

The **Unified District Information System for Education Plus (UDISE+)**, a data platform under the **Ministry of Education**, released its **2023-24 report**, highlighting critical issues in school education such as declining enrolment and systemic inequities.

2. About UDISE+

1. **Definition**:
   - A **comprehensive database** for tracking school education across India.
2. **Ministry**:
   - Operates under the **Ministry of Education**, Government of India.
3. **Aim**:
   - Ensure **transparency** in education data.
   - **Monitor progress** and **identify gaps** in education systems.
   - Collect **accurate, student-wise data** for policy-making.

3. Key Data Insights

a. Overall Enrolment Drop

Category	2022-23 (in Cr)	2023-24 (in Cr)
Total Enrolment	25.17	24.8
Girl Students	12.09	11.93
Boy Students	13.08	12.87

b. Enrolment Drop by Category

Category	2022-23 (in Cr)	2023-24 (in Cr)
Scheduled Castes	4.59	4.47
Scheduled Tribes	2.48	2.46
OBCs	11.45	11.2
Muslim Students	3.93	3.92
Minorities	5.01	4.98

4. Issues in Indian Education

1. **Access and Retention**:
   - **High dropout rates**, particularly at the secondary level, hinder consistent student progression.
2. **Marginalized Communities**:
   - Significant enrolment declines among **SC, ST, OBC**, and **minority groups**, reflecting systemic inequities.
3. **Infrastructure Utilization**:
   - **Uneven resource allocation**, with states underutilizing or facing infrastructure shortages.
4. **Quality of Education**:
   - **Gaps in teacher training** and shortages impact learning outcomes and engagement.
5. **GER Decline**:
   - **Gross Enrolment Ratios (GER)** for marginalized groups have fallen across **foundational, preparatory, middle**, and **secondary levels**.

5. Way Ahead

1. **Policy Implementation**:
   - Strengthen **NEP 2020** initiatives to achieve **universal GER by 2030** and integrate **skill-based learning**.
2. **Inclusive Education**:
   - Ensure equitable access to education for **SC, ST, OBC**, and **minority students** through targeted programs.
3. **Teacher Training**:
   - Focus on **enhancing teacher quality** and addressing gaps in the **student-teacher ratio**.
4. **Infrastructure Optimization**:
   - Align school resources with **enrolment trends** and improve access to facilities.

5. **Monitoring and Data**:
    - Leverage **student-wise data tracking** to identify dropouts and allocate resources effectively.

Live-In Relationships Among Tribes

Syllabus: Society – Tribal Issues, Cultural Changes (UPSC Mains GS-I)

1. Context

The **Konda Reddi tribe** of **Andhra Pradesh** has adopted **live-in relationships** as a cultural shift, moving away from costly traditional weddings. This reflects evolving societal norms among tribal communities in India.

2. New Culture of Live-In Relationships

1. **What It Is**:
    - Tribal couples choose **live-in arrangements** with the **approval of parents and the community**, bypassing elaborate traditional wedding rituals.
2. **Community Perspective**:
    - Elders treat these relationships as **equal to formal marriages**, ensuring they carry the same **social sanctity**.

3. Reasons for Transition

1. **Economic Factors**:
    - Traditional weddings involve **multi-day feasts** and rituals, creating significant **financial burdens**.
    - **Live-in relationships** eliminate these expenses, making partnerships more accessible.
2. **Practicality**:
    - Simplifies the process of forming partnerships without adhering to elaborate ceremonies.
3. **Influence of Modernity**:
    - **Urban exposure** and increasing interaction with **modern lifestyles** have influenced this shift.

4. Modernization and Westernization

1. **Cultural Adaptation**:
    - Reflects the tribe's ability to **adapt contemporary norms** while retaining core **cultural values**.
2. **Balancing Heritage**:
    - The shift highlights the **balancing act** between preserving **tribal heritage** and embracing **practicality**.
3. **Role of Global Trends**:
    - The adoption of **live-in practices** mirrors the impact of **globalization** and **westernized lifestyles**.

5. Broader Implications

1. **Changing Social Dynamics**:
    - Indicates a broader trend of **social fluidity** and adaptability among tribal communities.
2. **Economic Empowerment**:
    - Reduces **financial pressures**, empowering tribes to allocate resources to **health, education**, and livelihoods.
3. **Challenges to Tradition**:
    - May raise concerns about the **erosion of traditional practices** and rituals among certain sections of the community.
4. **Gender Equality**:
    - Could contribute to **women's autonomy** by providing more **flexibility** in partner choices and relationships.

6. Way Ahead

1. **Community Awareness**:
    - Promote **dialogues within tribal communities** to ensure a balance between **modernity** and **tradition**.
2. **Cultural Preservation**:
    - Document and preserve **traditional practices** to safeguard cultural identity while adapting to change.
3. **Policy Support**:
    - Introduce policies supporting **tribal socio-economic upliftment** while respecting their cultural shifts.
4. **Academic Research**:
    - Conduct **sociological studies** to analyze the long-term impact of such shifts on tribal structures and identities.

7. Conclusion

The Konda Reddi tribe's adoption of **live-in relationships** showcases their adaptability to **modern realities** while navigating the challenges of **cultural preservation**. It reflects the evolving dynamics of tribal societies in India, emphasizing the importance of maintaining a balance between **tradition** and **modernity**.

Transgender Identity Change: Legal and Procedural Framework

Syllabus: Social Justice – Rights of Vulnerable Sections, Gender Issues (UPSC Mains GS-II)

1. Context

The **Karnataka High Court** has ruled that transgender individuals have the right to change their **name** and **gender** on birth certificates, reinforcing the **Transgender Persons (Protection of Rights) Act, 2019**. This judgment emphasizes **inclusivity** and the **legal recognition** of transgender identities.

2. Key Highlights of the Court Judgment

1. **Case Reference**:
   - **Ms. X vs State of Karnataka (2024)**.
2. **Legal Precedence**:
   - The **Transgender Persons (Protection of Rights) Act, 2019** is a **special law**, overriding the **1969 Registration of Births and Deaths Act**.
3. **Mandates for Registrar**:
   - The **Registrar of Births and Deaths** must issue corrected birth certificates based on valid **identity certificates**.

3. Officials Responsible for Changes

1. **District Magistrate (DM)**:
   - Processes applications for **identity certificates** and transgender identity cards.
2. **Registrar of Births and Deaths**:
   - Issues **revised birth certificates** based on the identity certificate issued by the DM.

4. Eligibility Criteria

1. **Transgender Identity**:
   - Applicant must identify as **transgender** and declare their identity through an **affidavit**.
2. **Revisions Post-Sex-Reassignment Surgery**:
   - Requires a **medical certificate** from a **Chief Medical Officer** or **Medical Superintendent** of a recognized hospital.

5. Procedure for Changing Name and Gender

a. Application for Identity Certificate

1. **Submission**:
   - File an **affidavit** declaring gender identity with the **District Magistrate**.
2. **Issuance**:
   - DM issues an **identity certificate** and **transgender identity card** within **30 days**.

b. Revised Identity Certificate (Post-Surgery)

1. **Medical Certificate**:
   - Obtain from a recognized **medical authority** post-sex-reassignment surgery.
2. **Application**:
   - Submit to the DM for a **revised identity certificate**, processed within **15 days**.

6. Updating Official Documents

1. **Birth Certificate**:
   - Submit the identity certificate to the **Registrar of Births and Deaths** for changes.
2. **Other Documents**:
   - Apply for updates in **Aadhaar**, **passport**, or other official documents.
   - Changes must be implemented within **15 days** of application.

7. Significance of the Ruling

1. **Legal Empowerment**:
   - Strengthens the **legal recognition** of transgender individuals under the **2019 Act**.
2. **Inclusivity**:
   - Affirms the **right to self-identify** and access to documents reflecting true identity.
3. **Administrative Clarity**:
   - Establishes a clear **procedure** for name and gender changes in official records.
4. **Upholding Dignity**:

- Reinforces the **dignity and rights** of transgender individuals as equal citizens.

8. Way Ahead

1. **Awareness Campaigns**:
   - Educate transgender individuals about their rights and procedures under the **2019 Act**.
2. **Streamlined Processes**:
   - Ensure uniformity and efficiency in implementing the procedures across states.
3. **Training for Officials**:
   - Sensitize **DMs** and **registrars** to handle applications with respect and inclusivity.
4. **Legal Support Systems**:
   - Provide free **legal aid** and support to transgender individuals during the process.

9. Conclusion

The **Karnataka High Court's ruling** is a progressive step toward **gender justice** and **administrative inclusion**. By simplifying procedures for name and gender changes, the judgment underscores India's commitment to protecting the rights and dignity of **transgender persons**.

Comparative Study of School Education System (SES) Report

Syllabus: Education – Development and Challenges (UPSC Mains GS-II)

1. Context

The **Confederation of Indian Industry (CII)** released a report comparing the **School Education Systems (SES)** of India with countries like the **USA**, **UK**, **China**, **Sweden**, and **Australia**. The report examines **structures**, **methods**, **funding**, **assessments**, and **equity measures** to identify challenges and recommend improvements for India.

2. Comparison of India's SES with Other Countries

Aspect	India	Other Countries
Education Budget	~3% of GDP	**6%+ of GDP** in countries like Sweden and Australia.
Curriculum	Focused on rote learning	**Skill-based and adaptive** curricula emphasizing creativity, critical thinking, and problem-solving.
Assessment	Exam-centric	Countries like the UK focus on **continuous and holistic assessment**.
Equity Measures	Regional disparities, gender gaps	Sweden has **inclusive education policies**, especially for students with disabilities.
Technology Integration	Limited penetration of digital education	Countries like the USA and China have **well-established digital ecosystems** for education.

3. Challenges in India's Education System

1. **Regional Disparities**:
   - Stark differences in educational outcomes between **urban and rural areas**.
2. **Gender Gaps**:
   - Unequal access to education for girls, especially in rural regions.
3. **Infrastructure Deficits**:
   - Inadequate **classrooms**, **sanitation**, and **learning resources**, particularly in rural schools.
4. **Holistic Education**:
   - Limited focus on **critical thinking**, **creativity**, and **21st-century skills** hampers employability.
5. **Digital Divide**:
   - Unequal access to digital resources, hindering **online learning** and technology-based education.

4. Recommendations from the Report

a. Increase Education Budget

1. **Target**:
   - Allocate **6% of GDP** for education.
2. **Focus Areas**:
   - Enhance **infrastructure**, foster **innovative learning ecosystems**, and improve **teacher training**.

b. Digital Education

1. **Bridge the Gap**:
   - Provide **localized digital content** and ensure access to **digital devices**.
2. **Teacher Training**:
   - Boost **digital literacy** among teachers for effective online teaching.

c. Implement NEP 2020

1. **Teacher Training**:
   - Focus on continuous **professional development**.
2. **Flexible Curricula**:
   - Emphasize **skill-based and technology-driven education**.

d. Curriculum Framework

1. **Adaptiveness**:
   - Develop an **inclusive curriculum** that reflects **regional diversity**.
2. **Skill-Based Learning**:
   - Prioritize practical and employability skills.

e. Address Inequities

1. **Infrastructure**:
   - Invest in **rural education infrastructure** to reduce disparities.
2. **Inclusive Education**:
   - Draw from models like Sweden's **disability-inclusive frameworks**.

f. Pedagogical Changes

1. **Interactive Methods**:
   - Equip teachers with tools to foster **critical thinking** and **dynamic learning environments**.

5. Significance of the Recommendations

1. **Equitable Learning**:
   - Addresses **regional and gender disparities**, ensuring inclusivity.
2. **Global Competitiveness**:
   - Prepares students with **21st-century skills**, improving employability.
3. **Technology Integration**:
   - Enhances **digital literacy** and ensures access to modern education tools.
4. **Sustainable Development**:
   - Aligns with **SDG 4** (Quality Education), fostering sustainable and inclusive growth.

AGRICULTURE

Pradhan Mantri Fasal Bima Yojana (PMFBY)

Syllabus: Agriculture – Government Policies and Interventions (UPSC Mains GS-III)

1. Context

The Union Cabinet has approved the continuation of the **Pradhan Mantri Fasal Bima Yojana (PMFBY)** until **2025-26**, with an allocation of **₹69,515 crore**, reflecting the government's commitment to **agricultural risk management**.

2. About PMFBY

1. **Launched**:
   - **2016**, by the **Ministry of Agriculture & Farmers Welfare**.
2. **Objective**:
   - **Insurance Coverage**: Safeguard farmers against crop losses due to natural calamities.
   - **Income Stability**: Ensure financial security for farmers and promote continuity in farming.
   - **Modern Practices**: Encourage **credit flow** and adoption of **modern agricultural techniques**.
3. **Premium Rates**:
   - **Kharif Crops**: 2% of the sum insured.
   - **Rabi Crops**: 1.5% of the sum insured.
   - **Commercial/Horticultural Crops**: 5% of the sum insured.
   - **Subsidy**: Remaining premium is equally shared by **Central and State Governments**.
4. **Area-Based Approach**:
   - Coverage is implemented on a **notified area basis** for major crops.
   - **Unit of Insurance**: Village or Village Panchayat level.

3. Beneficiary Coverage

1. **Eligibility**:
   - All farmers growing **notified crops** with insurable interest.
2. **Participation**:
   - Became **voluntary** from **Kharif 2020**.

4. Risks Covered

1. **Yield Losses**:
   - Natural calamities such as **hailstorms, cyclones, droughts, floods**, and **pest attacks**.
2. **Prevented Sowing**:
   - Compensation up to **25% of the insured sum** for adverse weather conditions preventing sowing.
3. **Post-Harvest Losses**:
   - Coverage for crop damage up to **14 days** during drying.
4. **Localized Risks**:
   - Includes **hailstorms, landslides, and inundation** affecting specific farms.

5. Key Features of PMFBY

1. **Technology Use**:
   - Satellite imagery, drones, remote sensing, and **AI** for accurate yield assessments.
2. **YES-TECH Initiative**:
   - **Technology-based yield estimation** reduces dependency on traditional crop-cutting experiments.
3. **No Upper Limit on Subsidy**:
   - Government provides subsidy without a cap on premium rates.
4. **Ease of Reporting**:
   - Farmers can report crop loss within **72 hours** via the **Crop Insurance App**.

6. Significance of PMFBY

1. **Financial Security**:
   - Protects farmers against **economic shocks** from crop failures.
2. **Promotion of Modern Practices**:
   - Encourages adoption of **advanced technologies** and better farming methods.
3. **Inclusive Coverage**:
   - Covers **small and marginal farmers**, ensuring **equitable access** to benefits.
4. **Risk Mitigation**:
   - Reduces farmers' dependency on **moneylenders** and ensures continued agricultural activities.

7. Way Ahead

1. **Awareness Programs**:
   - Educate farmers on **claim processes**, **coverage details**, and technological features.
2. **Transparency Enhancements**:
   - Improve grievance redressal and ensure timely **claim settlements**.
3. **Inclusion of Tenant Farmers**:
   - Ensure better participation of **sharecroppers** and **tenant farmers**.
4. **Technology Expansion**:
   - Enhance the use of **real-time data systems** to improve loss assessments.

Project VISTAAR

Syllabus: Agriculture – Technology in Agriculture, Governance (UPSC Mains GS-III)

1. Context

Launch of Project VISTAAR: **IIT Madras** has collaborated with the **Ministry of Agriculture and Farmers' Welfare**to launch **Project VISTAAR**—a digital platform aimed at transforming **agricultural extension services** in India.

2. About Project VISTAAR

1. **What it is**:
   - A **digital platform** designed to enhance the **efficiency and reach** of agricultural extension services by providing **critical information** and **start-up-driven innovations** to farmers.

2. **Ministry Involved**:
    - **Ministry of Agriculture and Farmers' Welfare**, in partnership with **IIT Madras**.

3. Objectives of Project VISTAAR

1. **Digitalisation**:
    - Modernize the **agricultural extension system** to improve outreach and efficiency.
2. **Technology Access**:
    - Enable farmers to access **innovations** and **technologies** developed by agri-startups in agriculture and allied sectors.
3. **Sustainability**:
    - Promote adoption of **sustainable** and **climate-resilient farming practices**.

4. Key Features of Project VISTAAR

1. **Startup Integration**:
    - Incorporates data on **12,000+ agri-startups** via IIT Madras' **YNOS Venture Engine** platform.
2. **Comprehensive Advisory Services**:
    - Offers guidance on:
        - **Crop production**.
        - **Marketing strategies**.
        - **Value addition**.
        - **Supply chain management**.
3. **Access to Government Schemes**:
    - Provides seamless access to information on **agriculture-related government schemes**.
4. **Timely and Accurate Information**:
    - Delivers **contextual insights** to farmers, helping them make informed decisions.

5. Significance of Project VISTAAR

1. **Empowering Farmers**:
    - Bridges the gap between farmers and **innovative technologies**, ensuring **knowledge dissemination**.
2. **Promoting Startups**:
    - Supports **agri-startups** by integrating their solutions into the agricultural ecosystem.
3. **Sustainability**:
    - Encourages practices that are environmentally friendly and **resilient to climate change**.
4. **Efficient Governance**:
    - Digitalises extension services, making them **more transparent**, **accessible**, and **efficient**.
5. **Boost to Rural Economy**:
    - Facilitates **value addition** and **market access**, driving economic growth in rural areas.

6. Way Ahead

1. **Wider Rollout**:
    - Ensure the platform's reach to **small and marginal farmers**, particularly in remote areas.
2. **Training Programs**:
    - Conduct **awareness and training sessions** for farmers to utilize the platform effectively.
3. **Real-Time Feedback Mechanisms**:
    - Introduce channels for farmers to provide feedback, enhancing the system's responsiveness.
4. **Data Security**:
    - Strengthen measures to ensure the **security of farmer data** and startup innovations.
5. **Monitoring and Evaluation**:
    - Regularly assess the platform's impact on **farm productivity** and **income levels**.

Modifications in Crop Insurance Schemes Approved by Cabinet

Syllabus: Agriculture – Policies and Schemes (UPSC Mains GS-III)

1. Context

The Union Cabinet approved modifications in the **Pradhan Mantri Fasal Bima Yojana (PMFBY)** and **Restructured Weather Based Crop Insurance Scheme (RWBCIS)** to improve their effectiveness and integrate advanced technologies for enhanced implementation.

2. Key Modifications Approved

1. **Scheme Continuation**:
    - Extended until **2025-26** with a total outlay of **₹69,515.71 Crore**.

2. **Technology Infusion**:
    - Establishment of the **Fund for Innovation and Technology (FIAT)** with a corpus of **₹824.77 Crore**.
    - FIAT will support initiatives like:
        - **Yield Estimation System based on Technology (YES-TECH)**.
        - **Weather Information Network Data System (WINDS)**.

3. About PMFBY and RWBCIS

a. Aim

- Provide **affordable crop insurance** for comprehensive risk coverage against **non-preventable natural risks** from **pre-sowing to post-harvest** stages.
- **RWBCIS**: Protects against losses caused by **adverse weather conditions** (e.g., rainfall, temperature, wind).

b. Key Features

Feature	PMFBY	RWBCIS
Coverage	All farmers (including sharecroppers and tenant farmers).	Same as PMFBY.
Crops Covered	Food crops, oilseeds, horticultural, and commercial crops.	Same as PMFBY.
Risks Covered	Yield loss, localised calamities, post-harvest losses.	Weather-based losses like rainfall and temperature variations.
Premium Rates	Kharif: 2%, Rabi: 1.5%, Commercial: 5%.	Premiums are calculated based on weather indices.
Exclusions	Preventable risks, war, and nuclear events.	Similar exclusions.

4. Technology Adoption Efforts

1. **National Crop Insurance Portal**:
    - Centralized system for better **administration and coordination** of crop insurance schemes.
2. **YES-TECH (Yield Estimation System)**:
    - Technology-driven **direct yield estimation** at the **Gram Panchayat (GP)** level to improve claim accuracy.
3. **WINDS (Weather Information Network Data System)**:
    - Provides **hyper-local weather data** to assist in crop insurance claims.
    - Implementation to start in **2024-25**, aiding state governments with long-term weather predictions.

5. Significance of Modifications

1. **Enhanced Farmer Support**:
    - Improved accuracy in **yield estimation** and **weather-based predictions** reduces delays and errors in claim settlements.
2. **Increased Adoption**:
    - Greater trust and participation among farmers due to **transparent and technology-driven processes**.
3. **Risk Mitigation**:
    - Comprehensive coverage ensures protection from climate-induced risks, fostering **sustainable agriculture**.
4. **Modernized Administration**:
    - Leveraging advanced systems like **YES-TECH** and **WINDS** enhances the efficiency and reliability of the schemes.
5. **Reduction in Fiscal Burden**:
    - Technology helps streamline processes, reducing administrative costs and **fraudulent claims**.

6. Challenges and Way Ahead

Challenges

1. **Awareness and Accessibility**:
    - Farmers, especially in rural areas, may lack awareness about scheme benefits and procedures.
2. **Infrastructure Limitations**:
    - Technological interventions like WINDS require robust **infrastructure and data accuracy**.
3. **Implementation Delays**:
    - Coordination between states and the central government can hinder timely implementation.

Way Ahead

1. **Awareness Campaigns**:
    - Conduct extensive campaigns to educate farmers about **PMFBY** and **RWBCIS** benefits and processes.
2. **Capacity Building**:
    - Train state and district-level officials to effectively implement **WINDS** and **YES-TECH**.
3. **Public-Private Partnerships**:
    - Encourage private sector participation for technological and logistical support.
4. **Real-Time Monitoring**:
    - Use drones and satellite data for accurate yield assessments and faster claim processing.

Extension of Special Package for Di-Ammonium Phosphate (DAP) Beyond NBS Subsidy

Syllabus: Agriculture – Fertilizer Subsidies, Sustainable Agriculture (UPSC Mains GS-III)

1. Context

The **Cabinet** has approved the extension of the **One-Time Special Package for DAP** to ensure its continued availability at affordable prices to farmers. Initially approved in **July 2024**, the package has now been extended from **January 1, 2025, until further orders**.

2. About Di-Ammonium Phosphate (DAP)

1. **Composition**:
   - **DAP** is a widely used phosphorus fertilizer containing **Phosphorus (P)** and **Nitrogen (N)**.
2. **Importance**:
   - Phosphorus is vital for:
     - **Root development**.
     - **Flowering and seed production**.
     - **Overall plant health**.
3. **Production**:
   - Produced by reacting **phosphoric acid** with **ammonia** under controlled conditions.

3. Fertilizer Subsidy in India

a. Purpose

- **Subsidies** ensure fertilizers are affordable, boosting agricultural productivity and reducing input costs for farmers.

b. Major Schemes

Scheme	Description
Direct Benefit Transfer (DBT)	100% subsidy is released to manufacturers based on **Aadhaar-authenticated sales** to farmers.
Urea Subsidy	Provided to farmers at a **statutory MRP**. Subsidy covers the difference between **cost of production/import** and MRP.
Nutrient-Based Subsidy (NBS)	For **Phosphatic and Potassic (P&K) fertilizers**, a fixed subsidy is provided based on **nutrient content**.

4. Recent Measures to Control Overuse of Fertilizers

1. **Neem-Coated Urea**:
   - Mandatory **100% neem-coating** of urea to reduce wastage and overuse.
2. **Nano Fertilizers**:
   - Introduction of **Nano Urea** by IFFCO to improve nutrient use efficiency.
3. **PM PRANAM**:
   - **Programme for Restoration, Awareness Generation, Nourishment, and Amelioration of Mother-Earth**to reduce chemical fertilizer usage.
4. **Alternative Fertilizers**:
   - Promotion of **organic fertilizers**, **bio-fertilizers**, and **natural farming** practices.

5. Significance of Extending the Special Package for DAP

1. **Farmer Welfare**:
   - Ensures continued availability of **affordable DAP**, supporting **small and marginal farmers**.
2. **Agricultural Productivity**:
   - Sustains essential nutrient supply, improving **crop yields** and ensuring **food security**.
3. **Inflation Control**:
   - Helps curb rising input costs in agriculture, mitigating **food price inflation**.
4. **Support for Sustainable Practices**:
   - Encourages balanced use of fertilizers, reducing dependency on **urea** and addressing environmental concerns.

6. Challenges in Fertilizer Subsidy Framework

1. **Overuse of Subsidized Fertilizers**:
   - Excessive use of subsidized fertilizers like **urea** impacts **soil health**.
2. **Fiscal Burden**:
   - Fertilizer subsidies impose a significant burden on the **government exchequer**.
3. **Imbalanced Nutrient Usage**:
   - Favoritism towards nitrogen-based fertilizers leads to **nutrient imbalance** in soil.

4. **Black Marketing and Leakages**:
    - Issues with **diversion** of subsidized fertilizers for non-agricultural purposes.

7. Way Ahead

1. **Promote Balanced Fertilizer Use**:
    - Incentivize the adoption of balanced fertilizers through **awareness campaigns** and **soil testing**.
2. **Technology Integration**:
    - Expand **DBT** coverage and use **satellite monitoring** for tracking fertilizer use.
3. **Support for Alternatives**:
    - Increase subsidies for **organic and bio-fertilizers** to promote sustainable farming.
4. **Fiscal Reforms**:
    - Rationalize subsidies by targeting small and marginal farmers directly.
5. **Monitoring and Accountability**:
    - Strengthen mechanisms to prevent black marketing and misuse of subsidies.

GEOGRAPHY AND DISASTER

Crimea Peninsula

Syllabus: Geography (UPSC Mains GS-I)

1. Context

Environmental Crisis: A severe **oil spill** occurred in the **Kerch Strait**, near Crimea, following a collision between two oil tankers, causing a major ecological disaster in the **Black Sea**.

2. About Crimea Peninsula

1. **Location**:
    - Situated in **Eastern Europe**, Crimea is almost entirely surrounded by the **Black Sea** and the **Sea of Azov**.
2. **Geographical Connectivity**:
    - **Mainland Ukraine**: Connected via the **Isthmus of Perekop**.
    - **Russia**: Linked by the **Crimean Bridge** over the Kerch Strait.
3. **Borders**:
    - Maritime proximity with **Romania** (west) and **Turkey** (south) across the Black Sea.
4. **Historical Significance**:
    - Known as the **Tauric Peninsula** in early modern history.
    - Annexed and occupied by **Russia since 2014**, sparking international disputes.

3. Geological Features

1. **Mountains**:
    - Dominated by the **Crimean Mountains** in the south, with **Ai-Petri** being a notable peak.
2. **Rivers**:
    - Small rivers include **Salhir** and **Alma**.
3. **Coastal Features**:
    - The **Arabat Spit** separates the **Syvash lagoons** from the Sea of Azov.

4. Significance of Crimea

1. **Strategic Location**:
    - Acts as a critical **maritime hub** in the Black Sea, connecting Europe and Asia.
2. **Economic Importance**:
    - Rich in **natural resources** and a center for **trade and shipping activities**.
3. **Geopolitical Tensions**:
    - The annexation of Crimea by **Russia in 2014** has heightened **regional and global conflicts**.
4. **Environmental Concerns**:
    - Prone to **ecological crises** like oil spills, affecting marine biodiversity and coastal livelihoods.

Saraswati River

Syllabus: Ancient History and Geography (UPSC Mains GS-I)

1. Context

A sudden **geological event** in **Jaisalmer, Rajasthan**, led to water and gas erupting during tube well drilling, sparking debates about the **resurfacing of the Saraswati River**.

2. About Saraswati River

a. Origin and Flow

1. **Source**:
   - Believed to originate from **Kapal Tirith** in the Himalayas, near **Mount Kailash**, flowing southward toward **Mansarovar**.
2. **Course**:
   - Passes through modern-day **Haryana, Rajasthan**, and **Gujarat**, with traces near **Badrinath, Uttarakhand**.
3. **Alternate Name**:
   - Known as the **Guptagamini River** (hidden or subterranean river).

b. Historical Context

1. **Rigveda Mentions**:
   - Praised in the **Nadistuti Sukta hymn** as a "**perfect mother**" and "**supreme goddess**."
   - Revered for its vital role in **agriculture and sustenance**.
2. **Role in Harappan Civilization**:
   - Numerous **Harappan settlements** were located along its course, indicating its significance for trade, agriculture, and cultural development.

3. Ghaggar-Hakra River System and Saraswati

1. **Association**:
   - The **Ghaggar-Hakra River System** is widely believed to be the remnant of the **Saraswati River**.
2. **Ghaggar River**:
   - Originates from the **Shivalik Hills** in Himachal Pradesh.
   - Flows through **Punjab, Haryana**, and parts of Rajasthan.
3. **Hakra River**:
   - After the **Ottu Barrage** in Haryana, the Ghaggar becomes the **Hakra**, which dries up in the **Thar Desert**.

4. Significance of the Saraswati River

1. **Cultural and Religious**:
   - Revered in **Hindu texts** for its purity and divine status.
   - Integral to Vedic rituals and philosophy.
2. **Historical Importance**:
   - Supported **Harappan settlements**, marking its role in the growth of early urbanization in the Indian subcontinent.
3. **Geographical Insights**:
   - Provides clues about ancient river systems and climate changes affecting human settlement patterns.
4. **Modern Relevance**:
   - Renewed interest in reviving the Saraswati for **water resource management** and **heritage preservation**.

5. Challenges and Scientific Debate

1. **Geological Evidence**:
   - Lack of **conclusive evidence** of an uninterrupted Saraswati River in the present geography.
2. **Climatic Shifts**:
   - Believed to have dried up due to **tectonic activity** and **climatic changes** during the late Harappan period.
3. **Hydrological Complexity**:
   - Difficult to distinguish between ancient river systems like **Saraswati, Yamuna**, and **Ghaggar-Hakra**.

6. Way Ahead

1. **Research and Exploration**:
   - Use **satellite imagery** and **geological studies** to trace the ancient course of the Saraswati River.
2. **Hydro-Geological Conservation**:
   - Preserve underground water systems and mitigate their exploitation.
3. **Cultural Revival**:

- Promote awareness of Saraswati's historical and cultural significance.

4. **Collaboration**:
   - Encourage interdisciplinary efforts involving **archaeology, geology, and hydrology** to understand ancient river systems.

HISTORY, ART & CULTURE

Intangible Cultural Heritage

Syllabus: Indian Heritage and Culture (UPSC Mains GS-I)

x1. Context

Recognition of Sevdalinka: Bosnia's **Sevdalinka**, also called the **"Balkan Blues"**, has been added to **UNESCO's National Inventory of Intangible Cultural Heritage**, reflecting global efforts to preserve cultural traditions.

2. About UNESCO's National Inventory of Intangible Cultural Heritage

1. **Established**:
   - **Adopted in 2003**, came into force in **2006** under the **Convention for the Safeguarding of Intangible Cultural Heritage**.
2. **Aim**:
   - To **safeguard endangered cultural practices**, expressions, and knowledge systems threatened by **globalization**.
   - To ensure respect for **community heritage** and its sustainability.
3. **Criteria for Inclusion**:
   - **Cultural Identity**: Demonstrates importance to the cultural identity of a community.
   - **Community Participation**: Requires active engagement by the community.
   - **Human Rights Alignment**: Must uphold **human rights** and align with principles of **sustainable development**.
4. **Types of Lists**:
   - **Representative List of Intangible Cultural Heritage of Humanity**.
   - **List of Intangible Cultural Heritage in Need of Urgent Safeguarding**.
   - **Register of Good Safeguarding Practices**.

3. India and UNESCO's Intangible Cultural Heritage

1. **Membership**:
   - India is currently a member of the **ICH Committee (2022–2026)** and the **World Heritage Committee (2021–2025)**.
   - **Previous Tenures**: Served on the ICH Committee in **2006–2010** and **2014–2018**.
2. **Nodal Office**:
   - **Sangeet Natak Akademi**, under the Ministry of Culture, manages India's intangible cultural heritage matters.
   - Prepares **nomination dossiers** for UNESCO's Representative List.

4. About Balkan Blues (Sevdalinka)

1. **Definition**:
   - A **melancholic urban love song**, combining **South Slavic oral poetry** and **Ottoman music**, symbolizing Bosnia's history and identity.
2. **Nation**: Bosnia.
3. **Features**:
   - Traditionally performed **a cappella** or with instruments like the **saz (lute)**.
   - Originates from the **16th century**, reflecting themes of **love and melancholy**.
   - Recognized as a **cultural symbol of Bosnia's heritage**.

5. Significance of Recognizing Intangible Cultural Heritage

1. **Preservation**: Protects **endangered traditions** and practices.
2. **Cultural Identity**: Promotes understanding of a community's **history and values**.
3. **Global Recognition**: Strengthens **international awareness** and respect for diverse cultural traditions.
4. **Sustainability**: Encourages alignment with **sustainable development goals**.

Sanskrit Inscriptions

Syllabus: Indian Heritage and Culture (UPSC Mains GS-I)

1. Context

Discovery of Sanskrit Inscriptions: The **Archaeological Survey of India (ASI)** recently decoded an **ancient Sanskrit inscription** found in **Gilgit, Pakistan-Occupied Kashmir**, highlighting India's historical and cultural ties to the region.

2. About Sanskrit Inscriptions

1. **Location Found**:
   - **Gilgit, Pakistan-Occupied Kashmir**:
     - Written in **Brahmi script**, dated to the **4th century CE**.
   - **Near Peshawar, Pakistan**:
     - Written in **Sharada script**, dated to the **10th century CE**.
2. **Details of the Inscriptions**:
   - **Gilgit Inscription**:
     1. **Content**: Mentions **Pushpasingha**, who installed a **Mahesvaralinga** in honor of his **guru**.
     2. **Script**: Written in **Brahmi script**.
     3. **Religious Significance**: Reflects **Shaivism's influence** in the region.
   - **Peshawar Inscription**:
     1. **Content**: Fragmentary inscription engraved on a **stone slab**.
     2. **Script**: Written in **Sharada characters**.
     3. **Religious Reference**: Mentions **Buddhist Dharini (chants)** in line six, indicating ties to **Buddhism**.

3. Significance of the Findings

1. **Cultural Heritage**: Highlights the **religious diversity** and **syncretism** in ancient India, showcasing the coexistence of **Shaivism** and **Buddhism**.
2. **Historical Insights**: Provides evidence of **ancient Indian scripts** (Brahmi and Sharada) and their evolution.
3. **Geopolitical Significance**: Reinforces India's **historical and cultural connections** to regions like **Gilgit** and **Peshawar**, now outside modern India.
4. **Religious Significance**: Indicates the spread of **Hinduism and Buddhism** in the Himalayan and trans-Himalayan regions.
5. **Epigraphy Contribution**: Enriches India's **epigraphical database**, offering valuable insights into **ancient language, governance, and religious practices**.

Vice-President Addresses 27th International Congress of Vedanta

Syllabus: Indian Philosophy and Culture – Contributions to Society (UPSC Mains GS-I)

1. Context

The **27th International Congress of Vedanta** was held in **Delhi** under the theme "**Re-imagining Vedāntic World Order**," highlighting Vedanta's relevance in addressing contemporary challenges.

2. Key Highlights

1. **Theme**:
   - **"Re-imagining Vedāntic World Order"** to reflect the enduring relevance of Vedanta in modern times.
2. **Major Vedanta Schools**:

School	Key Idea	Philosopher
Advaita Vedanta	**Unity of Brahman and Atman**: Asserts non-duality of existence.	**Shankaracharya** (8th CE)
Dvaita Vedanta	**Dualism**: Brahman and Atman are distinct entities.	**Madhvacharya** (1238-1317 CE)
Vishishtadvaita	**Qualified Non-dualism**: Atman is different yet connected to Brahman.	**Ramanuja** (1017-1137 CE)

3. About Vedanta Philosophy

1. **Meaning**:
   - Vedanta translates to "**the end of the Vedas**," focusing on the **Upanishads**, the concluding parts of the Vedic texts.
   - It includes multiple interpretations of the **Upanishads**, forming the **Uttara-Mimāṁsā** school of thought.
2. **Philosophical Focus**:
   - Addresses existential questions:
     - **Who am I?**
     - **What is this universe?**
     - **How am I related to the universe?**

3. **Key Concepts**:
    - **Brahman**: The ultimate reality.
    - **Atman**: The individual soul.
    - **Prakriti**: The physical world.
4. **Global Spread**:
    - Introduced to the West by **Swami Vivekananda** at the **1893 Chicago Parliament of Religions**.

4. Contemporary Relevance of Vedanta

1. **Democracy and Pluralism**:
    - The principle "**Truth is one, but the wise express it differently**" promotes:
        - **Pluralism**.
        - **Coexistence**.
        - **Dialogues across cultures**.
2. **Global Harmony**:
    - The Vedantic idea of **Vasudhaiva Kutumbakam** ("The world is one family") fosters:
        - **Unity among nations**.
        - **Social and cultural inclusivity**.
3. **Addressing Climate Change**:
    - Advocates **sustainable living** by emphasizing humanity's unity with **nature**.

ENVIRONMENT & ECOLOGY

Environment Summits of 2024

Syllabus: Ecology and Environment (UPSC Mains GS-III)

1. Context

Global Environmental Setbacks: In **2024**, major **UN climate summits** failed to deliver impactful resolutions, underscoring the urgent need for **unified global action** on critical environmental issues.

2. Key 2024 Climate Summits and Outcomes

a. Biodiversity Summit (Colombia)

1. **Objective**: Finalize financing mechanisms for sustainable land-use practices.
2. **Outcome**:
    - Failed to achieve the **$700 billion annual goal** for biodiversity protection.

b. Climate Change Summit (Azerbaijan)

1. **Objective**: Transition from fossil fuels and secure funding for developing nations.
2. **Outcome**:
    - **Divisions** over the **fossil fuel transition**.
    - Inadequate **funding pledges** for developing nations.

c. Land Degradation Summit (Saudi Arabia)

1. **Objective**: Develop a legally binding protocol on drought management.
2. **Outcome**:
    - Lack of consensus on the protocol, stalling progress.

d. Plastic Pollution Summit (South Korea)

1. **Objective**: Curb global plastic pollution through reduction strategies.
2. **Outcome**:
    - No agreement reached due to **opposition from plastic-dependent economies** favoring **recycling** over **reduction**.

3. Role of Youth in Environmental Pacts

1. **Youth-led Litigation**:
    - Cases like **Held v. Montana** (U.S.) and **Ridhima Pandey's petition** (India) challenge inadequate climate policies.

2. **Human Rights Advocacy**:
    - Highlight **climate inaction** as a violation of fundamental rights, pushing for **science-based reforms**.
3. **Global Movements**:
    - Youth-led campaigns emphasize **intergenerational equity**, inspiring governments to prioritize sustainable policies.
4. **Courtroom Success**:
    - Landmark rulings in **Canada, the Netherlands, and Germany** demonstrate the impact of youth activism in shaping climate policies.

4. Reasons for Summit Failures

1. **Divergent Priorities**:
    - Developing nations demand **financial and technological support**, while developed nations cite **domestic constraints**.
2. **Economic Pressures**:
    - Global crises like **inflation**, **geopolitical conflicts**, and **post-pandemic recovery** divert resources and attention.
3. **Lack of Consensus**:
    - Disagreements on **accountability frameworks** and **operational mechanisms**.
4. **Inequitable Commitments**:
    - Wealthier nations failed to meet **financial and emission reduction targets**.

5. Road Ahead

1. **Climate Finance**:
    - Wealthier nations must **honour commitments** to fund and support developing countries.
2. **Integrated Strategies**:
    - Address **biodiversity loss**, **land degradation**, and **pollution** alongside climate action.
3. **Accountability Mechanisms**:
    - Develop **robust frameworks** to track commitments and enforce agreements.
4. **Youth Inclusion**:
    - Amplify **youth voices** in policymaking to ensure **equity and innovation**.
5. **Focus on Implementation**:
    - Shift from mere pledges to **actionable and measurable outcomes**.

Nitrate Contamination in Groundwater

Syllabus: Environment and Health (UPSC Mains GS-III)

1. Context

Health Hazards of Nitrate Contamination: Over **440 districts in India** report unsafe levels of nitrate contamination in groundwater, posing significant risks to public health and the environment as of **2023**.

2. About Nitrate

1. **Definition**:
    - A **naturally occurring nitrogen compound** essential for biological processes, but harmful to humans and the environment in excessive amounts.
2. **Sources**:
    - **Natural**:
        - Decomposition of **soil organic matter**.
    - **Anthropogenic**:
        - Overuse of **synthetic nitrogen fertilizers**.
        - Improper **sewage disposal**.
        - Livestock waste management failures.

3. Causes of Nitrate Contamination

1. **Agriculture**:
    - **Leaching of fertilizers** into groundwater due to overuse or improper application methods.
2. **Poor Waste Management**:
    - Improper disposal of **human and animal waste**, especially in rural areas.
3. **Industrial Effluents**:
    - Discharge of **nitrogen-rich untreated wastewater** from industries into water bodies.

4. Impacts of Nitrate Contamination

a. Health Hazards

1. **Methemoglobinemia (Blue Baby Syndrome)**:

    - Nitrate converts hemoglobin to **methemoglobin**, reducing oxygen transport in infants.
2. **Cancer**:
    - Linked to **gastric and colon cancers** due to formation of **nitrosamines**.
3. **Reproductive and Endocrine Disorders**:
    - Affects hormonal balance and fertility.

b. Environmental Toxicity

1. **Eutrophication**:
    - Excess nitrates lead to **algal blooms**, depleting oxygen and harming aquatic ecosystems.
2. **Soil Degradation**:
    - High nitrate levels **alter soil composition**, reducing agricultural productivity.
3. **Water Toxicity**:
    - Contaminated water bodies become unsafe for human consumption and aquatic life.

5. State-Wise Contamination Levels

- **Rajasthan**: 49% of water sources report unsafe nitrate levels.
- **Karnataka**: 48% contamination.
- **Tamil Nadu**: 37% contamination.

6. Way Ahead

1. **Sustainable Agricultural Practices**:
    - Promote **organic farming** and **precision agriculture** to minimize fertilizer leaching.
2. **Waste Management Improvements**:
    - Implement proper **sewage treatment plants** and **livestock waste management systems**.
3. **Regulation of Industrial Effluents**:
    - Enforce strict norms for **industrial wastewater treatment** before discharge.
4. **Groundwater Monitoring**:
    - Establish **real-time nitrate monitoring systems** for groundwater quality assessment.
5. **Community Awareness**:
    - Educate farmers and local communities about the risks of nitrate contamination and mitigation measures.

Chhattisgarh: Pioneering Green GDP Accounting

Syllabus: Environment and Sustainable Development – Green GDP, Climate Change Mitigation (UPSC Mains GS-III)

1. Context

Chhattisgarh has become the **first Indian state** to integrate **forest ecosystem services** into **Green Gross Domestic Product (Green GDP)**, highlighting the **environmental contributions** of its forests to the state's **economic progress**.

2. Key Highlights

1. **Chhattisgarh's Initiative**:
    - Links **forest ecosystem services** (clean air, water conservation, biodiversity) directly to **economic metrics**.
    - Forests constitute **44% of the state's land cover**, playing a vital role in **climate change mitigation**.
2. **Economic Contributions of Forest Products**:
    - **Non-Timber Forest Products (NTFPs)**:
        - Examples: **Tendu leaves**, **lac**, **honey**, **medicinal plants**.
        - Significant contributors to the **rural economy**, providing **livelihoods** to local communities.

3. About Green GDP

1. **Genesis**:
    - Concept introduced in the **late 1980s** to reflect the **environmental costs** of economic activities.
2. **Definition**:
    - **Green GDP** refers to the **environmentally adjusted GDP**, accounting for **natural resource depletion** and **ecosystem degradation**.
3. **Calculation**:
    - **Green GDP = Net Domestic Product - (Cost of Resource Depletion + Cost of Ecosystem Degradation)**.
4. **Need for Green GDP**:
    - Traditional GDP treats **environmental depletion** as **economic gains**.
        - Example: Cutting a rainforest boosts GDP via timber sales but damages **long-term well-being** and **growth prospects**.

4. Global Initiatives for Green GDP Accounting

1. **System of Environmental Economic Accounting (SEEA)**:
   - Introduced by the **UN (1993)** to standardize methods for producing globally comparable **environmental statistics**.
2. **Wealth Accounting and Valuation of Ecosystem Services (WAVES)**:
   - A **World Bank initiative** to measure and integrate **natural capital** into national economic accounts for **sustainable development**.

5. Challenges in Accounting Green GDP

1. **Inconsistent Valuation**:
   - Non-market techniques to assess **environmental depletion** lack **consistency** and remain **experimental**.
2. **Lower GDP Figures**:
   - Deducting natural resource depletion results in **lower GDP values**, causing **economic and political resistance**.
3. **Political Opposition**:
   - Example: In the U.S., **Congress halted Green GDP efforts**, likely due to **environmental politics** and industry lobbying.

6. Significance of Chhattisgarh's Green GDP Initiative

1. **Climate Action**:
   - Demonstrates proactive measures in **climate change mitigation** by recognizing forests as critical **carbon sinks**.
2. **Sustainability**:
   - Encourages **sustainable development** by balancing economic growth with **environmental preservation**.
3. **Livelihood Support**:
   - Highlights the role of **forest-based economies** in improving **rural livelihoods**.
4. **Policy Innovation**:
   - Sets a precedent for other Indian states and nations to adopt **Green GDP frameworks**.
5. **Global Alignment**:
   - Aligns with **global sustainability goals** like the **UN SDGs** and commitments under the **Paris Agreement**.

7. Way Ahead

1. **Capacity Building**:
   - Train state agencies in **environmental economic accounting** to ensure accurate assessments.
2. **Standardization**:
   - Collaborate with international frameworks like **SEEA** to develop **consistent valuation methods**.
3. **Public Awareness**:
   - Educate stakeholders on the benefits of Green GDP for **long-term economic stability**.
4. **Policy Integration**:
   - Embed Green GDP metrics into **state and national planning frameworks**, ensuring **sustainable resource use**.
5. **Scaling Up**:
   - Encourage other states to adopt similar measures to enhance **national-level Green GDP accounting**.

India Submits Fourth Biennial Update Report (BUR-4) to UNFCCC

Syllabus: Environment – Climate Change and International Agreements (UPSC Mains GS-III)

1. Context

India has submitted its **Fourth Biennial Update Report (BUR-4)** to the **United Nations Framework Convention on Climate Change (UNFCCC)**, updating its progress on climate commitments, including the **National Greenhouse Gas (GHG) inventory for 2020**.

2. About BUR-4

1. **Purpose**:
   - BUR-4 updates the **Third National Communication (TNC)**, providing detailed data on:
     - **GHG emissions**.
     - **Emission reduction initiatives**.
     - **Carbon sinks**.
2. **Coordinating Ministry**:
   - **Ministry of Environment, Forest and Climate Change (MoEF&CC)** is the nodal agency for managing and reporting under **Article 4.1 of the UNFCCC**.

3. Key Highlights of BUR-4

a. GHG Emissions

1. **Overall Emissions**:
   - **Decreased by 7.93% in 2020** compared to 2019.
2. **Sector-Wise Contributions**:
   - **Energy**: **75.66%** (highest contributor).
   - **Agriculture**: **13.72%**.
   - **Industrial Processes and Product Use (IPPU)**: **8.06%**.
   - **Waste**: **2.56%**.

b. Emission Intensity of GDP

- Reduced by **36% (2005–2020)**, exceeding India's **Nationally Determined Contribution (NDC)** target of a 33-35% reduction by 2030.

c. Non-Fossil Fuel Share in Electricity

- **46.52%** of installed electricity generation capacity is from **non-fossil sources** (as of October 2024).

d. Carbon Sink Generation

- An additional **2.29 billion tonnes of CO2** were sequestered through increased **forest and tree cover** between 2005 and 2021.

e. Forest and Tree Cover

- **25.17%** of the country's geographical area is under forest and tree cover, showing consistent growth.

4. Significance of BUR-4

1. **Global Leadership**:
   - Reinforces India’s commitment to international climate agreements, including the **Paris Agreement** and **UNFCCC**.
2. **Emission Reduction Progress**:
   - Highlights India’s **decarbonization efforts** and alignment with **Net Zero by 2070** targets.
3. **Sustainable Development**:
   - Showcases efforts in balancing economic growth with environmental sustainability through **carbon sinks** and **renewable energy adoption**.
4. **International Collaboration**:
   - Enhances India’s credibility in climate negotiations, fostering **global partnerships** in tackling climate change.

5. Challenges in Achieving Further Reductions

1. **Sectoral Dependence**:
   - Energy and agriculture sectors remain significant GHG contributors, requiring further **policy interventions**.
2. **Financial and Technological Constraints**:
   - Limited access to **climate finance** and **green technologies** for large-scale transition.
3. **Urbanization and Industrialization**:
   - Increasing demand for energy and infrastructure poses challenges to maintaining emission reductions.
4. **Monitoring and Reporting**:
   - Ensuring accurate data collection and reporting across diverse sectors remains complex.

6. Way Ahead

1. **Accelerating Renewable Energy Adoption**:
   - Increase the share of **solar, wind, and hydro energy** to meet the **500 GW non-fossil fuel capacity target by 2030**.
2. **Carbon Sink Expansion**:
   - Promote afforestation and reforestation programs to achieve the **2.5-3 billion tonnes CO2 equivalent sink goal by 2030**.
3. **Sector-Specific Policies**:
   - Implement targeted measures to reduce emissions in **energy** and **agriculture** sectors.
4. **Climate Finance and Technology Access**:
   - Strengthen global partnerships to secure funding and adopt advanced **green technologies**.
5. **Public Awareness**:
   - Enhance public participation in **sustainable practices** through education and incentives.

Annual Groundwater Quality Report 2024

Syllabus: Environment – Groundwater Management and Pollution (UPSC Mains GS-III)

1. Context

The **Union Minister of Jal Shakti** released the **Annual Groundwater Quality Report 2024**, highlighting groundwater quality trends, contamination levels, and challenges in groundwater management across India.

2. Key Highlights of the Report

a. Status of Groundwater Usage

1. **Global Leader in Groundwater Use**:
   - India extracts **more than 25% of the global total**, making it the largest user of groundwater worldwide.
2. **Sector-Wise Usage**:
   - **87%** of extracted groundwater is used in **agriculture**.
   - **11%** is consumed for **domestic purposes**.

b. Regional Variability in Quality

1. **Best Performing States**:
   - **100% compliance** with **BIS standards** in states like **Arunachal Pradesh** and **Mizoram**.
2. **Worst Performing States**:
   - Widespread contamination in states like **Rajasthan**, **Haryana**, and **Andhra Pradesh**.

c. Irrigation Suitability

1. **Suitable for Irrigation**:
   - States like **Arunachal Pradesh**, **Assam**, and **Tripura** have groundwater classified as **excellent for irrigation**.
2. **Unsuitable for Irrigation**:
   - Groundwater in **Andhra Pradesh**, **Gujarat**, and **Haryana** has **high sodium content**, making it unsuitable for irrigation.

d. Specific Contaminants of Concern

1. **Nitrate**:
   - Found in **Rajasthan**, **Tamil Nadu**, and **Maharashtra**.
2. **Fluoride**:
   - High levels detected in **Haryana** and **Karnataka**.
3. **Arsenic**:
   - Common in **Ganga** and **Brahmaputra floodplains**.
4. **Uranium**:
   - Detected in **Rajasthan** and **Punjab**.

3. Key Factors Contributing to Groundwater Quality Decline

1. **Industrialization**:
   - **Untreated industrial waste** discharges containing **heavy metals**, **chemicals**, and **solvents**.
2. **Agricultural Practices**:
   - Excessive use of **fertilizers** and **pesticides**, causing nitrate and fluoride contamination.
3. **Urbanization**:
   - **Improper waste disposal**, **sewage leakage**, and **landfill contamination** pollute groundwater.
4. **Climate Change**:
   - Variations in **precipitation patterns** and **over-extraction** hinder aquifer replenishment.

4. Key Innovations in 2024 Report

1. **Standard Operating Procedure (SOP)**:
   - Introduced **SOPs for groundwater quality monitoring**, ensuring **uniformity** in:
     - **Data collection**.
     - **Analysis**.
     - **Interpretation**.
2. **Improved Monitoring**:
   - Enhanced monitoring networks and assessment techniques for better regional insights.

5. Challenges in Groundwater Management

1. **Over-Extraction**:
   - Excessive groundwater usage for irrigation and industrial purposes.
2. **Lack of Regulation**:
   - Inadequate enforcement of **groundwater extraction laws**.
3. **Pollution**:
   - Increasing contamination from **industries**, **urban runoff**, and **agriculture**.
4. **Data Deficiency**:
   - Insufficient real-time data on **groundwater levels** and **quality trends**.

6. Way Ahead

1. **Policy Implementation**:
   - Strengthen the enforcement of the **Groundwater (Sustainable Management) Act, 2017**.
2. **Sustainable Agriculture**:
   - Promote **precision farming** and reduce the use of **chemical fertilizers**.
3. **Pollution Control**:
   - Ensure **industrial waste treatment** before discharge into water bodies.
4. **Community Engagement**:
   - Increase **public awareness** about the need for **groundwater conservation**.
5. **Technological Interventions**:
   - Use **GIS mapping** and **remote sensing** for groundwater monitoring.
6. **Rainwater Harvesting**:
   - Expand **rainwater harvesting initiatives** to recharge aquifers.

BIOTECHNOLOGY & HEALTH

Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD)

Syllabus: Health and Diseases (UPSC Mains GS-II & GS-III)

1. Context

Importance of Exercise: A recent study led by an Indian-origin researcher highlights **exercise** as a cornerstone in managing **Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD)**, previously termed **Non-Alcoholic Fatty Liver Disease (NAFLD)**.

2. About MASLD

1. **Definition**:
   - MASLD is a **chronic liver disease** caused by **excessive fat accumulation** in the liver, linked to **metabolic dysfunction**. It can progress to **inflammation (MASH)** and severe complications like **liver fibrosis** or **cirrhosis**.
2. **Causes**:
   - **Obesity**: Body Mass Index (BMI) ≥ 30.
   - **Insulin Resistance**: Leads to poor blood sugar control.
   - **Type 2 Diabetes**: A key metabolic risk factor.
   - **Dyslipidemia**: High cholesterol and lipid levels.
3. **Symptoms**:
   - **Early Stages**: Fatigue, weakness, and mild abdominal discomfort.
   - **Advanced Cases**:
     - Swollen belly.
     - Yellowing of the skin (jaundice).
     - Potential progression to **cirrhosis** or **liver cancer**.
4. **Diseases Associated**:
   - **MASH**: Inflammation of the liver with scarring.
   - **Hepatocellular Carcinoma**: Liver cancer.
   - **Increased Risk**: Cardiovascular diseases, breast cancer, colon cancer.
   - **Diabetes Development**: Type 2 diabetes in previously non-diabetic individuals.

3. Treatment and Management of MASLD

1. **Lifestyle Changes**:
   - **Weight Loss**: Effective in reducing liver fat and improving insulin sensitivity.

- **Regular Exercise**: Plays a pivotal role in all stages, including advanced liver disease like cirrhosis.

2. **Dietary Adjustments**:
   - Avoid high-fat and high-sugar foods.
   - Focus on balanced nutrition to support metabolic health.
3. **Pharmacotherapy**:
   - Medicines to manage metabolic risks such as **diabetes**, **cholesterol**, and **insulin resistance**.
4. **Exercise Protocols**:
   - Tailored exercise regimens are beneficial even for patients with **advanced liver disease**.

4. Significance of the Study

1. **Global Health Concern**: MASLD affects millions globally, with rising prevalence due to lifestyle-related disorders like **obesity** and **diabetes**.
2. **Cost-Effective Solutions**: Emphasizing **exercise** and **lifestyle interventions** offers an accessible approach to manage this chronic condition.
3. **Preventive Health**: Reducing MASLD's progression decreases risks of **life-threatening complications** like cirrhosis and cancer.

Norovirus

Syllabus: Health and Diseases (UPSC Mains GS-II & GS-III)

1. Context

Rise in Outbreaks: A significant increase in **Norovirus** cases has been reported across the **USA**, raising concerns about its impact on public health.

2. About Norovirus

1. **Definition**:
   - **Norovirus** is a highly contagious virus that causes **gastroenteritis**, leading to inflammation of the stomach and intestines.
2. **Common Name**:
   - Known as the **"stomach flu"** or **"winter vomiting bug"**.
3. **Primary Vector**:
   - Spreads through **stool or vomit** of infected individuals.

3. Transmission Modes

1. **Consumption**:
   - Eating or drinking **contaminated food or water**.
2. **Surface Contact**:
   - Touching **contaminated surfaces** and then touching the mouth.
3. **Close Contact**:
   - Direct interaction with **infected individuals**.
4. **High-Risk Locations**:
   - Commonly spreads in **crowded environments** like:
     - Schools.
     - Healthcare facilities.
     - Cruise ships.
     - Restaurants.

4. Symptoms of Norovirus

1. **Primary Symptoms**:
   - **Vomiting**.
   - **Nausea**.
   - **Stomach cramping**.
2. **Additional Symptoms**:
   - **Body aches**.
   - **Headaches**.
   - **Fever**.
   - **Reduced urination**.
   - **Dehydration**.

Human Metapneumovirus (HMPV)

Syllabus: Health and Diseases – Emerging Viral Threats (UPSC Mains GS-II & GS-III)

1. Context

The outbreak of **Human Metapneumovirus (HMPV)** in **China** has raised global concerns. However, Indian health authorities, including **Dr. Atul Goel**, Director-General of Health Services, have assured that the situation is under control, urging people to follow basic precautions.

2. About Human Metapneumovirus (HMPV)

1. **What is HMPV?**
   - A **respiratory virus** belonging to the **Pneumoviridae family**.
   - Causes **upper and lower respiratory tract infections**, often resembling the **common cold** or **flu**.
2. **Origin and Discovery**:
   - Discovered in **2001** in the **Netherlands** through **genomic sequencing** of patients with respiratory infections.

3. High-Risk Groups

1. **Children**:
   - Especially those under **5 years**, with infants at higher risk.
2. **Older Adults**:
   - Particularly those aged **65+**.
3. **Immunocompromised Individuals**:
   - Those with weakened immune systems or **chronic respiratory conditions** like asthma.

4. Symptoms of HMPV

1. **Common Symptoms**:
   - **Cough**, **runny nose**, **fever**, and **sore throat**.
2. **Severe Symptoms**:
   - **Wheezing** and **shortness of breath**, potentially leading to **bronchitis** or **pneumonia**.

5. Mode of Spread

1. **Respiratory Droplets**:
   - Through **coughing or sneezing**.
2. **Close Contact**:
   - Physical interactions like **handshakes**.
3. **Contaminated Surfaces**:
   - Touching **infected surfaces** followed by contact with the face.

6. Diagnosis

1. **NAATs (Nucleic Acid Amplification Tests)**:
   - Detects **viral genetic material** and is widely used in **outbreak scenarios**.
2. **Antigen-Based Immunoassays**:
   - Used for **severe cases** or during **large outbreaks** to confirm infection.

7. Treatment and Management

1. **No Specific Antiviral or Vaccine**:
   - Focus on **symptom management**.
2. **Home-Based Care**:
   - Ensure **hydration**, **rest**, and use **OTC medications** for fever and congestion.
3. **Severe Cases**:
   - May require **hospitalization** for:
     - **Oxygen therapy**.
     - **Intravenous (IV) fluids**.

8. Precautionary Measures

1. **Hygiene Practices**:
   - Frequent **handwashing** with soap.
   - Use of **sanitizers** in public spaces.

2. **Respiratory Etiquette**:
    - Cover mouth and nose while **coughing or sneezing**.
3. **Avoid Close Contact**:
    - Stay away from individuals showing **respiratory symptoms**.
4. **Surface Disinfection**:
    - Regularly clean frequently-touched surfaces.

SCIENCE & TECHNOLOGY

SpaDeX Mission

Syllabus: Science and Technology (UPSC Mains GS-III)

1. Context

ISRO's Milestone: ISRO is set to conclude 2024 with the **PSLV-C60/SpaDeX Mission**, scheduled for **December 30, 2024**.

2. About SpaDeX Mission

1. **Launch Vehicle**:
    - The mission uses the **Polar Satellite Launch Vehicle (PSLV-C60)** in its **core-alone configuration**.
2. **Aim**:
    - **Primary Objective**: Demonstration of **rendezvous, docking, and undocking** of two spacecraft.
    - **Secondary Objective**:
        - Transfer of **electric power** between docked spacecraft for robotic applications.
        - Control of composite spacecraft and post-docking **payload operations**.
3. **Features**:
    - **Satellites**:
        - **SDX01 (Chaser)** and **SDX02 (Target)**, each weighing **220 kg**.
    - **Orbit Details**:
        - Placement in a **470-km circular orbit** with a **55-degree inclination**.
    - **Docking Process**:
        - Initiates at a **20-km separation (Far Rendezvous)** and progresses to a **3-meter docking distance**.
    - **Electrical Power Transfer**:
        - Demonstration of **electric power sharing** between docked spacecraft.

3. Significance of SpaDeX Mission

1. **Foundation for Future Projects**:
    - Supports India's **Bharatiya Antariksh Station (BAS)** initiative.
    - Crucial for **future lunar missions** and other advanced explorations.
2. **Enhancement of Space Capabilities**:
    - Essential for ambitious missions like **Gaganyaan** and **Indian space station construction**.
    - Advances India's technological expertise in **satellite repair and refueling**, reducing costs.
3. **Global Collaboration**:
    - Strengthens India's ability to participate in **international space station projects**.

WAVES (World Audio Visual Entertainment Summit)

Syllabus: International Relations, Economic Development, and Science & Technology (UPSC Mains GS-II & GS-III)

1. Context

India to Host WAVES 2025: India is set to host the **World Audio Visual Entertainment Summit (WAVES)** for the first time in **November 2025** in **Goa**, highlighting its growing prominence in the **media and entertainment industry**.

2. About WAVES

1. **Full Form**:
    - **World Audio Visual Entertainment Summit**.
2. **What it is**:

- A **global platform** for fostering dialogue, collaboration, and innovation in the **media and entertainment (M&E)** sector.

3. **Established**:
   - **First edition** to be held in **2025**.
4. **Aim**:
   - To position **India** as a global powerhouse in the M&E industry.
   - Promote **innovation, investment**, and **skill development** in the sector.

3. Features of WAVES 2025

1. **Host Location**:
   - **Goa, India**.
2. **Organizers**:
   - **Ministry of Information and Broadcasting**, Government of India, in collaboration with the **Goa Government**.
3. **Key Focus Areas**:
   - **Content Production and Innovation**:
     - Exploring new avenues for storytelling and media creation.
   - **Animation, VFX, and Gaming**:
     - Promoting India as a hub for **AVGC (Animation, Visual Effects, Gaming, and Comics)**.
   - **Music and IP Creation**:
     - Encouraging growth in **intellectual property rights** and music production.

4. Significance of WAVES 2025

1. **Boost to India's M&E Industry**:
   - Strengthens India's reputation as a leader in **content production** and innovation.
2. **Global Collaboration**:
   - Provides a platform for international partnerships and **cross-border investments**.
3. **Economic Growth**:
   - Attracts investments in the AVGC sector, contributing to India's **economic development**.
4. **Skill Development**:
   - Encourages **training programs** and **capacity-building** in media-related fields.
5. **Cultural Exchange**:
   - Promotes Indian **culture and storytelling** on a global stage.

Parker Solar Probe

Syllabus: Science and Technology – Space Technology (UPSC Mains GS-III)

1. Context

Closest-Ever Approach to the Sun: NASA's **Parker Solar Probe** successfully survived its closest-ever approach to the **Sun**, operating normally at a distance of just **6.1 million km** from the solar surface.

2. About Parker Solar Probe

1. **Launch Year**:
   - **August 12, 2018**.
2. **Organisation**:
   - Developed by **NASA** under its **Living with a Star Program**.
3. **Aim**:
   - **Study the Sun's Corona**: Investigate the outermost layer of the Sun's atmosphere.
   - **Understand Solar Winds**: Explore their origins and impact on the **solar system**.
   - **Space Weather Forecasting**: Improve predictions to safeguard Earth's **technology and infrastructure**.
4. **Features**:
   - **Heat Shield**: Equipped with a **4.5-inch carbon-composite shield** to withstand extreme temperatures.
   - **Speed and Endurance**: Travels at speeds of up to **692,000 km/h**, enduring temperatures as high as **1,377°C**.

3. Significance of the Achievement

1. **Understanding the Sun**:
   - Provides **unprecedented insights** into the **Sun's high-temperature corona** and its structure.
2. **Solar Wind Exploration**:
   - Helps unravel the **mystery of solar winds**, which impact planetary systems and space weather.
3. **Mitigating Solar Risks**:
   - Contributes to understanding the effects of **solar activity** on Earth's:
     - **Power grids**.

- **Satellites**.
- **Communication systems**.

4. **Advancing Space Research**:
   - Supports progress in **solar physics** and enhances **space weather forecasting** to protect human technology and space missions.

Air Independent Propulsion (AIP) System

Syllabus: Science and Technology – Defence Technology (UPSC Mains GS-III)

1. Context

Integration of AIP Modules: The Indian Ministry of Defence signed contracts worth **₹2,867 crore** to integrate **indigenously developed AIP modules** and electronic heavyweight torpedoes into **Scorpene-class submarines**, enhancing their stealth and operational capability.

2. About Air Independent Propulsion (AIP) System

1. **Definition**:
   - A **technology enabling diesel-electric submarines** to operate underwater for extended periods without surfacing or using a snorkel to access oxygen.
2. **How It Works**:
   - **Electricity Generation**: Produces electricity underwater using **fuel cells** or heat engines.
   - **Fuel**: Carries **liquid oxygen** and either **diesel**, **methanol**, or **hydrogen** as fuel.
   - **Power Mechanism**:
     - Uses **electro-chemical cells** (e.g., fuel cells) or **heat engines** to generate energy.
3. **Features**:
   - **Enhanced Endurance**: Allows submarines to remain submerged for extended periods.
   - **Stealth**: Reduces vulnerability to detection by minimizing surfacing requirements.
   - **Compact Design**: Incorporates fuel cells that are efficient and safe for submarine use.

3. About Scorpene-Class Submarines

1. **What They Are**:
   - A series of **advanced diesel-electric attack submarines**, designed for **stealth, endurance**, and **maritime precision**.
2. **Project Timeline**:
   - Built under **Project-75** in collaboration with the **French Naval Group**, operational since **2005**.
3. **Features**:
   - Equipped with **modern sensor suites** and **weapons systems** for maritime operations.
   - **Modular Design**: Facilitates upgrades like AIP modules and advanced torpedoes.
   - Includes six submarines:
     - **INS Kalvari, INS Khanderi, INS Karanj, INS Vela, INS Vagir** (commissioned), and **Vagsheer** (in trials).

4. Significance of AIP and Scorpene-Class Integration

1. **Enhanced Stealth**:
   - AIP integration minimizes **surfacing frequency**, making submarines harder to detect.
2. **Operational Efficiency**:
   - Increases **underwater endurance**, allowing prolonged missions without exposure.
3. **Indigenous Capability**:
   - Strengthens India's **self-reliance** in defence technology through indigenous AIP development.
4. **Strategic Deterrence**:
   - Boosts India's **maritime security**, particularly in contested regions like the **Indian Ocean**.
5. **Defence Modernization**:
   - Ensures the Scorpene-class submarines remain technologically advanced through **modular upgrades**.

India Meteorological Department (IMD)

Syllabus: Governance, Science & Technology – Weather and Climate Services (UPSC Mains GS-II & GS-III)

1. Context

Nearly 150 Years of Service: The **India Meteorological Department (IMD)**, established in **1875**, continues to play a pivotal role in **weather forecasting**, disaster management, and **climate research** in India.

2. About IMD

1. **What it is**:
    - IMD is India's **national weather service agency**, responsible for **meteorological observations, forecasting**, and **research**.
2. **Established in**:
    - **1875**, in response to critical weather events like the **1864 Calcutta cyclone** and monsoon failures in **1866 and 1871**.
3. **Headquarters**:
    - Located in **New Delhi, India**.
4. **Ministry**:
    - Functions under the **Ministry of Earth Sciences**.

3. History of IMD

1. **Origins**:
    - Weather services began with **provincial observatories** like the **Madras Observatory (1793)**.
2. **Centralization**:
    - Unified meteorological services under a central authority in **1875** to ensure **nationwide coordination**.

4. Functions of IMD

1. **Weather Forecasting**:
    - Provides **short-term and long-term predictions** to support agriculture, aviation, and disaster preparedness.
2. **Cyclone Warnings**:
    - Issues specialized warnings for cyclones in the **Indian Ocean region**, saving lives and reducing damage.
3. **Data Collection**:
    - Operates over **700 observatories** and regional/state-level meteorological centres for real-time data collection.
4. **Climate Research**:
    - Studies **climate change**, **extreme weather events**, and **monsoon dynamics** to inform policy and planning.
5. **Sectoral Services**:
    - Provides meteorological support for:
        - **Aviation** and **shipping**.
        - **Fisheries** and **flood management**.
        - Energy and water resource planning.

5. Significance of IMD

1. **Disaster Management**:
    - Enhances preparedness for **natural disasters** like cyclones, floods, and heatwaves, minimizing loss of life and property.
2. **Agricultural Support**:
    - Accurate monsoon forecasting aids **farmers** in planning **sowing cycles** and **irrigation needs**.
3. **Economic Contributions**:
    - Supports industries like **aviation**, **shipping**, and **fisheries** with real-time weather data.
4. **Climate Change Insights**:
    - Provides critical data on **climate variability**, aiding India's **climate action plans**.
5. **Global Cooperation**:
    - Contributes to **international meteorological research** and disaster warning systems, especially in the **Indian Ocean region**.

6. Way Ahead

1. **Modernization of Infrastructure**:
    - Expand the use of **satellites, Doppler radars**, and **AI** for improved accuracy.
2. **Local Forecasting**:
    - Develop **micro-level weather services** for localized predictions.
3. **Data Accessibility**:
    - Enhance public access to weather data through **digital platforms** and **mobile applications**.
4. **Capacity Building**:
    - Invest in training personnel and developing advanced **meteorological models**.
5. **Climate Adaptation Research**:
    - Strengthen studies on **climate resilience** and its impact on agriculture, water resources, and biodiversity.

Injectable Hydrogel for Cancer Treatment

Syllabus: Science and Technology – Health and Medicine (UPSC Mains GS-III)

1. Context

Researchers from **IIT-Guwahati** and **Bose Institute, Kolkata**, have developed an **injectable hydrogel** designed for **localized cancer treatment**, offering a more precise and safer alternative to traditional chemotherapy.

2. About the Injectable Hydrogel

1. **What it is**:
   - A **water-based polymer network** capable of delivering **anti-cancer drugs** directly to the tumour site while sparing healthy tissues.
2. **Developed by**:
   - Collaborative research between **IIT-Guwahati** and **Bose Institute, Kolkata**.

3. Key Features

1. **Localized Drug Delivery**:
   - Precisely targets **cancerous cells**, minimizing exposure to healthy tissues.
2. **Responsive Design**:
   - Reacts to elevated **glutathione (GSH)** levels found in tumour cells, ensuring drug release occurs only at the tumour site.
3. **Biocompatibility**:
   - Mimics the properties of **living tissues**, allowing seamless integration with the biological environment.
4. **Stability**:
   - Remains **insoluble** in biological fluids, ensuring the hydrogel stays at the injection site for sustained drug release.

4. Significance of the Hydrogel

1. **Reduced Side Effects**:
   - Mitigates the harmful systemic side effects typically associated with traditional **chemotherapy**.
2. **Enhanced Precision**:
   - Facilitates **targeted therapy**, especially effective for cancers like **breast cancer**.
3. **Personalized Medicine**:
   - Represents a step forward in **personalized and localized cancer treatments**, aligning with individual patient needs.
4. **Improved Treatment Outcomes**:
   - Increases the **efficacy** of drug delivery by concentrating therapeutic agents at the tumour site.
5. **Innovation in Oncology**:
   - Aids in advancing cancer treatment technologies with **minimally invasive approaches**.

5. Way Ahead

1. **Clinical Trials**:
   - Conduct extensive **clinical testing** to validate the safety and efficacy of the hydrogel in humans.
2. **Scalability**:
   - Develop strategies for **mass production** and cost-effectiveness to ensure accessibility.
3. **Multifunctional Applications**:
   - Explore potential applications in treating other localized diseases beyond cancer.
4. **Integration with Other Therapies**:
   - Combine with immunotherapy and gene therapy for a **comprehensive cancer treatment approach**.
5. **Global Collaboration**:
   - Partner with international institutions to refine the hydrogel's design and expand its adoption.

Mission ShakthiSAT

Syllabus: Science and Technology – Space Technology, Women Empowerment (UPSC Mains GS-III & GS-I)

1. Context

Mission ShakthiSAT, led by ISRO, is an **all-girls lunar mission**, bringing together **12,000 talented girls from 108 countries** to design, build, and launch a satellite into lunar orbit. The mission highlights **global collaboration** and **gender inclusivity in STEM**.

2. About Mission ShakthiSAT

1. **What it is**:
   - An **international all-girls lunar mission** involving the design, development, and launch of a satellite to the **lunar orbit**.
2. **Expected Launch**:
   - Scheduled for **September 2026**, using ISRO's **Polar Satellite Launch Vehicle (PSLV)**.
3. **Organizations Involved**:
   - **ISRO**: Leading and executing the mission.
   - **Space Kidz India (SKI)**: Coordinating student participation and payload development.
   - **IN-SPACe**: Facilitating private sector collaboration and innovation.

3. Objectives of Mission ShakthiSAT

1. **Gender Inclusivity**:
   - Empower young women in **STEM (Science, Technology, Engineering, and Mathematics)** by providing hands-on experience in space missions.
2. **Global Collaboration**:
   - Foster international partnerships in **space science and technology**.
3. **Scientific Research**:
   - Conduct **experiments in lunar orbit** using student-designed payloads, contributing to space exploration knowledge.

4. Key Features

1. **Global Representation**:
   - **12,000 girls** from **108 countries** will participate in the mission.
2. **Age Criteria**:
   - **African and Latin American countries**: Girls aged **14–18 years**.
   - **Other regions**: Girls aged **14–16 years**.
3. **Skill Development**:
   - The **top 108 participants** will undergo **training in Chennai** to design and build payloads for the satellite.
4. **Inclusivity and Awareness**:
   - Promotes **equal representation** in space science, aiming to inspire future women leaders in STEM fields.

5. Significance of Mission ShakthiSAT

1. **Women Empowerment**:
   - Addresses **gender disparities** in STEM, providing **equal opportunities** to young girls globally.
2. **Skill Enhancement**:
   - Offers participants exposure to **space technology**, boosting technical and collaborative skills.
3. **Global Leadership in Space**:
   - Strengthens India’s position as a **pioneer in inclusive space missions**.
4. **Inspiring Generations**:
   - Encourages **interest in space science** among youth, especially women, to pursue STEM careers.
5. **Strengthening Partnerships**:
   - Promotes **international collaboration** in science and education, contributing to India's soft power.

6. Challenges and Way Ahead

Challenges:

1. **Logistics**:
   - Managing participation and training for 12,000 girls from 108 countries.
2. **Technical Skill Gap**:
   - Bridging knowledge disparities among participants from different regions.
3. **Funding and Resource Allocation**:
   - Ensuring adequate financial and infrastructural support for the mission.

Way Ahead:

1. **Enhanced Collaboration**:
   - Strengthen ties with international space organizations for resource sharing and expertise.
2. **Skill-Building Programs**:
   - Organize pre-training workshops to prepare participants before the main program in Chennai.
3. **Public Awareness Campaigns**:
   - Highlight the mission’s achievements to inspire broader participation in STEM globally.
4. **Sustained Support for Women in STEM**:
   - Launch follow-up programs to ensure continued opportunities for women in space science.