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POLITY & GOVERNANCE

TOPICS FOR MAINS

Election commission and internal democracy in political parties

Syllabus Mapping: GS-Paper 2, Elections

Context

Election Commission (EC) faces challenges in ensuring that political entities adhere to democratic principles.

Importance of Internal Democracy in Political Parties

- **Democratic ethos:** Political parties competing in India's democratic set up can uphold democratic virtues only when they adhere to democratic issues internally.
- **Family control:** Many Indian political parties have emerged as family fiefdoms, wherein the entire political party serves only family and leadership rotating among different family members.
- **Increasing authoritarianism:** Democratic functioning of parties gives space to views of all sections and factions of the party, promotes deliberation and checks authoritarian tendencies.
- **Dynamism:** Regular contest and elections inside political parties allows for fresh leadership and new ideas which will keep political parties healthy.
- **Integration of social groups:** Democratic functioning will allow space for groups such as youth, women, other vulnerable groups and grassroots participation to get space to voice their opinions. Otherwise an entrenched leadership structure will continue to dominate the political party.
- **Enhanced public trust:** Robust democratic culture within a political party will result in enhanced trust and allow political parties to get electoral success.

Challenges faced by the Election Commission

- **Limited Power:** The EC cannot deregister a party solely for not holding internal elections, it creates challenges in enforcing democratic practices within political entities.
- **Political Pressure:** If the EC were to regulate internal party processes, it risks becoming politicised and susceptible to external pressures.

- **Personality cult:** Many political parties are dominated by individual leaders, leading to unopposed elections and a lack of genuine democratic engagement despite formal compliance with election laws.
- **Public Perception:** There are concerns about its effectiveness in ensuring internal democracy within parties which hampers public trust in the electoral process.

Suggestions for Improvement

- **Amendment to Representation of Peoples Act (RPA), 1951:** Law Commission of India (In 255th Report) has recommended the introduction of a new section in RPA 1951 enabling ECI to regulate political parties. The section should mandating:
  - Each political party runs according to the Party Constitution which is in line with the Indian Constitution.
  - Each political party to be run by an elected Executive Committee after a term of 5 years.
  - Mandating decision making in political parties to be by secret voting and simple majority.
  - Election to be held from local levels to upward.
  - Provision of penalties for not organising inner party elections within a period of 10 years.
- **Electoral Discipline from Voters**: It is suggested that the discipline within political parties should come from the electorate. If voters perceive a party as undemocratic, they should choose not to support it in elections.
- **Focus on Core Responsibilities:** Conducting free and fair elections to uphold public trust.
- **Objective Decision-Making:** To uphold credibility, the EC should rely on objective measures about party splits or disqualifications.
  - **Eg**: Counting legislative support can provide a clear basis for determining which faction retains party recognition.
- **Leave Decisions to Electorate:** Regarding internal democracy rather than imposed through regulatory measures by the EC. This respects the sovereignty of voters in a democratic society.

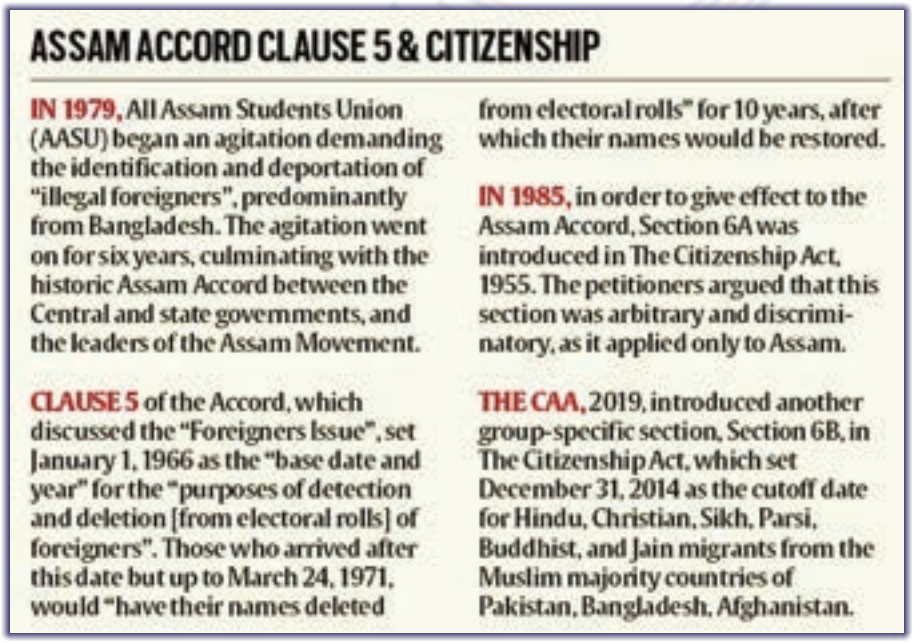
SC upholds Section 6A of Citizenship Act

Syllabus Mapping: GS-Paper 2, Citizenship

Context

In a 4:1 majority verdict, a Constitution Bench of the Supreme Court upheld the constitutionality of Section 6A of the Citizenship Act, 1955.

Background of Assam Accord



ASSAM ACCORD CLAUSE 5 & CITIZENSHIP

IN 1979, All Assam Students Union (AASU) began an agitation demanding the identification and deportation of "illegal foreigners", predominantly from Bangladesh. The agitation went on for six years, culminating with the historic Assam Accord between the Central and state governments, and the leaders of the Assam Movement.

CLAUSE 5 of the Accord, which discussed the "Foreigners Issue", set January 1, 1966 as the "base date and year" for the "purposes of detection and deletion [from electoral rolls] of foreigners". Those who arrived after this date but up to March 24, 1971, would "have their names deleted from electoral rolls" for 10 years, after which their names would be restored.

IN 1985, in order to give effect to the Assam Accord, Section 6A was introduced in The Citizenship Act, 1955. The petitioners argued that this section was arbitrary and discriminatory, as it applied only to Assam.

THE CAA, 2019, introduced another group-specific section, Section 6B, in The Citizenship Act, which set December 31, 2014 as the cutoff date for Hindu, Christian, Sikh, Parsi, Buddhist, and Jain migrants from the Muslim majority countries of Pakistan, Bangladesh, Afghanistan.

What is Section 6A of the Citizenship Act?

- Section 6A was inserted in 1985 into the Citizenship Act as a special provision to deal with the citizenship of people covered under the Assam Accord.
- Provides the legal framework to either recognize migrants in Assam as Indian citizens or expel them, based on their migration date.
- Migrants who arrived in Assam between **January 1, 1966, and March 25, 1971** from specified territories, including Bangladesh, are required to register under **Section 18** for citizenship.
- **March 25, 1971** is set as the cutoff date for granting citizenship to Bangladeshi migrants in Assam under this provision.
- Individuals who have lived in Assam during the specified period (between the two dates) are eligible to apply for **Indian citizenship**.

Legal Points over Section 6A

Parliament's power to regulate citizenship

- The Supreme Court ruled that **Articles 6 and 7** pertain to determining citizenship at the time of the Constitution's commencement in 1950.
- **Section 6A** addresses **later migrations** from East Pakistan.
- **Article 11** gives Parliament the authority to make laws regarding citizenship.

Section 6A and Right to Equality

- Section 6A violates Right to Equality (**Article 14**) as it applies only to Assam by setting a different cut-off date for citizenship compared to other states.
- The different treatment for Assam is due to the Assam Movement and the influx of migrants.
- **Cut-off date, i.e. March 24, 1971** is reasonable given the political and cultural context of Assam.

Section 6A facilitating External Aggression

- Allowing migrants to gain citizenship amounts to external aggression, as awarded in the court's ruling in **Sarbananda Sonowal vs Union of India (2005)**
- Section 6A offers a **controlled solution to migration**, as opposed to the unregulated influx that would amount to external aggression.

Section 6A Vs. Indigenous Rights

- As critics argue, granting citizenship to migrants from Bangladesh violates Article 29(1), which guarantees the protection of distinct cultural identities, as the increase in the Bengali population eroded Assamese culture.
- However the presence of diverse ethnic groups does not inherently infringe on the cultural rights of the Assamese people as fraternity & social cohesion stands at the heart of India's diversity.

Secularism in Indian Constitution

Syllabus Mapping: GS-Paper 2, Constitutional ideals

Context

The Supreme Court recently said, 'secularism is an inedible and core part of the constitution'

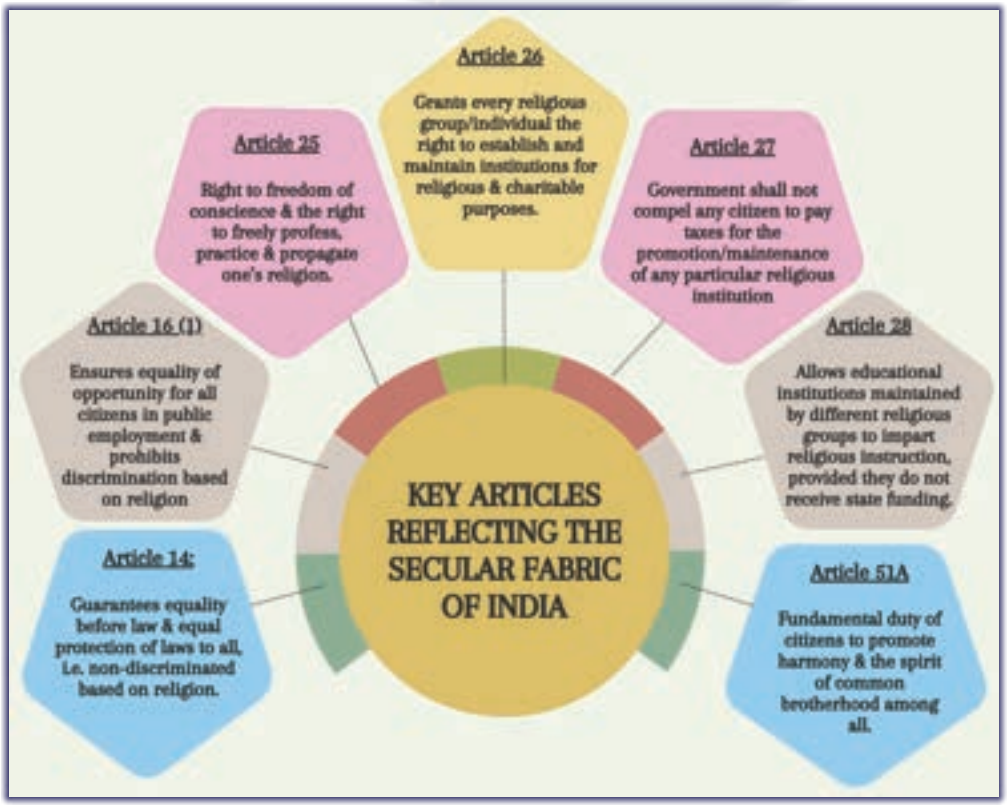
About Secularism In India

- **In the Indian context**, secularism means **equal treatment of all religions by the state**, without favouring or discriminating against any religion.
- The Indian model of secularism is based on the idea that the **state should neither support nor interfere with religious affairs**, while ensuring that citizens are free to practise their religion.

Status of Secularism

- Original constitution of India (1950) did not have the word 'secularism' in it.

- 'Secularism' was inserted in the Constitution of India in the Preamble by the 42nd Constitution Amendment Act. However, since this amendment was done during the Emergency, thus, is often contested.
- In the **Keshavanand Bharathi judgement (1973),** the secular character of the Indian constitution was accepted as one of the basic structures of the Indian Constitution.
- Later in the **S R Bommai judgement (1994),** the Supreme Court category said that secularism is included as one of the elements of the basic structure doctrines.
- **Nature of Secularism in Indian Constitution:**
  - **Group level secularism:** These rights are given to religious groupings so that all religion groupings are able to thrive and none is discriminated against.
    - No official or state religion of India
    - All religions are given equal rights or complete impartiality.
    - Special rights for religious minorities to preserve, propagate and profess their religions.
  - **Individual level secularism:** These rights are given to individuals so that on the name of religion practises a person is not discriminated against.
    - Right to freedom of conscience for all citizens.
    - Ex. Abolition of triple talak among Muslims.



Associated challenges

- **Communal Violence**: Incidents of communal riots, such as the 2013 Muzaffarnagar riots, underscore the tensions between different religious communities and erodes the social fabric.
- **Judicial Challenges:** The Supreme Court's decisions on matters like Ayodhya have sparked debates about the intersection of law and religion. Such creates perceptions of bias.
- **Cultural and Educational Rights:** The implementation of policies affecting minority educational institutions has led to tensions and springs feelings of alienation & undermine pluralistic ethos.
- **Media Representation**: The portrayal of religious communities in media narratives often reflects biases that fuel stereotypes, hate speech and spread of misinformation.

Way Forward

- **Strengthening Legal Frameworks:** To create a deterrence effect with stricter laws.
- **Judicial Reforms**: Ensure that judicial decisions reflect a commitment to secular principles by promoting diversity within the judiciary.
- **Inclusive policies:** Develop targeted economic programs aimed at uplifting marginalised communities, ensuring equitable access to education and employment opportunities.
- **Awareness:** Promote media literacy initiatives that educate citizens about responsible media consumption, helping them discern bias and misinformation.
- **Civic Education:** Incorporate civic education into school curricula that emphasises constitutional values, including secularism, tolerance, and respect for diversity.

Time for State governments to end systemic discrimination in prisons

Syllabus Mapping: GS-Paper 2, Criminal Justice

Context

Recently, the Supreme Court of India struck down a series of rules in various state prison manuals that were deemed to reinforce caste differences and violate the fundamental rights of prisoners, particularly targeting marginalised communities historically labelled as "criminal tribes."

Historical Context: Reinforcing Colonial Stereotypes

- **Criminal Tribes Act of 1871**: British labelled certain communities as "criminal tribes," subjecting them to **stereotypes** of being born criminals.
- Though the Act was repealed in **1952**, former "criminal tribes" became **denotified tribes**.
- **Madhya Pradesh Rule 411**: Allowed the state to treat any member of a denotified tribe as a habitual criminal, even without previous conviction.
- Similar rules existed in **Andhra Pradesh, Tamil Nadu, and Kerala.**

Story so far

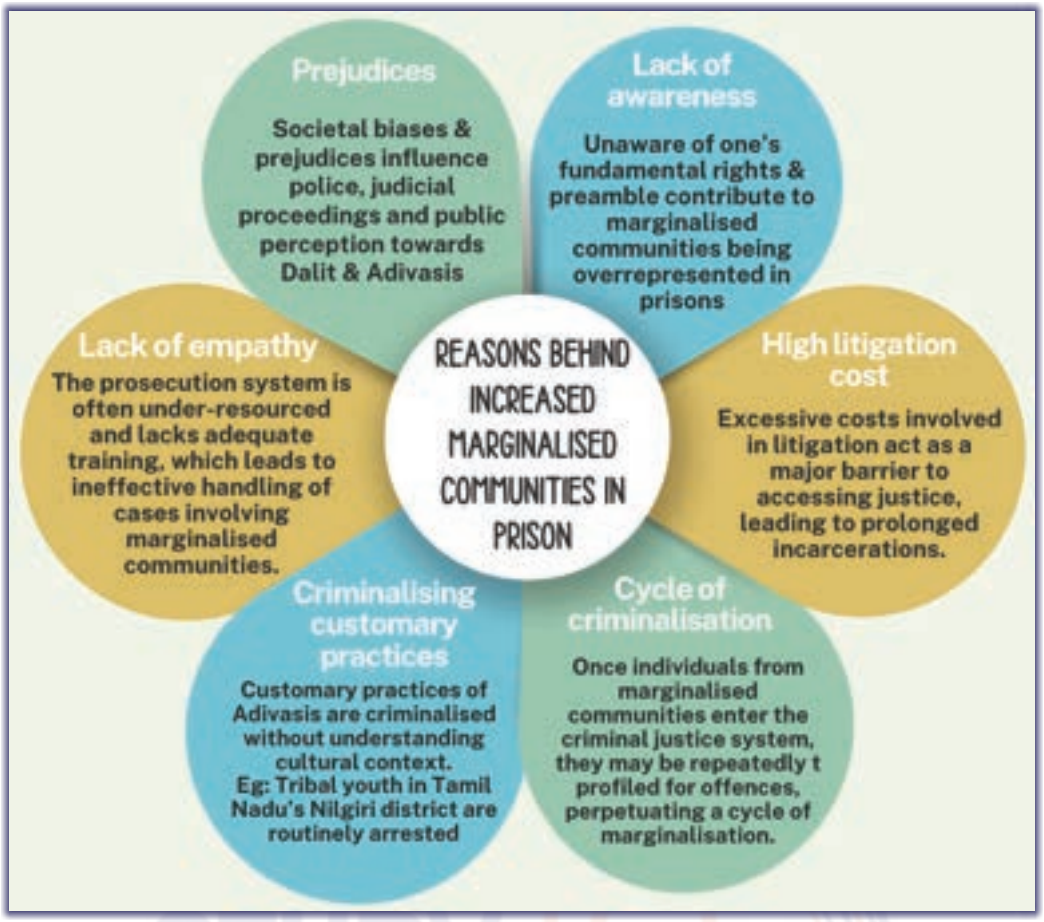
- Menial jobs of cleaning and sweeping are given to the marginalised communities, while the upper castes are assigned with work like cooking.
  - **Eg:** In Rajasthan, the prison rules designated Mehtars (a lower caste) for latrine duties while assigning higher-caste prisoners to kitchen tasks.
  - **Eg**: In Tamil Nadu, prisoners from communities like Thevars and Nadars were segregated into different sections of Palayamkottai Central Jail.
- The Apex Court ruling highlighted that caste-based discrimination within prisons is a **remnant of an oppressive colonial system** which was designed to dehumanise marginalised groups.

Violation of Articles

- **Article 15**: Prohibits discrimination on grounds of religion, race, caste, sex, or place of birth.
- **Article 17**: Abolishes untouchability in all forms.
- **Article 23**: Prohibits forced labour and exploitation.

Marginalised Communities in Jails: Data

- **Prison Statistics India report 2021:** Number of convicts in jails decreased by 9.5%, whereas the number of undertrial inmates increased by 45.8% between 2016 and 2021.
  - **Eg:** 3 out of 5 undertrial prisoners in Indian prisons are from Dalit, Adivasi and OBC communities
- **NCRB data:** 20.94% of undertrials were from SC, 9.26% belonged to ST, and 35.88% were from a socially and educationally backward community.



Judicial Interventions

Arnesh Kumar vs State of Bihar	Apex court stated that the police should ordinarily not arrest people instead send a notice if the offence they are charged with has a maximum sentence of less than or up to seven years.
Hussainara Khatoon v. Home Secretary, State of Bihar (1979) case	Keeping undertrial prisoners incarcerated for longer than their potential punishment constitutes a clear violation of their fundamental rights (Article 21)

Way forward

- Idea of open prisons must be considered.
- Need to strengthen Lok Adalats for minor offences such as traffic infringements, excise offences.
- There should be an alternative bail system. It should not be only financial.
- Speedy trial through Special fast track courts can become an effective tool.

Gruelling Course of Litigation in India

Syllabus Mapping: GS-Paper 2, Judiciary

Context

President Droupadi Murmu recently highlighted the pressing issue of court delays at the **National Conference of the District Judiciary**, noting that many people are reluctant to approach courts due to fear of the **'black coat syndrome'**

Black coat syndrome

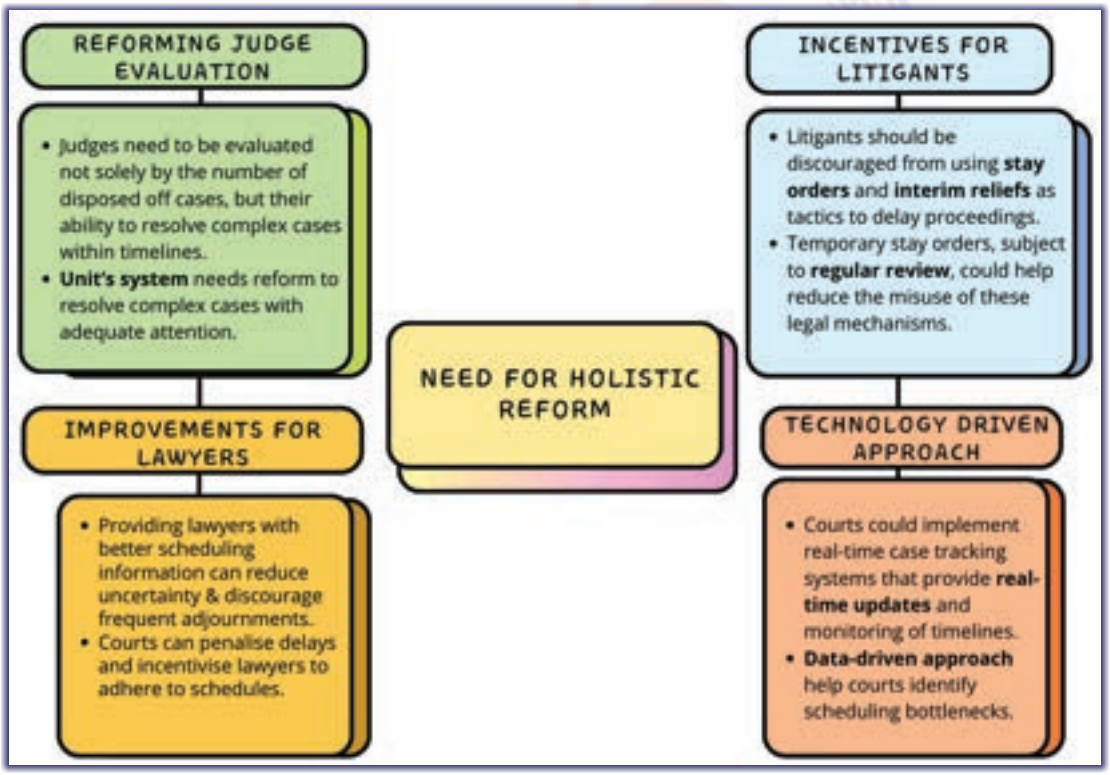
The term is like the **white coat hypertension** (where patients experience high blood pressure in clinical settings), symbolises how individuals dread engaging in the court process because of its lengthy, complex, and costly nature.

Challenges in the District Judiciary

- **Role of Judges:**
  - **Higher court directives** to prioritise and expedite certain cases disrupt overall scheduling in district courts.
  - Judges face external pressure to meet **case disposal targets**, often imposed without full consideration of district courts' operational constraints.
    - This results in prioritisation of easier cases over more complex ones.
- **Performance Evaluation – Units System**:
  - Judges are evaluated based on a **"units system"** here points are awarded according to the number and type of cases disposed of.
  - To maximise units, judges may focus on quickly resolving simpler cases, neglecting more complex cases that demand greater judicial intervention.
    - This leads to undue delays.

Role of Lawyers in Contributing to Delays

- **Scheduling Conflicts:**
  - Lawyers often manage multiple cases across different courts, which can lead to **strategic decisions** about which cases to attend.
  - Resultant **adjournments** disrupt the court schedule.
- **Stay Orders and Interim Relief**:
  - Lawyers, particularly in civil matters, may view **obtaining a stay** as a victory, reducing their interest in pushing for a speedy resolution.
  - It contributes to delays as on obtaining a stay, urgency to resolve the case diminishes.



Impact on Witnesses

- Witnesses face significant challenges due to **unpredictable court schedules**.
- The financial burden and inconvenience discourage witnesses from attending court, contributing to trial delays.

Relevance of Student Politics in India

Syllabus Mapping: GS-Paper 2, Elections

Context

The relevance of student politics to national politics is deeply rooted in its historical evolution and ongoing significance.

Historical Evolution of Student Politics

Post-Independence

- **All India Students' Federation (AISF)**:
  - **Formation**: Convened by Jawaharlal Nehru in 1931
  - **Objective**: To mobilise youth against British imperialism.
  - **First Conference**: Held in Lucknow in August 1936. Nehru inaugurated the event, which was presided by Muhammad Ali Jinnah.
    - In 1937, the Muslim Students Federation was formed under Jinnah and Muhammad Iqbal's patronage.
- **Splits in the AISF:**
  - At the Nagpur session in 1940, the AISF was split over — Indian Independence VS. global solidarity against fascism.
  - The All India Student Congress (AISC), emerged in 1943 with Ram Sumer Shukla as its first President.

Post-Independence

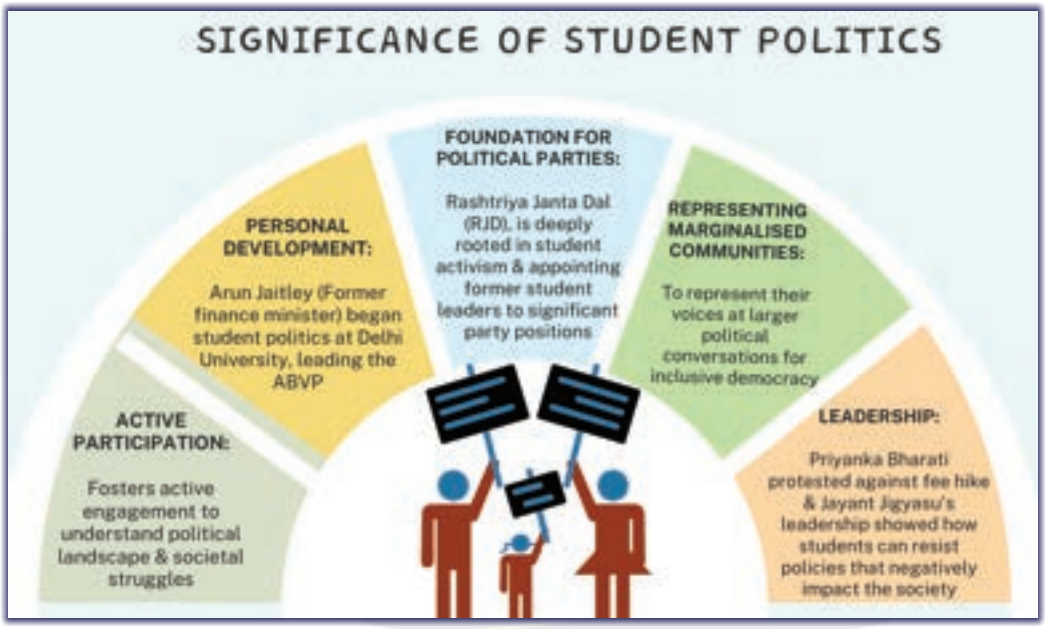
- **Akhil Bharatiya Vidyarthi Parishad (ABVP):** Established in July 1949 by Balraj Madhok and Yashwantrao Kelkar with RSS backing to counter communist influence in university campuses.
- **Samajwadi Yuvjan Sabha**: An offshoot of Ram Manohar Lohia's socialist party formed in December 1955.
- **National Students' Union of India (NSUI):** The student wing of the Indian National Congress, established by Indira Gandhi in April 1971.

Notable International and National Student Movements

- **Paris Student Movement (1968)**: A global inspiration, it promoted left-wing politics, anti-war sentiments, civil rights and counter-cultural ideals.
- **Indian Student Movements:**
  - **Anti-Hindi Agitation (1965):** Predominantly in south India.
  - **Anti-English Agitation (1967):** Primarily in north India.
  - **Sampoorna Kranti (1974-75):** Led by **Jayaprakash Narayan,** this call for "total revolution" involved students against the emergency imposed by Indira Gandhi.
  - **Mandal Commission Agitation (1990):** Large-scale protests erupted against the implementation of the Mandal Commission's recommendations on job reservations

Post-1991: Decline of Ideological Student Politics

- **Global Changes (1991):** The collapse of communism, symbolised by the fall of the Berlin Wall, the dissolution of the Soviet Union marked the decline of ideology-driven student politics.
  - **Eg: Francis Fukuyama's** "The End of History and the Last Man" (1992)" heralded the end of the ideological age, describing how liberal democracy and capitalism had triumphed.
- Indian Context (Post-1991):
  - **Economic Reforms and Globalisation**: The liberalisation of the Indian economy and **Washington Consensus** opened new paths, diminishing the appeal of student politics.
  - **Career Opportunities:** Beyond medicine, engineering, civil service, and student politics as prestigious career options, broadcasting, cable TV attracted the youth.



Conclusion

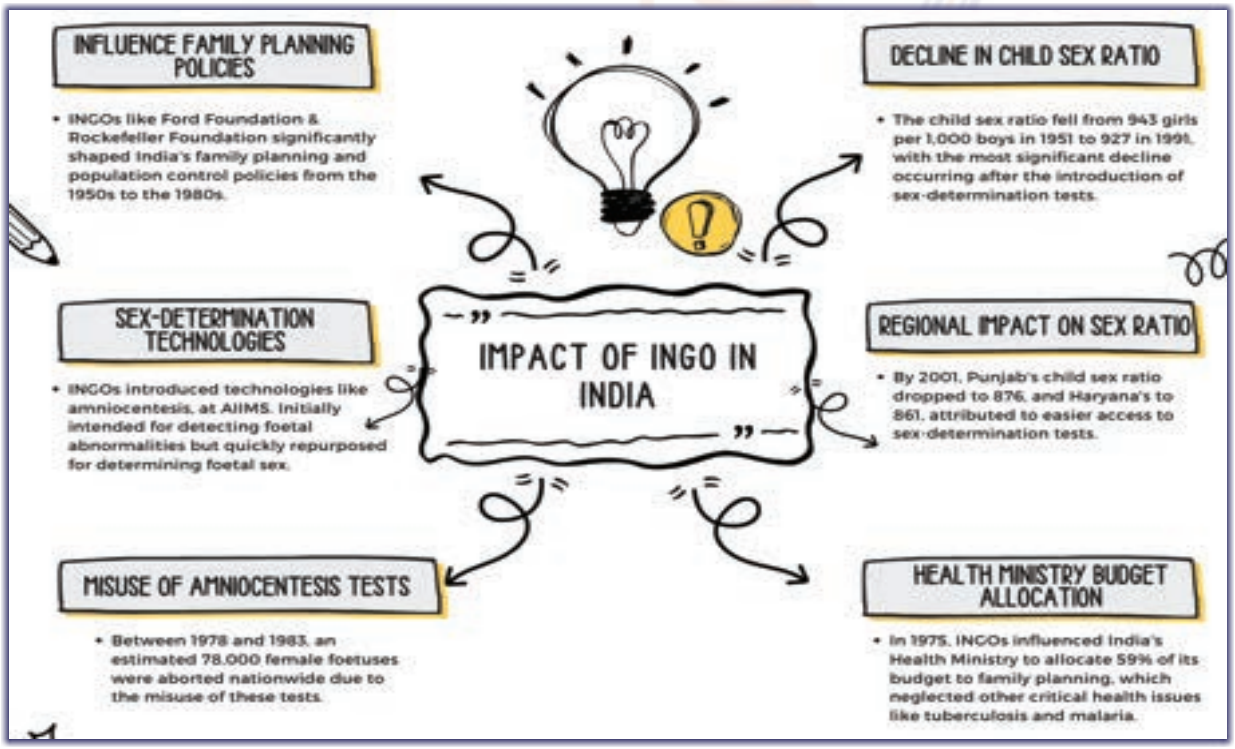
Today, student politics in India has largely retreated due to the broader opportunities post-1991 liberalisation and the decline of global ideological movements. Though some ideological factions remain active, student politics no longer holds the central role in national politics that it once did.

Concerns against International NGOs

Syllabus Mapping: GS-Paper 2, Governance

Context

International NGOs (INGOs) have often pursued donor-driven agendas that have had detrimental effects on local communities across various countries.



Incidents

- **Tanzania and Kenya:** INGO-led conservation efforts have resulted in the displacement of Maasai communities, undermining their traditional livelihoods.
- **Bolivia**: Water privatisation in Cochabamba, backed by INGOs, restricted access to water, leading to significant public outcry and a reversal of the policy.
- **India**: INGOs promoted projects that ignored local realities, ultimately undermining development goals.

Way Forward

While INGOs may have good intentions, their interventions have often resulted in lasting harm. Policymakers in India should approach external advice from INGOs with caution and scepticism, ensuring that local realities are considered.

TOPICS FOR PRELIMS

Regulation of Industrial Alcohol

Syllabus Mapping: Polity, Federalism, Judiciary

Context

A nine-judge Bench of the Supreme Court of India (SC), in an 8:1 decision, ruled that states have the authority to impose taxes not only on alcoholic beverages but also on industrial alcohol.

Overlapping Constitutional Entries

- The dispute involved two entries in the **Seventh Schedule** of the Constitution.
  - **Entry 8 of List II (State List):** Allows states to regulate "intoxicating liquors," including production, manufacture, transport and sale.
  - **Entry 52 of List I (Union List):** Allows the Centre to regulate industries declared by Parliament as expedient for public interest.
  - According to the central government, industrial alcohol falls under its jurisdiction due to its inclusion in the Industries (Development and Regulation) Act, 1951.

Case Law

- The Apex court has ruled in favour of states' rights to regulate industrial alcohol.
- It overturned the 1990 judgement from the Synthetics & Chemicals Ltd. v State of Uttar Pradesh case, which limited state authority to potable alcohol only.
- **Interpretation of "Intoxicating Liquor":** Supreme held that "intoxicating liquor" should include all forms of alcohol, even industrial alcohol, as it can be misused for illegal liquor production.

Doctrine of Repugnancy

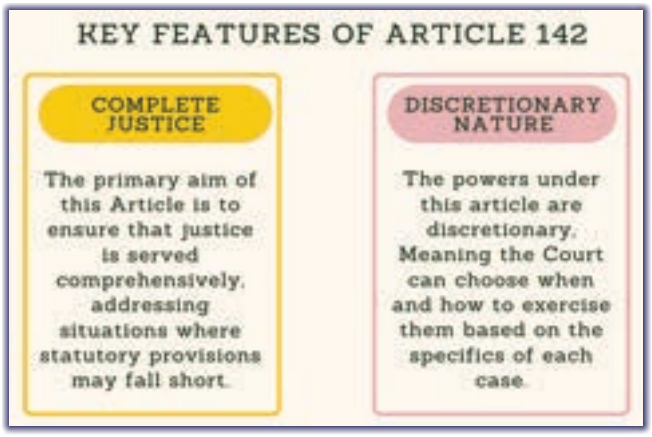
- It refers to the legal principle that addresses conflicts between laws made by different legislative bodies in federal systems.
- **Seventh Schedule** of the Constitution divides legislative powers between the Union (Centre) and the States, categorising subjects into three lists:
  - **Union List:** Centre can legislate.
  - **State List:** State Legislatures can legislate.
  - **Concurrent List:** Both the Centre and States can legislate, but if a conflict arises, the Doctrine of Repugnancy helps to resolve it.
- **Article 254**:
  - **If there is a conflict between central and state laws on a subject listed in the Concurrent List**, the central law will prevail.
  - If the state law has received **the President's assent**, it can prevail in the state.
  - **Parliament still holds** the power to override such a state law by enacting a new law.

Article-142 of Constitution

Syllabus Mapping: Polity, Judiciary

Context

While hearing a case of a student whose admission was cancelled due to non-payment of fees, the Supreme Court invoked Article-142 of the Constitution to provide complete justice.



Supreme Court Judgments Involving Article 142

- **Shilpa Sailesh v Varun Sreenivasan (2023):**
  - Context: Directly granting a divorce on the grounds of "irretrievable breakdown of marriage" under Article 142.
  - **Significance:** Allows the Supreme Court to bypass the procedure set in Hindu Marriage Act, which involves a cooling-off period for mutual consent divorces.
- **Chandigarh Municipal Corporation Elections (2023)**
  - Context: Overturning election results and ensuring electoral democracy was upheld.
  - **Significance:** Article 142 used to rectify procedural irregularities in electoral processes.

Ladakh demanding inclusion in Sixth Schedule

Syllabus Mapping: GS-Paper 2, Federalism

Context

Recently Climate Activist Sonnam Wangchuk has started a protest to support Ladakh's demand for inclusion in **6 Schedule** of the Constitution.

Types of federalism

- **Asymmetrical federalism**: It refers to a system where some states or regions have more autonomy than others.
- **Symmetrical federalism**: It grants equal powers to all states. (E.g. USA , Australia)

About Fifth & Sixth Schedule Areas

Fifth Schedule:

- It includes regions with significant tribal populations.
- **Declared by:** President of India
- Currently, **10 states** have scheduled areas under this schedule.
  - Andhra Pradesh, Chhattisgarh, Gujarat, Himachal Pradesh, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, Rajasthan and Telangana.
- **Key features:**
- **Tribes Advisory Councils (TAC):**
  - **Composition:** Not more than 20 Members
  - **Functions:** Advises the Governor on matters related to the welfare and advancement of Scheduled Tribes.
- The Governor regulates land allotment and transfer among STs and can modify laws applicable to these areas.

Dhebar commission recommendation to declare an area as a Scheduled Area

- The predominance of the tribal population
- Compactness and reasonable size of the area
- A viable administrative entity such as a district, block or taluk
- Economic backwardness of the area as compared to the neighbouring areas.

Sixth Schedule:

- **Article 244(2):** Makes special arrangements for the administration of Tribal Areas in the States of **Assam, Meghalaya, Mizoram and Tripura**. (Trick -AMTM)
- **Special Provisions under 6th Schedule:**
  - Creation of Autonomous district Councils with Legislative, Judicial and Executive powers.
  - District Councils empowered to prepare a budget.
  - The councils derive all their powers from the Constitution.
  - Acts passed by Parliament or state legislatures do not apply to autonomous districts
  - Each autonomous district has an Autonomous District Council (ADC).
- **Membership:** ADCs have up to **30** members
  - **4** are nominated by the governor
  - The remaining **26** are elected on the basis of adult franchise.
  - **Term: 5 years**

Nomination of MLAs in J&K assembly

Syllabus Mapping: Polity, State legislature

Context

The lieutenant governor's powers to nominate five members to the Jammu and Kashmir assembly over and above the 90 elected members has caused an upheaval.

Background

- The **Jammu and Kashmir Reorganisation Act, 2019** specified that the Lieutenant Governor may **nominate two members** to the Legislative Assembly to give representation to **women**.
- In **2023**, the Act was amended to **increase the number of nominated members to 5**. The three additional members:
  - 2 members from the Kashmiri migrant community (one of whom must be a woman).
  - 1 member representing displaced persons from POK.

Legislative Assembly J&K

- **Total Assembly Seats**: 90
- **Nominated Members**: 5
- **New Assembly Strength**: 95 (increasing majority requirement from 46 to 48)

Voting Rights and Precedent

- The Act leaves **discretion to the L-G** regarding these nominations but does not specify their **voting rights** or their role in **government formation**.
- However, the **J&K UT Assembly is modelled after the Puducherry Assembly**, where nominated members enjoy the same rights as elected MLAs, including **voting rights**.
- No state assembly in India allows for MLA nominations; provision applies only to the **UTs of Puducherry and J&K**.

Allocation of symbols to political parties

Syllabus Mapping: Polity, Elections

Context

Nationalist Congress Party (NCP) founder Sharad Pawar has filed a plea in the Supreme Court, seeking a direction to restrain the Ajit Pawar faction from using the 'clock' symbol in the upcoming assembly polls in Maharashtra.

Allocation of Symbols:

- **The Election Symbols (Reservation and Allotment) Order, 1968** empowers the ECI to allot symbols to political parties.
- The ECI is the only authority to decide on disputes among factions/groups of a recognized political party.
- The Supreme Court upheld this in **Sadiq Ali Vs ECI case, 1971.**

Types of Symbols:

- **Reserved Symbols:** These are reserved for recognized national and state political parties.
- **Free Symbols**: The ECI has a pool of 197 'free' symbols that are allotted to unrecognised parties and independent candidates.

Facts

- Animals as a party symbol has been banned by the ECI since 1990.
- Elephant symbol of BSP or the tiger symbol of Forward Bloc was allocated before the ban.

Legal Framework

- **In Sadiq Ali vs. ECI (1971),** the Supreme Court established a **three-test formula** for recognizing factions:
  - **Aims and Objectives:** Evaluating if both factions align with the original party's goals.
  - **Internal Democracy:** Assessing adherence to party constitution reflecting inner-party democracy.
  - **Majority Support:** Determining which faction commands majority support within legislative and organisational structures.

NCST Report on Santhal pargana

Syllabus Mapping: Polity, Constitutional Bodies

Context

The National Commission for Scheduled Tribes (NCST) has released a report examining demographic changes in the Santhal Pargana region of Jharkhand. It has suggested involving non-State actors and NGOs to address the issue.

Key Findings of the Report

- **Infiltration claims:** Illegal immigrants from Bangladesh have altered the demographics over the past seven decades.
- **Difficulty in enumeration:** Challenging to quantify the number of infiltrators due to fluctuating numbers and inadequate official records.
- **Land Conversion:** Johar Sthan (sacred land of Adivasis) is being converted into Muslim cemeteries.
- **Economic Impact:** Bangladeshi Muslims as middlemen obstruct Adivasis from receiving benefits from government schemes.

About National Commission for Scheduled Tribes (NCST)

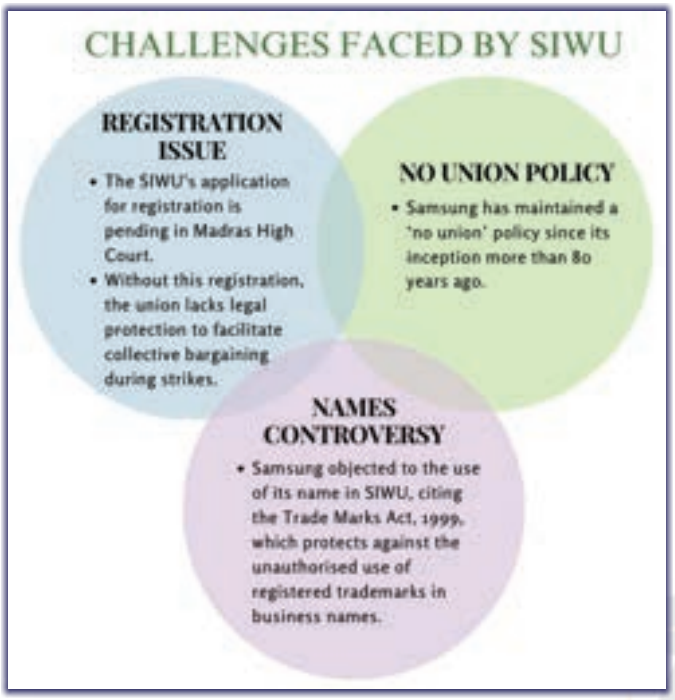
- It is a constitutionally mandated body under **Article-338A (Part-XVI)** of the Constitution.
- The Commission acts as a think tank for promoting welfare of STs.
- **89th Constitutional Amendment Act, 2003** bifurcated the existing NCSC and NSCT into two separate Commissions.
- **Nodal Ministry:** Ministry of Tribal Affairs **(**MoTA)
- **Appointment and Composition of the Commission:**
  - A Chairperson, vice-chairperson, 3 other members. (At least 1 women)
  - All are appointed by the **President**.
- **Term of Office:**
  - Members hold office for a term of **3 years**.
  - Not **eligible for appointment for more than two terms**

Right to Unionise (Samsung worker's case)

Syllabus Mapping: Polity, Rights Issues

Context

Workers at Samsung's Chennai plant are on strike demanding better wages, working conditions and recognition of their newly formed union, the Samsung India Workers Union (SIWU). The SIWU has filed for registration to gain legal recognition under the Trade Union Act.



About Trade Unions Act, 1926

- It is a landmark legislation that provides for the registration of trade unions.
- It aims to facilitate a peaceful dispute resolution.
- **Trade Union:** According to Section 2(h), a trade union is defined as a combination of workers formed primarily to regulate relations between workmen and employers, or among workers themselves, or between employers.
- **Registration:** The Act allows for the registration of trade unions, which is not mandatory but highly beneficial.

Case Law

- **B.R. Singh Vs. UOI (1989):** Apex court upheld the right to form associations or unions as a fundamental right under **Article 19(1)(c)**

Right to strike

- Right to strike is recognized as a **legal right** but is subject to statutory restrictions under the Industrial Disputes Act, 1947, which governs industrial relations in India.
- The Act **does not grant an absolute right to strike.**

Central Administrative Tribunal (CAT)

Syllabus Mapping: Polity, Non-constitutional bodies

Context

Recently Four senior IAS officers were repatriated to Andhra Pradesh cadre, They have approached the Central Administrative Tribunal (CAT) seeking cancellation of the Department of Personnel and Training (DoPT)'s repatriation orders.

About Central Administrative Tribunal (CAT)

- CAT was established in **1985 under Article 323-A of the Constitution.**
- **Aim:** To resolve grievances of central and state government employees.
  - Adjudicates disputes related to recruitment, conditions of service and union affairs.
- **Structure:**
  - CAT has 17 benches and 21 circuit benches across India.
  - Each bench has **2** members, one judicial and one administrative.
  - The Chairman of the CAT is from a judicial background.
  - **Appointment:** The President appoints the Chairman and Members of the CAT after consulting with the Chief Justice of India.
  - **Reappointment**: Members of the CAT are eligible for reappointment.
  - **Service conditions:** The conditions of service of the Chairman and Members of CAT are the same as applicable to a Judge of High Court.
- **Powers:**
  - Exercises jurisdiction related to service matters covered by the **Administrative Tribunals Act 1985.**
  - The CAT is **not bound** by the procedure laid down in the Code of Civil Procedure, 1908, but is guided by the **principles of natural justice.**
  - Holds power to exercise same jurisdiction in respect of contempt of itself as a High Court

Central government employees that are not covered under the CAT

- Members of the defence forces
- Supreme Court staff
- Parliament's secretarial staff.

Abatement to Sucide

Syllabus Mapping: Governance, Criminal Justice

Context

The Supreme Court recently clarified the law surrounding abetment to suicide cases, particularly in the workplace.

Abatement to Sucide

- It refers to the act of encouraging, instigating or aiding another person to commit suicide.
- **Legal Framework:**
  - It is governed by **Section 306** of the IPC, which awards imprisonment which may extend to ten years for abatement of suicide.

- To **secure a conviction** under Section 306 IPC:
  - Evidence that the accused intended to provoke the deceased to feel trapped.
  - The presence of a mens rea (guilty mind) is crucial.

Supreme Court ruling

The Supreme Court defined **'incitement'** to die by suicide as arising from:

- **Sentimental Ties:** Leading to psychological disturbances during conflicts.
- **Official Relations:** Professional obligations, where legal/ regulatory expectations are prescribed.

Conflict in Joint Parliamentary Committee of Waqf Bill

Syllabus Mapping: Polity, Parliament

Context

Opposition MPs on the Joint Parliamentary Committee examining the Waqf (Amendment) Bill have written to the Lok Sabha Speaker, alleging a 'gross violation of parliamentary code of conduct' by the Committee's Chairperson during a recent meeting.

About Joint Parliamentary Committee (JPC)

- A JPC is set up by the Parliament for the detailed scrutiny of a subject or Bill.
- It consists of members from **both the Houses** of Parliament
- There is **no fixed number of members** in the committee.
- It is dissolved after the task completion.
- The recommendations are **not binding on the government.**

Powers of JPC

- Gather evidence from experts, public bodies, associations, individuals or interested parties suo-motu or on requests made by them.
- If a witness fails to appear before a JPC in response to summons, his conduct constitutes **contempt of the House.**
- Ministers are not generally called by the committee to give evidence. But with the permission of the Speaker, the JPC can seek information from ministers.

Facts

Important cases for which JPC was formed:

- Bofors scandal (1987)
- Harshad Mehta Scam (1992)
- 2G spectrum case (2011)
- Personal Data Protection Bill (2019)

Opinion polls & Exit polls

Syllabus Mapping: Polity, Elections

Context

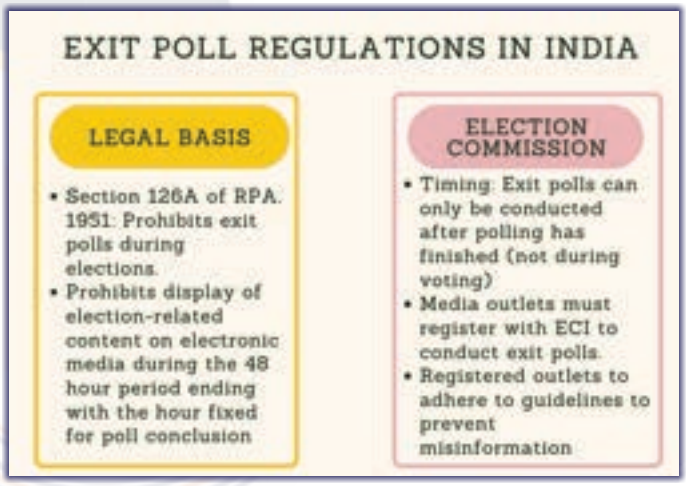
Recently, Chief Election Commissioner Rajiv Kumar stated that exit polls were causing distractions and asked media houses to self-introspect before publishing the verdict.

Opinion Polls

- Opinion polls are surveys conducted before an election to gauge voters' intentions and preferences.
- They aim to predict how the electorate might vote based on a sample of the population.

Exit Polls

- Exit polls are conducted immediately after voters leave polling stations on election day.
- Exit polls provide early indications of results before official counts are completed.



Bar Council of India (BCI)

Syllabus Mapping: Polity, Judiciary

Context

The Bar Council of India (BCI) issued a circular recommending a minimum stipend for junior advocates in response to a Delhi High Court directive from July 2023.The BCI has recommended that junior advocates in urban areas receive a minimum stipend of **Rs 20,000**, while those in rural areas receive **Rs 15,000**.

About Bar Council of India

- It is a **statutory body** established under the **Advocates Act 1961** to regulate the Indian bar.
- **Functions:**
  - Regulator: Prescribes standards of professional conduct & exercising disciplinary jurisdiction over the bar.

  - Protector: It protects the rights, privileges, and interests of advocates.
  - Sets standards for legal education and grants recognition to Universities
  - **Conducts All India Bar Examination (AIBE)** to grant a 'Certificate of Practice' to advocates practising law in India.
- In March 2023 BCI notified **Rules for Registration and Regulation of Foreign Lawyers and Foreign Law Firms in India,** allowing foreign lawyers and law firms to practice in India.
  - However, The foreign lawyers or foreign Law Firms **are not permitted** to appear before any court, tribunals or other statutory or regulatory authorities,

Composition of BCI

- Attorney General of India. (ex-officio)
- Solicitor General of India. (ex-officio)
- One member from each State Bar Council.
- Chairman and vice-chairman to be elected by the council.

Lawyer Vs. Advocate

- Lawyer: A legal professional who has graduated with a Bachelor of Law (LLB) degree.
- Advocate: When a lawyer joins the State Bar Council and passes the All India Bar Council exam, he/she is called an advocate.
- An advocate represents a client in a court of law, whereas a lawyer provides legal advice to a client.
- Every advocate is a lawyer, but every lawyer is not an advocate.

Who is an Advocate on Record (AOR)?

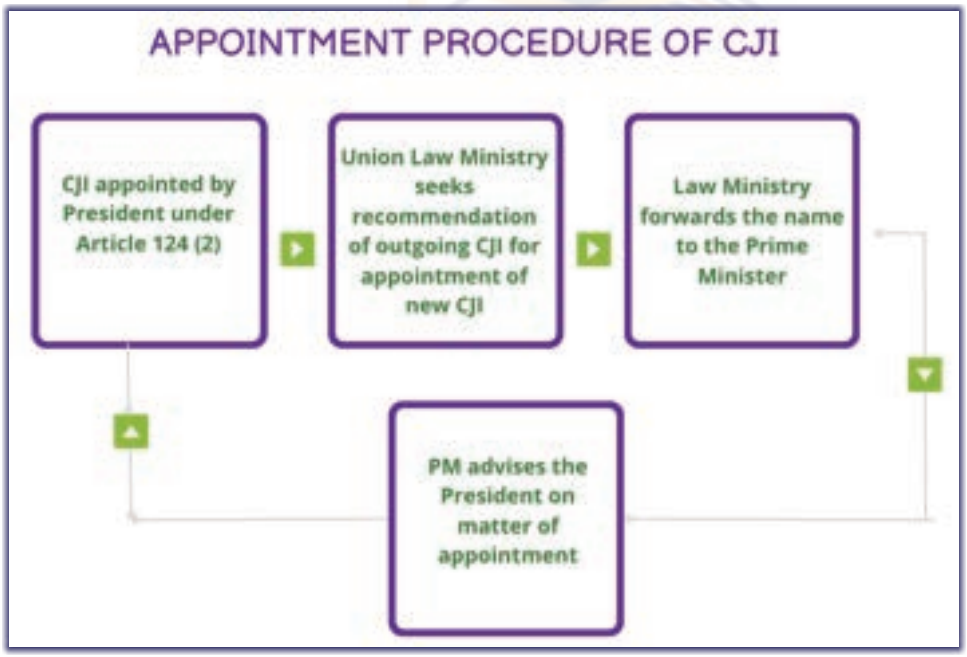
- AOR is a lawyer who is qualified to plead on behalf of their clients in the Supreme Court.
- Only AORs can file cases before the Supreme Court, and no other advocate can appear or plead for a party unless instructed by an AOR or permitted by the court.

Appointment of Chief Justice of India

Syllabus Mapping: Polity, Judiciary

Context

Chief Justice of India (CJI) D.Y. Chandrachud has recommended Justice Sanjiv Khanna for appointment as the 51st Chief Justice of India.



Did you know?

- The **convention** to appoint the **Senior most judge as CJI** has been broken **3 times** till date.
- The Constitution **does not provide a minimum age of qualification for SC judges.**
- **Qualifications for SC Judge:**
  - Citizen of India
  - At least 5 years of experience as a judge of a High Court or two or more High Courts in succession.
  - Advocate of a High Court or two or more High Courts in succession for at least ten years.
  - Distinguished jurist in the opinion of the President.

Habeas Corpus

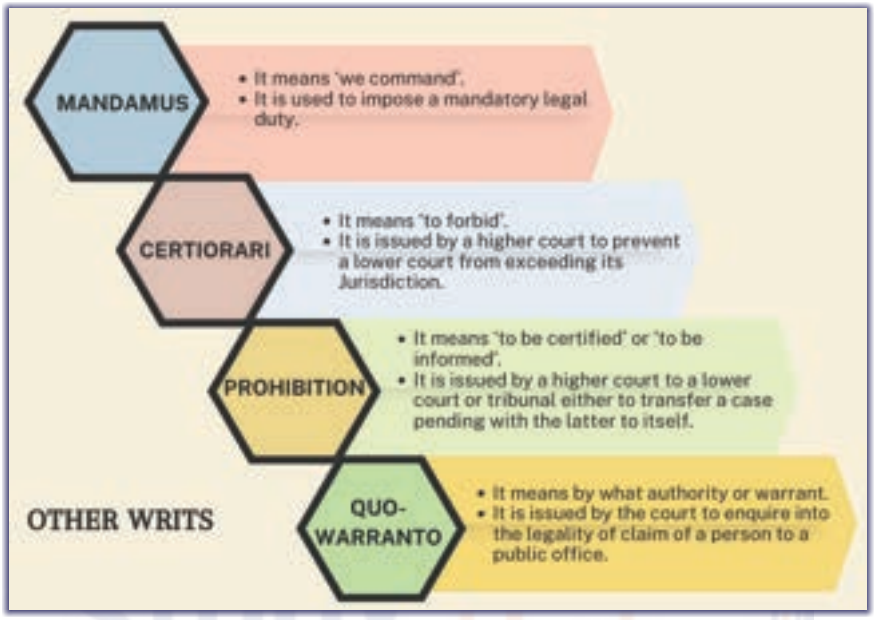
Syllabus Mapping: Polity, Rights Issue

Context

The Supreme Court has closed habeas corpus proceedings against Isha Foundation.

About Habeas Corpus

- It means **'to have the body of'** i.e. to present an arrested or detained person before the court.
- **Applicability:** It can be issued against both public authorities as well as private individuals.
- **Cases where it doesn't apply:**
  - Lawful detention
  - For contempt of a legislature or a court
  - Detention is by a competent court, and Detention is outside the jurisdiction of the court.
- Application of Habeas Corpus can be made by the prisoner himself or another person acting on his or her behalf.



Facts

- Writ jurisdiction of the Supreme Court is mentioned under **Article-32** & of the High Court under **Article-226.**
- **Writs not available against private citizens:** Mandamus, Prohibition, Certiorari.
- Writ jurisdiction in India is adopted from **Britain.**

Curative & Review Petitions

Syllabus Mapping: Polity, Judiciary

Context

A Special Bench of the Supreme Court has recalled its previous judgement with respect to the benami property law.

Curative Vs. Review petition

Aspect	Review Petition	Curative Petition
Purpose	To seek a re-examination of a judgement based on specific grounds like errors of law or fact.	To address fundamental injustices after all other remedies have been exhausted.
Origin	**Article 137**	Evolved from judicial interpretation- **Rupa Ashok Hurra vs. Ashok Hurra (2002)** **Not Explicitly mentioned in the Constitution.**
Filing Timeline	Must be filed **within 30 days** of the judgement.	**No specific time limit**
Hearing Process	Usually decided by the **same bench** that delivered the original judgement without oral arguments.	First circulated to the **three senior-most judges** of the Supreme Court, along with the **judges who delivered the original judgement** in the case. SC may allow **open court hearings** if requested.
Conditions	Any aggrieved party can file. It must specify grounds for review.	**Requires certification** by a senior advocate and proof of violation of natural justice principles.

Other Types of Petitions

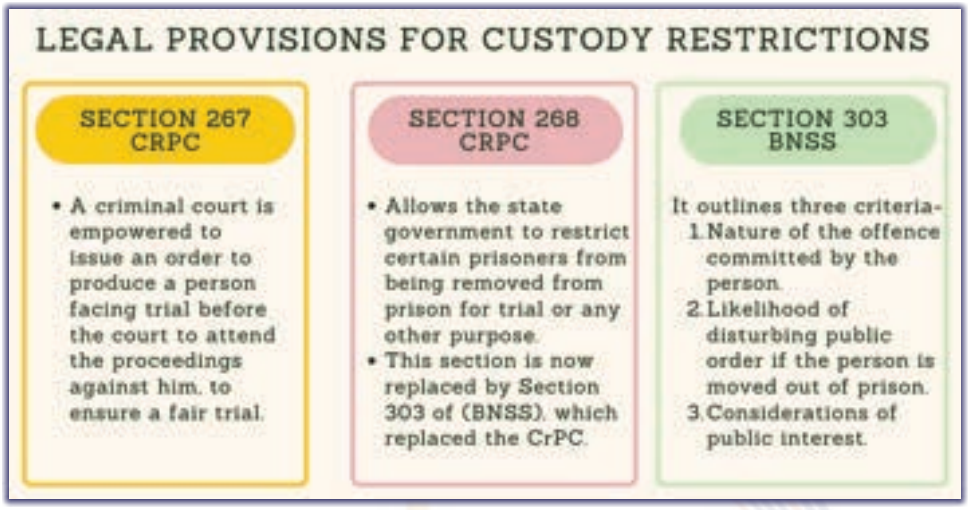
- **Special Leave Petition (SLP): Article 136** allows any person to seek special permission to appeal against any judgement or order from any court or tribunal in India.
- **Writ Petition: Article 32** seeks enforcement of fundamental rights.
- **Mercy Petition:** Under **Article 72** convicts seek clemency from the President of India after exhausting all legal remedies including review and curative petitions.

Restriction of movement under BNSS

Syllabus Mapping: Governance, Criminal Justice

Context

The Ministry of Home Affairs recently invoked Section 303 to restrict the movement of a gangster, preventing him from being taken out of jail for a year.



Types of custody

- **Police Custody:** Immediate physical custody by the police of a person who has committed crime.
- **Judicial Custody:** In Judicial Custody the accused is kept in jail by the order of the concerned magistrate.
  - When the accused is in judicial custody the **police have no right of interrogation.**

National Commission on Protection of Child Rights

Syllabus Mapping: Polity, Non-constitutional bodies

Context

The Supreme Court has stayed the National Commission on Protection of Child Rights (NCPCR) recommendation to shut madrasas not complying with RTE Act.

About NCPCR

- It is a **statutory** body constituted by the GOI under the Commission for Protection of Child Rights Act, 2005.
- **Composition:** Chairperson + 6 members **(At Least 2 Women)**
- **Appointment & Removal:** By the Central Government
- **Tenure:** 3 Years (Both Chairperson & Members)
  - Chairman and the members cannot hold office for more than **2 terms.**
  - **Maximum age to hold post:** Chairman (65 Years), Members (60 Years)
- NCPCR submits an **annual report to the Central Government.**
- NCPCR is responsible to ensure effective implementation of:
  - Right to Education Act,2005
  - Protection of Children from Sexual Offences(POCSO) Act,2012
  - Juvenile justice (care and protection of children) Act, 2015

A person between the ages of 0-18 is considered as a child by the Commission.

Initiatives by NCPCR to protect child rights

- **GHAR:** Go home and Reunite portal for repatriation of Children from child care homes to their families during Covid-19.
- **MASI portal:** Monitoring app for seamless investigation (for real time monitoring of child care institutions)
- **Bal Swaraj portal:** for online tracking and monitoring of the Children who are in need of protection and care

National Company Law Appellate Tribunal (NCLAT)

Syllabus Mapping: Governance, Judiciary

Context

The Supreme Court has reversed the NCLAT decision that had approved a settlement agreement between an edtech company and the Board of Control for Cricket in India (BCCI) for an outstanding payment.

About NCLAT

- Constituted in **2016** under **Section 410 of the Companies Act, 2013** for hearing appeals against the orders of the National Company Law Tribunal(s) (NCLT)
- **Benches:** Principal Bench - New Delhi, Additional Bench - Chennai
- **Hears Appeals against orders passed by:**
  - National Company Law Tribunal (NCLT)
  - Insolvency and Bankruptcy Board of India
  - Competition Commission of India (CCI)
  - National Financial Reporting Authority.
- **Composition:**
  - It is composed of a **chairperson, judicial and technical members.**
  - These members are appointed by the **Central Government**.
- Decisions of NCLAT can be appealed to the Supreme Court of India.

Capacity Building Commission (CBC)

Syllabus Mapping: Governance, Non-constitutional bodies

Context

The Capacity Building Commission has developed the Karmayogi Competency Model for civil servants.

About Capacity Building Commission (CBC)

- It is an **independent body (non-statutory)** of the GOI established in 2021 to transform the Indian civil services learning ecosystem.
- It is a **3-member** Commission, supported by an internal Secretariat headed by a Secretary (Rank of Joint Secretary to Government of India).
  - The members are appointed from diverse backgrounds, including the public sector, private sector, academia and civil society.
- **Purpose:** To provide policy guidance and tools to create a uniform approach to capacity building.
- **Karmyogi Competency Model:** It aims to redefine the civil service approach by transitioning from karmachari (employee) to karmayogi (dedicated worker), focusing on service without expectation.

National Programme for Civil Services Capacity Building (NPCSCB) - Mission Karmayogi

- Launched in **2020** to improve the civil service and public service delivery.
- **Structure**:
  - A PM-led HR Council to approve and monitor plans.
  - The Capacity Building Commission (CBC), that harmonises training standards.
  - A Special Purpose Vehicle (SPV) that owns and operates the online learning platform **(iGOT-Karmyogi)**

Operation Chakra-III by CBI

Syllabus Mapping: Governance, Non-constitutional bodies

Context

The Central Bureau of Investigation has arrested 26 accused persons from Pune, Hyderabad and Visakhapatnam, following a crackdown on a major cybercrime network. This action was part of CBI's ongoing Operation Chakra-III.

Operation Chakra-III

- It is an ongoing operation of CBI to **dismantle cybercrime networks** that operate across multiple countries.
- **Objectives:**
  - Combating cybercrime and protecting citizens and global communities.
  - Working with international law enforcement agencies like FBI and Interpol to dismantle cybercrime networks.

Operation Chakra-II

- Under this CBI partnered with Microsoft and Amazon to dismantle illegal call centres that posed as Microsoft and Amazon customer support.
- It also targeted international tech support fraud scams, cryptocurrency fraud and other cyber-enabled financial crimes.

Central Bureau of Investigation (CBI)

- **Established:** In **1963** on the recommendations of **Santhanam Committee.**
- **Legal Status:** It is **not** a statutory body. However, it derives its power to investigate from the **Delhi Special Police Establishment Act, 1946. (DSPE Act)**
- **Works under**: CVC (in corruption cases) and DoPT (for all other matters)
- **Appointment of CBI Director**: Appointed by the Appointment Committee on the recommendation of a

Selection Committee, as per the **Lokpal and Lokayuktas Act, 2013**
  - **Selection Committee: PM, LoP, CJI**
- **Term of CBI Director:** 2 years
  - After completion of 2 years, he can be given **3** extensions of **1** year each.
- **General consent**:
  - **Section 6 of DSPE Act:** Requires CBI to obtain consent from the state government to investigate within its jurisdiction **unless it's a union territory or railway area.**
    - Since 2015, states like Chhattisgarh, Jharkhand, Kerala, Mizoram, Punjab, Rajasthan, Telangana, Meghalaya, and West Bengal have withdrawn their general consent
- **Case where Consent not needed:**
  - If an investigation is directed by the Supreme Court or High Court.
  - For Union Territories.

Suicide pod under legal scrutiny in Switzerland

Syllabus Mapping: Polity, Rights Issues

Context

Recently Switzerland police has arrested 4 people in relation to death of a 64 year old American woman in a 'Suicide Capsule' (Sarco pod). This case has raised the debate around legality of euthanasia and assisted dying.

Sarco pod

- It is a euthanasia device consisting of a 3D printed detachable capsule
- It contains a canister of liquid nitrogen which decreases the oxygen level rapidly and assist in dying by suicide through **asphyxiation.**

About Euthanasia

- It is the practice of ending a patient's life to relieve suffering for those who are terminally ill or in great pain.
- **Types of Euthanasia:**
  - **Active euthanasia:** Under this a medical professional intentionally ends a patient's life, usually by administering a lethal dose of drugs. This is sometimes called aggressive euthanasia.
  - **Passive euthanasia:** It refers to the intentional withholding or withdrawal of medical treatments, allowing a person to die naturally.
  - This can include stopping treatments like ventilators, feeding tubes, or medications that keep the patient alive.

How Euthanasia is different from assisted dying

- While both euthanasia and assisted dying involves end of life the difference lies in the fact that Euthanasia requires a medical professional or physician to administer the lethal drug, However, assisted dying involves self- administration of the lethal substance and is not necessarily linked to terminal illness.
- In assisted dying, the role of medical practitioner is restricted only to drug procurement.

Legality of Euthanasia in India

- **Common Cause vs Union of India (2018)**:
  - The Supreme Court recognised the right to die with dignity as a fundamental right and an aspect of Article 21 (Right to Life).
  - The Court provided for the concept of living will and held that a terminally ill person can opt for passive euthanasia and execute a living will to refuse medical treatment.
  - Previously in 2011, the SC recognised passive euthanasia in the **Aruna Shanbaug case for the first time.**
- However, **Active Euthanasia is a crime and is not permitted in India**.

Co-districts in Assam

Syllabus Mapping: Polity, State Executive

Context

As a new administrative set up, the Assam government launched 21 co-districts in the state.

GEOGRAPHY, ENVIRONMENT & DISASTER MANAGEMENT

TOPICS FOR MAINS

Impact of Climate Change on Global Hydrological Cycle

Syllabus Mapping: GS-Paper 1, GS-Paper, Important Geophysical Phenomenon

Context

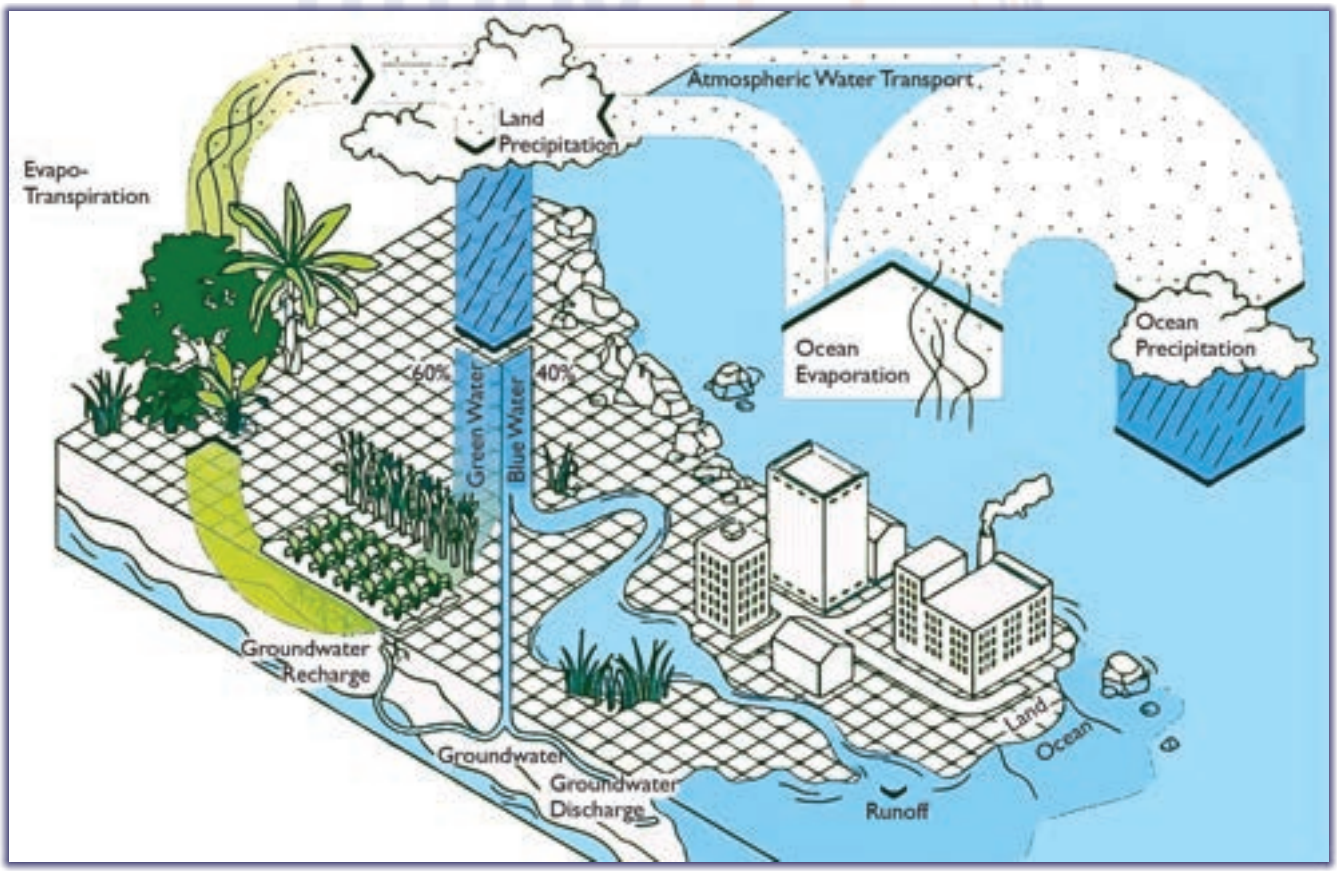
The Global Commission on the Economics of Water reports that climate change and chronic water mismanagement are placing "unprecedented stress" on the world's water systems.

The Global Hydrological Cycle

- Water moves around the globe in a complex and often invisible manner known as the hydrological cycle.
- It provides the basis for all life, enabling carbon cycling through the production of biomass, regulating the climate, and carrying nutrients, chemicals and pollutants.

The Cycle

- Driven by **solar radiation** and **gravity,** water cycles between its liquid, vapour, and solid phases, and move between land, oceans, and the atmosphere.
- Water enters the atmosphere through **evaporation** from land and water bodies, **transpiration** from plants.
- It then forms clouds and eventually **precipitates** back to Earth.
- Once precipitation falls on land, it can be broadly categorised as blue or green
  - **Blue water:** The water in the lakes, rivers and aquifers.



How Climate Change Impacts Global Hydrological Cycle?

- **Increased Evaporation**: Higher temperatures lead to more evaporation, which may amplify humidity and precipitation in some regions.
- **Intensified Rainfall Patterns**: Climate change shifts rainfall distribution, causing some areas to experience excessive rainfall while others face prolonged droughts.
  - E.g., the Indian monsoon has become more unpredictable, causing flooding in some years and drought in others.
- **Shrinking Glaciers and Snowpacks**: Rising temperatures reduce snow cover and glaciers, impacting seasonal water flows.
  - E.g., The melting of Himalayan glaciers can impact water flows in rivers such as Ganga, Brahmaputra,
- **Altered Ocean Circulation**: Changes in sea temperature disrupt ocean circulation and weather patterns.
  - E.g., The North Atlantic currents have been slowing, affecting Europe's climate and leading to wetter and warmer conditions.
- **Increased Water Demand**: Higher temperatures cause plants and soil to lose more moisture, increasing water demand for agriculture.

Consequences of Altered Hydrological Cycle

- **Water Scarcity**: Climate change induced altered rainfall patterns reduce water availability in regions already facing scarcity.
  - E.g., North Africa is witnessing more intense droughts.
- **Increased Flooding**: Intensification of rainfall and rapid snowmelt lead to frequent and severe floods.
  - E.g., Climate change is causing more frequent and severe floods in Bangladesh,
- **Decline in Crop Yields**: Irregular rainfall and water scarcity affect soil moisture and crop production, threatening food security.
  - E.g., In East Africa, unpredictable rainfall has reduced yields for staple crops like maize and sorghum.
- **Degraded Water Quality**: Increased rainfall and flooding cause pollutants to wash into rivers and lakes, affecting drinking water.
- **Loss of Biodiversity**: Altered water availability and quality disrupt ecosystems, threatening freshwater and terrestrial species.
  - E.g., Australia's Murray-Darling Basin has seen a decline in native fish species due to changing river flows and water quality.

Way Forward

- **Water as a Global Common Good:** The hydrological cycle should be managed as a shared global resource, acknowledging its role in achieving the SDGs.
- **Revolutionizing Food-System:** It should focus on enhancing water productivity in agriculture through sustainable practices, efficient irrigation methods, and innovative crop choices that require less water.
- **Conserve and Restore Critical Natural Habitats**: Conservation and restoration of forests, wetlands, and other natural habitats are crucial to protect green water.
- **Market Innovations**: It is important to shape markets to spur a wave of mission-oriented innovations, capacity-building and investments across the entire water cycle, to radically transform how water is used, supplied, and conserved.
- **Circular Water Economy:** It is important to develop a circular water economy, which aims to maximize water reuse and minimize waste.

The Other Monsoon: On Northeast Monsoon

Syllabus Mapping: GS-Paper 1, Climatology

Context

The IMD has forecast that 2024's post-monsoon rainfall is likely to be about 12% over the historical average.

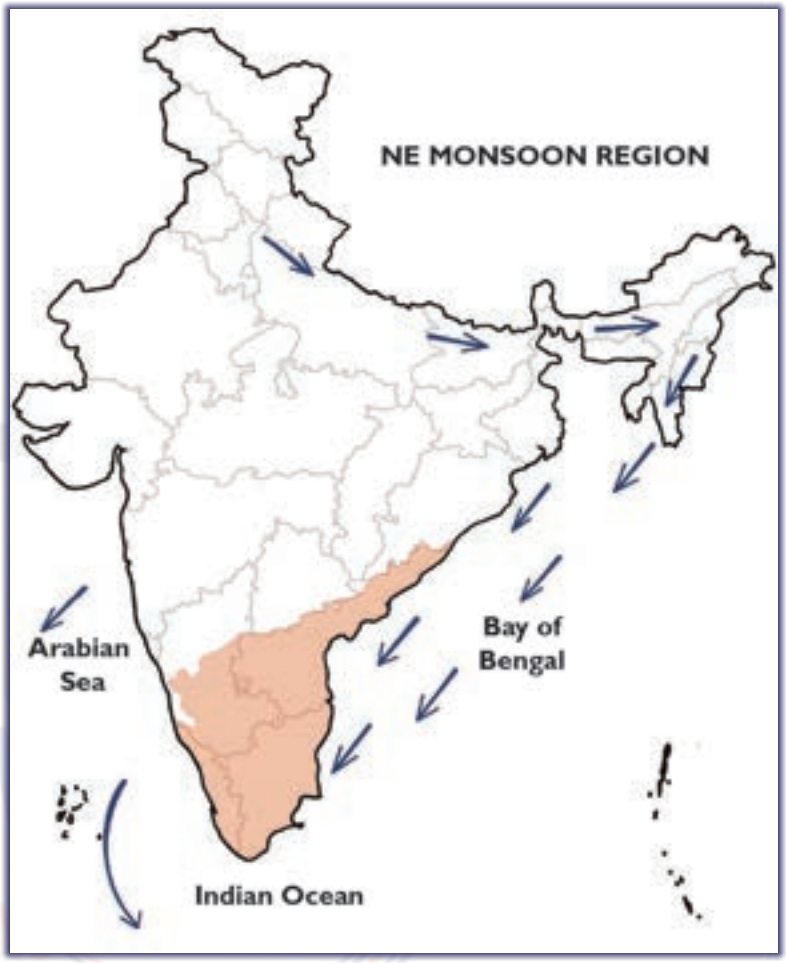
Background

- South Asia experiences two monsoons-the Southwest monsoon or summer monsoon during June to September and the Northeast (NE) Monsoon or winter monsoon during October to December.

- The rainfall received during the NE monsoon Season is important for the southern peninsula, Sri Lanka and Maldives.
  - During the southwest monsoon season, the southeastern parts of India remain in the rain-shadow region and receive moderate rains

Formation of Northeast Monsoon (NEM)

- During the southwest monsoon season, a surface pressure gradient is directed from the Indian Ocean to land with south-westerly monsoon winds in the lower troposphere.
- During the NE monsoon season, the pressure gradient reverses (from land to the Indian Ocean) resulting in north-easterly trade winds.
- This change in surface pressure gradient and lower tropospheric winds is associated with the southward movement of the ITCZ and the subtropical anticyclone in the upper troposphere, triggering the NE monsoon.



Factors affecting Northeast Monsoon

- **El Niño:** Can enhance rainfall by altering atmospheric circulation and directing more moisture-laden winds toward South India.
  - E.g., In 2023, El Niño-fuelled Northeast monsoon caused floods in south Tamil Nadu
- **La Niña:** especially during the second half of the NEM season, often increases rainfall
- **Indian Ocean Dipole (IOD):** Positive IOD tends to enhance NEM rainfall. Negative IOD weakens NEM rainfall.
- **Madden-Julian Oscillation (MJO):** When the MJO is in phases 2 to 4 with an amplitude greater than one, it promotes more favourable conditions for NEM rainfall.

Difference between Southwest and Northeast Monsoon

Feature	South West Monsoon	NorthEast Monsoon
Duration	June to September	October to December
Rainfall Contribution	About 75% of annual rainfall in India	Approximately 11% of annual rainfall in India
Geographical Impact	Affects most of India, especially the western and central regions	Primarily impacts Tamil Nadu, coastal Andhra Pradesh, and Rayalaseema
Wind Direction	Winds from the southwest (Arabian Sea)	Winds from the northeast (Bay of Bengal)
Temperature Changes	Sudden drop in temperature; high humidity	Less dramatic temperature changes; cooler conditions can prevail
Agricultural Impact	Critical for kharif crops like rice and cotton	Important for rabi crops, particularly rice and maize, in the southeastern states
Variability	More consistent rainfall patterns	Highly variable; can lead to droughts or floods depending on the year

Impact of Northeast Monsoon

- **Rainfall in Southern India**: The Northeast Monsoon primarily affects Tamil Nadu, Kerala, Andhra Pradesh, and parts of Karnataka, bringing significant rainfall to these regions.
  - E.g., For Tamil Nadu, the northeast monsoon is the main source of rainfall.
- **Agricultural**: It significantly affects the productivity of rice and maize in Tamil Nadu and Andhra Pradesh.
- **Water Resource Replenishment**: Reservoirs, lakes, and groundwater sources in southern states are replenished, supporting drinking water needs, irrigation, and hydroelectric projects.
- **Cyclones:** By early November, low-pressure conditions from north-western India shift to the Bay of Bengal, leading to tropical cyclones that form over the Andaman Sea and Bay of Bengal.
- **Flood and Drought Risks**: NE monsoon is highly variable and bring about flood and drought risks in southern India.
  - E.g., In 2015, Chennai experienced a deluge during the northeast monsoon, resulting in significant loss of life and property.

Conclusion

More focus is needed on modelling the impact of NE monsoon regarding urban flooding. Climate change uncertainty makes such prognosis essential, and disaster management agencies in southern states must develop credible strategies to incorporate these buffers into budgets.

Why Disaster Risk Insurance Matters?

Syllabus Mapping: GS-Paper 3, Disaster Management

Context:

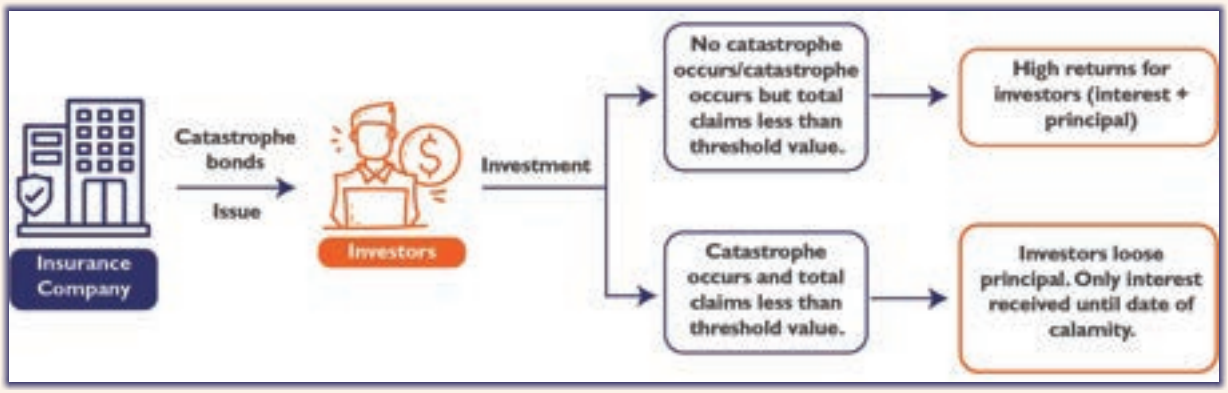
A report from the Center for Science and Environment reveals that weather-related disasters caused $56 billion in damages in India between 2019 and 2023, underscoring the urgent need for disaster risk insurance.

About Disaster Risk Insurance

- Disaster Risk Insurance is a financial tool that protects individuals, communities and economy against natural and human-made disasters.
- **Indemnity-based insurance:** It provides coverage based on the actual losses sustained by the insured party after a physical assessment of the damage is done.
  - E.g., Insurance to cover the repair costs after a cyclone damages a property.
- **Parametric Insurance:** It offers a pre-determined payout based on predetermined parameters of weather or geological events.
  - E.g., In 2021, Nagaland became the first state in India to launch a parametric insurance program for agriculture, covering losses due to weather anomalies.

Catastrophe Bonds

Also known as Cat bonds, it is a financial tool that allows governments, insurance companies, and reinsurance companies to transfer risk to investors.



Need for Disaster Risk Insurance

- **Financial Protection:** Insurance policies cover the cost of repairing or rebuilding damaged property, replacing lost assets, and compensating for lost income.
- **Post-Disaster Recovery**: Insurance helps communities recover and rebuild more swiftly after a disaster, and realistic adherence to the principle of **"build back better."**
  - Indian Prime Minister's Ten-Point Agenda on Disaster Risk Reduction (DRR) highlights the importance of risk coverage for everyone, including households and companies.
- **Coping with Macro-economic Shocks**: Disasters can severely hinder national economic aspirations, by causing downturns that affect developmental efforts.
  - Insurances lessen the need for emergency government funds and aid packages and reduces burden on the government.
- **Promoting Better Risk Management Practices:** Insurance can promote better risk management practices among businesses and communities by providing financial incentives for risk reduction measures.
- **Climate Change Mitigation:** As weather-related disasters have become more intense, disaster risk insurance has become an important financial safeguard.
  - E.g., in the initial nine months of 2022 alone, India faced weather-related disasters almost every day.
- **Ensuring National Security:** Disaster risk insurance plays a vital role in enhancing human security, which directly influences national security.

How do disasters affect Human and National Security?

Vulnerable populations displaced by natural disasters are often targeted by radical ideologies, leading to illegal migration and social unrest in recipient regions. This phenomenon poses a significant threat to regional stability and global security.

Examples

- **Haiti:** The 2010 Haiti earthquake resulted in 316,000 deaths and significant migration, which has still been affecting the USA.
- **Africa:** Frequent droughts have severely impacted countries like Somalia, Sudan, and Western Sahara, contributing to societal turbulence and pushing these nations into debt traps.
- **Pakistan:** In 2022–23 floods, 2.6 million displaced people remain vulnerable, and there is concern that their insecurities could be exploited by radical elements.

Challenges associated with Disaster Risk Insurance

- **Limited Coverage:** Many vulnerable populations, particularly in rural and disaster-prone areas, have limited access to insurance products.
  - E.g., In India, more than 90% of exposures to natural disasters are uninsured.
- **Poor Affordability:** Insuring disaster-prone areas often requires higher premiums, making it unaffordable for low-income individuals and small businesses.
- **Risk Assessment Gaps:** Accurate disaster risk assessment requires robust data, which is often lacking or inconsistent.
- **Delayed Payouts:** In indemnity-based insurance, complex claims processing and verification delay payouts and hinder immediate post-disaster recovery.
- **Institutional Constraints:** There is a lack of standardized policies and regulatory support for disaster risk insurance in developing countries.

Risk Insurance in India

- Pradhan Mantri Jeevan Jyoti Beema Yojna (Life Insurance),
- Pradhan Mantri Suraksha Beema Yojna (Accidental Death and Disability),
- Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (Health Insurance)
- Pradhan Mantri Fasal Beema Yojana (Crop Insurance)
- Public Liability insurance products offered by various insurance companies

Way Forward

- **Expanding Accessibility and Affordability** through meso and micro-insurance options tailored to low-income and rural populations.
  - E.g., The World Food Programme introduced a weather-index insurance scheme in Ethiopia to secure funds for protecting vulnerable populations from drought.
- **Improving Data Infrastructure** for disaster-prone regions to enable accurate risk assessment and product pricing.
- **Promoting Public-Private Partnerships** to develop affordable, wide-reaching disaster insurance solutions.
  - E.g., USA's National Flood Insurance Program (NFIP) is a partnership between the federal government and private insurance companies.
- **Streamlining Claim Processes** through digital processes and parametric insurance to ensure timely payouts for faster post-disaster recovery.
- **Enhanced Regulatory Support** that encourages innovative insurance models and provides incentives for insurers to offer disaster risk insurance.

Crisis in the Indian Himalayan Region

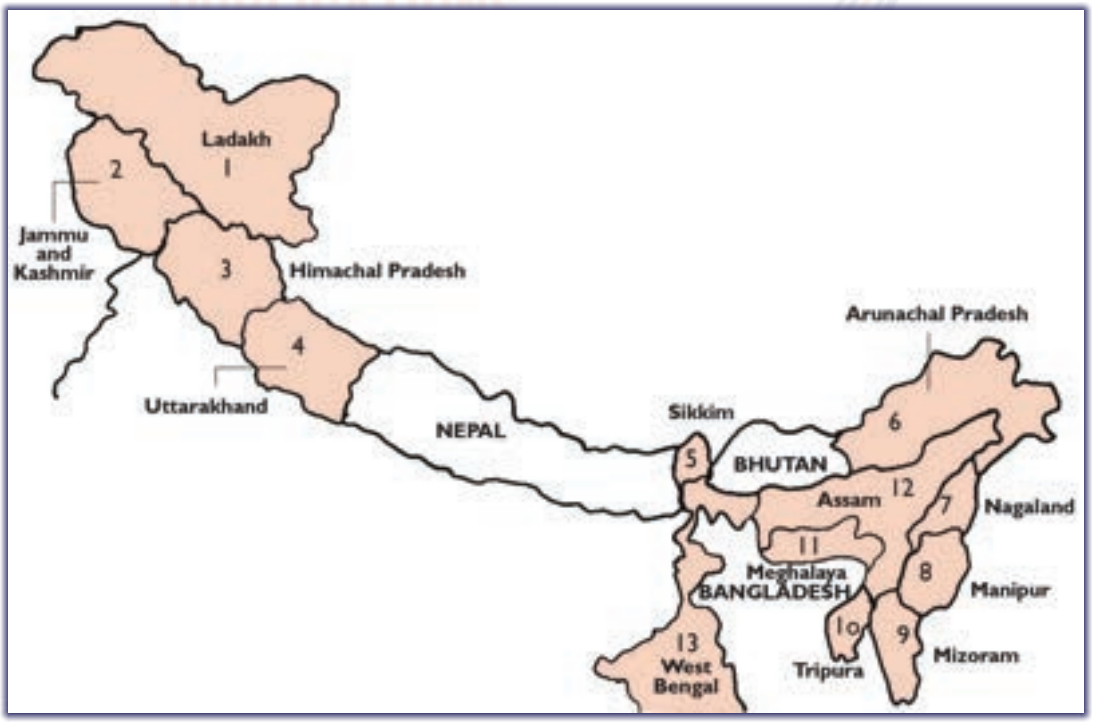
Syllabus Mapping: GS-Paper 3, Environment

Context

The Char Dham Highway Project is raising significant environmental concerns due to its negative impacts on the fragile Himalayan ecosystem.

About the Indian Himalayan Region (IHR)

- **The IHR** is the section of the Himalayas within the India, spanning **thirteen Indian states and union territories** namely Ladakh, Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, West Bengal, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, Assam, and Arunachal Pradesh.
- It has a geographical coverage of over **5.3 lakh kilometre square,** extends over 2,500 kilometres in length between the **Indus** and the **Brahmaputra** river systems.
- The IHR physiographically, starting from the **foothills in the south (Siwalik)**, extends up **to Tibetan plateau in the north (Trans-Himalaya).**



Significance of the Indian Himalayan Region

- **Biodiversity Hotspot:** The IHR is a biodiversity hotspot, home to a wide variety of flora and fauna, including many endangered species.
  - E.g., IHR is home to a diverse range of animal species, with over 300 mammal species (including 12 endemic and 4 threatened species)
- **Water Source:** The region is the source of several major rivers, including the Ganga, Yamuna, Brahmaputra, and their tributaries.
  - It is widely known as India's **"Water Tower"**
- **Cultural and Religious Significance**: The Himalayas hold deep cultural and religious significance in India. Many sacred sites, temples, and monasteries are located in the region.
- **Tourism:** The Himalayas are a major tourist destination, drawing visitors from around the world for trekking, mountaineering, and adventure sports.
- **Hydropower Generation:** The steep terrain and abundant rivers in the Himalayas make it an ideal location for hydropower generation.
  - Almost 33% of the country's thermal electricity and **52% of its hydropower** is dependent on river waters originating in the Himalayas.
- **Ecological Services:** The IHR provides essential ecological services such as carbon sequestration, soil conservation, and maintenance of microclimates.

Major Environmental concerns in the IHR

- **Climate Change:** Its impact can be seen in the form of retreating glaciers in the Himalayan region.
  - E.g., A study by the G.B. Pant Institute of Himalayan Environment and Development found that the Gangotri Glacier has retreated by over 1,500 meters in the last 70 years.
- **Deforestation:** It has intensified in the recent past due to population growth, industrialization, and unsustainable development in the region.
  - E.g., A 2018 study in the journal nature reported that the Himalayan region lost more than 24,000 square kilometres of forest cover between 2000 and 2014.
- **Increase in Forest Fires:** due to natural and human-made factors
  - E.g., A report by the Forest Survey of India estimated that nearly 49,000 hectares of forest cover in the Indian Himalayas were affected by forest fires in 2020.
- **Water Scarcity:** Due to the population boom, unsustainable development, and lack of awareness among the people, there has been increasing water scarcity in the region.
  - E.g., A study by the Central Ground Water Board (CGWB) indicates that more than 50% of the springs in the Indian Himalayas are drying up.
- **Biodiversity Loss:** due to habitat loss, degradation, and fragmentation caused by human activities such as deforestation, infrastructure development, and agriculture.
  - E.g., A 2020 study in Biological Conservation reported a 43% decline in vertebrate populations in the Himalayan region over the past 50 years.
- **Flash Floods:** common in monsoon season but has worsened due to human activities.
  - E.g., the 2013 flash flood in Kedarnath resulted in nearly 6000 deaths.
- **Landslides:** Tectonic activity makes the Himalayan region prone to landslides, but recent deforestation, hydropower projects, and construction of roads and tunnels have exacerbated the situation.
  - E.g., landslides caused over 150 deaths in Himachal Pradesh and around 70 in Uttarakhand between 2022 and September 2023.
- **Air Pollution:** due to unregulated industrialization, unplanned expansion of transportation, and weak implementation of policies.
  - E.g., A report released by the International Centre for Integrated Mountain Development (ICIMOD) in 2019 stated that the concentration of particulate matter (PM2.5) in the air in the Himalayan region exceeds the guidelines set by the WHO.

Government Initiatives for IHR

- **National Mission for Sustaining the Himalayan Ecosystem (NMSHE):** One of the missions under NAPCC, its goals include enhancing ecosystem resilience, promoting sustainable livelihoods, and addressing the impacts of climate change on the region.
- **WWF Conservation Program:** Launched in 1961, it aims to preserve the distinctive biodiversity of the Himalayan region while promoting sustainable development.
- **The Indian Himalayas Climate Adaptation Programme (IHCAP):** It strengthens Indian institutions and Himalayan states to enhance resilience and adaptation planning for vulnerable communities.
- **Sustainable Agriculture and Forestry Practices:** are being implemented by local communities and NGOs to promote sustainable development and protect the ecosystem.
  - E.g., Uttarakhand Biodiversity Board has initiated a project to promote sustainable farming practices and biodiversity conservation in the state.

Suggested Measures for Sustainable Development in the IHR

- **Sustainable land use planning:** Develop land use plans with clear zoning and use GIS for monitoring.
  - Further, a complete ban on construction activities in disaster-prone areas as suggested by the **Mishra Committee, 1976** should be implemented.
- **Resilient infrastructure:** Promote construction practices resilient to earthquakes, landslides, and floods.
  - E.g., Traditional Dhajji-Diwari of Kashmir which are earthquake resistant
- **Water resource management**: Promote rainwater harvesting and restore spring sheds to ensure the sustainability of water sources for local communities.
- **Promotion of eco-tourism:** Undertake carrying capacity assessments to decongest tourist destinations and minimize environmental impact.
  - Further, Inclusive, community-based management models based on principles of fair and equitable benefit sharing should be promoted.
- **Sustainable agriculture:** Encourage organic farming, integrate trees into farming systems and develop micro-hydropower projects
  - E.g., Sikkim's organic state model should be followed.

Corals Under Threat

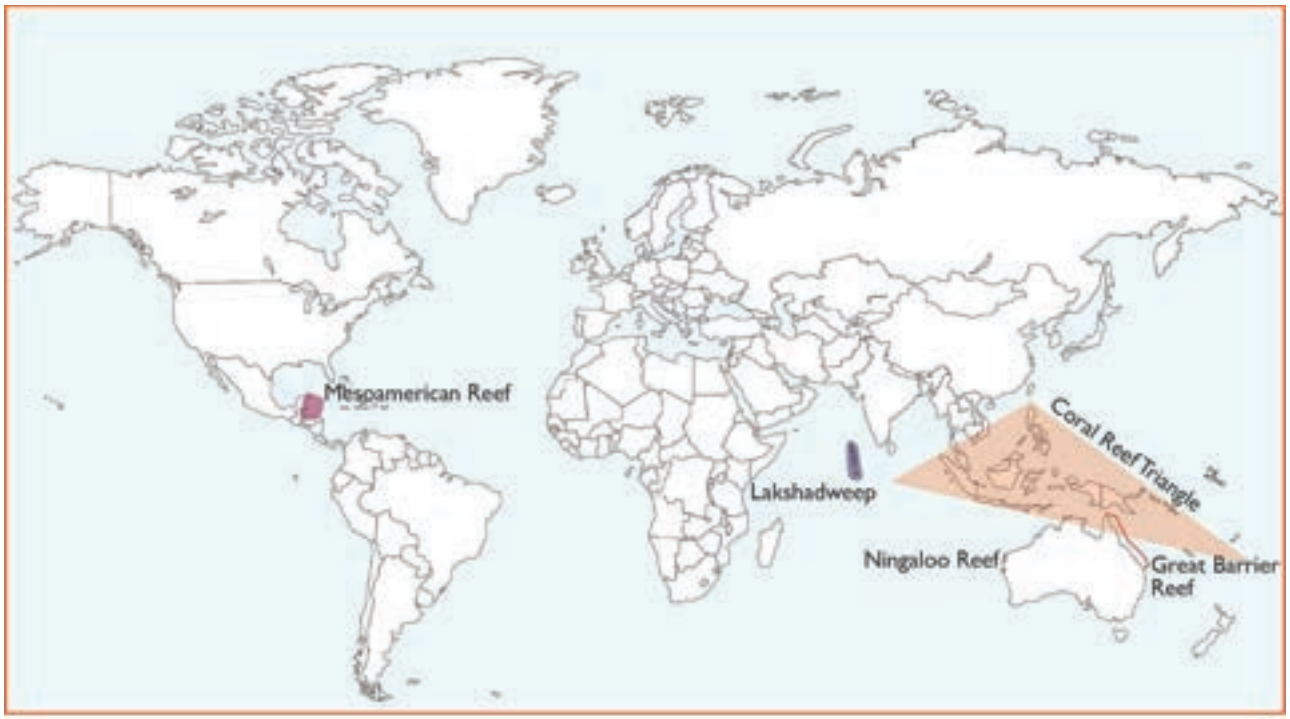
Syllabus Mapping: GS-Paper 3, Environment, Biodiversity

Context

The ongoing fourth global coral bleaching (GCBE4) event that began in January 2023 has surpassed the coral bleaching levels of 2014-2017 by over 11 per cent.

Corals and Coral Reefs

- Corals are tiny, jelly-like animals that live in colonies in warm, clear, shallow waters close to the coast.
- Reefs are underwater ecosystems made by coral polyps that secrete calcium carbonate, forming hard structures.



Ideal Conditions for Development of Coral Reefs

- Water Temperature range of 23°-29°C
- Low Levels of Salinity (30-40 parts per 1000)
- Clear, Shallow & Moving Water
- Semi-hard or hard Surface

Types of Corals

Hard Corals
Stony Corals, primary reef-building corals.

Soft Corals
Ahermatypic; do not form reefs.

Types of Corals Reefs

Fringing Reefs

Barrier Reefs

Atolls

Significance of Coral Reefs

- **Coastal Protection:** They act as natural barriers that protect coastlines from erosion, wave energy, and storm surges.
  - **E.g.** - A study conducted in Fiji found that reefs reduce wave energy by 97%, reducing coastal erosion.
- **Biodiversity & Ecosystem Support**: Coral reefs, also known as **"Rainforests of the Sea"** are home to a wide variety of marine species, providing critical habitats for fish, invertebrates etc.

  - **E.g**. - Coral Triangle region in SE Asia is known for its marine biodiversity, with more than 3,000 species of fish and over 500 species of coral.
- **Fisheries & Food Security:** Coral reefs serve as nurseries & habitats for commercially important fish species, supporting local fishing industries and contributing to global food security.
  - **E.g.** - In the Philippines, coral reef fisheries are estimated to support the livelihoods of 1 million people.
- **Tourism and Recreation:** Activities like snorkelling, diving around coral reefs generate revenue, support tourism industry and livelihoods of coastal communities.
  - **E.g.** - According to the World Travel and Tourism Council, coral reef tourism generates approximately $36 billion annually.
- **Carbon Sequestration:** Coral reefs absorb and store carbon dioxide, helping to mitigate climate change by reducing the concentration of GHGs in the atmosphere.
  - **E.g**. - coral reefs store around 70-90 million metric tons of carbon annually, as per a study published in the journal Nature.
- **Medicinal Resources:** Compounds derived from coral reef organisms have been studied for their potential in treating diseases like cancer and HIV/AIDS.

Threats to Coral Reefs

Natural Threats:

- **Predators:** such as parrotfish, barnacles, sea star 'Acanthaster planci', crabs and crown-of-thorns starfish, affect the life of coral reefs.
- **Hurricanes** or **prolonged cold and rainy weather** can harm coral reefs.
- **El Niño** which can result in lower sea level, altered salinity due to increased rainfall, and elevated sea-surface temperatures, damage coral reefs
- **Diseases:** Black band disease and white band disease that affect corals may cause local die-offs**.**

Anthropogenic Threats

- **Overfishing and Unsustainable Fishing** can damage coral reefs.
  - E.g., blast fishing destroys 64 square feet (5.9 square meters) of reef with a single blast.
- **Coastal Development** results in coastal erosion, and the run-off containing the excess sediment can block the light needed for the growth of zooxanthellae.
- **Pollution** from land, including hot water releases from power plants, pathogens, and trash from marine activities endangers coral reefs.
- **Careless Tourism**: Careless divers often trample on corals or break off pieces as souvenirs.
  - In addition, corals and tropical fish are harvested for the aquarium trade.

Climate Change

- **Climate Change:** According to a 2019 IPCC report, the average temperature of tropical oceans has increased by 0.1° C over the past century, resulting in extensive coral bleaching around the world.
- **Ocean Acidification:** The biodiversity of coral reefs drops, resulting in the elimination of key species needed for healthy reef formation.
- **Rise in Sea Level:** Corals are predicted to end up in deeper water, which means they will receive less sunlight (vital for their food source) and grow more slowly.

Coral Bleaching

- When corals overheat, they react to the stress by expelling their algae, which results in corals turning white.
- Bleaching leaves corals vulnerable to disease, stunts their growth, affects their reproduction.

Global Coral Bleaching Events

- **1998**: The first mass global bleaching event
- **2010:** The second mass global bleaching event
- **2014–2017:** The third global bleaching event, which affected over 70% of the world's coral reefs
- **2023–2024:** The fourth global bleaching event, most widespread and has been confirmed in at least 62 countries and territories

Initiatives for Conservation of Coral Reefs

Global

- **International Coral Reef Initiative (ICRI):** Established in 1994, it is an informal partnership among nations, international organizations and non-government organizations to help protect coral reefs globally.
- **Global Coral Reef Monitoring Network (GCRMN):**It aims to provide the scientific information on the status and trends of coral reef ecosystems for their conservation and management.
- **Global Fund for Coral Reefs:** It is the only global blended finance instrument to mobilize action and resources to protect and restore coral reef ecosystems.
- **Global Coral Reef Alliance:** It is a non-profit, environmental NGO that is on a mission to save the world's coral reefs.

India

- **Legal Protection**: Corals are protected under the Schedule I of the Wildlife Protection Act, 1992.
  - Section 7 (2) of the Costal Regulation Zone prohibits the construction of beach resorts or hotels on coral reefs.
- **Establishment of Marine Protected Areas**: India has designated several marine protected areas to safeguard coral reefs and associated marine ecosystems.
  - E.g., the Gulf of Mannar Marine National Park.
- **Conservation and Restoration Programmes**: Institutions like CSIR-National Institute of Oceanography (NIO) have taken several initiatives to restore coral reef habitat.

How Technology is saving the World's Coral Reefs?

- **Biorock technology**: A method that uses low voltage electrical currents to grow a white limestone coating on structures.
- **3D mapping and bathymetry**: Tools that are used to monitor reefs.
- **3D printed coral** to encourage reef restoration
- **Coral cryopreservation:** The process of preserving coral cells and tissues at very low temperatures.

Nature Restoration Law (NRL) and Its Relevance for India

Syllabus Mapping: GS-Paper 3, Ecology

Context

The **Nature Restoration Law (NRL)**, enacted by the **European Union (EU)** is a landmark environmental regulation aimed at reversing ecosystem degradation in Europe.

About the Nature Restoration Law (NRL)

- The law is part of the **EU's Biodiversity Strategy for 2030** and the **European Green Deal**.
- **Key Features of the NRL**
  - **Restoration Targets**: Restoration of at least **20% of land and sea areas by 2030**.
    - Achieve **full ecosystem restoration by 2050**.
  - **Broad Ecosystem Focus**:The law covers diverse ecosystems, including **forests, agricultural lands, rivers, and urban spaces**.
  - **Specific Measures**:
    - **Restoration of 25,000 km of rivers** into free-flowing rivers.
    - **Planting of 3 billion trees** by 2030.
  - **Biodiversity Focus**:The law tackles biodiversity loss, with **over 80% of Europe's habitats** currently in poor condition.

Ecological Restoration

- It is the process of helping ecosystems recover after they have been damaged, degraded, or destroyed.
- All kinds of ecosystems can be restored, including forests, farmlands, cities, wetlands and oceans.
- The **UN Decade on Ecosystem Restoration (2021-2030)** aims to prevent, halt and reverse the degradation of ecosystems on every continent and in every ocean

Need for Ecological Restoration in India

- **Combat Climate Change:** Ecosystem restoration will help deal with the increasing frequency of extreme climate events such as heatwaves, floods, and droughts in sensitive regions.
  - E.g., 70 per cent of the districts have seen an increase in the frequency and intensity of extreme rainfall events during the monsoon.
- **Combat Desertification:** According to ISRO's Desertification and Land Degradation Atlas, 29.7% of India's total geographical area (approximately 97.85 million hectares) experienced degradation in 2018-19
- **Biodiversity Conservation:** Restoration efforts will help preserve diverse species and habitats, which are under constant threat from urbanization, pollution, and climate change.
  - E.g., Due to climate change birds like the satyr tragopans have shifted their habitat to higher elevations, shrinking their range.
- **Soil and Water Quality Improvement:** Restoration can improve soil health and reduce siltation in water bodies, ensuring sustainable resources for future generations.
- **Adaptation to Sea-Level Rise:** Restoring ecosystems like mangroves offers natural protection against storm surges, thereby helping coastal communities adapt to rising sea levels.
  - E.g., 32 per cent of India's coastline underwent sea erosion between 1990 and 2018
- **Economic Gains**: Nature restoration could generate up to $10 trillion globally by 2030 (World Economic Forum), creating millions of jobs, particularly in rural areas, and enhancing agricultural productivity.

Measures taken in India

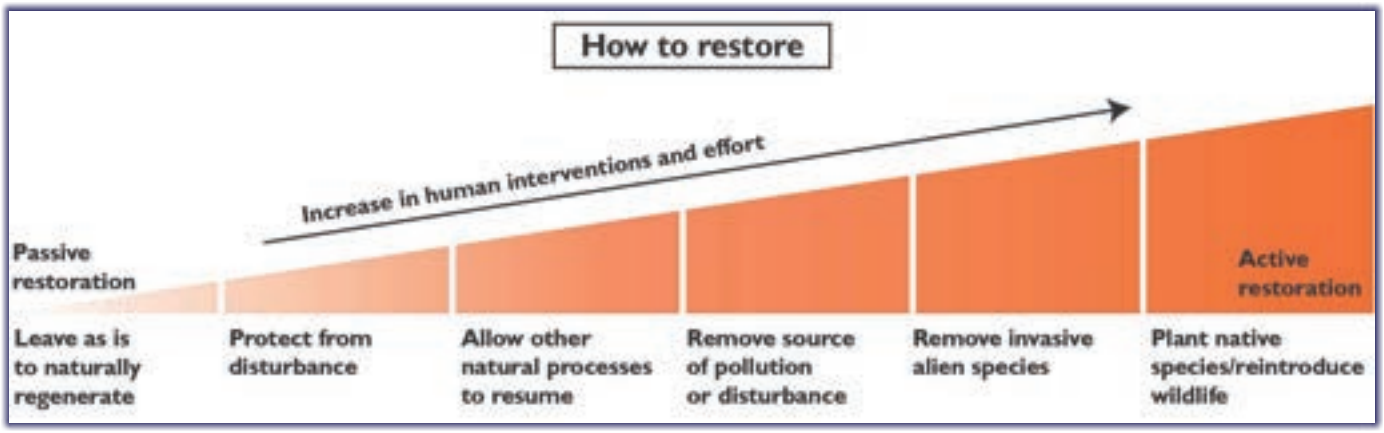
- **Green India Mission**: It aims at protecting; restoring and enhancing India's diminishing forest cover and responding to climate change by a combination of adaptation and mitigation measures.
- **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)**: It focuses on improving water use efficiency in agriculture through better irrigation and water conservation techniques.
- **Integrated Watershed Management Programme (IWMP)**: It aims to restore the ecology balance by harnessing, conserving and developing degraded natural resources such as soil, vegetative cover and water.
- **National Afforestation Programme**: Supports afforestation and reforestation efforts to expand forest cover and improve ecosystem health in degraded areas.
- **National Plan for Conservation of Aquatic Ecosystems (NPCA):** It aims at holistic wellbeing of aquatic ecosystems like lakes and wetlands.

State-level Best Practices

- **Sundarbans Mangrove Restoration Project**: It is a private sector-backed initiative to restore 4,500 hectares of degraded mangroves in the Sundarbans of West Bengal.
- **Restoration of Thol Lake Ecosystem in Gujarat:** It is a project to conserve and restore the Thol Lake, located near Ahmedabad.
- **Western Ghats Forest Landscape Restoration (WGFLR) in Maharashtra:** It aims to reverse deforestation and restore the region's natural ecosystems.

Proposed Elements of a Nature Restoration Law for India

- **Restoration Targets**: India could aim to restore **20% of degraded land** by 2030, with a goal of restoring all ecosystems by 2050.
- **Wetland Restoration**: A focus on restoring **30% of degraded wetlands** such as the **Sundarbans** and **Chilika Lake** by 2030.
- **Biodiversity in Agriculture**: Promote **agroforestry** and sustainable farming practices, using indicators like the **butterfly or bird index** to track progress.
- **River Restoration**: Focus on major rivers such as the **Ganga** and **Yamuna**, restoring their free-flowing nature and addressing pollution.
- **Urban Green Spaces**: Ensure **no net loss of green spaces** in cities like **Bengaluru** and **Delhi**, and promote urban forests to mitigate the effects of urban heat islands.



Way Forward

- **Prioritize Ecosystem Services in Restoration**: Restoration efforts should focus on improving ecosystem services, particularly water security.
- **Prioritize Biodiversity**: Prioritizing biodiversity restoration can help ecologically protect forests from invasive species and mitigate the negative impacts of infrastructure development.
- **Strengthen Natural Disaster Prevention**: Restoration projects should include natural disaster prevention.
- **Develop a Comprehensive Policy Framework**: A national restoration policy is essential to integrate climate, biodiversity, and ecosystem services.
- The policy also has to include aspects like goal setting, monitoring, leveraging diverse streams of knowledge, public-private partnership, funding, etc.
- **Capacity Building and Scaling Up**: It is important to expand ecological restoration education and training for key stakeholders, alongside scalable, cost-effective restoration models.

TOPICS FOR PRELIMS

Chaukhamba-III Massif

Syllabus Mapping: Geography, Locations

Context

Two women trekkers missing near the Chaukhamba-III massif in Chamoli were located by French mountaineers and later airlifted by IAF helicopters.

About Chaukhamba-III massif

- It is a group of 4 mountains (Chaukhamba I, II, III & IV) in the Garhwal Himalayas of Uttarakhand.
- **Location**: Between the Gangotri, Bhagirathi and Satopanth glaciers.
- **Highest Peak:** Chaukhamba I (7,138 metres)
- **Gangotri glacier** originates from the Chaukhamba Massif.

Additional Information

- **Mountain Massif:** It refers to a group of mountains that are part of a mountain range, or a compact portion of a mountain range that contains one or more summits. E.g., Saser Kangri in the Karakoram

Cloud Chamber

Syllabus Mapping: Geography, Climatology

Context

Under Mission Mausam, India is setting up a first-of-its-kind convective cloud chamber at the Indian Institute of Tropical Meteorology (IITM) in Pune.

About Cloud Chamber

- It is a scientific apparatus that mimics the conditions required for cloud formation.
- It resembles a closed cylindrical or tubular drum, inside which water vapour, aerosols, etc. are injected.
- **Adiabatic cooling process** (reducing heat through a change in air pressure caused by volume expansion) is used to create a supersaturated environment.
- Under the desired humidity and temperature inside this chamber, a cloud can develop.

Purpose of India's Cloud Chamber

- Analyse the formation of rain droplets and ice particles.

- Investigate the effects of cyclones, low-pressure systems and inter-cloud layer interactions.
- Understand how Indian monsoon clouds form and behave, which is essential for future weather modification strategies.

Cloud Seeding

- Cloud seeding involves dispersing substances into the air to encourage condensation, resulting in precipitation.
  - Common substances used for cloud seeding include **silver iodide, potassium iodide and dry ice** (solid carbon dioxide).
- **Cloud Aerosol Interaction and Precipitation Enhancement Experiment (CAIPEEX):** It aimed at understanding the interactions between clouds, aerosols, and precipitation.
  - Two Components: 1) Cloud-Aerosol interaction and (2) Precipitation Enhancement.

Additional Information

Mission Mausam

- Launched in 2024 by Ministry of Earth Sciences
- It aims to make India **'Weather Ready' and 'Climate Smart'.**
- **Objectives**
  - To exponentially enhance the country's weather and climate observations, understanding, modelling and forecasting.
  - To improve short to medium range weather forecast accuracy by five to 10 per cent and enhance air quality prediction in all major metro cities by up to 10 per cent.
  - To implement Next-generation radars, and satellites with advanced instrument payloads

Pluto

Syllabus Mapping: Geography, Universe

Context

Scientists detected carbon dioxide on Charon using the James Webb Space Telescope, offering new insights into the formation and evolution of icy celestial bodies.

About Pluto

- It is the largest among dwarf planets, located in the Kuiper belt.
- **Time taken to rotate on its axis**: Six earth days
- **Time taken to revolve around the sun**: 248 earth years
- Composition of atmosphere: nitrogen, methane, and carbon monoxide; also haze particles in which scatter blue light.
- **Surface Characteristics**: mountains, valleys, plains, and craters, with temperatures averaging around -226 to -240 degrees Celsius.
- **Moons of Pluto:** Charon (largest), Nix, Hydra, Kerberos, Styx.

Additional Information:

- **Dwarf Plants:** They are small and don't have a distinct orbital path.
  - There are four dwarf planets in the Kuiper Belt, viz. Pluto, Makemake, Haumea, and Eris.
  - Ceres is another dwarf planet located in the main asteroid belt.
- **Kuiper Belt:** A donut-shaped region that lies beyond Neptune's orbit, from 30 to 55 AU. Contains hundreds of icy bodies called Kuiper Belt objects (KBOs) or Trans-Neptunian objects (TNOs).

Brown Dwarfs

Syllabus Mapping: Geography, Universe

Context

Astronomers recently re-examined the first discovered brown dwarf, Gliese 229B, and found it to be two brown dwarfs in a rare binary system.

About Brown Dwarfs

- These are objects that are too big to be planets but too small to be stars.
- They are born like stars – out of a cloud of gas and dust that collapses – but do not have enough mass to sustain the fusion of hydrogen like a normal star.
- Have relatively low temperatures compared to stars and emit very little light and are often difficult to detect (They emit infrared radiation).

Cauvery River

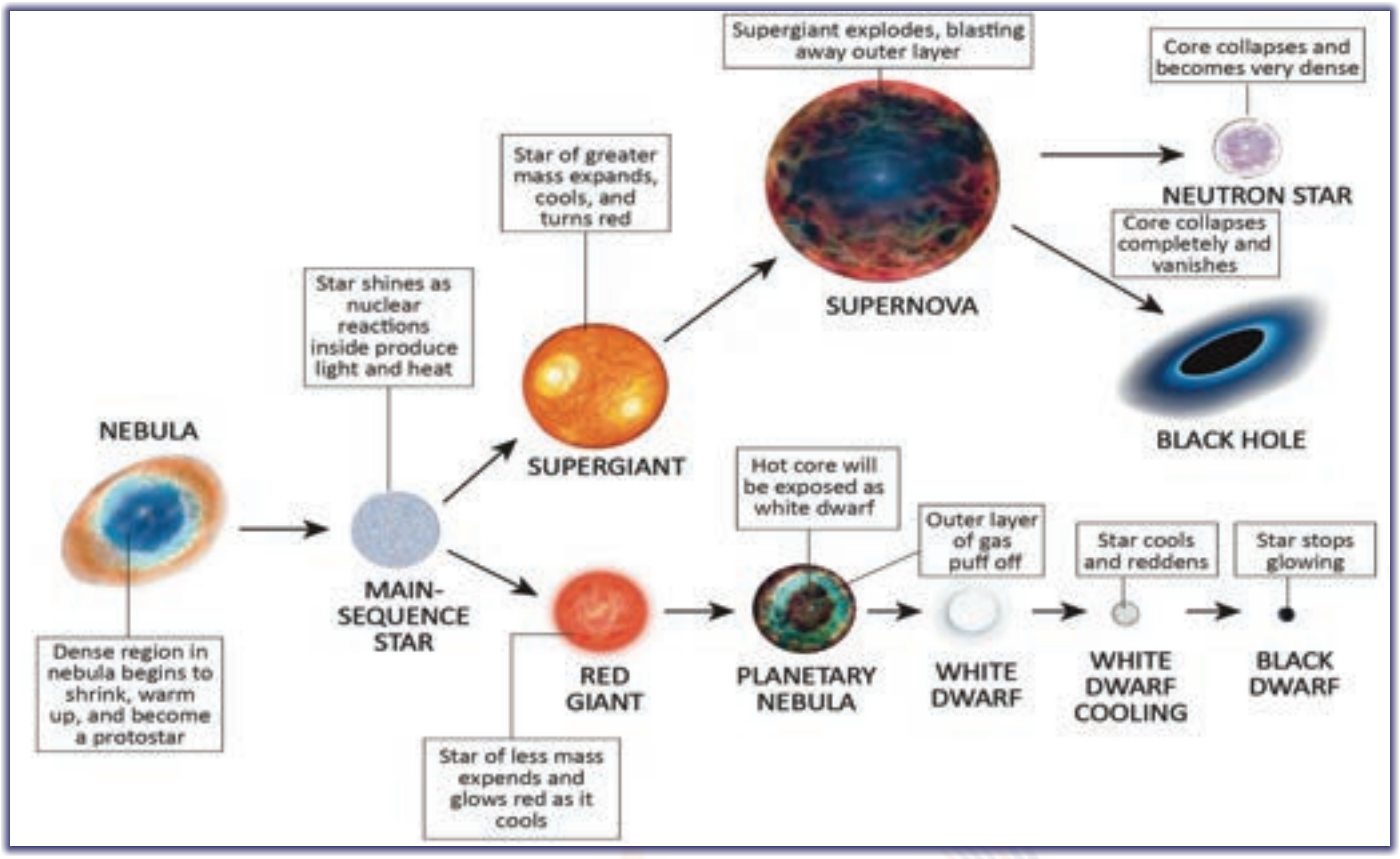
Syllabus Mapping: Geography, Drainage

Context

Karnataka Chief Minister said the State government will implement the Cauvery Stage VI project to ensure the future water needs of Bengaluru.

About Cauvery River

- **Origin:** Brahmagiri Hill of the Western Ghats in southwestern Karnataka state.
- **Mouth**: Bay of Bengal
- **Extent:** The Cauvery basin extends over the states of Tamil Nadu, Karnataka, Kerala and the Union Territory of Puducherry.
- **Major left bank tributaries:** Harangi, the Hemavati, the Shimsha and the Arkavati.
- **Major right bank tributaries:** Lakshmantirtha, the Kabbani, the Suvarnavati, the Bhavani, the Noyil and the Amaravati.



Life Cycle of a Star

- **Important Dams on Cauvery:** Mettur Dam, Krishnarajasagar Dam
- **Important Protected areas in Cauvery Basin:**
  - Nagarhole National Park
  - Sathyamangalam Tiger Reserve
  - Wayanad Wildlife Sanctuary
  - Cauvery Wildlife Sanctuary

Slag and its Significance

Syllabus Mapping: Geography, Resources

Context

A recent study reported the formation of a new type of sedimentary rock created from coastal slag deposits with the process of lithification.

About Slag

- Slag is a by-product generated during manufacturing of pig iron and steel.
- Primarily, slag consists of calcium, magnesium, manganese and aluminium silicates and oxides in various combinations.

Formation of sedimentary rock from slag

- Slag is transforming into new sedimentary rocks through **lithification.**
- This occurs as slag hardens into sedimentary rock, which then releases sediments back into the environment upon weathering.
- Two primary lithification processes: calcite cement precipitation (captures carbon dioxide), and calcium-silicate-hydrate (CSH) cement formation.

Significance of Slag

- **Construction Material:** Slag is often used in road construction, concrete production, and as an aggregate for cement.
- **Environmental Applications:** Some slags are used to neutralize acidic soils or water bodies due to their ability to absorb and stabilize contaminants.
- **Carbon Sequestration:** Certain types of slag can capture and store carbon dioxide (CO_2) through mineral carbonation.

- Mineral Carbonation is the process of chemically converting carbon dioxide (CO_2) into stable carbonate minerals by reacting it with naturally occurring minerals.

Shale Gas

Syllabus Mapping: Geography, Resources

Context

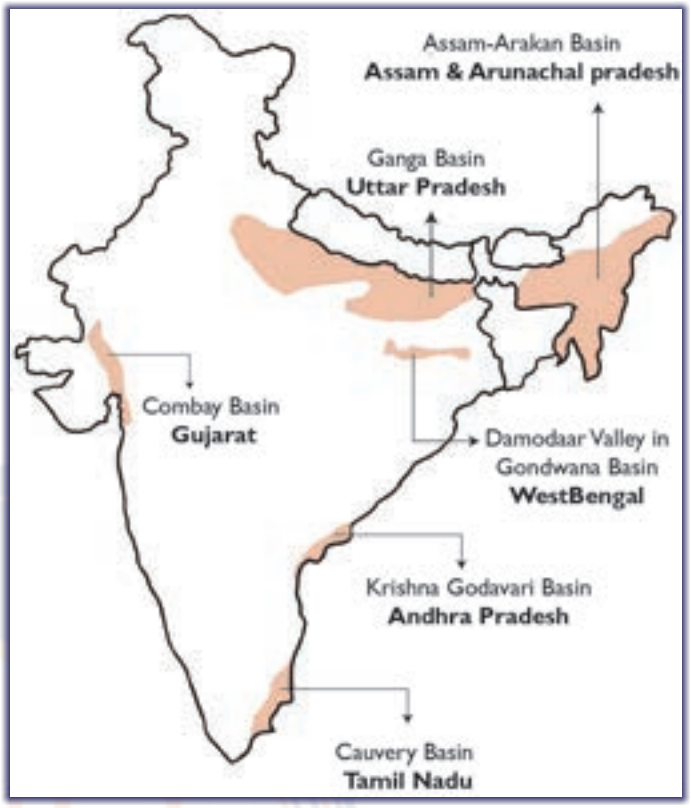
A recent study has highlighted that there is a significant potential for shale gas generation in the eastern part of the South Karanpura coalfield, located in Jharkhand.

About Shale Gas

- Shale gas is a natural gas that's trapped in **shale rock**, a fine-grained sedimentary rock
- It is a mixture of naturally occurring hydrocarbon gases, primarily methane (CH_4), which makes up 70–90% of its composition.
  - Other gases: Ethane, Propane, Butane, Carbon dioxide, Nitrogen, Helium and Hydrogen sulphide
- It is extracted through a process called **hydraulic fracturing**, also known as **fracking.**
- It is used to generate electricity and for domestic heating and cooking.

Distribution and Production of Shale Gas

- **Highest reserves of Shale gas worldwide: 1.** China, 2. Argentina, 3. Algeria, 4. USA
- **Shale gas production worldwide: 1.** USA, 2. Canada, 3. China-These 3 are the only countries that produce shale gas in commercial quantities presently.
- **Potential in India:** Estimated 96 trillion cubic feet (Tcf) of recoverable shale gas reserve
  - **Reserve areas include:** Krishna-Godavari Basin (KG basin) Indo-Gangetic basin, Cambay basin, Gondwana basin, Cauvery basin, Assam and Assam-Arakan basin.



Mineral reserves needed for energy transition

Syllabus Mapping: Geography, Resources

Context

This article, featured in The Hindu's Data Point section, discusses the global distribution of key mineral reserves and their significance.

Mineral	Uses	Reserves (Top 3)
Bauxite	• Primary source of Aluminium. • Essential for wind turbines, solar panels, batteries, electrolysers and transmission cables.	• Guinea • Vietnam • Australia • **India (8th)**
Chromium	• Used in wind turbines and for radiation shielding in nuclear power plants.	• Kazakhstan • South Africa • India
Cobalt	• Used in consumer electronics, catalysts for the oil industry, resistant metal alloys, critical components in many lithium-ion battery technologies.	• Congo • Australia • Indonesia
Copper	• Critical elements in solar photovoltaics, wind power, battery storage and electricity grids.	• Chile • Peru • Australia

Mineral	Uses	Reserves (Top 3)
Graphite	• Key component of battery anodes and therefore important for the transition to electric vehicles, and stationary batteries for balancing electricity grids.	• Chian • Brazil • Mozambique • **India (7th)**
Lithium	• Core component of lithium-ion batteries.	• Chile • Australia • Argentina
Manganese	• Widely used in solar and wind power and in lithium-ion batteries for electric cars.	• South Africa • Australia • China • **India (7th)**
Molybdenum	• Used as a catalyst in the petroleum industry also used in semiconductor baseplates	• China • USA • Peru
Nickel	• Key component in the cathodes of lithium-ion batteries in electric cars.	• Indonesia • Australia • Brazil
Rare Earths	• Used in wind power for permanent magnets.	• China • Indonesia • Brazil • **India (5th)**
Silver	• key component in the energy transition, with uses in solar panels, electric vehicles, and carbon capture and storage	• Peru • Australia • Russia • **India (10th)**
Uranium	• Primary fuel for nuclear energy production	• Kazakhstan • Namibia • Canada • **India (9th)**

Overburden in the Coal Sector

Syllabus Mapping: Geography, Resources

Context

The Union Minister of Coal & Mines released a report of the High-Powered Expert Committee on Gainful Utilization of Overburden (OB) in the Coal sector.

About Overburden (OB) in Coal Sector

- Overburden refers to the layers of soil and rock that lie above a coal seam and must be removed to access the coal.
  - It is excavated during open-pit or surface mining operations.
- **Composition:** Clay, Alluvial Sand, Sandstone, Rich Silica Content.
- **Utilization Initiatives:**
  - **Production of M-Sand:** Overburden is crushed and processed to create sand. It offers a sustainable alternative to river sand.
  - **Backfilling:** After coal extraction, overburden is used to fill mined-out areas, helping to reclaim land.
  - **Circular Economy:** These initiatives aim to convert waste materials into valuable resources, minimizing environmental footprints.

Additional Information

- **Highest Reserves Worldwide:** USA, Russia, Australia, China, **India**
- **Highest Production Worldwide:** China, India, Indonesia, USA, Australia.
- **Highest Reserves in India:** Jharkhand > Odisha > Chhattisgarh > West Bengal > Madhya Pradesh.
- **4 types of Coal found in India:** Anthracite (Highest grade), Bituminous, lignite, Peat (Lowest grade).

Cyclone Dana

Syllabus Mapping: Geography, Climatology

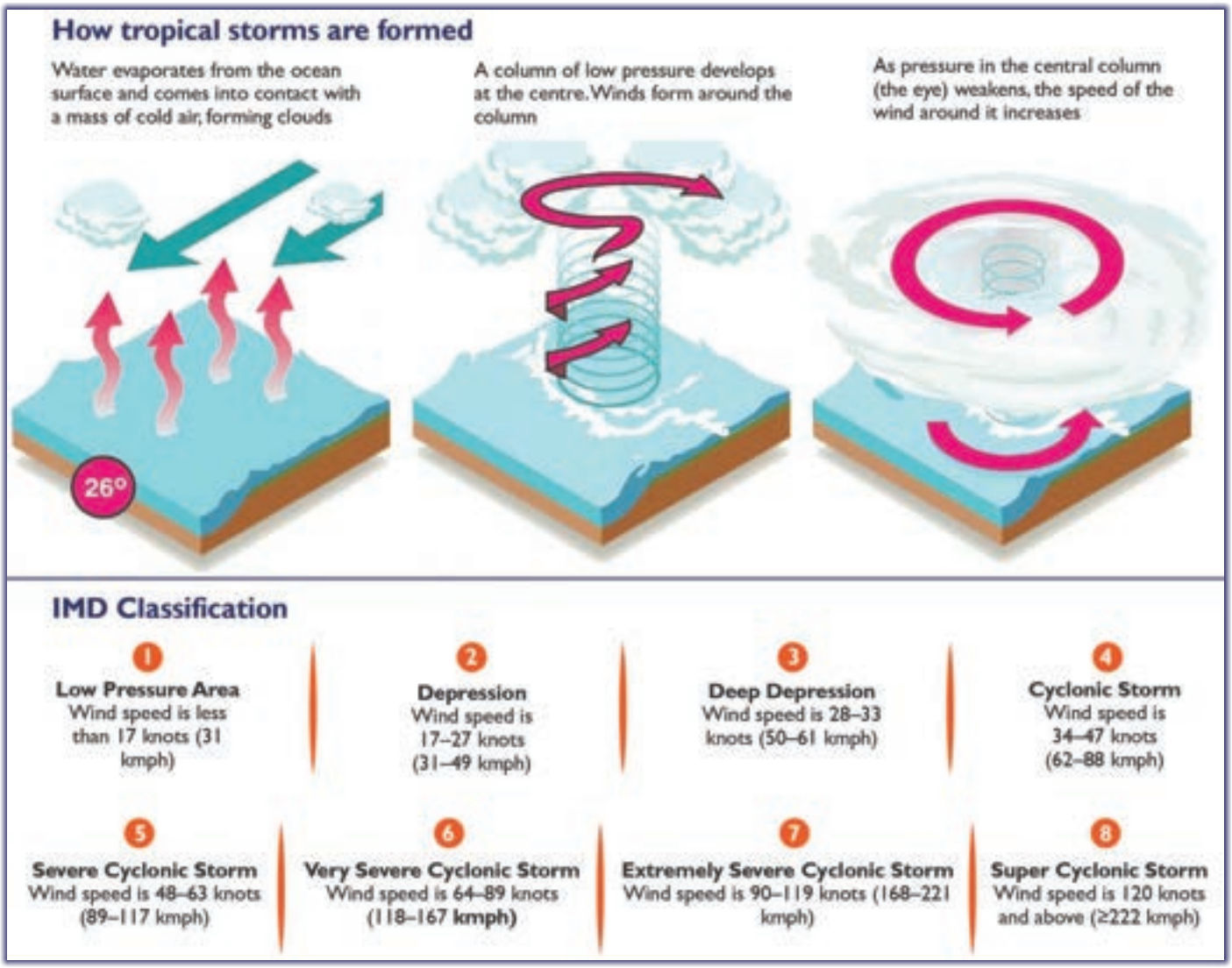
Context

Around 10 Lakh people were shifted due to Cyclone Dana in Odisha and West Bengal.

About Cyclone Dana

- It is a tropical cyclone that formed over the East-central Bay of Bengal.
- The name "Dana" means "generosity" in Arabic and was chosen by Qatar.

About Tropical Cyclones



Necessary Conditions:

- Large, continuous **moisture supply,** which is available mainly over oceans.
- A **high ocean temperature** (around 27°C) is essential for moisture supply, confining tropical cyclones within the tropics.
- Tropical cyclone requires a **sufficient Coriolis force** to achieve the required circular movement to set in the whirling motion.
- A **weak low-pressure area** helps intensify a depression into a cyclone through rising, saturated air, which releases latent heat and sustains the low pressure.
- Favourable **upper-air conditions**, like anti-cyclonic flow above a low-pressure area, support cyclone formation, while high-speed winds above discourage it.

Naming of Tropical Cyclones

- Each year, tropical cyclones receive names in alphabetical order.

- The name list is proposed by the National Meteorological and Hydrological Services (NMHSs) of WMO of a specific region.
- For the Indian Ocean region, the naming of cyclones started in 2000.
- Eight countries of the Indian Ocean Region - India, Bangladesh, Maldives, Myanmar, Oman, Pakistan, Sri Lanka, and Thailand, contribute a set of names accorded whenever a cyclonic storm develops.

Twilight Zone

Syllabus Mapping: Geography, Oceanography

Context

According to a study published in Nature, the impact of Marine Heat Waves (MHWs) is increasingly being felt in the Twilight zone.

About Twilight Zone

- Also known as the mesopelagic or dysphotic zone
- It is a layer of the ocean that plays a vital role in the ocean's ability to absorb and store carbon dioxide from the atmosphere
- **Location:** Just below sunlit zone, 200–1,000 meters below the ocean's surface
- **Features:**
  - Cold, dim light, flashes of bioluminescence
  - Contains a unique ecosystem, including plankton, fish and other marine organisms that form the base of the oceanic food web.
- **Reason behind MHWs in this zone:**
  - It is primarily driven by **Eddy currents** (large, swirling loops of water that transport warm or cold water over long distances)
  - As ocean temperatures rise due to global warming, these currents carry warmer surface water down into the twilight zone, leading to increased temperatures.

About Marine Heat Waves

- It is an extreme weather event which occurs when the surface temperature of a particular region of the sea rises to **3 or 4 degree Celsius above the average temperature for at least 5 days.**
- MHWs can last for weeks, months, or even years.
- **Impacts of MHWs:**
  - Coral bleaching
  - Harmful algal blooms
  - Kelp and seagrass dieback
  - Increased Hurricanes, Cyclones and more destructive flooding.

High Performance Buildings

Syllabus Mapping: Environment, Sustainability

About High Performance Buildings (HPBs)

- HPBs are buildings that are designed to be more efficient and sustainable than what is required by building codes.
- They are designed to use less energy for heating, cooling, lighting and ventilation.
- HPBs also consider other factors, such as: Durability, Life-cycle performance, Occupant comfort and productivity.
- **Features of HPBs:**
  - Designed to be aesthetically pleasing, accessible, cost-effective, safe, and secure.
  - Use energy efficiently and reduce greenhouse gas emissions.
  - Designed to improve indoor air quality and often include active ventilation. They use materials with lower amounts of volatile organic compounds (VOCs).
  - Made from sustainable materials, often recycled materials.
  - Designed to provide thermal comfort and appropriate humidity levels.

Difference between Green Buildings and HPBs

Aspect	Green Buildings	High-Performance Buildings (HPBs)
Scope and Focus	Basic sustainability goals like energy efficiency, water conservation, and materials sourcing.	Peak efficiency in all areas, including energy, water, and occupant comfort.
Technology and Monitoring	Typically assessed through certification programs to ensure sustainability goals are met.	Uses advanced technologies like energy-efficient HVAC, smart lighting, and real-time performance tracking via building management systems

Other Initiatives

- **GRIHA (Green Rating for Integrated Habitat Assessment):** It is a national rating tool that helps people assess the performance of their building against certain nationally acceptable benchmarks.
  - It is developed by **The Energy & Resources Institute (TERI)** with support from the **Ministry of New & Renewable Energy (MNRE).**
- **Lighting a Billion Lives (LaBL):** It aims to provide clean and sustainable energy access to people across the world.
  - It is also an initiative by TERI.
- **LEED (Leadership in Energy and Environmental Design):** It is a green building rating system that provides a framework for creating efficient, healthy, and cost-saving buildings.
  - It is developed by **U.S. Green Building Council (USGBC).**

Do you know?

Indira Paryavaran Bhavan in New Delhi is **India's first net-zero energy building** that has been constructed with the adoption of solar passive design and energy-efficient building materials

Living Planet report

Syllabus Mapping: Biodiversity

Context

The **World Wildlife Fund (WWF)** released its **biennial Living Planet Report**.

About Living Planet Report

- It is a measure of global biodiversity that tracks population trends of vertebrate species across terrestrial, freshwater, and marine ecosystems.
- The **Institute of Zoology (Zoological Society of London)** manages the Living Planet Index in a collaborative partnership with WWF.

Key Findings of the Report

- Globally, wildlife populations have decreased by 73% over the last 50 years.
  - The conclusions are based on tracking 35,000 population trends across 5,495 species, including amphibians, mammals, birds, fish, and reptiles.
- In India, decline was seen primarily in three vulture species – **white-rumped vulture, Indian vulture, and slender-billed vulture**.
- **Decline in Ecosystems**:
  - **Freshwater populations**: Highest decline at 85%.
  - **Terrestrial populations:** Declined by 69%.
  - **Marine populations:** Declined by 56%.
- **Major Causes of Habitat Loss:**
  - Habitat loss due to unsustainable agriculture, logging, mining, and fragmentation.
  - Overexploitation.
  - Climate change.
  - Pollution.
  - Invasive species and diseases.

Additional Information

- **World Wildlife Fund for Nature (WWF)**
  - It is the world's leading conservation organization, operating in over **100 countries**.
  - **Established** in **1961**
  - **Headquarter:** Gland, Switzerland.
  - **Mission**: To conserve nature and address the most urgent threats to Earth's biodiversity.

Prevention and Regulation of Greenwashing and Misleading Environmental Claims

Syllabus Mapping: Environment, Sustainability

Context

Central Consumer Protection Authority (CCPA) has issued guidelines for **Prevention and Regulation of Greenwashing and Misleading Environmental Claims.**

Key Features of the Guidelines

- The guidelines provide clear definitions of terms related to greenwashing and environmental claims, ensuring that both businesses and consumers have a common understanding.
- Manufacturers and service providers are required to substantiate their environmental claims with credible evidence.
  - This includes providing detailed information on the methodology and data used to support such claims.
- The use of vague or misleading terms such as "eco-friendly," "green," and "sustainable" without proper substantiation is sought to be prohibited.
- Third-Party Certifications are also accepted in substantiation of environmental claims.
- The companies are required to provide clear and accessible disclosures of material information.
  - Claims must specify the aspect referred to (good, manufacturing process, packaging, etc.) and be supported by credible certification or reliable scientific evidence.

About Greenwashing

- It refers to the practice of making false or exaggerated claims about the environmental benefits of a product, service or activity.
  - **E.g.** Companies overstating the impact of their eco-friendly practices or making false claims about emission reductions.

Additional Information

Central Consumer Protection Authority (CCPA)

- It is a regulatory body in India that protects and enforces consumer rights.
- Established under **Consumer Protection Act, 2019**.
- **Nodal Ministry:** Ministry of Consumer Affairs, Food and Public Distribution
- CCPA works with consumer organisations, industry stakeholders, and regulatory bodies to ensure that guidelines are implemented and complied with

Emission Gap Report

Syllabus Mapping: Climate Change

Context

The United Nations Environment Programme (UNEP) has released the Emission Gap Report for 2024.

About Emission Gap Report (EGR)

- It is an annual report by UNEP that tracks the gap between current and desired global greenhouse gas (GHG) emissions.
- **Emissions gap:** Difference between expected emissions under current policies and the levels required to meet global temperature targets.

Key highlights of Emission Gap Report 2024

- Emissions in India have gone up by 5.2%.
- Achieving the 1.5°C target requires emissions to drop by 42% by 2030 and 57% by 2035. Current efforts only project a 10% reduction by 2030.
- To maintain the 1.5°C target, a 7.5% annual reduction in emissions is required until 2035.

Additional Information

United Nations environment Programme (UNEP)

- Established on 5th June 1972, following the **Stockholm Conference on the Environment**. (HQ- Nairobi, Kenya).
- **UNEP works across six critical areas for nature conservation:**
  - Climate Change
  - Nature & Biodiversity loss
  - Disaster Management
  - Environmental Governance
  - Pollution
  - Hazardous/Harmful Substances
- **Important Reports released by UNEP:** Emission Gap Report, Adaptation Gap Report, Global Environment Outlook.
- UNEP along with the World Meteorological Organization (WMO) established the **Intergovernmental Panel on Climate Change (IPCC) in 1988.**

Cabinet approves India's joining of Energy Efficiency Hub

Syllabus Mapping: Environment, Sustainability

Context

The Union Cabinet has given approval for India to join the 'Energy Efficiency Hub'.

About Energy Efficiency Hub

- Energy Efficiency Hub is a government-to-government platform for global collaboration on energy efficiency.
- It is a voluntary collaboration of governments seeking to strengthen their effectiveness in deploying energy efficiency.
- **History:** At the G20 Leaders' Summit in Hamburg in 2017, Germany as the president of G20 proposed to establish the Energy Efficiency Hub. The Hub was established in 2019.
- **Task Groups:** It pursues solutions through thematic Task Groups focused on topics of common interest to Hub Members. Task groups inform policy-making, communicate best practices & share information between countries, organisations & private sector.
  - Currently**, five task groups are operational** under the Energy Efficiency Hub:
  - **Digitalisation Working Group (DWG):** Digitalisation of energy-efficiency technologies.
  - **Super-efficient Equipment & Appliances Deployment (SEAD):** Promotes manufacture, purchase and use of efficient appliances, lighting and equipment worldwide.
  - **TOP TENS:** Prepares list of best energy efficient technologies and best practices in key energy-consuming sectors.
  - **Energy Management Action Network (EMAK):** Facilitates public-private exchanges on systems for raising energy efficiency.
  - **Energy Efficiency in Buildings (EEB):** Serves as a platform to exchange policy information about improving energy efficiency in buildings.
- **Secretariat:** Hosted by International Energy Agency (IEA).
- **Membership:**
  - IEA Members, IEA Association Countries and Clean Energy Ministerial Members are eligible to join the Hub.
  - As of July 2024, **16 countries** are members of the Energy Efficiency Hub. They are Argentina, Australia, Brazil, Canada, China, Denmark, European Commission,

France, Germany, Japan, Korea, Luxembourg, Russia, Saudi Arabia, USA and UK.
  - Member governments get to learn international best practices on how to design and implement energy efficiency policies.
- **Governance of Energy Efficiency Hub:** Through a Steering Committee, composed of one representative from each member.

India and Energy Efficiency Hub

- Currently, India is an Association country of International Energy Agency, which makes India eligible to join the Energy Efficiency Hub as a member country.
- **India's nodal agency for Energy Efficiency Hub:** Bureau of Energy Efficiency, a statutory body, has been designated as the implementing agency on behalf of India.
- Energy Efficiency Hub is a successor of International Partnership for Energy Efficiency Cooperation (IPEEC). India was a member of IPEEC.

Environmental Ship Index

Syllabus Mapping: Environment, Indexes

Context

Mormugao Port Authority has been recognized globally as an incentive provider on the ESI platform.

About Environmental Ship Index (ESI)

- ESI is a voluntary system that measures the environmental footprint of merchant vessels. It identifies ships that perform better than the International Maritime Organization's (IMO) emission standards.
- ESI is published by the **International Association of Ports and Harbors (IAPH)**.
  - **IAPH** is a global trade association for seaports. It was founded in 1955 and is headquartered in Tokyo, Japan.
- ESI is administered by **Green Award Foundation** (a non-profit organisation).

Mormugao Port

- It is a major port of India located in Goa.
- It is India's **first port to introduce Green Ship Incentives (Harit Shrey scheme)** through the ESI.
- **Harit Shrey scheme (2023)**: It offers discounts on port charges based on ESI scores, rewarding ships with higher environmental performance

Warming in Antarctica

Syllabus Mapping: Climate Change

Context

According to a study published in the journal Nature Climate Change, Antarctica is warming twice as fast as the global average.

Key Findings of the Study

- **Vegetation Increase:** The extent of vegetation has increased 14 times over the past 35 years.
- **Accelerated Growth Rate:** Between 2016 and 2021, the rate of greening increased by over 30%, indicating a rapid response to climate change.
- **Temperature Changes:**
  - The Antarctic Peninsula is warming at an alarming rate, approximately 3 degrees Celsius higher on average since 1950, which is about five times faster than the global average.
  - The region has faced record-breaking heat waves, with temperatures in July 2023 reaching up to 10 degrees Celsius above normal.
  - The warming climate has led to a significant decrease in sea ice extent, facilitating conditions that favour plant growth.
- **Impact of Increased Vegetation**
  - Mosses colonizing ice-covered areas contribute organic matter, facilitating soil formation and creating new habitats for insects and small animals, such as springtails and mites.
  - Increased vegetation may attract invasive species, such as the Chilean mussel and various crabs
  - It may reduce the ability to reflect sunlight, leading to further warming and local climate changes.
  - It may alter ecosystem dynamics by altering food web interactions

Additional Information

Antarctica

- It is the Earth's southernmost continent, covered mostly by ice.
- It holds around 90% of the world's freshwater in its ice sheets.
- The Antarctic Treaty System regulates the continent of Antarctica, preserving it for peaceful and scientific purposes, and banning military activities and resource extraction.
- It is **one of the 4 Global Commons recognized by the United Nations.**
  - **Other 3:** The high seas, The atmosphere and Outer space
- **India's Research Stations in Antarctica:** Maitri, Bharati & Dakshin Gangotri

Geoengineering to cool Earth's Surface

Syllabus Mapping: Climate Change

Context

A recent study suggests that releasing five million tonnes of diamond dust annually into the stratosphere could reduce global temperatures by 1.6°C over 45 years.

About Geoengineering

It refers to a range of large-scale interventions aimed at manipulating the Earth's natural systems to combat climate change. It is also known as **climate engineering**.

Main Approaches to Geoengineering

- **Carbon Dioxide Removal (CDR):** CDR techniques focus on actively removing CO2 from the atmosphere. Some key methods include:
  - **Afforestation and Reforestation:** Planting trees to absorb CO2 from the atmosphere.
  - **Soil Carbon Sequestration:** Enhancing soil management practices to increase carbon storage in soils.
  - **Bioenergy with Carbon Capture and Storage (BECCS):** Growing biomass for energy production while capturing and storing the CO2 emissions.
  - **Direct Air Capture:** Using technology to extract CO2 directly from the air and store it underground.
- **Solar Radiation Management (SRM):** SRM techniques aim to reflect a portion of sunlight back into space to cool the Earth. Key methods include:
  - **Stratospheric Aerosol Injection:** Injecting aerosols (e.g., sulphur dioxide) into the stratosphere to reflect sunlight, mimicking the cooling effects of volcanic eruptions.
  - **Marine Cloud Brightening:** Spraying seawater into clouds to increase their reflectivity.
  - **Surface Albedo Modification:** Changing the reflectivity of land surfaces, such as painting roofs white or using reflective materials in urban areas.

Use of mining dust to enhance carbon capture

Syllabus Mapping: Climate Change

Context

A Darjeeling-based company, Alt Carbon, is utilizing a geochemical process known as enhanced rock weathering to tackle atmospheric carbon dioxide (CO2).

About Enhanced Rock Weathering

- It is a process that accelerates the natural weathering of rocks.
- Basaltic rock into fine powder increases the surface area of the rock dramatically, enhancing the reaction rate of carbon with minerals.
- This enhanced process can capture carbon **10 to 100 times faster** than natural weathering, depending on environmental factors like **soil, temperature, and proximity to rivers**.
- The bicarbonates formed from the process can be flushed into oceans within a **month**

About Rock Weathering

- Rock weathering is a geochemical process where rocks break down into minerals over thousands of years.
- During this process, atmospheric **carbon dioxide (CO2)** reacts with minerals like **calcium and magnesium**, turning into bicarbonates.
- These bicarbonates eventually travel through **aquifers** and settle in the **oceans**, where the carbon is locked away for aeons.
- Natural rock weathering takes a long time—over thousands of years—to remove significant CO2 from the atmosphere.

Additional Information

- **Carbon capture and storage (CCS):** It is a process that captures carbon dioxide (CO2) emissions from industrial facilities and power plants, and then stores or reuses it
- **Carbon sequestration:** It is the process of capturing and storing carbon dioxide (CO2) from the atmosphere to reduce global climate change
  - Carbon capture involves capturing carbon dioxide (CO2) at emission sources, while carbon sequestration involves capturing and storing atmospheric CO2.

Air pollution limits

Syllabus Mapping: Environment, Pollution

Context

Recently, air pollution levels in Delhi reached approximately eight times the safe limit set by the World Health Organization (WHO).

About WHO limits on Air pollution

- **Particulate matter (PM2.5):** The annual mean concentration should not exceed 5 µg/m3.
- **Nitrogen dioxide (NO2):** The annual mean concentration should not exceed 10 µg/m3.
- **Ozone (O3):** The peak season mean 8-hour concentration should not exceed 60 µg/m3.
- **PM10:** The annual mean concentration should not exceed 15 µg/m3, and the 24-hour mean concentration should not exceed 45 µg/m3.
- **Sulphur dioxide (SO2):** The 24-hour mean concentration should not exceed 40 µg/m3.
- **Carbon monoxide (CO):** The 24-hour mean concentration should not exceed 7 µg/m3.

Major Air Pollutants

Air Pollutant	Source	Effect on Health and Environment
Particulate Matter (PM)	Pollen, Sea spray, Windblown dust from: Construction, Agriculture, Transport, Mining, Soil erosion	PM is capable of penetrating deep into the lung and enter the bloodstream causing Cardiovascular disease, Cerebrovascular stroke, Respiratory impacts.
Nitrogen dioxide	Combustion of fossil fuels, crop residue, woods, Vehicular emissions, Industrial processes, Chemical productions	Coughing, Wheezing, Shortness of breath, Strokes and heart attacks, Reduced lung function
Ozone	Vehicular emissions, Factories, Paints, solvents and cleaning agents emit volatile organic compounds (VOCs)	Damages the DNA, Impaired cellular function, Shortness of breath, Asthma
Carbon monoxide (CO)	Vehicular emission, Home heating (natural gas, fuels), Industrial processes, Wildfires, Tobacco smoke, Power plants	Heart disease, Respiratory diseases Upon entering the bloodstream, carbon monoxide inhibits the body's ability to carry oxygen to organs and tissues.
Sulphur dioxide (SO_2)	Residential heating, Transportations, Industrial processes, Power plants	Respiratory irritation, Bronchitis, Bronchospasm
Lead	Lead based paint, Consumer products, Industrial emissions, Petrol, Batteries	Behaviour and learning problems, Lower IQ , Hyperactivity, Slowed growth, Hearing problems, Anaemia
Benzene	Motor vehicle exhaust, Industrial processes, Cigarette smoke, Glues, Adhesives, Cleaning products	Anaemia, Immune system damage, Reproductive problems, Cancer, Leukaemia, Carcinogen
Asbestos	Rocks and soil, Building materials, Insulators, Cement, Industries, Automotive parts	Lung cancer, Mesothelioma (a cancer of the lining of the lungs and other organs), Asbestosis (a chronic lung condition)

Protected Areas in News

Protected Area	Location	Details
Ratapani Wildlife Sanctuary	Vindhyachal Mountain Ranges of Madhya Pradesh	• **Rivers:** Narmada, Kolar • **Fauna:** Tigers, leopards, sloth bears, hyenas, spotted deer, sambar deer etc. • **Flora:** Dry and moist deciduous forests. About 55% of the area is covered by teak. • Houses **Bhimbetka rock shelters**
Bhitarkanika National Park	Kendrapara district of Odisha.	• **Rivers:** Bhitarkanika and its tributaries Brahmani, Baitarani and Dhamra. • **Fauna**: saltwater crocodiles, Olive Ridley turtles at Gahirmatha Beach • **Flora:** Mangrove forests of Sundari, Goran & Kadam. • It is a **Ramsar Site**
Karakoram Wildlife Sanctuary	Easternmost reaches of the Karakoram Range in Leh District, Ladakh.	• **Rivers:** Nubra, Shyok • **Fauna:** Ibex, Ladakhi Urial, Argali, Chiru, Tibetan Gazelle, Shapo, Bharal (Blue Sheep), Wild Yak, Snow Leopard, Lynx, • **Flora**: Broad-leaved shrubs like Rosia webbiana, Ephedra, Caragianae • **Major Peaks:** Saltoro Kangri, Saser Kangri I, and K12.
Ranthambore Tiger Reserve	Situated at the junction of the Aravalli and Vindhya hill ranges in Sawai Madhopur district of Rajasthan.	• **Fauna:** Tiger, Leopards, sloth bears, striped hyenas, sambar deer • **Flora:** Dry deciduous forests, grasslands, and scrublands, dominant species: Dhok, acacia.

Species in News

Species	Details
Water Hyacinth 	• A floating plant native to the Amazon, now widespread, including in India • Recognized for its purple flowers and glossy leaves. • **Habitat:** Prefers freshwater bodies but can also survive in brackish water. • **Negative Impacts** – Reduces oxygen levels, harming aquatic life. – Overgrows, choking native plants and reducing biodiversity. • **Uses** – Can be harvested for sustainable products like crafts and furniture. – Absorbs heavy metals and toxins, reducing water pollution. – Usable for animal feed, compost, and bioenergy production.
Asian Elephant 	• **Habitat:** Isolated pockets of India and Southeast Asia, including Sumatra and Borneo. • **Features:** – Largest land mammals in Asia. – Distinguished from the African elephant by its much smaller stature. • **Conservation Status** – IUCN: Endangered – CITES: Appendix I – WPA: Schedule I
Indian Wild Ass 	• Subspecies of the Asian Wild Ass, locally called Khur in Gujarat. • **Habitat**: Little Rann of Kutch and Great Rann of Kutch. • **Conservation Status:** – IUCN: Near Threatened – CITES: Appendix II – WPA:Schedule I
Tenkana jayamangali 	• New genus of jumping spiders, discovered in southern India. • Named after Jayamagali river of South India • Tenkana species are found in drier, ground habitats across Tamil Nadu, Karnataka, Andhra Pradesh, Telangana, and Puducherry.
Horse-shoe crab 	• Horse-shoe crabs are **closely related to spiders and scorpions.** • **Living Fossils:** – They are **marine arthropods** belonging to the family **Limulidae**. – They are considered "living fossils" due to their existence for over **450 million years with minimal morphological changes.**IUCN Data: Data difficient • **Physical Traits:** – Hard, horseshoe-shaped carapace, long tail spine (telson), and multiple pairs of legs. – Their **blood is bright blue** due to the presence of copper-based **hemocyanin,** which is crucial for their immune response. – Horseshoe crabs **glow under UV light**.This is because of a process called **cuticular fluorescence.** – Blue blood contains a substance called **Limulus Amebocyte Lysate (LAL) –** crucial for testing medical equipment for bacterial contamination in the biomedical industry. – They have six pairs of legs but only five are for walking. – One horseshoe crab can lay about **4,000 eggs.** – **Lifespan:** 20 – 100 years. • **Distribution in India** – **Species Found:** India is home to 2 species: ▪ Coastal Horseshoe Crab ▪ Mangrove Horseshoe Crab • **Location:** Northeastern coast of Odisha (Balasore and Kendrapara districts) and in parts of the Sundarbans in West Bengal. • IUCN: Data deficient

ECONOMY & AGRICULTURE

TOPICS FOR MAINS

Middle Income Trap

Syllabus Mapping: GS-Paper 3, Issues of Growth

Context

Only **34 middle-income nations** advanced to high-income status in **34 years as per World Development Report 2024.**

About Middle Income Trap

- Middle income trap is a situation where a country that attains a certain income gets stuck at that middle-income level and is **unable to transition to a high-income level.**

Or

- World Bank defines middle-income economies as those with incomes between **$1,136 and $13,845 per capita.**

Key Factors Contributing to the Middle-Income Trap

- **Diminishing Returns to Capital:** As countries grow, the returns on additional investments in physical capital tend to decline, making it harder to sustain high growth rates.
- **Exhaustion of Cheap Labour:** Initial advantages of low labour costs diminish as wages rise, leading to increased unit labour costs that can hinder competitiveness.
- **Premature Deindustrialization**: Many middle-income countries experience a decline in manufacturing at lower income levels than before, limiting their ability to drive growth through industrialization.
- **Weak Institutions**: Ineffective governance and institutions may not support an adaptive economy capable of fostering innovation and competition.
- **Misallocation of Resources**: Distorted incentives can lead to talent misallocation, where individuals are not employed in roles that maximise their potential contributions to the economy.
- **Inflation and Credit Bubbles**: High inflation rates and speculative investments can destabilise economies, making it difficult for them to maintain growth momentum.

Highlights of World Development Report 2024

- **Middle Income Trap:**
  - India is among **100 countries, including China,** at risk of falling into the **"middle-income trap,"** where nations struggle to move from middle-income to high-income status.
  - India stands at a crucial point, benefiting from favourable demographics and digitalization advancements but faces a more challenging global environment compared to earlier periods.
  - Achieving the goal of becoming a developed nation by 2047 will require a holistic approach that boosts overall economic performance, rather than focusing on specific sectors.
  - Since 1990, only 34 middle-income economies have transitioned to high-income status, often due to special circumstances like EU integration or oil reserves.
  - Middle-income countries face growth challenges due to diminishing returns on physical capital, unlike low-income countries that benefit from building physical infrastructure and improving basic education.
  - The World Bank criticises many middle-income countries for relying on outdated economic strategies that emphasise expanding investment.
- **Global Economic Impact:**
  - Middle-income countries are home to six billion people, representing 75% of the world's population, and contribute over 40% of global GDP.
  - The success or failure of these nations in reaching high-income status will have a substantial effect on global economic prosperity.
- **Per Capita Income Disparity:**
  - Although India is the fastest-growing major economy, it would take 75 years to reach just one-quarter of the U.S. per capita income if current trends persist.
  - China is projected to take over 10 years, Indonesia nearly 70 years, and India 75 years to achieve a quarter of U.S. per capita income levels.

- **Challenges and Risks:**
  - Middle-income countries face major challenges including ageing populations, increasing debt, geopolitical tensions, trade frictions, and environmental concerns.
  - If these nations continue on their current trajectories, they risk failing to achieve reasonably prosperous societies by the mid-21st century.

Challenges for India

Wealth Concentration and Inequality

- The influence of billionaires in India's economy has grown significantly, and there is a perception that they are closely aligned with political power.
- The state is seen as unable (or unwilling) to push for high rates of domestic investment from these billionaires.
- The manufacturing sector has stagnated, and India is experiencing a reversal in structural transformation, with a growing share of the population returning to low-productivity agriculture post-pandemic.

Wage Growth Discrepancy

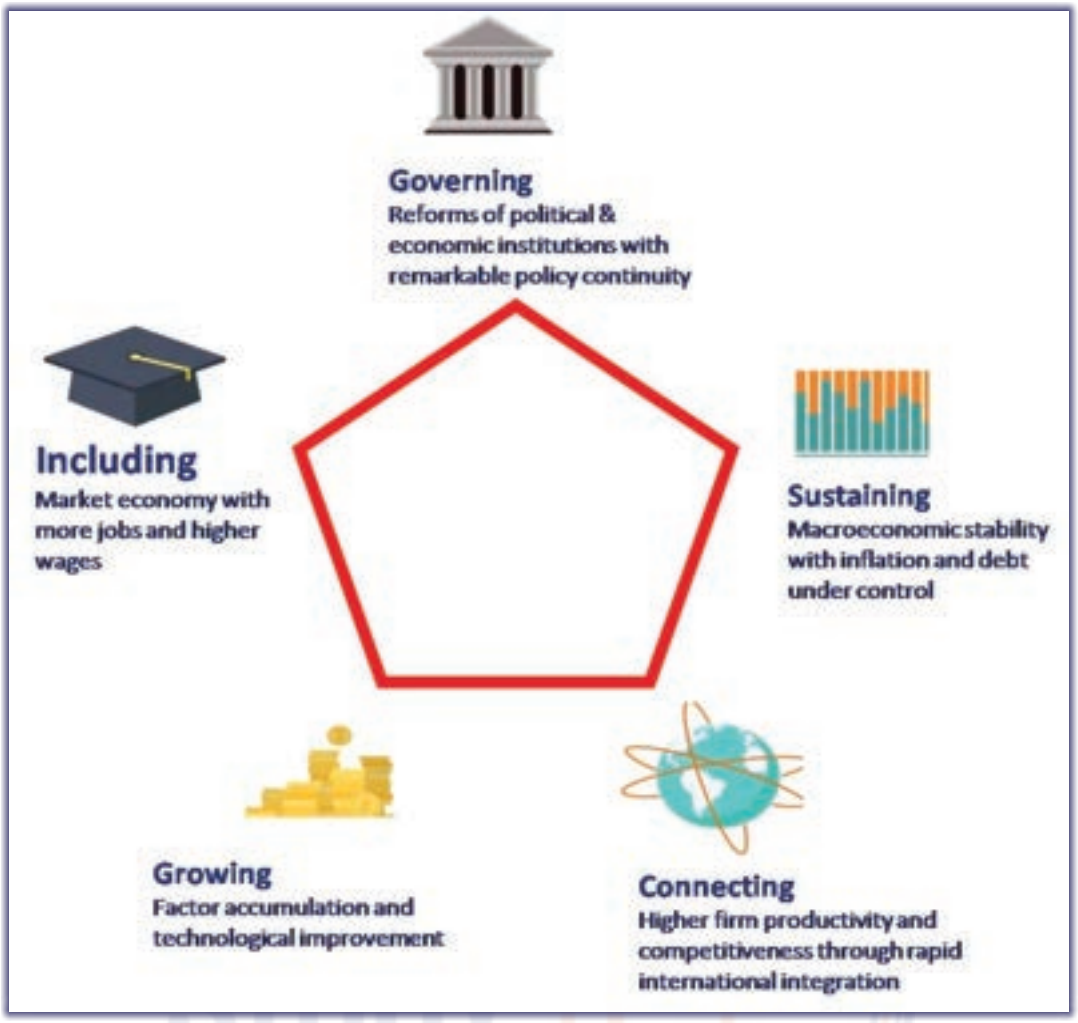
- Despite **India's projected real GDP growth of around 7%,** nominal wage growth has lagged behind.
- The **Periodic Labour Force Survey (PLFS)** indicates that nominal wages for regular workers grew by only **5% between April and June 2023-24,** and for **casual workers, by 7%.**
- With **inflation at 5%,** wage earners have seen minimal to no real wage growth, hindering broader participation in the economy's growth.
- A lack of wage growth limits consumption demand, which in turn, slows down overall economic progress.

Democracy and Growth

- Both **South Korea and Chile** had authoritarian governments when they transitioned to high-income economies.
- South Korea's military government suppressed labour unions to promote capital accumulation, and Chile's democratic government was overthrown in favour of a military dictatorship led by General Augusto Pinochet.
- India must not adopt the wrong lessons from these countries by compromising democracy in pursuit of economic growth.
- Policy must focus on maintaining a democratic ethos while promoting growth through state intervention.

Way forward

- **The 3i Approach**: The World Development Report 2024 emphasises a three-pronged strategy known as the "3i" approach:
  - **Investment**: Increasing capital investments in various sectors.
  - **Infusion**: Ensuring the adoption of new global technologies.
  - **Innovation**: Creating an environment conducive to domestic innovation.
  - These strategies require responsive state policies to navigate modern economic challenges effectively
- **Pursue Liberal Economic Policies**: Focus on policies that support private sector growth and entrepreneurship.
- **Develop Low-Skilled Manufacturing**: Encourage sectors like electronics assembly and apparel to create jobs and boost exports.
  - **Example**: South Korea and Taiwan's success through export-oriented manufacturing.
- **Build Industrial Clusters:** Develop clusters with plug-and-play infrastructure, similar to China and Vietnam.
  - Address cost disabilities in power, logistics, financing, and labour productivity.
- **Enhance Female Labor Force Participation:** Implement policies to increase FLFPR to levels seen in other rapidly growing economies.
- **Avoid Protectionist Policies:** Resist high import tariffs to prevent inefficiencies and maintain competitiveness in exports.
  - **Example**: Impact of tariffs on mobile phone manufacturing.
- **Minimum Government, Maximum Governance**: Reduce bureaucratic red tape and improve ease of doing business to encourage private investment.



Comeback of Krishi in Bharat

Syllabus Mapping: GS Paper 3, Agriculture

Context

The All India Rural Financial Inclusion Survey for 2021-22, released recently, found that there has been an increase in dependence on agriculture.

Key Highlights of All India Rural Financial Inclusion Survey (2021-22)

- 57% of rural households, including those in semi-urban centres with populations below 50,000, were classified as "agricultural."
  - This is a significant rise from 48% in the previous survey of 2016-17.
- An "agricultural household" is defined as one that:
  - Earns over ₹6,500 from farming (including crop cultivation, livestock rearing, aquaculture, etc.).
  - Has at least one member self-employed in farming.
- This threshold was ₹5,000 in 2016-17, showing an upward trend in rural households depending on agriculture.
- **Agricultural Household Income:**
  - Agricultural households earned an average monthly income of ₹13,661 in 2021-22, which was higher than the ₹11,438 earned by non-agricultural rural households.
  - In the 2016-17 survey, agricultural households earned ₹8,931 monthly, while non-agricultural households earned ₹7,269, showing a consistent trend of higher earnings from agriculture.

Rising Income from Farming Activities

- The share of income from farming (cultivation and animal husbandry) among agricultural households has increased:
  - For households with less than 0.01 hectares of land, farming income rose from 23.5% to 26.8%.
  - For households with 0.41-1 hectare, it increased from 38.2% to 42.2%.
  - For those with 1.01-2 hectares, it jumped from 52.5% to 63.9%.
  - Households with more than 2 hectares saw a rise from 58.2% to 71.4%.
- This shows a stronger reliance on farming income and less diversification into non-farming sources such as jobs, wage labour, or investments.

Impact of COVID-19 on Agriculture's Role:

- The survey period (2021-22) followed the COVID-19 lockdowns, during which agriculture remained largely unaffected compared to other sectors that experienced disruptions.
- Four consecutive good monsoons also benefited the farm sector.
- This context may explain the increased role of agriculture in rural livelihoods during the pandemic years, suggesting that the share of agriculture in rural income and employment may be slightly overestimated.

Paradox of Increased Agriculture Dependence in a Growing Economy

- Despite a growing economy (GDP growth of 8.3% annually from 2021-22 to 2023-24), dependence on agriculture for employment has remained high.
- The Periodic Labour Force Surveys (PLFS) show that agriculture engaged 42.5% of the country's workforce in 2018-19, but this increased to 45.6% in 2019-20 and 46.5% in 2020-21, during the pandemic.
- Even post-pandemic (2023-24), 46.1% of the workforce remains employed in agriculture, well above the pre-pandemic low of 42.5%.

Lack of Jobs in Manufacturing

- One of the reasons for continued reliance on agriculture is the lack of job creation in the manufacturing sector. Manufacturing employed only 11.4% of the workforce in 2023-24, down from 12.6% in 2011-12 and 12.1% in 2018-19.
- More people are moving from farms to sectors like trade, hotels, restaurants, and construction, which have low productivity and largely informal employment, similar to agriculture.
- States with the highest agricultural workforce include:
  - **Chhattisgarh (63.8%)**
  - **Madhya Pradesh (61.6%)**
  - **Uttar Pradesh (55.9%)**
  - **Bihar (54.2%)**
- States with the lowest agricultural workforce include:
  - **Goa (8.1%)**
  - **Kerala (27%)**
  - **Punjab (27.2%)**
  - **Haryana (27.5%)**

Key Takeaways

- **More Rural Households Rely on Agriculture:** There is an increased number of rural households dependent on agriculture for income.
- **Agricultural Incomes Are Rising:** Rural households are earning more from farming activities than before, but this income is less diversified.
- **Pandemic Impact on Agriculture**: COVID-19 lockdowns boosted the role of agriculture as other sectors struggled, but the trend persists even as the economy recovers.
- **Lack of Job Creation in Manufacturing:** Agriculture's dominance in employment is linked to slow job creation in other sectors, particularly manufacturing.

Agri Sector Report Card

Syllabus Mapping: GS-Paper 3, Agriculture

Context

NITI Aayog research paper by **Ramesh Chand** and **Jaspal Singh** highlighted that India's farm sector has registered improved growth over the past two decades, especially during the last ten years.

Growth Performance of Agriculture Sector

TABLE 1

AVERAGE ANNUAL GROWTH IN VALUE OF OUTPUT* (2014-15 TO 2022-23) (IN %)

1. Fishing & Aquaculture	9.08
2. Livestock	5.76
(a) Milk	5.78
(b) Poultry Meat	9.22
(c) Eggs	6.58
3. Crops	2.34
(a) Horticultural Crops**	3.94
(b) Non-Horticultural Crops	1.64
Foodgrains	2.63
Cereals	2.40
Pulses	4.67
Oilseeds	2.96
Sugarcane	4.33
Cotton	0.11
Jute	-2.00
Tea & Coffee	1.29
Tobacco	-3.31

**At 2011-12 prices; *Includes Fruits & Vegetables and Condiments & Spices*

TABLE 2

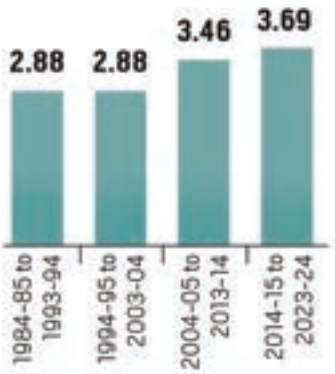
TOP AGRICULTURAL GROWTH STATES: 2014-15 TO 2022-23*

	Agriculture	Crops	Livestock	Fishing
Andhra Pradesh	7.97	3.65	8.41	18.45
Madhya Pradesh	6.9	5.96	12.6	15.31
Karnataka	6.32	4.53	11.49	11.74
Telangana	5.63	5.13	8.22	7.58
Tamil Nadu	5.39	2.72	9.73	3.65
Chhattisgarh	5.2	3.47	7.28	9.73
Odisha	5.11	4.45	5.16	11.79
Rajasthan	4.83	1.9	10.9	10.04
Jharkhand	4.73	3.59	6.18	11.88
Uttar Pradesh	4.64	4.44	5.17	7.98
Maharashtra	4.54	3.58	6.95	2.08
Bihar	4.3	1.83	8.28	7.84
Gujarat	4	2.44	5.59	5.75
ALL-INDIA	3.94	1.98	7.39	8.98

**Average annual % growth in Gross Value Added at 2011-12 prices.*

CHART 1

AVERAGE ANNUAL GROWTH OF AGRICULTURE*



**Growth of Gross Value Added in Agriculture, Livestock, Forestry & Fishing at 2011-12 prices.*

- From 1984-85 to 1993-94 and 1994-95 to 2003-04, agriculture's annual growth rate, based on **Gross Value Added (GVA)** at constant prices, averaged **2.9%**.
- Growth accelerated during 2004-05 to 2013-14 to **3.5%** annually and further increased to **3.7%** during 2014-15 to 2023-24.

What is the Current Status of the Indian Agriculture Sector?

- **Contribution to Economy:** Contributes 18.2 per cent in the country's GDP at current prices (Economic Survey 23-24).
- **Employment**: Employs 42.3%of the population.
- **Production(23-24):** 328.8 million tonnes (slightly lower than that of 2022-23 which stood at 329.7 million tonnes- all time high).
- **Export (23-24)**: US$ 38.65 billion (lower than 22-23 which stood at US$ 52.50 billion).

Subsector Performance of Agriculture sector

- **Crops subsector** (regular farming) recorded **only 2.3% annual growth** during 2014-15 to 2022-23, which is lower than the 3.4% growth during the UPA period.
- **Livestock** and **fisheries sub sectors** performed significantly better with:
  - Livestock growing at **5.8% annually**.
  - Fisheries growing at **9.2% annually** from 2014-15 to 2022-23.

- Within livestock and fisheries, specific areas showed even higher growth:
  - **Poultry meat**: **9.2%**
  - **Fishing & aquaculture**: **9.1%**
  - **Eggs**: **6.6%**
  - **Milk**: **5.8%**
- Even within crops, **horticulture** performed well, growing at **3.9% annually**.
- However, **non-horticulture field crops** like cereals, oilseeds, and cash crops (cotton, jute, tobacco) showed sluggish growth:
  - Regular field crops **grew by just 1.6%** annually.

Some concerns

- While official production estimates show significant growth, discrepancies have been noted between **cereal production** and **household consumption** data:
  - Cereal production rose from **185.2 million tonnes (mt)** in 2004-05 to **303.6 mt** in 2022-23.
  - However, household cereal consumption has remained almost flat at **153-156 mt** over the same period.
  - The gap between production and consumption increased from **29.5 mt** in 2004-05 to **151 mt** in 2022-23.
- Similar discrepancies exist in **milk production**, which **more than doubled** from 92.5 mt in 2004-05 to 230.6 mt in 2022-23, without a matching increase in consumption.

Policy Takeaways and Market-Led Diversification

- **Diversification in agriculture** has been market-driven, driven by increased demand for vegetables, fruits, milk, meat, eggs, and fish, resulting in accelerated agricultural growth.
  - Diets have diversified from calorie-heavy to protein-rich foods.
  - **New technologies** like hybrid seeds, drip irrigation, and improved livestock breeds have facilitated this shift.
- However, not all farmers have benefited equally:
  - Only **53%** of farmers engage in **livestock** activities.
  - Only **6.5%** cultivate **horticulture** crops.
  - A significant portion (**44.2%**) of farmers still rely on conventional crop farming (cereals, pulses, oilseeds, etc.).
- There has been no significant technological breakthrough in crops like **cotton** since the introduction of **Bt hybrids**, and India's domestic production of cotton has stagnated.

Concluding Observations

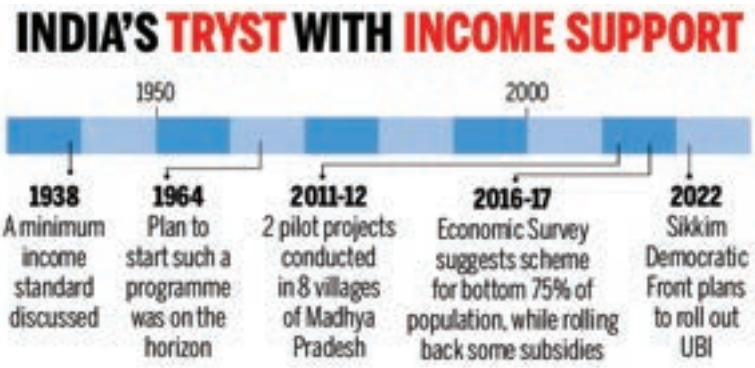
- The modest growth in field crops like rice and wheat, despite being covered under the **Minimum Support Price (MSP)** regime, underscores the importance of **demand-side factors** and **production technology improvements** over price or subsidy interventions.

A modified UBI policy may be more feasible

Syllabus Mapping: GS-Paper 3, Inclusive Growth

Context

The idea of **Universal Basic Income (UBI)** has resurfaced globally due to the challenges of **jobless growth** caused by automation and AI, as noted in a recent report by the **International Labour Organization (ILO)**.



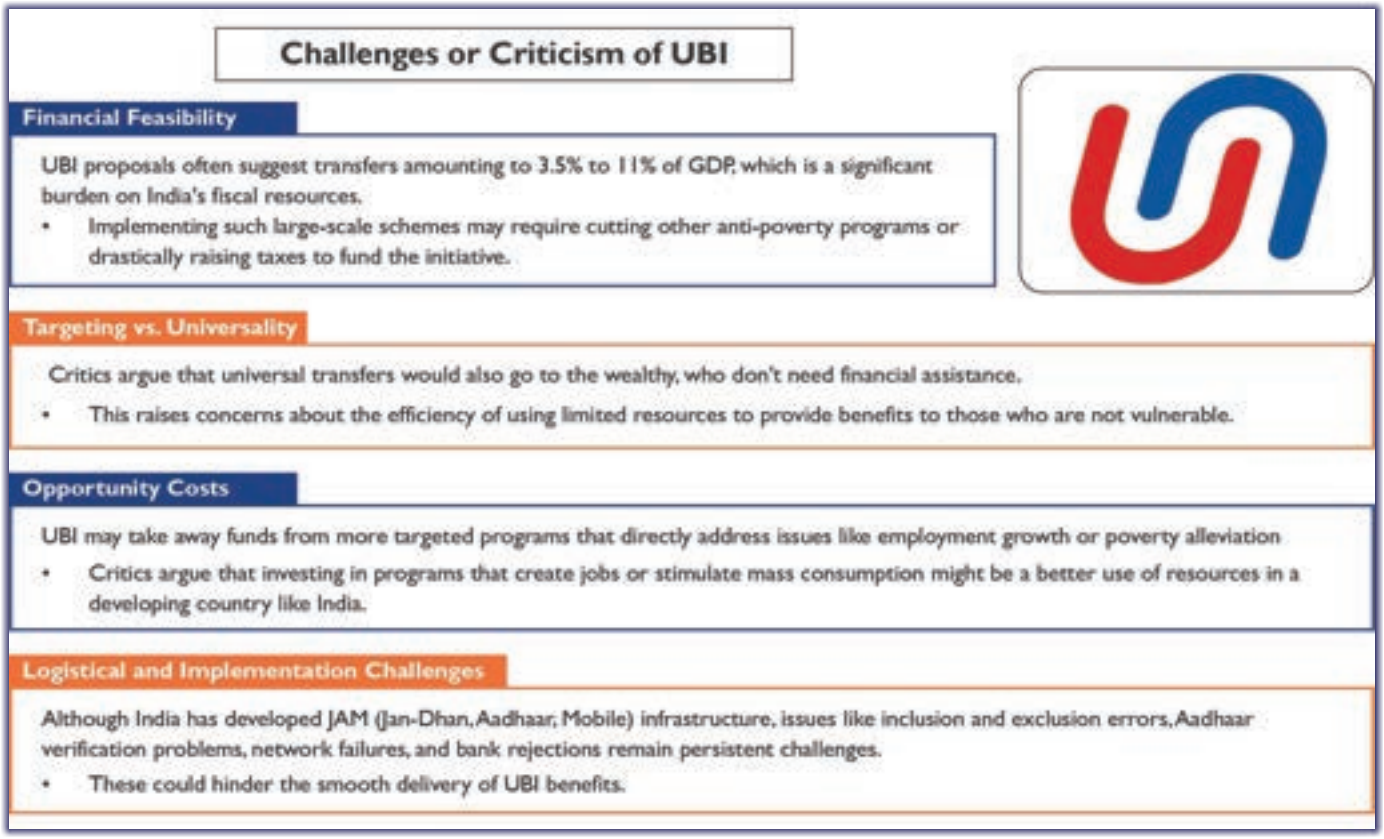
Universal Basic Income (UBI)

- It is a form of guaranteed income where every citizen or resident of a country is provided with a fixed, unconditional amount of money on a regular basis, regardless of any other income they may earn.

- The **2016-17 Economic Survey** recommended exploring UBI as a policy to replace inefficient welfare schemes.
- The report suggested the **JAM (Jan-Dhan, Aadhaar, Mobile)** infrastructure would enable **Direct Benefit Transfers (DBTs)** to beneficiary accounts.

Arguments for Universal Basic Income	Arguments against Universal Basic Income
• Poverty and vulnerability reduction • More choice to citizens on spending • Better targeting of aid • Insurance against shocks • Boost to financial inclusion • Psychological aid to people • More administrative	• High fiscal cost of Universal Basic income. • Once started cannot be taken back - political economy of exit. • Promote conspicuous spending. • Transfers to wealthy class waste of resources. • Induce people away from the labour force.

Challenges or Criticism of UBI



State and Central Schemes: Precursor to UBI

- India has already implemented **income transfer schemes**, notably in agriculture:
  - **Rythu Bandhu Scheme (RBS)**: Launched in Telangana in 2018, provided ₹4,000 per acre to farmers.
  - **KALIA (Krushak Assistance for Livelihood and Income Augmentation)**: Odisha's initiative for farmers.
  - **Pradhan Mantri Kisan Samman Nidhi Yojana (PM-KISAN)**: Launched in 2018-19, initially provided ₹6,000 per year to small landholding farmers and expanded to cover all farmers. The scheme aimed to reach **10 crore households** by 2020-21, costing ₹**75,000 crore** (roughly **0.4% of GDP**).

Modified UBI Proposals

- **Limited Universal Transfers**: Economist **Karthik Muralidharan** suggests a **modest universal income transfer** of about ₹**144 per month per person** or ₹**500 per household** pegged at **1% of GDP per capita**, much more feasible than full UBI proposals requiring 3.5%-11% of GDP.

- **Expand Existing Schemes**: **PM-KISAN scheme** provides an example of a **targeted scheme** that could be modified by **doubling** its budget and making it **universal**, it could cover not only farmers but also **landless labourers** who are often poorer, thereby increasing its reach.
- **Complementing Existing Programs**: Instead of replacing all social welfare programs, the modified UBI can **supplement existing programs** like **MGNREGS**.
  - **Example**: MGNREGS provides **100 days of employment**, but a modified UBI could extend coverage to groups like the **elderly and disabled**, who are unable to work and might not benefit from employment programs.
- **Cost Control through Modesty**: By keeping the transfer amount modest (₹144 per person), the modified UBI ensures that the program remains **financially sustainable** while still providing a meaningful safety net.
  - The relatively small transfer amount is significant in relation to the **Tendulkar poverty line** (₹1,500 per month in rural areas, ₹1,850 in urban areas).
- **Reduced Administrative Costs**: The universality of the scheme helps **reduce targeting costs**, **bureaucratic delays**, and **errors** associated with targeted programs.
  - It also reduces the risk of **corruption** and **leakages** by minimising the need for intermediaries in the delivery system.
- **Integration of Income and In-Kind Transfers**: A modified UBI can be integrated with **in-kind transfers** like the **Public Distribution System (PDS)**, ensuring a **holistic safety net**.
  - The COVID-19 pandemic underscored the importance of both **income transfers** and **food access**, showing that they are **complementary**.

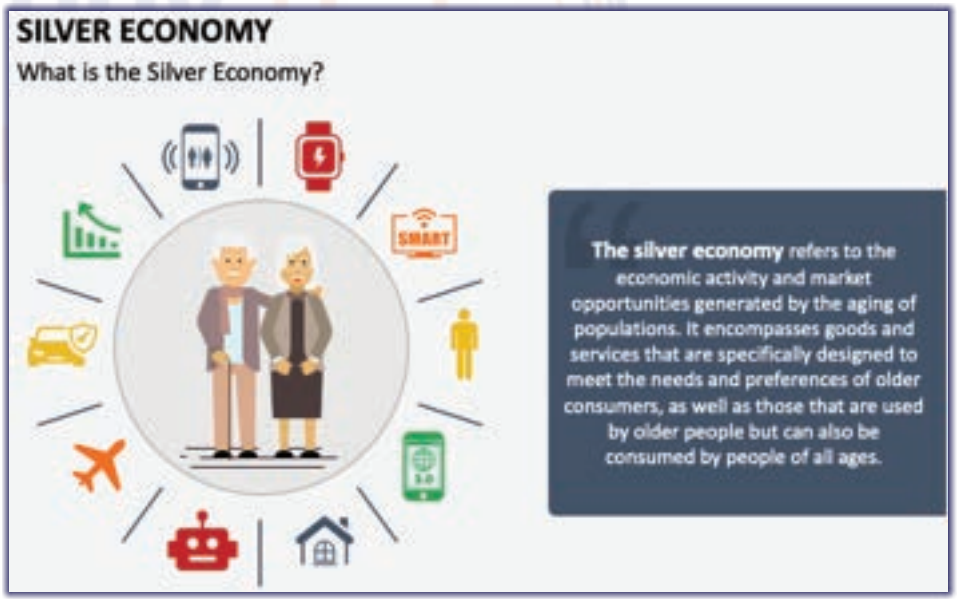
Silver Economy: Challenges to Opportunity

Syllabus Mapping: GS Paper 3, Inclusive Growth

Context

The rising elderly population in India and China poses significant challenges, particularly in healthcare consumption and social inclusion. This demographic shift necessitates comprehensive reforms to address the evolving needs of the elderly.

About Silver Economy



- Silver economy encompasses **all economic activities, products, and services tailored to meet the needs of individuals aged 50 and above.**
- Originating from Japan in the 1970s — a nation with the highest percentage of people over 65 — this concept, initially known as the silver market, refers to the senior demographic.
- It spans various sectors, including healthcare, finance, automotive, energy, housing, telecommunications, leisure, and tourism, among others.
- Silver economy offers vast opportunities for businesses and organisations that serve the elderly, with expectations of rapid growth and innovation in India and globally.

Growth of 'silver economy' in India

- India's population is ageing rapidly, with individuals aged 60 or older expected to grow from 8.6% of the population in 2011 to 19.5% by 2050.
- This equates to an **increase of the old age population from from 103 million in 2011 to 319 million by 2050**.

- Silver economy in India is currently valued at ₹73,082 crore and is expected to grow significantly.
- Senior citizens, along with professionals aged 45-64, are emerging as an influential and one of the wealthiest consumer segments.
- Healthcare accounts for about 31% of senior citizens' total expenditure, indicating significant growth potential for health and wellness-driven businesses within the senior care sector in India.

Opportunities for Growth of Silver Economy

- **Home Care Services:**
  - COVID-19 pandemic highlighted the importance of home healthcare, with limited hospital capacity driving demand for flexible and convenient home-based care options.
  - Currently, healthcare consumption among the elderly in India is estimated at $7 billion.
    - **Chronic Ailments**: 3/4th of the elderly suffer from at least one chronic ailment.
    - **Daily Limitations**: 1/4th of the elderly population faces limitations in daily living.
    - **Mental Health**: 1/3rd of them show depressive symptoms and low life satisfaction.
- **Health Technology:** COVID-19 accelerated the demand for products such as telehealth apps, remote patient monitoring, IoT devices, AI-driven smart homes, and assistive technology, all of which have potential to improve senior care.
  - Wearable devices for seniors, like smartwatches and fitness trackers, continue to grow in popularity, offering features like heart rate, blood pressure, and sleep monitoring.
  - Specialised devices, including fall detection sensors, GPS trackers, and emergency response systems, are also gaining traction for senior safety.
- **Health Insurance:** Only 18% of people over 60 in India have health insurance, leaving a vast untapped market with opportunities for investors.
  - While some insurance companies offer senior-specific health plans, a comprehensive product that covers OPD, diagnostics, and preventive care is still lacking.
  - The geriatric health insurance sector has potential to grow into a distinct segment.
- **Ayush-based Services**:
  - Ayush market has gained popularity due to the acceptance of traditional medical practices like Ayurveda, especially for their healing properties.

- The COVID-19 pandemic further boosted demand for Ayush-based treatments in India, which focus on holistic health and well-being.
- Elderly consumers increasingly seek preventive medications with minimal or no side effects, driving growth in the Ayush market.

Government Initiatives

- **Ayushman Arogya Mandir (AAM)**: A new initiative offering preventive, promotive, curative, and rehabilitative healthcare using AYUSH systems (Ayurveda, Yoga, Naturopathy, Unani, Siddha, and Homeopathy).
- Recently, the Union cabinet has approved an **expansion of the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB PM-JAY) health cover** to include all Indians aged 70 years and above, irrespective of their income.
- The government launched the **Senior Able Citizens for Re-Employment in Dignity (SACRED) portal**, aimed at connecting senior citizens with private sector job providers, promoting employment opportunities for the elderly.
- Based on the recommendations of an expert group on the silver economy, the Ministry of Social Justice and Empowerment introduced the **Senior Ageing Growth Engine (SAGE) initiative**.
  - This program is designed to promote and incentivize senior care products and services.
- The **SAGE portal** acts as a **'one-stop access' platform for senior care**, aggregating and delivering products and services directly to stakeholders.

Need for Reform

- **Health sector improvements:** Strengthening healthcare infrastructure to focus on the elderly, including expanding tele-consultation services and enhancing the skilled workforce.
- **Mental health services:** Addressing mental health needs alongside physical health through comprehensive care models.
- **Digital Inclusion:** Elderly people face challenges in adapting to the rapidly growing digital world, excluding them from schemes and benefits.
- Targeted efforts to improve digital literacy for both the current elderly and younger ageing populations are essential to ensure they can access digital services with ease.
- **Social Inclusion:** Peer support groups, community sensitization, and awareness campaigns on entitlements, inheritance, and legal protections can boost elderly confidence and well-being.
- **Financial Security:** Innovative schemes such as a ₹5 lakh insurance coverage for individuals above 70 years can help alleviate financial burdens due to healthcare costs.
- The elderly population can remain economically independent by reskilling and participating in the labour market.

Need for R&D Investment in Agri Sector

Syllabus Mapping: GS-Paper 3, Agriculture

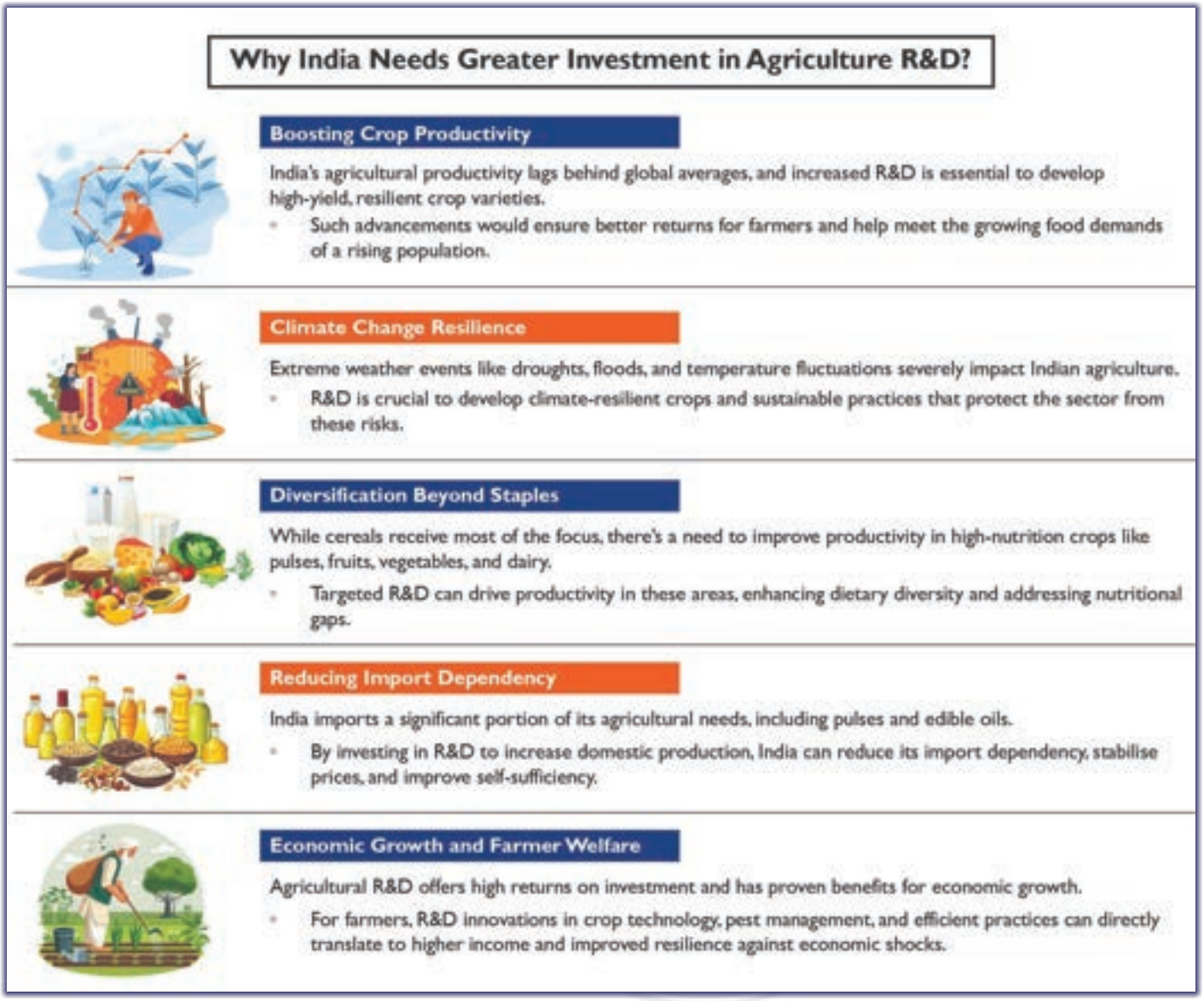
Context

India needs greater investment in agricultural research and development (R&D).

Current State of Agricultural R&D

- **Investment Levels:** Agricultural R&D expenditure in India was approximately ₹160 billion in 2020-21, with 89% from the public sector and 11% from the private sector.
  - However, public spending on agricultural research as a percentage of Gross Value Added (GVA) has stagnated at around 0.6% to 0.7% of GDP over the last two decades.
- **Return on Investment:** Investment in agricultural R&D has a high return rate; for every ₹1 invested, the return can be as high as ₹13, particularly in sectors like livestock and crop productivity.

Need for Greater Investment in Agriculture R&D



Way forward

- It is suggested that India should aim to raise its agricultural R&D spending to about 2% of GDP, aligning with practices in developed nations where such investments significantly contribute to agricultural growth.
- Emphasising the need for targeted research on climate-resilient crops and efficient water management practices will be crucial in addressing both current and future challenges faced by the agricultural sector.
- A balanced approach where funds are redirected from less effective subsidies towards agricultural R&D without compromising food security for vulnerable populations.

Food Security In India

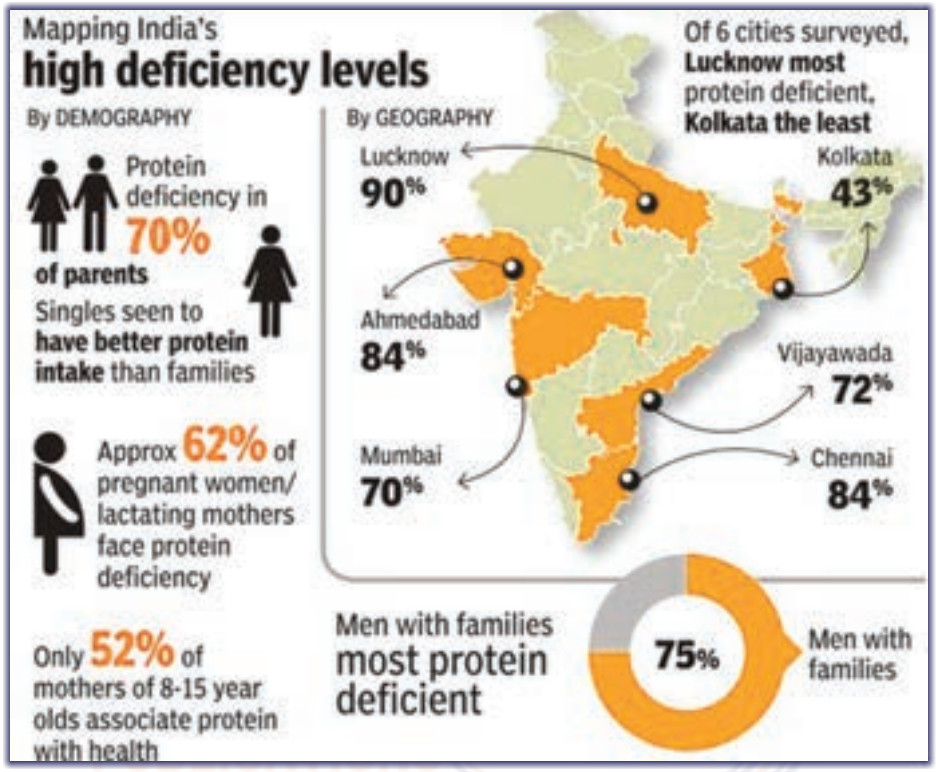
Syllabus Mapping: GS-Paper 3, Agriculture, PDS

Context

Ending hunger, food insecurity, and malnutrition is a key objective under the **Sustainable Development Goals (SDGs)**, specifically **Goal 2, which aims to achieve "zero hunger" by 2030.** However, this goal faces significant challenges due to rising conflicts, climate vulnerability, and economic slowdowns in food-deficient regions.

Historical Context of India's Food Security

- **Green Revolution:** India transitioned from a food-deficient nation to a food-surplus country over the past 60 years, largely due to the Green Revolution, which introduced high-yielding varieties (HYVs) of crops.
  - Initiatives like the White Revolution (milk production) and Blue Transformation (fisheries) have also contributed to transforming India's agrifood system.
- **National Food Security Act (NFSA):** Enacted in 2013, the NFSA provides food entitlements to over 800 million citizens, ensuring access to essential food items.
  - The government approved the distribution of fortified rice from July 2024 to December 2028, reflecting India's commitment to improving nutrition.



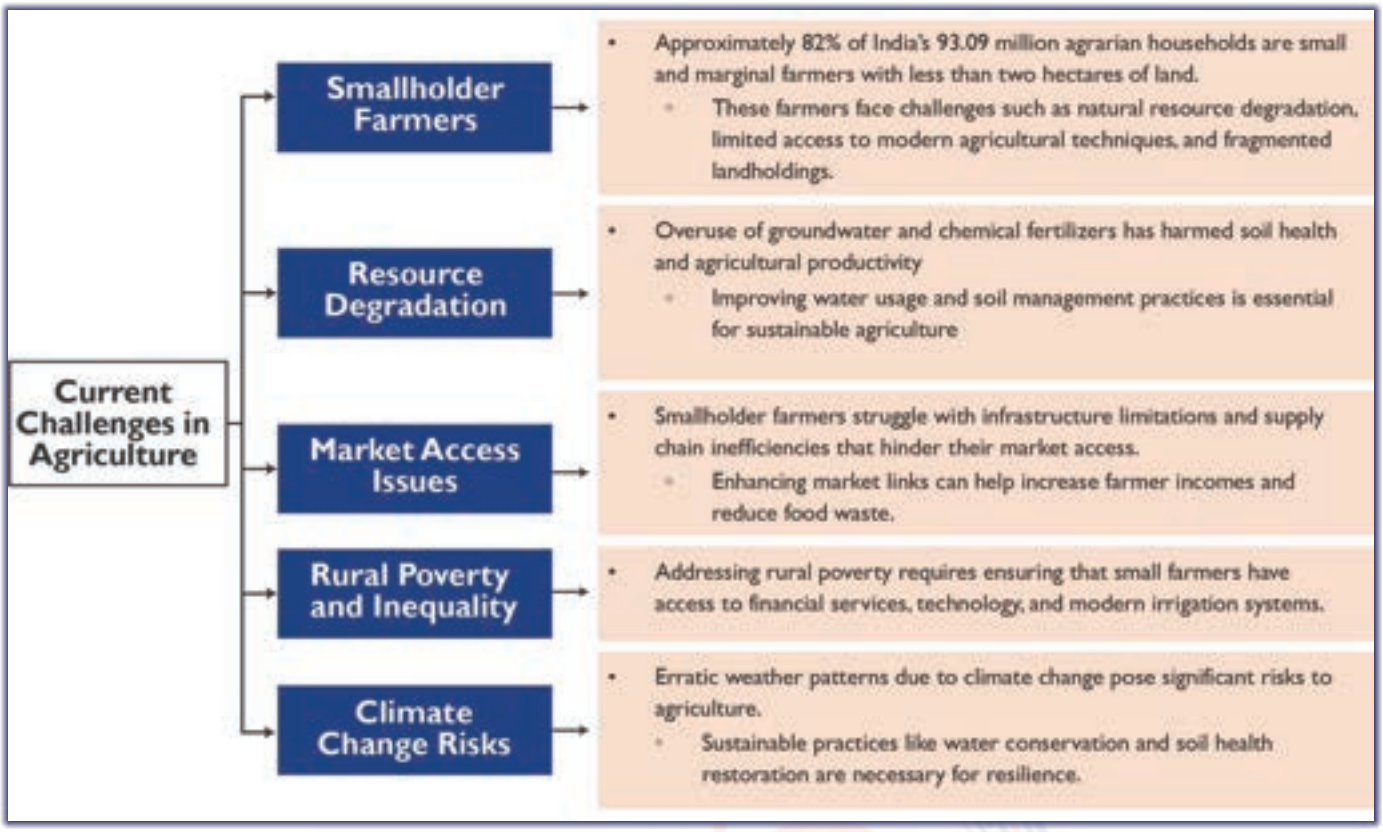
Unhealthy Diets in India

- **Diet Composition**: Indian diets are often unhealthy and do not meet the standards set by the EAT-Lancet reference or the Indian Council of Medical Research.
  - A reference diet in South Asia may cost about 60% of the mean daily per capita household income, making it unaffordable for many.
- **Consumption Patterns**: Even among wealthier households, there is a tendency to consume less protein-rich food compared to processed foods, indicating issues with availability, accessibility, awareness, and acceptability.

Global Hunger Index and Its Implications

- **Controversy Over Rankings:** India's ranking on the Global Hunger Index (GHI) has been criticised for focusing more on nutrition and mortality rather than actual hunger levels.
  - Surveys reveal that about 3.2% of the Indian population do not comply with having at least one meal a day.
- **Current Statistics:** Over 50% of the population reportedly consumes three meals daily.
  - Approximately 2.5% may not have two square meals daily, translating to around 3.5 crore people, which remains a significant concern.

Current Challenges in Agriculture



High Yield, Many Losses:

- **Nutritional Decline:** The focus on yield has reduced the nutritional quality of food.
  - A study by the Indian Council for Agricultural Research (ICAR) found significant declines in micronutrient content in staple crops:
    - **Zinc in rice:** Decreased by 33%.
    - **Zinc in wheat**: Decreased by 30%.
    - **Iron in rice**: Decreased by 27%.
    - **Iron in wheat:** Decreased by 19%.
  - This has contributed to micronutrient deficiencies in India, with **one-third of children under five stunted and two-thirds anaemic**, as reported by the National Family Health Survey.
- **Declining Fertilizer Efficiency:** Crop response to fertilizers has dropped by over 80% since the 1970s, leading farmers to use more fertilizers without proportional yield increases.
  - This results in higher costs with diminishing returns.
- **Impact on Year-Round Production:** Focusing only on maximising yields may improve seasonal outputs but fails to maximise yearly outputs.
  - **Example**: Intercropping sugarcane with crops like chilli, eggplant, tomato, and coriander in Andhra Pradesh improved year-round farm income and profitability, demonstrating that overall farm success depends on multi-seasonal planning.
- **Biodiversity Loss**: High-yielding seed varieties promoted everywhere have resulted in the loss of about 1,04,000 rice varieties since the Green Revolution, undermining resilience against climate change-related events like floods, droughts, and heatwaves.
  - Declining cultivation of resilient and nutritious crops such as millets has dropped by 10 million hectares, while rice and wheat areas have increased by 13 million and 21 million hectares, respectively. This also impacts food diversity for consumers.

Key Issues and Challenges Related to India's Food Security and Affordability

Key Issues and Challenges Related to India's Food Security and Affordability

Food Insecurity and Malnutrition:

Food insecurity stems from a lack of access to affordable healthy diets. Achieving food sufficiency is essential to combat hunger.

- Adequate food does not guarantee balanced nutrition; thus, addressing malnutrition requires a transformation towards nutritionally compliant diets.

Global Hunger Statistics

As of 2023, approximately 9.4% of the global population (or 757 million people) are undernourished.

- The **African region faces the highest percentage of hunger** at 20.4%, while Asia has the largest absolute number of hungry individuals at 384.5 million.

Economic Access to Food

The cost of a healthy diet peaked at an average of 3.96 PPP dollars per person per day in 2022, with Asia averaging $4.20.

- Despite a slight decrease in those unable to afford a healthy diet globally (from 2.88 billion in 2021 to 2.83 billion in 2022), many still lack access, particularly in low-income countries

India's Food Security Scenario

In India, 63.3% of the rural population (approximately 527.4 million) cannot afford the cost of a required diet even with all income spent on food.

- There is a pressing need to transform India's agri-food system to ensure that healthy diets are available and affordable for all citizens.

Call for Action

- The theme for World Food Day emphasises the "Right to food for a better life and future," highlighting the need for universal food security.
- Establishing food banks can help reduce food waste and ensure that no one goes hungry.
  - Regions that are food sufficient should engage in humanitarian redistribution to support food-deficient areas.
- A nation claiming self-sufficiency in food must also strive to be hunger-free.
- Addressing inequalities in food distribution is critical for achieving global hunger goals by 2030, ensuring that all individuals have access to safe and nutritious food throughout the year.
- Agriculture indicators should be collaboratively defined by various ministries (Health, Agriculture, Water, Environment) rather than solely by agricultural bodies.
- Indicators should reflect nutritional output per hectare per year to ensure food systems contribute positively to health outcomes.
- Indicators like **soil biological activity**, **water-use efficiency**, and **farm biodiversity** should be mainstream.
- **Example**: The **Saagu Baagu pilot project** in Telangana uses AI to optimise water use and enhance biodiversity, providing real-time data to farmers.
- A '**Landscape Diversity Score**' should be developed to capture regional crop diversity and economic resilience through diversification strategies such as intercropping.

On The Need To Make More Containers To Boost Trade

Syllabus Mapping: GS-Paper 3, External Sector, Trade

Context

India's trade growth heavily relies on the containerized transport of goods, which has become a vital component of global trade. However, the country faces a significant logistical bottleneck due to insufficient domestic container production.

Importance of Containers

- Containers are essential for transporting goods efficiently via rail, ship, and road, making them vital to global trade.
- Containers have revolutionised trade by reducing transportation time, port delays thereby facilitating globalisation.
- **Standardised in size and cargo capacity**, containers allow goods to move over long distances without being disturbed, streamlining the supply chain.

India's Current Container Scenario

- **Increased Focus on Container Trade:** India has increased **container handling capacity** at its ports to boost exports, with major projects like the **Vadhavan** and **Galathea Bay** ports and the **India Middle East Europe Economic Corridor** centred around container trade.
  - The country's container market is expected to grow significantly from **11.4 million TEU (Twenty-Foot Equivalent Unit)** in 2023 to **26.6 million TEU by 2028**.
- **Insufficient Container Production:** India manufactures only **10,000 to 30,000 containers annually**, far short of the projected demand for rapid trade growth.
  - In contrast, **China produces 2.5 to 3 million containers** per year, dominating global container manufacturing.
  - The cost of producing a container in India is **$3,500 to $4,800**, while in China, the cost is **$2,500 to $3,500**. This price difference forces India to lease containers, mostly from China.
- **Consequences of Shortage: Freight rates** often increase due to container shortages, contributing to congestion at Indian ports.
  - Despite India's strategic location on the **East-West trade route**, Indian ports are unable to compete as **hub ports**. Ports in **Colombo**, **Dubai**, and **Hong Kong** attract mother ship traffic, while Indian ports depend on **short-distance feeder vessels**, increasing tariffs for Indian shippers.
- **External Factors Affecting Container Availability: West Asia's crises** and disruptions in the **Suez Canal** can delay voyages by 10 to 15 days, further affecting container availability.
  - **Russia-Ukraine war** has closed ports, altered routes, increased insurance costs, and raised container freight rates.
  - **Piracy** also inflates freight costs, adding to the logistical burden.

Government Measures and Recommendations

- **Current Initiatives:** The government has introduced **Make in India** initiatives to promote local production of containers, either through **Public-Private Partnerships (PPP)** or by incentivizing private manufacturers.
  - Support measures like **direct subsidies** and **viability gap funding** are being explored.
- **Suggested Measures for Improvement: Reducing charges** for repositioning and storing empty containers would help ease the shortage.
  - Increasing **container yard capacities** at Indian ports would promote trade and reduce congestion.
  - Scaling up production is crucial, but it must be done in a way that brings **costs down to global levels**.
  - Implementation of **Production Linked Incentives (PLI)**, which has been discussed but not fully executed, would further support domestic container manufacturing.
- **Raw Material and Production Incentives:** Reducing **GST on raw materials** used for container production would lower input costs, making Indian containers more competitive.
  - Offering **incentives to Indian shippers** using Indian-made containers and promoting **long-term contracts** between shippers and manufacturers would boost market confidence.

  - Mandating the use of **Indian-made containers** would increase domestic demand and encourage the growth of the container production sector.
- **Tracking and Logistics Platforms:** Developing a **tracking and tracing mechanism** for containers through the **Unified Logistics Interface Platform** and **Logistics Data Bank** can reduce the turnaround time for export containers, further alleviating shortages.

Conclusion

India's container shortage poses a major obstacle to its trade goals, but the government is working to overcome this challenge with initiatives such as Make in India and public-private partnerships (PPP).

Textile Industry Struggling to Perform Better

Syllabus Mapping: GS-Papers, Industries

Context

Recently, Union Minister for Textiles Giriraj Singh highlighted ambitious goals for India's textile and apparel sector, aiming for a total business of **$350 billion annually by 2030,** which is expected to generate **3.5 crore jobs.** However, the industry has faced significant challenges over the past two financial years, raising concerns about sustaining a **10% compound annual growth rate (CAGR).**

What is CAGR?

- It is a useful measure that represents the mean annual growth rate of an investment or business over a specified time period, assuming that profits are reinvested at the end of each period.

$$CAGR = \left[\frac{\text{Ending Value}}{\text{Starting Value}}\right]^{\frac{1}{\text{Number of Years}}} - 1$$

- CAGR is expressed as a percentage and is calculated using the following formula:
- Ending Value is the final value of the investment or business.
- Beginning Value is the initial value at the start of the period.

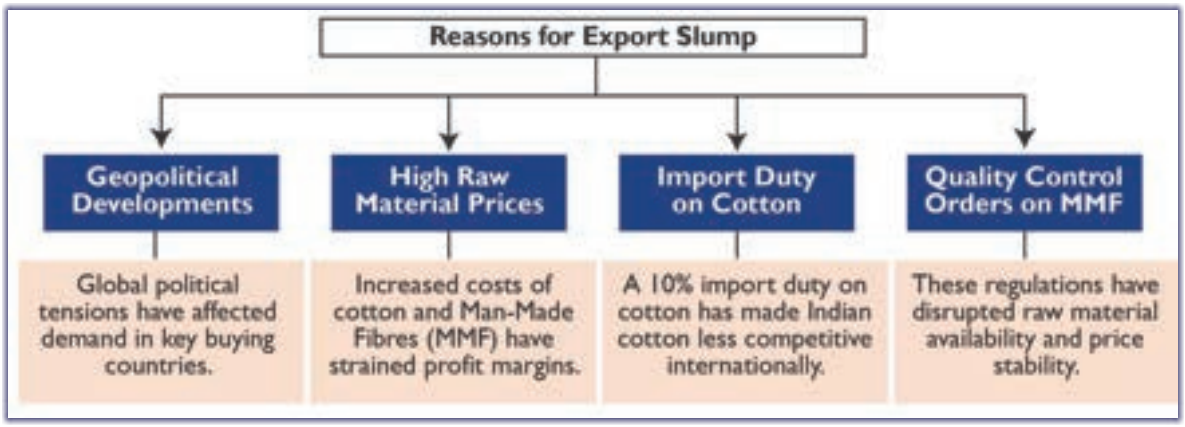
Current Status of Textile Industry

- Indian textile and apparel industry was valued at approximately **$153 billion in 2021**, with about **$110 billion** stemming from domestic business.
- In **FY22**, India ranked as the 3rd-largest textile exporter globally, holding a **5.4% share** of the market.
- The sector contributed nearly **2.3% to India's GDP in FY21** and accounted for **10.6%** of total manufacturing **Gross Value Added (GVA) in FY23.**
- **Approximately 105 million** people are employed directly and indirectly within the textile and garment units.

Challenges of Textile Industry

- The industry experienced **substantial growth in FY 2021-2022,** achieving **$43.4 billion in exports.**
- However, a slowdown in demand began in **FY 2022-2023**, worsening in FY24 due to reduced exports and domestic demand, severely impacting manufacturing clusters.
- **Example**: Tamil Nadu, known for its spinning capacity, witnessed the closure of nearly 500 textile mills over two years. In Tiruppur, a major knitwear production hub, businesses reported a 40% drop in revenue during FY23.
- **E-commerce Growth:** Direct retailing through e-commerce is becoming more prevalent among garment manufacturers, leading to increased competition.
- **Sustainability Demands**: Foreign brands are prioritising Environmental, Social, and Governance (ESG) sustainability across their supply chains.
- **Shifts in Consumer Preferences:** There is a rising demand for comfort wear, loungewear, and athleisure as consumer preferences evolve.

- **Retail Shift**: Rural and semi-urban consumers now prefer shopping in **multi-brand outlets** or **hypermarkets** rather than lesser-known brand stores.



Future Outlook

To meet the target of $350 billion by 2030, the industry aims to attract a total investment of $100 billion across various segments of the value chain. Key considerations include:

- Labour costs constitute about 10% of production expenses.
- The average daily wage for trained textile workers is approximately ₹550, while unskilled workers earn around ₹450.

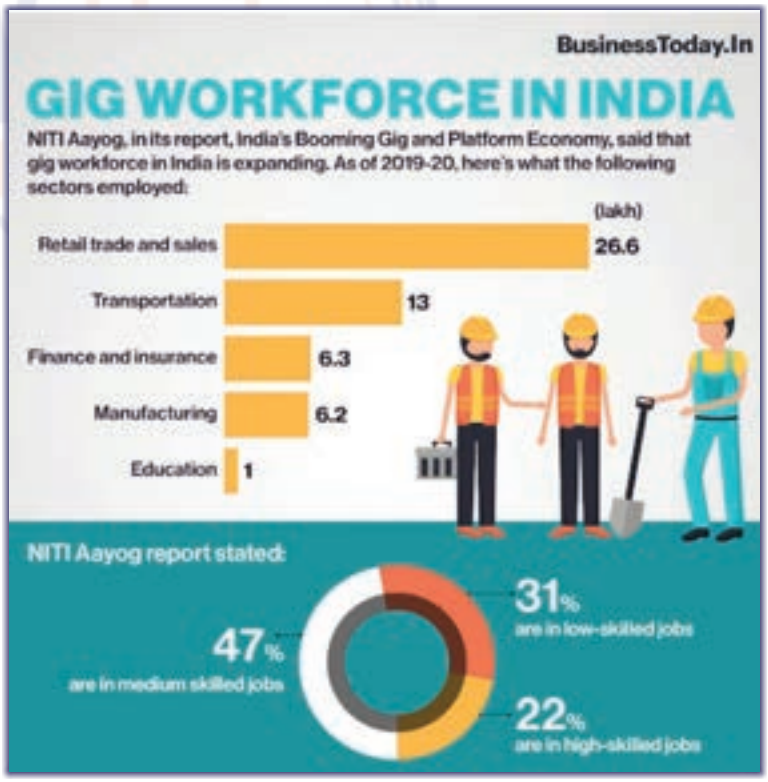
The industry recognizes the necessity of adopting technology and enhancing workforce skills to improve productivity and reduce waste.

Safeguarding Gig Workers

Syllabus Mapping: GS-Paper 3, Employment

Context

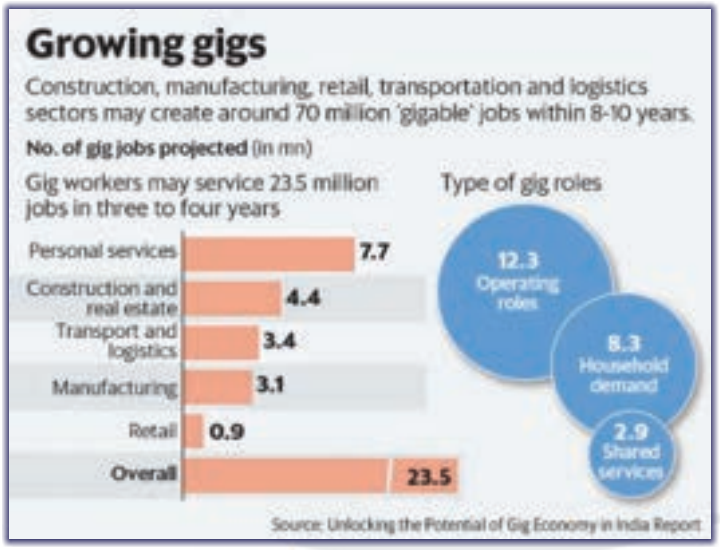
The Ministry of Labour and Employment is in the process of drafting a national law aimed at incorporating gig workers into social security schemes. This initiative is designed to provide essential benefits such as health insurance and retirement savings to a growing segment of the workforce.



Key Features of the Proposed Legislation

- **Social Security Fund:** The government plans to require aggregators (companies that facilitate gig work) to contribute 1%-2% of their revenue to create a social security fund.
  - This fund will be utilised for providing health insurance and other welfare benefits to gig workers.
- **Inclusive Definitions:** The definitions of gig and migrant workers are being revised to reflect current employment realities more accurately.
- **Welfare Board Model:** The proposed legislation will establish a welfare board that mandates:
  - Registration of all gig workers (**under the e-Shram portal through self-declaration**).
  - Aggregators must provide a 14-day notice before terminating a worker, along with valid reasons.

- Transparency in automated systems used by aggregators.
- Introduction of dispute resolution mechanisms to protect the rights of gig workers.



Current Status and Background

- **Gig Worker Population**: According to a NITI Aayog report, India's gig worker population was estimated at 7.7 million in 2020-21, projected to increase to 23.5 million by 2029-30.
- **Existing Labour Codes:** In 2019 and 2020, India enacted four new labour codes that merged 29 existing laws into four broad categories: wages, social security, industrial relations, and occupational safety.
  - The only code addressing gig workers specifically is the Social Security Code 2020, which categorises them as informal sector workers.

Challenges in Current Framework

- **Definition Issues:** Social Security Code 2020 places gig workers outside the traditional employer-employee relationship, complicating their access to benefits.
  - This categorisation allows aggregators to avoid obligations typically associated with formal employment.

- **Entitlement Discrepancies:** There is a significant difference between institutional social security (e.g., paid leave under the Maternity Benefit Act) and the limited benefits offered under social security schemes for gig workers.
  - For instance, while formal workers receive comprehensive maternity benefits, gig workers may only receive a cash benefit of ₹5,000-₹10,000.
- **Lack of Protections:** Gig workers are not covered under minimum wage protections or occupational safety regulations. They also lack access to dispute resolution mechanisms provided under the Industrial Relations Code 2020.

Core Issues and Recommendations

- **Clarify Employment Relationships:** Clearly defining the employment relationship in the gig economy is crucial.
  - Recognizing aggregators as employers would facilitate the inclusion of gig workers under existing labour codes.
- **Learn from Global Precedents:** The UK Supreme Court's ruling on Uber classified drivers as "workers," mandating compliance with labour laws.
  - Similar recognition in India could enhance protections for gig workers.
- **Avoid Separate Legislation:** Introducing separate laws for specific workforce segments undermines the goal of simplifying and rationalising labour laws.
  - Instead, integrating gig workers into existing frameworks would promote their formalisation.
- **State-Level Initiatives:** States like Rajasthan and Karnataka are already implementing policies for gig workers, including welfare funds and grievance redressal mechanisms.
  - These models can serve as blueprints for broader national policies.

Global Supply Chains

Syllabus Mapping: GS-Paper 3, External Sector, Manufacturing

Context

Global supply chains have evolved significantly over the years — from a focus on **efficiency** (just in time) to **resilience** (just in case) and now to **security** (just to be secure).

Key Instances

- **U.S. Proposed Rules on Connected Vehicle Systems**: The U.S. proposed rules to ban imports of connected vehicle systems from entities linked to China or Russia due to national security concerns over potential espionage and hijacking risks.
- **Israeli Supply Chain Attack:** Israel targeted Hezbollah's communication devices in Lebanon, resulting in over 30 deaths and thousands injured, raising concerns about the security vulnerabilities of advanced technologies.

Shift from Efficiency to Resilience to Security

India's Role in Supply Chain Security

India must take a balanced approach to ensure secure supply chains without completely banning imports or depending solely on resilience strategies.

Two-Pronged Approach for India

- **Just to be Secure (Trust but Verify and Zero Trust)**
  - **Trust but Verify**: Apply methods such as **audits**, **on-site inspections**, and establishing mechanisms to ensure compliance with **national and international security standards** for technologies used in **communications**, **transport**, or **critical infrastructure**.
  - **Zero Trust**: For the most critical technologies (used by the **Indian military**, **intelligence agencies**, or for **cutting-edge R&D**), apply a **zero-trust** model, assuming that all technologies could be compromised and enforcing stringent **checks** and **monitoring**.
- **Just in Case (Diversification and Friendshoring):** For less critical technologies, focus on **diversification of vendors** and **friendshoring** (sourcing from trusted countries) to avoid over-reliance on single suppliers and mitigate risks from supply chain disruptions.

TOPICS FOR PRELIMS

New SEBI rules for Futures and Options trading

Syllabus Mapping: Economy, Financial markets

Context

Securities & Exchange Board of India (SEBI) has released a set of new rules to regulate Futures and Options trading.

About Futures & Options:

- **Futures:**
  - **Definition**: They are **legal agreements** to buy or sell a specific commodity, asset or security at a **predetermined price** on a **specified future date**.
  - **Obligation**: In a futures contract, the buyer is **obligated to purchase** and the seller is **obligated to sell** the underlying asset at the agreed price, regardless of the market price at the expiration date.
  - **Purpose**: Commonly used for **hedging** (protecting against price fluctuations) or for **speculative purposes** (betting on future price movements) in financial markets.
  - **Underlying Assets**: Futures contracts can be based on **physical commodities** (such as oil, gold, or wheat) or **financial instruments** (including stocks, currencies, and bonds).
- **Option Contracts:**
  - **Definition**: It is a contract that gives the investor the **right, but not the obligation**, to buy or sell an asset (commodity, stock, etc.) at a **specified price** on or before a **specified future date** (expiration date).
  - They carry **limited risk and can reap either unlimited profit or loss.**
  - Advance is paid in the form of premiums in option contracts.

Changes made by SEBI under new rules

- Upfront collection of options premiums
- Intraday monitoring of position limits
- Removing calendar spread benefits on expiry day
- Increasing the contract size for index derivatives
- Rationalising weekly index derivatives to one benchmark per exchange
- Enhancing margin requirements on options expiry days

Input Tax Credit Mechanism

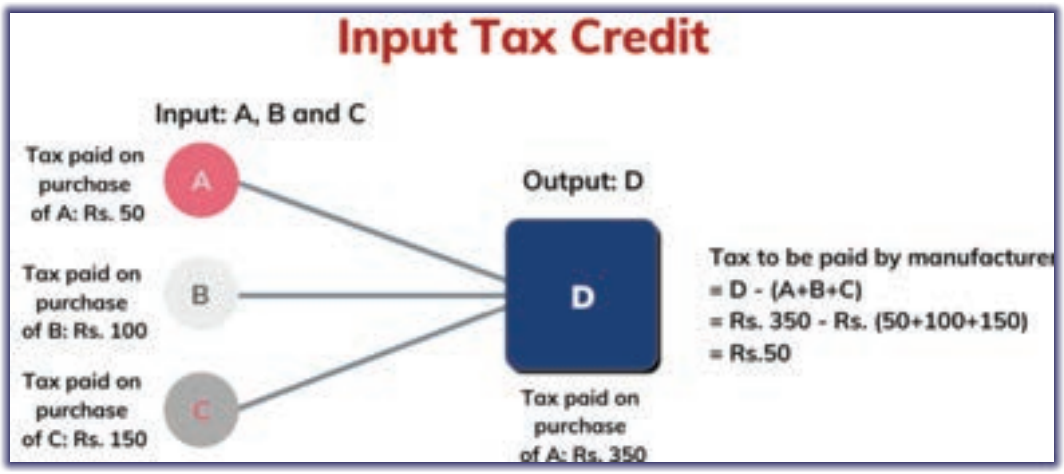
Syllabus Mapping: Economy, Taxation

Context

In a recent decision Supreme Court has allowed input tax credit (ITC) on construction expenses for buildings intended for leasing.

What is Input Tax Credit Mechanism (ITC) ?

- It is a mechanism designed to prevent the **cascading effect of taxes (tax on tax)**.
- It allows a person to deduct the tax they have already paid on the purchase of goods or services from the total tax payable on their sales.
- **Exceptions:**
  - A business under composition scheme cannot avail of input tax credit.
  - ITC cannot be claimed for personal use or for goods that are exempt.



RBI shifts its stance to Neutral

Syllabus Mapping: Economy, Money & Banking

Context

In its first meeting with **newly appointed external members,** the MPC voted **5-1** to maintain the benchmark **interest rate at 6.5%** for the 10th successive monetary policy review since April 2023.

- The committee unanimously agreed to change the policy stance from "withdrawal of accommodation" to "neutral," opening the door for potential rate cuts in future meetings.

About Monetary Policy

- It is a policy of the central bank to regulate money supply in the economy to achieve certain objectives like price stability, accelerating economic growth or exchange rate stabilisation.
- RBI uses various tools to achieve these objectives.

CONVENTIONAL MONETARY POLICY TOOLS

- **Repo rate:** It is the interest rate charged by the RBI on overnight loans given to the commercial banks under the Liquidity Adjustment Facility.
- **Standing Deposit Facility (SDF):** It is a monetary policy tool that RBI uses to absorb excess liquidity from commercial banks.
- **Liquid adjustment facility (LAF):** It is a facility provided by RBI to scheduled commercial banks to avail of liquidity in case of need or to park excess funds with RBI on an overnight basis against the collateral of government securities.
- **Cash Reserve Ratio (CRR):** The amount of money that banks must keep with the RBI as a percentage of their net demand and time liabilities (NDTL). A higher CRR reduces the funds available for banks to lend, tightening liquidity in the market.
- **Statutory Liquidity Ratio (SLR)**: The percentage of a bank's total deposits that must be invested in government securities or other approved securities. A higher SLR reduces the money available for banks to lend, limiting cash flow in the economy.

RBI's Monetary Policy stances

- **Withdrawal of Accommodation:**
  - It indicates a tightening of monetary policy where the RBI aims to reduce liquidity in the economy to control inflation.
  - Under this RBI may increase interest rates to make borrowing costlier, thereby discouraging spending and investment.
- **Neutral Stance:**
  - It signifies that the RBI is neither actively trying to stimulate the economy nor suppressing it. It allows for flexibility to adjust rates based on evolving economic conditions.
  - The RBI maintains the current interest rate while monitoring inflation and growth indicators closely.
- **Accommodative/Expansionist Stance:**
  - It aims to support economic growth by making borrowing cheaper and encouraging spending.
  - RBI lowers interest rates to boost liquidity and stimulate investment and consumption.

Unified Payment Interface (UPI)

Syllabus Mapping: Economy, Payment Systems

Context

To encourage wider adoption of the Unified Payments Interface (UPI), the RBI announced an increase in transaction limits on UPI123 and UPI Lite.

About UPI

- UPI Instant payment system developed by the NPCI, It is built over the IMPS infrastructure
- The different channels for transferring funds using UPI are:
  - Send/Collect through Virtual ID
  - Account Number + IFSC
  - Aadhaar Number
- Single mobile application for accessing different bank accounts.
- Transactions are carried out through mobile devices with two factor authentication using device binding and a UPI PIN as security.

Did You Know

- RBI has recently introduced **'Delegated Payments'** through UPI.
- This will enable a secondary user, like a spouse, to make payments via UPI by using the bank account of the primary user.
- It would enable a UPI user to set a payment limit for another user on their bank account.
- This product is expected to add to the reach of digital payments.

UPI 123 Pay

- **Developed by:** National PaymentsCorporation of India (NPCI)
- Works on both feature phones and Smartphones (**without Internet**).
- **Transaction Methods:**
  - **IVR (Interactive Voice Response):** Users can call a predefined number and follow voice prompts to complete transactions.
  - **Missed Call Approach:** Users give a missed call and receive a callback to authenticate the transaction using a UPI PIN.
  - **App-based Functionality:** A simplified UPI app for feature phones offering basic payment functions.
  - **Proximity Sound-based Payments:** Users tap their phone on a merchant device, utilising sound waves for contactless payments.
- **Transaction Limit:** Increased from ₹5,000 to ₹10,000 per transaction to enhance usability.

UPI LITE

- It is designed for small-value transactions.
- It enables quick payments (no need to connect to a bank server for each transaction).
- **Wallet Limits:** The wallet limit has been raised from ₹2,000 to ₹5,000, with a per-transaction limit of ₹1,000 (previously 500).

Protests against sale of Vizag steel plant

Syllabus Mapping: Economy, Disinvestment

Context

Regular protests are going on after the announcement of 100% strategic disinvestment of the Vizag steel plant by the Union finance Minister.

Reasons for potential sale

- **Lack of Captive Mines**:VSP has not been allotted captive iron ore or coal mines, which would have reduced operating costs. Instead, it spends an additional ₹4,000 crore annually on purchasing iron ore, which is worsening its financial condition.
- **Real Estate Potential**: VSP owns 20,000 acres of land valued at around ₹1 lakh crore. Employees allege that private buyers are more interested in this land rather than the plant's steel-making potential.

Facts

- **Top 3 steel producing countries worldwide:**
  - 1. China 2. India 3. Japan
- **Top 3 steel producing states in India:**
  - 1. Odisha 2. Chhattisgarh 3. Jharkhand

About Rashtriya Ispat Nigam Limited (RINL)

- It is the corporate entity of Visakhapatnam Steel Plant (VSP).
- It is a Navratna Company under the Ministry of Steel, Govt. of India.
- **Visakhapatnam steel plant is the only shore-based** steel making public sector unit (PSU) in the country

Modes of Disinvestment

- **Minority stake sale:** This involves selling a minority stake in a company without transferring management control. Methods for minority stake sale include:
  - Initial Public Offer (IPO)
  - Offer for Sale (OFS)
- **Strategic disinvestment:** This involves selling a substantial or entire shareholding of a company, along with transferring management control.
  - **Privatisation:** This is a type of strategic disinvestment where the government transfers its equity and management control to a private buyer.

Proceeds of Disinvestment

- The proceeds from disinvestment are channelled into the **National Investment Fund (NIF)**, which was established in 2005.
- NIF is managed by Public Sector Mutual Funds and LIC Mutual Fund Asset Management Company Ltd.
- **Utilisation of Funds:**
  - **75%** of the annual income generated from the NIF is allocated for financing selected social sector schemes aimed at promoting education, health, and employment.
  - The remaining **25%** is used for capital investments in profitable and revivable CPSEs to support their expansion and diversification efforts.

Rise in WPI Inflation

Syllabus Mapping: Economy, Inflation

Context

Inflation in India's wholesale prices ticked up to 1.84% in September from 1.31% in August, with food prices surging to a two-year high.

About Wholesale Price Index (WPI)

- WPI is a price index that measures the **average change in wholesale prices** of a basket of goods.
- The WPI is calculated by the **Office of Economic Adviser (OEA)** in the **Ministry of Commerce and Industry.**
- The WPI is typically released on a monthly basis.
- The **base year of All-India WPI** has been revised from **2004-05 to 2011-12 in 2017**.
- It **does not capture changes in the prices of services.**

Major Groups	Weightage	Articles
Primary Articles	22.6%	• **Food Articles**: Cereals, Paddy, Wheat, Pulses, Vegetables, Potato, Onion, Fruits, Milk, Eggs, Meat & Fish • **Non-Food Articles**: Oil Seeds • **Minerals** • **Crude Petroleum**
Fuel & Power	13.2%	LPG, Petrol, High-Speed Diesel
Manufactured Products	64.2%	**Manufacture of Food Products**: Vegetable And Animal Oils and Fats Manufacture of Beverages, Manufacture of Tobacco Products, Wearing Apparel, Pharmaceuticals, Medicinal Chemical and Botanical Products, and other Non-Metallic Mineral Products etc.

Difference between WPI & CPI

Feature	Wholesale Price Index (WPI)	Consumer Price Index (CPI)
Definition	Measures average changes in prices at the wholesale level for goods and services.	Measures average changes in prices at the retail level for a basket of consumer goods and services.
Released By	Office of Economic Advisor, Ministry of Commerce & Industry.	National Statistical Office (NSO), Ministry of Statistics and Programme Implementation.
Coverage	Primarily covers goods only, focusing on manufacturing inputs and intermediate goods.	Covers both goods and services, including food, housing, transportation, and medical care.
Base Year	2011-12	2012

Centre increases MSP for rabi crops

Syllabus Mapping: Agricultural pricing

Context

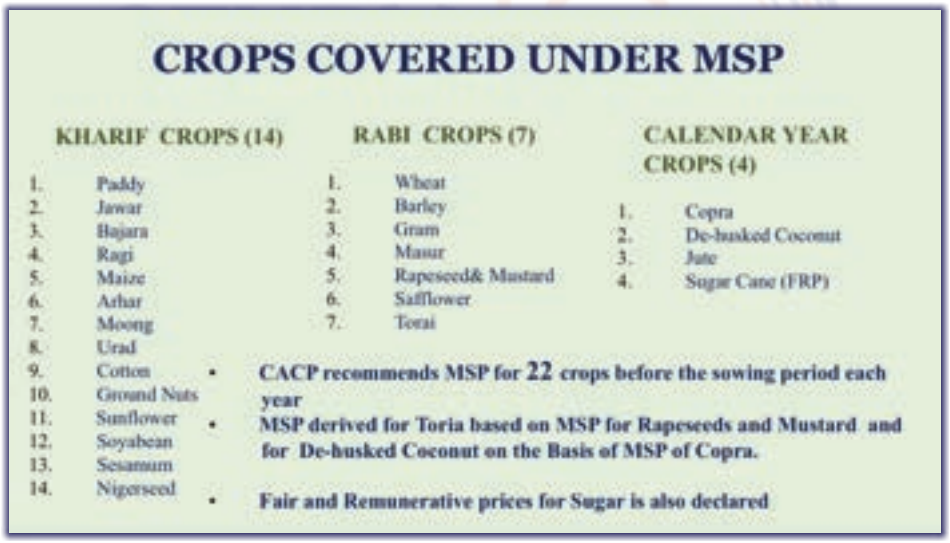
The Cabinet Committee on Economic Affairs has increased the minimum support price (MSP) for rabi crops for the next marketing season of 2025-26.

Minimum Support Price (MSP)

- MSP is a form of market intervention by the Government of India to insure agricultural producers against any sharp fall in farm prices.
- The Government sets the MSP at the start of the sowing season, based on the recommendation of the Commission for Agricultural Costs and Prices (CACP).

Process of deciding MSP

- **Recommendation**: **Commission for Agricultural Costs and Prices (CACP)**
  - Attached office under the Ministry of Agriculture and Farmers' Welfare.
  - It was established in 1965 as the Agricultural Prices Commission and was renamed in 1985.
  - **Composition:** Chairman, Member Secretary, 1 official member and 2 non-official members.
    - The non-official members are representatives of the farming community.
  - **Determinants of MSP**
    - Demand and supply
    - Cost of production
    - Price trends in the market, both domestic and international
    - Inter-crop price parity
    - Terms of trade between agriculture and non-agriculture
    - A minimum of 50 percent as the margin over cost of production
    - Likely implications of MSP on consumers of that product.
- **Decision Stage: Cabinet Committee on Economic Affairs (CCEA)**
  - It is **headed by the Prime Minister.**
  - Presently it has **11 members** including key Union Ministers like the Minister of Finance, Commerce and Industry, agriculture, and others.
  - It reviews and approves MSP levels
- Procurement is done by **Food Corporation of India (FCI)** and State agencies



Trends in Tax Collection

Syllabus Mapping: Economy, Taxation

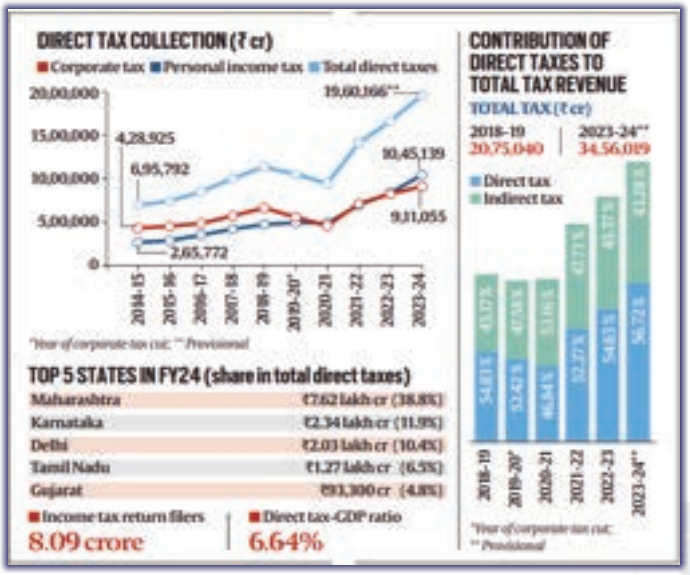
Context

According to data released by the Central Board of Direct Taxes (CBDT), the contribution of direct taxes to total tax revenue climbed to 56.72 per cent in 2023-24, the highest in 14 years.

Key highlight of the data

- In FY24, the contribution of direct taxes to total tax revenue reached 56.72%, the highest in 14 years.
- The direct tax-to-GDP ratio also hit a two-decade high of 6.64%.
- Personal income tax collections exceeded corporate tax collections for the second consecutive year.
- Tax buoyancy has increased to 2.12 in FY24, compared to 1.18 in FY23.

- The cost of tax collection dropped to 0.44% of total tax collections, the lowest since 2000-01.



Related Terms

- **Direct Tax:** It is a tax paid directly by the taxpayer to the government. In direct tax point of incidence and point of impact of a tax are the same.
  - **E.g.** Individual income tax, Corporate income tax, Capital gains tax etc.
  - Direct Taxes in India are administered by the **Central Board of Direct Taxes (CBDT).**
- **Corporate Tax:** It is a direct tax imposed by the government on the income or profits earned by a corporation.
- **Tax Buoyancy Ratio:** It is the ratio of change in tax revenue to the change in gross domestic product (GDP) of an economy. It measures how responsive a taxation policy is to growth in economic activities.
- **Tax to GDP Ratio:** It is an economic indicator that measures the proportion of a country's total tax revenue relative to its Gross Domestic Product (GDP).
  - A higher ratio indicates the government is effectively collecting more direct taxes from its citizens.

Bima Sugam Portal

Syllabus Mapping: Economy, Financial Markets

Context

Insurance Regulatory and Development Authority of India (IRDA) is going to launch Bima Sugam, a digital insurance platform.

About the Portal

- It will provide a single platform for buying, renewing and claiming both life and non-life insurance policies.
- The portal will facilitate the entire insurance journey—from policy purchase to claims settlement—digitally, reducing paperwork and time.
- It will bring together various insurance intermediaries like agents, brokers and web aggregators, allowing seamless interaction and transactions.

Insurance Regulatory and Development Authority of India (IRDA)

- It is a **statutory body** under IRDA Act, 1999 that regulates the insurance industry in India.
- **Composition:** Chairman and a maximum of 10 members. All are appointed by the Central Government.
- **Bima Trinity:** It is a three-part strategy by the IRDA to increase insurance penetration in India:
  - **Bima Sugam:** A digital platform that combines insurers and distributors into one place.
  - **Bima Vistar:** A comprehensive insurance policy that covers life, health, property and accidents.
  - **Bima Vaahaka:** A women-led field distribution force that operates at the Gram Sabha level. They educate and convince women about the benefits of insurance.

Export ban on Non-Basmati Rice lifted

Syllabus Mapping: Agriculture Exports

Context

In a recent decision the Union Government has lifted the ban on export of Non-Basmati White Rice.

Key Decisions and Changes

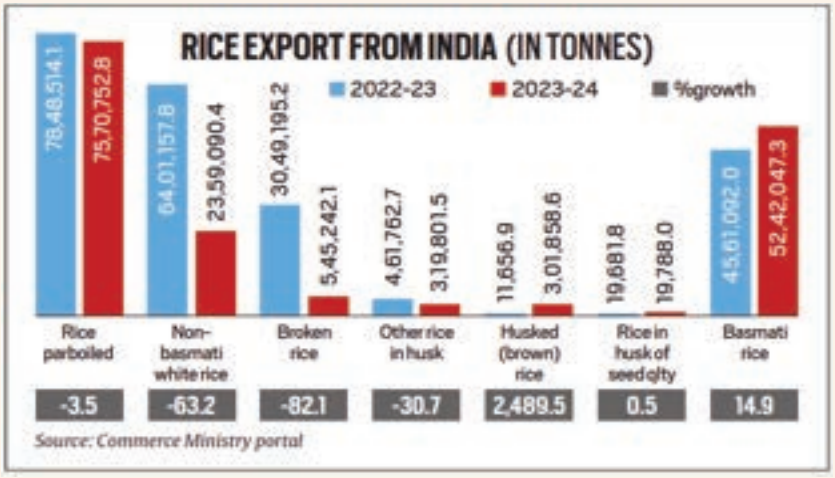
- **Export Ban Lifted:** The ban on Non-Basmati White Rice exports was removed, allowing traders to resume exports under new regulations.
- **Minimum Export Price (MEP):** An MEP of $490 per tonne is fixed for Non-Basmati White Rice exports.
- **Reduction in Export Duties:**
  - Export duty on Non-Basmati rice totally removed. It was 20% earlier.
  - The export duty on other rice categories such as brown rice & parboiled rice was halved from 20% to 10%.

Why was this decision taken ?

- **Higher Sowing Rates:** As of September 2024, the area under paddy cultivation was reported at 413.50 lakh hectares, a 2.2% increase from last year and a 3% increase from the five-year average.
- **Projected Production Increase:** India's total rice production for the 2023-24 season is estimated at 137.82 million tonnes, representing a 1.5% increase from the previous year.
- **Declining Wholesale Prices:** Wholesale prices for rice dropped to Rs 3,324.99 per quintal, down from Rs 3,597.09 in September 2024.
- **Surplus Stocks:** The Food Corporation of India reported rice stocks of 323.11 lakh tonnes as of September 1, well above buffer stock norms.

Facts

- **Production of Rice:**
  - **Worldwide Top 3 Countries:** (1) China (2) India (3) Bangladesh
  - **India Top 3 States:** (1) West Bengal (2) Uttar Pradesh (3) Punjab
    - Around 36% of India's total rice production comes from these 3 states
- **Export of Rice:**
  - **Worldwide Top 3 Countries:** (1) India (2) Thailand (3) Vietnam
    - According to USDA estimates, India accounted for 33% (17 million tonnes) of total world rice exports in 2023.
- **India's Top Rice Export Destinations:** (1) Saudi Arabia (2) Iran (3) Iraq
- **Rice Exports from India:**



DAP Shortage dampens Rabi Crop prospects

Syllabus Mapping: Agriculture, Fertilisers

Context

A shortage of di-ammonium phosphate (DAP), a crucial fertiliser needed during sowing, is negatively affecting crop production prospects for the ongoing rabi season. The shortage is due to higher global prices and inadequate government subsidies.

Types of Fertilisers

- **Urea (Nitrogen-based):**
  - Urea is the most widely used fertiliser in India, providing nitrogen (N) to plants.
  - Nitrogen is essential for vegetative growth, aiding in leaf and stem development.
  - India is one of the largest producers and consumers of urea globally.
- **Di-Ammonium Phosphate (DAP) (Phosphatic-based):**
  - DAP contains both nitrogen (18%) and phosphorus (46%), which help in early root development and the overall growth of crops. (Important for wheat and potatoes).
  - Phosphatic fertilisers are produced domestically but are heavily reliant on imported raw materials like rock phosphate and phosphoric acid.
  - India imports a significant portion of DAP, mainly from countries like **Saudi Arabia, Morocco and China.**
- **Muriate of Potash (MOP) (Potassic-based):**
  - MOP is used to supply potassium (K) to plants, improving water retention, resistance to diseases and enhancing the quality of crops.
  - India is entirely dependent on imports for potash, which is mainly sourced from countries like **Canada, Russia, and Belarus.**
- **Complex Fertilisers (NPK blends):**
  - These are fertilisers containing a balanced mix of nitrogen (N), phosphorus (P), and potassium (K), such as 12:32:16, 10:26:26, and 20:20:0:13.
  - They are used to address the combined nutrient needs of crops.

PM- PRANAM Scheme

- It stands for Programme for Restoration, Awareness, Nourishment, and Amelioration of Mother Earth. It was announced in the 2023-24 budget.
- **Aim:** To reduce chemical fertiliser consumption while promoting alternative fertilisers and sustainable practices.
- The scheme offers grants to states and union territories (UTs) that reduce their chemical fertiliser use.
- The grants are equal to **50%** of the fertiliser subsidy that the state or UT saves compared to the previous **three years**.

National Agriculture Code

Syllabus Mapping: Agriculture, Modernisation

Context

Bureau of Indian Standards (BIS) has begun the process of formulating a National Agriculture Code (NAC), on the lines of the existing National Building Code and National Electrical Code.

Proposed National Agriculture Code (NAC)

- Will cover the **entire agriculture cycle**, and contain a **guidance note for future standardisation**.
- The code will have **2 parts**:
  - General principles for all crops
  - Crop-specific standards for the likes of paddy, wheat, oilseeds, and pulses.
- Serve as a guide for farmers, agriculture universities, and officials involved in the field.
- **Objectives of National Agricultural Code**
  - Offers recommendations for agricultural practices, considering agroclimatic zones, crop types, socio-economic diversity, and all elements of the agri-food value chain.
  - Promote a quality culture in Indian agriculture by providing a reference to incorporate NAC provisions in schemes, policies, and regulations.
  - Provide farmers with a comprehensive guide for informed decision-making in agricultural practices.
  - Integrate relevant Indian Standards with recommended agricultural practices.
  - Address broader agricultural concerns such as SMART farming, sustainability, traceability, and documentation.
  - Support capacity-building programs organised by agricultural extension services and civil society organisations.

Need For NAC

Need For NAC

The Bureau of Indian Standards (BIS) is the national body responsible for setting standards across various economic sectors.

In the field of agriculture, it has already established standards for machinery such as tractors and harvesters, as well as inputs like fertilisers and pesticides.

However, there are still many areas not covered by the BIS standards.

- **Example:** There is no standard for agriculture practices like preparation of fields, micro irrigation and water use.

Standardised Agriculture Demonstration Farms (SADF)

- The BIS is also setting up SADFs at selected agricultural institutes to experiment with and implement agricultural practices and technologies according to Indian Standards.
- These farms will be **used for training officials** involved in agricultural extension, farmers, and industry representatives.
- The BIS plans to sign **Memorandums of Understanding (MoUs)** with premier agricultural institutes for the development of SADFs.
- Ten institutes have been identified, and two MoUs have already been signed, including one with **Govind Ballabh Pant University of Agriculture and Technology (GBPUAT)** in Pantnagar.
- **BIS** will **provide financial assistance for the setup of these farms**, following China's successful implementation of such initiatives.

Bureau of Indian Standards (BIS)

BIS is a statutory body given the status of national standards body and incorporated under the Bureau of Indian Standards Act, 2016.

Flags of Convenience & Shadow Fleets

Syllabus Mapping: Economy, Infrastructure

Context

The shadow fleet has gained attention due to its role in transporting sanctioned commodities like oil, from Russia after its Ukraine invasion.

About Flags of Convenience (FoCs)

- FoC refers to the practice where shipowners register their vessels in a country different from where they are owned to avoid stricter regulations, higher taxes and labour laws.
- These countries are called **flag states.** They offer more lenient legal, regulatory and financial environments, allowing shipowners to operate with fewer restrictions.
- **Common FOC Countries:** Panama, Liberia, and the Marshall Islands are among the most popular flags of convenience.

About Shadow Fleets

- It refers to a group of tanker ships that operate covertly to transport commodities, especially oil, from sanctioned countries like Russia or Iran.
- These vessels hide their true ownership, destinations and cargo origins to evade international sanctions.

National Dairy Development Board

Syllabus Mapping: Agriculture, Dairy sector

Context

The Union Minister of Cooperation inaugurated several farmer welfare activities during the Diamond Jubilee celebrations of the National Dairy Development Board.

About National Dairy Development Board (NDDB)

- It was established in **1965. (HQ- Anand, Gujrat)**
- **It became a statutory body** under the National Dairy Development Board Act of 1987.
- It is an institution of national importance.
- **Nodal Ministry:** Ministry of Fisheries, Animal Husbandry and Dairying
- It was founded by **Dr Verghese Kurien**, often called 'India's milkman'.
- **NDDB's subsidiaries** include Mother Dairy, Indian Immunologicals Ltd., Hyderabad (IIL), Indian Dairy Machinery Company Ltd, Anand (IDMC) and NDDB Dairy Services.

Facts

- India is the **world's largest** milk producer, with a production of 230.58 million tonnes in 2022-23. (25% of total world production)
- The per capita availability of milk in India is **459 grams/day,** which is higher than the global average of **323 grams/day.**
- **Top 5 states:**(1) Uttar Pradesh (2) Rajasthan (3) Madhya Pradesh (4)Gujarat (5) Andhra Pradesh.
  - They contribute over **53%** of total production.

INTERNATIONAL RELATIONS & SECURITY

TOPICS FOR MAINS

Recent Developments in Anti-Maoist Operations in Chhattisgarh

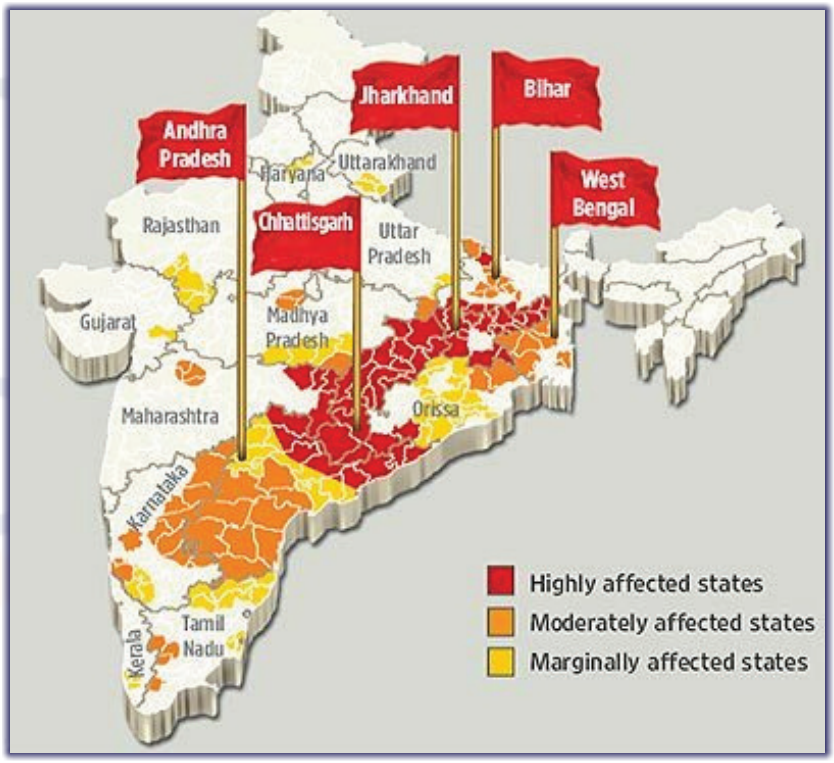
Syllabus: GS Paper 3, Internal Security, Left Wing Extremism

Context

In a significant operation against Maoist insurgents, security forces in Chhattisgarh killed 31 Maoists during a firefight on October 4, 2024, in the Abujhmad region, which is known as a stronghold for the insurgents. This encounter is noted as one of the largest in Chhattisgarh's 24-year history of anti-Naxal operations and marks a substantial blow to the Maoist movement in India.

About Left-Wing Extremism (LWE)

- **Ideological Beliefs:** Naxals are a group that adheres to political theories **influenced by** the teachings of **Chinese leader Mao Zedong**.
- **Objective**: They strongly believe that the existing **political system must be overthrown** to address social and economic discrimination.
- **Impact on Internal Security:** Violent acts committed by LWE have posed significant challenges to India's internal security, revealing weaknesses at various levels and underscoring the ongoing threat posed by Naxalism.



Origin of LWE

- Origins of Left-Wing Extremism (LWE) can be traced back to **1967** in the regions of **Naxalbari**, Phansidewa, and Khoribari in West Bengal's Darjeeling District.
- The initial uprising began as a peasant uprising and was led by Charu Majumdar, Kanu Sanyal, and Jangal Santhal, who were members of the Communist Party of India (Marxist).
- In **1969**, the **Communist Party of India (Marxist–Leninist)** was formed, two years after the initial uprising.
- Although it originated in West Bengal, the movement **spread to less-developed rural regions** of southern and eastern India, including Telangana, Andhra Pradesh, Odisha, and Chhattisgarh.
- The Communist Party of India (Marxist–Leninist) People's War Group (PWG) was founded in 1980 in Andhra Pradesh by Kondapalli Seetharamaiah and Dr. Kolluri Chiranjeevi, emerging from a split in the Andhra Committee of the CPI (M–L).
- Today, nearly all Naxal groups trace their origins to the CPI (M-L).
- The Maoist Communist Centre (MCC) was established in 1975 and later merged with the People's War Group in 2004 to form the CPI (Maoist).

Factors Contributing to the Rise of Naxalism

- **Land-Related Issues (Jal-Jungle-Jameen)**:
  - **Unfulfilled Promises of land reforms**: Incomplete land reforms and loopholes in land ceiling laws leave many individuals landless and frustrated.
  - **Unequal Access:** The haves and haves not.

  - **Tribal Dispossession:** Ineffective enforcement of tribal land rights and inadequate compensation for land acquired for development projects lead to resentment.
    - **Example**: Protests by tribal communities in Chhattisgarh's Hasdeo Arand region against coal mining activities.
- **Governance Challenges**:
  - **Neglect and Inaction**: Historical neglect of tribal needs and the absence of empowerment mechanisms for disadvantaged communities create discontent.
  - **Corruption and Brutality**:Allegations of police brutality and corruption erode trust in the government and foster feelings of alienation.
  - **Development Deficit:** Remote areas lack basic infrastructure, healthcare, and education, creating a power vacuum that Naxalites exploit.
    - **Example**: Poor infrastructure and services in Jharkhand's Naxal-affected districts.
- **Socio-Economic Inequality**:
  - **Poverty Trap:** Limited access to education, healthcare, and employment perpetuates poverty, making individuals more vulnerable to extremist ideologies.
  - **Increasing Inequality:** The widening income gap between rich and poor fuels a sense of injustice and hopelessness.
  - **Agrarian Distress:** Issues such as crushing debt, inadequate irrigation, unfair pricing of produce, and corporate interference create distress among farmers.
    - **Example**: Farmers' protests in Maharashtra and Punjab over unfair pricing and debt issues.
- **Environmental Degradation:**
  - **Resource Exploitation**: Mining and industrial activities deplete land and water resources, impacting tribal livelihoods and sparking protests.
    - **Example**: Ongoing protests by tribal communities in Odisha against the establishment of mining projects.
- **Social and Human Rights Concerns**:
  - **Human Rights Violations**: Disregard for human rights and abuses against marginalised communities create fertile ground for rebellion.
  - **Social Isolation:** Lack of integration with mainstream society exacerbates feelings of isolation and exclusion.
    - **Example**: Reports of human rights abuses by security forces in Naxal-affected regions of Bastar, Chhattisgarh.

Threats of LWE to India

- **Violent Tactics**: LWE groups aim to overthrow the government through armed violence, targeting anyone they consider an enemy, including innocent civilians. Their actions include murder, abduction, and extortion.
- **High-Profile Attacks:** They often conduct high-profile murders and kidnappings to instil fear in their opponents and the general public.
- **Political Nexus:** They establish connections with politicians to amplify their demands through political channels.
- **Tribal Support:** In regions where the government has failed to provide basic amenities, LWEs sometimes gain support from local tribal communities.
- **Impact on Tribals and Poor:** The primary victims of LWE violence are often the tribal and poor populations. The extremists do not hesitate to kill tribal members suspected of being informers.
- **Targeting Local Representatives:** They frequently target local elected officials, such as Panchayat members, to deter public participation in democratic processes.
- **Parallel Governance:** LWEs aim to create a power vacuum at the local level, establishing a parallel system of governance in areas where they have significant control.
- **Sympathy and Perception:** Despite their violent methods and rejection of religion, some sections of society sympathise with them, perceiving them as dedicated to delivering justice.
- **Tax Collection:** In areas where they exert substantial control, LWEs often levy taxes on local populations.
- **Recruit Vulnerable:** They hire vulnerable people (low literacy levels, unemployed or low income) particularly the tribals, who aren't aware of the consequences of joining such forces to build up their cadre.

- **Attacks to Acquire Ammunition and Technological Devices:** They attack the police, government and collect weapons, technological devices to fight against them on technological front.
- **Control Zones:**
  - **Liberated Areas:** Regions where LWEs hold significant control and consider themselves as having 'liberated' the area.
  - **Guerrilla Zones:** Areas where LWEs and the government have an equal footing.
  - **Base Areas:** Locations where the government maintains predominant control.

Government Approach to Naxalism

The government's strategy to address left-wing extremism is comprehensive, focusing not only on security measures but also addressing the root causes such as developmental deficit, ensuring the rights of local communities, governance improvements, and managing public perception.

Constitutional Measures:

- **Article 244:** Provides for the creation of Tribal Areas in the states, ensuring special provisions for the administration and control of these regions.
- **Article 275:** Allocates financial resources to states for the development of Scheduled Areas and Tribal Areas.
- **Fifth Schedule**: Details the governance and administrative framework for the administration of Tribal Areas in certain states.
- **Sixth Schedule**: Grants autonomy to tribal areas in Assam, Meghalaya, Tripura, and Mizoram, with provisions for self-governance and cultural preservation.

Institutional and Policy Measures:

- **Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006:** Recognises and vests forest rights to tribal communities.
- **National Tribal Policy:** Aims to address the socio-economic development of tribal communities and improve their quality of life.
- **CFR (Community Forest Rights) Recognition:** Chhattisgarh and other states have recognized CFR rights within protected areas like Kanger Ghati National Park.
- **Anti-Naxal Operations**: Establishment of specialised forces such as the CRPF's CoBRA (Commando Battalion for Resolute Action) to tackle Naxal insurgency.
- **Tribal Development Programs:** Implementation of schemes like the Tribal Sub-Plan (TSP) and the Integrated Tribal Development Projects (ITDP) for infrastructure and socio-economic development.
- **LWE Mobile Tower Project:** Improves mobile connectivity in affected regions.
- **Skill Development Initiatives:** ROSHNI and Skill India Mission offer training and job opportunities for youth.
- **Aspirational District Program:** Launched in January 2018 by the Prime Minister, aims to accelerate development in lagging districts.
- **SAMADHAN Policy:** A comprehensive strategy combining immediate and long-term solutions.

Security Measures:

- **Operation Green Hunt (2010):** Mobilised over 100,000 personnel in Naxal-affected areas.It led to Significant reduction in Naxal-affected districts from 223 in 2010 to 90 by 2021.
- **Specialised forces:** Black Panther and Bastariya Battalions, staffed with local tribal personnel, target Naxalite activities.

Policy Measures:

- **National Policy and Action Plan (2015):** Implements a multi-faceted approach integrating security, development and rights.
- **Infrastructure development**: Enhances road connectivity through RRP-I & II projects.

Fiscal Measures:

- **Security Related Expenditure (SRE):** Like the Government of India provides ex-gratia payment of Rs.1 lakh to the family of civilians killed and Rs. 3 lakh to family of security personnel killed due to naxal attacks
- **Monitoring Naxalite Funding:** Multidisciplinary teams track and disrupt financial flows to Maoists.

Technological Measures:

- **National Technical Research Organization (NTRO):** Supplies unmanned aerial vehicles (UAVs) for anti-Naxal operations.

- **Improved Intelligence Gathering**: Enhances technical intelligence to support counterinsurgency efforts.

Rights and Entitlements:

  - **Forest Rights Act (FRA)**: Addresses land rights grievances by ensuring benefits reach eligible individuals.

Case Studies in Addressing Naxalism

- **Victim Register Initiative:** Chhattisgarh aims to implement a Victim Register to document those affected by violence in Bastar Region.
  - Victims' register has been successfully used in more than a dozen countries for conflict resolution, notably in Colombia's left-wing extremism insurgency.
  - The Proposed Victim Register will register the victims of all kinds of violence in the region - State, Left Wing and even those by vigilante Salwa Judum.
- **Saranda model (2011):** Socio-economic development and infrastructure. Like Development of roads and administrative offices; provision of subsidised food under PDS; job creation under MGNREGA.
- **Greyhound Model (1989)**: Focus on Integrated counter-Naxal strategy with development.
  - Established the Greyhound squad; improved infrastructure; implemented effective surrender and rehabilitation policies which led to successful reduction of Naxal activities in Andhra Pradesh.
- **Surrender and Rehabilitation Policy**: Reintegration of former Naxalites.
  - Provided financial assistance, vocational training, and social support to ex-Naxalites.
  - **E.g.**, Tailored policies in Maharashtra and Odisha have contributed to reduced insurgent activities.
- **Salwa Judum**: Peace Force, was initiated by villagers who were frustrated with Naxal interference in their local tendu leaf trade.
  - This initiative recruited local tribals and former Naxalites, appointing them as Special Police Officers (SPOs).
  - However, the Supreme Court declared it as illegal and unconstitutional.

Factors Related to Decline of Maoist Influence

The setbacks faced by the Maoists are attributed to several factors:

- **Waning Tribal Support:** The Maoists have faced **fatigue and alienation** from these tribal communities after years of exposing them to violence and conflict.
- **Overdependence on Militarism:** Indian Maoists have overly relied on militarism, focusing on violence rather than **political-ideological work**, which has driven away potential supporters, particularly among poor tribal populations.
- **Anachronistic Ideology:** Maoists cling to an outdated **Maoist ideology**, unsuitable for the modern context of India, which is vastly different from **1920s China**, where Maoism first emerged.
- **Anti-Terror Operations**: A series of anti-terror operations have been conducted by security forces, leading to significant losses for Maoist groups.
  - **Example**: A recent operation resulted in the death of 31 Naxalite rebels in Chhattisgarh
- **Neglect of Democratic Opportunities:** The Maoists have failed to recognize the strength and **resilience of India's democratic institutions** and have neglected the opportunities available within the Indian democratic system, despite its imperfections.

Pathways to Peace

- **Prioritise Dialogue:** Focus on facilitating dialogue between the Meitei and Kuki communities rather than relying solely on military intervention.
- **Community-Led Solutions:** Solutions must arise from within the communities themselves, supported by other ethnic groups in Manipur.
- **Formation of Peace Committees:** Create a peace committee that includes representatives from all communities except Meiteis and Kukis to ensure objectivity and inclusivity.
- **Role of Civil Society Organizations:** Local civil society organisations should work towards rebuilding trust between communities and conduct awareness programs to combat misinformation.
- **Government Support for Trust-Building:** The state government should provide financial assistance and security for community-led peace efforts.
- **Engagement with Youth:** Central government should explore educational opportunities for affected youths to prevent them from joining insurgent groups or engaging in illicit activities.

- **Special Relief Packages:** Targeted relief packages should be developed for displaced individuals, focusing particularly on women and children affected by the conflict.
- **Regulating Borders:** To combat drug trafficking and prevent instability linked to Myanmar's conflicts, regulating the porous India-Myanmar border is essential through selective fencing and increased manpower at Integrated Check Posts (ICPs).

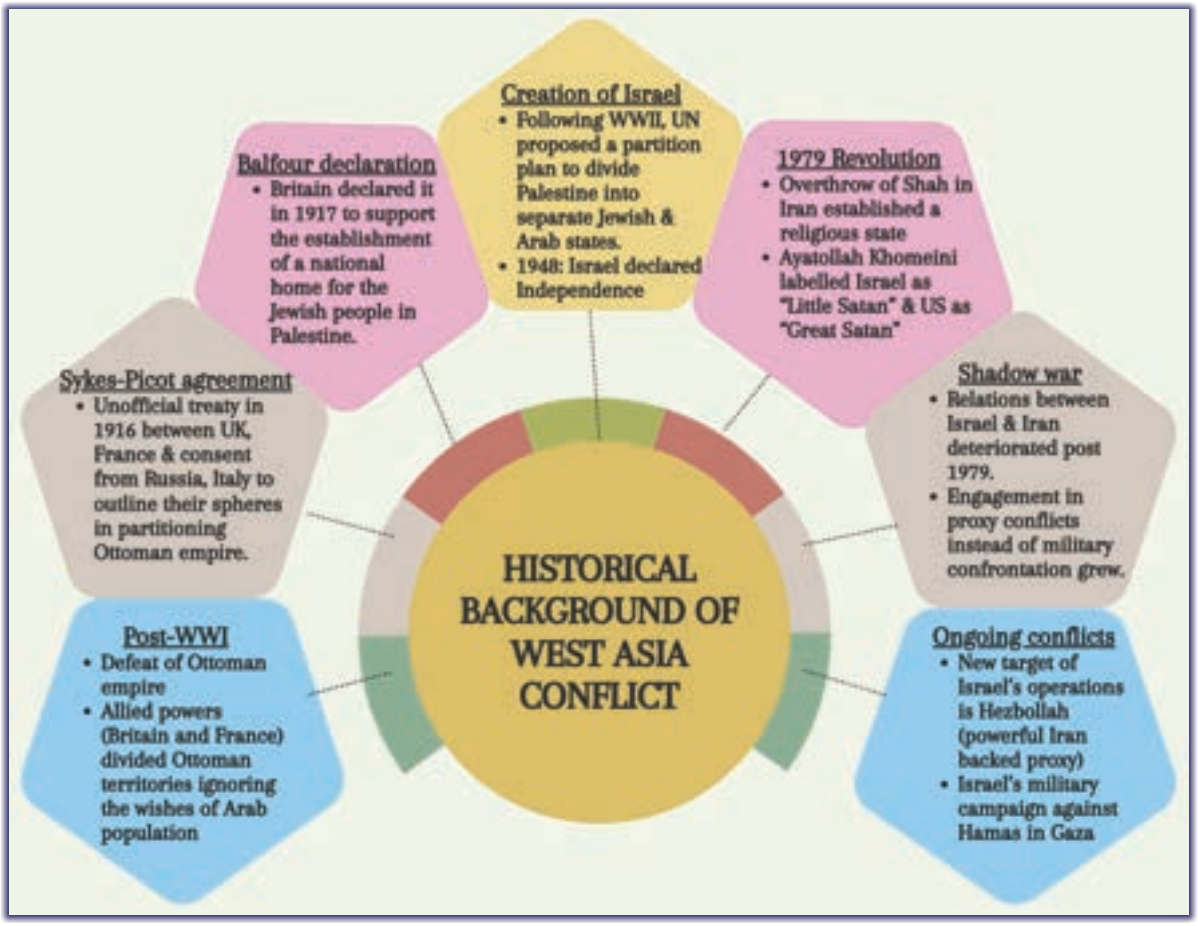
West Asia Conflict

Syllabus Mapping: GS-2, IR, Extended Neighbourhood

Context

As the conflict in West Asia enters a new and precarious phase, Iran launched a substantial missile attack on Israel overnight.

Roots of the Present Conflict



Implications of West-Asia conflict

Global

- **Food Insecurity:** Around 17.6 million people in West Asia face food and nutritional insecurity.
- **Displacement:** As of 2024, about 18.2 million people in West Asia require humanitarian assistance and 4.5 million are displaced individuals.
- **Refugees**: The region hosts about 11.9 million refugees and asylum seekers, with Turkey hosting the largest number at 3.7 million.
- **Trade Disruptions:** Hezbollah's ties with Houthi rebels in Yemen, who are responsible for attacks on ships in the Red Sea disrupt trade.
- **High logistics cost:** Disruptions in key shipping routes through the Suez Canal and Red Sea have forced vessels to take longer routes via the Cape of Good Hope.

Domestic

- **Disruption of trade routes:** Has affected India's trade with Europe, the US, Africa, and West Asia which amounted to over $400 billion in trade in FY23 (as per Global Trade Research Initiative).
- **Increased logistics cost**: Ships diverted around Cape of Good Hope have increased shipping cost by 15-20%, impacting India's export profitability.
- **Decline in Exports:** India's petroleum exports dropped 38% in August 2024 due to rising freight costs and shrinking margins.
- **Economic Corridor at Risk:** The conflict threatens to derail the recently launched India-Middle East-Europe Economic Corridor (IMEC).

India-Middle East Economic Corridor (IMEC)

- **About**: The India-Middle East-Europe Economic Corridor (IMEC) is a strategic trade and connectivity initiative linking Asia, Europe via Railroad, Ship-to-Rail networks.
- **Signatories:** India, the US, Saudi Arabia, UAE, the European Union, Italy, France, and Germany.
- **Connectivity**:
  - **India**: Mundra, Kandla (Gujarat), and Jawaharlal Nehru Port Trust (Navi Mumbai).
  - **Middle East**: Fujairah, Jebel Ali, and Abu Dhabi (UAE); Dammam and Ras Al Khair (Saudi Arabia).
    - A railway line will link Fujairah (UAE) to Haifa (Israel) via Saudi Arabia (Ghuwaifat, Haradh) and Jordan.
  - **Israel**: Haifa.
  - **Europe**: Piraeus (Greece), Messina (South Italy), and Marseille (France).

Proposals to address the conflict

- **Ceasefire:** Calls for immediate ceasefire agreements to halt hostilities.
  - **Brokered Ceasefire**: Brokered by regional actors such as Egypt and Qatar during periods of intense conflict.
- **Mediation:** Russia proposed a West Asia Peace Conference to focus on a two-state solution, emphasising the need for credible engagement with both Palestinians and Israelis.
- **Two-State Solution:** The UN and Arab League, advocate for a two-state solution where Israel and Palestine coexist as independent sovereign states.
- **Addressing Core Issues:** Efforts to address fundamental issues like land disputes, resource access, and refugee rights are essential for long-term stability.
  - **Human Rights Compliance:** Ensuring both parties respect international humanitarian law and human rights standards, with accountability for violations through mechanisms like ICC investigations.

- **People-to-People Initiatives:** Initiatives like Seeds of Peace and OneVoice promote cooperation through joint business, educational, and cultural projects.
- **Regional Cooperation:** Arab Peace Initiative offers normalisation of relations between Israel and Arab states in exchange for a comprehensive peace agreement with Palestinians.

India- Maldives Relations

Syllabus Mapping: GS-2, IR, Neighbourhood

Context

Maldives President Mohamed Muizzu arrived in New Delhi on a state visit to India, with the agenda focused on addressing his country's economic crisis and seeking Indian support for easing its financial burden.

This visit marks a thaw in India-Maldives relations as we know after President Muizzu got elected as he called for an India-Out Campaign. The increasing warmness towards India is being attributed to increasing economic distress, underwhelming support from China and assured support from India. Improvement of relations between India and Maldives will allow India to improve relations across the political spectrum.

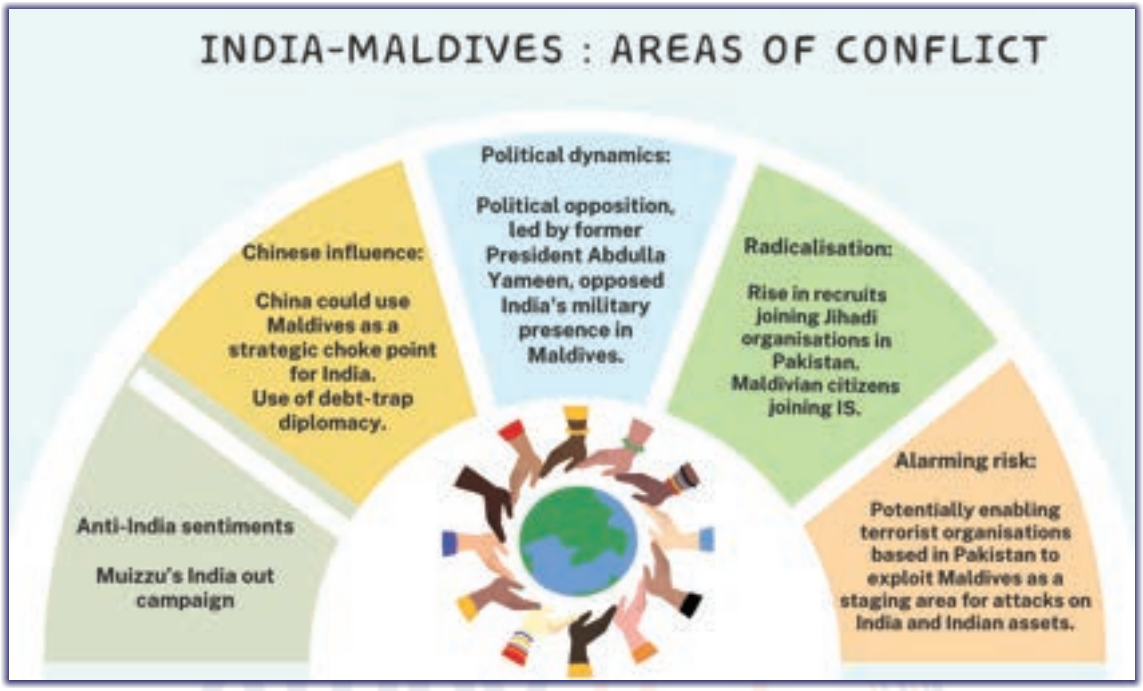
Quote

- External affairs minister **S.Jaishankar** remarked that India's relations with Maldives rest on the **twin important pillars** of **'mutual interests'** and **'reciprocal sensitivity'.**
- PM Narendra Modi stated, **"India attaches the highest importance to its relationship with the Maldives."**

Significance of Maldives for India

- **Trade:** In 2021, India became the Maldives' third-largest trading partner.
  - **Eg:** Bilateral trade stands at **US $ 290.27 million.**
- **Maritime:** The strategic location of the Maldives in the Indian Ocean, instils the two countries to regularly conduct **joint naval exercises.**
  - **Eg**: Exercises like **Dosti and Ekatha series**
- **Tourism sector:** In 2019, India was the **2nd largest** source of tourist arrivals in Maldives **(23%** market share)
- **Geographical Location:** Maldives is strategically located in the **gateway between** the choke points of **Western (Gulf of Aden and the Strait ofHormuz) and Eastern (Strait ofMalacca) Indian Ocean.**

- **Economic Significance**: More than **97% of India's total international trade by volume and 75% by value** passes through this region.
- **Strategic Significance**: China is rapidly undertaking naval expansion into the Indian Ocean.
  - **Eg:** Maldives is a party to **(SAARC) and the South Asia Subregional Economic Cooperation (SASEC)**
- **Indian Diaspora**:There are numerous Indians employed in the **Maldives' education and medical care** systems, as well as in the **tourism and hospitality sector.**



Ways forward for India-Maldives relations

- **Enhanced Economic Cooperation:** Continue supporting and investing in significant infrastructure projects.
  - **E.g.: Greater Male Connectivity Project, Covid aid by providing $150 million currency swap** support.
- **Joint Tourism Campaigns:** Launch collaborative tourism campaigns to attract more tourists from India to the Maldives and vice versa, highlighting cultural and natural attraction.
  - **E.g.:** Collaborating for the **promotion of YOGA,** India's dictum of **Vasudhaiva Kutumbakam**, **Growth for all** etc.
- **Diplomatic Engagement:** Facilitate regular high-level visits and dialogues between Indian and Maldivian leaders to discuss bilateral issues and deepen mutual understanding.
  - **E.g.: UTF harbour** agreement to develop the UTF harbour in 2021.

India-ASEAN Relations

Syllabus Mapping: GS-2, IR, Extended Neighbourhood, Regional Groupings

Context

The 21st India-ASEAN summit was held in Vientiane, Lao PDR.

About Association of Southeast Nations (ASEAN)

- **Established**: On **8 August 1967** by **ASEAN Declaration (Bangkok Declaration)**
- **Members:**
  - **Founding:** Indonesia, Malaysia, Philippines, Singapore and Thailand.
  - **Current Members (10)**: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam.
    - **India is not a member.**

- **Motto:** "One Vision, One Identity, One Community".
- **Objective**: To accelerate economic growth, social progress and cultural development through joint endeavours in the spirit of equality and partnership in order to strengthen the foundation for a prosperous and peaceful community of Southeast Asian Nations.
- **ASEAN Summit**: It is the **highest policy-making body** in ASEAN comprising the Head of States or Government of ASEAN Member States. It is **headed by a chair—a position that rotates annually** among member states—and is assisted by a secretariat based in **Jakarta, Indonesia**.
- **Institutional mechanisms for engaging ASEAN**
  - **ASEAN-India Summit**: This is at the apex and is an annual summit.
  - **ASEAN-India Foreign Ministers Meeting**: It supports the ASEAN-India Summits by meetings at the Foreign Minister level.
  - **ASEAN-India Ministerial**: Here, Indian line ministries interact with their ASEAN counterparts through sector-specific dialogue mechanisms. Some of the important sectoral bodies are business and trade, energy, education, etc.
  - **ASEAN-India Senior Officials Meeting**: It is an annual Secretary level meeting, co-chaired by Secretary (East) from the Indian side and counterpart Secretary from the Country Coordinator from the ASEAN side.

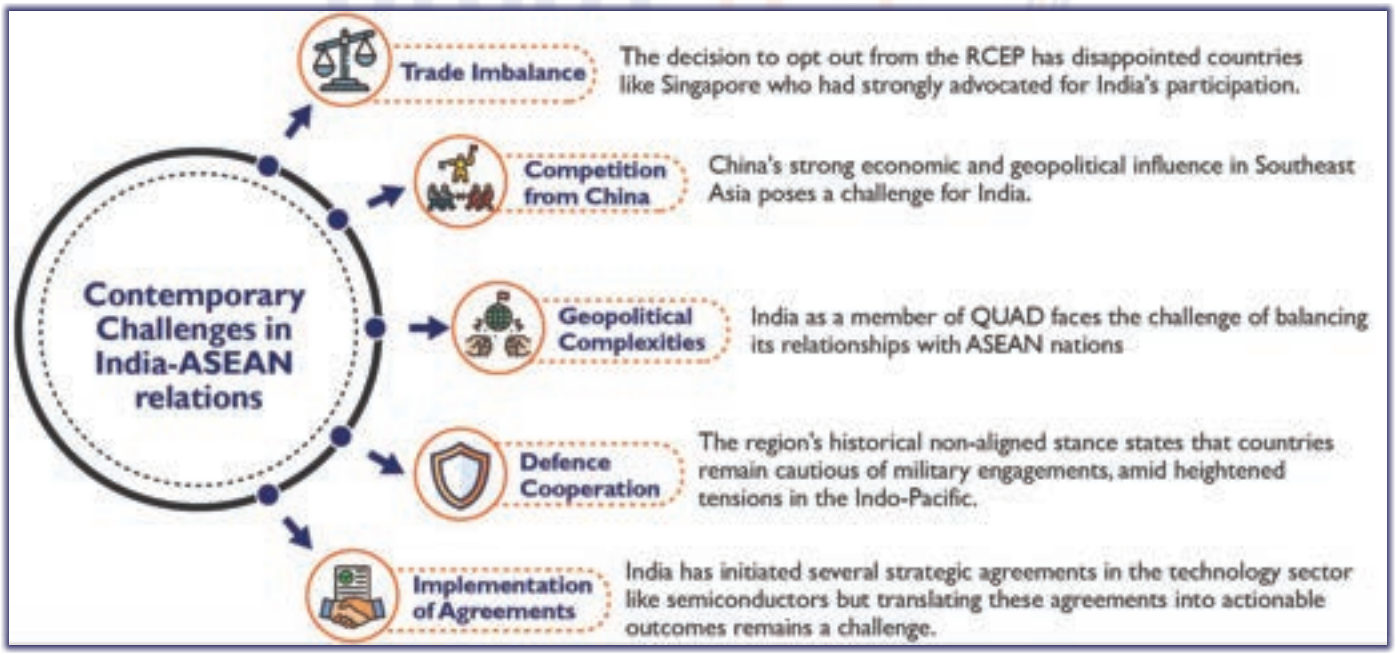
India and ASEAN Relations

Economic Engagements

- **Bilateral Trade**: **India's trade with ASEAN** has nearly **doubled**, crossing **USD 130 billion**.
- **Investment**: FDI inflows from India into ASEAN experienced an increase from US$ 2.04 billion in 2022 to US$ 5.63 billion in 2023.
- **The Framework Agreement on Comprehensive Economic Cooperation (CECA)**: **Free trade agreement between India and ASEAN** that aims to eliminate tariffs on most goods traded.
  - **Eg: The India-ASEAN Agreement on Investments (AII)**: The AII was signed in 2016 and came into force in 2022. It is an agreement between India and ASEAN that aims to **promote and protect investments between the two regions.**

Defence & Security

- India and ASEAN conducted their inaugural **ASEAN-India Maritime Exercise** (AIME) from **May, 2023**.
- India has bilateral exercises with individual countries like **SIMBEX, CORPAT.**
- India and ASEAN agreed to strengthen cooperation in Maritime security, Counter-terrorism, Cybersecurity, Military medicine, Transnational crime and Peacekeeping operations



Socio-Cultural Cooperation

- Cooperation in education, health, biodiversity, and climate change are supported by the ASEAN-India Fund and the **ASEAN-India Green Fund.**
- **ASEAN Integration Initiative (IAI):** India actively contributes to the Initiative for ASEAN Integration (IAI) by implementing projects such as Scholarships for students from CLMV countries for two-year Masters programs at Nalanda University.
- Commemorative events like the **ASEAN-India Artist Camp 2022** and **ASEAN-India Music Festival** marked the 30th anniversary of ASEAN-India relations.

10 Point plan announced for India-ASEAN Relations

- **ASEAN-India Year of Tourism (2025):** India announced USD 5 million to support joint tourism activities, marking 2025 as the ASEAN-India Year of Tourism.
- **Celebrating a Decade of Act East Policy**: India will organise multiple **people-centric activities** like musical festival, Youth summit, hackathons, start-up festival, etc.
- **Women Scientists Conclave**: **ASEAN-India Women Scientists Conclave** will be organised under the **ASEAN-India Science and Technology Development Fund**.
- **Scholarships for ASEAN Students**:
  - India plans to **double the scholarships** at **Nalanda University** and offer new scholarships for ASEAN students in **Agricultural Universities** in India.
- **Trade Review**: The **ASEAN-India Trade in Goods Agreement** will be reviewed by **2025** to enhance trade cooperation.
- **Disaster Resilience**: India pledged **USD 5 million** to enhance **disaster resilience** across ASEAN nations.
- **Health Ministers' Track**: A new initiative to build **health resilience** with regular meetings of ASEAN-India Health Ministers.
- **Cyber Policy Dialogue**: India will initiate a regular **ASEAN-India Cyber Policy Dialogue** to strengthen **digital and cyber resilience**.
- **Green Hydrogen Workshop**: India will host a **workshop on green hydrogen**, reflecting a commitment to clean energy cooperation.
- **Climate Resilience Initiative**: Prime Minister Modi invited ASEAN leaders to join India's **'Plant a Tree for Mother' campaign** aimed at building climate resilience.

Way forward

- **New Priority Areas**: Both sides identified **resilient supply chains, food security, energy security, health and financial stability** as priority areas of cooperation in the latest ASEAN Economic Ministers - India Consultation in August, 2023.
- **Digital Economy**: ASEAN is one of the fastest growing digital economy regions in the world. India has a role to play with a burgeoning start-up sector and a digitally proficient human capital base.
- **Humanitarian and Disaster Relief Cooperation**: Collaborative efforts in disaster relief and humanitarian assistance can enhance mutual trust and goodwill.

India-China Agreement over Patrolling Arranagements along the LAC

Syllabus Mapping : GS-Paper 2 & 3, Security, IR, Neighbourhood, Border Security

Context

India and China have recently agreed on "patrolling arrangements" along the Line of Actual Control (LAC) to disengage and resolve issues that emerged in 2020. This is seen as a step toward de-escalating tensions at the border.

Before this India & China mutually agreed to resolve other flash points such as Pangong Tso, Gogra and Hot Springs in the LAC.

Key Points of the Agreement

- Restoration of patrolling rights in the **Depsang Plains (PP 10-13)** and **Charding nullah in Demchok**.
- Patrolling and grazing activities will resume as per the pre-May 2020 status, specifically in Demchok and Depsang.
- Areas like Galwan Valley and Pangong Tso, which previously saw friction, remain outside current negotiations.

India-China border dispute (sector-wise)

- **Western Sector:** The Aksai Chin region is a territorial dispute where both countries claim it as part of their own territory.
- **Middle Sector:** China stakes claim over an area in Uttarakhand, creating a border dispute.
- **Eastern Sector:** The McMahon Line, the boundary between India and Tibet, is disputed by China.
- **Johnson Line vs. McDonald Line:** India and China hold different positions on the demarcation of the border.

About Border Dispute with China

- There is no mutually agreed **Line of Actual Control (LAC).**

LAC is divided into three sectors:

  - **Western sector (Ladakh)**,
  - **Middle Sector (Himachal Pradesh and Uttarakhand)**
  - **Eastern Sector (Arunachal Pradesh and Sikkim)**
  - Certain areas along the LAC that are **areas of differing perception**.

- It is part of the **Chinese Salami Slicing tactic or Cabbage strategy.**
  - It is a strategy of **acquiring new territories, at the expense of its neighbours.**

Impact of the border standoff

- Military standoff in the Ladakh region
- Shadow over economic ties

Article 4 of the India-China border Pact 2005, guides troops to avoid escalation, exercise restraint, and refrain from marking spots.

Disengagement Process and Troop De-Stationing

- The agreement is expected to initiate disengagement in regions with approximately 50,000-60,000 troops from both sides.
- The process is focused on disengagement, then moving to de-escalation and de-induction.

Implications of the Agreement

- **De-escalation of Tensions:** Reducing tensions in India-China border areas with a heavy military presence, potentially preventing clashes similar to those that occurred in Galwan Valley in 2020.
- **Restoration of Diplomatic Relations:** Successful implementation could pave the way for improved economic ties and higher-level diplomatic engagements between India and China.
- **India's diplomatic strength:** India adopted a very vocal opposition to China's aggressiveness in the LAC areas. India banned Chinese tech companies like Tiktok, imposed tough investment conditions on Chinese companies and also stalled Chinese projects under the Belt & Road Initiative. At the same time, India invested quickly in boosting conventional border security along the LAC.
- **Economic relations:** India's dependence on Chinese supply chains is a critical concern. Economic Survey 2023-24 highlights the need for easing of economic trade and investment ties between the two countries to boost India's economic growth.
- **Geopolitical implications:** As the incoming US President Donald Trump is expected to take an increasing hawkish stance towards China, China aims to normalise relations with India to prevent future conflict with India.

Cautionary Notes

- Despite positive developments, there are concerns regarding trust and verification. Indian readout from the Modi-Xi meeting emphasised complete disengagement, while the Chinese statement focused on general progress without specific commitments.
- There are apprehensions about how effectively both sides will adhere to the terms of the agreement, given historical tensions and mutual suspicion.
- Some structural concerns:
  - **China's Middle Kingdom Syndrome:** China believes that it is the middle kingdom and is the automatic leader in the world. China considers India as a regional second power.

- **Increasing asymmetry between the two countries:** China's GDP is about 5 times that of India. China's defence budget and capabilities are also disproportionate as compared to India which gives China an edge over India.
- **China's stance towards India:** China continues to support Pakistan. China has also blocked proposals from India to ban terrorist by the UN Security Council. China has also blocked India's attempts at permanent membership of the UN Security Council and Nuclear Supplier's Group, all reflecting lack of support for India on India's core interests.
- **India's growing closeness to US:** The world is returning to a Cold War like scenario wherein the deepening alliance between China-Russia-North Korea-Iran have emerged as challengers to the status of global powers led by USA. India has adopted an increasing convergence with the USA on geopolitical issues reflecting growing distrust.

Issue of Chagos Archipelago & Indian Ocean

Syllabus Mapping: GS-Paper 2 & 3, IR, Security, Neighbourhood

Context

The recent agreement between the United Kingdom and Mauritius to transfer sovereignty over the Chagos Archipelago marks a significant shift in international relations and maritime geopolitics, particularly in the Indian Ocean region. (IOR)

History of dispute over Chagos Archipelago

- Chagos Archipelago is a group of 58 islands in the Indian Ocean.
- **Location:** 500 km to the South of Maldives archipelago in the Indian ocean.
- Chagos Archipelago was detached from Mauritius in 1965 to create the British Indian Ocean Territory.
- Mauritius gained independence from Britain in 1968, and has consistently maintained its claim over the Chagos Islands.
- About 2,000 residents were displaced to facilitate the military base which has been widely criticised as colonial injustice.
- **In 2019, the International Court of Justice (ICJ)** dismissed the UK's right to govern the Chagos Islands and called on its government to withdraw from the archipelago.'
- The recent agreement is seen as a culmination of decades of advocacy by Mauritius and international pressure, including rulings from the International Court of Justice (ICJ) and resolutions from UNGA.

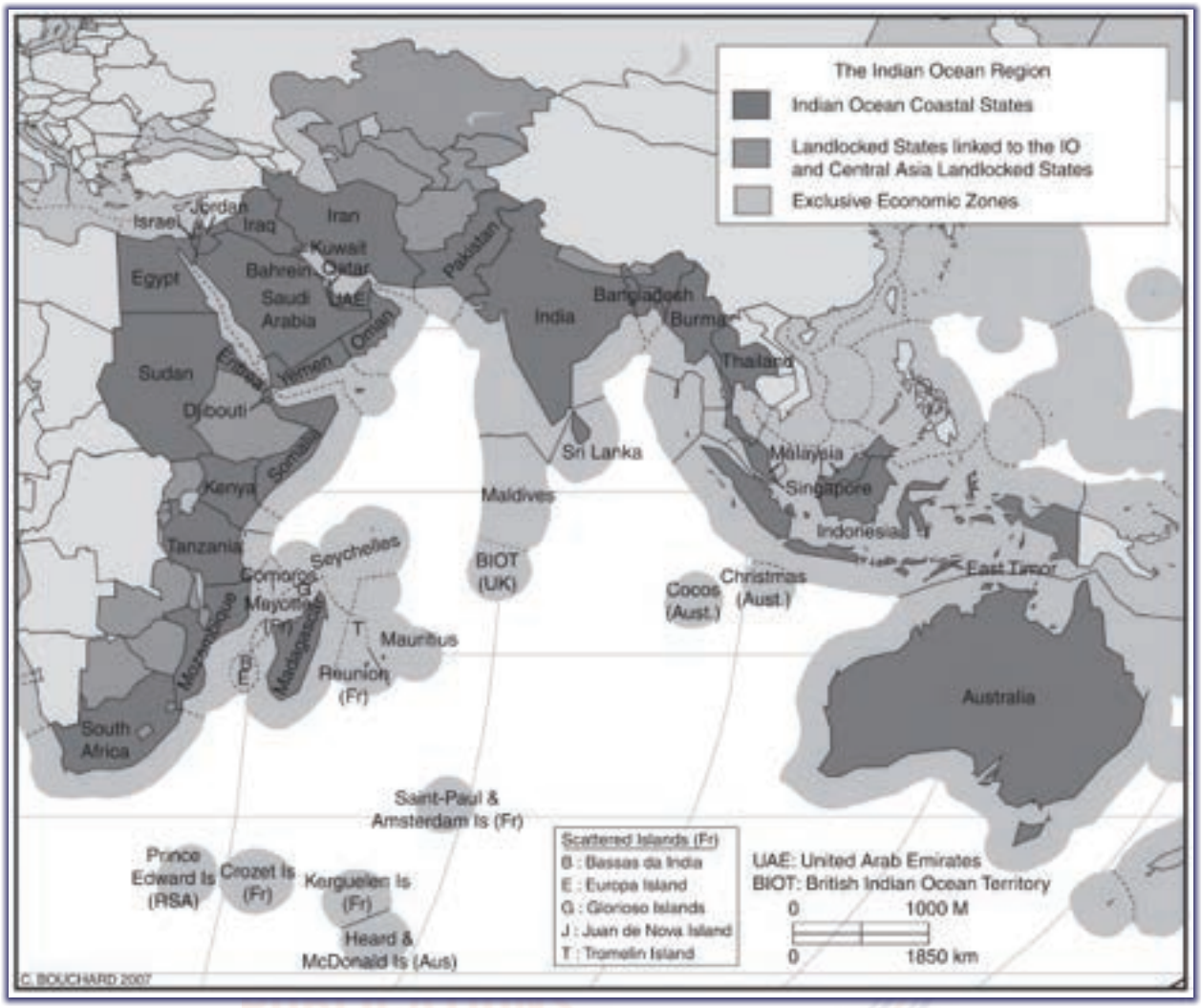
About the agreement UK-Mauritius Agreement over Chagos

- UK has ceded claims over the islands of Chagos. Now, Mauritius is free to implement the programme of resettlement on the islands of Chagos other than Diego Garcia.
- The military base at Diego Garcia will remain operational on an initial lease of 99 years.
  - UK will still have sovereign rights over Diego Garcia.

Significance of Chagos archipelago:

- **Strategic location:** Britain retained sovereignty over Chagos and signed a strategic agreement with the USA in 1966 for defence purposes.
  - Diego Garcia became an operational military base in 1986.
- **USA's presence in the region:** The archipelago maintains US presence in the Indian Ocean which is critical especially in the ongoing situation in West Asia.
- **Global Choke Point:** The island is also crucial for the USA as an outpost to monitor Malacca Strait, a global choke point vital to China.

Indian Ocean Region (IOR)



Key Factors Highlighting IOR's Significance for India

- **Trade Importance**: **70% of India's oil imports** are channelled through IOR, utilising various ports.
  - The vast majority of India's international trade relies on maritime routes.

Challenges Associated with IOR

- **Geopolitical competition:** IOR is a hotspot for geopolitical competition involving strategic interests and access to resources culminating in potential conflicts.
  - Eg: Escalated tensions between **China-Japan, China-US, and China-ASEAN** in the South China Sea.
- **China's militarization move:** China's increasing military presence in the region, including building military bases and providing military assistance to India's neighbours.
  - Eg: **Hambantota port in Sri Lanka and the Kyaukpyu port in Myanmar.**
- **Drug trafficking:** IOR contains infamous drug production areas known as the **Golden Crescent and the Golden Triangle.**
- **Maritime Monitoring Challenges:** India faces challenges in monitoring maritime activities due to its extensive coastline and around 200,000 fishing boats, and 4 million fishermen.
- **Adversarial Exploitation:** The vast maritime activity can be exploited by adversaries to launch attacks on land, as seen in events like the 26/11 terrorist acts.
- **Illegal Fishing Concerns:** A **World Wildlife Fund report** highlighted that 87% of surveyed fish stocks in the Western and Eastern Indian Ocean are exposed to high levels of illegal, unreported, and unregulated (IUU) fishing

- **Resource Dependence**: India's **fishing and aquaculture sectors**, integral to its economy, heavily rely on Indian Ocean resources.
  - Contribute to exports and provide livelihoods for over 14 million individuals.
- **Counterbalancing China's Influence**: China's assertive and influential soft power diplomacy has played a pivotal role in reshaping the dynamics of the IOR.

Way Forward

- **Advancing Blue Economy Initiatives:** IOR holds significant marine resources, making the blue economy a driver of sustainable economic growth.
  - **Eg**: Renewable energy generation from ocean sources, advancing marine biotechnology, and nurturing eco-tourism.
- **Collaborative Maritime Security:** Integrating state police agencies, special access to fishermen and local communities can aid in gathering vital human intelligence.
- **Building Climate Change Resilience:** The IOR is highly susceptible to climate change effects like rising sea levels, extreme weather events, and ocean acidification.
  - **Eg**: Need to check on climate-resilient infrastructure and early warning systems.

Need for a Robust and Capable Air Force

Syllabus Mapping: GS-Paper 3, Security, Armed Forces

Context

During the 92nd Raising Day of the Indian Air Force, the Chief of Air Staff emphasised that the global security landscape is continuously changing, and the ongoing conflicts underscore the critical necessity for a robust and capable Air Force.

Glimpse of 92nd Anniversary of Indian Air Force

- **Celebrated in**: Marina beach, Chennai
- **Theme**: "Bhartiya Vayu Sena: Saksham, Sashakt, Atmanirbhar" (Potent, Powerful, and Self-Reliant).

About Indian Air Force

- **Established on**: October 8, 1932.
- Its initial role was to **support the Royal Air Force (RAF)** of the United Kingdom in its **fight against Japan** in World War II. The IAF was instrumental in halting the advance of the Japanese army into India by targeting their bases in Burma.
- The **first airstrike** by the IAF occurred in **Arakan**, followed by missions against Japanese air bases in northern Thailand.
- In recognition of its service, **King George VI** conferred the prefix "**Royal**" in 1945, making it the Royal Indian Air Force (RIAF).
- After India became a republic in 1950, the prefix 'Royal' was dropped and renamed as the Indian Air Force.
- IAF has since evolved into a modern air force, adapting to contemporary warfare and enhancing its operational capabilities.
- **Motto of IAF**: "Touch the sky with Glory" **(**Nabhah Sparsam Diptam) – taken from the 11th chapter of the **Bhagavad Gita.**

Recent Relief Operations by IAF

- **Teesta River Flash Floods, 2023**: It has caused devastation in **Sikkim** and **West Bengal**.
  - The IAF deployed **Chinook** and **Mi-17-1V helicopters** for rescue and relief operations, evacuating over **1,700 people**, including foreign nationals.
- **Silkyara Tunnel Collapse, 2023**: In response to the collapse in **Uttarakhand**, the IAF used **C-17 Globemaster**, **C-130J Hercules**, and **Chinook** helicopters for evacuations and equipment transport.
- **Nepal Earthquake Relief, 2023:** The IAF provided humanitarian aid, transporting essential supplies and personnel.
- **Israel-Hamas Conflict Relief:** In **October and November 2023**, the IAF delivered **70 tonnes of humanitarian aid** to Egypt's **El-Arish airbase** near the Gaza border.

Bilateral and Multilateral Exercises

- **International Exercises:**

  - The IAF participated in **Red Flag (USA)**, **Eastern Bridge (Oman), Pitch Black (Australia), Udara Shakti (Malaysia), Garuda (France), and Desert Knight (UAE).**
  - These exercises enhanced the IAF's global standing and demonstrated India's growing influence in global airpower.
- **Exercise Vayushakti**: Held on February 17, 2024, at Pokhran, it demonstrated the IAF's offensive capability with live firing exercises.
- **Exercise Gagan Shakti 2024:** Commenced on April 1, 2024, simulating two-front threats.
- **Exercise Tarang Shakti 2024**: The largest multilateral exercise conducted by the IAF in 2024, with 11 countries participating and 27 countries observing.

Indian Air and Space Force (IASF)

- IAF aims to broaden its capabilities into the space domain, signified by the proposed name change to "Indian Air and Space Force" (IASF).
- The IAF's vision for the IASF extends beyond merely acquiring space assets.
- It plans to establish a comprehensive space program that encompasses various capabilities, including:
  - **Space Situational Awareness (SSA):** Monitoring and tracking objects in space to ensure the safety and security of Indian spacecraft and infrastructure.
  - **Space Communication:** Providing secure and reliable communication channels for military operations.
  - **Space Navigation**: Enhancing the accuracy and reliability of navigation systems for military aircraft and spacecraft.
  - **Satellite Intelligence**: Gathering critical intelligence information from space-based sensors.
  - **Cybersecurity**: Protecting space systems from cyberattacks

Challenges Associated with IAF in Recent Years

- **Depletion of Fighter Squadrons:** The IAF currently operates only 30 fighter squadrons, significantly below the authorised 42 needed to counter threats from China and Pakistan.
  - This shortfall is particularly concerning given China's military buildup along the border, which includes advanced aircraft and drones
- **Technological Lag Behind China:** The IAF has acknowledged falling behind China's advancements in technology and defence production rates, particularly in the aerospace sector.
  - China's 5th-generation fighter jets, like the J-20, and its advanced airborne warning and control systems (AWACS) and long-range missiles pose significant challenges to the IAF.
- **Slow Modernisation**: Despite some progress, the modernization of the IAF has been uneven.
  - While sectors like helicopter capabilities have advanced, the development of fifth-generation fighter aircraft has lagged.
  - The LCA Mk1A, while promising, is still not on par with China's capabilities and remains years away from full operational readiness.
- **Supply Chain Issues:** The **reliance on foreign suppliers for spare parts**, particularly for Russian-origin aircraft, poses a significant challenge, especially amid geopolitical tensions affecting supply lines.
- **Indigenous Production Challenges:** Indigenous projects, like the LCA Tejas and Advanced Medium Combat Aircraft (AMCA), have faced delays, making it challenging to reduce reliance on foreign suppliers.

Road Ahead for the Indian Air Force (IAF)

- **Commitment to Modernisation:** Despite existing challenges, the IAF is dedicated to its modernization objectives, which include the induction of new aircraft, helicopters, and air defence systems.
  - These modernization efforts are expected to enhance India's air power significantly over the next decade.
- **Addressing the Gap with China**: Closing the technological and operational gap with China requires a coordinated effort from both the government and the defence industry.
- **Essential Investments**:
  - Increased investment in research and development is crucial.
  - Faster production cycles are necessary to keep up with demands.
  - Greater involvement of the private sector is essential for bolstering capabilities.

- **Long Path to Self-Reliance**: The journey towards achieving a fully self-reliant and technologically advanced air force is extensive but achievable with appropriate policies and focus.
- **Future Readiness**: With the right strategies, the IAF is positioned to meet future demands effectively.

Conflict in Manipur Continues

Syllabus Mapping: GS-Paper 3, Armed Forces

Context

Union Ministry of Home Affairs (MHA) has invited **Manipur MLAs** from the three major communities — **Meitei**, **Kuki-Zo**, and **Naga** — for a peace meeting. The initiative highlights the need for dialogue between the **Kuki-Zo** and **Meitei** communities to address the ethnic conflict in Manipur.

Background

- On May 3, 2023, ethnic violence erupted in Manipur, India, primarily between the Meitei and Kuki communities.
- This conflict was triggered by a peaceful protest organised by the All Tribal Student Union of Manipur (ATSUM) against a recommendation from the Manipur High Court to **grant Scheduled Tribe (ST) status to the Meitei community.**

Underlying Causes

The violence is rooted in longstanding tensions exacerbated by several government policies perceived as anti-Kuki:

- Manipur High Court's recommendation for ST status for Meiteis.
- "War on drugs" targeting Kuki-majority hill districts.
- Imposition of the Inner Line Permit (ILP).
- Eviction drives in Kuki villages under claims of encroachment on state forest land.
- Support from across the border areas from insurgent groups in Myanmar.
- Free Border Regime which allows easy movement of arms from across the borders.

These policies have intensified existing ethnic rivalries between hill and valley communities in Manipur.

The situation is complicated by external factors such as:

- The civil war in neighbouring Myanmar affected local dynamics.
- Increased involvement from insurgent groups and armed factions on both sides.

Demands of Both tribes

- **Demand of Kukis:** Separate autonomous legislative assembly for Kuki-dominated areas.
- **Demand of Meiteis:** Advocating for the preservation of territorial integrity.

Despite attempts at dialogue, both communities remain divided, with a lack of trust exacerbated by ongoing violence.

Related Information

Suspension of Operations (SoO) Pact

- It is an agreement that was **signed in 2008 as a ceasefire agreement between the Indian government and various Kuki militant groups** operating in the northeastern states of Manipur and Nagaland.
- The agreement came about in the **aftermath of the Kuki-Naga clashes in the 1990s** when hundreds were killed.

Terms of the Suspension of Operations (SoO) Pact (2008)

- **Agreement**:
  - Kuki groups stop violence and move to designated camps monitored by security forces.
  - The Indian government suspends operations against these groups.
- **Monitoring:** Joint Monitoring Group (JMG) oversees implementation.
- **Restrictions:**
  - Security forces cannot attack, and Kuki groups cannot launch attacks.
  - Kuki militants stay in camps with weapons stored securely.
  - Arms only allowed for camp security and leader protection.
- **Compliance**: Signatories agree to respect the Indian Constitution, laws, and Manipur's territorial integrity.

Regional Implications and Challenges in Manipur

- **Shift in Perceptions:** The prolonged conflict has caused a significant and irreversible change in how the people of Manipur view each other and the central government.
- **Impact on Tourism and Infrastructure**: The region had started attracting domestic and international tourists, with improving infrastructure connecting it to mainland India via railways. However, the violence has disrupted this progress.
- **Increased Division**: The ongoing violence has deepened the divide between the Meitei and Kuki communities.
  - Many individuals feel unsafe in areas dominated by rival ethnic groups, leading to large-scale migration to safer regions like Assam and Mizoram.
  - **Example**: According to a report by the Geneva-based Internal Displacement Monitoring Centre (IDMC), in 2023 conflict and violence in South Asia led to 69,000 displacements, with the Manipur violence contributing to 67,000 of these.
- **Educational Disruption**: Schools and educational institutions have closed due to the conflict, and internet shutdowns have hindered online learning, pushing youths towards militancy as a means of survival.
- **Economic Consequences:** Retail inflation reached 9.7% in September 2023, causing economic insecurity, while attacks on farmers and road blockages raised food security concerns.
- **Mental Health Crisis:** There has been a rise in post-traumatic stress disorder (PTSD) cases since the violence began, exacerbating mental health issues among the affected populations.
- **Geopolitical Importance**: Manipur's strategic location as a border state with Myanmar makes it crucial for India's Act East Policy (AEP), which aims to enhance cultural links, trade, tourism, and connectivity with Southeast Asia.
- **China's Influence**: Instability in Manipur could benefit China, especially given its growing power and influence in conflict-ridden Myanmar.
- **International Concerns**: The ongoing conflict has tarnished India's global image, drawing serious concerns from organizations such as Human Rights Watch, the European Union, the United Nations, Genocide Watch, and the United States.

TOPICS FOR PRELIMS

Civil War in Sudan

Syllabus Mapping: GS-Paper 2, Locations

Context

Sudan has been undergoing a civil war between Sudanese Armed Forces (SAF) and the paramilitary Rapid Support Forces (RSF) since the past 18 months. Recently, a major offensive was launched by Sudanese Armed Forces against the RSF in Khartoum and Bahri.

Key Actors in the Civil War

Sudanese Armed Forces (SAF)

- **Leadership:** Led by General Abdel Fattah al-Burhan.
- **Claims:** The SAF positions itself as the legitimate government of Sudan, despite coming to power via a coup in 2021.
- **Military Strategy:** The SAF has recently intensified airstrikes and captured regions around **Khartoum.**

Rapid Support Forces (RSF)

- **Leadership:** Commanded by General Hamdan Dagalo, also known as Hemedti.
- **Background:** Originally formed from the Janjaweed militia, the RSF has gained control over significant territories, particularly around the capital.
- **International Relations:** The RSF seeks alliances with various Arab nations to bolster its legitimacy.

Facts:

African Countries which have seen Copus in recent time: Niger, Gabon, Mali, Sudan, Burkina Faso, Guinea.

United Nations Peacekeeping Force (UN PKF) & UNIFIL

Syllabus Mapping: Locations

Context

Recently, Israel Defence Forces (IDF) tanks destroyed the main gate of a facility of the UN peacekeeping forces at Ramyah in south Lebanon.

About UN Peacekeeping Forces (UNPKF)

- It is a global partnership that helps countries transition from conflict to lasting peace.
- UNSC plays a major role in deployment of peacekeeping forces.
- **Purpose:** The UN peacekeeping force helps countries prevent disputes from escalating into war, restore peace after armed conflict, and promote lasting peace.
- **Personnel:** The force includes civilian, police, and military personnel from over 120 countries. They are often called **"Blue Berets" or "Blue Helmets"** because of their light blue berets or helmets.
- **History:** The first UN peacekeeping mission was established in May 1948 to monitor the Armistice Agreement between Israel and its Arab neighbours.

Do you know?

- India is the **third largest** contributor to the UN Peacekeeping Force as of June 2023, with 6,073 personnel. **(1st - Nepal, 2nd - Bangladesh)**
- India is one of the largest contributors to UN peacekeeping missions, having sent over 250,000 personnel since 1948.
- **Current deployment:** As of January 2024, around 5,900 Indian troops are deployed across 12 UN peacekeeping missions

About United Nations Interim Force in Lebanon (UNIFIL)

- Established in 1978 by UNSC through Resolution 425. **(HQ: Naqoura, southern Lebanon)**
- It comprises more than 10,000 peacekeepers from 50 nations.
- **Purpose:** It was created in response to the conflict between Israel and Lebanon, primarily to confirm Israeli withdrawal from Lebanon and restore peace and security.
- **Mandate:**
  - Restoring peace and security
  - Supporting the Lebanese government to regain authority in the area.
  - Monitoring hostilities.
- **Area of Operation:** Southern Lebanon, near the border with Israel (Blue Line)
  - **Blue Line is a 120km (75-mile) "border" drawn up by the UN between Lebanon and Israel.**

Inter Parliamentary Union (IPU)

Syllabus Mapping: Organisations

Context

The 149th Assembly of the Inter-Parliamentary Union (IPU) was held in Geneva. The Indian delegation was led by Lok Sabha Speaker **Om Birla**. There he delivered an address on **"Harnessing Science, Technology and Innovation for a More Peaceful and Sustainable Future**

About IPU

- It is an international organisation of national parliaments that promotes parliamentary dialogue, diplomacy and cooperation among nations.
- **Founded:** In 1889 (Paris), it was the world's first permanent forum for political multilateral negotiations.
- **The IPU's work includes:**
  - Promoting peace, democracy, and sustainable development
  - Establishing cooperation between parliamentarians on issues of common concern
  - Facilitating parliamentary diplomacy
- **Membership:** It has 180 members and 15 associate members.
- **Main political body:** IPU's main political body is the Assembly, which is held twice a year. At the Assembly, MPs from around the world can:
  - Exchange best practices
  - Adopt parliamentary resolutions on global issues

Northern Sea Route

Syllabus Mapping: Locations

Context

The India-Russia working group on cooperation in the Northern Sea Route (NSR) held their first meeting recently. They discussed possible training of Indian sailors for polar navigation and development of joint projects in Arctic shipbuilding.

About Northern Sea route (NSR)

- It is a shipping route that runs along the Russian Arctic coast, connecting the Barents Sea to the Bering Strait. It connects the Pacific and Atlantic oceans through the Arctic
- It spans approximately 5,600 km and offers a shorter maritime pathway between Europe and Asia-Pacific.
- The entire route lies in Arctic waters and within Russia's exclusive economic zone (EEZ)

Advantages Over Traditional Routes

- **Reduced Distance:** The NSR can save up to 50% in distance compared to traditional routes like the Suez Canal.
- **Faster Transit Times:** Chennai-Vladivostok Maritime Corridor (CVMC) is expected to reduce the time required to transport cargo between India and far-east Russia by up to 16 days, cutting the current 40-day travel time by almost half to 24 days.
- **Access to Untapped Resources:** The Arctic region holds over 40% of the world's undiscovered oil and gas reserves.

Diplomatic Immunity

Syllabus Mapping: Conventions

Context

India has decided to withdraw its High Commissioner and other senior diplomats stationed in Canada. It has also expelled six Canadian diplomats from India.

Diplomatic Immunity

- Principle of international law that protects foreign government officials from the jurisdiction of local authorities and courts.
- It protects diplomats, their families and their property while they are on diplomatic assignment.
- It protects them from prosecution, arrest, and other legal proceedings.
- **Diplomatic immunity does not prevent the host country from expelling the diplomat.**

Vienna convention on diplomatic relations, 1961

- It is an international treaty that establishes rules and principles for diplomatic relations between countries.
- It is ratified by **193** countries.
- India passed the Diplomatic Relations (Vienna Convention) Act of 1972 to ratify it.

Important Articles:

- **Article-29:** It provides diplomats immunity from arrest or detention. Their private residences are also protected under Article 30.
- **Article-31:** It provides diplomats with immunity from the criminal jurisdiction of the host state.
- **Article-26:** The host nation must ensure freedom of movement and travel in its territory for diplomats.
- **Article-27:** It allows the diplomatic mission to send and receive documents and necessary materials without being opened or inspected by the host country.

Five Eyes Alliance

Syllabus Mapping: Conventions

Context

All members of Five Eyes Alliance have backed Canada's allegations on the Indian Government regarding the killing of a Canadian Citizen.

About Five Eyes Alliance (FVEY)

- It is an intelligence-sharing network comprising **5 English-speaking countries.**
  - Countries of Five Eyes Alliance: USA, United Kingdom, Canada, Australia & New Zealand.

- Established in the aftermath of World War II, its roots trace back to the **UKUSA Agreement signed in 1946**.

Objectives of the Five Eyes Alliance

- **Intelligence Sharing:** Collect, analyse and share intelligence on global threats.
- **National Security Enhancement:** By pooling resources and intelligence, it aims to bolster national security capabilities.
- **Signals Intelligence (SIGINT):** FVEY focuses heavily on SIGINT, which involves intercepting and analysing electronic communications. This includes monitoring phone calls, emails and internet activities.

Did you know?

- **Nine Eyes** (adding Denmark, France, Netherlands and Norway)
- **Fourteen Eyes** (including Germany, Belgium, Italy, Spain and Sweden), which enhance global surveillance capabilities.

Shanghai Cooperation Organisation (SCO)

Syllabus Mapping: Regional Organisation

Context

External Affairs Minister S. Jaishankar participated in the Shanghai Cooperation Organisation (SCO) Council of Heads of Government meeting which was held in Islamabad.

About Shanghai Cooperation Organisation (SCO)

- **Formed:** June 15, 2001 (Successor to Shanghai Five group)
- **Founding Members:** Kazakhstan, China, Kyrgyzstan, Russia, Tajikistan, Uzbekistan
- **SCO Countries:**
  - **9 Member States:** India, Iran, Kazakhstan, China, Kyrgyzstan, Pakistan, Russia, Tajikistan, Uzbekistan.
  - **3 Observer states:** Afghanistan, Belarus, Mongolia.
  - **14 Dialogue Partners**: Azerbaijan, Armenia, Bahrain, Egypt, Cambodia, Qatar, Kuwait, Maldives, Myanmar, Nepal, United Arab Emirates, Saudi Arabia, Turkey, Sri Lanka.
- **Headquarters:** Beijing, China
- **Official Languages:** Russian, Chinese
- **Goals**:
  - Strengthen regional security and good neighbourliness
  - Promote economic cooperation among members
  - Foster cultural and educational exchange
  - Create a stable and peaceful region
- **Decision-Making**:
  - **Council of Heads of States (CHS)**: Meets annually, decides on major issues
  - **Council of Heads of Government (CHG)**: Meets annually, sets economic strategy.

HAMAS

Syllabus Mapping: Security, Terrorism

Context

Recently, Israeli forces in Gaza killed Hamas's top leader Yahya Sinwar.

About HAMAS

- **Formation:** It was founded in **1987** during the First Intifada (Palestinian uprising) as an offshoot of the Egyptian Muslim Brotherhood. It emerged as a response to Israeli occupation in the **West Bank and Gaza Strip**.
- **Ideology:** The group aims to establish an Islamic state in Palestine and rejects any compromise on Palestinian land.
- **Political and Military Wing:** Hamas operates both as a political party and a militant organisation.
- **Control of Gaza:** Following violent clashes with Fatah in 2007, Hamas took control of the Gaza Strip, leading to a geographic and political split between Gaza (controlled by Hamas) and the West Bank (controlled by Fatah).
- Recently **China has brokered a peace deal between HAMAS & FATAH.**
- **Designation as Terrorist Organization:** Several countries, including the United States and Israel, classify Hamas as a terrorist organisation.

Jabalia

Syllabus Mapping: IR, Locations

Context

Israeli military strikes have resulted in the deaths of at least 50 Palestinians across the Gaza Strip. These strikes have intensified as Israeli forces focus on Jabalia, the largest refugee camp in Gaza, amidst ongoing conflicts with Hamas fighters.

About Jabalia

- It is a refugee camp in **northern Gaza.**
- The Israel military launched a deadly offensive in the Jabalia area a week ago which it claims is aimed at stopping Palestinian group Hamas from regrouping.
- The attacks have trapped thousands of Palestinian civilians and international charity Doctors.
- **Israel Bordering Countries:**
  - Lebanon, Syria, Egypt, Jordan (shares longest boundary)
  - Mediterranean Sea - West of Israel

Important Border Crossings in Israel, Gaza, and Adjoining Areas

- **Rafah Crossing**
  - **Location:** Southern border of the Gaza Strip, bordering Egypt's Sinai Peninsula.
  - **Significance:** The only exit point from Gaza that does not lead to Israeli territory.
- **Erez Crossing (Beit Hanoun)**
  - **Location:** Northern border of the Gaza Strip, leading into Israel.
  - **Significance:** The primary crossing for people travelling between Gaza and Israel, mainly for medical treatment or work permits.
- **Kerem Shalom Crossing**
  - **Location:** Southern border of the Gaza Strip with Israel.
  - **Significance:** The main commercial crossing for goods entering Gaza from Israel and Egypt.
- **Nitzana Border Crossing**
  - **Location:** Between Israel and Egypt, near the Sinai region.
  - **Significance:** Serves as an alternative route for goods entering Gaza during emergencies.
- **Allenby Bridge Crossing**
  - **Location:** Between the West Bank (under Israeli control) and Jordan.
  - **Significance:** Main crossing point for Palestinians in the West Bank travelling to Jordan.

Important locations in Israel & Palestine

Location	Significance
Jerusalem	A city of profound religious importance for Judaism, Christianity, and Islam, claimed as the capital by both Israel and Palestine.
Gaza Strip	A densely populated area home to about 2 million Palestinians, significant for its ongoing conflict and humanitarian issues.
West Bank	Contains key Palestinian cities like Ramallah and Bethlehem; it is central to the Israeli-Palestinian conflict and settlement issues.
Ramallah	The de facto administrative capital of Palestine, serving as the political hub for the Palestinian Authority.

Location	Significance
Golan Heights	A strategic plateau captured by Israel from Syria in 1967, important for its military and water resources.
Bethlehem	Birthplace of Jesus Christ, significant for its religious heritage and tourism related to Christian pilgrimage.

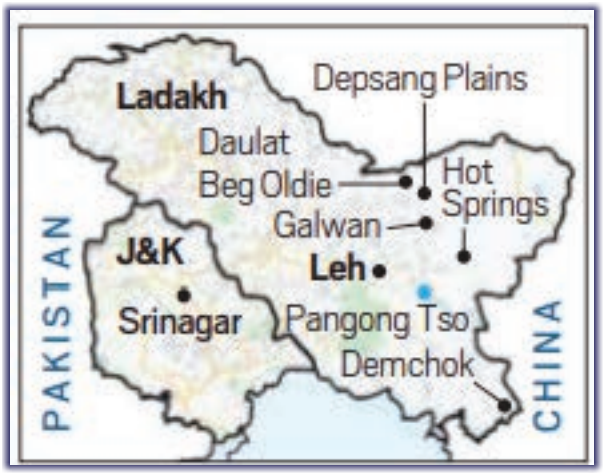
Strategic locations of Ladakh

Syllabus Mapping: Security, Locations

Context

India and China have reached an agreement on patrolling arrangements along the Line of Actual Control (LAC) in eastern Ladakh.

Key strategic locations



Location	Description
Aksai Chin	A high-altitude desert region controlled by China but claimed by India. It serves as a vital transit route for China, connecting Tibet with Xinjiang.
Demchok	Situated in eastern Ladakh, near the LAC (Line of Actual Control) with China.
Depsang Plains	Located north of Aksai Chin, near the DBO (Daulat Beg Oldie) airstrip. The area has been a site of recent confrontations.
Siachen Glacier	Located north of Ladakh, where the borders of India and Pakistan meet. It is the highest battlefield in the world.
Nubra Valley	Situated north of the Khardung La pass, Nubra Valley connects to Xinjiang through the Karakoram Pass.
Galwan Valley	Located near the LAC, adjacent to the Aksai Chin region. This area gained international attention during the 2020 India-China clashes.

Important Passes of Ladakh

- **Khardung La:** Connects the Leh district to the Nubra Valley.
- **Chang La:** Connects Leh to the Changthang region. Changthang plateau, known for its unique culture and wildlife.
- **Zoji La:** Connects Srinagar to Leh.
- **Fotu La:** Located on the Leh-Srinagar highway. It is the highest point on the Leh-Srinagar highway.
- **Burzil Pass:** Connects the districts of Kargil and Gurez in Jammu & Kashmir.

Z- Morh Tunnel

- It is a 6.4 km long tunnel connecting **Kangan town to Sonmarg** in Ganderbal district (J&K).
- It is part of a larger infrastructure project aimed at providing all-weather connectivity between Srinagar and Leh.
- It is crucial for maintaining year-round connectivity on the Srinagar-Leh highway, one of only two roads linking Ladakh with the rest of India.

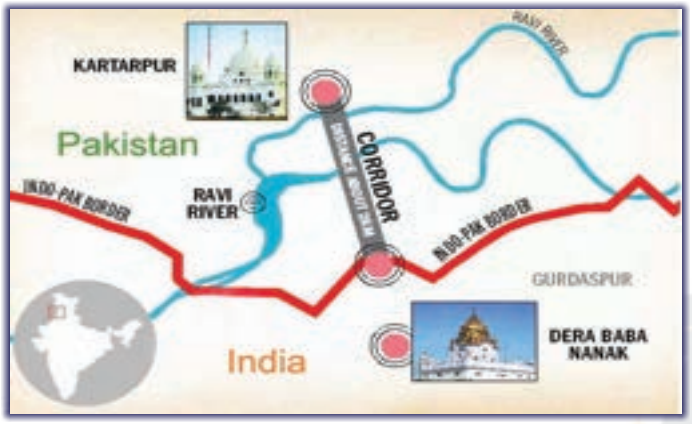
Kartarpur Corridor

Syllabus Mapping: IR, Locations

Context

India and Pakistan have agreed to renew their agreement for another five years to operate the Kartarpur Corridor.

About Kartarpur Corridor



- It is a visa-free border crossing and religious corridor between India and Pakistan.
- The corridor connects the town of **Dera Baba Nanak** in Gurdaspur (India) with the **Gurdwara Kartarpur Sahib** in Narowal (Pakistan).
- Kartar Sahib was established by **Guru Nanak Dev Ji (1469-1539) -** Founder of Sikhism.
- He spent the last 18 years of his life at Kartarpur Sahib.
- The corridor was built in **2019** to commemorate **550th birth anniversary celebrations of Guru Nanak Dev.**
- Kartarpur is located at the west bank of **river Ravi.**

Cabinet Committee on Security clears deal for 31 MQ-9B Drones

Syllabus Mapping: Armed Forces

Context

Cabinet Committee on Security has approved the acquisition of 31 MQ-9B Unmanned Aerial Vehicles (UAVs). Under the deal 16 Sky Guardian and 15 Sea Guardian High Altitude Long Endurance (HALE) Remotely Piloted Aircraft Systems (RPAS) will be purchased for the Indian Armed Forces.

About MQ-9B Drones

- It is an advanced unmanned aerial vehicle (UAV) developed by General Atomics Aeronautical Systems (USA).
- **Capabilities:**
  - Equipped for intelligence, surveillance, reconnaissance (ISR) and strike missions.
  - It has enhanced payload capacity, advanced sensors and longer endurance compared to earlier models.
  - Can operate in various environments and conditions, making it versatile for military applications.
- **Key Features of MQ-9B:**
  - **Endurance:** Capable of flying for over 40 hours without refuelling.
  - **Payload:** Can carry a variety of sensors and weapons, including precision-guided munitions.
  - **Autonomy:** Designed for both remote control and autonomous operations.
  - **Advanced Technology:** Incorporates AI for data analysis and decision-making support.

About Cabinet Committee on Security (CCS)

- **Headed by:** Prime Minister.
- **Members:** Ministers of Defence, Home Affairs, Finance and External Affairs.
- **Functions:**
  - It makes all the important decisions on defence policy and expenditure.
  - It is the apex body regarding appointments of the officials in the national security bodies.
  - Deals with all issues related to the law and order and national security of India.

Cabinet Committees

- The roots of Cabinet committees lie in the **Indian Council Act, 1861** which came into force during the time of **Lord Canning** which introduced the **portfolio system** and the Executive Council of the Governor-General.
- **Features of Cabinet Committees:**
  - **Extra-Constitutional nature:** not mentioned in the constitution. The Government of India Transaction of Business Rules, 1961 provides for their establishment.
  - **Types:** Standing and Ad hoc.
  - **Constituted** by the Prime Minister
  - **Membership:** 3 to 8 ministers. Generally, they are made up of only Cabinet Ministers. However, **Non-Cabinet Ministers can also be invited** for their meetings.
  - **Chairman:** The Prime Minister is usually in charge of these committees. Sometimes other Cabinet Ministers are also in charge.
    - E.g. Cabinet Committee on Parliamentary Affairs is headed by Raj Nath Singh, Minister of Defence

Expansion of scope of iDex scheme

Syllabus Mapping: Armed Forces

Context

The Ministry of Defence is planning to broaden the scope of its flagship **Innovations for Defence Excellence (iDEX)** scheme and has requested additional funding from the Finance Ministry to sustain its progress.

About iDex Initiative

- **Launched in** 2021.
- **Implementing Body:** Defence Innovation Organization (DIO) under the Department of Defence Production, Ministry of Defence, India.
- **Objectives of iDEX**
  - **Rapid Development:** Facilitate quick development of indigenized technologies to meet defence needs.
  - **Engagement with Startups:** Encourage collaboration and co-creation with innovative startups in the defence sector.
  - **Empower Technology Co-Creation:** Promote a culture of co-innovation within the Defence and Aerospace sectors.
- **Funding and Support**
  - **Grants Available:**
    - Up to ₹1.50 crore for projects.
    - Up to ₹10 crore under the iDEX Prime initiative.
  - **Support Framework:** Includes the Support for Prototype and Research Kickstart (SPARK) framework to facilitate research and development.

Related Initiatives of the iDEX Scheme

Defence India Startup Challenges (DISC)

- **Purpose:** Launched to address specific problems faced by the Armed Forces, Defence Public Sector Undertakings (DPSUs) and Ordnance Factories (OFB).
- **Structure:** Startups and innovators are invited to provide solutions to various problem statements issued by the Ministry of Defence.
- **Funding:** Winners receive grants for prototype development through the SPARK framework, with amounts up to ₹1.5 crore.

ADITI Challenges

- Aims to develop innovative technologies for the Defence sector.
- **ADITI 2.0:** Recently launched, featuring 19 challenges from armed forces and allied agencies focusing on areas like:
  - Artificial Intelligence (AI)
  - Quantum Technology
  - Military Communication
  - Anti-drone Systems
  - Adaptive Camouflage
- **Funding:** Offers grants up to ₹25 crore, targeting critical technological advancements.

Medical Innovations and Research Advancement (MIRA) Initiative

- Part of DISC, MIRA focuses on developing medical technologies tailored for the armed forces.
- Introduces targeted challenges to address the unique medical needs within military environments.

Dragon Drones

Syllabus Mapping: Armed Forces

Context

A new weapon named Dragon Drone has emerged in the ongoing Russia-Ukraine conflict, with both sides sharing footage of drones that seem to unleash fire from the skies.

Dragon Drones

- It is a new weapon in the Russia-Ukraine war.
- These drones drop a highly dangerous substance that appears to rain fire from the skies.
- These drones release thermite which burns at 2,427 degrees Celsius.
- The moniker "dragon drone" comes from the fiery destruction they cause, resembling the breath of a dragon.

About Thermite

- Thermite is a mixture of **aluminium and iron oxide** that, when ignited, triggers a self-sustaining reaction that burns intensely.
- **Thermite properties:**
  - **Self-Sustaining Reaction**: Once ignited, thermite undergoes an exothermic reaction (releasing heat), which continues without the need for external fuel or oxygen. This makes it hard to extinguish.
  - **Intense Heat but Non-Explosive**: Unlike explosives, thermite doesn't detonate but rather burns very intensely, creating molten iron.
  - **Versatility**: It can burn through various materials, including **metal**, **concrete**, and even under **water**.
  - **High Temperature**: When ignited, thermite produces extremely high temperatures, reaching up to **2,427°C (4,400°F)**. This heat is enough to melt metals like steel.
  - **Difficult to Extinguish**: Because thermite doesn't rely on atmospheric oxygen, traditional fire extinguishers or water won't stop its burn. It requires special methods, like sand or Class D fire extinguishers.

Legality of Using Thermite in War:

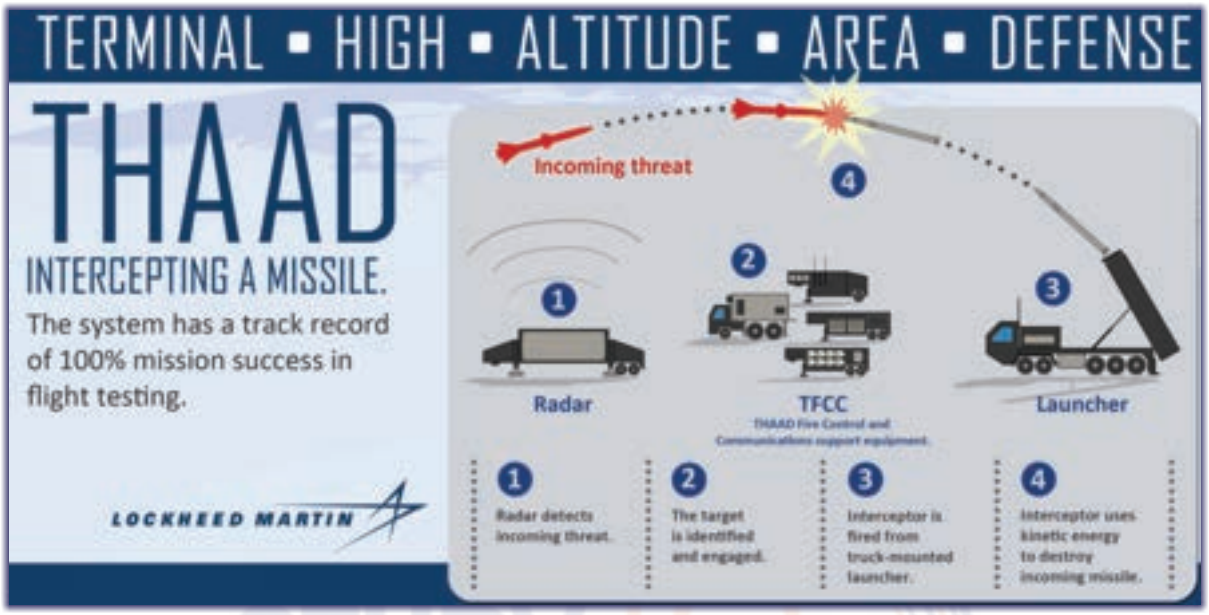
- The use of thermite in weapons is **not banned** under international law.
- However, the use of incendiary weapons like thermite **against civilian targets is prohibited** under Protocol III of the **Convention on Certain Conventional Weapons.**
- It was also used during **World War-II** by both the Allies and Axis powers.

THAAD Missile Defence System

Syllabus Mapping: Armed Forces

Context

Recently, the USA has announced that it will send a **Terminal High Altitude Area Defense (THAAD)** battery to Israel, including troops to operate the system.



About Terminal High Altitude Area Defense (THAAD)

- **Purpose:** Designed to intercept and destroy short, medium and intermediate-range ballistic missiles during their terminal phase of flight.
- **Components**
  - **Interceptor Missiles:** Single-stage, solid-fuel rocket motor with thrust vectoring.
  - **Radar System:** Radar system that detects and tracks incoming missiles at ranges from 870 m to 3,000 km.
  - **Launcher Vehicle:** Mobile platform based on a heavy expanded mobility tactical truck (HEMTT), capable of carrying up to eight interceptors.
- **Operational Capabilities**
  - Intercepts missiles both inside (endoatmospheric) and outside (exoatmospheric) the atmosphere.
  - High lethality with proven hit-to-kill capability, which means it destroys targets through kinetic energy rather than explosive warheads.
- **Countries Using THAAD**
  - United States: Primary developer and operator.
  - South Korea, United Arab Emirates, Israel, Saudi Arabia

Difference between THAAD Missile system & S-400 Missile system

Feature	THAAD	S-400
Range	150-200 Km	Up to 400 Km
Type of Threats Engaged	Short/medium-range ballistic missiles	Aircraft, cruise missiles, and ballistic missiles
Missile Types	Single-stage solid-fuel rocket	Multiple missile types (48N6, 40N6, etc.)
Simultaneous Engagements	Limited to several targets	Can engage up to 36 targets simultaneously
Countries Deployed In	US, South Korea, UAE, Israel, Saudi Arabia	Russia, India, Turkey, China, Belarus

India launched its 4th Nuclear powered Submarine

Syllabus Mapping: Armed Forces

Context

India's fourth nuclear-powered ballistic missile submarine (SSBN), referred to as **S4***, was launched into water at the **Ship Building Centre (SBC) in Visakhapatnam**

About S4 Submarine

- It features **75% indigenous content** and is equipped with **3,500 km range K-4 nuclear ballistic missiles**.
- It is larger and more capable than the INS Arihant (S2), India's first SSBN
- **India's SSBN (Sub-Surface Ballistic Nuclear) fleet consists of:**
  - **INS Arihant (S2):** First SSBN, armed with 750 km range K-15 nuclear missiles.
  - **INS Arighaat (S3):** Commissioned in 2024.
  - **INS Aridhaman (S4):** To be commissioned in 2025.

Difference between Nuclear Powered and Traditional Submarines

Feature	Nuclear Powered Submarine	Traditional Submarine
Power Source	Nuclear reactors provide virtually unlimited power for propulsion and systems.	Diesel engines require regular surfacing to recharge batteries.
Operational Range	Can operate submerged for months or even years, limited only by food supplies and crew endurance.	Limited operational range; requires surfacing every few days for recharging.
Speed	Generally faster, capable of high-speed manoeuvres underwater.	Slower compared to nuclear submarines due to battery limitations.
Stealth	Extremely stealthy; can remain submerged indefinitely, making detection difficult.	Less stealthy; noise from diesel engines can be detected more easily.

Early Warning & Control Aircraft

Syllabus Mapping: Armed Forces

Context

Indian Air Force (IAF) is planning to procure 12 early warning aircrafts.

Early Warning Aircrafts

- They are special military planes that have powerful radars and sensors which help them detect and track other aircraft, ships or vehicles from very far away.
- They act like flying radar stations, giving military forces a clear view of the battle area and improving awareness during operations.
- They are often referred to as **AWACS (Airborne Warning and Control System).**

Current AWACS Fleet of Indian Air Force (IAF)

- 5 operational (3 Phalcon + 2 Netra Mk-1)
- **Phalcon:**
  - Procured from **Israel.**
  - Mounted on Russian IL-76 transport aircraft.
  - It has 360-degree radar coverage and a range of 400 km.
- **Netra Mk-1:**
  - Indigenously developed by **Defence Research and Development Organisation (DRDO) and the Centre for Airborne Systems (CABS).**
  - Mounted on Brazilian Embraer ERJ-145 jets.
  - It provides 240-degree coverage and a range of 500 km.

Defense Research & Development Organisation (DRDO)

- It is India's largest **Research and Development (R&D) agency** which develops technologies and systems for the Indian Armed Forces.
- **Formation:** 1958 (HQ- New Delhi)
- **Vision:** To build an indigenous technology base and provide technological solutions to optimise combat effectiveness.
- **Major Achievements:**
  - **Light Combat Aircraft (LCA):** Tejas
  - **Missiles**: Agni, Prithvi, Nag, BrahMos, trishul etc.
  - Laser-Guided Anti-Tank Guided Missiles (ATGM), Lightweight Bullet Proof Jackets etc.

- **Centre for Airborne Systems (CABS)** is a laboratory of the DRDO that designs, develops, tests, evaluates and certifies airborne surveillance systems. (Location: Bangalore)

Hizb-ut-Tahrir declared terrorist organisation

Syllabus Mapping: Security, Terrorism

Context

The Union Home Ministry has declared **Hizb-ut-Tahrir (HuT)** a terrorist organisation under the Unlawful Activities (Prevention) Act (UAPA).

About Hizb-ut-Tahrir (HuT)

- **Founded** in 1953 in Jerusalem by Taqiuddin al-Nabhani.
- **Aim**: To establish a global Islamic Caliphate governed by Sharia law, seeking to overthrow secular governments in Muslim-majority countries.
- **Global Presence:** Operates in over 30 countries, including the U.K., U.S., Canada and Australia.
- **Headquarter**: Lebanon
- **Activities and Tactics:**
  - Focuses on radicalising youth to join extremist groups like ISIS.
  - Involved in fundraising for terrorism and promoting its ideology through online platforms and Dawah meetings
- **International Ban:** It is banned by Germany, Egypt, UK and several Central Asian and Arab countries
- **Recent Developments in India:**
  - On October 10, 2024, the Indian government designated HuT as a terrorist organisation under the **Unlawful Activities (Prevention) Act (UAPA)**.
  - The Ministry of Home Affairs cited its role in radicalization, fundraising for terrorist activities and posing a threat to national security.
  - The National Investigation Agency (NIA) arrested several members, including Faizul Rahman, for conspiring to promote secessionism and recruit for HuT.

Unlawful Activities Prevention Act (UAPA)

- **Purpose**: The UAPA was enacted to effectively prevent certain unlawful activities, including terrorist activities that threaten the sovereignty and integrity of India.
- **Scope**: It applies to all individuals and associations, whether they are Indian citizens or foreign nationals, and extends to actions taken outside India by Indian citizens.

Key Provision

- **Declaration of Unlawfulness**: The Act gives the government the authority to declare any association as unlawful through a notification in the Official Gazette.
- **Terrorist Activities**: It includes provisions for defining and penalising terrorist acts, allowing for severe punishments, including life imprisonment and the death penalty.
- **Preventive Detention**: UAPA allows law enforcement agencies to detain individuals without trial if they are suspected of being involved in terrorist activities.

Amendments

- **2004**: Included specific definitions of "terrorist acts" and empowered the government to ban organisations involved in terrorism.
- **2019**: Allowed the government **to designate individuals as terrorists** without due process and granted more power to the National Investigation Agency (NIA) regarding property seizure

Nobel Peace Prize 2024

Syllabus Mapping: Non-proliferation

Context

The Nobel Peace Prize 2024 has been awarded to Nihon Hidankyo.

Awardees of Nobel Peace Prize 2024

- It was awarded to **Nihon Hidankyo.**
- It is a **Japanese** organisation made up of survivors of the 1945 atomic bombings of Hiroshima and Nagasaki.
- **Hibakusha** have played a central role in the global movement to end nuclear weapons.
  - **Hibakusha** is a Japanese term for the survivors of the atomic bombings of Hiroshima and Nagasaki
- **Nihon Hidankyo Background:**
  - **Founded** on August 10, 1956.
  - It is the only nationwide organisation of A-bomb survivors from Hiroshima and Nagasaki.
  - **Main goals:** welfare of Hibakusha, elimination of nuclear weapons and compensation for victims.
  - It has helped to establish the **nuclear taboo**, which has prevented the use of nuclear weapons since 1945.

Atomic Bombings of 1945

- On August 6, 1945, the US dropped the bomb **"Little Boy"** on Hiroshima.
  - 70,000+ people died instantly; the final death toll exceeded 100,000.
- On August 9, 1945, the bomb **"Fat Man"** was dropped on Nagasaki.
  - 40,000+ people died instantly, with many more dying afterward.
- Japan **surrendered on August 15, 1945, marking the end of World War II.**

SOCIETY, SOCIAL JUSTICE & SCHEMES

TOPICS FOR MAINS

Marital Rape: Criticism of Centre's Affidavit

Syllabus Mapping: GS-Paper 1, Marriage, Women's Issues

Context

Marital Rape Exception (MRE), under **Section 63, Exception 2** of the **Bharatiya Nyaya Sanhita, 2023** (formerly **Section 375, Exception 2** of the **Indian Penal Code, 1860**), states that **sexual intercourse or sexual acts by a man with his wife (who is not under 18 years of age) is not rape**. This provision is under **challenge before the Supreme Court of India**, and the **Centre has filed an affidavit** supporting the MRE.

The Issue of 'Expectation'

The affidavit argues that the **differential treatment of married and unmarried women** does not violate **Article 14 of the Constitution (Right to Equality)**, because the **factum of marriage** creates a **"continuing expectation of reasonable sexual access"**, which is absent in other relationships.

Critique of the Expectation Argument

- **Vagueness**: The term **"reasonable sexual access"** is vague and **unclear**.
  - **Who defines this access**: Is it **subjective** (decided by the person with the expectation) or **objective** (applying a standard across society)?
  - **What parameters** define it: **Type of sexual acts, frequency**, or both?
- **Dubious Claim**: The idea that marriage creates an expectation of sexual access is problematic and lacks **legal basis**.
  - It would be akin to saying that since a husband is expected to provide for his wife, she could take and sell his belongings without consent, which clearly wouldn't be legal.
- **Marriage vs. Live-in Relationships**: The affidavit fails to explain why **marriage** creates this expectation while other intimate relationships (like **live-in relationships**) do not.
  - **Expectation** is personal and can exist in various types of relationships.
- **Socially Sanctified Expectation**: The argument's subtext implies that the **expectation of sexual access** in a marriage is **socially acceptable** but may not be in other relationships.
  - However, in a legal context, **individual autonomy** and **dignity** (constitutionally protected) should prevail over social expectations.

Institution of Marriage and 'Misuse'

- **Centre's Arguments:**
  - Criminalizing marital rape would **affect the sanctity of the institution of marriage**.
  - It could lead to **false allegations** of marital rape, which would be difficult to disprove.

Critique of Institution and Misuse Arguments

- **No Evidence**: There is no proof that recognizing marital rape weakens the **institution of marriage**. The suggestion that **impunity for marital rape** is necessary to uphold marriage brings the value of the institution into question.
- **Red Herring Argument of Misuse**:
  - Concerns of **misuse** exist for any criminal law, but the **purpose of a trial** is to determine whether an offence has been committed **beyond reasonable doubt**.
  - **Sexual offences are under-reported** in general, and the challenge often lies in **proving rape**, not **disproving false claims**.

Arguments on Jurisdiction

- **Centre's Claim**: Marital rape is a **social issue** rather than a legal one and should not fall under the Court's jurisdiction.

Critique of Jurisdiction Argument

- **No Distinction between Social and Legal Issues**: Law **regulates most aspects** of human life, including social issues. The affidavit itself engages with legal arguments under **Articles 14 and 21 (Right to Life)**, indicating that there is a **legal dimension** to the matter.
- **Legislative vs. Judicial Competence**: The affidavit asserts that **determining criminal offences** is a matter for the **legislature**, not the judiciary. While this is valid, it is irrelevant to this case.
  - The **Court's role** is to assess the **constitutionality** of **existing laws** under **Part III of the Constitution**.
  - The question is whether the MRE violates **fundamental rights**, and the Court is empowered to strike down the exception if it does.

Conclusion

- Considering the legal maxim of 'right over one's body', Centre support support criminalisation of marital rape which is expected to result in empowerment of women, reduce violence against women and trauma of lakhs of women.
- Women should not be treated as a property of their husbands and the entire burden of preserving marriage should not be equated to being subjected to sex against one's wishes or under force.
- In line with progressive legislations such as Prevention of Domestic Violence Act etc., it is high time, that we criminalise marital rape in the country.

Child Betrothals and Child Marriages

Syllabus Mapping: GS-Paper 1, Marriage, Women's Issues

Context

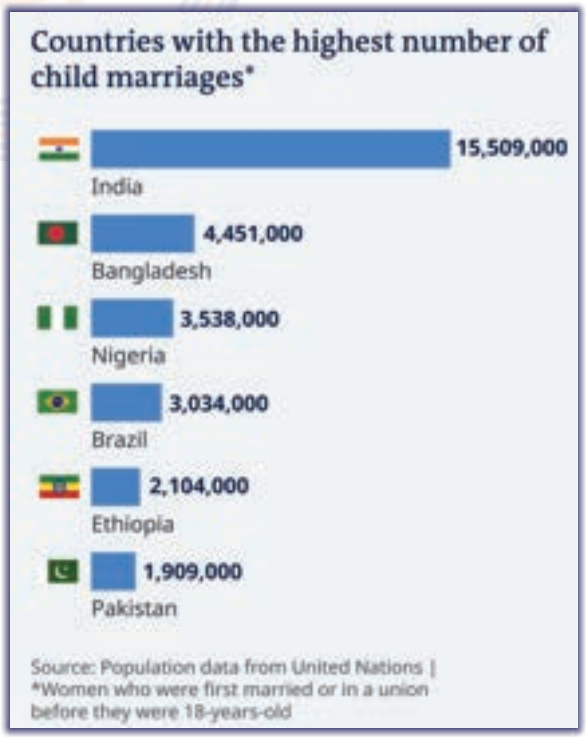
The Supreme Court has urged Parliament to consider banning child betrothals by amending the Prohibition of Child Marriage Act (PCMA), 2006.

More In News

- The Court urged the Parliament to declare a child whose marriage was fixed as "a minor in need of care and protection" under the Juvenile Justice Act.
- The Supreme Court has rejected the government's plea to enforce the Prohibition of Child Marriage Act (PCMA) over personal laws.

What is Meant by Child Betrothals?

- It refers to the **arrangement or formal engagement of a child**, typically before they reach the age of consent, to marry at a future date.
- It is a practice where families agree to the marriage of their children, often when they are still very young.
- These agreements can be based on cultural traditions, familial alliances, economic reasons, or social expectations.
- While the practice of child betrothal is **different from child marriage** (the actual marriage of a child), it sets the **stage for such unions**.



Concerns Related to Child Betrothal

- **Violation of Basic Rights**: Child betrothals infringe on a child's **right to make independent life decisions**, such as choosing whom and when to marry also deprives children of their **right to enjoy a carefree childhood**, forcing them into adult roles prematurely.
- **Circumvention of Law:** Child betrothals are used as a "clever ploy" to evade punishment under the Prohibition of Child Marriage Act (PCMA) as it does not explicitly address child betrothals.

- **Undermining POCSO Act:** Child betrothals and subsequent marriages **expose children to sexual abuse**, contradicting the Protection of Children from Sexual Offences Act (POCSO), which aims to safeguard minors.
  - The absence of culturally sensitive sexuality education for children makes them more vulnerable to exploitation.

Prevalence of Child Marriage in India

- The prevalence of child marriages in India has **halved** from 47% to 27% in 2015-16 and 23.3% in 2019-2021 (according to NFHS-5).
  - 8 States have a higher prevalence of child marriage than the national average — **West Bengal (41.6%), Bihar (40.8%) and Tripura (40.1%) top the list** with more than 40% of women aged 20-24 years married below 18.
- According to the UNICEF report, India is home to the largest total number of girls and women who married in childhood (34%).

Other Key Facts Related to UNICEF Report

- One in three of the world's child brides live in India.
- Over half of the girls and women in India who married in childhood live in five states: Uttar Pradesh (highest), Bihar, West Bengal, Maharashtra and Madhya Pradesh.
- The majority of young women who married in childhood gave birth as adolescents.

What are the Reasons Behind Its Prevalence?

- **Economic Pressure:** Families facing financial hardships may view marrying off their daughters as a way to alleviate their economic burden.
  - This practice can sometimes be seen as a means to secure financial support through dowries or to reduce the number of mouths to feed.
- **Cultural Beliefs**: In some cultures, marrying girls at a young age is believed to "protect" their sexuality and uphold family honour.
- **Social Expectations:** In communities where child marriage is common, families often feel compelled to conform to social norms.
  - Families often face pressure to get their daughters married off early. Otherwise, they risk social ridicule and shame.
- **Safety from Violence:** In situations of extreme poverty, abuse, or danger like rape, families see child marriage as a way to "secure" their daughter's future and protect her from potential threats in society.
- **Inequality:** Child marriage reflects deep-rooted gender discrimination. The families prioritise early marriage over education and opportunities for girls.
- **Weak Enforcement:** Registration processes may overlook age verification, allowing child marriages to occur without legal repercussions.

Table 2: Odds ratio from logistics regression of women aged 20-24 years married < 18 years of age, NFHS-5

Characteristics	Odd Ratio	Characteristics	Odd Ratio
Educational status		***Wealth status***	
Ref Cat: Higher		Ref Cat: Richest	
No education	15.508***	Poorest	1.472***
Primary	12.867***	Poorer	1.454***
Secondary	6.141***	Middle	1.361***
		Richer	1.229***
Religion		***Social groups***	
Ref Cat: Hindu		Ref Cat: General	
Muslim	0.814***	Schedule tribe	1.055***
Christian	0.523***	Schedule caste	0.790***
Other	0.528***	OBC	1.009
Place of residence			
Ref Cat: Urban			
Rural	1.158***		

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What are its Impacts?

- **Burden of Heteronormativity:** Children are pressured to conform to heterosexual marriage norms, which **restrict their personal and sexual autonomy.**
- **Health Issues**
  - **Stunted Growth:** Children born to adolescent mothers are more likely to experience stunted growth. According to NFHS-5, the prevalence of stunting was 35.5% in 2019-21.
  - **Premature Pregnancy:** Young brides often lack knowledge about contraception and face barriers to reproductive health services, leading to early and frequent pregnancies.
  - **Maternal Mortality:** Girls under 15 are five times more likely to die during childbirth or pregnancy. Pregnancy-related complications are a leading cause of death for girls aged 15 to 19.

  - **Infant Mortality**: Babies born to mothers under 20 have nearly 75% higher mortality rates compared to those born to older mothers. They are also more likely to be born prematurely or with low birth weight.
  - **Mental Health Issues:** Experiences of abuse and violence can lead to serious mental health conditions such as PTSD and depression.
  - **Increased Risk of STIs:** Young girls are at a higher risk for sexually transmitted infections due to limited access to reproductive education and healthcare, along with power imbalances in relationships.
- **Education Disruption:** Child brides are often forced out of school, resulting in lower literacy rates for themselves and their children.
- **Economic Impact:** Child marriage perpetuates poverty by limiting educational and job opportunities for both girls and boys.
  - Early marriages lead to larger families and increased economic strain on households.
- **Early Widowhood:** In societies where child marriage is prevalent, it is common to find widows under the age of 18, further complicating their social and economic situations.
  - **Example**: Girls in the tribal communities of Pardhis, Bhils and Thakars residing in and around the districts of Pune, Ahmednagar, Aurangabad and Amravati are facing high divorce rate, according to a report by Child Rights and You (CRY).

Steps Taken To Combat Child Marriage In India

Category	Measures
Historical Efforts	• **Social Reformers** like Raja Rammohan Roy, Iswarchandra Vidyasagar, Pandita Ramabai fought to end child marriage. • **Colonial Laws**: The legal marriageable age for girls was raised to 10 years in 1860 and further increased to 12 by the **Age of Consent Act, 1891**.
Legislative Steps	• **Sharda Act, 1929**: Raised the age of marriage to 14 for girls and 18 for boys. • **Hindu Marriage Act, 1955**: Set the legal age for marriage at 18 for girls and 21 for boys. • **Prohibition of Child Marriage Act, 2006**: Criminalized child marriage with up to 2 years imprisonment and INR 1 lakh fine. • Other laws include **Juvenile Justice Act, 2015**, **Domestic Violence Act, 2005**, and **Protection of Children from Sexual Offences Act, 2012**. • A **Parliamentary Standing Committee** is considering raising the age of marriage for women to 21.
Government Policies and Schemes	• **National Population Policy 2000** and **National Youth Policy 2003**: Strategies to address child marriages through non-formal education, vocational training, and awareness about sexual and reproductive health. • **Beti Bachao Beti Padhao**, **Sukanya Samriddhi Yojana** promote girl child welfare. • **Rajasthan**: Action Approach for the Reduction of Early Marriage and Early Pregnancy. • **West Bengal**: **Kanyashree Scheme** provides financial aid for higher education and **Rupashree Scheme** provides INR 25,000 for marriages of girls above 18.

Way Forward

- **Empowering Girls and Building Infrastructure**: The solution to child marriage lies in empowering girls through education and economic opportunities, alongside creating proper public infrastructure.
- **Strengthening Child Protection Mechanisms**: Ensuring that Child Protection Committees and Child Marriage Prohibition Officers are effectively performing their duties is crucial.
- **Activating Community Support**: Community support groups need to be mobilised to actively prevent child marriages.
- **Education and Awareness**: Local gram panchayat members should be educated to spread awareness, not only about the illegality of child marriage but also its adverse health effects on both the child and her future offspring.

Issues Around Ageing South

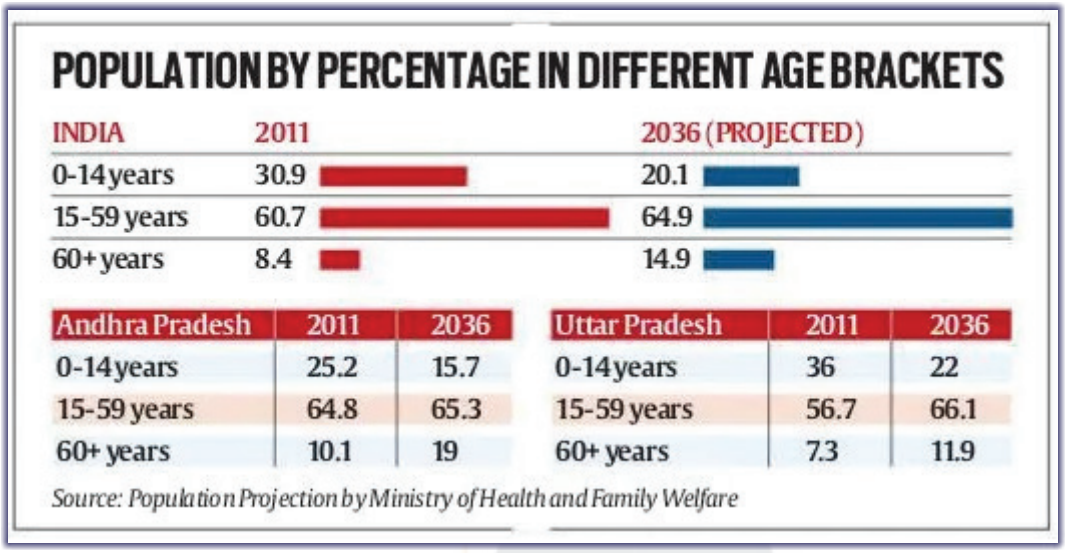
Syllabus Mapping: GS-Paper 1, Population issues

Context

Andhra Pradesh **Chief Minister N. Chandrababu Naidu** has encouraged citizens in southern states to have more children, expressing concerns about the State's ageing population. He announced that the Andhra Pradesh government is working on a law

to encourage residents of the state to have more children. South India has lower fertility rates, compared to Northern states, which will lead to a rapid increase in the aged population, which could strain resources in the future.

Demographic Trends in India



POPULATION BY PERCENTAGE IN DIFFERENT AGE BRACKETS

INDIA	2011	2036 (PROJECTED)
0-14 years	30.9	20.1
15-59 years	60.7	64.9
60+ years	8.4	14.9

Andhra Pradesh	2011	2036
0-14 years	25.2	15.7
15-59 years	64.8	65.3
60+ years	10.1	19

Uttar Pradesh	2011	2036
0-14 years	36	22
15-59 years	56.7	66.1
60+ years	7.3	11.9

Source: Population Projection by Ministry of Health and Family Welfare

- India's population dynamics are shifting significantly, particularly with an ageing population.
- The 60+ age bracket is projected to increase across all states, although the rise will be more pronounced in Southern states due to their earlier transition to lower fertility rates.
  - **Example**: Uttar Pradesh is expected to reach the **Replacement Level of Fertility** only in 2025, more than two decades after Andhra Pradesh achieved this milestone in 2004.

Population Projections (2011-2036)

- **Total Population Increase**: India's population is projected to grow by 31.1 crore from 2011 to 2036.
- **State Contributions:**
  - Five states (**Bihar, Uttar Pradesh, Maharashtra, West Bengal, and Madhya Pradesh**) will account for **nearly 17 crore of this increase**.
  - The **Southern states (Andhra Pradesh, Karnataka, Kerala, Telangana, and Tamil Nadu)** are expected to **contribute only 2.9 crore**, or about **9% of the total increase**.
- **Ageing Population Statistics:** The number of older individuals (60+) is expected to more than **double** from 10 crore in 2011 to 23 crore in 2036, increasing their share from **8.4% to 14.9%**.
  - In **Kerala**, the proportion of people aged 60+ will increase from 13% in 2011 to 23% by 2036, indicating an **almost one-in-four ratio**.
  - In contrast, **Uttar Pradesh**'s population will **remain relatively younger**, with the proportion of 60+ individuals rising from 7% in 2011 to 12% in 2036.

Two Key Concerns

- **Ageing Population:** An ageing population means that a larger share of the population will be dependent (over 60 years old) and not part of the workforce.
  - This can put a strain on resources, as governments may need to allocate more spending on healthcare and pensions.
- **Declining Population and Electoral Representation**: A declining population in Southern states has raised concerns about representation in Parliament.
  - Electoral delimitation could reduce the number of Lok Sabha seats allocated to Southern states, which have already undergone demographic transitions, compared to Northern states with higher population growth.

Concerns Over Pro-Natalist Policies

- Studies show that pro-natalist policies (encouraging people to have more children) have generally failed.

- Scandinavian countries, with comprehensive family and gender-equality policies, are the only places where pro-natalist measures have had some effect in stabilising fertility rates. However, financial incentives alone are insufficient to encourage more births.

Solution

- **Internal Migration as a Solution:** Internal migration can balance the demographic transition between North and South India.
  - Migration already brings working-age individuals to Southern states, allowing these regions to benefit from their labour without having to invest in their early education and upbringing.
  - **Example from the US:** This strategy mirrors the United States, where immigrants contribute to the workforce, fertility rates, and overall economic growth.
- **Productivity Over Population Growth:** Rather than trying to increase fertility rates, the focus should be on enhancing the economic productivity of the current labour force.
  - Ensuring that India capitalises on its demographic dividend (a large working-age population) is crucial for long-term economic growth.

Conclusion

While Southern states face ageing populations, policies aimed at increasing fertility may not be effective. Instead, migration and boosting workforce productivity are seen as more viable solutions to address demographic challenges.

Mental Health in India

Syllabus Mapping: GS-Paper 2, Social Justice, Mental Health

Context

On 10th October, World Mental Health is observed every year. Recent incidents in India highlight the importance of maintaining a balance between mental health and the workplace.

Quote

- **"The unexamined life is not worth living."** – **Socrates**
- **"There are 2 things a person should never be angry at, What they can help, what they cannot." — Plato**

About World Mental Health

- **Origin**: First initiated in 1992 by the World Federation for Mental Health (WFMH).
- **Aim**: To raise awareness about mental health issues and mobilise efforts in support of mental health care worldwide.
- **Theme for 2024**: "Mental Health at Work"

Rise in Workplace Suicides

- **Global Trend:** An alarming increase in suicides among young professionals has emerged, with excessive workplace stress identified as a primary cause.
- **Crisis in Japan**: The term 'karoshi' (death from overwork) is used in Japan, where 2,900 people committed suicide in 2023 due to overwork.
- **Statistics in India:** According to a Statista report, 11,486 suicides among Indian professionals in the private sector were recorded in 2022.
  - **Recent Incidents:** In July, a **26-year-old woman executive** from a multinational consulting firm took her life due to immense work pressures.
    - In September, a **38-year-old software engineer** with **15 years of experience** in Chennai ended his life while being treated for depression linked to work stress.
- These incidents highlight the struggle between outward success and internal mental health challenges, such as **depression** and **anxiety**.

Reasons for Rising Stress and Anxiety

- The modern emphasis on **efficiency and material wealth** leads to **disconnection from self-awareness** and contributes to the mental health crisis.

- **Urban Pressures**: The pressures of **urban living, financial instability, and fierce competition** contribute significantly to mental health issues.
  - Many individuals find that material success does not equate to true well-being, leading to **feelings of isolation and purposelessness.**
  - The focus on profit, efficiency, and cost-cutting leads to immense pressure on employees, resulting in **long working hours and stressful conditions.**
- **Consumerism:** A growing focus on consumerism fosters a culture where **status is defined by luxury goods, resulting in stress and social comparison**.
  - This cycle of chasing material wealth **neglects emotional and psychological needs**.

Reasons for Poor Mental Health Status in India

- **Lack of Awareness and Sensitivity:** In India, mental health issues are often **not regarded as healthcare concerns**.
  - **Example**:
- **Shortage of Mental Healthcare Personnel**: India faces a severe shortage of mental health professionals.
  - **Example**: National Mental Health Survey (2015-2016) highlighted that India has only 0.75 psychiatrists per 1 lakh population.

Another Fact that can be used as example:

- **2023 Parliamentary Standing Committee Report on Health and Family Welfare:**
  - **Number of working psychiatrists in India**: 9,000.
  - **Required number of psychiatrists to meet WHO guidelines:** 36,000.
  - **Number of psychiatrists entering the workforce annually:** 1,000.
  - **Time required to meet WHO guidelines at the current rate:** 27 years.

- **Treatment Gap:** The National Mental Health Survey 2015-16 showed that 10.6 per cent adults suffered from mental disorders in India while the treatment gap for mental disorders ranged between 70 to 92 per cent for different disorders.
- **Low Budget Allocation:** While developed countries allocate 5-18% of their healthcare budget to mental health, India allocates just 1.11% (interim budget 203-24).
- **Changed Lifestyle:** The increased use of social media has heightened stress and mental illness, particularly among young people.
- **Income Inequalities**: Individuals living in poverty are at a higher risk of developing mental health conditions.
  - Conversely, those with severe mental health issues are more likely to fall into poverty due to job loss and increased healthcare costs.

Key Initiatives Taken By The Government Of India For Improving Mental Health Care:

- **National Mental Health Survey (NMHS):** Conducted by the **National Institute of Mental Health and Neurosciences (NIMHANS)** in Bengaluru in **2016**.
  - Found that approximately 10.6% of adults over the age of 18 suffer from mental disorders.
- **District Mental Health Programme (DMHP):** Launched as a key component of the **National Mental Health Programme (NMHP)**.
  - Implemented in **767 districts** with support for States/UTs under the **National Health Mission**.
  - Aims to provide:
    - Suicide prevention services.
    - Workplace stress management.
    - Life skills training.
    - Counselling for schools and colleges.
  - Offers outpatient services, psycho-social interventions, continued care for severe mental disorders, drugs, outreach programs, and ambulance services through district hospitals, **Community Health Centres (CHCs)**, and **Primary Health Centres (PHCs)**.
  - Provides a **10-bed in-patient facility** at the district level.

  - Over **1.73 lakh Sub Health Centres (SHCs)** and **PHCs** have been upgraded to **Ayushman Arogya Mandirs**, integrating mental health services.
- **Expansion of Tertiary Care Component:** Expansion of the NMHP's tertiary care component to enhance mental healthcare capacity.
  - **25 Centres of Excellence** sanctioned to increase intake in postgraduate departments specialising in mental health and provide tertiary treatment facilities.
  - Strengthening of **47 postgraduate departments in mental health** across **19 government medical colleges**.
  - Mental health services provisioned in **22 newly established AIIMS**.
  - There are **47 government-run mental hospitals** in India, including three central mental institutions:
    - **National Institute of Mental Health and Neuro Sciences**, Bengaluru.
    - **Lokopriya Gopinath Bordoloi Regional Institute of Mental Health**, Tezpur, Assam.
    - **Central Institute of Psychiatry,** Ranchi.
- **National Tele Mental Health Programme (NTMHP):** Launched on **October 10, 2022**, to improve access to quality mental health counselling and care.
  - **53 Tele MANAS Cells** operational across **36 states/union territories**.
  - As of **October 8, 2024, over 14.5 lakh calls** have been handled through the helpline.

Economic Survey 2023-24 Highlights

- For the first time, the Economic Survey 2023-24, presented by Union Minister of Finance and Corporate Affairs Smt. Nirmala Sitharaman on July 22, 2024, addresses mental health.
- The Survey emphasises the significance of mental health and its implications for policy recommendations.

Prevalence of Mental Health Disorders

- According to the National Mental Health Survey (NMHS) 2015-16:
  - 10.6% of adults in India suffer from mental disorders.
  - The treatment gap for mental disorders ranges between 70% and 92% for various conditions.
- Mental morbidity is more prevalent in urban metro regions (13.5%) compared to rural areas (6.9%) and urban non-metro areas (4.3%).

Impact on Adolescents

- Citing the NCERT's Mental Health and Well-being of School Students Survey, the Economic Survey notes:
  - The COVID-19 pandemic has exacerbated poor mental health among adolescents.
  - 11% of students report feeling anxious, 14% report experiencing extreme emotions, and 43% experience mood swings.

Economic Impact of Mental Health Disorders

- Mental health disorders are linked to significant productivity losses, which include:
  - Absenteeism.
  - Decreased productivity.
  - Disability.
  - Increased healthcare costs.
- There is evidence that poverty increases the risk of mental health issues through:
  - Stressful living conditions.
  - Financial instability.
  - Lack of opportunities for upward mobility, contributing to heightened psychological distress.

International Practices

- **Brazil's Initiative**s: Community gardens in Brazil have successfully fostered social connections among residents. Similar initiatives in India could help mitigate the isolation caused by urban living.

Way Forward

- Emphasis should be placed on mental, emotional, and social well-being rather than wealth accumulation.
- **Mindfulness programs**, **social-emotional learning**, and **community living initiatives** are essential to cultivate a culture valuing mental well-being.
- Social policies aimed at reducing inequality and providing mental health support are critical.

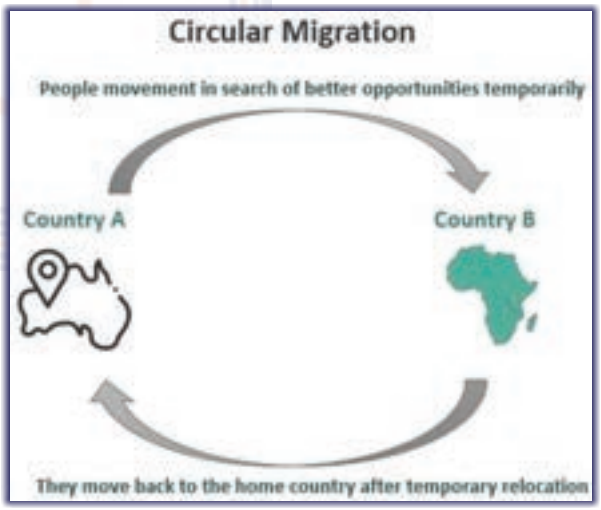
- **Reassessing Work Culture**: Companies should evaluate and adjust their work culture, reducing excessive hours, and embracing flexible schedules and remote work.
- **Benefits of Flexibility**: Employees with control over their schedules report higher satisfaction and lower stress levels.
- **Encouraging Breaks and Vacations**: Regular breaks and time off are essential in preventing burnout.
- **Providing Psychological Support**: Investment in employee assistance programs and access to mental health professionals is crucial. Early intervention can significantly mitigate long-term stress effects.
- **Fostering Open Conversations**: Creating a culture that encourages open discussions about mental health can help eliminate stigma.
- **Training for Managers**: Managers should be trained to recognize burnout signs and intervene proactively.
- **Mental Health Check-Ins**: Establishing routine mental health check-ins and prioritising stress management can foster a healthier workforce.
- **Performance Metrics**: Companies should shift focus from measuring productivity by hours worked to assessing the quality of work produced.
- **Debunking Myths**: The misconception that constant busyness equates to productivity needs to be addressed. A balanced work culture benefits both employees and organisations.
- **Setting Realistic Expectations**: Employers should set achievable goals, and employees must learn to set boundaries around their work hours, including the ability to say "no" when necessary.
- **Collective Effort Required**: Addressing workplace stress requires collaboration between employees and employers.
- **Employee Resilience**: Employees can build resilience through mindfulness, regular exercise, and strong social support networks.
- **Seeking Professional Help**: Prompt professional support is vital when stress becomes overwhelming.

Circular Migration to enhance Economic Opportunities

Syllabus Mapping: GS Paper 1, Society, Migration

Context

The recent initiative involving the migration of youth from Maharashtra to Israel highlights a significant shift in labour mobility, focusing on circular migration as a means to enhance skills and economic opportunities for both countries.



More in News

- A group of 997 young individuals from Maharashtra, holding only high school certificates, will begin jobs in Israel with a monthly salary of ₹1.37 lakh.
- This is part of India's labour mobility agreements, crafted by Prime Minister Narendra Modi with countries like Israel, Germany, and Japan.
- This migration is termed **circular migration**, which brings skill benefits for both countries, unlike permanent migration that results in brain drain.

Issue of Brain Drain vs. Remittances

- **Brain Drain**: The permanent migration of highly qualified professionals (doctors and engineers) has been termed "brain drain," particularly when these individuals have studied in subsidised Indian institutions.
  - Although they sent remittances in the early years, their contribution dwindled after settling.
- **Remittance Data:**
  - Only 32% of India's inward remittances come from high-income countries (US, UK, Canada, Australia).
  - Around 40% of remittances come from manual workers in the UAE, Saudi Arabia, Kuwait, Qatar, and Oman, demonstrating the significant role of less-skilled migrant workers in India's remittance economy.

Opportunities

- Millions of Indian citizens already work in the Middle East and USA. The demographic shift in rest of globe provides further opportunities for India to emerge as a supplier of global talent.
- Ageing populations in Western Europe and Japan create a demand for skilled workers from developing countries like India.
- There is a significant shortage in fields such as healthcare and technology, creating opportunities for Indian workers.
- The Indian government has signed bilateral agreements with countries like **Germany, Japan, and Israel** to meet their skill deficits.
  - **Example:** Israel has a demand for over **100,000 skilled masons, carpenters, and home-based carers**. Indian workers selected for these jobs are assured wages of Rs 1.3 lakh per month, accommodation, and social security.

Challenges to Fulfilling Global Skill Gaps

- Exact skill-matching and language proficiency are major hurdles for circular migration.
- Compliance with legal procedures, such as acquiring passports and demonstrating skills as per foreign standards also poses challenges.
- Mutual regulation of educational degrees and skill certifications
- Human rights abuses of outgoing labour in host countries.
- Frauds by agencies involved in the facilitation of outgoing labours.

Various Initiatives To Support Circular Migration

- **National Skill Development Corporation (NSDC)** has aggregated skill gap demands from India's partner countries.
- **Maharashtra Institution for Transformation (MITRA)** worked closely with NSDC, the Union Ministry of Skill Development, and state departments to facilitate the recruitment of skilled workers for Israel.
- A four-day course on **Recognition of Prior Learning (RPL)** was developed to upgrade existing skills.
- ITI Pune created specific testing facilities to meet Israeli standards, including fabricating a bar bending testing machine not previously used in India.
- Ministry of External Affairs expedited passport applications for candidates, even scheduling interviews on holidays.

Learning Over Rankings: Redefining Education

Syllabus Mapping: GS-Paper 2, Education

Context:

The ongoing emphasis on university rankings has significantly impacted the education ecosystem, particularly in India.

Global and National Ranking Systems

- The rise of global ranking agencies has led to an increasing focus on quantifying university performance through metrics.
  - Eg: India has its own National Institutional Ranking Framework (NIRF) to evaluate universities.
- Universities are primarily intended to educate future citizens and foster knowledge through research. Teaching and research are essential for fulfilling societal obligations.
- Examples of global rankings of educational institutions:
  - QS World University Rankings produced by Quacquarelli Symonds.
  - Times Higher Education World University Rankings published by Times Higher Education along with Thomson Reuters

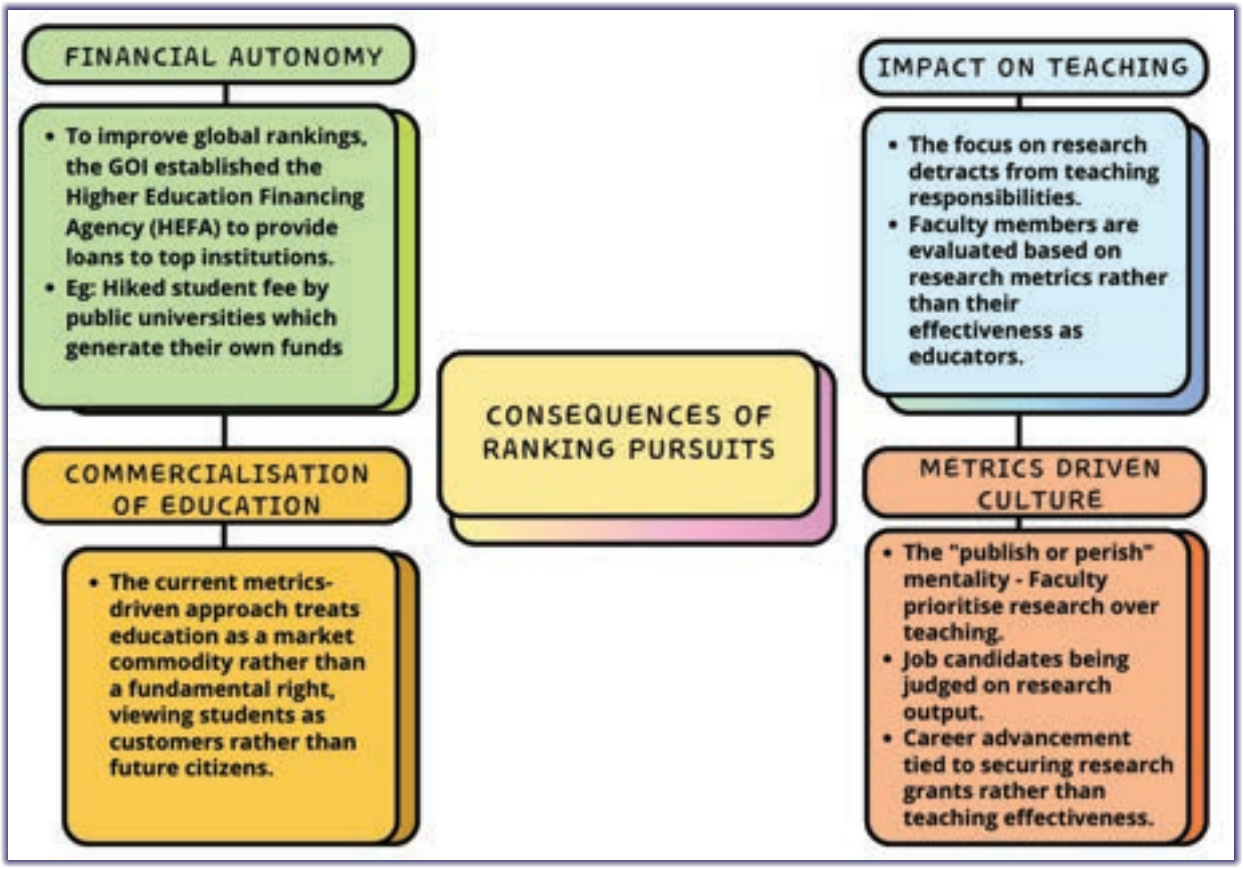
Critique of Ranking Systems

- **One-Dimensional Focus**: Global rankings prioritises research output, using criteria such as:
- Number of published papers
- Impact factor of journals
- Research funding acquired
- Number of PhD students admitted and graduated

- **Limitations**: These metrics fail to capture the quality, relevance, and societal impact of research. Despite this, Indian universities strive for high rankings for visibility and to attract students and faculty.

Call for Change

- Create distinct tracks for research-focused and teaching-focused faculty members.
  - This would allow educators to excel in their primary roles without the pressure to perform in both areas simultaneously.
- Universities must recognize that the societal impact of research is more important than mere publication metrics.
  - Teaching should be valued equally alongside research efforts.
- There is a need for transparent assessment methods that prioritise teaching quality and mentoring capabilities over quantitative measures.



Conclusion

The current obsession with university rankings has created a skewed educational environment where research is prioritised at the expense of teaching. A balanced approach that values both teaching and research is essential for fostering an educational ecosystem that truly serves its mission to society.

TOPICS FOR PRELIMS

Dharti Aaba Janjatiya Gram Utkarsh Abhiyan

Syllabus Mapping: Schemes, Tribal Development

Context

Recently, PM Narendra launched the Dharti Aaba Janjatiya Gram Utkarsh Abhiyan, a package for basic scheme saturation in tribal-majority villages from Jharkhand's Hazaribagh district.

About Dharti Aaba Janjatiya Gram Utkarsh Abhiyan (DAJGUA)

- **Nodal Ministry:** Ministry of Tribal Affairs (MOTA)
- **Objective:** It focuses on addressing critical gaps in social infrastructure, health, education, and livelihood through 25 targeted interventions.

- **Key Features of the Scheme**
  - **Comprehensive Coverage:** The program will span across 549 districts and 2,911 blocks, impacting tribal-majority villages within 30 States and UTs.
  - **Multi-Ministerial Convergence:** Implementation will involve collaboration among 17 different ministries, ensuring a coordinated approach to address various developmental needs.
  - **Infrastructure Development Initiatives:** The scheme includes the inauguration of 40 Eklavya Model Residential Schools (EMRS) and laying of foundations for 25 more, with a target to make 728 schools functional by March 2026 which will serve 3.5 lakh tribal students.

PM Internship Scheme

Syllabus Mapping: Employment

Context

The Union government has opened up a portal for India's top companies to participate in the one-year internship scheme which was announced in this year's Union Budget.

About PM Internship Scheme

- **Aim:** To provide internship opportunities to one crore youth in the top 500 companies.
- **Benefits:**
  - A monthly stipend of ₹4,500 will be provided to the interns from the central government via DBT (Direct Benefit transfer)
  - Additional ₹500 offset will be provided by the company's CSR fund.
- **Internship Period:** 1 Year
- **Eligibility:**
  - Candidates aged between 21 and 24 years who are not engaged in full-time employment are eligible for the one-year internship programme.
  - Internships are available to those who have passed class 10 or higher.
- **Exceptions:**
  - Individuals from families with government jobs are excluded
  - A candidate who graduated from premier institutes such as IIT, IIM or IISER, and those who have CA, or CMA qualification would not be eligible to apply for this internship.
  - Anyone from a household that includes a person who earned an income of ₹8 lakh or more in 2023-24, will not be eligible.

CSR (Corporate Social Responsibility)

- It is a concept whereby companies integrate social and environmental concerns in their business operations.
- In India, Companies Act, 2013 has made CSR contribution mandatory.

E-Shram One Stop Solution Portal

Syllabus Mapping: Schemes, Employment

Context

The Union Minister of Labour & Employment has launched eShram One Stop Solution portal.

About E-Shram One Stop Solution Portal

- It aims to provide seamless access to various Social Security Schemes for unorganised workers registered on the eShram portal.
- It has integrated 12 schemes of different Ministries and departments to the site.
- States and Union Territories can also bring their schemes and benefits for unorganised workers onto the eShram platform.

About E-Shram Portal

- It is a database of unorganised workers in India, launched by the Ministry of Labour & Employment (MoLE) in 2021.
- The portal's main purpose is to:
  - Provide identity cards to unorganised workers
  - Facilitate the delivery of social security measures and welfare benefits to unorganised workers
  - Create a centralised database of unorganised workers
  - Maximise employability

Swachh Bharat Mission

Syllabus Mapping: Schemes, Health

Context

Recently, Swachh Bharat Mission has completed 10 years of its launch.

About Swachh Bharat Mission

- **Launch:** on October 2, 2014
- **Nodal Ministry:** Ministry of Jal Shakti
- **Key Objectives:**
  - **Eliminate Open Defecation:** Construction of toilets in rural and urban areas to ensure that every citizen has access to sanitation facilities.
  - **Solid Waste Management:** Implementing scientific waste management practices to handle municipal solid waste effectively.
  - **Behavioural Change:** Encouraging community participation through awareness campaigns and promoting cleanliness as a cultural norm.

Achievements of Swachh Bharat Mission

- India declared open defecation free on 2nd October 2019.
- More than 10 crore toilets were constructed under the rural phase.

- Sanitation coverage improved from 39% in 2014 to 100% in 2019 in India (National Annual Rural Sanitation Survey).
- Tamil Nadu has reclaimed the most area from dumpsites at 837 acres (42%).
- Gujarat leads in performance with a reclamation rate of 75% (698 out of 938 acres).

Swachh Bharat Mission 2.0

- **Launch:** on October 1, 2021
- **Key Objectives:**
  - Achieving "garbage-free" cities by 2026.
  - Ensuring 100% source segregation, door-to-door collection of waste and scientific management of all waste fractions.
  - Remediation of legacy dumpsites to convert them into green zones.

Legacy Waste Dumpsites

- Dumpsites that contain solid waste that have been collected and stored for years in an unscientific and uncontrolled manner.
- These dumpsites originally developed on the outskirts of the cities.

Union Cabinet has extended supply of Fortified Rice till 2028

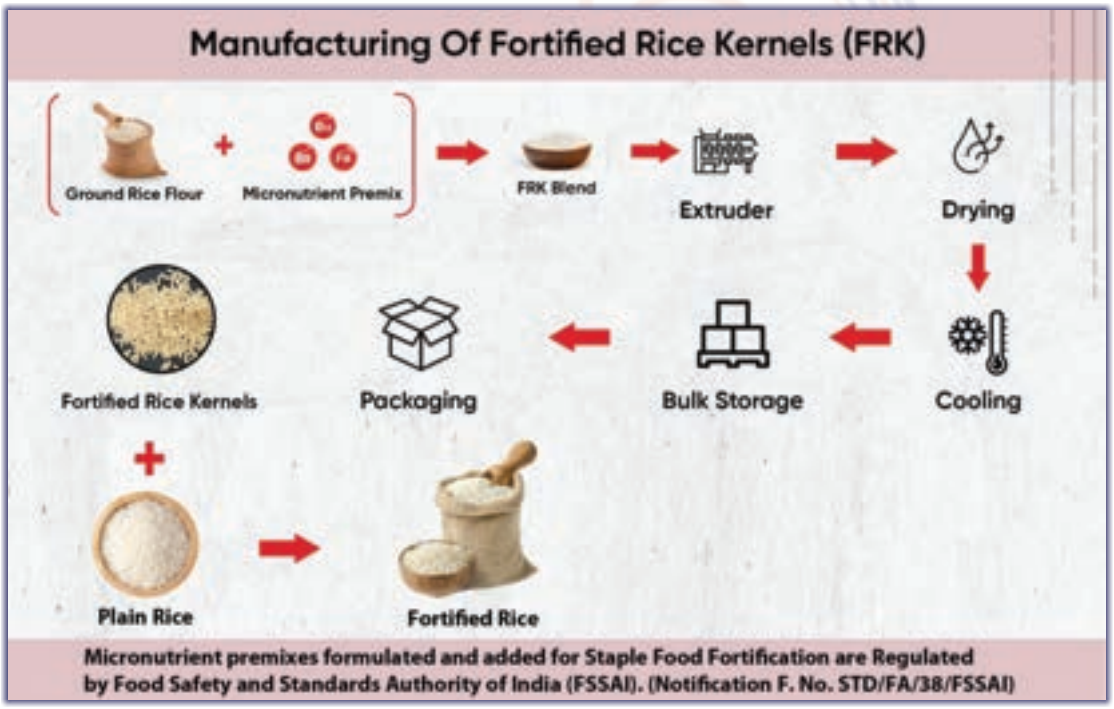
Syllabus Mapping: Schemes, Health, Nutrition

Context

- The Union Cabinet has extended the universal supply of fortified rice under central government schemes until December 2028. The initiative covers programs like the Targeted Public Distribution System (TPDS), Integrated Child Development Services (ICDS), and PM POSHAN for all states and union territories.

Rice fortification

- It is the process of adding micronutrients like iron, folic acid, and vitamin B12 to rice to improve its nutritional value.
- According to FSSAI norms, fortified rice must contain:
  - Iron: 28 mg - 42.5 mg
  - Folic Acid: 75 - 125 micrograms
  - Vitamin B12: 0.75 - 1.25 micrograms
  - Additional nutrients may include zinc, vitamin A, and various B vitamins.
- The rice fortification initiative will continue as a central sector initiative with 100% funding by the Centre as part of **Pradhan Mantri Garib Kalyan Anna Yojana (PMGKY).**



Difference between Fortification and Biofortification

- Fortification is the practice of deliberately increasing the content of one or more micronutrients (vitamins and minerals) in a food or condiment to improve the nutritional quality of the food supply.
- Biofortification is the process by which the nutritional quality of food crops is improved through agronomic practices, conventional plant breeding, or modern biotechnology.

About Pradhan Mantri Poshan Shakti Nirman (PM-POSHAN) Scheme

- **Launched in**: September 2021.
- This initiative replaces the previous Mid-day Meal Scheme and is set to run from 2021-22 to 2025-26 with a financial outlay of Rs 1.31 trillion.
- **Aim**: To provide one hot cooked meal to children in Government and Government-aided schools.
- **Objectives:**
  - **Addressing Malnutrition**: Aims to reduce stunting, under-nutrition, anaemia, and low birth weight among children.
  - **Improving Educational Attendance**: Encourages regular school attendance among disadvantaged children by providing nutritious meals.
  - **Holistic Approach:** Promotes a lifecycle approach focusing on the first 1,000 days of a child's life, emphasising adequate nutrition during pregnancy and early childhood.

Key Features

- **Target Population:** Covers 11.8 crore children from classes I to VIII across 11.2 lakh schools.
  - Includes children aged 3-5 years in pre-primary classes (Balvatikas).
- **Nutritional Standards:**
  - Primary school children (Classes I-V) receive 100 grams of food grains daily, ensuring a minimum of 450 calories.
  - Upper primary schoolchildren (Classes VI-VIII) receive 150 grams, ensuring a minimum of 700 calories.
- **Supplementary Nutrition:** Additional nutrition for children in aspirational districts and those with high anaemia prevalence.
  - Removal of restrictions on additional food items like milk or eggs.
- **Community Engagement:** The Tithi Bhojan Concept encourages community participation by allowing local communities to provide special meals on occasions.
- **Direct Benefit Transfer (DBT):** Implementation of DBT for compensation to cooks and helpers, aiming to reduce administrative leakages.
- **Nutrition Experts:** Appointment of nutrition experts in schools to monitor health metrics like Body Mass Index (BMI) and haemoglobin levels.
- **Social Audit:** Mandated social audits for each school to assess the scheme's implementation.

About Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY)

Launched	2020
Nodal Ministry	Ministry of Finance
Implemented by	Department of Food and Public Distribution under the Ministry of Consumer Affairs, Food and Public Distribution.
Purpose	• To supply free food grains to migrants and the poor. • was designed to provide **5kg free foodgrains to eligible ration card holders under the National Food Security Act, 2013 (NFSA)**.
Implementation	• PMGKAY has been extended for another five years from **January 1, 2024** over a **5 year period.**
Benefits	• PMGKAY provides **5 kg** of food grain to each family holding a ration card free of cost. This is in addition to the subsidised ration provided under the **National Food Security Act (NFSA)** to families covered under the **Public Distribution System (PDS).**
Eligibility	• Families belonging to **Antyodaya Anna Yojana (AAY) and Priority Households (PHH) categories** will be eligible for the scheme. • PHH are to be identified by State Governments/Union Territory Administrations as per criteria evolved by them. • AAY families are to be identified by States/UTs as per the criteria prescribed by the Central Government: • **Households headed by widows or terminally ill persons** or disabled persons or persons aged 60 years or more with no assured means of subsistence or societal support. • All primitive tribal households. • Landless agricultural labourers, marginal farmers, rural artisans/craftsmen. • All **eligible Below Poverty Line families of HIV positive persons.**
Recent Update	• From **January 1, 2023**, the **PMGKAY had subsumed** other schemes under the **National Food Security Act** such as the **Antyodaya Anna Yojana (AAY) and Priority Households (PHH) for one year.** • AAY card holders would get **35 kilograms of foodgrains per family per month** and **PHH scheme beneficiaries will get five kilograms per person per month.**

Pradhan Mantri Schools for Rising India (PM-SHRI)

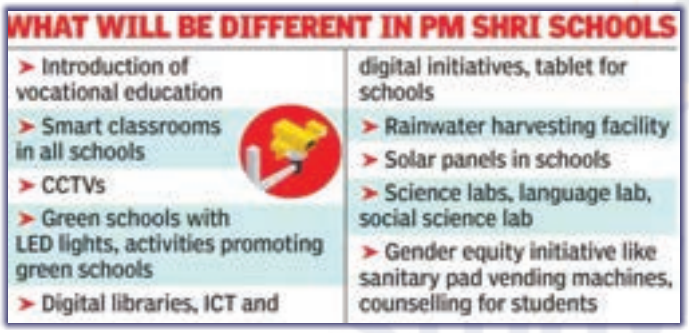
Syllabus Mapping: Schemes, Education

Context

Delhi government has signed a MoU with the Union Education Ministry to implement the PM-SHRI Scheme.

About PM SHRI Schools Scheme

- **Launched**: 2022
- **Type**: Centrally Sponsored scheme.
- **Nodal Ministry**: The Department of School Education and Literacy.
- **Objective**: To develop over 14,500 schools nationwide by enhancing existing schools managed by the Central Government, States, UTs or local bodies.
- **Duration**: Scheduled from 2022-23 to 2026-27, after which the responsibility for maintaining achieved benchmarks will be of the respective States/UTs.
- **Features**:



STARS Project

- Strengthening Teaching-Learning and Results for States (STARS) project is a **World Bank-funded** initiative to improve the quality of education in India.
- Presently implemented in six state**s: Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Odisha and Rajasthan.**

Pradhan Mantri Bhartiya Janaushadhi Pariyojana (PMBJP)

Syllabus Mapping: Schemes, Health

Context

Recently PMBJP achieved a significant milestone, with Janaushadhi medicines amounting to ₹1,000 crore sold in the year 2024-25 up to October 2024.

About PMBJP

- It was launched by the Union govt. in 2016 to provide affordable quality medicines to the general public.
- **Nodal Ministry:** Ministry of Chemicals and Fertilisers (Department of Pharmaceuticals)
- **Implementing Agency:** Pharmaceuticals & Medical Devices Bureau of India (PMBI)
- **Salient Features:**
  - **Generic Medicines:** PMBJP focuses on making generic medicines available, which are up to 50%-90% cheaper than branded medicines.
  - **Janaushadhi Kendras:** Special outlets called "Pradhan Mantri Bhartiya Janaushadhi Kendras" are set up to sell these affordable generic drugs. As of now, there are over 9,000 Kendras across India.
  - **Quality Assurance:** Medicines sold under PMBJP are of high quality, tested and certified by government-approved laboratories.

Facts

- The share of **Government Health Expenditure (GHE) in the GDP has increased** from 1.13 % in 2014-15 to 1.84% in 2021-22. (Target - 2.5% of GDP by 2025)
- Between 2014-2022, the **share of Out of Pocket Expenditure (OOPE)** in the Total Health Expenditure **has declined** from 62.6% to 39.4%.
  - OOPE refers to the direct payments made by households when accessing healthcare services.
  - It excludes those covered by public or private insurance or social protection schemes.

Global Hunger Index

Syllabus Mapping: Social Justice, Malnutrition

Context

Recently the Global Hunger Index report 2024 was released.

Facts

- **GHI Score**: 27.3 (reflecting serious hunger)
- **Ranking**: 105th out of 127 countries
- This places India behind its neighbours **Sri Lanka, Nepal, Myanmar,** and **Bangladesh**, but just above **Pakistan** and **Afghanistan**.

About Global Hunger Index

- The Global Hunger Index (GHI) is a tool designed to measure and track hunger globally, focusing on its dimensions and causes.
- It is published **annually by the Welthungerhilfe and Concern Worldwide**.
- **GHI score is calculated based on four indicators:**
  - **Undernourishment:** The proportion of the population that is undernourished.
  - **Child Wasting:** The percentage of children **under 5** who have low weight for their height (indicative of acute malnutrition).
  - **Child Stunting:** The percentage of children **under 5** who have low height for their age (indicative of chronic malnutrition).
  - **Child Mortality:** The mortality rate of children **under 5.**

SCIENCE & TECHNOLOGY

TOPICS FOR MAINS

Private Participation in India's Nuclear Energy

Syllabus Mapping: GS-Paper 3, Nuclear Technology

Context

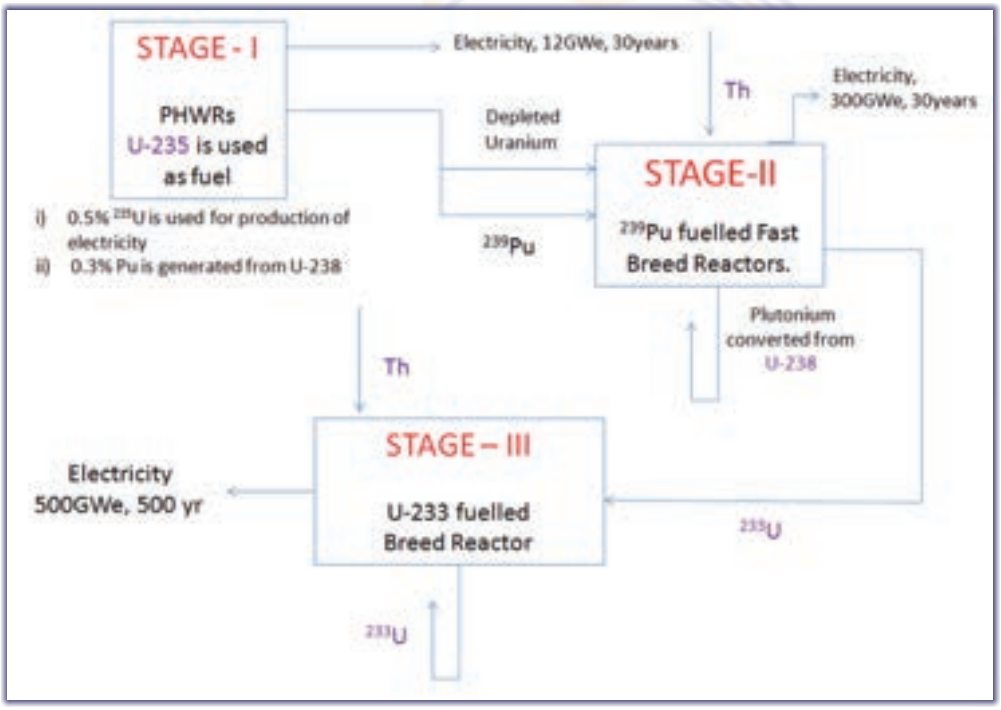
In the Union Budget for FY 2024-25 Government of India announced the expansion of the nuclear energy sector by inviting private sector partnership for R&D of **Bharat Small Reactors (BSR)**, **Bharat Small Modular Reactors (BSMR)**, and other nuclear technologies.

Boosting Nuclear Energy aligns with India's goal of decarbonizing energy generation, tackling climate change and ensuring energy security by achieving **500 Gigawatts (GW)** of non-fossil fuel-based energy by 2030, as pledged at **COP26 Summit** (2021, Glasgow).

Stages of India's Nuclear Programme

First Stage: Pressurised Heavy Water Reactors (PHWRs)

- Focuses on establishing Pressurised Heavy Water Reactors (PHWRs) along with the necessary fuel cycle.
- **Fuel & Coolant**: Utilise **natural uranium (U-238)** as fuel and **heavy water (deuterium oxide)** as both coolant and moderator.
- **Current Operations**: **Nuclear Power Corporation of India Limited (NPCIL)** currently operates **22 commercial nuclear power reactors**, with a combined installed capacity of **6,780 MWe**.



(Schematic for India's three stage nuclear program)

Second Stage: Fast Breeder Reactors (FBR)

- **Fuel Type**: FBRs will initially operate using **Uranium-Plutonium Mixed Oxide (MOX)** fuel.
- **Breeding Process**: The surrounding **Uranium-238** will undergo nuclear transmutation to generate **Plutonium-239** fuel, earning the term "Breeder."
- **Thorium Utilisation**: Through transmutation, **Thorium-232** will produce fissile **Uranium-233**, which will be used as fuel in the third stage.

- **Establishment of BHAVINI**: In 2003, the government approved the establishment of **Bharatiya Nabhikiya Vidyut Nigam Ltd (BHAVINI)** to construct and operate India's advanced **Prototype Fast Breeder Reactor (PFBR)**.
- **Significance**: Once operational, India will become the second country, after Russia, to have a commercial Fast Breeder Reactor.

Third Stage: Thorium-based Reactors

- **Utilisation of Thorium**: The third stage aims to leverage India's extensive Thorium reserves.
- **Proposed Reactor**: An **Advanced Heavy Water Reactor (AHWR)** is proposed for this stage, which will utilise **Uranium-233**.
- **Fuel Generation**: Through transmutation, Thorium will generate fissile **Uranium-233**, which will serve as fuel in this stage.

Potential Benefits of Private Investment in Nuclear Energy for India's Energy Security

- **Increased Capacity:** India plans to add 11,000 megawatts (MW) of nuclear power generation capacity by 2040. Expanding nuclear power will help reduce the country's heavy reliance on coal for electricity generation, which currently constitutes over 50% of its installed capacity.
- **Financial Investment and Infrastructure Development**: The initiative aims to attract approximately **$26 billion** in private investments, facilitating the construction and operation of new nuclear power plants.
  - This financial influx is crucial for achieving ambitious clean energy targets.
- **Technological Advancements and Innovation**: Private companies may introduce innovative technologies and practices that enhance efficiency and safety in nuclear operations.
  - Collaborative efforts could also promote research and development, particularly in areas such as **Small Modular Reactors (SMRs)**, which offer potential cost savings and shorter construction times.
- **Alignment with National Energy Goals**: Private investment aligns with India's objective of achieving **50% non-fossil fuel-based electricity generation** by **2030**, supporting the transition towards cleaner energy sources.
- **Reduction in Carbon Emissions**: Nuclear energy is a non-carbon-emitting source that can significantly lower greenhouse gas emissions. Increasing nuclear capacity will help India move closer to its goal of achieving **50% non-fossil fuel-based electricity generation** by **2030**.
- **Conservation of Natural Resources:** Nuclear power plants require less land per unit of electricity generated compared to solar or wind farms. This efficiency can aid in conserving land resources and minimising habitat disruption, especially in densely populated areas.

Legislative Hurdles for Private Participation in India's Nuclear Energy Sector

- **Legal hurdles for Private Sector in Nuclear Energy**
  - Atomic Energy Act, 1962 serves as the primary legislation governing the development and operation of the nuclear energy sector in India.
  - AEA empowers only the central government "to produce, develop, use, and dispose of atomic energy."
  - AEA grants the government exclusive control and responsibility over all nuclear energy activities, whether conducted through an authority or a company established by it.
  - Currently, the Department of Atomic Energy (DAE) and the Nuclear Power Corporation of India Limited (NPCIL) hold comprehensive control over the nuclear energy infrastructure.
  - Supreme Court Ruling (2024), in Sandeep T.S. vs. Union of India dismissed a petition challenging the AEA's restrictions on private participation. SC emphasised on the necessity of strict regulatory safeguards due to potential misuse and the risks associated with nuclear accidents.
- **Nuclear Liability Requirements:** Ongoing legal challenges to the Civil Liability for Nuclear Damage Act, 2010 (CLNDA) contribute to uncertainty for private investors in the nuclear sector.
  - The CLNDA aims to provide no-fault liability for operators in the event of nuclear accidents; however, its constitutionality is currently under scrutiny.
- **Financial Risks:** Nuclear projects demand substantial upfront investments and have long gestation periods. Significant costs and financial uncertainties surrounding project completion and returns on investment deter private investors.
- **Public Perception & Acceptance:** Public opposition to nuclear energy, driven by safety concerns and environmental impacts, can influence private companies' willingness to invest.

  - For example, local opposition against the Kudankulam Nuclear Power Plant in Tamil Nadu.
- **Technological Challenges:** Development and maintenance of nuclear technology requires specialised expertise and infrastructure.
  - The private sector may lack the necessary knowledge and resources to manage these complex technologies effectively.
- **Waste Management:** The government is exploring SMRs as a viable option for generating low-carbon electricity, particularly in locations unsuitable for larger reactors.
  - However, experts express concerns about whether SMRs can effectively mitigate waste management issues associated with traditional reactors.
- **Market Competition:** Nuclear energy competes with other energy sources, particularly renewables, which are often less expensive and face fewer regulatory obstacles.
  - This competitive landscape makes it difficult for nuclear power to attract private investment.
- **High Risk Nature**: Presence of reactors near populated areas necessitates stringent safety protocols.
  - Past nuclear disasters like Chernobyl and Fukushima highlight the risks associated with nuclear technology.

Measures to Increase Private Investment

- **NITI Aayog** emphasises promoting private sector participation in Small Modular Reactors (SMRs) by:
  - A supportive regulatory framework.
  - A clear civil nuclear liability framework.
- **Public-Private Partnerships (PPP)**: A proposed model suggests that Nuclear Power Corporation of India Limited (NPCIL) or a similar authority could retain 51% ownership of nuclear plants, allowing private investment while ensuring government accountability.
  - This structure would also comply with transparency requirements under the Right to Information Act.
- **Legislative Needs**: To facilitate private participation in nuclear energy, significant legislative changes are necessary.
  - This includes revising the AEA to allow private sector involvement in R&D and addressing legal uncertainties surrounding CLNDA.

Biobank laws

Syllabus Mapping: GS-Paper 3, Biotechnology

Context

Precision medicine in India faces hurdles due to inconsistent biobank regulations, which are crucial for storing biological samples and ensuring data privacy, thereby hindering research and innovation.

Biobanks: Foundation of Precision Medicine

Biobanks store biological samples (blood, DNA, tissues) and genetic data for research, helping identify treatments and potential therapies.

- India has **19 registered biobanks**, with notable projects like:
  - **Genome India**: Sequenced 10,000 genomes from **99 ethnic groups** for rare disease treatments.
  - **Phenome India**: Collected 10,000 samples for cardio-metabolic disease prediction.
  - **Paediatric Rare Genetic Disorders (PRaGeD)**: Identifies genetic diseases in children.
- Biobanks store large quantity of biological samples
- Ensure data security which is essential for R&D and developments of precision medicine.
- However, biobank success depends on **large and diverse collections** of samples for accurate research outcomes.

Precision Medicine

Precision medicine is a personalised healthcare approach that tailors treatments based on an individual's genetic makeup, lifestyle, and environment. It aims to move away from one-size-fits-all treatments, providing more effective and targeted therapies for various diseases like cancer, cardiovascular conditions, and genetic disorders.

Evolution and Status of Precision Medicine in India

Precision medicine gained momentum globally with the completion of the **Human Genome Project**, and in India, the field is growing rapidly:

- The Indian precision medicine market is projected to grow at a **CAGR of 16%** and exceed **$5 billion by 2030**.
- It contributes to **36% of India's bioeconomy**, with advancements in cancer immunotherapy, gene editing, and biologics.
- **Key developments**:
  - **NexCAR19**: India's domestically developed **CAR-T cell therapy** approved in 2023.
  - AI collaborations, such as between **Siemens Healthineers** and the **Indian Institute of Science**, aim to harness precision medicine for cancer treatments.

Biobank Regulations in India

Biobanking regulations in India are **inconsistent** and pose challenges:

- India lacks a law to protect the rights of individuals who provide samples, unlike countries like the **U.S., U.K., and Japan**.
- Existing guidelines from **Indian Council of Medical Research (ICMR)** and **Department of Biotechnology (DBT)** have gaps, such as **no clarity on how long data will be stored**, who can **access** it, or **safeguards** against data misuse.
- Without a **single regulatory authority** and penalties for misconduct, ethical violations like unauthorised sample sharing are a significant risk.
- The absence of clear regulations threatens to let **foreign pharmaceutical companies exploit** Indian samples without Indians benefiting from research profits or innovations.

Way forward for strengthening biobanks in India

India can strengthen its leadership in precision medicine by:

- Implementing **strong biobank regulations** to align with global standards, ensuring data protection, privacy, and transparency.
- Establishing an **expert regulatory committee** to oversee biobanks and penalise violations.
- Leveraging its existing strengths in **pharmaceuticals** and **vaccine manufacturing** to expand into **next-generation therapeutics** and **global biobank partnerships**.
- Encouraging public participation by ensuring **privacy protections**, fostering greater research and innovation in the field of precision medicine.
- Becoming a global leader by **integrating biobank frameworks into international collaborations** through platforms like BRICS and the Quad.

How NM-ICPS is Shaping India's Cyber-Physical Landscape

Syllabus Mapping: GS-Paper 3, ICT

Context

As part of the 100-day agenda the government launched **BharatGen at IIT Bombay** to develop multilingual (across 22 Indian languages) and multimodal AI (speech, text, and vision) models under the **National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS).**

About Cyber-Physical Systems

- Cyber-Physical systems are networked systems in which the computational (cyber) part is tightly integrated with physical systems.
- Here the computational system continuously assesses the system and the environment and then provides continuous feedback for controlling the system.
- The paradigm of Industry 4.0 is deeply integrated with the concept of cyber-physical systems. It relies on combining technologies and knowledge, providing autonomy, reliability and control without human participation.
- Key technological trends underlying CPS include Internet of Things (IoT), Big Data, smart technologies, cloud computing, etc.
- CPSs are the basis for the development of smart manufacturing, smart medicine, smart buildings and infrastructures, smart city, smart vehicles, wearable devices, mobile systems, defence systems, meteorology, etc.

Concerns with Cyber-Physical Systems

- **Automation and job losses:** Industry 4.0 and resultant technologies can replace human labour and can thus cause unemployment.
- **Compromise of confidentiality:** These systems are increasingly under threat due to cyber attacks such as DDoS, Ransomware, surveillance etc.

About National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS)

- **Launched in:** 2018
- **Nodal body:** Department of Science & Technology
- **Funding:** Rs 3660 for a period of 5 years.
- **Goal:** To establish India as a global leader in Cyber-Physical Systems (CPS).
  - Drive innovations in AI/ML, robotics, cybersecurity, and autonomous systems.
  - Focus on translational research to convert academic findings into market-ready products.
- **Mechanisms:**
  - Formation of **Technology Innovation Hubs** in 25 reputed institutions to facilitate applied research.
  - These hubs operate as **Section 8 companies**– ensuring operational freedom and a focus on national priorities.
- **Key Accomplishments:**
  - **Drone Swarm at the Beating Retreat Ceremony:** Showcased coordinated drone displays at the Rashtrapati Bhavan.
  - **India-made Commercial System-on-Chip**: Released the first India-made SoC designed for secure IoT environments.
  - **World's First "Digital Entomologist"**: Developed a digital system for sustainable agriculture and entomology.
  - **Autonomous Navigation and Security Operations Testbeds**: Created first-of-its-kind testbeds for critical infrastructure security and autonomous systems in India.
- **Achievements:**
  - Over 1,500 new technologies developed.
  - More than 650 startups/spinoffs created.
  - Generation of 16,000 jobs and training for over 150,000 individuals in entrepreneurship within six years.

Key Innovation Hubs and Their Projects

- **C3iHub at IIT Kanpur**
  - Developed an IT-OT Security Operations Center (SOC) for 24/7 cyber threat protection.
  - Integrates technologies like intrusion detection and malware analysis.
  - Cost-effective solution implemented across critical sectors like power and water treatment.
- **TiHAN Foundation at IIT Hyderabad**
  - Focuses on autonomous navigation with a state-of-the-art testbed.
  - Supports applications for Autonomous Ground Vehicles (AGVs) and Unmanned Aerial Vehicles (UAVs).
  - Collaborates with Texas A&M and Tata Technologies.
- **AWaDH at IIT Ropar**
  - Pioneers technologies for sustainable agriculture and water management.
  - Developed the world's first Digital Entomologist, an AI-powered livestock management system, and nanobubble technology for water treatment.
  - International deployment of solar-powered biodiversity sensors.

Innovative Startups from Innovation Hubs

- **Botlabs Dynamics (I-Hub Foundation for Cobotics at IIT Delhi):** Specialises in drone-swarming technology used in defence and entertainment sectors. Valued at over Rs 160 crore.
- **COMRADO Aerospace (ARTPARK at IISc):** Develops UAVs for high-altitude, long-endurance surveillance and cargo delivery in extreme weather.

- **Mindgrove Technologies (Pravartak Technology Foundation at IIT Madras):** A semiconductor company that developed Secure IoT, India's first commercial SoC for secure IoT devices, with a 30% cost advantage.
- **Ayu Devices (TIH Foundation for IoT & IoE at IIT Bombay)**: Developed AyuSynk, a digital stethoscope for primary healthcare that enhances diagnostics and offers real-time transmission and recording of heart and lung sounds.
- **Domain-based Legal LLM:** Developed by IIT Mandi for the High Court of Punjab and Haryana.
- **iRASTE (Intelligent Road Safety Solutions):** Created by iHub Data, IIIT Hyderabad.
- **Digital Museum:** Developed by iHub Drishti, IIT Jodhpur.
- **TARS Modular Electronics:** From Vishleshan I hub Foundation, IIT Patna.

Future Plans

- **Self-funding through commercialisation:** Innovation hubs are expected to move toward financial autonomy by commercialising their technologies.
- Promoting partnerships between Technology Innovation Hubs and the industry for commercialisation of products.
- Increasing awareness of innovations under the NM-ICPS.

Conclusion

The NM-ICPS has positioned India on the global map for cutting-edge CPS technologies. With its focus on high-TRL products and significant societal impacts like job creation and entrepreneurial development, it is expected to further drive India's economic growth, self-reliance, and technological leadership.

Elusive Nobel Prize for Indian Scientists working in India

Syllabus Mapping: Contributions of Indians in Science

Context

It has been 94 years since an Indian scientist won a Nobel Prize in the sciences (Physics, Chemistry, or Medicine) while working in India. **C.V. Raman being the only Indian** to have received this honour, winning the Nobel Prize in Physics in 1930.

Famous Indian Scientists Omitted From Nobel Prize

- **Jagadish Chandra Bose**: Demonstrated wireless communication in 1895 but was never nominated despite his earlier work being recognized with a Nobel Prize awarded to others later.
- **K.S. Krishnan:** Co-discovered the Raman scattering effect with C.V. Raman but was also overlooked for a nomination.
- **C.N.R. Rao**: Considered for a Nobel Prize in solid-state chemistry but has not yet received one.
- **Satyendra Bose:** Developed the foundations for Bose-Einstein statistics and Bose-Einstein condensates. Particles obeying bose statistics were named after him as bosons.

Did You Know?

Three other Indian-origin scientists have won Nobel Prizes—**Hargovind Khorana (Medicine, 1968), Subrahmanyan Chandrasekhar (Physics, 1983),** and **Venkatraman Ramakrishnan (Chemistry, 2009)**—but they were working outside India and were not Indian citizens at the time of the award.

Challenges in India's Nobel Prize Pursuits in Science

- **Limited Focus on Basic Research**: India's scientific progress is hampered by inadequate attention to fundamental research, reducing the scope for groundbreaking discoveries.
- **Insufficient Public Funding**: Research funding in India is low compared to global standards, limiting resources available for scientists to pursue advanced scientific inquiries.
- **Excessive Bureaucracy:** Scientific research is often slowed down by bureaucratic red tape, making it difficult for scientists to navigate funding processes and institutional requirements.
- **Lack of Private Research Opportunities:** There are few incentives or infrastructure to encourage private sector involvement in research and innovation.
- **Deteriorating Research in Universities:** Many Indian universities have seen a decline in their research capabilities, further restricting the development of future Nobel-worthy scientific work.

- **Small Pool of Researchers:** The number of researchers in India is significantly lower than the global average, reducing the chances of producing high-impact scientific work.

Other Countries Performance in Science Nobels

- **Israel**: Despite having strong scientific indicators and a high proportion of Nobel laureates globally (especially among the Jewish community), Israel has won only 4 Nobel Prizes in Chemistry.
- **China**: Despite significant investment in research, China has produced only 3 Nobel winners in the sciences.
- **South Korea**: A scientific powerhouse, yet no Nobel laureates in science.

Nominations Without Awards

Nobel Prize Trends

- USA & Europe dominate Nobel Prizes in the sciences, attracting scientists from other regions.
- Only 13 Physics, 15 Chemistry, and 7 Medicine Nobel laureates have come from outside North America and Europe.
- **Japan** has the **largest number of science Nobels outside of these regions,** with 21 prizes.
- Though there have been occasional accusations of bias, the research ecosystems in the U.S. and Europe remain superior.

Future Prospects

- **China**: With significant investments in areas like clean energy, quantum computing, and artificial intelligence, China may see an increase in its Nobel wins soon.
- **India**: Without a strong research ecosystem or adequate support for scientific endeavours, India's Nobel success will continue to depend on individual brilliance rather than institutional support.

Digital Public Infrastructure emphasised in Global Digital Compact

Syllabus Mapping: GS-Paper 3, ICT

Context

Increasingly the world is realising the importance of Digital Public Infrastructure (DPI) and this was also emphasised by the recently adopted Global Digital Compact which was adopted by UN members in the recently concluded United Nations Summit of Future 2024.

Global Digital Compact follows the Universal Safeguards for Digital Public Infrastructure (DPI) initiative launched in 2023 by the Office of the UN Secretary-General's Envoy on Technology (OSET) and the UN Development Program (UNDP).

Global Digital Compact (GDC)

- It is an agreement negotiated by 193 United Nations (UN) member states to establish shared principles for a secure, open, and free digital future.
- It was first proposed by the UN Secretary General in the report 'Our Common Agenda' to be agreed upon by all countries in the UN Summit of the Future in 2024.
- During the United Nations' Summit of the Future 2024, the UN General Assembly adopted the Global Digital Compact as part of the 'Pact for the Future'.
- It is a **non-binding** diplomatic instrument that outlines shared goals for governments, institutions, and stakeholders.
- **Aim:** To harness and regulate digital technologies for the common good and focusing on their potential benefits while addressing associated challenges.

Key Objectives of Global Digital Compact

- **Closing all Digital Divide and deliver an inclusive digital economy:**
  - Ensuring everyone has access to digital technologies and the internet.
  - Connect all people, schools and hospitals to internet.
  - Make digital technologies more accessible and affordable for everyone, including in diverse languages and formats.
  - Increase investment in digital public goods and digital public infrastructure.
  - Support women and youth innovators and small and medium enterprises.
- **Build an inclusive, open, safe and secure digital space:**
  - Strengthen legal and policy frameworks to protect children online.
  - Ensuring the Internet remains open, global, stable and secure.
  - Facilitate access to independent, fact-based and timely information to counter mis- and disinformation.
- **Strengthen international data governance and govern AI for humanity**
  - Support development of interoperable national data governance frameworks
  - Establish an international scientific panel on AI and global AI policy dialogue
  - Develop AI capacity building partnerships and consider options for a Global Fund on AI.

Digital Public Infrastructure (DPI)

Digital Public Infrastructure refers to the technology systems that provide essential digital services to people. These are technologies that have been developed by governments which aim to provide universal access to technologies developed by governments.

- DPIs can help governments serve people better and faster, especially in areas like financial inclusion, where more people can access bank accounts, credit, and government benefits.
  - **Example:** In India, **80% of adults** now have bank accounts, compared to just **25% in 2008**. Women own **56%** of these accounts, improving financial independence.
- DPIs are also crucial for **economic development**. Digital transactions in India make up nearly **50% of the country's GDP**, showing how much digital infrastructure can boost the economy.

- DPI includes:
  - **Digital IDs** like India's **Aadhaar**, which helps people prove their identity online.
  - **Payment platforms** like **UPI**, which allow people to send and receive money digitally, in real-time.
  - **Government services** that are provided online to make people's lives easier.

Global Support and Spread of DPI

- India has become a global leader in DPIs, especially in the **Global South** (developing countries). Under India's **G20 presidency**, DPIs were promoted as tools to help countries grow faster.
- **India's Achievements**:
  - India has **Aadhaar**, the world's largest digital identity system.
  - India also leads in digital payments, with **14.96 billion transaction**s made in just one month (August 2024).
- **Other countries are following India's example:**
  - The **World Bank's ID4D program** is helping **60 countries** develop digital IDs.
  - Programs like **MOSIP (Modular Open Source Identity Platform)** are working in 11 countries, helping governments build their own DPI systems.

Challenges in Digital Public Infrastructure (DPI) Implementation

- **Lack of Granular Data for Impact Assessments**: Current data on DPI initiatives, such as Aadhaar enrollments, UPI transactions, or Jan Dhan accounts, does not reflect the true social and economic impact on individuals.
  - The absence of **intersectional data** (e.g., gender, income, education) makes it difficult to link DPI usage to outcomes like financial inclusion, livelihoods, or systemic risk.
- **Difficulty in Deconstructing Causality**: Understanding the direct connection between digital initiatives and socio-economic improvements (e.g., UPI's impact on income or rural women's financial independence) is challenging without proper data.
- **Systemic Risk in DPI-Enabled Lending**: DPI's role in credit facilitation, such as pre-sanctioned loans via UPI, could either increase or decrease systemic financial risks. The absence of specific data on this makes evaluation difficult.
- **Underreporting of Socio-Economic Impact**: Current metrics are primarily **macro-level achievements** (e.g., percentage of people with bank accounts), which fail to capture deeper effects on income, well-being, and social agency, especially in marginalised groups.
- **Limited Private & Government Sector Data**: DPIs affect not only individual citizens but also the private and public sectors. Assessing the broader impact on these sectors is not adequately addressed due to limited data availability.

Recommendations to Address These Challenges

- **3D Approach: Design, Data, and Dialogue**:
  - **Design**: Integrate mechanisms for impact assessment into the initial design of DPI systems, similar to how privacy and security are incorporated. These should enable continuous data collection for evaluations.
  - **Data**: Encourage trusted and well-governed data-sharing mechanisms to provide granular, anonymized data that can offer insights into who benefits from DPIs and why certain groups may be left behind.
  - **Dialogue**: Foster ongoing dialogue between **third-party assessment agencies, policymakers, the private sector, and civil society** to drive participative governance and accountability.
- **Incorporating Impact Assessments as Routine Practice**: Make impact evaluations part of DPI design from the start, forming a continuous feedback loop to adjust and improve systems.
- **Use of Intersectional Data**: Collect data on user demographics, usage frequency, and behavioural changes to better understand the societal impact. This can help quantify the DPI's effects, such as financial independence in rural women.
- **Promote Participative Governance**: Build protocols for regular engagement with various stakeholders, including the private sector and civil society, to improve ownership of DPIs and ensure accountability.

TOPICS FOR PRELIMS

Nobel Prize in Chemistry 2024

Syllabus Mapping: Computing, Biotechnology

Context

Nobel Prize in Chemistry awarded to **David Baker, Demis Hassabis and John Jumper** for using AI tools like AlphaFold to **predict protein structures and create new synthetic proteins.**

Key Contributions

David Baker's Work

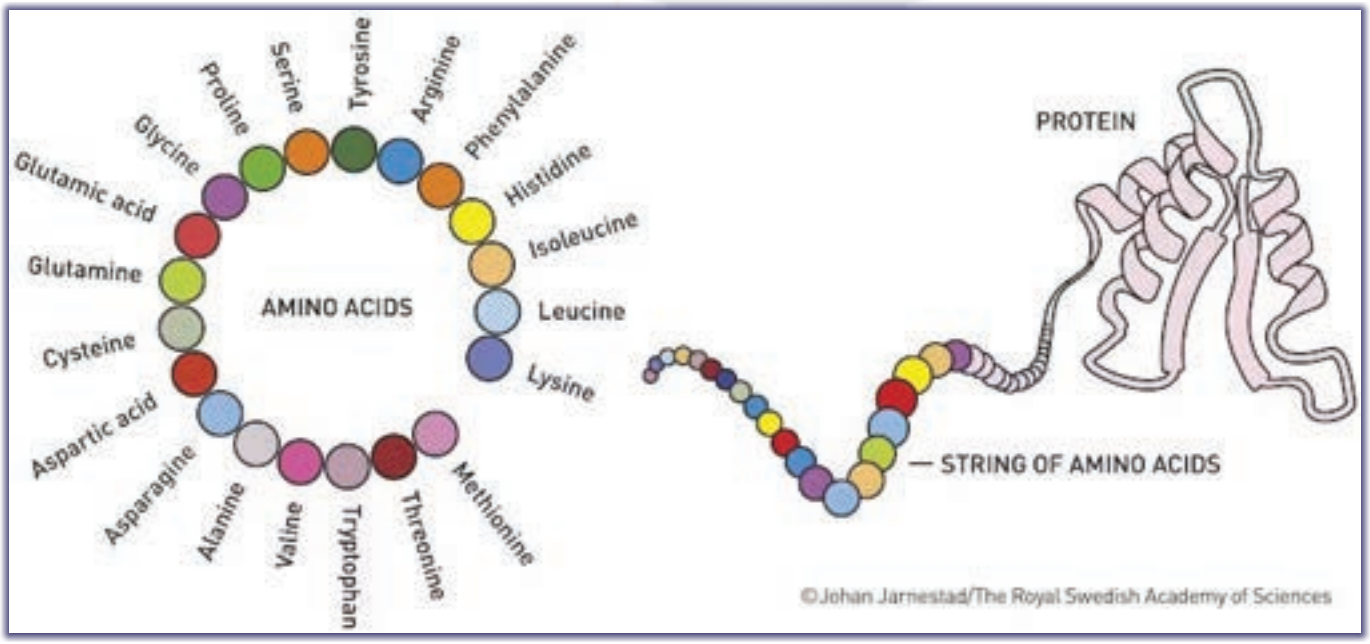
- Baker developed the Rosetta software, a computational tool for designing novel proteins with specific functions, impacting fields like pharmaceuticals and vaccine development.

Demis Hassabis and John Jumper's Contributions

- Co-creators of **AlphaFold2,** revolutionised biology by developing an AI model that accurately predicts protein structures, solving a key challenge in understanding amino acid folding.

Proteins

- Proteins are the molecular machines of life.
- They make up a significant portion of our bodies, including muscles, enzymes, hormones, blood, hair and cartilage.
- Understanding proteins' structures is essential because their shapes determine their functions.
- A protein's overall shape depends on the tiny interactions, the attractions and repulsions, between all the atoms in the amino acids it's made of.



Protein Folding Problem

- The sequence of Amino acids in a protein determines its structure. Thus, decoding the structure of the protein will help
- Earlier the structure of the protein was determined using X-ray crystallography which is a very slow and labour intensive process.

Implications of the Research

- **Impact on Drug Discovery**
  - Developing targeted therapies for diseases caused by protein disorders.
  - Creating enzymes capable of degrading plastics and addressing environmental challenges.
- **Accelerating Biological Research**
  - Advancements by Baker, Hassabis, and Jumper empower researchers to explore biological processes, antibiotic resistance, and enzyme functions, accelerating innovation in biotechnology and medicine.

Nobel Prize in Physics 2024

Syllabus Mapping: Computing

Context

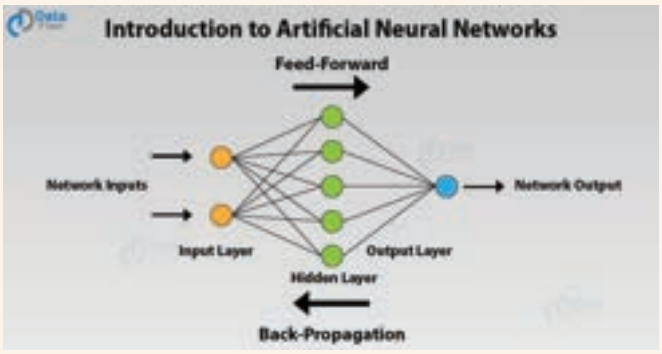
The 2024 Nobel Prize in Physics was awarded to John Hopfield and Geoffrey Hinton for their foundational contributions to **machine learning** through **Artificial Neural Networks (ANNs).**

Foundational discoveries

Hopfield and Hinton's 1980s research revolutionised machine learning, enabling AI to perform complex human-like tasks, such as pattern recognition and intelligent decision-making, now integral to modern technology.

Artificial Neural Networks (ANN)

- ANNs are computational models inspired by the human brain's structure and function.
- It is designed to simulate the way the human brain analyses and processes information.
- The development of ANNs has made it possible for computers to handle complex tasks beyond simple calculations.



John Hopfield's Contributions

- **Hopfield Network:**
  - The Hopfield Network, introduced in 1982, is a neural model that mimics how the brain remembers patterns, allowing it to recognize and recall patterns even when the information is incomplete or unclear.
  - Hopfield's work paved the way for applications like **face recognition and image enhancement tools** by enabling computers to recall and regenerate patterns.

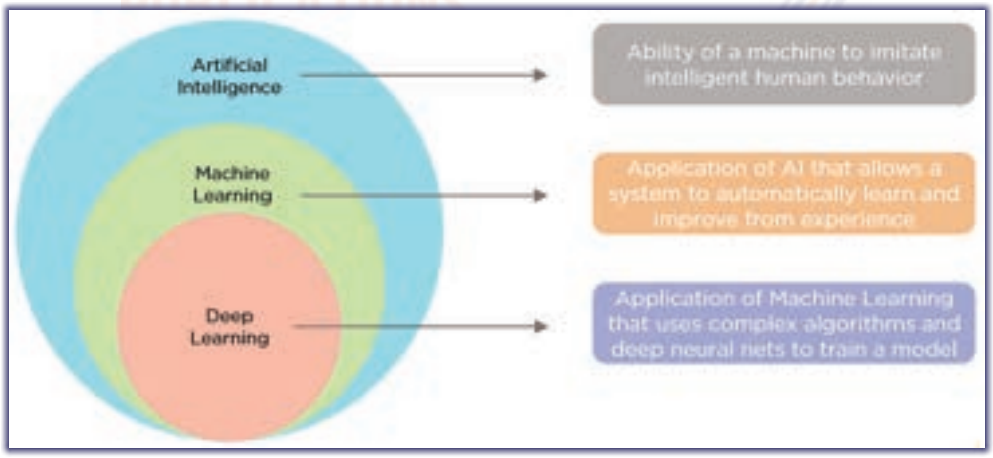
Geoffrey Hinton's Contributions

- **Deep Learning:**
  - Building on Hopfield's work, Hinton developed advanced neural networks and introduced **backpropagation**, enabling them to recognize complex patterns like voices and images by learning from large datasets.
  - His work led to the creation of deep neural networks, which are crucial for modern AI applications like speech recognition, self-driving cars and advanced medical diagnostics.
- **Boltzmann Machine:**
  - Geoffrey Hinton developed an advanced neural network that uses statistical physics, random sampling, and probability to identify patterns in data.
  - This model can not only classify images but also create new examples based on what it has learned. This capability allows it to perform more complex tasks than earlier models.

Applications of their work

- **Physics:** Used in particle physics and material science.
- **Medicine:** Assisting in diagnosing conditions through image analysis.
- **Everyday Technology:** Underpinning tools such as facial recognition systems and virtual assistants.

Difference between Artificial Intelligence, MAchine Learning & Deep Learning



Nobel Prize

- It is an international award that recognizes people and organisations for their achievements in **6 fields**.
  - Physics, chemistry, physiology or medicine, literature, peace and economic sciences **(Added in 1968)**
- It was established in 1901 by the will of Alfred Nobel, a Swedish inventor, scientist and philanthropist.
- The **Norwegian Nobel Committee** is responsible for the selection of eligible candidates and the choice of the Nobel Peace Prize laureates.
  - The Committee is composed of **5 members appointed by the Storting (Norwegian parliament)**.

Nobel Prize in Medicine, 2024

Syllabus Mapping: Biotechnology

Context

Nobel Prize for Medicine 2024 has been awarded jointly to **Victor Ambros and Gary Ruvkun** for the **discovery of microRNA** and its role in **post-transcriptional gene regulation.**

About MicroRNA (MiRNA)

- MicroRNAs are short, non-coding RNA molecules that regulate gene expression by targeting mRNA transcripts.
- **Function:** They inhibit the translation of mRNA into proteins, thereby controlling protein production, which is crucial for various biological processes.
- **Process of Protein Production:**
  - **Transcription:** DNA is transcribed into mRNA in the nucleus.
  - **Translation:** mRNA is translated into proteins at the ribosome with the help of transfer RNA (tRNA).
  - **Regulation by miRNA:** After transcription, miRNAs bind to mRNA, inhibiting protein production and adding an extra regulatory layer.

Gene Regulation

- Each cell in a multicellular organism contains the same set of chromosomes which contains the genetic material.
- Despite this, each cell specialises to perform a specific set of functions. For example, the nerve and muscle cells have different functions despite the same genetic material in them.

C. Elegans

- It is a nematode species. It is about 1 mm in length that lives in temperate soil environments.
- It was the first multicellular organism to have its whole genome sequenced.
- Four noble prizes have been awarded for work on C. Elegans, including this years.

Future Applications of MiRNA Research:

- **Cancer**: Understanding how miRNA malfunctions lead to abnormal protein production offers new avenues for cancer treatment.
- **Genetic Disorders**: Mutations in miRNA-related genes can result in conditions like congenital hearing loss and skeletal disorders.
- **Drug Development**: Although clinical miRNA-based drugs are not yet available, ongoing research shows promise for future therapeutic breakthroughs.

MACE Observatory

Syllabus Mapping: Space

Context

The Major Atmospheric Cherenkov Experiment (MACE) Observatory was officially inaugurated at Hanle, Ladakh.

About MACE observatory

- It is the highest and largest imaging Cherenkov telescope in the world located at an altitude of almost 4,300 metres.
- It is built indigenously by the **Bhabha Atomic Research Centre (BARC) & Electronics Corporation of India Ltd (ECIL).**

Why Hanle?

- Hanle is like heaven for gamma ray astronomers with its dark skies, low humidity and almost no air pollution.
- The longitudinal advantage of its location enables MACE to observe sources invisible to other parts of the world.
- Hanley Dark Sky Reserve is **India's first dark sky reserve.** It is situated in **Changthang Plateau (Ladakh)**. It is operated by the Indian Institute of Astrophysics.

Scientific Objectives of the MACE Observatory

- Observe high-energy gamma rays from some of the most energetic events in the universe, such as: Supernovae, Black Holes gamma-Ray Bursts.
- Detect and understand dark matter,
- Complement existing observatories worldwide, strengthening India's role in multi-messenger astronomy.

Related Terms

- **Gamma Rays:** Gamma rays are a form of electromagnetic radiation, similar to visible light but with much higher energy. They help scientists understand extreme phenomena in the universe, like supernovae (exploding stars) and black holes.
- **Cherenkov Telescope:** It is a telescope that detects gamma rays using the faint light emitted by charged particles in particle showers. The light is called **Cherenkov radiation**, which is created when charged particles move **faster than the speed of light in that medium.**

- **High-Energy Range (20 - 100 GeV):** giga-electron volt (GeV) is a unit of energy used in particle physics. One GeV equals one billion electron volts.
- **Astrophysics:** Branch of astronomy that deals with the physical properties and behaviour of celestial bodies.
- **Multi-Messenger Astronomy:** It is an approach that combines information from different types of astronomical signals (like light, gravitational waves, and neutrinos) to get a fuller picture of cosmic events.

VIPER Mission

Syllabus Mapping: Space

Context

NASA has cancelled its Volatiles Investigating Polar Exploration Rover (VIPER) mission to the moon due to delays and cost overruns.

VIPER Mission

- It is NASA's first mobile robotic mission to the Moon.
- **Objective:**
  - It is designed to map the distribution and concentration of water ice deposits in the permanently shadowed regions (PSRs) of the lunar south pole.
  - To collect and analyse samples of the lunar soil and rocks to understand the geology of the south pole region.
- **Launch Vehicle:** SpaceX Falcon Heavy rocket.
- **Relation to Artemis Accord:** VIPER was expected to be a crucial component of the US led Artemis Accord.

Artemis Accords

- They are established by the U.S. State Department and NASA in 2020 with seven other founding members:
  - Australia, Canada, Italy, Japan, Luxembourg, the United Arab Emirates, and the United Kingdom.
- **Purpose:** Setting common principles to govern civil exploration and use of outer space, Moon, Mars, comets and asteroids for peaceful purposes.
- It is based on the principles of the **Outer Space Treaty 1967.**
  - It is a multilateral pact under the United Nations which emphasises space as a shared resource for humanity, prohibits national appropriation and encourages the peaceful use of space.

Fluorescent Nanodiamonds

Syllabus Mapping: Nanotechnology

Context

Researchers at Purdue University have successfully levitated and spun fluorescent nanodiamonds (FNDs). This has unlocked new possibilities for their applications in sensing and quantum computing.

Fluorescent Nanodiamonds (FND's)

- They are **tiny carbon-based nanoparticles** that are **non-toxic and stable.**
- **Key Properties of FNDs**
  - **Size:** Generally very small, ranging from 10 nanometers to 1 micrometre in diameter.
  - **Fluorescence:** Emit light when excited, showing stable fluorescence without blinking.
  - **Photostability:** Highly photostable **i.e.** they do not degrade or lose their ability to fluoresce under light exposure.
  - **Biocompatibility:** Generally non-toxic and compatible with biological systems, making them suitable for use in living organisms.
  - **Mechanical Strength:** As diamonds, they possess excellent mechanical properties, making them robust and durable.

Applications of FNDs

- **Medical Imaging:** For high-resolution imaging of cells and tissues.
- **Temperature Sensing:** To Measure temperature changes at a microscale, which is useful in various scientific experiments and applications.
- **Correlative Microscopy:** They can be combined with other imaging techniques to provide more comprehensive data about biological samples.
- **Sensor Technologies:** Due to their sensitivity to electric fields and acceleration, FNDs can be utilised in sensors for industrial applications and gyroscopes for rotation sensing.
- **Quantum Computing:** FNDs doped with nitrogen have potential applications in quantum computing due to their unique electronic properties.

Marburg Virus

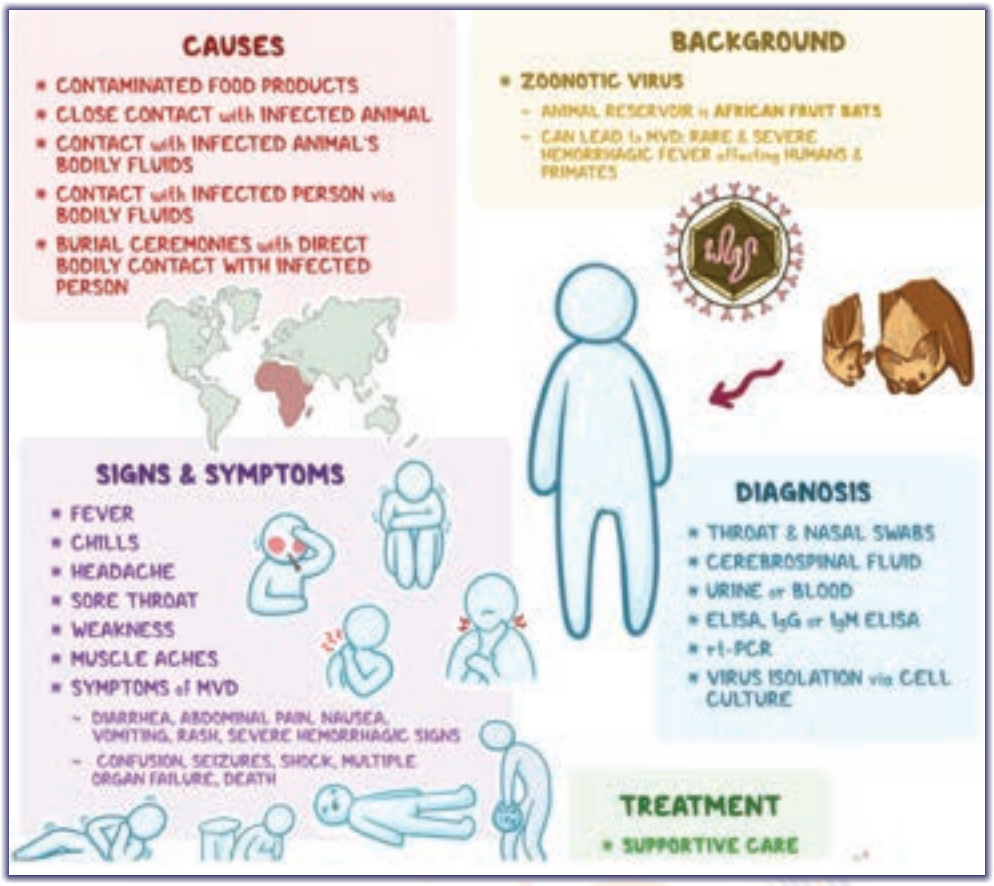
Syllabus Mapping: Health

Context

Rwanda is facing its first outbreak of the Marburg virus.

About Marburg Virus

- It is a zoonotic RNA virus that causes Marburg virus disease (MVD),
- **First Outbreak:** Occurred in 1967 in Marburg, Germany, associated with laboratory exposure to African green monkeys.
- **Family:** Belongs to the **Filoviridae family**, similar to Ebola virus.



India eliminates Trachoma Disease: WHO

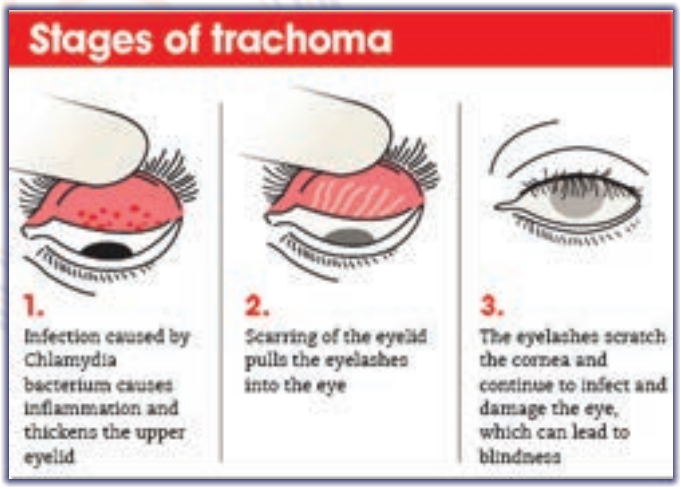
Syllabus Mapping: Health

Context

World Health Organization (WHO) has officially recognized that India has successfully eliminated trachoma.

About Trachoma Disease

- It is an infectious eye disease caused by the **bacterium Chlamydia trachomatis.**
- It is the leading infectious cause of blindness worldwide and primarily affects people in impoverished regions with limited access to clean water and sanitation.
- WHO has termed Trachoma as a **Neglected tropical disease (NTD).**
- **Transmission**
  - Through direct contact with eye or nose secretions from infected individuals.
  - It can also spread via contaminated objects (like towels) and through flies that carry the bacteria.
- **At-Risk Populations:**
  - Preschool-age children are the main reservoir for the infection, but anyone in crowded living conditions without proper hygiene can be affected.
  - **Blindness from trachoma is irreversible.**



Prevention and Treatment

- **No trachoma vaccine is available,** but prevention is possible.
- World Health Organization (WHO) recommends the **SAFE strategy,** which includes:
  - **S**urgery: To correct trichiasis (inward-turning eyelashes).
  - **A**ntibiotics: Mass treatment with azithromycin to clear infections.
  - **F**acial Cleanliness: Promoting hygiene to reduce transmission.

- Environmental Improvements: Enhancing access to clean water and sanitation facilities.

Re-entry mission of PSLV C-37

Syllabus Mapping: Space

Context

The PSLV-C37 upper stage re-entered Earth's atmosphere, marking a significant milestone in ISRO's commitment to space debris mitigation.

About Polar Satellite Launch Vehicle (PSLV-C37)

- It was launched by the Indian Space Research Organisation (ISRO) into space in 2017.
- **Launch site:** Satish Dhawan Space Centre (SDSC) in Sriharikota, Andhra Pradesh
- **Payload:**
  - The primary payload was Cartosat-2D, an Earth observation satellite.
  - The secondary payloads included **103 nanosatellites,** including two from India and 101 from other countries.
- **Re-entry:**
  - Upper stage of the PSLV-C37 re-entered Earth's atmosphere on October 6, 2024, after nearly eight years in space.
  - Regularly tracked by **ISRO System for Safe and Sustainable Space Operations Management (IS4OM) & the U.S. Space Command (USSPACECOM)**
  - Atmospheric re-entry of the rocket body is fully compliant with the international debris mitigation guidelines of **Inter-Agency Space Debris Coordination Committee (IADC).**

ISRO's System for Safe and Sustainable Space Operations Management (IS4OM)

- IS4OM is an initiative by ISRO focused on ensuring safe and sustainable operations in space.
- **Functions:**
  - **Monitoring Orbital Decay:** Regularly tracking defunct satellites and rocket stages to predict their re-entry.
  - **Space Debris Management:** Implementing strategies to mitigate space debris and ensure that defunct objects do not pose risks to active satellites or human activities in space.
  - **Collaboration with International Entities:** Working with organisations like the U.S. Space Command to share information about objects in orbit.

U.S. Space Command (USSPACECOM)

- It is a unified command of the U.S. Armed Forces responsible for conducting operations in outer space.
- **Functions:**
  - **Tracking Objects in Space:** Monitoring satellites and debris to ensure safe operations for military and civilian assets.
  - **Providing Data:** Sharing tracking data with international partners and organisations to enhance global space situational awareness.

Inter-Agency Space Debris Coordination Committee (IADC)

- It is an inter-governmental forum established in 1993 aimed at coordinating efforts to address space debris issues.
- **Functions:**
  - **Information Exchange:** Facilitating communication among member space agencies regarding space debris research and mitigation strategies.
  - **Debris Mitigation Guidelines:** Developing recommendations for managing space debris, which include:
    - Limiting debris released during normal operations.
    - Minimising potential on-orbit breakups.
    - Planning for post-mission disposal of spacecraft.
- **Members of IADC:** NASA (USA), ESA (European Space Agency), ISRO (India), CNSA (China National Space Administration), JAXA (Japan Aerospace Exploration Agency)

NASA's Europa Clipper Mission

Sybbus Mapping: Space

Context

NASA's **Europa Clipper** mission aims to explore Jupiter's moon Europa to assess its potential to support life.

About Europa Clipper Mission

- **Launch:** Launched aboard a SpaceX Falcon Heavy from Kennedy Space Center, Florida.
- **Journey:** Will **travel 1.8 billion miles (2.9 billion km)** to reach Jupiter by April 2030, using gravity assists from Mars and Earth.
- **Scientific Flybys:** Will conduct 49 close flybys of Europa, approaching as close as 16 miles (25 km) to study its ice shell and subsurface ocean.
- **Instruments:** Equipped with nine instruments, including:
- **Ice-penetrating radar to measure ice thickness.**
- **Cameras and spectrometers for surface composition analysis.**
- **Thermal sensors to detect potential eruptions or water flow.**
- **Power:** Features NASA's largest interplanetary solar arrays (100 feet/30.5 m) to power instruments in Jupiter's dim sunlight.

Other Missions to Jupiter

- **NASA:** Galileo (first spacecraft to orbit Jupiter), Juno, Voyager.
- **European Space Agency:** JUICE (Jupiter Icy Moons Explorer)

Objectives of Europa Clipper Mission

- **Assess Habitability**: Investigate Europa's subsurface ocean and environmental conditions for supporting life.
- **Study Ice Shell and Ocean**: Measure the ice shell thickness, its interaction with the ocean, and detect any active water plumes.
- **Analyse Surface Composition**: Examine Europa's surface chemistry to identify organic compounds and energy sources essential for life.
- **Characterise Geology**: Explore Europa's surface features and geological activity to understand its history and potential for life.

About Jupiter

- Jupiter is the fifth planet from the sun at a distance of about 778 million km.
- It is the largest planet in the solar system – more than twice as massive as all the other planets combined.
  - Jupiter, Saturn, Uranus and Neptune are called **Jovian or Gas Giant Planets.** These have thick atmospheres, mostly of **helium and hydrogen.**
- Jupiter has more than 75 moons. **(Ganymede - largest moon in the Solar System)**

About Europa

- Smallest of the four Galilean moons of Jupiter - Io, Ganymede, Callisto and Europa. (Galilean moons are the one's which are visible from Earth's surface.)
- Slightly smaller in size compared to Earth's Moon.
- Europa is made of silicate rock and has a water-ice crust and probably an iron–nickel core.
- It has a thin atmosphere primarily composed of oxygen.
- Europa has one of the smoothest surfaces among all objects in the solar system due to the water ocean beneath the surface.
- This underground ocean is one of the probable places to harbour extra-terrestrial life like bacteria or virus etc.

Bone Ossification Test

Syllabus Mapping: Biology

Context

Recently, a bone ossification test was conducted on an accused person in the murder case of a political leader to determine if he was a minor.

What is the Bone Ossification Test ?

- It is a medical procedure that analyses bones in order to determine age.
- Involves taking **X-rays** of certain bones in the body, such as the clavicle, sternum and pelvis to assess skeletal development.
- **Ossification** is the process of bone formation that occurs in humans from infancy until the end of their adolescent stage.

Allocation of Satellite Internet Spectrum

Syllabus Mapping: Space, Computing

Context

The Central Government will allocate satcom spectrum administratively under the Telecommunications Act, 2023, benefiting companies like Starlink and Kuiper over auction-based allocation.

What is Satellite Internet ?

- Satellite internet refers to a type of internet connection that uses satellites to provide broadband service.
- This technology enables users to access the internet from virtually anywhere, particularly in remote or underserved areas where traditional terrestrial internet infrastructure is lacking.
- Satellite internet works by transmitting data from a user's dish to a satellite in orbit, which then relays the information to a ground station connected to the internet backbone.

Regulation of Satellite Internet in India

- It falls under the purview of the Department of Telecommunications (DoT) and is guided by the Telecommunications Act, 2023.

Key Aspects of Spectrum Allocation

- **Administrative Allotment:** The spectrum will be allocated based on an administrative process as stipulated in the Telecommunications Act.
- **Pricing Determination:** The Telecom Regulatory Authority of India (TRAI) will be responsible for determining the pricing structure for this spectrum allocation.
- **Shared Spectrum Concept:** The government emphasises that satellite spectrum is considered shared spectrum, which complicates individual pricing.
  - **Shared spectrum concept** in satellite internet is a way for multiple users to share the same frequency bands.
- Global Context: The Indian government argues that its approach is consistent with international practices regarding satellite spectrum allocation, aiming to create a conducive environment for investment in satellite broadband services.

Jiangmen Underground Neutrino Observatory

Syllabus Mapping: Space

Context

China's $300-million Jiangmen Underground Neutrino Observatory (JUNO), begun in 2015, is set to start full neutrino data collection by late 2025.

About Jiangmen Underground Neutrino Observatory (JUNO)

- It is designed to be one of the largest and most sensitive neutrino detectors in the world.
- JUNO is a globally collaborative project with contributions from scientists and institutions in **France, Germany, Italy, Russia, the U.S., and Taiwan**, among others.

Objectives of JUNO

- **Neutrino Mass Hierarchy:** One of JUNO's key goals is to determine the neutrino mass hierarchy—whether neutrinos have a normal mass ordering or an inverted one.
- **Precise Measurement of Oscillation Parameters:** Neutrinos undergo oscillations, where they change from one type (or flavour) to another as they travel. JUNO aims to precisely measure the parameters governing these oscillations, contributing to our broader understanding of particle physics.
- **Exploration of New Physics:** JUNO has the potential to detect anomalies or behaviours in neutrino interactions that could indicate new physics beyond the Standard Model.
- **Supernova Detection:** The observatory is equipped to detect neutrinos from distant supernova explosions, providing insights into astrophysical phenomena and the life cycles of stars.

Neutrino observatories around world

- **IceCube:** Located at the South Pole, this is the largest neutrino telescope in operation.
- **Super-Kamiokande:** Located in Kamioka, Japan.
- **Gran Sasso National Laboratories (LNGS):** Located in the Gran Sasso mountains in Italy.
- **Underground Neutrino Observatory:** Located in Mont Blanc, France / Italy.
- **Deep Underground Neutrino Experiment (DUNE):** Located in South Dakota, USA.

About Neutrino

- Neutrinos are a type of subatomic particle.
- They don't have an electric charge. They have a small mass and are left-handed
  - **Left-Handed:** A physics term meaning the direction of its spin is opposite to the direction of its motion
- They are the second-most abundant particles after photons (particles of light).
- They are produced in high-energy processes such as within stars and in supernovae.
- On earth, they are produced by particle accelerators and nuclear power plants.
- They are very hard to detect as they hardly interact with other forms of matter due to their lack of electrical charge.

India's Neutrino Observatory

- It is a proposed particle physics research mega project.
- **Objective of the project:** To study neutrinos in a 1,200-metre deep cave.
- **Proposed Site:** Pottipuram village in Theni district in Tamil Nadu.

Kala Azar Elimination

Syllabus Mapping: Health

Context

India is close to WHO certification for eliminating Kala-azar as a public health issue, maintaining cases below 1 in 10,000 for two consecutive years.

About Kala Azar

- It is also known as **Visceral leishmaniasis.**
- **Kala-azar**: Hindi for "black disease" due to skin discoloration during infection.
- It is transmitted to humans through the bite of an infected **female sandfly.**
- It is a **Parasitic disease (Leishmania donovani** is the primary cause in India**)**
- It is the **second deadliest** parasitic disease after malaria in India.
- **Affected Organs:** Infects the **Reticuloendothelial system (RES)**, particularly the spleen, liver, and bone marrow.

Reticuloendothelial system (RES): A network of cells and tissues throughout the body involved in immune function, blood cell production and waste removal. It includes organs like the spleen, liver, bone marrow and lymph nodes.

About National Vector Borne Diseases Control Programme (NVBDCP)

- **About:** It is a comprehensive initiative aimed at managing diseases such as Malaria, Dengue, Lymphatic Filariasis (Filaria), Japanese Encephalitis, and Kala-azar.
- **Administrative Body:** National Centre for Vector Borne Diseases Control (NCVBDC)
- **Elimination Goals**:
  - Malaria: 2030.
  - Lymphatic Filariasis: 2030.
  - Kala-azar: 2023.

Iodine Deficiency

Syllabus Mapping: Health

Context

World Iodine Deficiency Day, observed on October 21, aims to raise awareness of iodine's importance for health and the risks of deficiency.

About Iodine

- Iodine is a non-metallic, lustrous, solid element & is the least reactive halogen.
- Iodine is an essential nutrient for the human body, especially for the brain, nervous system, and thyroid gland.
- It is a component of **thyroxine**, a hormone that controls the body's rate of development.
- WHO recommends a daily intake of **150 micrograms** of iodine for adults and higher amounts for pregnant and lactating women.
- **Sources:** Seafood, eggs, iodized salt, milk and milk products
- **Other Uses of Iodine:**
  - **Antiseptic:** Iodine solutions are used for disinfecting wounds and surgical sites.
  - **Imaging:** Radioactive iodine is used in medical imaging and treatments for thyroid disorders.
  - **Fertiliser Production:** To enhance plant growth and health.
  - **Iodine-131** is a radioactive isotope that can be used in radiation therapy and as a tracer.

Health Effects of Iodine Deficiency

- **Goitre:** Enlargement of the thyroid gland due to insufficient hormone production.
- **Hypothyroidism:** A condition where the thyroid gland can't make enough thyroid hormones.
- **Mental and neuromotor retardation:** Iodine deficiency can cause cognitive impairments and mental disabilities, especially in children born to mothers who were iodine deficient during pregnancy or while nursing.
- **Thyroid or other cancers:** Chronic iodine deficiency increases the risk of thyroid cancer.

Standard model of Particle Physics

Syllabus Mapping: Space

Context

New findings of James Webb Space Telescope have challenged the application of the standard model of particle physics in cosmology.

About standard model of Particle Physics

- It is a theoretical framework that describes the fundamental particles and forces that govern the universe, excluding gravity.
- It categorises all known elementary particles into two main groups:
- **Fermions (matter particles):**
  - **Quarks:** Building blocks of protons and neutrons.
  - **Leptons:** Includes electrons and neutrinos.
- **Bosons (force carriers):**
  - **Gluons:** Mediate the strong force.
  - **W and Z bosons:** Responsible for the weak force.
  - **Photon:** Carrier of electromagnetic force.
  - **Higgs boson:** Provides mass to other particles through the Higgs mechanism.
- **Higgs Mechanism**: Discovered in 2012, it explains how particles acquire mass through the Higgs field.

Significance of the Standard Model in Various Fields

- **Particle Physics:** Provides a comprehensive understanding of particle interactions and fundamental forces.
- **Cosmology:** It helps to explain phenomena such as the formation of elements in the early universe and cosmic microwave background radiation.
- **Technology Development:** Advances in particle physics have led to technologies like MRI machines, radiation therapy and advancements in computing.

Venture Capital Fund for Space Startups

Syllabus Mapping: Space

Context

Union Cabinet has approved establishment of Rs.1,000 crore Venture Capital Fund for Space Sector under the aegis of IN-SPACe.

About Indian National Space Promotion and Authorisation Centre (IN-SPACe)

- It is a single-window, independent, nodal agency that functions as an autonomous agency in the **Department of Space (DOS).**
- It acts as an interface between ISRO and Non-Governmental Entities (NGEs) to facilitate private sector participation.
- It authorises and supervises various space activities like building launch vehicles & satellites, sharing space infrastructure etc.

Venture capital (VC) refers to a type of private equity financing that venture capital firms or funds offer to startups, early-stage and emerging businesses that have shown a high growth trajectory or are deemed to have high growth potential.

New Space India Limited (NSIL)

- It is the commercial arm of the Indian Space Research Organisation (ISRO). It is a government-owned company.
- It was established in **2019** to promote and commercially use the products and services of the Indian Space Programme.

X- Band Radar

Syllabus Mapping: Space, Disaster Management

Context

Following the floods and landslides in Wayanad in July 2024, the Union Ministry of Earth Sciences approved an X-band radar installation in Wayanad for improved weather monitoring.

What is a X-band Radar:

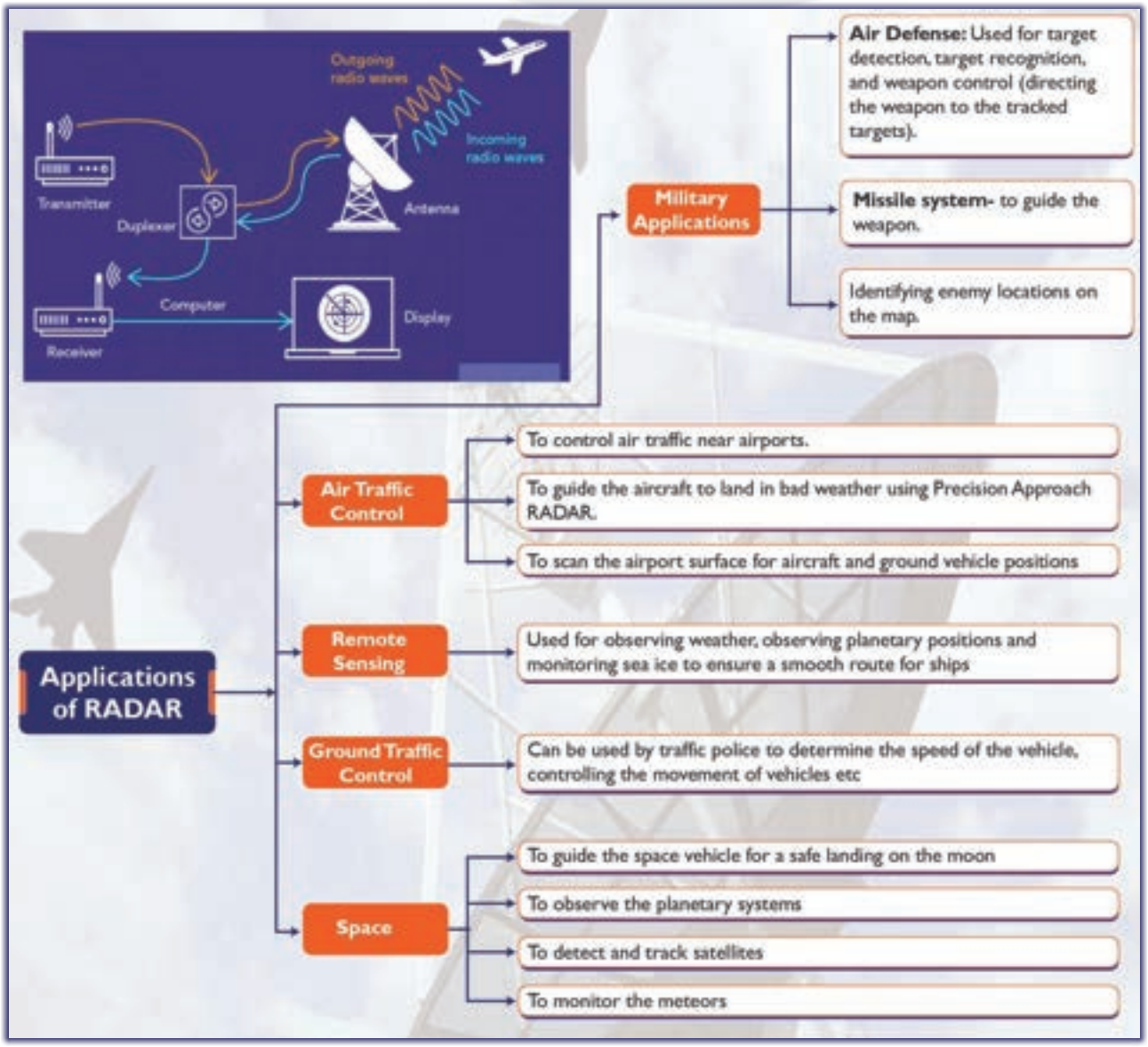
- X-band radar operates in the **8-12 GHz range** (2-4 cm wavelength).
- Its shorter wavelengths make it effective for detecting smaller particles, such as raindrops, fog and fine particulate matter.
- **Usage in Wayanad:** The radar will monitor particle movement, such as soil shifts, providing real-time data to issue landslide warnings.

Other Radar's

- **Doppler Radar**: It is a common weather radar, it tracks movement and speed using the Doppler effect. The radar emits pulses of radiation, which are reflected back by clouds or other particles. The frequency of the reflected waves changes with motion, revealing speed and direction.
- **Pulse-Doppler Radar**: It measures rainfall intensity by emitting pulses of radiation and measuring how often they are reflected back.

About Radars (Radio Detection and Ranging System)

- It is an electromagnetic system used to notice, track, locate and identify different objects which are at certain distances.
- **Working of RADAR's:**
  - It transmits electromagnetic energy in the direction of targets to observe the echoes and returns from them.
  - Targets can be ships, aircraft, astronomical bodies, automotive vehicles, spacecraft, rain, birds, insects, etc.



Google's Nuclear Energy Agreement with Kairos Power

Syllabus Mapping: Nuclear Technology

Context

Google has signed its first-ever corporate agreement to purchase nuclear energy from multiple small modular reactors (SMRs) that will be developed by Kairos Power.

Google's First Corporate Nuclear Energy Deal

- Google has been an industry leader in clean energy, with its first 20-year wind farm power purchase agreement (PPA) dating back to 2010.
- The company is seeking alternative energy sources like nuclear due to challenges in renewable energy such as intermittency and storage limitations.
- The agreement involves purchasing energy from small modular reactors (SMRs) developed by Kairos Power, a California-based company.
- This initiative aims to power **Google's artificial intelligence (AI) data centres** with clean & reliable nuclear energy.

Did You Know

- **Nuclear fission:** It is a process in which the nucleus of an atom is split into two or more smaller nuclei, releasing a large amount of energy in the process.
  - This process is used in nuclear power plants to generate electricity.
  - **E.g.** Reaction that occurs in a nuclear reactor when uranium atoms are split into smaller atoms.
- **Nuclear fusion:** It is a process in which two or more atomic nuclei come together to form a single, more massive nucleus, releasing a large amount of energy in the process.
  - This process occurs naturally in stars, including the Sun.
  - **E.g.** Reaction that occurs in a hydrogen bomb.

Small Modular Reactors (SMRs)

- **Small Modular Reactors (SMRs) are:**
  - **Small:** A fraction of the size of a conventional nuclear power reactor.
  - **Modular**: Systems and components to be factory-assembled and transported as a unit to a location for installation.
  - **Reactors**: Harnessing nuclear fission to generate heat to produce energy.
- **Power capacity: Up to 300 MW(e) per unit**, which is about **one-third** of the generating capacity of **nuclear power reactors**.
- **Key features and benefits of Small Modular Reactors (SMRs)**
  - **Size and Portability:** SMRs are smaller and more compact than conventional reactors, allowing for easier transport, installation and scalability.
  - **Enhanced Safety Features:** SMRs incorporate advanced safety features to ensure the protection of the public and the environment. These features include passive cooling systems, advanced control mechanisms, and robust containment structures.
  - **Flexibility and Grid Resilience:** Their smaller size and modular nature make them suitable for deployment in remote areas or as a supplement to existing power grids, enhancing grid resilience.
  - **Reduced Capital Costs:** The modular design of SMRs allows for standardised manufacturing processes, potentially reducing construction costs.
  - **Potential for Decentralization:** SMRs offer the potential for decentralised power generation, allowing communities or industries to have their own local sources of electricity.
  - **Integration with Renewable Energy:** SMRs can complement renewable energy sources, such as solar and wind, by providing baseload power and maintaining grid stability during periods of low renewable generation.

International Atomic Energy Agency (IAEA)

- An autonomous international organisation **(established in 1957)** within the United **Nations system.**
- Seeks to maximise the contribution of nuclear technology to society while verifying its peaceful use.
- **Member States: 175 (**India has been a member since its inception.)
- **Headquarter**: Vienna, Austria.

HISTORY & CULTURE

TOPICS FOR PRELIMS

Classical Language Status for 5 Languages

Syllabus Mapping: Art & Culture, Literature

Context

The Union Cabinet has accorded Classical language status to 5 new languages - Marathi, Pali, Prakrit, Assamese & Bengali.

Classical Status to Languages in India

- **Newly added languages:** Marathi, Pali, Prakrit, Assamese and Bengali
- **Previous:** Tamil (2004), Sanskrit (2005), Kannada (2008), Telugu (2008), Malayalam (2013), and Odia (2014).
- All the Classical Languages **are not** listed in the **8th Schedule of the Constitution**.
  - **Pali & Prakrit** are not part of the 8th Schedule.

Official Languages under Eighth Schedule of the Constitution

- **Languages Included**: Eighth Schedule lists **22 languages**: Assamese, Bengali, Gujarati, Hindi, Kannada, Kashmiri, Konkani, Malayalam, Manipuri, Marathi, Nepali, Oriya, Punjabi, Sanskrit, Sindhi, Tamil, Telugu, Urdu, Bodo, Santhali, Maithili, and Dogri.
- **Initial Languages:** Initially, **14 languages** were included in the Constitution.
- **Amendments:**
  - **Sindhi** was added by the **21st Amendment Act of 1967.**
  - **Konkani, Manipuri, and Nepali** were included by the **71st Amendment Act of 1992**.
  - **Bodo, Dogri, Maithili, and Santhali** were added by the **92nd Amendment Act of 2003**, effective from 2004

Current Criteria

LEC (Linguistic Experts Committee) has unanimously revised the criteria for classical status. Present criteria now includes:

1. High antiquity of early texts, and recorded history over a period of 1500- 2000 years;
2. A body of ancient literature/ texts, which is considered a heritage by generations of speakers
3. Knowledge texts, especially prose texts in addition to poetry, epigraphical and inscriptional evidence
4. Classical languages and literature could be distinct from its current form or could be discontinuous with later forms of its offshoots.

Linguistics Experts Committee (LEC)

- Non-statutory body constituted by the Ministry of Culture to examine the proposed languages for the status of classical language.
- Nodal Agency for Linguistics Experts Committee: Sahitya Akademi
- President of Sahitya Akademi is the ex-officio president of LEC.
- **Note:** Decision on conferring classical language status upon a language is taken by the Union Cabinet and notification for the same is published by the Ministry of Culture.

Benefits of Classical Language Status

- Once a language is designated as a Classical language, the Human Resource and Development Ministry offers several benefits to promote it:
  - **Two major annual international awards** are established for distinguished scholars in classical Indian languages.
  - A **Centre of Excellence for studies** in Classical Languages is created.
  - University Grants Commission (UGC) is asked to establish a certain number of Professional Chairs for the Classical Languages, initially in Central Universities.

Pali Language

Syllabus Mapping: Buddhism, Art & Culture, Literature

Context

The Indian Council for Cultural Relations (ICCR) recently organised a gathering of Buddhist monks and scholars in Colombo to discuss India's decision to recognize Pali as a classical language.

About Pali

- **Origin:** The term "Pali" is a modern designation, and its origins are debated among scholars. Prior to the 6th or 7th century, there wasn't a distinct language recognized as Pali.
- **Early References:** The earliest mentions of Pali can be found in the commentaries of Buddhist scholar **Buddhaghosa**.
- **Literary Contributions of the Pali Language:**
  - It was adopted by Buddhist and Jain sects in ancient India and it became the primary medium for disseminating Lord Buddha's teachings.
  - **Canonical Literature:** Entire corpus of Buddhist literature, especially the Tipitaka (or "Threefold Basket"), is composed in Pali:
    - **Vinaya Pitaka (Basket of Discipline):** Enunciates the rules of monastic conduct for monks and nuns of Buddhist Sangha. Compiled in the first Buddhist

Council conducted shortly after Buddha's death. Consists of three parts:

- **Part I - Suttavibhanga:** Enunciates the rules of monastic life **(Pattimokkha)** and commentaries there upon. There are 227 rules for Buddhist monks (bhikkhus) and 311 rules for buddhist nuns (bhikkhunis).
- **Part II - Khandaka:** This part of Vinaya Pitaka contain two parts - (i) **Mahavagga** dealing with Buddha's life, awakening of first ten great disciples of Buddha, rules of Uposatha day and (ii) Cullavagga containing accounts of first and second buddhist councils, establishment of community of bhikkhunis and rules of dealing with offences in the Sangha.
- **Part III - Parivara:** Commentary on the earlier two parts by Buddhist scholars. This part is considered to be a late addition to Vinaya Pitaka.
    - **Sutta Pitaka (Basket of Discourse):** Contains more than 10,000 verses attributed to Buddha and his disciples during his lifetime and just after his death. According to Buddhist legend, Buddha's disciple Ananda. Sutta Pitaka is divided into 5 parts known as Nikayas. They are:
- **Digha Nikaya:** Contains the long discourses.
- **Majjhima Nikaya:** Middle Length discourses
- **Samyutta Nikaya:** Shorter discourses
- **Anguttara Nikaya:** Contains several thousands of discourses based on the number of dhamma items contained in them from one to eleven.
- **Khuddaka Nikaya:** Heterogeneous mix of sermons. There are around 18 books which are part of this:
    - **Khuddakapatha:** Handbook of novice monks.
    - **Dhammapada:** Collection of sayings of Buddha. One of the most popular Buddhist texts.
    - **Udana:** Collection of utterances of Buddha and its context.
    - **Itivuttaka:** Collection of 112 discourses of Buddha which was memorised by lay female bhikkhuni Khujjuttara.
    - **Suttanipata:** Collection of discourses of Buddha, which is considered to be oldest Buddhist texts.
    - **Vimanavatthu:** Contains stories of characters who have attained residence in heaven due to their good deeds.
    - **Petavatthu:** Contains conversations between Buddha and his disciples describing how bad actions can lead to rebirth in the world petas (ghosts).
    - **Theragatha:** Short poems attributed to early Bhikkhus of the Sangha.
    - **Therigatha:** Collection of short poems of early Bhikkhunis.
    - **Jataka:** Collection of stories of Buddha's previous births both as human and animals.
    - **Niddesa:** Commentary on Suttanipata.
    - **Patisambhidamagga:** Discourses on knowledge in Buddhism.
    - **Apadana:** Collection of biographical stories of Buddhist monks and nuns who lived in the lifetime of Buddha.
    - **Buddhavamsa:** Describes the life of Buddha and 24 other Buddhas who preceded him.
    - **Cariyapitaka:** Contains an account of 35 previous lives of Buddha (Similar to Jataka) where Buddha as Bodhisattva exhibited perfections known as 'Paramitas'.
        - **Abhidhamma Pitaka (Basket of Higher Doctrine):** Contains a detailed scholastic analysis of teachings of Buddha in Suttas.
        - **Paracanonical literature:** These are books which are considered to be included as canonical in some schools of Theravada buddhism.
- **Nettipakarana or Netti:** Deals with Buddhist hermeneutics i.e. how buddhist texts are to be interpreted.
- **Petakopadesa:** Similar to Nettiprakarana, it is a work related to interpretation of Buddhist texts.
- **Milindapanha:** Records a dialogue between Indian Buddhist monk Nagasena and Indo-Greek king Menander I of Bactria.
    - **Non-Canonical literature:** Text such as **Dipvamsa and Mahavamsa, Milindpanho, Vishuddhimagga are also written in Pali language.**
- Emperor Ashoka (268-232 BCE) played a significant role in promoting Pali. Many of his **Rock edicts and Inscriptions** used Pali.

Indian Council for Cultural Relations (ICCR)

- An autonomous body under the Ministry of External Affairs.
- Promotes Indian culture abroad through its network of cultural centres.
- Founded in **1950 by Maulana Abul Kalam Azad** (Independent India's first Education Minister).

International Abhidhamma Divas

Syllabus Mapping: Art & Culture, Literature

Context

International Abhidhamma Divas was organised by The Ministry of Culture in association with International Buddhist Confederation (IBC).

About Abhidhamma Divas

- It commemorates the day when Lord Buddha descended from the celestial realm (Tāvatimsa-devaloka also known

as Tushita) to Sankassiya (now Sankisa Basantapur) in Uttar Pradesh.

- According to Buddhist literature, when Buddha was 41 years he travelled from Shravasti to Tushita heaven and taught Abhidharma to his mother Mayadevi.
- Three months later, Buddha descended from heaven accompanied by lord Indra and Brahma with all gods thanking him to Sankissa or Sankassya through a flight of gold stairs. This event is called the 'Miracle of descent from heavens'.
- The **Asokan Elephant Pillar at Sankassiya** marks this significant event.
- **Abhidhamma:**
  - Refers to the third "basket" (pitaka) of the Pali Canon which forms the doctrinal foundation of Theravada Buddhism.
  - The primary texts of the Abhidhamma are: **Dhammasangani**, **Vibhanga**, **Puggalapaññatti**.
- **Important Buddhist Texts:**
  - Buddhacarita - **Ashvaghosha**
  - Mahavibhasa Sastra - **Vasumitra**
  - Visuddhimagga, Sumangala-vilasini, Atthakathayen - **Budhhaghosh**

Sankissa

- Sankissa is a small village in Uttar Pradesh's Farukkhabad district.
- Considered one of the 8 great cities of Buddhist pilgrimage.
- Alexander Cunningham identified the village of Sankisa Basantpur as Sankassya of Buddhist legend.
- Fa-xian and Xuanzang visited Sankissa who refer to the place as 'Song-kia-she or Kia-pi-tha' in their accounts.
- Presently, the place a large mound with three staircases to the top.

National Maritime Heritage Complex development in Lothal

Syllabus Mapping: Art & Culture, Architecture

Context

The Union Cabinet approved the development of the National Maritime Heritage complex at Lothat (Gujarat).

About National Maritime Heritage Complex

- **Purpose**: The project aims to showcase India's 4,500-year-old maritime heritage and will become the world's greatest maritime complex once completed.
- **Components**: The complex will include several features such as a Lighthouse Museum and a five-dimensional theatre offering interactive experiences.
- **Development**: By the Ministry of Ports, Shipping, and Waterways.

About Lothal

- **Location:**
  - One of the **southernmost sites** of the Indus Valley Civilization,
  - Believed to have been built around **2200 BC**.
  - Located along the Bhogava river, a tributary of Sabarmati, in the Gulf of Khambhat (Gujarat).
- **Meaning**: The name **Lothal** means "mound of the dead" in Gujarati.
- **Discovered by**: SR Rao.
  - Excavation took place from 1955 to 1960.
- **Features:**
  - Only port-town of the Indus Valley Civilisation.
  - It was known for its harbour, cotton and rice-growing, and bead-making industry.
  - It was part of a coastal trade route, linking sites such as Dholavira and Sutkagen Dor on the Makran coast.
  - Lothal was divided into a citadel (upper town) and a lower town.
    - Citadel or Upper Town (also known as Acropolis)
    - Lower town
  - Buildings were made of fire-dried bricks, lime, and sand mortar.
  - The city had a well-planned and sophisticated drainage system.
- **Key Archaeological Findings:**
  - **Port:** Lothal has a large dockyard which was used by traders to trade with other neighbouring regions.
  - **Trade:** Presence of Persian Gulf Seals is testimony to the thriving trade relations in Lothal.
  - **Religion:** Presence of fire altars gives evidence of fire worship. Lothal has no presence of female figurines which was evident in other parts such as Harappa etc.
  - **Ivory Scale**: The smallest known decimal scale from the Indus civilization.
  - **Bead-making industry:** Lothal is famous for its bead making industry. There were metal working shops. There were also shops for shell ornaments and beads.
  - **Burial Practices:** Lothal gives evidence of twin burial where a male and female were buried in a single grave.
  - Warehouse
  - Merchant house
  - Cloth impressions on some seals
  - Twelve bathrooms in the citadel
  - Well
- **UNESCO Nomination**: Lothal was nominated as a UNESCO World Heritage Site in 2014.

Bhartiya Adim Jaati Sevak Sangh

Syllabus Mapping: Modern Indian History

Context

The President of India, Smt. Droupadi Murmu, attended an event celebrating the 75th anniversary of the Bharatiya Adim Jati Sevak Sangh.

About Bhartiya Adim Jati Sevak Sangh (BAJSS)

- It was established in 1948 by **Thakkar Bapa (Amritlal Vithaldas Thakkar)**
- **Objective:** To promote the welfare of the tribal and marginalised communities in India.
- It works on issues like poverty, illiteracy and poor health prevalent in the tribal society.
- **Dr. Rajendra Prasad,** was designated as the Founder-President of BAJSS.

Thakkar Bapa

- Amritlal Vithaldas Thakkar, also known as Thakkar Bapa, was born on 29 November 1869 in Bhavnagar, Gujarat.
- He was a prominent social reformer, freedom fighter and humanitarian, renowned for his dedication to the upliftment of tribal and marginalised communities in India.
- **Contribution to freedom struggle:** Thakkar Bappa joined India's freedom struggle and became an ardent advocate for the welfare of underprivileged communities.
  - In 1918, he played a crucial role in presenting the **Compulsory Primary Education Bill to the Bombay Legislative Council.**
  - Thakkar Bappa was actively involved in setting up the **Harijan Sevak Sangh in 1932.**
- **Literary work:** He authored the book, **Tribes of India.** It was published in 1950.

Ramayana Outside India

Syllabus Mapping: Art & Culture, Literature

Context

Prime Minister Shri Narendra Modi witnessed an episode of Lao Ramayan during his recent visit to Laos.

Different versions of Ramayana outside India

- **Laos:** Phra Lak Phra Lam/ Phalak Phalam
- **Japan:** Ramaenna or Ramaensho.
- **Cambodia:** Reamker
- **Indonesia:** Ramayana Kakawin
- **Thailand:** Ramakien
- **Nepal:** Siddhi Ramayana and Bhanubhaktako Ramayan
- **Sri Lanka:** Janakiharan
- **Malaysia:** Hikayat Seri Rama
- **Myanmar:** Yama Zatdaw

Battle of Walong

Syllabus Mapping: Modern Indian History

Context

The **Indian Army** is organising a month-long series of events to commemorate the **62nd anniversary** of the **Battle of Walong**. The newly renovated Shaurya Sthal (Walong war memorial) at Lama Spur, a tribute to the soldiers of the battle, will be inaugurated alongside infrastructure projects in the border areas.

About Battle of Walong

- The Battle of Walong was a significant engagement during the Sino-Indian War of 1962, near the town of Walong in Arunachal Pradesh, India.
- This battle was marked by fierce fighting between Indian forces and the People's Liberation Army (PLA) of China.
- The Indian Army, despite being outnumbered, halted PLA for 27 days in the unforgiving terrain of Arunachal Pradesh.
- Even with limited resources, the Indian Army fought until the last man and last round.This courage was acknowledged globally, with Time magazine writing in 1963, "At Walong, Indian troops lacked everything.The only thing they did not lack was guts."

Strategic Locations Near Walong

- **Bumla Pass:**
  - It is a significant border pass between India and China in Arunachal Pradesh.
  - This pass provides access to the region and has historical significance as a route for military logistics and movement.
  - It is also a point for Indian and Chinese soldiers to engage in flag meetings to maintain peace along the border.
- **Kibithu:**
  - It is situated about **5 km** from Walong and is significant as it serves as the easternmost point of India.
  - The area holds strategic importance due to its proximity to the India-China border.
- **Dong:**
  - It is famous for being the first place in India to see the sunrise each day.
  - While not a military base, Dong's unique geographical position makes it a point of interest for surveillance activities and local tourism.

ETHICS, INTEGRITY & APTITUDE

TOPICS FOR MAINS

Relevance of Gandhi's Conscientious Politics

Syllabus Mapping: GS-Paper 4, Teaching of Great Thinkers

Context

Despite ongoing conflicts, human rights violations, and widespread violence, there is a pressing need to engage with Gandhi's teachings on nonviolence, which offer a path toward peace and moral leadership.

Relevance of Gandhi's Conscientious Politics

- **Nonviolence as a Moral Imperative**:
  - Gandhi's politics were rooted in the principle of **nonviolence (Ahimsa)**, emphasising that **peaceful resistance** to injustice is not only a strategic choice but a **moral necessity**. In a world marked by wars, terrorism, and civil unrest, Gandhi's teachings on nonviolence offer a framework for peaceful resistance.
- **Promoting Social Justice**
  - **Empowerment of the Marginalised:** Gandhi's philosophy emphasises the empowerment of the powerless and the importance of educating individuals about their capacity to resist authority when it is abused. This aligns with modern movements advocating for human rights and social equity.
  - **Swaraj (Self-rule):** His idea of politics encourages people to take responsibility for their own governance rather than authoritarian control. This principle encourages active participation in democracy and civic life.
- **Fostering Dialogue and Understanding**
  - **Pedagogy of Dialogue**: Gandhi's approach promotes a "pedagogy of dialogue," where nonviolent struggle fosters understanding and opens pathways for new perspectives. This is essential in today's polarised societies, where constructive dialogue can resolve conflicts.
  - **Living Together:** Challenge of coexisting peacefully while respecting individual identities is central to Gandhi's vision. His emphasis on empathetic plurality encourages societies to embrace diversity while working towards common goals.

Monitoring Investment-Driven Performance of District Magistrates in Uttar Pradesh

Syllabus Mapping: GS-Paper, Ethics Case Studies, Accountability

Context

The Uttar Pradesh government has implemented an innovative system to assess District Magistrates (DMs) based on their ability to attract investments to their districts. This initiative marks a shift in governance strategy by linking investment performance with officer evaluations in the Annual Confidential Report (ACR).

Objective: Fostering Economic Growth through Competitive Engagement

Stimulate economic growth by encouraging district officials to actively promote industrial investments. This competitive engagement is intended to enhance economic development within various regions of the state.

Key Investment Promotion Criteria

Officers will be evaluated based on specific investment-promotion metrics, which include:

- **Timely Land Allocation and Clearance**: Ensuring land is made available for industrial use with efficiency.
- **Land Banks and Subsidies:** Creating a reserve of land for potential investors and providing land subsidies.
- **Improving Credit Deposit Ratio:** Fostering financial support and ease of credit access for regional businesses and investors.

Rewards for Performance

To incentivize officers, those who excel in attracting investments will receive special recognition and higher grades in their ACRs.

Expected Impact on Economic Development

This initiative will drive economic growth by embedding investment-focused goals within regional governance. Officers are encouraged to facilitate industrial activities and banking support, further promoting localised economic progress.

Criticisms and Concerns

- This approach resembles a corporate evaluation model, prioritising profit metrics in public service roles.
- This may shift responsibility for economic development solely onto officers, potentially overlooking broader systemic factors.

Conclusion: A New Model for Localised Development

This initiative highlights the Uttar Pradesh government's commitment to accelerating local economic growth, with officers positioned as central figures in investment attraction. This case presents a unique approach to integrating investment goals within government accountability structures.