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SHANKAR IAS ACADEMY

MARCH 2024

1. IMPORTANT TOPICS OF THE MONTH

1.1 SC's stand on Parliamentary Privileges

Why in news?

Recently the Supreme Court ruled that legislators cannot claim immunity from criminal prosecution for bribery related to their speech and votes in the House.

Parliamentary Privileges

- **Art 105** – It relates to special rights, immunities and exemptions enjoyed by the members of the Parliament and their committees.
- **Need-** To secure the independence and effectiveness of their actions.
- Without these privileges the Houses can neither maintain their authority, dignity and honour nor can protect their members from any obstruction in the discharge of their parliamentary responsibilities.
- **Extended to** - Those persons who are entitled to speak and take part in the proceedings of a House of Parliament or any of its committees which include *Attorney General of India and Union Ministers*.
- **Exception-** It *does not extend to the President* who is an integral part of the Parliament.
- **Article 121-** It restricts members from discussing the conduct of the judges of the Supreme Court and the High Court.
- Freedom of speech in Parliament is subject to the provisions of the Constitution and the rules regulating the procedure of the Houses.
- **Rajya Sabha Rulebook-** An essential pre-requisite for the efficient discharge of their Parliamentary duties, without which, they may not be able to speak and express their views in the House without any fear.
- **Classification-**
 - **Collective privileges-** Those privileges that are enjoyed by each house of Parliament collectively.
 - **Individual privileges-** Those privileges that are enjoyed by the members individually.

What are the provisions that grant legislators immunity from prosecution?

- **Article 105(2)-** No MP shall be liable to any proceedings in any court in respect of anything said or vote given by him in Parliament and no person shall be liable in respect of the publication by or under the authority of either House of Parliament of any report, paper, votes or proceedings.
- It exempts MPs from any legal action for any statement made or act done in the course of their duties.
- **Article 194(2)-** It provides immunity to members of state legislatures similar to that given under Art. 105.
- **Defamation** – The defamation suit cannot be filed for a statement made in the House.
- **Role of Speaker-** In cases where a member oversteps or exceeds the contours of admissible free speech, the Speaker of the House will deal with it, as opposed to the court.

What is the current issue?

- **Sita Soren case-** Sita Soren, a member of the Jharkhand Mukti Morcha (JMM), revolves around bribery allegations related to the 2012 Rajya Sabha elections.
- The three judge bench of Supreme Court noted that *P.V.Narashimo Rao case* is directly related to this case, and it was referred to a larger bench as the issue was “substantial and of general public importance”.
- Recent judgement – It ruled that parliamentary privileges do not grant legislators higher immunity from general criminal law.

P.V.Narshima Rao Case, 1993

- During 10th Lok Sabha, no-confidence motion was introduced against the then Prime Minister P.V.Narashima Rao, it is alleged that Jharkhand Mukti Morcha MPs and Janata Dal (Ajit Singh) had accepted massive bribes from Rao to vote against the no-confidence motion.
- **5 bench of Supreme Court** - By 3:2 majority, it held that lawmakers have immunity against criminal prosecution for any speech made and the vote cast inside the House under Articles 105(2) & 194(2).
- The court held that in order to protect the independence of MP's, the phrase "in respect of" in the Article must be given a "broad meaning" to protect the MP from all civil or criminal proceedings that have a connection with anything they have said or voted for in Parliament.
- The court refused to extend the same protections to Ajit Singh, since he had neither made a speech nor cast a vote. It also refused to extend protections to bribe-givers.

What are the key highlights of the verdict?

- **Over turned P.V.Narasimha case-** The recent ruling ensures that legislators cannot escape accountability for bribery, regardless of their subsequent actions.
- **No violation of the doctrine of stare decisis-** The doctrine is not an "inflexible rule of law" and that a larger bench is well within its limits to reconsider a prior decision.
- **Supremacy of Constitution** - Legislative privileges have to conform to Constitution, so they are subject to judicial review.
- **Stressed on two fold test-** Immunity from prosecution for bribery fails two fold test
 - **Collective functioning-** The privilege claimed must be linked to the overall functioning of the House.
 - **Essential duties-** The necessity for the privilege should relate to the legislator's essential duties.
- **Bribery is not immune-** It is not immune because it is not essential to the casting of the vote or decision-making, the same principle applies to bribery related to speeches in the House or committees.
- **Bribery, a complete offence-** It is considered complete when a legislator accepts an illegal gratification, regardless of whether it is followed by voting or making a speech as desired by the bribe giver.
- **Accountability of legislators** – Bribery charges can be treated by the House as contempt or a breach of privilege, but this does not exclude judicial proceedings.
- **Parallel jurisdiction of Courts and Houses-** The court's jurisdiction to prosecute criminal offenses and the House's authority to address breaches of discipline operate independently.
- **Applicability to Rajya Sabha elections-** Voting in Rajya Sabha elections falls within the ambit of Article 194(2) as the parliamentary privileges extends beyond law making on the floor of the House, it encompasses other powers and responsibilities of elected members, even when the House is not in session.

Previously, the legislators were immune for accepting a bribe and voting as agreed. However, they could be prosecuted if they accepted a bribe but voted independently.

Doctrine of stare decisis is a legal principle that obligates judges to adhere to prior verdicts while ruling on a similar case.

Kuldip Nayar case (2006) held that elections to the Rajya Sabha are not proceedings of the legislature but a mere exercise of franchise and therefore fall outside the ambit of parliamentary privileges under Article 194.

What lies ahead?

- It underscores the importance of constitutional scrutiny in determining the boundaries of legislative privileges.
- Supreme Court made clear that the Parliament is not the sole judge of its privileges, allowing for judicial review of the House and its members' actions
- Sita Soren vs Union of India is a significant step towards strengthening legislative accountability and upholding the rule of law.
- By outlining a clear stance in relation to parliamentary privilege concerning bribery cases the court reaffirms principles of moral uprightness and openness within public life.

1.2 Women in the making of Indian Constitution

Why in news?

Among the 299-member Constituent Assembly, there were 15 women who advocated passionately for a kind of India that would bear the imprint of both genders.

Who are the influential women members that shaped Indian Constitution?

Annie Mascarene

- She became the *first woman* to hold a *ministerial and legislative assembly position in Travancore*, she raised concerns about under-representation of women in politics.
- She was the first woman to be part of the Travancore State Congress Working Committee.
- In the Constituent Assembly debates she spoke about the *centralisation of power* for a smooth functioning but also warned against complete centralisation which would negatively affect the nature of democratic institutions.

Hansa Jivraj Mehta

- She became the President of All India Women's Conference in 1946 and proposed the Charter of Women's Rights.
- She presented the *first national flag on behalf of the women of India* on August 15, 1947, which symbolized the integral role women played in the nation's independence and the new era of democracy.
- She made strong arguments against reservations for women.
 - "What we have asked for is social justice, economic justice and political justice, not reserved seats for quotas and separate electorates," she said.
- She also served on the board of *UNESCO* and became the first Vice Chancellor of MS University in Baroda.
- **Gender neutral language**- Her appointment to the *UN Human Rights Council* was a significant moment in history, as she piloted a change of phrase from "All men are born free and equal" to "*All human beings are born free and equal*".

Dakshayani Velayutham (from Kerala)

- She was the *first and only Dalit woman* to be elected to the Constituent Assembly in 1946.
- Her term in the constituent assembly was defined by two objectives, both inspired and molded by her time with Gandhi and Ambedkar.
 - To make the assembly go beyond framing a constitution and to give "people a new framework of life"
 - To use the opportunity to make untouchability illegal, unlawful and ensure a "moral safeguard that gives real protection to the underdogs" in India.
- **Untouchability**-She was a Gandhian, opposed untouchability and supported Article 17 of the Constitution which abolishes untouchability.
- She held strong to the conviction that only an Independent socialist republic can help uplift the dalits and give them the liberties exercised by every other citizen.

Amrit Kaur

- She joined Gandhiji in the *Civil Disobedience movement* in 1930 and was passionate about the political participation of women.
- She advocated for universal adult franchise and *did not believe in reservations* for women.
- **Universal adult franchise**- She believed that true equality would only be gained when women made it to the legislature through ordinary elections rather than through reservations.
- **Secularism**- She advocated for the Uniform Civil Code along with Hansa Mehta and wanted to replace "free practice of religion" with "freedom of religious worship" in the draft Constitution.
- She was *India's first Health Minister* and the *founder of the All India Institute of Medical Sciences (AIIMS)* who argued for its autonomy.

Ammu Swaminathan

- A social worker, politician and anti-caste activist.

- **Women's India Association, 1917-** She along with Annie Besant co-founded this association to tackle the social and economic issues faced by women workers.
- She was a proponent of the adult franchise and supported the removal of untouchability, reflecting her commitment to social equality.
- When the Constituent Assembly resolution was being discussed, she remarked that,
 - “The people outside have been saying that India did not give equal rights to her women. Now we can say that when the Indian people themselves framed their Constitution they have given rights to women equal with every other citizen of the country.”
- She advocated for the Child Marriage Restraint Act, the Age of Consent Act and also supported the Hindu Code Bills, which sought to reform Hindu religious laws and promote gender equality.

Durgabhai Deshmukh- Mother of Social Work

- At 12 years of age, she participated in the Non-Co-operation Movement and along with Andhra Kesari T. Prakasam, she participated in the Salt Satyagraha movement in Madras city in 1930.
- **Andhra Mahila Sabha-** She established the sabha in 1937, which became a beacon for education and social welfare
- In the Constituent Assembly, she weighed in on judicial matters and advocated lowering the age from 35 to 30 to hold a seat in the Council of Ministers.
- After Independence, she also served in the Planning Commission as a leader of social services and became the chairperson of the Central Social Welfare Board (CSWB).

Begum Aizaz Rasul

- She was the only Muslim woman member of the Constituent Assembly and was a notable figure in India's constitutional history.
- She firmly opposed reservations and separate electorates based on religion, arguing that such measures would perpetually divide minorities from the majority.
- **Reserved seats-**She was instrumental in creating consensus amongst the Muslims leadership to voluntarily give up the demand for reserved seats for religious minorities.
- Her efforts in promoting women's hockey in India were recognized by naming Indian Women's Hockey Cup after her.



Vijayalakshmi Pandit

- She was the first leaders to call for an Indian constituent assembly to frame a Constitution.
- She was the ***first women to hold a cabinet minister position*** during British era and was a vocal proponent for the establishment of an Indian Constituent Assembly.
- Notably, she was the ***only woman delegate*** at the United Nations Organisation Conference and made history by becoming the ***first woman and first Asian President*** of the UN General Assembly in 1953.

Kamala Chaudhri

- She was closely associated with Mahatma Gandhi and took part in the Civil Disobedience Movement in 1930.
- Influenced by Mahatma Gandhi's non-violent call for freedom movement, she formed Charkha Committees to unite women.
- She remained active for the upliftment of women through literature and politics throughout her life.
- Her famous works were Unmaad (Passion), Picni, Yatra (Journey) and Bel Patra (Leaf Letter) along with many short stories

Leela Roy

- She inspired women to join politics, she was a brave soldier and was a close associate of Subhash Chandra Bose.
- **Dipali Sangha**- In 1923, with her friends, she founded it to establish schools which became centres of political discussion in which noted leaders participated.
- **Chhatri Sangha**- In 1926, an association of women students in Dacca and Kolkata, was founded.
- She was instrumental in forming the ***Dacca Mahila Satyagraha Sangha***, which played an active role in the anti-salt tax movement.
- She started publishing a magazine called ***"Jayashree"*** in 1931 which was edited and managed by women only.
- She quit the Constituent Assembly in protest against the partition of India.

Sucheta Kriplani

- She is credited with having established the women's wing of the Congress party in 1940.
- She led the Constituent Assembly in singing Vande Mataram, Saare Jahan Se Achcha and the national anthem.
- She was ***India's first women Chief Minister***, she made history by assuming the office as the head of Uttar Pradesh government in 1963.

Malati Choudhury

- Nicknamed ***"toofani"*** by Mahatma Gandhi for her dazzling energy and belief in the fight for freedom, Malati Choudhary not only played a significant role in the Civil Disobedience Movement, but also as a powerful voice of dissent against tyranny and inequality.
- Rabindranath Tagore affectionately called her ***Meenu***.
- **Bajiraut Chhatravas**- She found the organisation to fight for the upliftment of vulnerable communities in Odisha.
- She was brought in as an important member of the Constituent Assembly in 1948.

Purnima Banerjee

- Her belief that education was ***"right of livelihood and right of earning an honourable bread"*** should be a part of the fundamental rights of the constitution accounted for many of her early speeches in the assembly.
- She debated that it was the government's responsibility to ensure that through an approved syllabus, proper appreciation of all religions is inculcated into students for the sake of unity of the country.

Renuka Roy

- In 1934, she put forth the famous document: "Legal Disabilities of Women in India; A Plea for a Commission of Enquiry", where she argued for a uniform personal law code, in terms of the situation of women in the eyes of the law in India.
- She was appointed as the President of All India's Women's Conference and made efforts to advocate women rights and inheritance rights in the parental property.
- She was also credited with establishing the All Bengal Women's Union and the Women's Coordinating Council.

Sarojini Naidu

- She is known as the Nightingale of India, the first Indian woman to become the president of the Indian National Congress and the first woman to be appointed as an Indian state governor.
- Fondly called **Bulbul** by Mahatma Gandhi, Sarojini Naidu was one of the women who were in the forefront during the freedom struggle.
- As a member of the '**Ad-hoc Committee on National Flag**', she spoke at length in the Constituent Assembly about the importance and meaning of the national flag for India.
- Bappaditya Bandopadhyay quoted "Sarojini Naidu inspired the Indian renaissance movement and had a mission to improve the life of Indian woman."

1.3 WTO MC13

Why in news?

The World Trade Organization's (WTO) 13th Ministerial Conference (MC13) held at Abu Dhabi in the UAE adopted the Abu Dhabi Ministerial Declaration.

What is WTO?

- It is the only international organization that deals with the rules of trade between countries.
- **Established in** – 1995 under the Marrakesh Agreement, replacing the 1947 General Agreement on Tariffs and Trade (GATT).
- **Members**- 164 members, representing 98% of world trade.
- **Decision making**- Unlike other organisations, such as the IMF or World Bank, it does not delegate power to a board of directors or an organisational chief.
- All decisions are taken through consensus and any member can exercise a veto.
- **Aim**- To promote free trade through trade agreements that are discussed and signed by the member states.
- To provide a forum for countries to negotiate trade rules and settle economic disputes between them.
- **Ministerial Conference**- The topmost decision-making body of WTO which usually meets every two years.
- **General Council** - WTO's highest-level decision-making body that meets regularly.
- It also meets as the Dispute Settlement Body and as the Trade Policy Review Body.

WTO	
Founded in	1995
Headquarters	Geneva, Switzerland
India's membership	India is a member

What are the key takeaways from the meeting?

The key takeaways from the **Abu Dhabi Ministerial Declaration** and other Ministerial Decisions are as follows.

- **E-Commerce** – Members agreed to maintain the current practice of not imposing customs duties on electronic transmissions until the 14th Ministerial Conference or 31st March 2026, whichever is earlier.
- **TRIPS Non-Violation and Situation Complaints** – Moratorium on this was extended until MC14.
- **Dispute Settlement Reform** – To accelerate discussions and work on unresolved issues such as appeal/review to have a full and well-functioning dispute settlement system accessible to all Members by 2024.
- **Transition support to LDC category** – Member graduating from LDC category shall continue to benefit from special procedures available in *Dispute Settlement Understanding* for 3 years.
- During this period, the Member will also be eligible for LDC-specific technical assistance and capacity building provided under *WTO's Technical Assistance and Training Plan*.
- **Agriculture** – Divergences remained on public stockholding (PSH) for food security purposes and in respect of timelines, expected outcomes and the scope of the flexibility to be provided to food imports by the most vulnerable countries from export restrictions.
- **Fisheries Subsidy** - *Fisheries Subsidies Agreement* has been formally accepted by some 71 WTO Members till now.
- **Agreement on Application of Sanitary and Phytosanitary Measures and Agreement on Technical Barriers to Trade** – The officials were instructed to continue their work in the WTO Committee on Trade & Development in Special Session, the SPS Committee and the TBT Committee and report the progress by 2024.

- **Investment Facilitation for Development Agreement** – Joint Ministerial Declaration was issued on finalisation of *Investment Facilitation for Development (IFD) Agreement* to facilitate the flow of FDI between the Parties.
- **Environment**– It called for increased transparency and continued work on the subjects of Plastics pollution, environmental sustainability, and fossil fuel subsidy reform.
- **Women in international trade** - WTO and the International Trade Centre (ITC) launched a USD 50 million global fund to help women tap opportunities in international trade and digital economy.
- **Services Domestic Regulation** - The disciplines on services domestic regulation entered into force for a group of 72 WTO members.
- **New members** - The WTO membership terms of *Comoros and Timor-Leste* was approved at a special ceremony held at the MC13.

What issues were unaddressed?

- **Fisheries subsidy** - The delegates left MC13 with no progress on fisheries beyond the MC12 deal.
- Issues will continue to plague global fishing, particularly the lack of subsidy bans on active overfishing.
- **Agriculture (Public stockholding)** – It is a policy tool under which the government procures crops like rice and wheat from farmers at a minimum support price (MSP), stores and distributes foodgrains to the poor.
- It can distort trade when the government purchases food from farmers at fixed prices.
- During MC13, **the G33** (a group of developing nations including India) pushed for the long sought-after permanent solution to public stockholding.

G33 (or *Friends of Special Products in Agriculture*) - A coalition of developing countries formed ahead of 2003 Cancun ministerial summit to cooperate during the Doha Round of World Trade Organization negotiations, particularly in agriculture. **India is a member.**

- However, other developing countries and the United States refused to accept the permanent solution outright.
- **Agriculture (unrelated market access)** - Many nations, including Brazil and some within the Cairnes Group coalition, demanded progress on unrelated market access negotiations.
- However, the European Union staunchly opposed to such linkages, further complicating negotiations.

Cairns Group, established in 1986, a coalition of agricultural countries advocating market-oriented reforms in the international agricultural trading system. **India is not a member.**

1.4 CAA Rules, 2024

Why in news?

The Ministry of Home Affairs has recently notified the rules for implementation of the Citizenship (Amendment) Act, which was enacted by Parliament in 2019.

Rules for citizenship in India

- Constitutional provisions- It deals with the citizenship from **Articles 5 to 11** under **Part II**.
- **Citizenship Act 1955**- It specifies that citizenship may be acquired in India through five criteria.
- **Birth in India**- It specifies certain conditions for acquiring citizenship by birth.
- **Descent**- A person born outside India on or after January 26, 1950, but before December 10, 1992, is a citizen of India if his/her father was a citizen of India at the time of his/her birth.
- A person born outside India on or after December 10, 1992 is considered as a citizen of India if either of his parents is a citizen of India at the time of his birth.
- **Registration**-Certain categories of people, such as those of Indian origin residing abroad, can apply for citizenship through registration

- **Naturalization-** Individuals who have resided in India for a specified period and fulfil other conditions prescribed by the central government may acquire citizenship by naturalization.
- **Incorporation of territory-** If any territory becomes part of India, the central government may specify the persons who shall be citizens of India by virtue of their connection with that territory.
- **CAA, 2019-** It amends the Citizenship Act 1955 and introduces religion as the sixth criteria to acquire citizenship in India, while excluding Muslims.

What are the key provisions of Citizenship (Amendment) Act, 2019?

- It is a legislative enactment that the Parliament has passed in 2019 to amend the Citizenship Act of 1955.
- **Aim-** To grant citizenship to persecuted minorities from neighbouring Muslim majority countries of Pakistan, Bangladesh, and Afghanistan.
- The specified class of illegal migrants from the three countries - *Afghanistan, Bangladesh and Pakistan* - will not be treated as illegal migrants, making them eligible for citizenship.
- **Eligibility-** It allows Indian citizenship for *Hindu, Sikh, Buddhist, Jain, Parsi, and Christian* religious minorities who fled from the neighbouring countries of Pakistan, Bangladesh and Afghanistan before 31st December 2014 due to "religious persecution or fear of religious persecution".
- **Residence requirement-** It reduced the residence requirement for naturalisation from 11 years to 5.
- **Overseas Citizens of India (OCI)** – It allows cancellation of OCI registration if the person has violated any law notified by the central government.
- **Exemption from CAA** – Autonomous councils created under the 6th Schedule of the Constitution and Inner Line Permit region are exempted from the purview of CAA.
- **Autonomous councils-** The exception applies to

A foreigner may register as an OCI under the 1955 Act if they are of Indian origin or the spouse of a person of Indian origin.

State	Autonomous Council
Assam	<ul style="list-style-type: none"> • Karbi Anglong Autonomous Council • Dima Hasao Autonomous District Council • Bodoland Territorial Council
Meghalaya	<ul style="list-style-type: none"> • Garo hills
Mizoram	<ul style="list-style-type: none"> • Chakma district
Tripura	<ul style="list-style-type: none"> • Tripura Tribal Area District

- **Inner Line Permit (ILP)-** It is regulated under *Bengal Eastern Frontier Regulations 1873*, the permit is required for a visit by people from other parts of the country in North-eastern states.

The ILP is in place in parts of Arunachal Pradesh, Nagaland, Mizoram and Manipur.

What are the CAA rules, 2024 notified by Ministry of Home Affairs?

- **Dedicated portal-** For application, processing, and grant of citizenship.
- **Eased citizenship-** It excluded the requirement of a "valid passport" of their origin countries or a valid visa from India.
- **Eligible applicants-** Individuals of Indian origin, spouses of Indian citizens, minor children of Indian citizens, individuals with registered Indian citizen parents, and Overseas Citizens of India Cardholders among others.
- **Application process-** Requires submission of *Form VIII A*, an affidavit, and a declaration of proficiency in an *Eighth Schedule* language.
- **Eligibility certificate-** It should be issued by a "locally reputed community institution" confirming that he/she belongs to "Hindu/ Sikh/ Buddhist/ Jain/ Parsi/ Christian community and continues to be a member of the above mentioned community."

Eighth Schedule lists 22 official languages of India.

- **Visa replacement-** A certificate issued by an elected member of a local body can be a replacement for a visa.
- **Empowered Committee-** A committee led by the *Director* (Census Operations) and including various officials will review applications.
- **District-Level Committee-** It will be headed by Senior Superintendent or Superintendent of Post which will also involve in the scrutiny process.
- **Oath of Allegiance-** Applicants must renounce their previous citizenship and take an oath of allegiance.

What are the shortcomings of the CAA, 2019?

- **Religious centric approach-** The United Nations High Commissioner for Human Rights ([OHCHR](#)) has called the Act as “fundamentally discriminatory” as it discriminates against citizenship on the basis of religion.
- **Exclusion of Muslims-** The Muslim sects like Shias and Ahmedis has faced religious persecution in Muslim majority countries like Pakistan but they were not included in this new provision, they fear that the CAA, along with the proposed National Register of Citizens (NRC), could lead to their marginalization.
- **Limited scope-** The exclusion of other religious minorities belonging to other religions, namely *Myanmar, Tibet, and Sri Lanka*, was also believed to be discriminatory to a large extent.
- **Against Secularism and Equality -** Granting citizenship based on religion is argued to be against the secular principles, particularly Article 14 which ensures *equality before the law*.
- It lacks a “reasonable classification” under Article 14, as it excludes persecuted groups like Tamil Hindus in Sri Lanka and Rohingyas in Myanmar.
- **Impact freedom of religion-** It could impinge upon the freedom of religion under Article 24 and Article 25 by creating incentives for religious conversion in order to benefit from the citizenship provisions of the Act.
- **Technical challenges-** Joint Parliamentary Committee report 2019 said that the CAA did not use the term ‘minority’ but specified six non-Muslim religious groups, which goes against the secular categorization of minorities like SC and ST in the Indian Constitution.
- **Violation of Assam accord-** The CAA’s modification of the cut-off date from 1974 to 2014 for citizenship eligibility is seen as conflicting with the Assam Accord, which set the date at 1971.

Section 6A was introduced as part of the Assam Accord, setting March 24, 1971, as the cut-off date for identifying foreigners in Assam.

What is the view of judiciary on CAA, 2019?

- **Centre’s stand-** The Parliament has the authority to enact legislation addressing issues such as persecution on the ground of religion, particularly in neighbouring countries with theocratic constitutional positions.
- The Court refused to stay the operation of the law, it suggested that the government clarify the intent of the Act to avoid public confusion.
- **Section 6A of Citizenship Act-** A five-judge bench reserved its verdict on the validity of Section 6A, recognizing its historical significance. If the cut-off date is upheld, the CAA’s different timeline could be considered in violation of the Assam Accord.
- Recently the petitioners have moved the Supreme Court seeking a stay on the new rules, as it eliminate the independent scrutiny of citizenship applications by District Collectors and recommendations from State governments.
- The petitioners argue that the government should have waited for the Supreme Court’s final decision before implementing the rules.

National Population Register	National Register of Citizens	CAA, 2019
<ul style="list-style-type: none"> • It is a <i>register of residents in India</i> that includes demographic and biometric data 	<ul style="list-style-type: none"> • It is meant to be a <i>register of all Indian citizens</i> so that illegal immigrants can be identified and deported. 	<ul style="list-style-type: none"> • To grant citizenship to persecuted minorities from neighbouring Muslim majority countries of Pakistan, Bangladesh, and Afghanistan.
<ul style="list-style-type: none"> • First prepared in 2010, updated in 2015 under Citizenship Act, 1955. 	<ul style="list-style-type: none"> • Mandated by 2003 amendment of Citizenship Act, 1955 	<ul style="list-style-type: none"> • Enacted in 2019 by amending the Citizenship Act 1955

<ul style="list-style-type: none"> NPR is not a citizenship enumeration drive, as it would record even a <i>foreign national</i> staying in a locality for <i>more than six months</i>. It's not directly linked to the NRC, but the government could potentially use NPR data for NRC purposes. 	<ul style="list-style-type: none"> It includes only Indian citizens while seeking to identify and exclude non-citizens. It has been implemented for the state of <i>Assam</i> starting in 2013–2014, the plan to implement in the rest of the country has not yet been implemented. 	<ul style="list-style-type: none"> The six non-Muslim minority community from neighbouring countries who entered India on or before December 31, 2014 and Those the Centre has exempted under the Passport Act, 1920, or the Foreigners Act, 1946, were not to be treated as “illegal migrants” and would instead be eligible for citizenship under the 1955 Act.
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G.S PAPER I

2. HISTORY

2.1 Gandhi vs Tagore

Why in news?

Mohandas Karamchand Gandhi and Rabindranath Tagore shared an enduring friendship that lasted from 1914-15 till Tagore's demise in 1941.

What are the outcomes of the historic meeting between Tagore and Gandhi?

- Historic meeting-** They met on March 6, 1915, at Santiniketan in West Bengal.
- Gandhi's influence-** Gandhi's stay at Santiniketan left a lasting impact on Tagore's school.
- Gandhi Punyaha Din-** Santiniketan observes 'Gandhi Punyaha Din' annually on March 10 to honor their meeting.
- Teachings of Self-reliance-** The celebration includes a day off for the school's staff, while students and teachers perform the chores, reflecting Gandhi's principles of self-reliance.
- Cultural impact-** Their interactions at Santiniketan symbolize the confluence of ideas that shaped India's cultural and political landscape.

Rabindranath Tagore founded Santiniketan in 1901, aiming to unite humanity beyond religious and cultural divides.

Tagore referred to Gandhi as “Mahatma” (Great Soul) as early as 1915. Gandhi, meanwhile, readily adopted Tagore as “Gurudev” (Teacher)

How Gandhi and Tagore shared principles to the betterment of society and individuals?

Key aspects	Mahatma Gandhi	Rabindranath Tagore
Commitment to service	His life epitomized dedicated service, and he advocated for decisions and policies (“Talisman”) guided by their impact on the poorest and weakest individuals.	Tagore, though primarily recognized as a creative artist, engaged in service, particularly in the rural areas of Bengal, where he aimed to make villages self-reliant through cooperation rather than self-interest.
Vision of swaraj	He emphasised on abhaya (fearlessness) where individuals should have the strength to fearlessly conduct their own daily lives.	He believed in atmasakthi (soul force), he stressed that true freedom is social freedom, the freedom to do good.
Ahimsa	He adopted Eklo Cholo re by Tagore as his life's motto, demonstrating his commitment to non-violence (ahimsa) and fearlessness (abhaya), even when it meant standing alone against popular movements or political decisions.	Tagore withdrew from the Swadeshi movement due to its deviation from his ideals and composed the song “Ekla cholo re,” emphasizing the importance of walking alone when necessary.
Harmony	Both Tagore and Gandhi's idea of India <i>was inclusive, assimilative and free from religious and religious hatred.</i>	

How Gandhi and Tagore differed in their views?

Key aspects	Mahatma Gandhi	Rabindranath Tagore
Symbol of chakra (Spinning wheel)	Gandhi defended chakra as a symbol of dignity of labour and self-reliance.	Tagore criticized the charkha as an overwhelming symbol that overshadowed other efforts to attain swaraj (self-rule)
Bihar earthquake, 1934	Gandhi interpreted the earthquake as a divine punishment for the sins committed against Harijans (lower castes), urging people to repent and purify themselves.	He disagreed with Gandhi's interpretation, argued against associating ethical principles with cosmic phenomena and criticized the acceptance of such views by a large section of society.
Publication of contrasting views	Gandhi, in his defense, published a piece titled 'Superstition vs. Faith' in Harijan, reaffirming his belief in the connection between natural disasters and moral behaviour.	Tagore drafted a statement challenging Gandhi's interpretation of the earthquake, expressing his surprise and disagreement with the idea of divine punishment.
Moral and ethical principles	Gandhi's adherence to certain beliefs, even in the face of criticism, demonstrated his unwavering commitment to his principles.	Tagore's dissent showcased his intellectual independence and willingness to challenge prevailing notions, even those held by his friend Gandhi.

- Gandhi and Tagore shared a deep friendship and engaged in *meaningful discourse*, their relationship was characterized by significant philosophical differences.
- Despite their friendship, they did not hesitate to challenge each other's viewpoints, emphasizing the importance of *critical thinking* and *scientific reasoning* in understanding complex phenomena.
- Their ability to engage in respectful debate while maintaining their individual perspectives underscores the richness of their *intellectual exchange* and the complexity of their relationship.

2.2 Hindustani Music and Carnatic Music

Why in news?

Recently the Carnatic classical vocalist T M Krishna has been conferred the Sangita Kalanidhi award, the most prestigious recognition in Carnatic music by the Madras Music Academy.

What are the key features of Indian classical music?

- Indian classical music is generally described using terms like *Marg Sangeet and Shastriya Sangeet*.
- **Origin**-The roots of the classical music of India are found in the *Vedic literature of Hinduism* and the ancient *Natyashastra, the classic Sanskrit text* on performing arts by *Bharata Muni*.
- **Samaveda**- It is one of the four Vedas, structured entirely to melodic themes.
- **Pillars**-
 - **Swara**- It is used to define 'note' or 'scale degree' in composition
 - **Raga**- It forms the fabric of melodic structure
 - **Tala**-It keeps the time cycle.
- **Rasas**-The reason behind the creation of ragas was to evoke emotional responses in the performer and the audience which is evoked through the singing and playing of instruments are called Rasas.
- **Traditions**- Indian classical music has two major traditions
 - North Indian classical music known as *Hindustani* and
 - South Indian expression known as *Carnatic* music.
- **Evolution of traditions**- During the period of *Mughal rule* of the Indian subcontinent, the traditions separated and evolved into distinct forms.

4 vedas - Rigveda, Yajurveda, Samaveda and Atharvaveda.

- **Sangeeta Ratnakara**- It is a 13th century Sanskrit text of Sarangadeva patronized by King Sighana of the Yadava dynasty in Maharashtra, which is regarded as the definitive text by both the Hindustani music and the Carnatic music tradition

Key aspects	Hindustani music	Carnatic music
Origin	It can be traced back to <u>ancient India</u> , where it evolved from the sacred music of Hindu temples	It is comparatively pure, formed during the <u>Bhakti movement</u> in the 15th and 16th centuries, and gained popularity in the 19th and 20th centuries.
Prevalence	North India	South India
Total Ragas	6	72
Scale	It adopted a scale of Shudha Swara Saptaka or the 'Octave of Natural Notes'	It creates music that is played in the traditional octave
Main Instruments	Tabla, Sarangi, Sitar and Santoor	Veena, Mridangam and Mandolin
Influence	Afghan, Persian, and Arab	Indigenous
Total Sub-Styles	Several sub-styles which lead to emergence of 'Gharanas'.	Only one particular prescribed style of singing.
Improvisation	Open to experimenting with variations and improvisation	Improvisation is restricted
Gharana system	Characterized by distinct music styles.	Emphasis is on learning and interpreting the compositions rather than adhering to a particular style associated with a family or lineage.
Need of Instrument	Instruments equally important as vocals	Vocal is more important than Instrument
Similarity	Flute and Violin	

What are the features of Gharana system in Hindustani music?

- It is a system of **social organisation** characterized by distinct musical styles that trace back to particular instructors or regions, often linked by lineage or apprenticeship.
- The word gharana comes from the Urdu/Hindi word 'ghar', which means 'family' or 'house', it typically refers to the place where the musical ideology originated.
- **Origin**- It emerged in the 19th century as a means for musicians to maintain their artistic authority in an era of declining court patronage
- It also indicates a comprehensive musicological ideology and differentiates one school from another. It directly affects the thinking, teaching, performance and appreciation of music.
- **Example**- Some of the gharanas well known for singing Hindustani classical music are Agra, Gwalior, Indore, Jaipur, Kirana, and Patiala.

What is the genesis of Carnatic music?

- **Parts**- Pallavi, Anu Pallavi, Charana
- **Annamacharya**- First known composer of Carnatic Music who composed sankirtanas in praise of Lord Venkateswara, a form of Lord Vishnu.
- **Purandara Dasa** - He is referred as father/grandfather of Carnatic Music", his composition includes **Dasa Sahithya**.

Annamacharya is widely recognised as 'Grandfather of Telugu Song-writing'.

- **Trinity of Carnatic Music-** They are also known as the Three Jewels of Carnatic Music, refers to the outstanding trio of composer-musicians of Carnatic music in the 18th century
 - Tyagaraja,
 - Muthuswami Dikshitar, and
 - Syama Sastri.

Madras Music Academy

- **Origin-** It emerged from the All India Congress Session in Madras, 1927.
- **Inauguration-** Officially opened on August 18, 1928, by Sir CP Ramaswami Aiyar.
- **Purpose-** It is aimed to be the benchmark for Carnatic music standards.
- **Annual conferences-** It is started in 1929, leading to the *December music festival* in Madras.
- **Sangita Kalanidhi award-** It is the title awarded yearly to a Carnatic musician by the Madras Music Academy.
- The idea of the award was conceived in 1942 by the then Academy President KV Krishnaswami Iyer.

2.3 Delisting of Monuments by ASI

Why in news?

Archaeological Survey of India (ASI) plans to declassify 18 monuments from protected status citing diminished national significance.

Archaeological Survey of India

- **About-** It is a premier organization for the archaeological researches and protection of the cultural heritage of the nation.
- **Established year-** 1861
- **Founder-** Alexander Cunningham, he is the first Director-General of ASI.
- **Ministry** - Ministry of Culture
- **Prime functions** – Custodian of all Centrally Protected Monuments (CPM) in India. Maintenance of ancient monuments, archaeological sites and remains of national importance.
- **Centrally protected monuments-** India has a total of 3,693 Centrally Protected Monuments or Sites.
- Uttar Pradesh having the largest number in the country at 743, followed by Tamil Nadu which has 412.
- **Regulating functions** – It regulates all archaeological activities in the country as per the provisions of the,
 - Ancient Monuments and Archaeological Sites and Remains Act, 1958.
 - Antiquities and Art Treasure Act, 1972.
 - Ancient Monuments and Archaeological Sites and Remains (AMASR) (Amendment) Act, 2010.
- **Conservation measures in foreign countries-**
 - Bamiyan Buddhas in Afghanistan
 - Ta Prohm and Preah Vihear temples in Cambodia
 - My Son Group of Temples in Vietnam
 - Friday Mosque in Maldives

What is called as monument of national importance?

- **AMASR Act, 1958-** Section 4 of the Act states that ancient monuments or archaeological sites which are of historical, archaeological or artistic interest and which have been in existence for not less than 100 years may be declared as of national importance.

- **Coverage-** It covers temples, cemeteries, inscriptions, tombs, forts, palaces, step-wells, rock-cut caves, and even objects like cannons and mile pillars (“kos minars”) that may be of historical significance.
- **Designation importance-** If designated by ASI, it authorises the central government to “*maintain, protect and promote the site*”, which may be considered of significant historical importance, as mandated by the Act.
- **Protection-** The monuments of national importance are to be conserved and maintained by the ASI and any kind of construction-related activity is not allowed around the protected site.
- **Regular inspection-** ASI should regularly inspect protected monuments to assess their condition, and to conserve and preserve them.
- **Prohibit encroachments-** In cases of encroachment, the ASI can file a police complaint, issue a show-cause notice for the removal of the encroachment, and communicate to the local administration the need for demolition of encroachments.
- **Delisting monuments-** ASI plans to delist 18 monuments demand no longer of national importance, drawn from a list of 24 traceable monuments.

Why ASI plans to delist monuments?

- ASI has invoked *section 35 under AMASR Act* to delist the 18 monuments, stating that these “have ceased to be of national importance”.
 - This is the first such large-scale delisting exercise in several decades.
- **Section 35-** It states that if the Central Government is of the opinion that any ancient monument or archaeological site and remains have ceased to be of national importance, it may, by notification in the Official Gazette, declare that such a monument or site and remains shall no longer be considered to be of national importance.
- **Delisted monuments-** The precise location of these monuments, or their current physical state, is not known.

Plan to delist monuments	Location
Kos Minar No.13	Haryana
Barakhamba Cemetery	Delhi
Gunner Burkill’s Tomb	Jhansi
Telia Nala Buddhist ruins	Uttar Pradesh

- **Untraceable-** It refers to those sites that have been lost due to various factors such as urbanisation, encroachments, construction of dams and reservoirs, or sheer neglect.
- **Lost monuments-** Some lesser-known sites have deteriorated or disappeared, with no public memory remaining to identify their locations.
- **Impact-**Delisting means the ASI will no longer protect these monuments, allowing for regular construction and urbanization activities in the area.
- **Public feedback-** A gazette notification invites public objections or suggestions within 2 months regarding the delisting of these monuments.

What are the challenges faced by ASI?

- **Historical dysfunctionality-** ASI focused more on uncovering new archaeological sites rather than conserving and protecting existing ones.
- **Poor resource allocation-** Post independence, the government's allocation of resources prioritized sectors like health, education, and infrastructure over heritage protection which resulted in limited funding and attention towards preserving historical monuments.
- **Loss of monuments-** The Ministry of Culture's report to a parliamentary committee revealed that 50 out of India's 3,693 centrally protected monuments were missing which underscores the challenges in adequately safeguarding these sites against various threats such as urbanization, encroachment, and neglect.
- **Shortage of security personnel-** Only 6.71% of the protected monuments have security guards, this compromises the ability to monitor and protect these sites effectively, leaving vulnerable to damage and theft.

- **Urban development-** The Parliamentary panel suggested that the Barakhamba Cemetery in Delhi Cemetery in Delhi might have been compromised due to the redevelopment of the New Delhi railway station
- **Remote monuments-** While high-profile monuments may receive more attention, smaller and remote sites are often neglected, increasing the risk of their loss.
- **Failed guardianship-** Supreme Court observed that Archaeological Survey of India (ASI) failed to act as guardian of India's heritage in the context of Taj Mahal as it faces threats from political interference and encroachments.

What lies ahead?

- A comprehensive holistic approach is required to increase funding, improved coordination between government agencies, community engagement, and leveraging technology for better monitoring and conservation efforts.
- The recent delisting of monuments reflects larger effort to rationalize and categorize monuments based on their significance and heritage value.
- However it also underscores the need for better preservation strategies and resources to protect India's rich cultural heritage.

3. GEOGRAPHY

3.1 JORC classification vs. UNFC

Why in news?

In a bid to spur private investment in India's mining sector, representatives of Vedanta Group pushed the Mines Ministry to consider the adoption of Joint Ore Reserve Committee (JORC) classification, as opposed to the currently used United Nations Framework Classification (UNFC).

Status of mining sector in India

- The number of mines which reported mineral production (excluding minor minerals, fuel minerals and atomic minerals) in India was **1319** in 2021-22.
 - In the number of mines, **Madhya Pradesh** tops followed by Gujarat and Karnataka.
 - In value of mineral production, **Odisha** tops followed by Chhattisgarh and Rajasthan in 2021-2022.
 - In value of minor minerals produced, **Telangana** tops followed by Rajasthan and Andhra Pradesh.
- India is the **2nd largest crude steel producer** in the world.
- India is largely self-sufficient in metallic minerals including bauxite, chromites, iron ore, and lignite as well as mineral fuels like coal and lignite.
- India is deficient in magnesite, manganese ore, rock phosphate, etc. which were imported to meet the domestic demand.
- **Mines and Minerals (Development and Regulation) Amendment Act, 2021** enabled captive mines owners (other than atomic minerals) to sell up to 50% of their annual mineral (including coal) production in the open market.
- Ministry of Mines announced the **National Mineral Policy, 2019** that allows State Governments to take advance action for auction of mineral blocks before the expiry of lease period.

A **Mineral** is any substance occurring naturally in or on the Earth, in or under water or in tailings, residue or stock piles, having been formed by or subjected to a geological process and includes sand, stone aggregates, gravel, clay, and soil but excludes, water, oil and gas .



What is Indian Mineral Industry Code (IMIC)?

- It indicates the required minimum standard for Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves.
- **Published by** - National Committee for Reporting Mineral Resources and Reserves in India (NACRI)
- **Published on**- July 05, 2019
- A resource classification code is necessary to assess resources and reserves in a mineral block, to prepare geological reports to facilitate its auction for both exploration and mining, and for a mining company to evaluate its assets.

What is United Nations Framework Classification for Resources (UNFC)?

- **UNFC** – A global classification and management system applicable to mineral, petroleum, nuclear fuel, renewable energy and anthropogenic resources, as well as injection projects for geological storage.
- **Criteria** - It is a three digit code based system with 3 axes:
 - Geological Assessment
 - Feasibility Assessment
 - Economic viability
- **Features**- It also reports all resources including mineral occurrences and mineral zones that have *very low level of confidence* in terms of estimation of quantity and quality.
- The highest category of resources will have the code (111) and lowest category the code (334).
- India's current resource classification rules is based on the UNFC.
- **Issues** - It fails to provide any degree of economic certainty, which in turn has hindered the flow of private investment in the sector.

What is JORC classification?

- It is produced by the **Australasian** Joint Ore Reserves Committee (Committee).
- It sets minimum standards for Public Reporting of minerals Exploration Results, Mineral Resources and Ore Reserves.
- It require the reporting of reserves, which are economically viable deposits *with high geological confidence* confirmed through studies at least to a pre-feasibility level.
- The JORC Committee is a member of CRIRSCO, the Committee for Mineral Reserves International Reporting Standards to ensure international consistency in the development of reporting standards.

CRIRSCO consists of 15 members that comply with the CRIRSCO template. India was admitted to CRIRSCO in 2019 following the recognition of the IMIC as a CRIRSCO-compliant code.

4. SOCIAL ISSUES

4.1 Gender Pay Gap

Why in news?

World Bank Group report found that globally, women earn just 77 cents for every dollar paid to men highlighting the gender pay gap.

How the gender pay gap is measured?

- The International Labour Organisation terms the gender pay gap as a “measurable indicator” of inequality between women and men.
- As per ILO [gender pay gap](#) is defined as the gap between the average wage level of all women and all men working in the labour market for a monthly salary, hourly or daily wage.
- It is the average wage difference between all working women and men, not just for “equal work.”

- **Differ from equal pay-** It differs from “equal pay for equal work,” which mandates equal pay for men and women with the same qualifications doing the same job.
- **Calculation variance-** There is no single method for calculating the gap. Different organizations use different metrics, such as hourly or weekly wages, leading to varied findings.
- **Gender inequality-** Despite methodological differences, a gender pay gap is present in most countries and industries, indicating a persistent issue of inequality.

Why there is a gender pay gap?

- **Low labour force participation-** Women are often underrepresented in the workforce compared to men due to societal expectations and traditional gender roles.

Labour force participation rate	Men	Women
Global	72%	47%
India	53.26%	25.51%

- **Occupational segregation-** Women are more likely to be employed in lower-paying jobs, while men dominate higher-paying sectors such as engineering and computer science, this leads to differences in average earnings.
- **Underrepresentation** - ILO’s Women in Business and Management report found that women are less likely to hold management or leadership positions, especially at higher levels affecting their salary levels.
- **Part-time work-** Women are more likely than men to work part-time, often due to caregiving responsibilities. Part-time work typically offers lower wages and fewer benefits compared to full-time positions.
- **Motherhood penalty-** Women may experience a decline in earnings when they take breaks from their careers to take care for children, thus reduced opportunities for advancement or discrimination in the workplace.
- **Gender stereotype-** Historical gender roles have often assigned the role of primary breadwinner to men, while women have been expected to prioritize caregiving and domestic responsibilities, which can influence workplace dynamics and lead to women being undervalued or overlooked for higher-paying positions.
- **Low investment in education-** Limited access to quality education or may face barriers such as cultural norms or financial constraints that discourage them from pursuing higher education or specialized training.
- **Safety-** Safety concerns in the workplace and during commute can affect their career choices.
- **Service sector-** Pay discrimination increased with the growth of the services sector in the 20th century.
- **Age related patterns-** Women’s earnings tend to dip in their mid-30s and 40s compared to men in similar positions and professions, it is often attributed to factors such as career breaks taken by women.
- **Work-family balance-** [Claudia Goldin](#), a renowned economist argues that men have historically been able to prioritize their careers while women have been expected to prioritize family responsibilities.

G.S PAPER II

5. INDIAN POLITY

5.1 Rajya Sabha Elections

Why in news?

The recent Rajya Sabha election in several States raised concerns about the sanctity of election process as it witnessed cross-voting by MLAs.

Rajya Sabha

- **Parliament of India-** The President, the Council of States and the House of the People.
- **Rajya Sabha-** The upper house which represents the States and Union Territories of the Indian Union.

- **Article 80-** It deals with the composition of Rajya Sabha with a maximum strength of 250 members.
- **Current strength-** It currently has 245 members representing States and Union Territories.
- **Nominated members-** 12 are directly nominated by the President from art, literature, sports, science, etc.,
- **UT representation-** Out of 8, only UTs Delhi, Puducherry and Jammu and Kashmir.
- **Permanent house-** It is a continuing chamber and not subject to dissolution.
- **Tenure-** Members serve 6-year term, with one-third of them retiring every two years to ensure continuity.
- **Fourth Schedule-** It is related to the allocation of seats in the Council of States or Rajya Sabha.

How are Rajya Sabha elections held?

- **Indirect election-** By the elected members of the Legislative Assembly of each State and the respective UTs.
- **Proportional Representation System-** Each MLA's vote is counted only once (Single Transferable Vote) with members casting their votes in order of preference.
- **Preference Voting-** MLAs submit a list of candidates based on their preferences. The first preference carries the most weight.
- **Quota requirement-** A candidate must secure a certain number of votes (the "quota") to be elected.
- **Elimination process-** If no candidate reaches the quota, the candidate with the fewest votes is eliminated. Their votes are redistributed based on subsequent preferences.
- **By-elections-** In case of a member's death, disqualification, or resignation, by-elections are held to fill the vacant seat.

What are the issues with the Rajya Sabha elections?

- **Cross voting-** It occurs when members vote for a candidate from a party different from the one to which they belong which questions the integrity of election process.
- **Open ballot system-** To prevent cross-voting, an amendment to the Representation of the People Act, 1951 in 2003 introduced an open ballot system for Rajya Sabha elections.
- Members are required to show their ballot paper to the authorized agent of their party & Failure to do so may result in disqualification of the vote.
- **Outside the purview of anti-defection law-** The Tenth Schedule of the Constitution, introduced in 1985, contains the [anti-defection law](#), but this law is not applicable to Rajya Sabha elections.
- **EC's stand-** It specified that the political parties cannot issue any 'whip' to its members for such elections.

Independent MLAs are barred from showing their ballots to anyone.

Judiciary ruling on Rajya Sabha election

- **Kuldip Nayar versus Union of India (2006)** - The Supreme Court upheld the system of open ballot for Rajya Sabha elections.
- The court clarified that an elected MLA of a political party would not face disqualification under the Tenth Schedule for voting against their party's candidate.
- **Ravi Naik case, 1994-** The Supreme Court clarified that voluntarily giving up membership under the Tenth Schedule is not confined to formal resignation from the political party to which the member belongs.
- The conduct of a member both inside and outside the legislative house can be examined to determine if it qualifies as voluntarily giving up party membership.
- **Disqualification of MLAs in Himachal Pradesh-** 6 Congress MLAs who engaged in cross-voting in Himachal Pradesh were disqualified under the Tenth Schedule for defying party whip and being absent during the passage of Budget in the Assembly.

What lies ahead?

- There is a need to bring in amendments and strengthen the Constitution against such voting practices since ruling parties benefit from cross voting.
- The Supreme Court can take proactive measure by initiating a suo motto Public Interest Litigation (PIL) in response to the threat posed by cross voting.

5.2 SC's Stand on Stay Order

Why in news?

The Supreme Court has recently issued guidelines concerning interim orders of stay in High Court.

What is an interim order?

- **Temporary relief-** Interim orders are temporary in nature and only provide immediate relief.
- **Benefits-** It is intended to address immediate concerns, maintain the status quo, or prevent irreparable harm until a final judgment can be rendered.

Types of interim order	About
Attachment before judgment	Securing assets before a final judgment
Appointment of a receiver	Designating a neutral party to manage disputed property
Commission to examine witnesses	Authorizing the examination of witnesses before trial.
Interim custody, visitation rights, and maintenance in matrimonial disputes	Addressing family law matters during litigation.
Stay orders	Temporarily halt legal proceedings to secure the rights of the citizen.

- These reliefs are designed to address urgent situations and ensure that justice is done while the case is ongoing.
- If a High Court in a case had to consider the challenge against an order framing charges by the trial court, it would first grant a stay of trial and then grant a date for hearing arguments on framing charges.

What are the guidelines issued by Supreme Court for interim relief?

- **Limited duration-** Ex-parte ad-interim relief should be granted for a specific period.
- **Hear both sides-** High courts should hear both parties before granting or vacating interim relief.
- **Vacation of interim orders-** Even if interim relief is granted after hearing both sides, the aggrieved party is not prevented from applying for vacating the same on available grounds.
- **Priority for vacating orders-** Applications for vacating stay orders should be given priority.
- **Ensure transparency-** If a party applies for vacating an interim order due to suppression of facts, it should be taken up promptly to prevent the misuse of interim relief.
- **Reversal of Asian resurfacing case, 2018-** The 2018 ruling mandated that interim orders automatically expire after 6 months unless extended by the high courts.
- The direction for automatic expiration of interim orders cannot be issued under Article 142.

Ex-parte ad-interim relief is granting interim order without hearing the affected parties.

Article 142 empowers the Supreme Court of India with a discretionary power to pass any such order that it deems as 'necessary for complete justice', in any matter pending before it.

Grounds for vacating the interim relief

The High Courts are empowered to vacate or modify an order of interim relief passed after hearing the parties based on various grounds

- **Deliberate prolongation-** If a litigant seeks unwarranted adjournments or remains absent to take undue advantage of the order of stay.
- **Suppression or misrepresentation-** If the order of interim relief is granted due to suppression or misrepresentation of material facts.
- **Material change-** If there is a material change in circumstances requiring interference with interim order.
- **Flexibility-** The listed grounds for vacating interim orders are not exhaustive, and there can be other valid grounds for vacating the interim relief.

Why Supreme Court reversed 2018 judgement?

- **Failure** - It did not achieve its goal of reducing case pendency in ensuring speedy disposal of matters.
- **Discretion for lower courts**- The Supreme Court should refrain from laying down precise timelines for deciding cases, as lower courts are more aware of grass root issue it must be given discretion in handling cases.
- **Caseload dynamics**-Different courts have varying patterns when it comes to their pending caseload, hence the concerned court is best positioned to determine which cases require immediate attention.
- **Prevent injustice**-Imposing precise timelines for deciding cases can sometimes lead to injustice.
- **Against separation of powers**- The power of deciding timelines for judicial proceedings is a decision for Parliament, the intervention of judiciary would amount to court created legislation.

What lies ahead?

- The Supreme Court through the guidelines for interim relief aims to strike a balance between granting interim relief and ensuring fair and just legal process.
- The recent guidelines underscores the importance of allowing lower courts flexibility in managing cases, recognizing their awareness of local issues.

5.3 Shanan Hydropower Project

Why in news?

The Centre has ordered that status quo be maintained on the Shanan hydropower project, over which Punjab and Himachal Pradesh have made competing claims.

What is the history of Shanan hydropower project?

- A British-era 110-MW hydel project, a point of contention between Punjab and Himachal Pradesh.
- **Location**- Uhl (a tributary of the Beas River) in Himachal Pradesh.
- **Control**- Punjab Power Corporation Limited (PSPCL).
- **Lease Agreement**- It was originally leased to Punjab in 1925 signed by Raja Joginder Bahadur (then ruler of Mandi) and Col BC Batty, a British representative and Chief Engineer of Punjab.
- **Lease Expiration**- The 99-year-old lease came to an end on March 2, 2024.
- Himachal Pradesh contends that the project should remain under its control once the lease expires, it stated that they would not allow Punjab to stake claim on the project after the lease period.

What are the claims made by both States over Shanan hydropower project?

Punjab claim	Himachal Pradesh
<ul style="list-style-type: none"> • Historical significance- Used to supply electricity to undivided Punjab and Delhi before India's Independence. • Post partition- The supply to Lahore was discontinued and transmission line was halted at Verka village in Amritsar. • Punjab Reorganisation Act, 1966- The project was allocated to Punjab by a notification issued on 1967 by the Union ministry of irrigation and power. • The Centre directed both States to maintain status quo with regard to functioning of the plant after the expiry of lease <u>period till a final decision</u> is taken by Ministry of Power. 	<ul style="list-style-type: none"> • It had been waiting for the lease to expire, keen to claim the power plant. • The project was allocated to Punjab in 1966 when Himachal Pradesh was a Union Territory at that time. • In 1971, Himachal Pradesh became a <u>full-fledged State</u> and the demand to hand over the project gained momentum. • It has contended that the land belongs to it and the entire project is within its boundaries, and it was wrongly given to Punjab.

What are the claims made by Punjab under Article 131?

- Punjab has filed an original suit against the Himachal Pradesh government and the Centre under Article 131 of the Constitution.

- It has requested a *permanent prohibitory injunction* to prevent the Himachal Pradesh government from disturbing their lawful possession and smooth functioning over the project.
- It has also urged the Supreme Court to issue a "*mandatory injunction*" directing the Himachal Pradesh government not to depute any officer or team to take over the project from its management and control.

Article 131 deals with original jurisdiction of the top court in a dispute between the Centre and one or more states or a dispute between two or more states.

5.4 Kovind Committee Report on Simultaneous Elections

Why in news?

The High level committee on One Nation, One Election recently submitted its report to the President.

What is One Nation, One Election?

- It means that the voters will cast their vote for electing members of the Lok Sabha and the state assemblies on a single day, at the same time or in a phased manner as the case may be.
- **Simultaneous Elections**- It refers to structuring the Indian election cycle by synchronizing the elections to Lok Sabha and State Assemblies.
- **Historical context**- Simultaneous elections were previously implemented in 7 states in 1957 to streamline the electoral process and enhance administrative efficiency.
- **Decline of simultaneous election**-The simultaneous elections which was implemented in 1957 ceased after 1967 due to various factors such as constitutional provisions allowing dismissal of state governments and the collapse of coalition governments.
- **Current scenario**- The elections to the state assemblies and the Lok Sabha are held separately (whenever the incumbent government's 5-year term ends or whenever it is dissolved).

To know more about simultaneous elections click [here](#)

Why the government is in favour of conducting simultaneous elections?

- **Financial burden**- Frequent elections burden the government exchequer with additional expenditure. If the expenditure incurred by political parties is also added, these figures will be even higher.
- **Uncertainty**- Asynchronous elections cause uncertainty and instability, adversely affect supply chains, business investments and economic growth.
- **Disruption of government machinery**- The staggered nature of elections disrupts the functioning of government machinery, leading to *administrative challenges* and *hardships for citizens*.
- **Impact of Model Code of Conduct**- The frequent imposition of the Model Code of Conduct (MCC) can cause *policy paralysis* and slows down the pace of the developmental programmes.
- **Voter's fatigue**- Staggered elections induce 'voters' fatigue' and present a significant challenge in ensuring their participation.
- **Disrupt duties** - The frequent use of government officials and security forces adversely affect discharge of their duties.

What are the key highlights the committee's recommendations?

High level committee

- **Purpose**- It was set up to recommend constitutional amendments for simultaneous elections to Lok Sabha, State assemblies, and local bodies.
- **Chairman**- Former President Ram Nath Kovind.
- **Launch year**- 2023
- **Constitutional amendments**- The committee suggests amending the Constitution to enable simultaneous elections in two steps.
- **First step**- It involves simultaneous elections to Lok Sabha and State Assemblies *without requiring state ratification*.
- **Second step**- It involves synchronizing local body elections with national and state elections, *requiring ratification by at least half of the states*, which would be held *within 100 days*.

- **Article 82(1)** - It is introduced by the committee in the Constitution to establish the process for transitioning to simultaneous elections.
- **Amendment to tenure**- Articles 83 and 172 must be amended to redefine the terms "full term" and "unexpired term" for Lok Sabha and state Assemblies, respectively, in case of dissolution before completion.
- The new provisions ensure that the replacement Lok Sabha or state Assembly serves only the unexpired term before dissolution upon completion of simultaneous elections.
- **Election preparation**-To prepare *single electoral roll* and *electoral photo identity cards* for use in elections to all the three tiers of government, the Constitution should be amended which requires ratification by not less than one-half of the states.
- **Conduct fresh elections**- In the event of a *hung House, a no-confidence motion, or any such event*, fresh elections should be held to constitute the new Lok Sabha or State Assembly for the unexpired term of the House.
- **Logistics planning**- To meet logistical requirements, the Election Commission of India will plan and estimate logistical requirements (manpower, polling personnel, EVM/VVPAT etc.,) so that free and fair simultaneous elections are held in all the three tiers of the government.

How the Kovind committee addresses the concerns with simultaneous elections?

Concerns	Clarification by the committee
<ul style="list-style-type: none"> • Unconstitutional- It requires premature dissolution of state Legislative Assemblies, which could be against the people's will. • Altering fixed terms for Parliament and Assemblies would violate the Constitution's basic structure. 	<ul style="list-style-type: none"> • While Articles 83 and 172 specify a maximum term of 5 years, they do not mandate a minimum term. • Free and fair election- The committee emphasizes on the <i>Golden Triangle of the Constitution</i> (Article 14, 19 and 21), it says that the simultaneous elections don't "impinge upon citizens' rights under <i>Part III or rule of law</i> or any other feature such as a free and independent judiciary
<ul style="list-style-type: none"> • Against democratic principles- One Nation, One Election would hamper the electoral process. • The scheme would also violate the rights of citizens. 	<ul style="list-style-type: none"> • Resource utilization- It argues that simultaneous elections would optimize the use of time, reduce financial burden which is a major concern of free and fair elections. • Improve governance- The governments would focus less on populist measures, leading to better governance.
<ul style="list-style-type: none"> • Undermines federalism- The simultaneous elections would infringe upon states' rights 	<ul style="list-style-type: none"> • Article 327- It grants Parliament the authority to make provisions for all election-related matters to both Houses of Parliament and State Legislatures, including electoral rolls and constituency delimitation. • Article 328- It allows States to legislate on elections to their Legislative Assembly to the extent that it is not covered by Parliamentary legislation. • It asserts that simultaneous elections do not encroach upon States' constitutional rights in this regard.
<ul style="list-style-type: none"> • Failure to address special conditions- The proposal lacks provisions to address the issue of a hung Parliament/Assembly. 	<ul style="list-style-type: none"> • Sarkaria commission- It talks about this commission which addressed the issue and gave suggestions to address the challenge. The Governor can do the following in the same order of preference. <ul style="list-style-type: none"> ○ Invite pre-election coalition ○ Largest party to stake the claim with the support of others, including independents. ○ Post-election coalition of parties can be invited ○ Post-election coalition with some parties in the coalition form the government, and others support it from outside. • The report mentions that the government, the leader of the House, and the elected executive must have the confidence of the House.

5.5 Challenges of Post Retirement

Why in news?

Recently a Calcutta High Court judge and a senior IPS officer in West Bengal resigned from their posts and joined political parties.

What are the Constitutional provisions that ensure the independence of judiciary?

- **Article 50-** The State is directed to take measures to ensure the separation of the judiciary from the executive within the public services of the State.
- **Independent judiciary-** It is needed as Supreme Court is
 - A federal court, the highest court of appeal
 - The guarantor of the fundamental rights of the citizens and the guardian of the Constitution.
- **Security of tenure-** Judges are not appointed on the pleasure of the President, they can't be removed from office without any reasonable cause that too on the ground of misbehaviour and incapacity.
- **Financial independence-** The judge's salaries are fixed and charged on the Consolidated Fund of India and Consolidated Fund of State in the case of Supreme Court judges and High Court judges respectively, which can't be reduced or altered until and unless an emergency arises like a financial crisis.
- **Punish for contempt-** Supreme Court (Article 129) and High Court (Article 215) have the power to punish for their contempt either civil or criminal contempt.
- **3rd Schedule-** It deals with the "**Forms of Oaths and Affirmations**" of various constitutional posts which demands that judges perform their duties 'without fear or favour, affection or ill-will'.
- **Article 32-** Supreme Court has the power to issue writs, the Parliament can't abridge the power of issuing a writ in any case.
- **Ban on practice post retirement-**
 - The Supreme Court judge is not allowed to practice in any court of India after his retirement, but he can be appointed in tribunals, review panels or committees.
 - A High Court judge is allowed to practice in the Supreme Court and other High Courts (excluding the lower courts and the High Court in which he was a judge.)

Bangalore Principles of Judicial Conduct, 2002

- It gained international acceptance as indicated by the Judicial Integrity Group, emphasize the importance of independence, impartiality, integrity, and propriety in judicial behavior.
- Judges should avoid comments that could affect case outcomes and must disqualify themselves if they cannot be impartial.

Restrictions placed on senior government officials

- **Independence of Constitutional bodies-** Election Commission, Public Service Commission, and Comptroller and Auditor General (CAG) perform their constitutional duties without interference from the government, thereby ensuring transparency and accountability in governance.
- **Post retirement-** The CAG and the chairman/members of the Public Service Commission cannot take up any other employment with Central or State governments after demitting office.

Whether Constitution has placed restrictions on joining politics?

- There are no constitutional restrictions on former judges or senior government officials joining political parties or contesting elections.
- Two Supreme Court judges have resigned to contest elections
- A former Chief Election Commissioner became a Rajya Sabha member and Minister.
- A retired Chief Justice of India was nominated to the Rajya Sabha shortly after retirement.
- Many bureaucrats have entered politics by joining political parties and contesting elections post-retirement.

What are the suggestions recommended for judges and senior bureaucrats from joining political party?

Election Commission recommendation

- **Cooling-off period**- In 2012 Election Commission suggested a cooling off period for top bureaucrats post-retirement before joining political parties or contesting elections.
- **Government stand**- The recommendation was rejected by the government citing Constitutional provisions and democratic values.
- **Democratic right**- The government said that the right to contest election is the fundamental aspect of democracy which can't be restricted.
- **Avoid conflict of interest**- The government argued that the existing rules prevent senior bureaucrats from taking up private jobs for at least a year after retirement.
- **Supreme Court's stand**- It dismissed a writ petition seeking a law for a cooling off period stating that it's the role of legislature to decide on such matters.

Discussion in Constituent Assembly

- **Judicial independence**- A member of the Constituent Assembly, K.T. Shah, had suggested that judges of constitutional courts should be legally barred from occupying executive posts.
- The Constituent Assembly did not favour this as implementing external rules to control the judicial behaviour of judges would be antithetical to the idea of judicial independence.

Supreme Court stand on judicial conduct

- **C. Ravichandran Iyer vs Justice A.M. Bhattacharjee (1995)**- The Court emphasised the importance of a judge's character, integrity, and behaviour in maintaining the purity of justice
- **All India Judges' Association vs Union of India (1991)**- The Court highlighted the high expectations society holds for the conduct and performance of judicial officers.

What lies ahead?

- The principle of visible justice, "Justice should not only be done but should also be seen to be done" should extend beyond the tenure of office to maintain public trust.
- A cooling off period can be recommended for at least 2 years before joining political parties or accepting political nominations post-retirements, to reinforce public confidence in judiciary and senior government offices.
- It is imperative for the Supreme Court for clear prohibition against judges entering politics post-resignation.

5.6 Legality of Watching Child Pornography

Why in news?

The Supreme Court will scrutinise a Madras High Court ruling deeming watching child pornography as non-offensive.

Child Pornography

- Child pornography is defined as "any visual depiction of sexually explicit conduct involving a child that includes photographs, videos, computer generated image indistinguishable from an actual child & an image created, adapted or modified but appear to depict a child.
- **POCSO Act 2012**-- It addresses several forms of abuse including showing pornography to children, and it also includes provisions for prosecuting sexual offenses against boys.
- **Information Technology Act, 2000**- It defines child pornography as any representation through electronic media including computer generated images and animations of a child engaged in sexually explicit conduct.
- The Act makes it illegal to produce, create, publish or possess child pornography in India.
- **Indian Penal Code, 1860**- Section 292 makes it a criminal offence to sell, distribute, exhibit, circulate, import or export any obscene material including pictures, paintings, writings, books, pamphlets or drawings that are lustful or lewd or that deprave or corrupt another person.

What is the issue?

- **S. Harish vs. Inspector of Police and Another**- The Madras High Court stated that merely downloading and watching child pornography is not an offence under POCSO Act and Information Technology Act (IT), 2000.

- Two NGOs has filed plea in Supreme Court arguing that the Madras HC's ruling could negatively impact child welfare, they argued that the order was contrary to the established law in this regard.
- A three judge bench of Supreme Court has called the Madras HC order as atrocious and also sought a response from the Tamil Nadu government.

What did the Madras HC rule?

- The Court quashed criminal proceedings initiated against 28 year old man booked under POCSO and IT Acts for downloading child pornography videos from the internet.
- The materials that have been placed before this Court do not make out an offence under Section 67-B of IT Act, 2000 and Section 14(1) of POCSO Act.
- **Section 67-B of IT Act-** It does not cover cases where a person has merely downloaded child pornography on his electronic gadget and watched the same without doing anything more.
- It punishes the publishing, transmitting, or creating of material depicting children in sexually explicit acts in electronic form with 5 to 7 years of imprisonment and a fine that can extend up to Rs 10 lakh.
- **Section 14 of POCSO Act-** It prescribes punishment for using a child for pornographic purposes.
 - Imprisonment for a term which shall not be less than 5 years and shall also be liable to fine.
 - In the event of second or subsequent conviction with imprisonment for a term which shall not be less than 7 years and also liable to fine.
- **Proper education-** The society must properly educate the *Generation Z children* who are grappling with porn addiction.
- **Attend counselling-** The Madras HC advised the accused to attend counselling if he is still afflicted with his addiction.
- **Kerala HC ruling-** The Court relied on Kerala HC ruling which said that watching pornography in private did not constitute an offence under Section 292 of IPC that pertains to the sale of obscene books, objects etc.,
- The order said that for something to be obscene it must be lustful or lewd or that deprave or corrupt another person, but these terms are not clearly defined hence there is interpretations by the courts.

Generation Z is commonly refereed as Gen Z, the name given to the generation of people born between 1997 and 2012.

What does the law say about viewing child pornography in India?

- **Section 67-B of IT Act-** It punishes all kinds of act pertaining to child pornography, including watching child pornography, a closer look at this provision punishes 5 categories of people involved in child pornography.
- **Sam Infant Jones vs State, 2021-** The Madras High Court ruled that there is no provision in law that prohibits viewing pornography privately, but there is a distinction between pornography and child pornography.
- The child pornography *falls outside the circle of freedom* due to existence of *Section 67-B of IT Act*, which *penalises every kind of act pertaining to child pornography* and concluded that even viewing child pornography is an offence and held the accused as guilty.

What lies ahead?

- As the Supreme Court prepares to delve into this contentious issue, the case underscores the need for a balanced approach that prioritizes the protection of children.
- There is a crucial need for legal clarity and consistency in interpreting laws related to child pornography.
- Implementing a multi-stakeholder approach that integrates legal, social, and preventive measures is essential to safeguarding children and fostering a safer online environment.

5.7 Imposition of Bail Condition

Why in news?

The recent ruling by the Supreme Court overturned the order of the Odisha High Court stating that imposing a condition for a politician to refrain from participating in political activities in exchange for bail would infringe upon fundamental rights.

How bail is regulated under Indian legal system?

- **Legal provision-** Bail is a temporary release of an accused person awaiting trial, secured by a guarantee.

The word bail has been coined from the French word 'bailer', which means to deliver or give.

- **Khilari vs State of UP, 2009**- Supreme Court observed that while exercising its discretion to release a person on bail, the court must ensure it acts “judiciously”.
- **Documentation**- Appellate courts are required to record reasons for granting bail.
- **Article 21**- A person is assumed to be innocent unless proved guilty. Hence, an accused shall not be deprived of personal liberty unless prescribed by a fair and just procedure.

Article 21 guarantees the right to life and personal liberty to every individual.

Types of bail	About
Regular bail	It is basically the release of an accused from custody to ensure his presence at the trial.
Interim bail	A temporary means for a short period of time, either during the time of pendency of an application or when the application of anticipatory or regular bail is pending before the court.
Anticipatory bail	A type of bail which is given to someone who is in anticipation of getting arrested for a non-bailable offence by the police.

- **Section 437(3), CrPC**- It lists potential conditions for bail in serious offenses punishable with imprisonment of seven years or more, it is done to prevent re-offense and protect the judicial process.

Bailable offence	Non-bailable offence
<ul style="list-style-type: none"> • <u>Section 436 of CrPC</u> deals with provisions for bail in bailable offences. • This provision is <u>mandatory</u> in nature, and the police or the court has no discretion over it. 	<ul style="list-style-type: none"> • <u>Section 437 of CrPC</u> deals with provisions for bails regarding non-bailable offences. • It is based <u>purely on the discretion</u> of the court (other than the High Court and Sessions court).

What did the Odisha High Court rule in Siba Shankar Das @ Pintu vs State of Odisha?

- **Bail on condition**- The High Court has stipulated that Das should not engage in any political activity as a condition of his bail.
- **Infringes right**- The petitioner Das contested this condition in the High Court as it infringed upon his rights as a political person, especially considering the upcoming general elections.
- The state government opposed the plea, citing Das’s involvement in new criminal cases and an attack against him, which they argued could lead to administrative difficulties if the bail condition were lifted.
- The High Court, acknowledging the potential threat to Das’s life and the administrative challenges, upheld the bail condition.
- Das appealed to the Supreme Court against the High Court’s decision.
- **Supreme Court ruling**- It stated that preventing a person from participating in political activities as a bail condition violates their fundamental rights under the Constitution.
- As a result, the Supreme Court quashed and set aside the condition, emphasizing that bail conditions should not violate constitutional rights.

What are the other instances where the Supreme Court has struck down the bail conditions?

- **Right to political engagement**- The Supreme Court lifted the bail condition in Andhra Pradesh High Court that restricted N. Chandrababu Naidu’s participation in public rallies and meetings.
- **Against severe bail conditions**- The court ruled against overly burdensome bail conditions, quashing a Rajasthan High Court order that required the accused to deposit a substantial sum as fine and surety.
- **Unreasonable condition**- The court set aside an Allahabad High Court condition that demanded the sealing of a university while granting bail to a political leader.
- **Gender sensitivity**- The court overturned a ruling by the Madhya Pradesh High Court, which had asked a man accused of sexual assault to get a rakhi tied on his wrist by the victim as a pre-condition for getting bail.
- **Advocacy for women’s rights**- The court emphasized that bail conditions should not reflect stereotypical or patriarchal notions about women and should strictly adhere to the requirements of the Code of Criminal Procedure (CrPC).

What lies ahead?

- The Supreme Court’s ruling reinforce the principle that bail conditions should be fair, reasonable, and in line with the requirements of the CrPC.
- The recent ruling aligns with the court's stance on protecting fundamental rights and ensuring that bail conditions are reasonable and not overly restrictive.

6. GOVERNMENT POLICIES AND INTERVENTIONS

6.1 Lesser Penalty Regulations, 2024

Why in news?

The [Competition Commission of India](#) notified the ‘Lesser Penalty’ Regulations, 2024 to introduce the ‘Lesser Penalty Plus’ regime.

Competition Commission of India

- **Established** - 2003
- **Ministry**- Ministry of Corporate Affairs
- **Statutory body**- CCI has been established to enforce the competition law under ***Competition Act 2002***.
- **Aim**- To establish a competitive environment in the Indian economy by engaging with all stakeholders, the government, and international jurisdiction
- **Raghavan committee**- Based on the recommendations the Monopolies and Restrictive Trade Practices Act, 1969 (MRTP Act) was repealed and replaced by the Competition Act, 2002.
- **Competition (Amendment) Act 2009**- The Competition Appellate Tribunal have been established.
- **Competition Appellate Tribunal**- A judicial body that hears and decides appeals against the orders of the CCI.
- **Appellate mechanism**- The government of India replaced Competition Appellate Tribunal (COMPAT) with the National Company Law Appellate Tribunal (NCLAT) in 2017.
- **Composition**- CCI consists of a Chairperson and not more than 6 Members.
- **Appointment**- It is made by the Central Government.

What is lesser penalty plus regime?

- **Existing provision**- Section 46 of the Competition Act encourage enterprises involved in cartelization to come forward and provide information to CCI.
- **Incentive**- The regime goes a step further by incentivizing leniency applicants to disclose information about the existence of other cartels beyond the one they are initially accused of participating in.

Cartelisation is one of the horizontal agreements that shall be presumed to have appreciable adverse effect on competition.

Lesser penalty applicant	Lesser penalty plus applicant
The applicant is required to state their role in the cartel, goods or services involved, entities involved, geography covered, date of commencement of the alleged cartel, its present status and the estimated volume of business affected in India by alleged anti-competitive act.	The applicant is required to elaborate if there are any similarities or differences in the conduct, product, service or parties with respect to the first cartel, among other things.

- **Procedure to apply**- Leniency applicants can file for leniency only during the course of the investigation.
- **Assessment of benefits**- It is based on 2 key parameters namely
 - Priority status
 - Significant added value

- **Priority status-** Based on applicant's position in the queue for leniency, as early disclosure maximizes benefits.
- **Significant added value-** Qualitative assessment of evidence quality, including its ability to strengthen the regulator's case. Directly relevant incriminating evidence carries more weight than indirect evidence.
- **Evaluation of evidence-** The direct relevance of the alleged cartel conduct is given greater weightage than indirect relevance, this would strengthen the case against cartels and enhance the overall effectiveness of leniency programs in uncovering and prosecuting anti-competitive practices.
- Penalty is reduced.

What are the benefits of the recent lesser penalty plus regime?

- **Promote fair competition-** It play a crucial role in uncovering hidden collusion and promoting fair competition within the business ecosystem.
- **Confidentiality-** The identity of the 'lesser penalty' applicant is kept confidential until the passing of the final order and completion of proceedings.
- **Wider ambit of applicant-** The "applicant" definition is amended in the recent regulation, clarifying that any cartel participants, regardless of whether they are engaged in business activities similar to those of other cartel members, can file a lesser penalty or lesser penalty plus application.
- **Penalty reduction-** The updated regulations grant CCI wide discretion to decide penalty reduction for a leniency plus applicant.
- **Qualitative assessment of evidence quality-** The 'lesser penalty plus' regime aims to encourage timely cartel disclosure while ensuring the quality of evidence provided.
- **Incentive-** The incentive for self-reporting exists when cartelists believe that the sanctions imposed will be lesser than the gains from collusion.
- **Additional incentives-** It is provided for whistleblowers to disclose information about multiple cartels, thereby promoting early reporting and strengthening the competition regulator's ability to combat anti-competitive practices.
- **On par with global regulations-** The regime aligns with similar leniency programs in regions like US, European Union and Brazil, which have proven effective in revealing cartels and associated players.
- **Game theory concept-** The regulation emphasize the benefits of being the first to come forward, as leniency offered can extend up to 100%.

6.2 India's Disability Law

Why in news?

The Central Public Works Department (CPWD) has asked its regional offices to ensure that all public buildings are accessible to people with disabilities (PwD).

What are the recent guidelines issued by CPWD?

- All lifts should be modified with audio announcement, visual display of the floor number from inside the lift
- Emergency evacuation routes for persons with disabilities (PwD) should be "displayed appropriately with signage announcement in braille language".
- The retrofitting of all other buildings, which are yet to be done, should be taken on priority".
- It is a much delayed compliance with the
 - [Rights of Persons with Disabilities Act, 2016](#) and
 - Harmonised Guidelines and Standards for Universal Accessibility in India, 2021.

Access to public buildings

- **Right of Persons with Disabilities Act, 2016-** The Act mandates the central government to notify guidelines and standards for public buildings, ensuring accessibility for persons with disabilities (PwD).
- **Rights of Persons with Disabilities Rules, 2017-** It is derived from 2016 Act which focuses on accessibility in public buildings.

- It covers the physical environment, transport, and information and communication technology. All establishments must comply with these standards.
- Existing buildings are required to be made accessible *within five years*.
- **Accessible India Campaign**- It was launched in 2015 which aims to enhance accessibility for PwD in public buildings, transportation, and websites.

What are the key provisions of Right of Persons with Disabilities Act, 2016?

Key aspects	About
Aim	<ul style="list-style-type: none"> • To protect and promote the rights of individuals with disabilities.
Replaced outdated Act	<ul style="list-style-type: none"> • The act replaces the Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995.
Obligation to international law	<ul style="list-style-type: none"> • It fulfils the obligations to the United National Convention on the Rights of Persons with Disabilities (UNCRPD), to which India is a signatory.
Categorization of persons with disability	<ul style="list-style-type: none"> • Person with benchmark disability • Person with disability • People with disabilities having high support needs.
Rights and entitlement	<ul style="list-style-type: none"> • Right to equality and non-discrimination • Right to live in the community • Right to access justice • Reproductive right of PwDs • Right to vote etc.,
Education	<ul style="list-style-type: none"> • Educational institutions are obligated to provide inclusive education for persons with disabilities.
Skill development	<ul style="list-style-type: none"> • The act focuses on vocational training, self-employment, and non-discrimination in employment. • Employers are encouraged to adopt equal opportunity policies and records related to disability inclusion are maintained.
Special provisions	<ul style="list-style-type: none"> • The act provides special provisions for persons with benchmark disabilities, including free education and reservation in higher educational institutions. • Incentives are offered to employers in the private sector who hire persons with disabilities. • Special employment exchanges and development programs are established.
Grievance redressal	<ul style="list-style-type: none"> • The <i>Chief Commissioner for Persons with Disabilities</i> is the nodal authority to address the grievances and issues of persons with disabilities.
Special courts	<ul style="list-style-type: none"> • It must be provided for speedy trial, the state government shall notify for each district a <i>Court of Session</i> to be a Special Court to try the offences under this Act. • This has to be done with the concurrence of the <i>Chief Justice of the High Court</i> of the state.
Penalty	<ul style="list-style-type: none"> • Breach of the provisions of the Act are penalised by a fine of an amount up to Rs.10,000 and • For subsequent contravention a fine of Rs 50,000 which could be extended up to 5 lakhs.

What is harmonised guidelines and standards for universal accessibility in India?

- The first set of guidelines were published in 2016, it was reviewed during COVID-19 by experts and the updated document was notified in 2021.
- **Aim-** To sensitize, guide and facilitate the approach towards implementing accessibility in all facets of built environment and beyond.
- **Key objectives-** It is guided by the Model of holistic approach to Universal Accessibility
- *Sensitize diverse stakeholders* regarding the various accessibility needs and provisions for diverse population groups in the built environment.
- Introduce and orient *universal design perspectives* to all stakeholders for creating inclusive built environments for all.
- Recommend *specific built environment elements* along with their accessibility attributes and specifications.
- Develop a holistic approach to accessibility through *integration of appropriate technologies*.
- Guide *accessibility assessment* and implementation in built environments.

What are the challenges faced in improving accessibility for PwD?

- **Lack of implementation-** The 2016 guidelines were never effectively implemented, and the same issue persists with the 2021 guidelines.
- **Lack of State's will-** No state has incorporated the harmonized guidelines into their building by-laws, and state governments have not prioritized accessibility.
- **Lack of awareness-** Engineers in public works department who are responsible for implementing accessibility standards lack proper awareness and accountability.
- **Fund deficit-** There is insufficient budget allocation for retrofitting and ensuring accessibility.
- **Lack of consistency-** The implementation of accessibility standards has been inconsistent due to various factors such as many states and cities have not submitted applications despite fund availability.
 - Example- The tactile paths at airports are rendered unusable due to trolleys placed on them.
- **Ambiguity-** CPWD notification lacks clarity and may lead to resource utilization.

What lies ahead?

- The importance of punitive actions would drive change in the implementation of accessibility standards.
- Proper awareness with the individuals who implement the standards is necessary to foster accountability.
- There is a need for sufficient budgetary allocation to enforce proper implementation of accessibility standards.

6.3 Self Help Groups

Why in news?

In India, women self-help groups have been a source of empowerment, fostering economic independence, social stature and community resilience.

How SHGs evolved in India?

- A Self-Help Group is an informal association of individuals who come together to improve their living conditions.
- It is a self-governed and peer-controlled group comprising people with similar socio-economic backgrounds and a shared desire to achieve a common purpose.
- **Primary purpose-** To pool financial resources for joint economic activities and provide reasonable-interest loans to members for starting small businesses.
- **Historical origin-** The concept of SHGs began in the 1970s, notably with the formation of the Self-Employed Women's Association (SEWA) in Gujarat.
- **Linkage to banks-** In 1992, SHGs were linked to banks for small loans, leading to the SHG Bank Linkage Project (SHG-BLP) for setting up livelihood opportunities.

As per National Rural Livelihood Mission (NRLM) data, there are around 9 million SHGs with nearly 100 million women members, averaging 14 SHGs per village.

- **Swarna Jayanti Gram Swarojgar Yojana**- It was launched in 1999 to recognize the potential of SHGs in promoting self-employment in rural areas.
- **NRLM**- In 2011, SHGs were integrated into the National Rural Livelihoods Mission (NRLM), becoming core implementers of the government's objective to ensure livelihood opportunities for the poor.
- **Community Investment Fund**- It was launched in 2014 that provided SHGs with up to Rs 50,000 per year for designing and implementing local livelihood programs.
- **Formal village groups**- The integration into NRLM and the creation of the Community Investment Fund marked a transformation of SHGs from informal alliances to formal village groups.

What is the significance of SHGs?

- **Functional capacity enhancement**- It improves the functional capacity of poor and marginalized individuals by providing them with skill development, employment generation and increased income opportunities.
- **Conflict resolution**- SHGs acts as forums for collective leadership and mutual dialogue fosters a sense of community cohesion and shared responsibility.
- **Credit access**- They play a pivotal role in providing collateral free loans to their members, the interest rates on these loans are market driven ensuring fairness and sustainability in financial transactions.
- **Microfinance prowess**- SHGs are recognized as the world's largest microfinance project, with millions of groups availing substantial loans.
- **Risk mitigation**- The SHGs serve as a collective guarantee system providing assurance for members seeking loans from organized sources.
- **Financial inclusion**- It facilitate the inclusion of marginalized individuals into the formal banking system that enables the poor to save money in banks promoting financial literacy and inclusion.
- **Economic empowerment**- The members can utilize the loans obtained through SHGs to start micro-enterprises.
- **Poverty alleviation**- SHGs contribute to the overall goal of poverty alleviation by focusing on employment generation, income enhancement and financial inclusion.
- **Women empowerment**- Women can utilize their skills and talents to start businesses and become financially self-reliant.

How the SHGs has shaped India over years?

- **Credit discipline**- It is highlighted by a repayment rate of more than 96% contrasting with challenges faced by India's commercial banks often dealing with massive non-performing loans.
- **Growth**- As per Economic Survey 2022-23, SHGs have shown impressive growth rates, with a compound annual growth rate (CAGR) of 10.8% in credit linkages and 5.7% in credit disbursement per SHG over the last ten years.
- **Government support**- The government's active pursuit of SHGs is evident in their inclusion in policies and programs, reflecting a recognition of their organizational effectiveness at the grassroots level.
- **Diversified roles**- The SHGs manage local community kitchens, running health services, overseeing slum redevelopment initiatives, and managing agri-nutri gardens.
- **Political will**- SHGs have become a significant influence in politics, with political parties incorporating them into women-focused manifestos.
- **National significance**- Prime Minister Narendra Modi has emphasized their role in transforming from "Self-Help Groups" to "Nation Help Groups," showcasing their national significance.

Kudumbashree Mission

- **Launch year**- 1999
- **Launched by**- Kerala
- **About**- It is a government sponsored mission aimed at empowering women, primarily through credit activities in Kerala's rural areas.
- **Support**- Union government and NABARD.
- **Significance**- Kudumbashree has proven its resilience, particularly during times of crisis from the devastating Kerala floods of 2018 to the unprecedented challenges posed by the covid-19 pandemic, women affiliated with the mission have emerged as pillars of support for their communities.
- From an initiative to empower women the mission has become lifeline of the State.

- **Financial commitment from States-** State governments, especially in Uttar Pradesh, Madhya Pradesh, Bihar, Rajasthan, Tamil Nadu, Kerala, and Odisha, have provided substantial budgetary support, totalling Rs 5 lakh crore, directly to SHGs.
- **Vote bank-** SHGs have become a vehicle for seeking votes from women, reflecting their increasing participation in elections.

6.4 Cinematograph (Certification) Rules, 2024

Why in news?

Ministry of Information and Broadcasting, Government of India has notified the Cinematograph (Certification) Rules, 2024 in accordance with the Cinematograph (Amendment) Act, 2023.

What are the key aspects of Cinematograph (Certification) Rules, 2024?

Cinematograph (Certification) Rules, 2024	
Key aspects	About
Aim	To streamline and modernise the film certification process for the digital age, keeping pace with the emerging technologies and advancement in the film sector
Comprehensive revision	<i>Cinematograph (Certification) Rules, 1983</i> have been comprehensively overhauled in order to improve and contemporize the entire process of certification of films for public exhibition.
Online certification process	It is adopted to enhance transparency, efficiency, and ease of doing business for the film industry.
Time-effective	Implementation of <i>complete digital processes</i> is to eliminate transactional time and reduce the time taken for film certification.
Accessibility features	Movies/feature films to have accessibility features for certification to make it inclusive for disabled persons, as stipulated in the guidelines issued in this regard from time to time.
Age- based certification	The UA category is classified into <i>UA+, UA13+ and UA16+</i> , these would serve as recommendations for parents or guardians to decide whether the content is suitable for their children.
Women representation	Ensuring greater representation of women in the Central Board of Film Certification (CBFC) Board and Advisory Panels, with one-third of the members on the Board being women, and preferably half on the Panels.
Priority screening	It is provided to expedite the certification process in case of urgency felt by filmmakers due to prior commitments, this would enhance transparency and promote ease of doing business.
Perpetual validity of certificates	Removal of the restriction on the validity of certificates for only 10 years for perpetual validity of CBFC certificates
Recertification for TV broadcast	Recertification of the edited film for Television broadcast, as only Unrestricted Public Exhibition category films can be shown on television.

What lies ahead?

- The age based certification will play a crucial role in balancing the need to protect vulnerable audiences, such as children, with the principles of *freedom of expression* and *consumer choice*.
- The recent rules reflect a comprehensive effort to address the evolving needs of the film industry, considering advancements in technology, audience demographics, and content distribution methods.
- The updated regulations aims to support the growth and success of Indian cinema by fostering *efficiency, transparency and inclusivity*.

Central Board of Film Certification

- **Statutory body**- CBFC regulates the public exhibition of films under the provisions of the ***Cinematograph Act 1952***.
- **Ministry**- Ministry of Information and Broadcasting.
- **Launch year**- 1951.
- **Headquarters**- Mumbai.
- **Composition**- A *Chairman and non-official members*.
- **Appointment**- All the members are appointed by the Central government.
- **Regional offices**- CBFC has *9 regional offices* at Mumbai, Kolkata, Chennai, Bangalore, Thiruvananthapuram, Hyderabad, New Delhi, Cuttack and Guwahati.
- **Advisory panel**- The regional offices are assisted in the examination of films by advisory panel.
- **Appointment of panels**- The members of the panel are nominated by the Central government by drawing people from different walks of life for a period of 2 years.
- **Public exhibition of movies**- Films can be publicly exhibited in India *only after they have been certified by the Central Board of Film Certification*.

6.5 All about MGNREGA

Why in news?

The Centre has recently notified new wage rates for MGNREGA, with Goa seeing the highest hike.

What is MGNREGA?

- **MGNREGA** - The Mahatma Gandhi National Rural Employment (MGNREG) is the largest public employment program in the world.
- **Implementation**- By Ministry of Rural Development in India.
- **Legal provision**- The scheme is based on ***MGNREGA Act, 2005*** which makes a legislative commitment to provide right to work.
- **Aim**- To enhance the livelihood security of people by guaranteeing *100 days of wage-employment* in a financial year to a rural household whose adult members volunteer to do unskilled work.
- **Goals of MGNREGA**
 - Rejuvenate natural resource base of rural areas.
 - Create a durable and productive rural asset base.
 - Empowerment of the socially disadvantaged, especially, women, Scheduled Castes (SCs) and Scheduled Tribes (STs), through the processes of a rights-based legislation.
 - Strengthen decentralized, participatory planning through convergence of various anti-poverty and livelihoods initiatives.
 - Strengthening Panchayati Raj Institutions
- **Implementation** - The State government have to incorporate all features of MGNREGA in the State MGNREGS as mentioned in Schedule-I & condition of employment as mentioned in Schedule-II of the act.

MGNREGA is a bottom-up, people-centred, demand-driven, self-selecting and rights-based programme.

	Category of public works
Category A	Natural resource management (Irrigation canal)
Category B	Individual assets for vulnerable sections (House construction or Refurbishment)
Category C	Common assets and infrastructure to promote agricultural productivity (Poultry shelter)
Category D	Rural infrastructure (Foot bridge)

- **Fund allocation-** The central government provides 100% funding for wages for the unskilled manual work, and covers 75% of the material cost. 25% of the material cost is borne by state governments.
- **Wage-** The wage rates are fixed according to changes in the **CPI-AL (Consumer Price Index- Agriculture Labour)**, which reflects the increase in the inflation in the rural areas. The wages under the scheme are usually done through **Direct Benefit Transfer**.

MGNREGA new wage rates	High	Low
Rate	Haryana (Rs 374/day)	Arunachal Pradesh and Nagaland (Rs 234/day)
Hike	Goa	Uttarakhand

- **Household-** It is defined as members of a family related to each other by blood, marriage or adoption and normally residing together and sharing meals or holding a common ration card.
- **Geotag-** Assets developed under MGNREGA are geo-tagged and displayed on a public website, GeoMGNREGA, to enhance transparency.
- **Women empowerment-** Roughly one-third of the stipulated work force must be women.
- **Unemployment allowance-** It mandates that work should be provided **within 15 days** of demanding work failing which the workers are entitled to an unemployment allowance.
- **Gram Sabha-** It is the principal forum for wage seekers to raise their voices and make demands.
 - It determines the order of priority of works in the meetings of the Gram Sabha keeping in view potential of the local area, its needs, local resources
 - It monitors the execution of works within Gram Panchayat, it is the primary forum to conduct social audits.
- **Social Audit-** Auditing of MGNREGA works is mandatory, which leads to accountability and transparency.
- **Amarjeet Sinha committee-** It was constituted in 2023 to review the implementation of the MGNREGA scheme.



What are the issues with MGNREGA?

- **Low wage rates-** If MGNREGA wage rates are lower than state minimum wages, it disincentivizes workers from participating in the program.
- **Fund deficit-** Insufficient funds and irregular flow of funds hamper the effective implementation of MGNREGA, especially during peak seasons when demand for work is high.
- **Delayed payments-** Regular late payments create financial instability for workers and erode trust in the program.
- **Limited banking infrastructure-** Banking infrastructure is limited in rural areas exacerbates the problem of delayed payments and adds unnecessary burden on workers.
- **Faulty MIS data-** Over-reliance on technology without addressing its shortcomings contributes to corruption and reduces transparency and accountability.
- **Excessive centralisation-** It diminishes the role of local governance institutions, reducing their ability to address issues and serve their communities effectively.

What lies ahead?

- The government should address the challenges by increasing fund allocation, reducing delay in payments etc., which would foster and deepen the grassroots democracy.
- Despite several criticisms since its inception MGNREGA remains relevant as a safety net for the most vulnerable in India.
- The World Bank in its World Development Report, 2014 termed MGNREGA as a stellar example of rural development underscores India's commitment to alleviate rural poverty.

7. GOVERNANCE

7.1 Supreme Court's Stay on Govt's Fact Check Unit

Why in news?

Supreme Court had stayed the operation of the amended IT rules which introduced Fact Check Unit (FCU) to identify “fake news” on social media.

What is a FCU under Public Information Bureau (PIB)?

- **Launch year-** 2019
- **Ministry-** Ministry of Information and Broadcasting.
- **Location-** It is based in the National Media Centre (New Delhi).
- **Mandate-** To counter misinformation related to government policies, initiatives, and schemes.
- **Coverage-** Any matter that does not pertain to the Union Government is not taken up for evaluation or fact-checking by the PIB unit.
- **Function-** It addresses complaints either *voluntarily or upon receiving references* through various channels such as WhatsApp, email, postal mail, and the PIB's website.
- **Fact check mechanism-** It is based on the “**FACT model**” – Find, Assess, Create, and Target.
- **Evaluation of complaints-** It is done by a two-step process.
 - The received complaints are researched against *authoritative government sources* such as websites, press releases, and government social media accounts.
 - The unit then checks complaints with the *concerned Ministry*, and creates content for social media.
- **Tools-** Technological tools like *reverse image search and video analysis* are used to verify the authenticity of viral content.
- **Categories-** After rigorous fact checking procedure the unit classifies information into **Fake, Misleading, and True**.
- **Report-** The unit reports to the **Principal Director General, PIB** who functions as the Principal Spokesperson of the Government of India.



What is the recent notification by the Centre regarding FCU?

- **Notification-** The fact check unit under the Press Information Bureau as the authorised unit for the Union government.
 - It has been notified under the recently amended Information and Technology Rules of 2021.
- **About-** To flag “fake, false or misleading online content related to the government”.
- **Check accuracy-** It will confirm whether online information related to the Central Government is accurate.
- **Label content-** It will have the authority to label content related to the government on online platforms like Facebook and Twitter as “fake” or “misleading”.
- **Safe-harbour provision-** The online intermediaries will have to take down the content labelled as fake by the FCU or lose their legal immunity against third-party content online.
- **Block content-** Social media sites will have to take down such posts, and internet service providers will have to block URLs of such content.
- The Bombay High Court recently refused to stay the setting up of a Fact Checking Unit (FCU) under the recently amended Information Technology Rules.
- Supreme Court overturned a previous decision by the Bombay High Court, granting a stay on the establishment of the Fact Check Unit.

To know more about authorizing fact checking click [here](#)

Why Supreme Court stayed the operation of FCU?

- There are concerns regarding misuse by the government to control information available to voters, impacting free speech.
- The court recognized the potential impact of the FCU on free speech guaranteed by the Constitution of India.
- **Split verdict**- It was delivered by the Bombay High Court about the validity of Rule 3(1)(b)(5) of IT rules 2021, with one judge striking down the rules and another upholding them, a third judge's decision is pending.
- The Supreme Court stayed the FCU operation until Bombay High Court arrives at a final decision on the challenge to the amended IT rules.
- **Centre's stand**- It would be limited to government business and would not include criticism of the prime minister.

*Information Technology
(Intermediary Guidelines and Digital
Media Ethics Code) Amendment
Rules 2023 amended IT rules, 2021.*

What lies ahead?

- The FCU under PIB would function the same way except the powers ascertained to them by the Centre's recent notification as it is stayed by the government.
- The Supreme Court's decision to set aside the Bombay High Court's order and its recognition of the constitutional implications of the Fact Check Unit underscore the importance of protecting fundamental rights, including freedom of speech and expression.
- The outcome of the Bombay High Court case would affect the legality of similar FCUs in other states ([Tamil Nadu](#), Karnataka, and Uttarakhand)
- This legal battle highlights the judiciary's role in safeguarding democratic principles and ensuring accountability in governance.

7.2 India's Birth Crisis

Why in news?

Recent lancet study reveals that by 2050, 1 in 5 Indians will be a senior citizen while there will be fewer younger people to take care of them.

What are the key highlights of the lancet study?

- **Data**- Based on the Global Burden of Diseases (GBD), Injuries and Risk Factors Study 2021.
- **Decline in TFR**- India's TFR has fallen to 1.29 well below the replacement rate of 2.1.
- **Global trends**- TFR is globally more than halved from 1950 to 2021, declining from 4.84 to 2.23.
- Global annual live births peaked in 2016 at 142 million, then decreased to 129 million by 2021.
- Researchers estimate that by 2050, 76% of the world will be below the replacement level of fertility.
- **China**- It is already dealing with the demographic disadvantage of an ageing population, India too is heading in that direction.

Both India and China account for more than a third of world's population, the ageing population will increase the dependency ratio.

Why there is decline in India's TFR?

- **Effective policies**- Family planning programs and incentives for limiting family size.
- **Enhanced health**- It leads to decreased infant mortality and increased confidence in child survival.
- **Economic changes**- The society is witnessing the reversed Inter-generational flow of wealth, children are now seen as a significant financial burden rather than an economic asset.

Key terms

Total Fertility Rate (TFR)

- It is the average number of children born to a woman (15-49 years) over her lifetime.
- It's calculated by adding up all of the age-specific fertility rates over five-year intervals.

Replacement level

- It is the level of fertility at which a population replaces itself exactly from one generation to the next.
- A TFR of 2.1 is known as the replacement rate, when it is less than 2.1 the population in a given area will eventually decrease.

- **Rising female literacy**- Education empowers women, providing them with greater knowledge about family planning and reproductive health.
- **Women participation in workforce**- Career consciousness, financial returns and economic independence have meant that women are reconsidering their options of having a second child.

Steps taken by India to combat population

- **National Family Planning Program**- It was started in 1952 as part of the First Five-Year Plan, and became the first country in the world to have a state-sponsored population programme.
- **National Family Planning Indemnity Scheme (NFPIS)** - The clients are insured in the eventualities of death, complication and failure following sterilization.
- **National Population Policy, 2000**- It was launched to address the unmet needs for contraception, healthcare infrastructure, and health personnel, and providing integrated service delivery for basic reproductive and child healthcare.
- **Mission Parivar Vikas**- It was launched in 2016 that substantially increase access to contraceptives and family planning services in 146 high-fertility districts with a TFR of above 3.
- **Family Planning Logistic Management and Information System (FP-LMIS)**: A dedicated software to ensure smooth forecasting, procurement and distribution of family planning commodities across all the levels of health facilities.
- **360 degree media campaign**- Launched a comprehensive media campaign including TV commercials, radio shows, and a dedicated website in 2017.
- **Awareness generation**- Observance of *World Population Day (July 11)*, Vasectomy Fortnight, and promotional activities in high fertility districts.

What are the long term consequences of declining TFR?

- **Increase in aged population**- By 2050, over 20% of India's population will be senior citizens, it poses challenges related to care, support, and health care.
- **Financial burden**- Healthcare for the elderly lead to increased healthcare costs and pressure on public health budgets.
- **Shrinking workforce**- A smaller working age population could lead to labour shortages and affect economic growth.
- **Lack of skilled employees**- Industries that heavily rely on younger workers, such as healthcare, manufacturing, and technology, may face challenges in finding skilled employees, potentially leading to inefficiencies and decreased competitiveness.
- **Wage inflation**- Labor shortages can also result in increased competition for talent, leading to wage inflation and potential economic instability.
- **Gender imbalance**- Son meta preference will impact demographic structure resulting in unequal access to education, employment opportunities, and resources for women.

Global experimental policies to boost fertility

- **Germany**- Boosts births through liberal labour laws, allowing more parental leave and benefits.
- **Denmark**- Offers state-funded IVF for women below 40 years.
- **Hungary**- Nationalised IVF clinics.
- **Poland**- Gives out monthly cash payments to parents having more than two children.
- **Russia**- It makes a one-time payment to parents when their second child is born.
- Russia reinstated the Soviet-era *'Mother Heroine'* title, who bore and raised more than 10 children amounting to Rs. 13 lakh.

What lies ahead?

- Proactive measures such as *affordable childcare and health care investments* can help mitigate the negative impacts of demographic changes and ensure sustainable development.

- *Gender equity* is essential men can support women's participation in the workforce by sharing the burden of unpaid care work which would contribute to more balanced family dynamics.
- The need of the hour is *economic policies* that prioritize growth, job creation, and social security reforms are vital for adapting to demographic changes and mitigating their impacts.
- India can adapt policies and strategies of the successful models from other countries which suit India's specific contexts and needs.

7.3 Uses of Cannabis

Why in news?

Bhang, obtained from the Cannabis sativa plant or true hemp, is popularly consumed on the occasion of Holi across India.

What is cannabis?

- It refers to a group of three plants with psychoactive properties.
- The Mexican term 'marijuana' is frequently used in referring to cannabis leaves or other crude plant material in many countries.
- **Plants** – Cannabis sativa, Cannabis indica, and Cannabis ruderalis.
- **Products derived**- From the cannabis plant, three main products are obtained namely fibre, oil, and narcotics.
- **Literary references**- There are evidences of medical use of marijuana which can be found in ancient Indian texts such as the Atharvaveda and the Sushruta Samhita, dating back to around 1500 BCE.
- **Atharvaveda**- It hails bhang an edible preparation of marijuana as one of the five sacred plants.
- **Sushruta Samhita**- Marijuana was recommended for health ailments including phlegm, catarrh and diarrhoea.
- **Cultural significance**- It has deep cultural roots in India, with historical ties to Hindu mythology and rituals.
- **Charas**- Produced by rubbing the resin of the flower from the plant.
- **Bhang**- Derived from the Cannabis sativa plant, holds cultural significance in India, particularly during Holi festival where they are ground into a powder, filtered and then mixed with cold, flavoured milk or thandai.

Bhang is essentially a green-coloured paste made from seeds and leaves of the female cannabis plants – they have higher potency and Tetrahydrocannabinol (THC) content than their male counterparts.

Regulation of cannabis in India

- **Cannabis in India**- It is predominantly found in the Indo-Gangetic plains Himachal Pradesh, Punjab, Haryana, Uttar Pradesh, Bihar, and West Bengal – along with the Deccan region.
- **NDPS, 1985**- Narcotic Drugs and Psychotropic Substances Act *prohibits the sale and production of cannabis resin and flowers* which is a criminal offence, but the *use of leaves and seeds are permitted*.
- **Power of States**- They have the power to regulate and form the State rules for it.
- **Status of cultivation**- Farming of cannabis has been *legalised in Uttarakhand*.
- **Controlled cultivation**- It is done in some districts of Gujarat, Madhya Pradesh and Uttar Pradesh
- **Regional names**- It is known as Ganzai in Telugu, Ganja in Tamil, and Bangi in Kannada.

What are the uses of cannabis?

- **Medicinal value**- In treating diseases like cancer, AIDS, and epilepsy, with Cannabidiol (CBD) showing promise as a therapeutic agent.
- **Treat haematoma**- Cannabis ash is applied on animal's skin to treat conditions like haematoma a condition in which blood clots outside of the blood vessels.
- **Cure cattle shivering**- In Himachal Pradesh, boiled cannabis leaves is used to cure shivering in cattle.

Marijuana was first used as an anesthetic by a Chinese surgeon.

- **Insect bite relief**- Cannabis leaves are heated, crushed, and applied as a paste to alleviate irritation and pain caused by honey bee or wasp stings.
- **Agriculture**- Treating paddy seed with bhang is effective in paddy seed germination and this treatment is common in temperate areas of Jammu and Kashmir, where temperature during nursery raising is low.
- **Natural pesticide**- In Jammu and Kashmir, it is used to control threadworms by placing the uprooted cannabis plant in standing water of paddy nursery or by using crushed cannabis leaves.
- **Industrial uses**- Hemp seed oil derived from cannabis is derived in varnish industries as a substitute for linseed oil and manufacturing of soft soap.
- **Rope making**- The fibre, known for its strength, is separated from the stems and branches, the extracted fibre is stronger than jute making it suitable for making durable ropes.

Why India should legalise cannabis?

- **Historical usage**-Marijuana has been used in traditional Indian and Chinese medicine for centuries, with ancient texts documenting its medicinal applications¹.
- **Global regulation**-Over 18 countries have legalized medical marijuana, with varying degrees of regulation, and studies suggest that legalization does not lead to increased drug use or crime.
- **Dominance of black market**- Studies suggest that drug result in the circulation of poor quality or adulterated drugs, increasing the risks of overdose and poisoning.
- **Job creation**- If cannabis is legalized a new industry dealing with cultivation, processing, packing, and distribution of marijuana would emerge.
- **Reduce illegal trade**- There will be laws regarding the possession, cultivation, and supply of marijuana in the market by the government and not by drug dealer which would reduce the crimes related to illegal trade.
- **Increase government revenue**- Economists have advocated for legalizing and regulating it like other goods as taxing cannabis could generate significant revenue.
- **Supporting local farmers**-In states like Himachal Pradesh and Tamil Nadu, where cannabis plants grow, legalizing marijuana would benefit local farmers who currently face challenges due to its banned status.
- **Proper regulation**- Kofi Annan, former Secretary-General of the United Nations has stated that while cannabis consumption is not necessarily associated with significant problems for most users but regulation is necessary to mitigate potential risks and ensure responsible use.

Cannabis Medicine Project

- It is India's first cannabis medicine project.
- **Initiative by**- Council of Scientific and Industrial Research-Indian Institute of Integrative Medicine (CSIR-IIIM), Jammu.
- **Mode**- The project is under public-private partnership (PPP) with a Canadian firm.
- **Significance** –
 - Produce export quality drugs for neuropathies, diabetic pains, cancer, etc.
 - Helps in spreading awareness in J&K and Punjab.
 - Impetus for huge investment in Jammu & Kashmir.

7.4 Phone Tapping in India

Why in news?

Recently two senior police officials has been arrested in Telangana for their involvement in phone tapping and destroying official data.

What is phone tapping?

- Phone tapping, also known as **wiretapping** or **telephone interception**, refers to the unauthorized monitoring or recording of telephone conversations or electronic communication.
- **Legal provision**-*Telegraph Act of 1885*

How phone tapping is regulated under Telegraph Act 1885?

- **Condition for phone tapping-** On the occurrence of any public emergency or in the interest of the public safety.
- **Other criteria to phone tap-** Sovereignty and integrity of India, state security, foreign relations, public order or prevention of incitement to commit offenses.

Authority to tap phone	
At State level	Police have the authority to tap phone
At national level	<p>10 agencies are granted this power</p> <ul style="list-style-type: none"> • Intelligence Bureau • Central Bureau of Investigation (CBI) • Enforcement Directorate • Narcotics Control Bureau • <u>Central Board of Direct Taxes</u> • <u>Directorate of Revenue Intelligence</u> • National Investigation Agency • Research and Analysis Wing • <u>Directorate of Signal Intelligence</u> • <u>Delhi Police Commissioner</u>

- **Exception for press-** The press messages intended for publication by accredited press correspondents should not be intercepted or detained unless explicitly prohibited.
- **Authorisation procedure-** Rule 419A of the Indian Telegraph (Amendment) Rules, 2007 says that the authorization must be communicated *in writing* to the service provider before interception can commence.
- **Authority-** Phone tapping orders is issued by designated government officials such as
 - **National level-** The Secretary to the Government of India in *Ministry of Home Affairs*
 - **State level-** Secretary to the State government in charge of Home department.
- **Rule-** The law is clear that interception must be ordered only if there is no other way of getting information
- **Tenure-** The directions for interception remains in force with a maximum duration of 60 days, extendable up to a total of 180 days.
- **Review committee-** Any order issued by the competent authority has to contain reasons, and a copy is to be forwarded to a review committee within seven working days.
 - **At national level-** Headed by Cabinet Secretary with the Law and Telecom Secretaries as members.
 - **At State level-** Headed by the Chief Secretary with the Law and Home Secretaries as members.
- **Power of review committee-** When it is of the opinion that the directions are not in accordance with the provisions, it may set aside the directions and orders for destruction of the copies of the intercepted messages.
- **Destruction of records-** Records pertaining to such directions shall be destroyed every 6 months and service providers must destroy records within 2 months of discontinuance of interception.
- **Unauthorised interception-** In this case, the service provider may be fined or even lose its licence.

Judiciary view on intercepted conversation as an evidence

- **R.M.Malkani vs State of Maharashtra-** The Supreme Court allowed the use of tape-recorded conversation as evidence under *Indian Evidence Act, 1872*.
- The Court also clarified that such evidence should be used sparingly under proper direction.
- In another case husband tapped wife’s conversation with friends and parents which was declared as *illegal* by Supreme Court as it infringed wife’s constitutional right to privacy.

What is the protocol for issuing phone tapping orders in exceptional circumstances under Telegraph Act 1885?

- **Emergency authorization-** In unavoidable circumstances where prior authorization is not feasible, the order can be issued by an officer not below the rank of a Joint Secretary to the Government of India who has been authorised by Union Home Secretary or State Home Secretary.
- **Exceptional circumstances-** In remote areas or for operational reasons it is not possible to get prior directions.
 - A call be intercepted with prior approval of the head or

- At national level-Second senior most officer of the authorised law enforcement agency
- At State level- By authorized officers not below the rank of Inspector General of Police.
- **Approval-** The interception order has to be communicated within 3 days to the competent authority who has the authority to approve or disapprove it within 7 working days.
- **26/11 Mumbai attack-** A mail was sent to the service provider by the Intelligence Bureau, and phones of terrorists were put under surveillance as adherence to the complete interception procedure is not feasible, the proper procedure would be followed later.

Does India needs reforms in Indian Telegraph Act 1885?

- **Violates Article 21-** Telephone conversation is an important facet of a man's private life hence telephone tapping would infringe Right to Privacy under Article 21 of the Constitution.
- **Outdated law-** The Act is introduced during colonial era, it must be reformed to align phone tapping with modern requirements and to address the privacy concerns associated with phone tapping.
- **Telecommunication bill, 2023-** It provides a more updated set of guidelines of lawful interceptions of communications, ensuring the process is transparent, accountable and respectful of individual's right to privacy.
- **Follow judiciary guidelines-** In the public interest the *procedure established by the court* is to be followed while breaching the privacy of an individual and keeping it secretive.

8. HEALTH

8.1 Cervical Cancer Vaccine

Why in news?

India's interim Union Budget 2024-25 has taken a significant step by supporting the vaccination of girls aged 9 to 14 against cervical cancer, marking a new era in women's health.

Status of cervical cancer

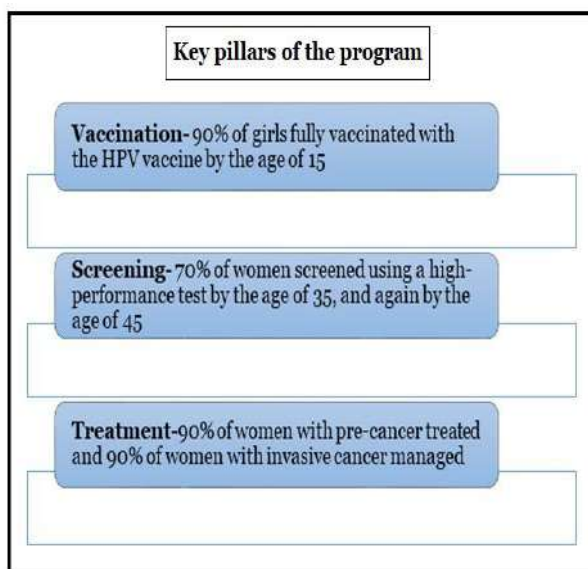
- A type of cancer that occurs in the cells of the cervix -the lower part of the uterus that connects to the vagina.
- It is a common sexually transmitted infection which is caused mainly due to the long-lasting infection with certain types of HPV.
- It is preventable as long as it is detected early and managed effectively.
- **Global burden-** Cervical cancer is the 2nd most common cancer type and the 2nd most common cause of cancer death in women of reproductive age (15-44).
- **Status of India-** As per World Health Organisation, India accounts for about a fifth of the global burden, with 1.23 lakh cases and around 67,000 deaths per year.
- It remains the 2nd most common cancer among women in India by killing one women every eight minutes.

What is cervical cancer?

- Cervical cancer develops in a woman's cervix (the entrance to the uterus from the vagina), it is preventable and curable, as long as it is detected early and managed effectively.
- **Causes-** 99% of cases are caused due to high-risk HPV, a virus transmitted through sexual contact.
- **Other risk factors-** Multiple sexual partners, early sexual activity, other sexually transmitted infections, a weakened immune system, smoking, exposure to miscarriage prevention drug, etc.
- **Symptoms -**
 - Vaginal bleeding after intercourse, between periods or after menopause,
 - Pelvic pain or pain during intercourse
 - Watery, bloody vaginal discharge that may be heavy and have a foul odour.
- **Prevention -** Effective primary (HPV vaccination) and secondary prevention approaches (screening for, and treating precancerous lesions) will prevent most cervical cancer cases.

What are the steps taken against cervical cancer?

- **Global Strategy for Cervical Cancer Elimination-** In 2020, the WHO adopted this strategy in order to eliminate cervical cancer as a public health problem.
- **Aim-** To eliminate cervical cancer, all countries must reach and maintain an incidence rate of below four per 100 000 women.
- Each country should meet the **90-70-90 targets by 2030** to get on the path to eliminate cervical cancer within the next century.
- **Existing vaccines** - Two vaccines licensed globally are available in India -
 - A quadrivalent vaccine (Gardasil, from Merck) and
 - A bivalent vaccine (Cervarix, from GlaxoSmithKline).



- Although HPV vaccination was introduced in 2008, it has yet to be included in the national immunisation programme.
- **Cervavac-** It is India's first indigenous quadrivalent human papillomavirus vaccine (qHPV) vaccine, and intended to protect women against cervical cancer.
- **Developed by-** Serum Institute of India in collaboration with the Department of Biotechnology
- **Immunisation drive** – It will be conducted through schools and existing vaccination points, planned in 3 phases over 3 years and is likely to start from the 2nd quarter of 2024 for free.

Success stories of Immunisation drive

- **Global scenario-** Over 100 countries have adopted HPV vaccination programs¹.
- **Impact in Scotland-** A study reported zero cases of cervical cancer in fully vaccinated women born between 1988 and 1996².
- **Australia's Progress-** Since starting HPV vaccinations in 2007, Australia is on track to eliminate cervical cancer by 2035.
- **Rwanda's Achievement-** The country's campaign has greatly lowered the occurrence of HPV types targeted by the vaccine.
- **South East Asia-** 6 out of 11 countries have rolled out the HPV vaccine nationwide.
- **Bhutan-** It was the first Low Middle Income Country to launch a nationwide HPV vaccination program for girls aged 12 to 18 in 2010, achieving an initial coverage of 95%, research shown a decrease in the prevalence of HPV transmission.
- **Sikkim model-** In 2018, HPV vaccine was provided free of cost to girls aged 9 to 14 with the program achieving 95% coverage for both doses, thanks to the effective communication and outreach.

What can be done to increase HPV vaccination?

- **Address vaccine hesitancy-** The misinformation about vaccines must be addressed.
- **Equitable access-** The vaccination services should reach the underserved population.
- **Community engagement-** The messages must be tailored to cultural and societal norms.
- **Education-** It must inculcate information regarding HPV to generate vaccine demand among adolescents.
- **U-WIN Portal-** The rollout of U-WIN portal in lines of Co-WIN should help maintain an electronic registry of immunizations and enhance the responsiveness of vaccination programs.
- **Multi stakeholder approach-** Partnerships among government, community groups, healthcare providers, and civil society are key to building trust.
- **Public private partnership-** For providing equitable vaccination services and promoting women's health.

What lies ahead?

- The *successful Sikkim model* has set a precedent for other Indian States to follow, demonstrating the importance of *communication in public health interventions*.
- India's commendable performances in vaccination drives particularly the COVID-19 campaign sets a promising precedent for the upcoming HPV vaccination initiative.
- HPV vaccination is not just a health measure but also a step towards reducing the societal and economic impacts of cervical cancer.

8.2 Harmonising Ayush and Modern Medicine

Why in news?

Modern medicine practitioners are being urged to be more open to working with the traditional or alternative systems of medicine, to move towards an integrated medicine.

Integration Models

- AYUSH stands for Ayurveda, Yoga & Naturopathy, Unani, Siddha, and Homeopathy, they are practiced in India and are based on well-defined medical philosophies.
- Integrated medicine is the combination of modern medicine and traditional or alternative system of medicines for the larger good of patients.
- **3c approach**- It provide a framework for understanding the different approaches to integrating traditional and modern medicine namely **Competitive, Coexistent and Cooperative**.
- **Competitive model**- There is rivalry between modern and traditional medicine, with disputes and litigation at the association level.
- **Coexistence model**- Both systems recognize each other's legitimacy, with clear boundaries set to avoid encroachment¹.
- **Cooperative model**- The ideal scenario where both systems work together to provide the best care, acknowledging each other's strengths².

What are the challenges?

- **Trust deficit**- There's a lack of trust between modern medicine and Ayush practitioners, often due to anecdotal evidence and unsupported claims of cures by Ayush.
- **Heterogeneity**- AYUSH is diverse, and each of these therapeutic disciplines requires separate consideration.
- **Contention over prescription**- The compatibility of dosha based management with modern medicine's protocol is debatable.
- **Operational complexities**- For a team-based approach, members must understand their limits and others' strengths, which is hindered by a lack of knowledge about AYUSH among modern practitioners impacting decision making.
- **Lack of awareness**- Patients may not be well informed to make choices between AYUSH and modern treatments.
- **Regulatory challenges**-The integration faces significant regulatory hurdles, particularly in ensuring that practitioners do not prescribe treatments outside their expertise.
- **Problematic prescription**- Modern medicine practitioners sometimes prescribe Ayurvedic treatments without fully understanding them.
- **Lack of accountability**- There is a lack of confidence in professional councils to enforce regulations and hold practitioners accountable for their actions.
- **Curriculum challenges**- The addition of AYUSH subjects to the already extensive MBBS curriculum may not be feasible.

What can be done?

- **Evidence based approach**- There is a need for evidence to bridge the trust gap and suggest building composite standard treatment guidelines.

- **Promote research-** Developing standardized protocols for integration where evidence exists and promoting further research for areas lacking evidence can aid in addressing technical challenges.
- **Enhance operational efficiency-** Establish clear roles, responsibilities, and referral pathways within healthcare teams.
- **Regulatory framework-** A strong regulatory framework is crucial to ensure safe, coordinated care and clear accountability.
- **Holistic approach-** The regulatory framework should address issues such as insurance coverage, quality control of medicinal products, and mechanisms for handling disputes or adverse events.
- **Medical education-** Optional or elective courses within MBBS curriculum may be a viable approach, provided they are adequately resourced and incentivized to encourage uptake.
- **Selective integration-** It involves teaching basic principles and concepts of AYUSH modalities alongside modern medicine, promoting interdisciplinary understanding among future healthcare professionals.
- **Pilot projects-** It can serve as testing grounds for integrated healthcare models, allowing stakeholders to assess feasibility, efficacy, and acceptability in real-world settings.

Steps taken by Ministry of AYUSH to harmonise AYUSH and modern medicine

- **Co-location strategy-** AYUSH facilities are co-located at Primary Health Centres, Community Health Centres, and District Hospitals, offering patients a choice of medical systems under one roof.
- AYUSH doctors and paramedics receive training from the *Department of Health & Family Welfare*.
- **Financial assistance-** It is provided through the *National AYUSH Mission* (NAM) for the establishment and operation of AYUSH facilities, it helps in infrastructure development, procurement of equipment and medicines, as well as the training of AYUSH personnel.
- **State Annual Action Plan-** States and UTs can obtain financial aid for AYUSH facilities through the State Annual Action Plan as per NAM guidelines.
- **Evidence based approach-** Collaboration between the Ministry of AYUSH and the Directorate General of Health Services for initiatives such as the *National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases, and Stroke* (NPCDCS).
- **Research-** The Ministry of AYUSH collaborates with health services to *manage non-communicable diseases* through research councils, integrating Ayurveda with modern medicine.
 - Central Council for Research in Ayurvedic Sciences (CCRAS),
 - Central Council for Research in Unani Medicine (CCRUM) and
 - Central Council for Research in Homoeopathy (CCRH)
- **Promotion of Yoga-** The *Morarji Desai National Institute of Yoga*, under the Ministry of AYUSH, operates 4 yoga therapy centres in collaboration with various government medical hospitals in Delhi.
- **Siddha system integration:** *The National Institute of Siddha* has signed MoUs with institutions such as *National Institute of Epidemiology* and *AIIMS Raipur* to create a synergy with modern medicine

9. BILATERAL ISSUES

9.1 Significance of Gelephu project

Why in news?

Bhutan is launching the Gelephu Mindfulness City, an interconnected bridge of sustainable development between South and Southeast Asia.

What are the features of Gelephu Mindfulness City?

- **Location-** Gelephu is a town in southern Bhutan, near the India-Bhutan border.
- **Dynamic economic corridor-** It *traverses Assam and Northeast Indian states*, to Myanmar, Thailand, Cambodia, Laos, Vietnam, Malaysia, and Singapore.

- **Integration with nature**- Designed to seamlessly integrate with the natural landscape of Bhutan.
- **Environment sustainability**-The layout takes inspiration from flow of rivers and streams, creating ribbon like neighbourhoods resembling paddy fields that cascade down from the hills to valley.
- **Biodiversity corridors**- To mitigate flooding during the monsoon season, paddy fields will be established along the rivers and tributaries, serving as biodiversity corridors for local flora and fauna while protecting existing and future development.
- **Sustainable design**- Local materials such as wood, stone, and bamboo will be used in construction, inspired by vernacular motifs and traditional Bhutanese architecture.
- **Cultural preservation**- The city aims to preserve and evolve Bhutanese culture, with cultural centres and landmarks incorporated into the design offering visitors a deeper understanding of the country's heritage.
- **Hydroelectric dam**- The *Sankosh Temple-Dam* serves as a symbolic and functional centrepiece of the city, embodying its foundational values of culture and nature.
- **Key destinations**- The city includes key destinations such as new airport, Vajrayana spiritual centre, health care centre, university, greenhouse, cultural centre and market.
- **Carbon neutral city**- It includes non-polluting industries mainly IT, education, hotel and hospital sectors and would be promoted as investment destination and health & wellness hub in the middle of the region.
- **Special Administrative Region**-The city will have executive autonomy and legal independence, aiming to attract businesses that align with Bhutanese values and sustainability.

How the city will improve India-Bhutan ties?

- **Strategic location**- It can be a key node in India's "Act East" policy, which aims to strengthen economic and strategic ties with Southeast Asian nations.
- **Regional connectivity**- It contributes to the India's vision for enhanced engagement with ASEAN countries and the broader Indo-Pacific region.
- **Inter-country cooperation**- It plays a crucial role in India-Japan connectivity plans and in linking India's northeast through Bangladesh to Bay of Bengal and Indian Ocean.
- **Indian Ocean region connectivity**- Integration with connectivity networks like [India-Middle East- Europe Economic Corridor](#) and [Trilateral Highway](#) promotes trade, investment, and cultural exchange across the Indian Ocean region.
- **Economic cooperation**- India's involvement in the project, can contribute to its success and foster socio-economic development in remote regions of West Bengal and Assam.
- **Foster connectivity**- Improve and expand the major roads leading to Bhutan, also to connect two or three of India's border towns with railway lines.
- **Neighbourhood first policy**- India's support reinforces its commitment to bolstering Bhutan's economic development and sovereignty, particularly in the face of external pressures.
- **Hydropower cooperation**- It is bedrock of India's relation with Bhutan, India's cooperation in Gelephu project would further promote government to government cooperation.
- **Partnership for prosperity**- The partnership is based on mutual benefits and respect for each other's priorities, it is visible with the support of India for the Gelephu project.

India-Myanmar-Thailand Trilateral Highway – An infrastructure project aimed at enhancing connectivity & trade within the ASEAN-India Free Trade Area.

Punatsangchu-II hydropower project is expected to be completed in 2024.

10. INTERNATIONAL ISSUES

10.1 Significance of Agaléga Island's development for India

Why in news?

Recently India and Mauritius jointly inaugurated the new Airstrip and St. James Jetty along with six community development projects at the Agaléga Island in Mauritius.

What is the history of India-Mauritius relationship?

- **Historical relation-** The historical ties have been deeply rooted, with a significant influence on the cultural, social, and political aspects of the island nation.
- **Pre-independence period-** Mauritius maintained connections with India during successive Dutch, French, and British occupations. Indian workers began arriving in Mauritius from the 1820's to work on sugar plantations.
- **Abolition of Slavery, 1834-** Following the abolition of slavery by British in 1834, large numbers of Indian indentured labourers were brought to Mauritius.
- **Mahatma Gandhi's visit-** He had a brief stopover in Mauritius en route to India from South Africa in 1901 while awaiting the departure of his ship SS Nowshera.
- Barrister Manillal Doctor, on Gandhiji's suggestion, arrived in Mauritius in 1907 who organized the Mauritian Indian community and laid the foundation for their struggle for political and social rights.
- **Diplomatic relations-** Established in 1948, even before the independence of Mauritius
- **Post-independence-** Mauritius got independence in 1968 and it emphasized the centrality of India in Mauritius' foreign policy.
- **Bilateral trade-** India has been among the largest trading partners of Mauritius since 2005 and the trade has grown by 132% in the last 17 years (2005-2019)
 - Petroleum products have been the largest export item for India.
- **Bilateral agreements - [Double Taxation Avoidance Convention](#),** Bilateral Investment Promotion and Protection Agreement, Extradition treaty etc.,
- **Comprehensive Economic Cooperation and Partnership Agreement (CECPA) -** It was signed in 2021 which is the 1st trade Agreement signed by India with a country in Africa.
- **Development projects-** Indian-assisted projects include the Mahatma Gandhi Institute, the Upadhyay Training Centre, Cyber Tower at Ebene etc.,
- **Cultural relations-** *Indira Gandhi Centre for Indian Culture* in Mauritius is the India's largest cultural centre abroad.
- **Education-** Mauritius is one of the major beneficiaries of the Indian Technical and Economic Cooperation (ITEC) programme.
- **Pan African e-Network Project-** Inaugurated in 2009 connecting Mauritius and other African countries with India through a satellite and fibre-optic network for sharing India's expertise in education and health care.
- **Emergency assistance-** India has traditionally been the 'first responder' for Mauritius in times of crisis, including during the recent Covid-19 and Wakashio oil-spill crises.
- **Visa free regime –** Introduced *by Mauritius for Indian tourists* for a period up to 90 days.
- **Recent developments –** Inauguration of an airstrip & a jetty that India has built on Agaléga, a two-island Mauritian dependency 1,100 km to the north of Port Louis and 2,500 km southwest of Malé.

The arrival of the ship 'Atlas' carrying the first batch of Indian indentured labourers is observed as 'Aapravasi Day' in Mauritius.

The National Day of Mauritius is celebrated on March 12 every year, marking the date when the Dandi Salt March was launched.

What is the significance of Agalega islands development for India?

- **Strengthens diplomatic relations -** It further enhances goodwill and trust between India and Mauritius.
- **Commitment to SAGAR-** The joint development underscores India's commitment to the vision of Security And Growth for All in the Region (SAGAR).
- **Maritime diplomacy-** It fosters India's willingness to assist smaller maritime nations in capacity-building and capability development.



- **Preferred partner in Indian Ocean region-** It demonstrates that India is a friendly country that respects the sovereignty of independent nations, hence Agalega islands will not serve as an Indian military base.

Mauritius stand	Maldives stand
<ul style="list-style-type: none"> • The recent infrastructure development is aimed at improving connectivity and bolstering security. • Agaléga's development is seen as a means to enhance monitoring, counter piracy, terrorism, and illegal activities, and strengthen security. 	<ul style="list-style-type: none"> • India Out campaign- It was started in 2020 as on-ground protests in Maldives and later spread widely across social media platforms. • Pro-China stance- The newly elected government in Maldives is pro-China, that is a threat to India's security is. • Indian technical personnel are being sent to replace military personnel in the Maldives which is part of an agreement between the two countries.

- **Maritime security-** The presence of India on Agaléga Island will enhance monitoring of Mauritius' vast 2.3 million sq km Exclusive Economic Zone (EEZ).
- **Counter china's presence-** China maintains embassies in each of the six islands in the Indian Ocean namely Sri Lanka, Maldives, Mauritius, Seychelles, Madagascar, and Comoros.

In 2017, China opened its first overseas military facility in the Indian Ocean in Djibouti on the Horn of Africa.

What lies ahead?

- India will have to manage its diplomatic relationships while continuously pursuing its strategic interests in Indian Ocean region.
- India's infrastructure improvement in Mauritius, reflects its commitment to assist in the development goals of partner nations while respecting their sovereignty.

10.2 Pakistan's Airstrikes in Afghanistan

Why in news?

Recently Pakistan conducted airstrikes in the Afghan provinces of Paktika and Khost.

Why there is a straining relationship between Afghanistan and Pakistan?

- **Dispute over Durand line-** It serves as the international border between Pakistan and Afghanistan, has fuelled tensions.
- Both sides have historical and territorial claims over Pashtun-dominated regions along the border, leading to disputes and resistance from Pashtun communities, including Taliban factions.
- **Border disputes-** Following the Taliban's return to power in Afghanistan in 2021, they outrightly rejected the Durand Line as a permanent border, further exacerbating tensions with Pakistan.
- **Presence of militant groups-** Pakistan accuses Afghanistan for providing support to militant groups operating against Pakistan.
- The resurgence of the Tehreek-e-Taliban Pakistan (TTP) and its increased attacks within Pakistan have strained relations further.
- **Surge in violence-** A significant increase in terror incidents, in 2023, with Khyber Pakhtunkhwa and Balochistan being the most affected provinces.

Durand Line is a 2,670-kilometre border stretching from China to Iran.



To know about Pakistan's neutrality, Taliban's worry click [here](#)

Why there is disagreement over Durand line?

- In 19th century Afghanistan was used as a buffer by the British against the fear of Russian expansionism.
- Hence it was fixed by *British civil servant Sir Henry Mortimer Durand* and the then Afghan Emir, Abdur Rahman Khan in 1893, the treaty was meant to be for 100 years, but it was *not renewed*.
- It was established in order to fix the respective spheres of influence and also to improve the diplomatic ties between the British establishment in India and the Afghan Kingdom.

- The line puts the *strategic Khyber Pass* on the British side, it cuts through Pashtun tribal areas, leaving villages, families, and land divided between the two spheres of influence.
- It was accepted as the then Indo-Afghan border, the modern state of Afghanistan does not accept IT.
- However, it is internationally recognised as the western border of Pakistan.
- The Pakistani side of the border includes, among others, the North Western Frontier Province, which was renamed Khyber Pakhtunkhwa in 2010.
- *India* also has a small claim to the borderline, through *Pakistan-occupied Kashmir* (about 105 km of the easternmost section of the boundary line).

What triggered the recent air strikes?

- The airstrikes were response to a dead attack on Pakistan by Tehreek-e-Taliban Pakistan (TTP) where a suicide bomber killed seven Pakistani soldiers in North Waziristan.
- The Taliban claimed that Pakistani planes bombed districts in Paktika and Khost provinces, while Pakistan acknowledged the airstrikes targeted the TTP's Hafiz Gul Bahadur Group, which had claimed responsibility for recent attack.
- The Taliban warned Pakistan of severe consequences if such attacks continue, denying allegations of sheltering TTP militants while admitting challenges in controlling some border areas.

10.3 Hong Kong's Safeguarding National Security Bill

Why in news?

Recently Hong Kong passed a new national security law granting the government more power to curb dissent.

What is the status of Hong Kong?

- Hong Kong, at roughly 1,100 sq km, is smaller in size than Delhi, and is home to an estimated 7.4 million people.
- **Sino-British Joint Declaration, 1984**-It was a British colony from 1841 until sovereignty was returned to China in 1997.
- **Basic law**- It is a mini-constitution that affirms the principle of "one country two systems"
- **One country two systems**-Hong Kong remains a semi-autonomous region with the Basic Law for 50 years from 1997.
- **Special Administration Region**- The city enjoys *high degree of autonomy* in all matters *except foreign affairs and defence*, which are responsibilities of the China.
- **Administration**- Hong Kong keeps its own judicial independence, its own legislature and economic system, it has its own land and courts.
- **Protests**- Hong Kong residents have repeatedly protested to protect their Basic Law freedoms, with the first major pro-democracy protest taking place in 2003.
- **Umbrella revolution**- In 2014, over 1 lakh residents protested against China's denial of democratic reforms.
- **Extradition law**- It 2019 Hong Kong people agitated against the proposed law which resulted in the withdrawal of legislation.
 - The proposed extradition law allows suspects accused of crimes such as murder and rape to be extradited to mainland China to face trial.
- The Economist Intelligence Unit rated Hong Kong a "*Hybrid regime*" in 2022. Hybrid regimes are nations with regular electoral frauds, preventing them from being fair and free democracies.

One country two systems
principle is applied to the governance of Hong Kong and Macau, both of which are Special Administrative Regions (SARs) of China.



What are the provisions of 'Safeguarding National Security Bill'?

- **Prevent future protests**- It aims to prevent protests for protection against "potential sabotage."
- **Expansion of punishment**- It broadens the government's ability to penalize acts of treason and insurrection.

- **Harsh penalties**- Punishments for espionage (up to 20 years) and unlawful disclosure of state secrets (up to 10 years).
- **Extraterritorial jurisdiction**- Criminal prosecution of specific acts committed anywhere in the world.
- **Punishment for working with foreign government**- Individuals convicted of collaborating with foreign governments to commit crimes can face up to 10 years in prison, without the need to prove intent to incite disorder or violence.
- **National security law, 2020**- It punishes the protestors with harsh punishments for offences including secession, subversion, terrorist activities, and collusion with a foreign country.
- It allows the prosecution of persons who are not the residents of Hong Kong for committing an offence under the law outside the city.

Taiwan	Hong Kong
It is de facto independent, with its own government, military, economy, and currency, even as it lacks de jure independence.	It is administered by the Hong Kong Special Administrative Region government, which acts as China's proxy.
It is physically separated from China by the Taiwan Straits, it results in <u>weaker mainlandization</u> influence compared to Hong Kong.	<u>Sham chun river</u> is the natural border between Hong Kong and China, suggesting closer proximity and potentially stronger influence from China due to mainlandization.
The <u>Sunflower Movement in 2014</u> emerged in response to a trade agreement with China, which protesters feared would undermine Taiwan's sovereignty and democratic principles	The <u>Umbrella Movement in 2014</u> was sparked by concerns over China's encroachment on the city's political freedoms and the lack of genuine universal suffrage.
The <u>"one China principle"</u> is that People's Republic of China is the sole representative of China, including Taiwan, which is a part of China, US acknowledges this principle	It is administered by <u>"One country two systems"</u> principle which allows for the coexistence of two different economic and political systems within a single country.

10.4 Gaza and Haiti on the brink of famine

Why in news?

Gaza and Haiti are facing imminent famine due to severe hunger caused by conflict and crisis.

What is the status of food security in Gaza and Haiti?

- **Gaza food crisis**- It is due to ongoing war between Israel and Hamas in Gaza, nearly every resident is struggling for food, with half the population facing severe hunger soon.
- As per report from the Integrated Food Security Phase Classification (IPC), famine could strike Gaza between mid-March and May if hostilities continue and essential supplies are not provided.
- **Haiti food insecurity**- It is due to the crisis caused by criminal gangs, approximately 1.4 million people are on the brink of famine, with over 4 million in need of food assistance.
- United Nations warns Haiti as catastrophic hunger has been recorded for first time.

Operation Indravati was launched by India to evacuate its citizens stranded in war-torn Haiti.

What is famine?

- Famine occurs when a country has such a severe food shortage that its population faces acute malnutrition, starvation, or death.
- **Classification**- It is decided using a UN scale called the Integrated Food Security Phase Classification (IPC).
- **Five tier scale**- The IPC utilizes a five-tier scale to assess food access and hunger levels.
 - *Food insecurity - No/minimal, stressed, crisis, emergency and at last as catastrophe or famine.*

- **Famine-** It is the *highest phase* (Phase 5), is declared when an entire population or subgroup faces absolute food inaccessibility, leading to potential short-term death.
- **Criteria for famine-** To officially declare as famine 3 things need to happen in a specific geographic area

- At least 20% of households face an extreme lack of food
- At least 30% of children suffer acute malnutrition
- Two adults or four children per 10,000 people die each day "due to outright starvation or to the interaction of malnutrition and disease".



- **Famine declaration-** It would be made by top United Nations officials based on the IPC criteria.
 - It was previously declared by IPC in Somalia (2011) and South Sudan (2017)
- **Risk of famine-** Afghanistan, the Democratic Republic of Congo, Ethiopia, Pakistan, Somalia, Syria and Yemen are at the risk of famine.

Factors of famine

- **Hunger-** It is described as the sensation when the body needs food, it becomes a concern when people lack access to adequate nutrition over time.
- **Malnutrition-** It is a medical condition from not receiving proper calories, leading to health issues.
- Severe acute malnutrition is critical, especially in children.
- **Starvation-** It refers to extreme suffering or death due to no food intake, leading to the body consuming its own resources, ultimately causing organ failure and death without intervention.
- **Vulnerable population-** Children younger than 5, pregnant and breastfeeding women, the elderly and people with underlying health conditions are most at risk from malnutrition.
- In acute crises like that seen in Gaza, malnutrition affects the youngest children first.

What are the common causes of famine?

- **Conflict-** It leads to population displacements & disrupts people's traditional ways of dealing with food scarcity.
- **Natural hazards-** Drought, flooding, and cyclones, as well as crop pests, affect food access and availability.
- **Decline in economy-** Disruptions to food trade, food price inflation, and currency volatilities.
- **Human epidemics-** Diseases such as measles outbreaks affects the food security and nutrition.
- **Animal diseases-** Affect the food availability of households whose livelihoods depend on their livestock.
- **Pests-** Desert Locusts or Fall Army Worm, can devastate crops and cause higher levels of acute food insecurity.
- **Inadequate humanitarian response-** When a shock occurs, and the humanitarian response is not sufficient, well-coordinated, or fast enough, the affected populations can only cope for a short period

10.5 UNSC resolution on Gaza ceasefire

Why in news?

Recently UNSC resolution 2488 has been passed calling for an immediate ceasefire in Gaza.

Ongoing conflict in Gaza

- **Gaza strip-** It is home to about 2 million Palestinians, many of them displaced after leaving or being driven from [Israel](#) during the War of Independence.

- **Armistice agreement**- Signed during Arab-Israeli war 1948, Gaza strip administered by *Egypt*.
- **Suez crisis, 1956**- Israel captured Sinai Peninsula & Gaza Strip but withdrew in 1957.
- **1967 six day war**- Israel gained territory including *Sinai Peninsula, Gaza Strip, West Bank, East Jerusalem and Golan Heights* (Syria).
- **Camp David Accords 1978**- Established after Yom Kippur War 1973, which brought an end to the conflict between Israel and Egypt.
- **2023 war**- Hamas, a terror group has launched surprise attack on Israel on October 7, 2023.
- Israeli military embarked on an extensive aerial bombardment of the Gaza Strip followed by a large-scale ground invasion.

What are the key highlights of the resolution 2488?

- UNSC adopts a resolution tabled by its 10 non-permanent members (E-10) demanding a ceasefire in Gaza by a vote of 14 in favour to none against, with United States abstained from voting.
- The urgency of the issue is underscored by the recent veto by Russia and China of a US-sponsored resolution that sought an immediate and sustained ceasefire.
- It meant that Israel was now “under an obligation, essentially, to stop its military campaign for the next 15 days” – the duration of the remainder of the Muslim holy month of Ramzan,
- **Russia**- UNSC rejected a Russia-proposed amendment that would have called for a permanent ceasefire.
- **Israel’s stand**- Israel said that the draft’s lack of condemnation of Hamas is “a disgrace”.
- **Palestine**- They welcomed the adoption of the resolution, saying it was a step in the right direction.

What is the outcome of the resolution?

- **Legally binding**- As per UN Charter, resolutions passed by the UNSC are indeed legally binding on all 193 member nations.
- **Restore humanity**-The resolution demands not only a ceasefire but also the immediate and unconditional release of all hostages.
- **Relief to Gaza**- As more than 90% of Gaza’s 2.3 million residents have been displaced, and conditions under Israeli siege and bombardment have pushed Gaza to the brink of famine.
- **Famine threat**- As per report from the Integrated Food Security Phase Classification (IPC), [famine](#) could strike Gaza between mid-March and May if hostilities continue and essential supplies are not provided.
- **Enforcement challenges**-Despite the binding nature of such resolutions, enforcement remains a challenge and often depends on the willingness of the conflicting parties to comply and the UNSC’s ability to enforce its decisions.
- **Legal validity**- South Korea has raised concerns about the legal validity of resolution citing the absence of the word “decide” and its non-adoption under the charter.

G.S PAPER III

11. ECONOMY

11.1 Small Scale LNG (SSLNG)

Why in news?

India’s largest gas utility GAIL (India) Limited recently commissioned the country’s first SSLNG unit at its Vijaipur complex in Madhya Pradesh.

What is small scale LNG?

- **Liquefied Natural Gas**- A natural gas cooled to about -161°C , reducing its volume by 600 times and making it half the weight of water, transported globally by ship and regasified at the destination for pipeline distribution.

- **Small scale-** It involves the liquefaction and transportation of natural gas on a smaller scale using specialized trucks and vessels, catering to areas *without pipeline connectivity*.
- **Utility-** It supplies LNG in liquid form to *industrial and commercial consumers*, with options for regasification or direct use as fuel.
- **Regasification-** LNG can be regasified using small vaporizers, allowing it to be supplied as compressed natural gas (CNG) for vehicles or piped gas for industrial and commercial consumers
- **Direct use-** In liquid form, it is delivered directly to end users without the need for regasification.
- **Supply chain-** The SSLNG chain can originate from large-scale LNG terminals or small liquefaction plants near natural gas sources, like GAIL's Vijaipur unit.
- **GAIL's Vijaipur Complex-** A small liquefaction plant is established at a site with abundant natural gas, making it GAIL's largest gas processing location.

Vijaipur facility, SSLNG

- It is equipped with SSLNG skids that have a total capacity of 36 tonnes per day.
- **Treatment skids-** The natural gas undergoes initial processing in the Zeolite Pre-treatment Skids (ZPTS) at about 15 bar pressure to *remove impurities* like nitrogen, water, sulphur, and CO₂.
- **Liquefaction skids-** The gas is then compressed to approximately 260 bar using a four-stage compressor and cooled down to -60 to -70 degrees Celsius via a *propane-based refrigeration system*.
- It is then expanded, dropping the temperature below -140 degrees Celsius to liquefy it.
- **Cryo boxes-** These are used for the actual conversion of natural gas to LNG.
- **SCADA system-** An automated web-based Supervisory Control and Data Acquisition (SCADA) system controls the LNG unit.
- **Distribution-** The produced LNG is distributed through cryogenic LNG tankers for use in city gas distribution networks and proposed LNG filling stations for vehicles.

Why there is a need of SSLNG?

- **Gas-Based Economy-** India aims to raise the natural gas share to 15% by 2030 from the current 6%.
- **Cleaner alternative-** The natural gas is considered less polluting to conventional hydrocarbons like oil and coal as they produce fewer emissions of GHG gases and air pollutants.
- **Energy security-** India can reduce its dependence on imported oil as it imports around 85% of oil by diversifying its energy sources and increasing the use of domestically available natural gas.
- **Economy benefits-** It could lead to significant foreign exchange savings by substituting diesel with domestically produced or imported LNG.
- **Transition fuel-** It can complement renewable energy sources such as solar, wind power by providing reliable and flexible energy supply.
- **Cost effective-** Using LNG as a fuel for heavy-duty trucks and buses can result in cost savings for transport operators and fleet owners, potentially lowering operational expenses.
- **Global competitiveness-** India can potentially lower energy costs for consumers and improve economic competitiveness by increasing the share of natural gas in its energy mix.
- **Distribution challenges -** Petronet, a public limited company has pushed for LNG, it supplied LNG to Kochi terminal which was struggling due to lack of pipeline connectivity to major consumers.

What are the issues with LNG?

- **Energy intensive-** LNG production and transportation require significant amounts of energy, contributing to its overall carbon footprint. From extraction to liquefaction, transportation, and regasification, each stage involves energy-intensive processes.
- **Methane leakage-** The complexity of LNG production and transportation increases the risk of methane (a potent GHG) leakages across the supply chain.
- **High emission intensity-** LNG emits approximately twice as much greenhouse gas as ordinary natural gas due to additional energy requirements and methane leakage risks.

Challenges	Solutions
There is limited availability of LNG-powered vehicles in India	Companies like Petronet and GAIL are working with commercial vehicle manufacturers to promote the development and adoption of LNG-powered trucks and buses.
The absence of a comprehensive LNG retail network is another challenge	The companies are establishing LNG dispensing stations along major highways to facilitate refuelling for LNG-powered vehicles.
LNG-powered vehicles may have higher initial costs compared to diesel vehicles.	The lower fuel costs and potential government incentives can help offset these initial expenses and make LNG vehicles more financially viable.
Absence of LNG vehicle financing ecosystem.	Collaborate between financial institutions, vehicle manufacturers, and government agencies to provide financing options and incentives for LNG vehicle purchases.

11.2 RBI's Framework for Climate-related Financial Risks

Why in news?

Recently Reserve Bank of India (RBI) has proposed a Disclosure framework on Climate-related Financial Risks, 2024 to address the financial risks associated with climate change.

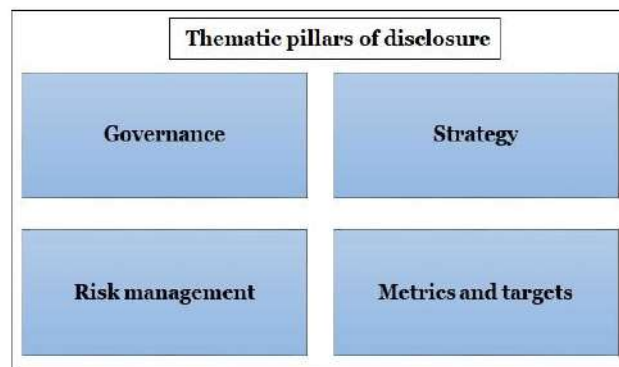
Why there is a need of disclosure framework by RBI?

- **Credit risk-** If customers' asset values decline due to climate-related factors such as damage from extreme weather events), banks could face credit risk this may impact borrowers who struggle to repay debt, leading to potential losses for lenders.
- **Supply chain impact-** Disruptions in supply chains due to climate events can affect operations, profitability, and viability which in turn impacts borrowers' ability to service debt.
- **Liquidity demand-** Consumers may need funds to cope with extreme weather events or other climate-related challenges which leads to liquidity demand.
- **Asset liquidation-** Consumers may perceive difficulties in liquidating assets affected by climate events, affecting their capacity to raise funds.
- **Claims exposure-** Banks face the risk of not meeting exposure to claims from customers seeking to recover climate-related losses, it is particularly risky in vulnerable sectors such as agriculture, tourism etc.,
- **Market risks-** A shift in investor preferences toward sustainable investments can impact financial markets.
- Adverse climate effects on economic activity can lead to market risks.
- **Vulnerable NBFCs-** Non-Banking Financial Corporations extend significant credit to sectors like power and automobiles (both with high carbon footprints) and MSMEs that rely on conventional fuel.
- The interconnectedness of these sectors raises concerns about potential "large-scale default" leading to "macro financial instability".

What are the key highlights of disclosure framework by RBI?

- **Climate related financial risk-** It means the potential risks that may arise from climate change or from efforts to mitigate climate change, their related impacts and economic and financial consequences.
- **Purpose-** The regulated entities must disclose information about their climate-related financial risks and opportunities for the users of financial statements.
- **Disclosure of information-**
 - Identified climate-related risks and opportunities over short, medium and long term.
 - The impact of climate-related risks and opportunities on their businesses and financial planning.
 - The resilience of the RE's strategy taking into consideration the different climate scenarios.
- **Applicability-** It shall be applicable to entities, collectively referred to as Regulated Entities (REs)
 - All Scheduled Commercial Banks (*excluding Local Area Banks, Payments Banks and Regional Rural Banks*)

- All Tier-IV Primary (Urban) Co-operative Banks (UCBs)
- All All-India Financial Institutions (viz. EXIM Bank, NABARD, NaBFID, NHB and SIDBI)
- All Top and Upper Layer Non-Banking Financial Companies (NBFCs).
- **Governance**- Detail the governance processes and procedures used by the RE to identify, assess, manage, mitigate, monitor and oversee climate-related financial risks and opportunities.
- **Strategy**-It should detail the RE’s strategy for managing climate-related financial risks and opportunities.
- **Risk management**- Identify, assess, prioritize and monitor climate-related financial risks and opportunities, including whether and how those processes are integrated into and inform the RE’s overall risk management process.



Risk categorization	
Physical risks	Transitional risks
<ul style="list-style-type: none"> ● <u>Direct consequences</u> of extreme weather events can lead to economic costs and financial losses. ● <u>Long-term shifts</u> in climate patterns can affect the value of assets, particularly immovable property serving as collateral for loans. ● Damage to properties or data centers can <u>disrupt banking operations</u>. ● Degradation of soil quality or marine ecology can <u>indirectly affect economic activities</u>. 	<ul style="list-style-type: none"> ● Risks associated with the transition to a low-carbon economy, including <u>policy changes</u> favouring clean energy or technological innovations. ● <u>Downgrades in credit ratings</u> or financial valuation due to climate mitigation policies. ● <u>Depreciation</u> of assets dependent on older, high-carbon technologies. ● <u>Shifts in public sentiment</u> towards climate-friendly investments, impacting demand for certain financial products.

- **Metrics and targets**- It should detail the RE’s performance in relation to its climate-related financial risks and opportunities, including progress towards any climate-related targets it has set, and any targets it is required to meet by statute or regulation.

11.3 Kerala’s Financial Crisis

Why in news?

Kerala government has approached the Supreme Court claiming the Centre’s borrowing limit restrictions violate fiscal federalism.

How the State’s borrowing is regulated in India?

- **Article 293**- It grants fiscal autonomy to states, allowing them to borrow only from within the territory of India on guarantee from the Consolidated Fund of the State.
- **7th Schedule**- The "Public Debt of the State" falling under the State List, giving states exclusive jurisdiction over this matter.
- **FRBM Act 2003**- The Fiscal Responsibility and Budget Management Act 2003 was enacted to ensure intergenerational equity in fiscal management, it sets limit on fiscal deficit and borrowing for both the Central and State governments.
 - The borrowing limits set as 3% of the Gross State Domestic Product (GSDP).
- **Finance Commission**- It periodically makes recommendations regarding fiscal matters, including borrowing limits for States, it is crucial for determining the borrowing ceilings for states.
- **State Fiscal Responsibility Acts**-Each State may have its own Fiscal Responsibility Act, which further defines the limits and guidelines for borrowing and fiscal management within the State.

- **Role of Centre-** It plays a significant role in overseeing fiscal matters, including approving borrowing limits for States based on recommendations from bodies like Finance Commission.
- It can influence the State's borrowing limits through legislative changes, or by exercising discretion in granting additional funds or relaxing borrowing constraints in exceptional circumstances.

Why Kerala is facing financial crisis?

- **Uncontrolled fiscal deficit-** Kerala has struggled to contain its fiscal deficit within the mandated limits.
- **Debt servicing-** The state's borrowing is used for ongoing expenses rather than profitable investments, affecting its credit rating.
- **Low revenue generation-** The State's revenue generation may not be sufficient to meet its expenditure requirements, the fluctuations in economic activity and external factors impact tax collections.
- **High recurrent expenditure** – Salaries, pensions and subsidies which contributes to financial strain.
- **Natural disasters-** It cause widespread damage to infrastructure and disrupt economic activities.
- **Impact of pandemic-** COVID-19 pandemic has exacerbated Kerala's financial challenges, the economic slowdown resulting from lockdowns and restrictions has affected revenue streams while increasing healthcare and social welfare spending have added to expenditure pressures.

The average fiscal deficit of Indian States is 2.5%, in 2021-22 Kerala's fiscal deficit was 4.17%

What is the stand of Kerala and Centre?

Kerala's stand	Centre's stand
<ul style="list-style-type: none"> • Centre's amendments to the FRBM Act, 2003, infringe upon its fiscal autonomy and also violating the 7th Schedule of the Constitution. • One time package- It was suggested by Supreme Court for Kerala to help with funds shortage while imposing stricter conditions for the next financial year. • The State rejected Rs 5000 crore loan as it would need around 10,000 crore rupees as loan. 	<ul style="list-style-type: none"> • The Centre argues that Kerala's financial woes are due to the state's mismanagement and extravagance, not the borrowing limit. • 15th Finance Commission- It labelled Kerala as "highly debt stressed," with a history of breaching fiscal deficit targets and high expenditure on salaries. • Conditions-The Centre said its one time package offer (Rs 5000 crore) comes with strict conditions. • The borrowing in the first 9 months of FY25 would be issued quarterly, up to 25% of the eligible amount, after deducting the early special concession of Rs 5,000 crore.

12. AGRICULTURE

12.1 India-Thailand Spat at WTO

Why in news?

In the recent [WTO MC13](#) Thailand claimed that India's public stockholding program is distorting the global market and violating the World Trade Organisation rules.

What is the issue?

- Thailand criticized India's rice procurement program, alleging that it was aimed at capturing the export market rather than benefiting the public.
- Thailand, a part of Cairns group argues that India's program distorts global food prices, and harms the food security of other nations.
- **Trade distortion-** It is a situation where prices and production are higher or lower than levels that would usually exist in a competitive market
- **Breached de minimis limit-**As per WTO, nearly all domestic support measures are considered to distort such trade, but they are permitted to a certain limit called the 'de minimis' limit.

The de minimis limit under WTO's Agreement on Agriculture is 10% for developing countries, but India exceeded this limit with subsidies worth 13.7%

World Trade Organization

- WTO is the only international organization that deals with the rules of trade between countries.
- Establishment**- It was created in 1995 superseding the 1947 General Agreement on Tariffs and Trade (GATT).
- Marrakesh Agreement**- WTO officially commenced under the Marrakesh Agreement, replacing the General Agreement on Tariffs and Trade (GATT).
- Created by** - Uruguay round of negotiations and established in 1995.
- Members** - 164 members representing 98% of world trade.
- Ministerial Conference**- It is the topmost decision-making body of WTO which usually meets every two years.
- General Council** - It is the WTO's highest-level decision-making body that has representatives from all member governments and meets regularly to carry out the functions of the WTO.

WTO	
Founded in	1995
Headquarters	Geneva, Switzerland
India's membership	India is a member

What is India's stand?

- Public stockholding program**- It is a policy tool under which the government procures crop like rice and wheat from farmers at a [Minimum Support Price \(MSP\)](#) and stores and distributes food grains to the poor.
- Support farmers**- India need to support its small farmers through subsidies there is already ongoing issue of [farmer protest 2.0](#) where they demands legal guarantee of MSP, debt waiver etc.,
- Outdated subsidy calculations**-India challenges the way subsidies are calculated at the WTO, arguing that the calculations are based on a fixed and outdated 1986-88 price, it seeks changes in the subsidy calculations during WTO negotiations on agriculture.

WTO's Agreement on Agriculture

Types of subsidies	About
Green box	<ul style="list-style-type: none"> Domestic support allowed without limits as it does not distort trade.
Blue box	<ul style="list-style-type: none"> Minimally trade-distorting, so subject to limitation.
Amber box	<ul style="list-style-type: none"> Distort trade and therefore subject to reduction commitments. Developed countries- Subsidy up to 10% of their agriculture's value of production and up to 5% for developing countries.
Development box	<ul style="list-style-type: none"> Allows developing countries in providing domestic support to provide input subsidies to low income or resource poor farmers and investment subsidies

- Less subsidy than developed countries**- India asserts that its agricultural subsidies (300 dollars per farmer) are comparatively modest when compared to the substantial subsidies provided by developed nations like the US (40,000 dollars per farmer) and the European Union.
- Temporary protection under peace clause** – For developing countries but comes with conditions like extensive notification requirement which makes its implementation challenging.
- Permanent solution**- India emphasizes the need for a permanent solution regarding its public stockholding program for food grains to ensure food security for large and vulnerable population.

Peace clause is provided under Bali Agreement in 2013 which protects developing countries from being challenged for breach of subsidy levels.

What lies ahead?

- The 13th Ministerial Conference of the WTO held in Abu Dhabi concluded without reaching a decision on permanent solution for public stockholding of food.

- India cannot leave WTO agreements as it could pose challenge for India and other developing nations in disciplining subsidies provided by developed countries.
- The way ahead is to reach a permanent solution on food subsidy as quoted by India in its MC13 WTO agenda.

Cairns group

- **About-** It is a coalition of 20 agricultural fair-trading countries which together account for *almost 30% of the world's agricultural exports*.
- **Launch year-** 1986 in *Cairns, Australia* just before the beginning of the Uruguay Round.
- **Vision-**
 - Deep cuts to all tariffs including tariff peaks and removal of tariff escalation
 - Elimination of all trade-distorting domestic subsidies
 - Elimination of export subsidies and clear rules to prevent circumvention of export subsidy commitments.
- **Member countries-** Argentina, Australia, Brazil, Canada, Chile, Colombia, Costa Rica, Guatemala, Indonesia, Malaysia, New Zealand, Pakistan, Paraguay, Peru, the Philippines, South Africa, Thailand, Ukraine, Uruguay and Vietnam.



12.2 White Revolution 2.0

Why in news?

Recent [Household Consumption Expenditure Survey \(HCES\) 2022-23](#) highlights the growing importance of White Revolution 2.0 as the top food item both in urban and rural areas is milk.

Operation flood- White Revolution 1.0

- **Origin-** The [success of green revolution](#) enabled India to launch operation flood.
- **Launch year-** 1970
- **National Dairy Development Board-** It introduced Operation Flood to create a national grid that could streamline the production and distribution of milk across the country.
- **Aim-** To increase milk productivity and ensure competitive market prices for milk.
- **Objectives-** Increase milk production, Improve rural income, Provide affordable milk to consumers.
- **Dr.Vergheese Kurian-** He is called as the Father of the White Revolution as he played a pivotal role in its success and also the founder of Amul, the largest milk producer in India.
- **Phase I(1970–80)-** It was financed by the European Economic Community (EEC) through the World Food Program (WFP) to set up milk cooperatives.
- **Phase II(1981-85)-** It led to the dairy development in the states of Karnataka, Rajasthan and Madhya Pradesh.
- **Phase III (1985-96)-** The emphasis was now on veterinary care and better breeding practices.
- **Outcome-**
 - It transformed the dairy-deficient nation into the global leader in milk production.
 - Women dairy farmers played a crucial role in India's dairy transformation.
 - As per World Bank report "Operation flood can be viewed as a 20 year experiment confirming the rural development vision".

Why there is a need of white revolution 2.0?

- **Inflation-** The all-India modal price of milk has risen significantly, from Rs 42 to Rs 60 per litre over the last five years.

- **Reduction in demand-** Higher prices may result in consumers cutting back on their milk consumption, impacting the overall demand for dairy products.
- **Increased production cost-** The costs associated with fodder, feed, and raw materials have seen a significant increase, prompting dairies to raise procurement prices paid to farmers.
- **Impact on consumers-** Inflation and increased production cost falls on consumers, as there is a limit on how much more consumers can pay for milk before it causes demand destruction.

How India can implement white revolution 2.0?

- **New breeding technologies-** The genetic improvements like sex sorted semen, embryo transfer and in vitro fertilisation can produce more female calves and high yielding cows from existing genetic resources.
- **Sex sorted semen-** There is a 90%-plus probability of only female calves being born, as against 50:50 with conventional semen.
- **Adoption of embryo transfer (ET) technology-** It exploits the high genetic merit (HGM) of existing cows, resulting in multiple calves from a single HGM cow.
- **In vitro fertilization (IVF) -** It is the method of mature ova outside the cow's body, leading to higher embryo production and more calves.
- **Bovine breeding centres-** This would breed a nucleus herd of high-genetic-merit bulls and cows through production of superior semen and in vitro-fertilized embryos for artificial insemination (AI) or transferring to farmers' animals.
- **Animal Nutrition-** There is a need to encourage farmers to cultivate high-yielding protein-rich green fodder grasses.
- **Lower feed cost-** This can be done by reducing the reliance on expensive compound like cattle feed and oil-meal concentrates.
- **Balanced diet-** Farmers are encouraged to implement Total Mixed Ration (TMR) plants to provide a balanced diet in a ready to eat farm, saving farmers the cost of purchasing and storing fodder separately.
- **Lower overall cost-** The government should emphasis on lowering the overall costs of producing milk at the farm-gate, rather than solely relying on increasing procurement prices.

Steps taken by India to promote milk production

- **Rashtriya Gokul Mission** – It was initiated in 2014 with a focus on the conservation and development of indigenous breeds and improve their genetic makeup.
- **E-Pashu Haat-** An e-market portal connecting breeders and farmers to provide quality- disease free bovine germplasm.
- **Pashu Sanjivni-**An Animal Wellness Programme with the provision of animal health cards along with UID identification.
- **National Animal Disease Control Programme** – It was launched in 2019 to control and eradicate the Foot & Mouth Disease (FMD) and Brucellosis amongst the livestock
- **Animal Husbandry Infrastructure Development Fund (AHIDF)-**It aims to incentivize the investments to establish dairy and meat processing and value addition infrastructure and animal feed plants.
- **National Dairy Development Board-** It was launched in 1965 as a premier institution to accelerate the pace of dairy development on cooperative lines in the country.
- **National Program for Dairy Development-** It aims to strengthen infrastructure for the production of high-quality milk as well as for the procurement, processing, and marketing of milk and milk products.

12.3 Pakistan's Piracy of Indian Basmati Rice Varieties

Why in news?

Indian Agricultural Research Institute (IARI) scientists and exporters have red-flagged the “illegal” cultivation of its improved basmati rice varieties in Pakistan.

Status of India's basmati rice industry

- Basmati is long grain aromatic rice grown for many centuries in a specific geographical area, in the Himalayan foothills of the Indian sub-continent,
- **Market size-** As of 2023, the market size reached Rs 490.5 billion and is projected to grow to Rs 533.6 billion by 2032.
- **Cultivation areas-** Jammu and Kashmir, Himachal Pradesh, Punjab, Haryana, Delhi, Uttarakhand and western Uttar Pradesh.
- **Major export destinations-** Saudi Arab, Iran, Iraq, United Arab Emirates and Yemen
- **Varietal improvement-** They have enhanced yield, quality, and resistance to pests and diseases. Example- Pusa Basmati 1509, Pusa Basmati 6 etc.,

What is the issue?

- **Illegal cultivation-** IARI improved basmati rice varieties are being unlawfully grown in Pakistan.
- **Violates IPR-** Illegal cultivation in Pakistan constitutes an infringement of intellectual property rights as they are protected under India's Protection of Plant Varieties and Farmers' Rights Act.
- **Market competition-** India's basmati rice exports are likely to fall in 2024 as Pakistan is offering the grain at competitive prices.
- **Loss of quality-** Unauthorized cultivation in Pakistan may result in quality dilution if not grown under controlled conditions, potentially affecting India's reputation as a supplier of premium basmati rice.
- **Undermine GI protection-** Being a Geographical Indication (GI) product, and its cultivation is restricted to specific regions in India, any cultivation outside these designated areas undermines the GI protection.

Key provisions of Protection of Plant Varieties and Farmers' Rights Act, 2001

Aim	<ul style="list-style-type: none"> • To establish a system for the protection of plant varieties, the rights of farmers & plant breeders, and to encourage the development & cultivation of new varieties of plants.
Breeders' rights	<ul style="list-style-type: none"> • Exclusive rights to produce, sell, market, distribute, import, or export. • They can also appoint agents or licensees and seek civil remedies for infringement.
Researchers' rights	<ul style="list-style-type: none"> • They may use registered varieties for research, including as a source for developing new varieties, though repeated use requires the breeder's permission.
Farmers' rights	<ul style="list-style-type: none"> • Farmers who develop new varieties can register and protect them. • They can save, use, sow, re-sow, exchange, share, or sell their farm produce, except for branded seeds of protected varieties. • Eligible for recognition, rewards, and compensation related to plant genetic resources conservation.
National Gene Fund	<ul style="list-style-type: none"> • Support the conservation and sustainable use of plant genetic resources.
National Gene Bank	<ul style="list-style-type: none"> • Store the seed material submitted by the breeders of the registered varieties.
Benefit sharing	<ul style="list-style-type: none"> • It allows citizens of India, firms, or non-governmental organizations (NGOs) formed or established in India to submit claims for benefit sharing. • Upon assessment of the claim, the variety breeder is required to deposit the determined amount into the Gene Fund, which serves as a repository for benefit-sharing payments.
Align with WTO	<ul style="list-style-type: none"> • The Act aligns India's obligations under Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement of the World Trade Organization (WTO), aiming to stimulate investment in agriculture, accelerate agricultural development, and facilitate the growth of the seed industry

What India can do to address the illegal cultivation?

- **Diplomatic engagement**- India should engage diplomatically with Pakistan, urging Pakistan to enforce intellectual property laws to prevent such infringements.
- **International forums**- India can raise the issue of Intellectual Property Rights violation at World Trade Organization (WTO) so that it can garner support for addressing the violations.
- **Proper monitoring**- Strengthening monitoring mechanisms to detect and prevent the illegal trade.

13. ENVIRONMENT

13.1 Single Use Plastic

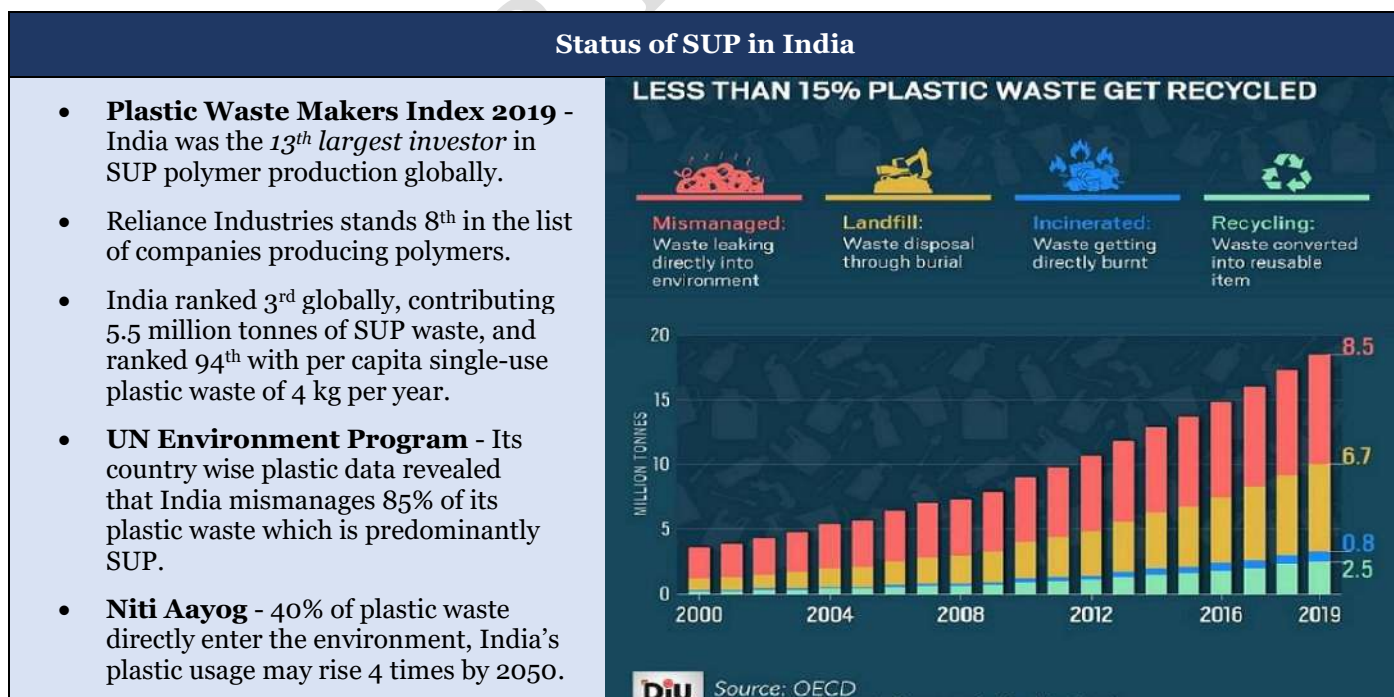
Why in news?

The Single Use Plastic (SUP) plastic ban in India addresses roughly 11% of the entire gamut of single-use plastic waste.

What is the issue?

- India announced that it would phase out single-use plastics by 2022 in 2018.
- Ministry of Environment, Forest and Climate Change (MOEFCC) issued the ban on specific SUP items through the Plastic Waste Management Amendment Rules, 2021, it came into effect from July 1, 2022.
- **Selected ban**- Only 19 selected SUP items based on their utility and impact.
- **Ambiguity**- The criteria used for listing ban on SUPs items were unclear as certain items with high environmental impact scores were not considered.
- **Lack of clarity**- India's definition does not distinguish between necessary and unnecessary plastics or between recyclable and non-recyclable plastics.
- **Presence of non-recyclable items**- India allows multi-layered packaging to still circulate on the basis of the rationale that we do not have alternatives for those plastics.

India defined single-use plastic for the first time, as a "plastic item intended to be used once for the same purpose before being disposed of or recycled."



What are the steps taken by government to curb SUP?

- **Ban on SUP**- Since July 1, 2022, India has banned the manufacture, import, stocking, distribution, sale, and use of single-use plastic items with low utility and high littering potential.

- **Plastic Waste Management Amendment Rules, 2021** - It prohibits identified single use plastic items by 2022, the thickness of plastic carry bags increased from 50 to 75 microns from 2021 and to 120 microns.
- **Plastic Waste Management Amendment Rules, 2022** - It provide a framework to strengthen the [circular economy](#) and develop new alternatives of plastic packaging waste.
- **Comprehensive Action Plan**- Central Pollution Control Board (CPCB) issued a plan to all the State Pollution Control Boards (SPCBs) and the Pollution Control Committees (PCCs).
- It covers both demand side and supply side interventions.
- Promoting alternatives to single-use plastics (SUPs) and creating awareness on phasing out SUPs.
- CPCB monitoring module for compliance on elimination of SUPs and CPCB grievance redressal app.

Survey on SUP ban in India - Centre for Science and Environment

- Decline in awareness campaign.
- Weak enforcement on ban of SUP by SPCB and local governments.
- Insufficient measures to halt production of SUPs at the source.
- There is a lack of updates and progress as mentioned in comprehensive action plan.
- Discrepancy in environmental compensation as the production and selling units still continue their operation.
- Lack of comprehensive data on fines and manufacturers of SUPs.
- Carry bags below 120 microns persist as the most widely circulated banned single-use plastic item, constituting almost a third of all such items.
- Plastic alternatives market is severely underdeveloped.

What can be done?

- **Capacity Building**- Training to the government officials for effective inspections.
- **Mandatory public disclosure**- The States and local governments should provide *quarterly updates* on environmental compensation levied and units shut/fined on their websites.
- **Promote transparency**- CPCB should share data collected from private players through the Extended Producer Responsibility (EPR) and state authorities through the Single-Use Plastic (SUP) monitoring module.
- **Ban plastic carry bags**- Impose a nationwide ban on plastic carry bags irrespective of thickness similar to the successful bans in Tanzania, Rwanda and [Himachal Pradesh](#) (India).
- **Invest in SUP alternatives**- Provide subsidies and reduce tax rates for alternatives.
- **Tamilnadu model**- *Meendum Manjappai* scheme is the awareness campaign on using yellow cloth bags and discard plastic bags.
- **Kerala initiative**- Reusables in government offices switch to ink pens and steel cutlery to ensure articles like plastic water bottles, disposable teacups and plastic carry bags are no longer used.

Himachal Pradesh through its Non-biodegradable Garbage Control Act of 1998 has completely banned the production, distribution, storage and use of carry bag

13.2 Bengaluru's Water Crisis

Why in news?

Bengaluru, India's 3rd most populous city is facing the worst potable water crisis in its nearly 500-year history.

What is the issue?

- Bengaluru was once known as the "[the necklace of lakes](#)".
 - **Important lakes** - Dharmambudhi, Shoolay, Akkithimanhalli, Sampangi, Bellandur, Hebbal, Madiwala, Ulsoor, Lalbagh, Agara Lake, etc.

Day Zero refers to the "day when a city's taps run completely dry, forcing people to stand in queues to collect their daily quota of water."

- **Important rivers** - Vrishabhavathi, Arkavathi, Dakshina Pinakini, Chinnar, Suvarnamukhi, Cauvery and Netravathi rivers.

- At present, the city is facing a severe water shortage.

What led to severe shortage of water in Bengaluru?

- **Lack of rainfall** - There hasn't been enough rain thereby causing the water levels in the Cauvery River to drop.
- As per the Karnataka State Natural Disaster Management Centre, the water levels in Cauvery Basin reservoirs like Harangi, Hemavathi, KRS, and Kabini are at 39% of their total capacity.
- **Geography** – Bengaluru is part of the *semi-arid zone* and falls in the *rain shadow* of the Western Ghats, without a perennial source of water.
- Tributaries of the Cauvery, such as the **Arkavathy and Vrishabhavathi** were seasonal.
- **Changing climatic conditions** - The plunging groundwater levels, with more than 3,000 borewells drying up, have caused the current water crisis is also adding to the issue of water shortage.
- **Urbanisation and industrialization** - Population explosion, Encroachment, unplanned urbanisation, unfriendly industrial policies have also resulted in this problem.
 - Bengaluru, up until 1961, had 262 lakes which has now come down to 81.
- **Pollution** - In Bengaluru (once known as the city of 1,000 lakes), many lakes are polluted and marked as Category D or E lakes.
- **Other issues** - Poor Rainwater Harvesting (RWH) in the city has also added to the problem.
 - Bengaluru requires 2,100 million litres per day (MLD) of potable water, of which 1,450 MLD comes from the Cauvery River.

What efforts have been taken in this regard?

- The Karnataka government has banned the use of drinking water for gardening and other purposes.
- It has ordered supply of water in huge tankers to Bengaluru from adjoining towns.
- A substantial budget of Rs 131 crore is allotted by civil bodies for drilling borewells in priority zones.
- To control water prices, all private water tankers and borewells are instructed to register with the BWSSB.
- The phase 5 of Cauvery **project**, is about to start that aims to provide 110 liters of drinking water daily to 12 lakh people that is expected to be completed by May 2024.
- **Karnataka Water Policy 2022** had suggested strategies like re-cycling, re-use of treated waste water and rain water harvesting and industrial water use planning.

India was one of the first signatories to the First World Convention on Waterbodies and Conservation held in Ramsar, Iran in 1971.

What lies ahead?

- **RWH** - According to a vision document, '**Mattongu Cauvery**' prepared by the Centre for Public Problem Solving, harvesting just 10% of rainwater in the Bangalore Metropolitan Region will increase the water supply in the region by nearly 100%.
- Minor changes can be made to the building code to enable open spaces to be more permeable to water can help promote groundwater recharge.
- **People centred planning** - Approaches towards water governance should be more human-centric rather than tech-centric to help common people understand what is happening with respect to water planning.
- **Local water management** - There is a need to identify local watersheds, mark their boundaries, and create a water balance plan to use the local water more effectively.
- **Use of treated water** - Given Bengaluru's limited water resources, systematic use of treated water for most purposes is crucial in bringing down the demand for fresh water.
- Dual piping should be mandatory in all new constructions to ensure treated water is used for tertiary purposes.
- **Lake rejuvenation** – It is crucial in ensuring better water seepage to recharge the groundwater tables.

13.3 Impacts of Invasive Alien Species

Why in news?

India, with its largest land area in the group of seven countries in South Asia, tops the list with 185 invasive alien plants.

Status of invasive plant species

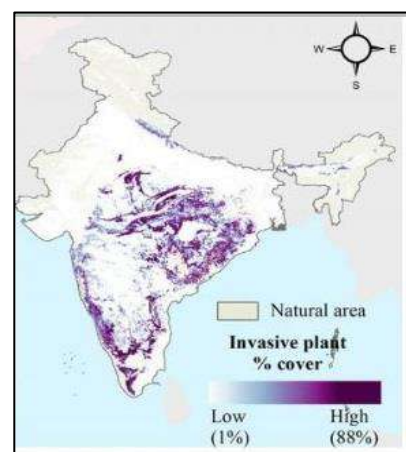
- **Integrated inventory of invasive alien flora of South Asia**- It is first time the scientists from India and 6 other countries have come up with an inventory of 241 plants, which were introduced in south Asian countries and have over the years become Invasive Alien Species (IAS).
- **India tops the list among 7 nations with 185 invasive alien plants** in sub-continent, it is followed by Bhutan (53), Sri Lanka (45), Bangladesh (39), Nepal (30), and Pakistan (29).
- Maldives has the *lowest invasive plants* with just 15 species.
- **Lantana camara**- It is a native of south and Central America and was introduced by the British in this part, is now *invasive in all the seven countries* in South Asia.
- At least 150 plant species of the 241 identified were still restricted to a single country.

Major contributor of invasive species	Introduction of alien species
<ul style="list-style-type: none"> • Southern America • Northern America • Africa and Europe 	<ul style="list-style-type: none"> • Escape pathway (40%) • Stowaway such as in ballast water of ships (24%) • Released into environment (21%)

What is invasive species?

- **Invasive alien species (IAS)** – They are the species introduced into places outside their natural range that have negative impacts on native biodiversity.
- **Terrestrial invasive species**- It refers to introduction of non-native species in terrestrial ecosystems such as forests, grasslands, deserts, and urban areas.
- **Aquatic invasive species**-It refers to introduction of non-native species into aquatic ecosystems, including freshwater and marine environments.
- **Criteria** - To be invasive, a species must adapt to the new area easily, it must reproduce quickly, it must harm property, the economy, or the native plants and animals of the region.
- **Historical propagation**-Due to the increase in the movement of people and goods around the world, the number of species being introduced into new areas is rising.
- **Human modifications**- Human made alterations to natural environment through activities like urbanization, deforestation, agricultural expansion creates new opportunities for invasive species to thrive.
- **Shifting soil moisture regimes**- Invasive species may have a competitive advantage in altered soil moisture conditions, species adapted to drier or wetter soils may thrive when these conditions change allowing them to outcompete native species.
- **Altered cycle of natural disturbances**- If the frequency or intensity of wildfires changes, it may favor invasive species that are adapted to such disturbances, allowing them to outcompete native species.

Not all non-native species are invasive.



A 2017 study found that over one third of all introductions in the past 200 years occurred after 1970.

What are the impact of invasive species?

- **Loss of biodiversity**- According to IUCN Red List of Threatened Species, IAS are one of the top causes of biodiversity loss and the second most common cause of species extinctions.

- **Species extinction-** It have contributed either solely or alongside other drivers, to 60% of recorded global extinctions. Islands are particularly vulnerable as 90% of global animal and plant extinctions are occurring here.
- **Economic impact-** It affects not only local ecosystems but also water, biology and security.
- **Impact on vulnerable population-** The economic costs are disproportionately borne by disadvantaged populations living in degraded environments heavily infested by IAS.
- **Impact on nature-** A study indicates that about 66% of India's natural systems are threatened by IAS by negatively impacting ecosystems crucial for survival of apex predators like tigers.
- **Impacts human health-** IAS pose threat to human health directly or indirectly.
 - The *Asian tiger mosquito* (*Aedes albopictus*), native to South-East Asia, is a vector of a number of human diseases such as Dengue fever and West Nile virus.

The estimated global cost of invasive species was 423 billion dollars with costs increasing fourfold every decade since 1970.

- **Reduces navigation-** *Water hyacinth* native to South America, has rapidly invaded water ways, irrigation channels, lakes and rice paddies.

- In Africa's Lake Victoria, water hyacinth infestations covering 12,000 hectares have blocked shipping trade and access to ports, and halted fishing activities.

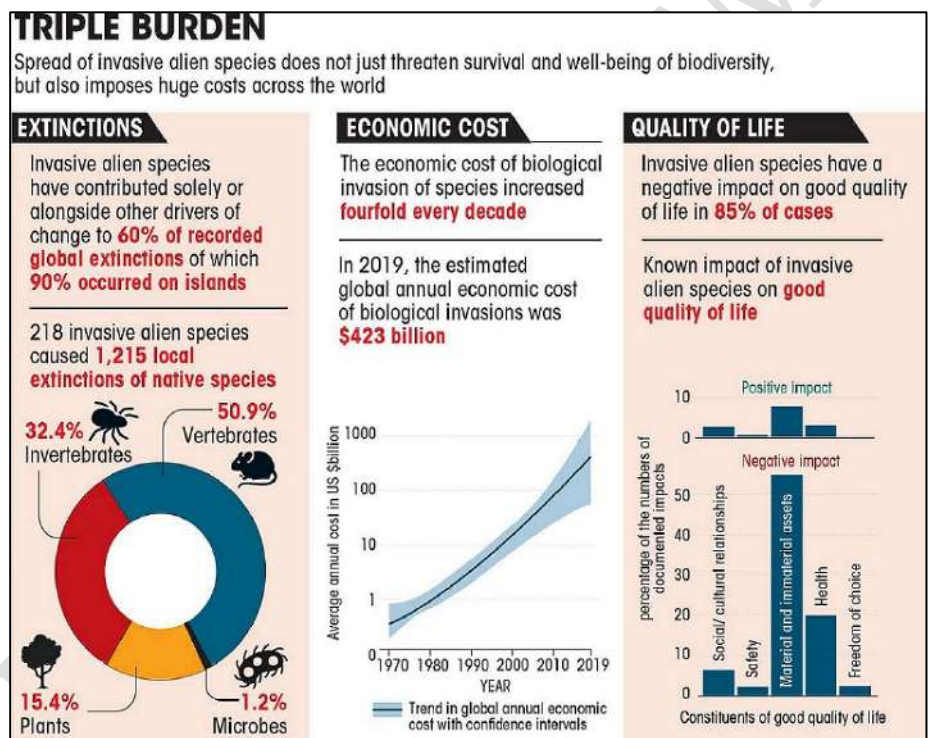
- **Impact on food security-** Agriculture and fisheries are particularly vulnerable to the impacts of IAS.

- The *fall armyworm* was introduced to sub-Saharan Africa, it is spreading rapidly across the continent causing yield losses of over 40% for smallholder maize farms in some countries.

- **Climate change-** IAS reduces the resilience of natural habitats to the impacts of climate change.
 - Introduced grasses and trees may alter fire regimes, particularly in areas that are becoming warmer and drier due to climate change, putting habitats and human life at risk

What can be done?

- The most cost effective measure to address the impact of invasive alien species is to prevent their introduction.
- A collaborative approach involving various sectors such as environment, health, agriculture, fisheries, customs, transport, private sector, and civil society is essential.
- Governments, donors, and agencies need to understand the impacts of IAS to integrate prevention and management measures into projects, including those supporting the Sustainable Development Goals (SDGs).
- ***Kunming-Montreal Global Biodiversity Framework***, agreed at COP-15 to UN Convention on Biological Diversity, speaks of reducing the impacts of IAS on biodiversity and ecosystem by at least 50%, by 2030.



13.4 Pros and Cons of Tiger Safari in India

Why in news?

Recently Supreme Court bans tiger safari in core areas of Jim Corbett National Park in Uttarakhand.

What is tiger safari?

- A "tiger safari" typically refers to a designated area within or near a tiger reserve where visitors can observe tigers and other wildlife in their natural habitat.
- **NTCA, 2012**- This concept was first envisaged in the Guidelines for Tourism issued by the National Tiger Conservation Authority (NTCA) in 2012.
- **Guidelines evolution**- 2016 guidelines emphasizes that tigers should not be sourced from zoos.
- **Central Zoo Authority (CZA)** - In 2019, NTCA permitted zoos to provide animals for tiger safaris.
- **Wildlife (Protection) Act, 1972**- It does not explicitly define tiger safari, the act states that no construction of commercial tourist lodges, hotels, zoos, and safari parks shall be undertaken inside a sanctuary except with the prior approval of the National Board constituted under the Act.

The guidelines said that a tiger safari can be proposed only by tiger reserves that have already utilised 100% of their tourist carrying capacity.

Pros of tiger safari	Cons of tiger safari
<ul style="list-style-type: none"> • Reduce tourism pressure- Establishing safari parks in buffer areas can reduce the number of visitors within the core areas of the reserve • Provide sanctuary for unfit animals- It offer a solution by providing a controlled environment within the natural surroundings of the reserve. • Support local livelihoods- It can serve as a source of income and employment for these communities. • Economy development- The Pakharau safari park near the Corbett Tiger Reserve is seen as a means to distribute the economic benefits of tiger tourism more evenly, as the Ramnagar area has previously reaped most rewards. 	<ul style="list-style-type: none"> • Increased tourism demand- Opening new safari routes have not decreased vehicle crowding but have attracted more tourists. • Display of rescued tigers- It deviates from the previous approach of keeping them in non-display facilities. • Against the guidelines-The 2016 NTCA guidelines required an assessment of each recovered animal before displaying in safari parks. • Habitat disturbance- Safari parks within tiger reserves may prioritize individual welfare at the expense of species interest. • Ranthambore safari park- Lunched in 2016, raise concerns about structural integrity of enclosures and the stress on wildlife. • Wildlife stress- Introduction of captive animals into safari parks within protected forests has led to stress and aggression among resident territorial species as observed with leopards in Nahargarh Biological Park, Rajasthan.

What is the Supreme Court's view on tiger safari?

- The Court criticized the Uttarakhand State government for the illegal felling of over 6,053 trees for the Pakharau Tiger Safari, citing a Central Empowered Committee report.
- **Complete investigation**-The court also gave CBI three months to complete its investigation into alleged irregularities inside the Corbett tiger reserve, as directed by the Uttarakhand High Court.
- **Tiger safari rules**- It would now be allowed only in the peripheral and buffer zones of the Jim Corbett Park.
- Safari parks are meant only for "injured, conflicted, or orphaned" local tigers, and not those sourced from zoos.
- **Create a committee**- To suggest ways to repair ecological damage in Jim Corbett National Park caused by illegal construction and tree felling *within 3 months*.
- It will assess environmental damage, identify responsible officers, recommend restoration measures, and evaluate the feasibility of tiger safaris in buffer areas, keeping ecocentrism in mind.

What lies ahead?

- The Supreme Court's stance aligns with conservation goals, indicating that tiger safaris should not simply be zoos within tiger reserves.
- It is essential for authorities to carefully consider *site-specific factors* and develop guidelines that balance conservation objectives with the needs of local communities and the welfare of wildlife.
- The establishment of tiger safari parks should not become a routine practice but rather be proposed based on careful evaluation of carrying capacity and other ecological factors within each tiger reserve.

13.5 Equity Issues in IPCC Reports

Why in news?

Intergovernmental Panel on Climate Change (IPCC) recently released 6th Synthesis report which updated and compiled IPCC's sixth assessment cycle.

Intergovernmental Panel on Climate Change

- It is the United Nations body for assessing the science related to climate change.
- **Established by-** The World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP)
- **Launch year-** 1988.
- **Secretariat-** Geneva, Switzerland, hosted by the WMO.
- **Member states-** 195 member states, ***India is a member*** of IPCC.
- **Assessment reports-** About the state of scientific, technical and socio-economic knowledge on climate change, its impacts and future risks, and options for reducing the rate at which climate change is taking place.
 - Special Report on Global Warming of 1.5°C in 2018.
 - Special Report on Climate Change and Land (SRCCL) in 2019, and
 - Special Report on the Ocean and Cryosphere in a Changing Climate in 2019.

What are the key highlights of future emission scenarios presented by IPCC?

- **Per-Capita GDP disparities-** By 2050, per-capita GDP in regions like Sub-Saharan Africa, South Asia, and West Asia (together constitutes 60% of the world population) will remain below the global average.
- **Inequities in consumption-** There is an expected continued disparity in the consumption of goods, services, and energy between the Global North and South.
- **Mitigation burden-** Developing countries are projected to have a greater burden of carbon sequestration and deployment of Carbon Capture and Storage technologies.
- **Unprecedented global warming-** Fossil fuel use remains the primary driver, contributing significantly to GHG emissions.
- **Climate related disasters-** Individuals in highly vulnerable regions facing a significantly higher risk of mortality from climate-related disasters.
- **Emission reductions-** A deep, and sustained cuts in greenhouse gas emissions are necessary to limit warming to 1.5°C.
- **Utilize technology-** Carbon dioxide removal (CDR) technologies may complement emission reductions but must be deployed judiciously.
- **Recommendations -** It emphasizes the need for a substantial reduction in fossil fuel use and the elimination of fossil fuel subsidies.
- **Protect ecosystems-** The commitment to halt deforestation by 2030 and implementing biodiversity frameworks are urgent imperatives as safeguarding forest offers significant mitigation potential.
- **Shift demand -** Energy conservation and shifting dietary patterns can yield substantial emission reductions, particularly in high emission sectors like transportation and agriculture.
- **Adaptation efforts-** Integrated climate resilient development pathways are vital for synergistic mitigation and adaptation action.
- **Role of finance-** Increased finance, technology transfer, and international cooperation are crucial for accelerating climate action.

Achieving collective net-zero CO₂ emissions by 2050 demands drastic reductions: a 48% cut by 2030, 65% by 2035, and 99% by 2050

Article 3 of UNFCCC emphasizes that countries should protect the climate system for the benefit of present and future generations, based on equity and considering their respective capabilities.

What lies ahead?

- The report serves as a critical guide for the upcoming Global Stocktake at COP28 and highlights the urgency of action within this decade.
- It should consider fairness which means wealthier countries should take on more immediate and significant climate action, reflecting their greater financial capacity and historical emissions.
- Developed regions should accelerate toward net negative emissions, allowing less developed regions to access the remaining carbon budget.
- There is a need for equitable and environmentally sound construction of IPCC scenarios, highlighting a significant gap in emissions modelling that needs to address equity and climate justice.

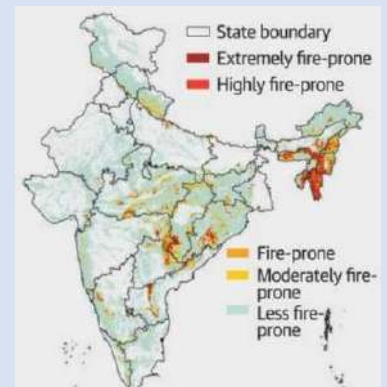
13.6 Forest Fires in India

Why in news?

Forest fires have been raging in the Coonoor forest range in the Nilgiris in Tamil Nadu for almost a week.

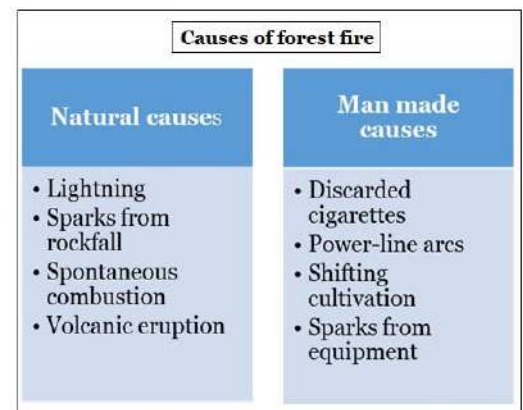
Status of forest fire in India

- **Fire season**- It runs from November to June, with the peak occurring from February to May.
- **Fire prone areas**-As per State of the Forest Report 2019, *over 36% of India's forest cover is prone to fires*, with 4% being extremely prone and 6% very highly prone.
- **Vulnerable forests**- *Dry deciduous forests* are more prone to severe fires, while evergreen and montane temperate forests are less susceptible.
- **Forest fire prone States**- Regions like Northeast India, Odisha, Maharashtra, Jharkhand, Chhattisgarh, and Uttarakhand are particularly vulnerable during *November to June* period.
- **South India**- *Telangana and Andhra Pradesh* are prone to forest fire, Tamil Nadu has experienced wildfires in recent years, indicating a shift in fire vulnerability patterns.
- **Goa bushfire, 2023**- Investigations is on to find if they were caused by human activities.
- **Forest fire, 2021**- A series of forest fires broke out in Uttarakhand, Himachal Pradesh, Nagaland-Manipur border, Odisha, Madhya Pradesh, and Gujarat, including in wildlife sanctuaries.
- **Global range**- In 2015, approximately 3% of the world's forests, or 98 million hectares, were affected by fires, predominantly in tropical regions.



What is forest fire?

- **Wildfire** - An uncontrolled fire in an area of combustible vegetation that occurs in the countryside or rural area.
- It can burn in vegetation located both in and above the soil.
- **Ground fires**- It ignites in soil, thick with organic matter that can feed the flames, like plant roots.
- **Surface fires**- It typically burns in dead or dry vegetation that is lying or growing just above the ground. Parched grass or fallen leaves often fuel surface fires.
- **Crown fires** -It burns in the leaves and canopies of trees and shrub.



What is the reason of forest fire in India in 2024?

- Forest Survey of India - *Mizoram leads* with the highest number followed by Manipur, Assam, Meghalaya, and Maharashtra.
- ISRO's satellite data indicates a surge in forest fires since early March, affecting areas along the Konkan belt, south-coastal Gujarat, southern Rajasthan, Madhya Pradesh, coastal and interior Odisha, and Jharkhand.

- **Conductive atmosphere**- Factors such as hot and dry temperatures, high tree density, and low humidity create an environment conducive to fire ignition and propagation.
- **High aridity**- Southern India has experienced high aridity leading to dry conditions and increased fire risk.
- **High temperature**-February was recorded as the hottest month in South India since 1901, with January being the fifth warmest. These exceptionally high temperatures have accelerated the drying of biomass in forests, making them more susceptible to ignition.
- **Summer season**
 - **Clear skies**- It increase solar radiation, intensifying the drying process
 - **Calm winds**- It allow fires to spread more rapidly.
- **Excess Heat Factor (EHF)** - IMD has warned of the prevalence of the EHF over western Andhra Pradesh and Karnataka.
- **Heat waves**- Elevated maximum temperatures, reaching up to 40 degrees Celsius in mid-March, indicate an increased risk of heatwaves.
- **Mild aridity**- The absence of rain and prevailing high temperatures have led the IMD to classify almost all districts of southern India under 'mild' aridity, which exacerbate the susceptibility of forests to fire incidents.

EHF is an index used to quantify heatwave intensity relative to the local climate, it provides an estimate of excess temperature based on the last 30 days' excess and the last three days' extreme temperatures.

Steps taken by India to combat forest fire

- **Early warning systems**- Utilizing MODIS and SNPP-VIIRS sensors to detect forest fires and provide real-time monitoring.
- **Fire danger rating**-Implementing the **Forest Fire Danger Rating System** based on the Canadian Forest Fire Danger Rating System (CFFDRS) for early warnings.
- **National Action Plan**- It empowers forest fringe communities and incentivizes collaboration with forest departments to minimize forest fires.
- **National Forest Fire Prevention and Management Scheme**- It is the Centrally Sponsored Scheme with the primary objective to enhance the prevention, control, and management of forest fires in the country.
- **Bambi bucket**- Also called a helicopter bucket or a helibucket helpful in fighting wildfires, it is a specialised container that is suspended by cable under a chopper, and which can be filled by lowering into a river or pond before being flown above a fire and discharged aerially by opening a valve at the bottom of the bucket.
- **Forest Survey of India**- It monitors forest fires using satellite data and has initiated the Large Forest Fire Monitoring Programme using SNPP-VIIRS data.
- **Joint forest management**- Participation of people in forest management, improvement of forests including the management of forest fires.

13.7 State of Global Climate Report

Why in news?

The World Meteorological Organisation (WMO) has officially confirmed 2023 to be the hottest year on record.

What are the key highlights of the report?

- **Published by**- World Metrological Organization
- **Warmest year**-2023 was the warmest year on record with global average temperatures reaching 1.45°C above pre-industrial levels.
- **Green House Gases (GHG)** - Concentrations of the three main GHGs – carbon dioxide, methane, and nitrous oxide – reached record high levels.
- **Short term climate drivers**- A prolonged period of La Niña from mid-2020 to early 2023 gave way to El Niño conditions which were well established by September 2023, contributing to the observed rise in global mean sea-surface temperatures during 2023.

In 2023, ocean heat content reached its highest level in the 65-year observational record.

- An ongoing El Niño event contributed to below-normal monsoon rainfall in India and record-breaking heat in southern India during January and February.
- **Sea level rise-** The global mean sea level reached a record high, the rate of sea level rise in the past ten years (2014–2023) has more than doubled since the first decade of the satellite record (1993–2002).
- **Cryosphere-** The profound changes seen in the cryosphere clearly illustrate the global scale of climate change.
- **Antarctic sea-ice extent-** It has reached an absolute record low in February, the annual maximum extent was around 1 million km² below the previous record low maximum.
- **Loss of ice-** There is largest loss of ice on record (1950–2023), driven by extremely negative mass balance in both western North America and Europe.
 - Glaciers in Switzerland lost around 10% of their remaining volume in the past two years.
- **Snow cover-** Seasonal snow cover in the Northern Hemisphere has been experiencing a long-term decline in the late spring and summer.
- **Extreme weather-** Extreme heat, wildfires, flood etc. leads to socio-economic impacts.
- **Wildfires-** It affected parts of Hawaii, Canada and Europe.
- **Flood-** It is associated with extreme rainfall from Mediterranean cyclone Daniel affected Greece, Bulgaria, Turkey, and Libya.
- The Greater Horn of Africa region, which had been experiencing long-term drought, suffered substantial flooding in 2023, following heavy rains associated with El Niño and the positive Indian Ocean Dipole.
- **Economic loss-** The largest reported economic loss from a single event in 2023 was from Hurricane Otis, which hit the Pacific coast of Mexico within 15 hours it had intensified to a category 5 system.
- **Marine heat waves (MHWs)-** It have become more frequent, intense, and longer lasting since the late 20th century, El Nino events tend to cause wide-spread MHWs in the eastern Tropical Pacific.
- **Vulnerable population-** Food security, population displacement and impacts on vulnerable populations continue to be of mounting concern in 2023.
- **Climate finance-** The global adaptation financing gap is widening, falling well short of the estimated 212 billion dollars per year needed up to 2030 in developing countries alone.
- **Renewable energy growth-** There was a nearly 50% increase in renewable capacity additions in 2023, totalling 510 gigawatts – the highest in two decades

The cryosphere comprises the frozen parts of Earth – glaciers and ice sheets, sea-ice, snow, and permafrost.

Tropical cyclone Freddy was one of the world's longest-lived tropical cyclones.

What lies ahead?

- Increasing support for National Meteorological and Hydrological Services (NMHS) is crucial for providing essential information services.
- Nationally Determined Contributions (NDCs) need to be based on science to effectively cut greenhouse gas emissions and transition to renewable energy sources.
- The need of the hour is to secure adequate financing at COP-29 which is scheduled to be held in Baku, Azerbaijan to support the implementation of national climate plans.

13.8 Solar Waste Management

Why in news?

As per the study by Ministry of New and Renewable Energy, the amount of solar waste produced by the country is expected to reach 600 kilo tonnes by 2030.

What is solar waste?

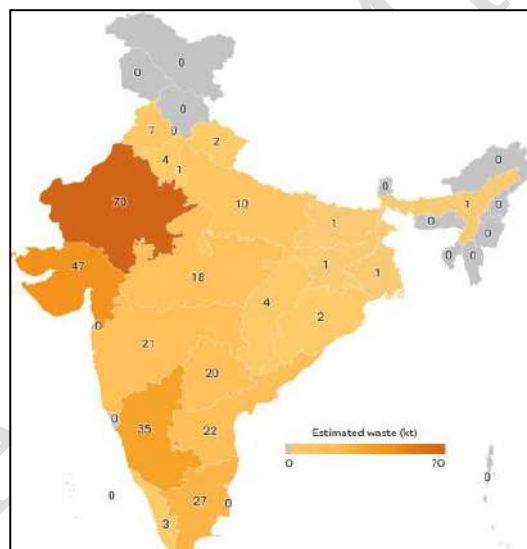
- It is the electronic waste generated during the manufacturing of solar modules and waste from the field (project lifetime).
- **Manufacturing waste-** It includes scrap produced during production and waste from photovoltaic (PV) modules failing quality tests.

Photovoltaic cell is an electronic device that converts the energy of light directly into electricity by means of the photovoltaic effect.

- **Field waste-** It consists of waste generated during transportation and handling, damage incurred by solar modules during their lifetime, and end-of-life waste when modules are no longer usable.
- According to the International Renewable Energy Agency, India is projected to become the 4th largest producer of solar panel waste by 2050, with cumulative volumes ranging from 4.5 to 7.5 million tonnes.
- Photo Voltaic (PV) waste poses environmental risks, particularly through the leaching of harmful metals such as lead, cadmium, and silver into soil and groundwater.

What are the key highlight of the study?

- **Title-** Enabling a Circular Economy in India’s Solar Industry – Assessing the Solar Waste Quantum.
- **Current solar capacity-** As of March 2013, India’s solar capacity stands at 66.7 GW, it has increased by 23 times in the past 10 years.
- It is slated to jump to 292 GW of installed solar capacity by 2030 which highlights the importance of solar waste.
- **Focus-** On the waste from the field category and excluded waste generated during manufacturing.
- **Increase in solar waste-** By 2030, India's current installed solar capacity is estimated to generate around 340 kilo tonnes (kt) of waste, 3 times more than the present.
- By 2050, this figure is expected to increase dramatically to about 19,000 kt.
- **State wise distribution of waste-** Approximately 67% of the projected waste by 2030 is expected to be produced by five states namely Rajasthan, Gujarat, Karnataka, Tamil Nadu, and Andhra Pradesh.
- **Waste composition-** It is expected to contain critical minerals such as silicon, copper, tellurium, and cadmium.
- The 340 kt waste expected to be produced by 2030 would consist of 10 kt of silicon, 12-18 tonnes of silver, and 16 tonnes of cadmium and tellurium.



What are the recommendations suggested by the study to deal with solar waste management?

- **Comprehensive database-** Policymakers are urged to maintain a comprehensive database of installed solar capacity to estimate future waste generation accurately.
- **Incentivise recyclers-** The government should provide incentives for recyclers to encourage effective management of solar waste.
- **Market creation-** There is a need to create a market for solar recycling, focusing on both end-of-life modules and other sources of waste generated during the lifecycle.
- **Recycling methods-** The study describes two methods of study

Conventional recycling	High value recycling
<ul style="list-style-type: none"> • It involves mechanical processes such as crushing, sieving, and shearing of waste. • While it can recover materials like glass, aluminium, and copper it cannot recover silver and silicon. 	<ul style="list-style-type: none"> • It combines mechanical, chemical, and thermal processes to recycle modules. • It can recover valuable materials like silver and silicon through chemical processes.

What are the challenges with solar waste management?

- **High cost-** There is a negative cost differential ranging from 5% to 15% between the value of materials recovered from recycled solar panels and the cost of transportation and recycling.
- **Reliance on producer plans-** This may pose uncertainties due to changes in ownership, financial stability, or adherence to the proposed recycling strategies.
- **Mixed materials-** PV panels contain mixed and difficult-to-separate materials, reducing efficient recycling.
- **Infrastructure deficit-** The existing Treatment Storage and Disposal Facilities (TSDFs), may not be equipped to handle the specific requirements of solar panel waste effectively.

- **Issues with conventional recycling-** They are ineffective in recovering materials with high enough quality to be used in the production of new solar panels, particularly in applications requiring high-grade glass.

What lies ahead?

- Governments and industry stakeholders should invest in developing specialized recycling facilities.
- Collaboration between government agencies, industry players, research institutions, and waste management experts can facilitate knowledge sharing and the development of best practices.
- Public-private partnerships may also be leveraged to improve infrastructure and resource allocation.
- Implementing *Extended Producer Responsibility* schemes can incentivize manufacturers and producers to take responsibility for the entire life cycle of their products, including end-of-life management.

Global regulatory landscape to address solar waste

- **Guarantee fees-** Countries like Germany and the Netherlands impose guarantee fees on manufacturers or developers involved in the production or installation of solar panels which can be used for *managing solar panel waste at the end of its life cycle*.
- **Recycling plans-** States such as California and Washington in the United States require detailed recycling plans from solar panel waste producers, including manufacturers, developers, or installers.
- **European Union-** It is the *first* to revise its *Waste Electrical and Electronic Equipment legislation* to include *Photo Voltaic modules*, recognizing them as a category of waste that needs special handling.
- **India-** E-Waste (Management) Rules, 2022 regulate the handling of PV waste and require manufacturers and recyclers to adhere to specified guidelines and standards.
- **China-** It has introduced *new industrial standards and rules* detailing the decommissioning, dismantling, and recycling of solar facilities.

13.9 Water for Peace

Why in news?

The theme of 2024 World Water day observed on March 22, 2024 is Water for Peace.

World Water Day- March 22

- **First proposal-** During the United Nations Conference on Environment and Development in Rio de Janeiro under Agenda 21 in 1992.
- **UN Resolution-** In 1992, the UN General Assembly passed a resolution declaring March 22 as World Water Day.
- **Implementation-** It is a United Nations (UN) observance coordinated by *UN-Water*.
- **Need-** It is now observed globally to advocate for the sustainable management of freshwater resources.
- **Report-** UN launches its flagship report on water and sanitation for the sustainable management of freshwater resources.
- **2024 theme-** '*Water for prosperity and peace*', focuses on critical role water plays in the stability and prosperity of the world.

Why there is water crisis in India?

- Around 72% of all water withdrawals are for use in agriculture, 16% by municipalities for households and services, and 12% by industries.
- **Groundwater depletion-** Groundwater tables are declining in nearly every state and major city, with alarming overuse in States like Punjab, Rajasthan, Delhi, and Haryana.

As per World Resources Institute, 17 countries face 'extremely high' levels of water stress which may result in conflict, unrest and peace among people, India is not an exception to these problems.

Key Issue	About	Impact
Rapid Urbanization	There is increased demand for water for domestic, industrial, and commercial purposes	It results in <i>overexploitation</i> of local water sources and strain on water supply systems. Example- Bengaluru water crisis .
Industrialization	It require significant amounts of water for various manufacturing purposes.	It leads to <i>water pollution</i> that degrade water quality and reduce availability for other uses.
Unsustainable agricultural practices	It is the largest consumer of water in India, with irrigation accounting for the majority of water withdrawals	It contribute to water scarcity and <i>degradation of soil and water quality</i> .
Climate change	Changing weather patterns, including erratic rainfall, prolonged droughts, and more intense monsoon seasons, exacerbate water stress in many regions of India.	It adversely <i>affects water cycle</i> resulting in worsening floods, rising sea levels, shrinking ice fields, wildfires and droughts.
Inefficient water management	Insufficient investment in water infrastructure hinders the efficient management and distribution of water resources.	It result in significant water losses and contamination.
Lack of stakeholder engagement	A lack of engagement and collaboration among stakeholders, including government agencies, communities, and industries	It hampers effective water management and conservation efforts.

How water insecurity affects women?

- **Gendered Burden**-Water collection is often seen as a woman's responsibility, leading to a disproportionate time burden on them.
- **Effects on education**- Girls' school attendance and academic performance suffer due to the time spent on water collection.
- **Health risks**- Lack of access to adequate water often leads to the practice of open defecation exposes individuals, particularly women, to various waterborne diseases such as diarrhoea, typhoid, and cholera.
- **Hygiene**- Women who engage in open defecation may also face challenges related to menstrual hygiene management.
- **Psychological stress**- The lack of privacy and dignity associated with openly defecating in public spaces can cause embarrassment, anxiety, and feelings of insecurity among women, impacting their overall well-being and mental health.
- **Safety concern**-Women who engage in open defecation are at a greater risk of experiencing non-partner sexual violence.
- **Impact on health**- Women who engage in open defecation are at a greater risk of experiencing psychosocial stress and non-partner sexual violence.

What can be done to conserve water?

- **Sustainable agriculture**- It's crucial to promote sustainable agricultural production and maintain environmental integrity.
- **Rainwater harvesting**-Implementing both in-situ and ex-situ rainwater harvesting (RWH) can combat water scarcity and support irrigation.
- **Waterbody revival**- There's a need for protocols to revive and create ponds and waterbodies, which are essential for ecosystem services and water quality.

Steps taken by India to conserve water

- **National Water Policy** - It was updated in 2012 to govern the planning and development of water resources and their optimum utilization.

- **Master Plan for Artificial Recharge to Groundwater** - It has been prepared in 2020 with respective State counterparts which includes artificial recharge in both rural and urban areas.
- **Jal Shakti Abhiyan: Catch the Rain 2023**- It is targeting “Source sustainability for drinking water” for source strengthening/ source stabilization of rural drinking water supply schemes.
- **Pradhan Mantri Krishi Sinchayee Yojana**- It was launched in 2015 to *enhance water use efficiency* and irrigation coverage in agriculture.
- **Mission Amrit Sarovar**- It was launched in 2002 with the aim to *develop and rejuvenate 75 water bodies* in each district of the country as a part of celebration of Azadi ka Amrit Mahotsav.
- **Atal Bhujal Yojana**- It was piloted in 2018 along with *World Bank* to recharge ground water and create sufficient water storage for agricultural purposes.
- **Central Ground Water Authority**- It has advised all States/UTs to take measures to promote and adopt artificial recharge to ground water and rain water harvesting.
- **Jal Jeevan Mission**- The studies conducted in rural areas of Tamil Nadu show that access to safe drinking water under the leads to time savings for women, which they can utilize for household tasks, childcare, and children's schooling

13.10 Nuclear Energy

Why in news?

Recently Brussels, Belgium hosted the first-ever Nuclear Energy Summit highlighting the role of nuclear energy in addressing climate change.

What are the key highlights of the nuclear summit?

- **Organised by- International Atomic Energy Agency (IAEA) and Belgium.**
- **Aim-** To tackle global challenges such as reducing fossil fuel usage, enhancing energy security, and boosting economic development.
- **COP 28-** The summit followed the [triple nuclear pledge by 2050](#) and historic inclusion of nuclear energy in the [Global Stocktake](#) agreed upon at UN Climate Change Conference (COP 28) in Dubai.
 - It called for accelerating the deployment of nuclear energy alongside other low-carbon energy sources.
- **Atoms4NetZero** – The launch of the IAEA’s Atoms4NetZero initiative, emphasize the importance of nuclear energy in the transition to clean energy.
- **Atoms4Climate** – It is IAEA’s initiative which focuses on the safe and peaceful uses of nuclear energy and science for climate change mitigation and adaptation
- **Capacity building-** The summit emphasized the importance of capacity building for project execution in countries embarking on nuclear energy development, ensuring efficient use of resources for nuclear projects.
- **Project bankability-** Strategies to increase bankability include minimizing project costs, reducing the cost of capital and supporting adequate revenue models.
- **Nuclear non-proliferation-** The Treaty on the Non-Proliferation of Nuclear Weapons (NPT) is central to global efforts to prevent the spread of nuclear weapons and promote peaceful uses of nuclear energy.
- **International collaboration on licensing-** It is to establish a unified licensing framework across different countries which would facilitate new build and increase deployment speed.
- **Spent nuclear fuel management-** It is a critical step in the nuclear fuel cycle, with most fuel stored until a decision is made.
- **Workforce development-**It ranges from education and training to continual performance improvement.

1/3rd of the global spent fuel is reprocessed while the rest awaits processing or disposal.

How nuclear energy can promote clean energy transition?

- **Superior clean energy-** It emits *4 times less carbon than solar farms* or other renewable sources.
- **Combat climate change-** It is a low carbon source of energy.

SDG 7 goal is to “Ensure access to affordable, reliable, sustainable and modern energy for all”.

- **Energy security**- It can provide long term energy security in a sustainable manner.
- **Lesser life cycle emissions**- Even considering the full life cycle, nuclear energy's greenhouse gas emissions are significantly lower than those of coal, and generally less than solar and wind.
- **Perennial availability**- Unlike solar or wind, it can provide a constant supply of electricity, making it suitable for baseload generation.
- **Decarbonisation**- It has already helped avoid over 1 billion tonnes of CO₂ emissions annually.
- **Risk management**- The advancements in nuclear technology, regulatory frameworks and waste management practices addresses the concerns regarding safety and risk associated with nuclear energy.

To know about the need of nuclear waste click [here](#)

India's role in nuclear energy

- India has 23 operational nuclear reactors but yet to acknowledge their role in its decarbonisation plan.
- India commits to achieving Net Zero emissions by **2070**, as announced at [COP26](#) in Glasgow.
- **Power targets** – India plans to triple nuclear power generation by 2030 and significant share in electricity mix by 2047.
- **Tarapur Atomic Power Station**- It is the oldest nuclear power plant located in Maharashtra which offers energy at competitive rates.
- **Kudankulam Nuclear Power Plant**- It is situated in Tamil Nadu that provides electricity at tariffs comparable to coal-fired plants.

What are the challenges with nuclear energy?

- **Safety concerns**- Incidents like the Fukushima disaster, 2011 have heightened safety concerns, impacting public perception and investment in nuclear energy.
- **Limited growth**- The decrease in the number of operational nuclear reactors over the past two decades indicates the lack of significant growth in nuclear energy sector.
- **High costs**- Nuclear power requires significant upfront investment and has high operational costs compared to other forms of electricity generation.
- **Fund deficit**- Multilateral Development Banks (MDBs) and private investors have not made any significant contribution to the industry.
- **Regulatory cholesterol**- The nuclear sector is heavily regulated, which can slow down the construction and operation of new reactors.
- **Technological hurdles**- Unlike renewable energy sources, nuclear technology has not seen breakthroughs that significantly lower costs or speed up deployment.
- **Concerns with SMRs**- While Small Modular Reactors are promising, they are not yet widely adopted and face barriers to deployment.

What lies ahead?

- The need of the hour is technological innovation and financial investment for the large scale adoption of nuclear energy.
- International funding models such as *Mankala* in *Finland* must be adopted which have been successful in supporting nuclear energy projects.

14. SCIENCE & TECHNOLOGY

14.1 Genome India project

Why in news?

The Department of Biotechnology announced the completion of the Genome India Project the largest initiative to conduct sequencing of 10,000 genomes of the Indian population.

Genome India Project

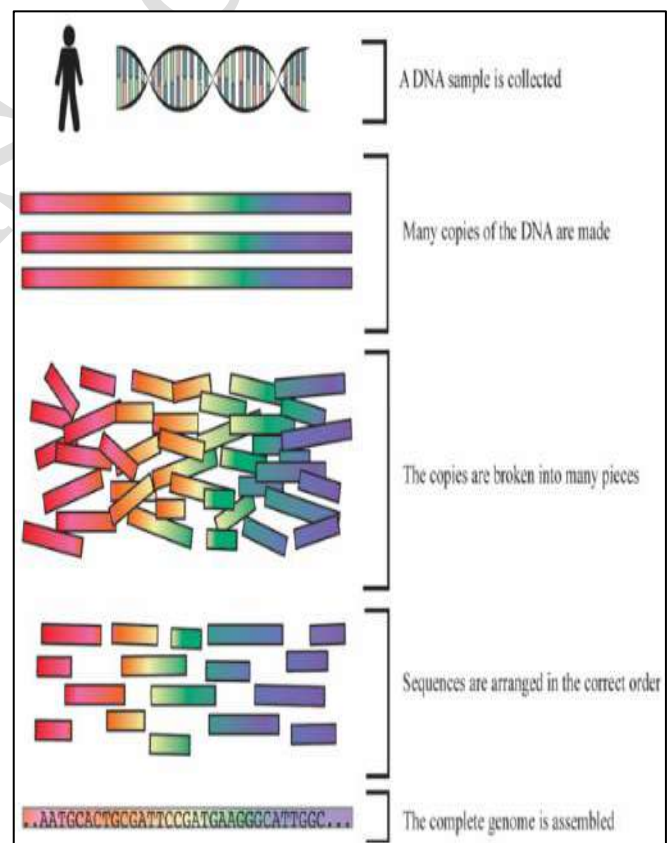
- **Launch year** - 2020.
- **Aim**- To create a comprehensive catalogue of 10,000 genetic samples from citizens across India, to build a reference genome.
- **Vision**- “Cataloguing the genetic variations in Indians” for 3 years (2020-2023).
- **Institutional support** - Indian Institute of Science’s (IISc) Centre for Brain Research.
- **Partner organisations** - 20
- **Funded by** – Department of Biotechnology.
- **Genome sequencing method**- It is based on the [Next-Generation Sequencing \(NGS\)](#) platform.
- **Next-Generation Sequence**- It involves fragmenting DNA/RNA into multiple pieces, adding adapters, sequencing the libraries, and reassembling them to form a genomic sequence.

What is genome sequencing?

- **Genome**- It is an organism’s complete set of *Deoxyribose Nucleic Acid (DNA)*, including all of its genes which contains all of the information needed to build and maintain that organism.
- In humans, a copy of the entire genome has more than 3 billion DNA base pairs.
- **Genome sequencing**- It is a high throughput technique to sequence the order of bases in the genome of an organism in one process.

What are the advantages of the project?

- **Study genetic diversity**- The diverse genetic makeup of India, with over 4,635 anthropologically defined population groups can be studied.
- **Understand disease**- The data will help to compare and contrast the impact of genetic variations on physical health as India is the “largest genetic lab in the world.”
- **Rich dataset**- It creates reference genetic database which serves as a foundational template offering insights into the genetic makeup of the population
- **Accessible database** – It generated an extensive dataset of 8 petabytes, requiring 80 GB storage for each sequence making the dataset accessible to researchers.
- **Digital public good**- The data will be stored at the *Indian Biological Data Centre in Faridabad*, serving as a “digital public good”, it aims to foster advancements in diagnostics, therapies, and disease understanding.
- **Personalised health care**- A specific genetic mutations have been identified within the Indian population.
- **Precision medicine**- An Indian genome database will aid in understanding the genetic makeup to develop targeted treatments, especially for rare diseases resulting from genetic anomalies.
- **Drug discovery**- It helps in development of new diagnostics to identify resistance-indicating variants.
 - **mRNA vaccines**- It is based on genetic mutations and identifying populations with specific resistance or susceptibility to certain medicines.
- **Gene therapy** - Understanding genetic predispositions to diseases like cancer and lung diseases, it is also considered vital in comprehending infectious diseases like COVID-19.



- **Indigenization**- It allows for deploying *Indian solutions using Indian data for Indian problems*, showcasing the country's commitment to utilizing its diversity for scientific advancements.
- **Technological advancement**- While the 1st whole genome project required 13 years and 3 billion dollars to complete the project whereas this project is completed in 3-4 months.

What are the challenges?

- **Expensive medicines**- The genome sequencing has opened up new complexities, despite advancements the accessibility and affordability of medicines for rare genetic conditions remain a challenge.
- **Monogenic disease**-The [Human Genome Project](#), completed in 2003, promised to decode the secrets of the genome and pave the way for personalized medicine but subsequent decades have revealed that only a small fraction of diseases are monogenic (caused by a single gene).
- **Privacy issues**- The issue of disclosing and managing incidental and secondary findings.
- **Huge dataset management**- The massive dataset generated (8 petabyte), poses significant challenges in terms of storage, management, and data security.
- **Genetic discrimination**- Some regions or ethnic groups may be underrepresented, affecting the project's dataset.
- **Limited representation**- The 10,000 genomes is a significant achievement but it may not fully capture the immense genetic diversity present in India's population of 1.4 billion people.

There are over 4,600 distinct groups, and achieving comprehensive representation is challenging.

What lies ahead?

- As Genome India Project moves forward, its impact on healthcare, genetics, and scientific research is poised to be transformative, ushering in a new era of understanding and utilizing the genetic diversity within the country.
- The findings of the project should not remain confined to academia but involve collaborations with scientists, students, technology companies, ethicists, and social scientists.

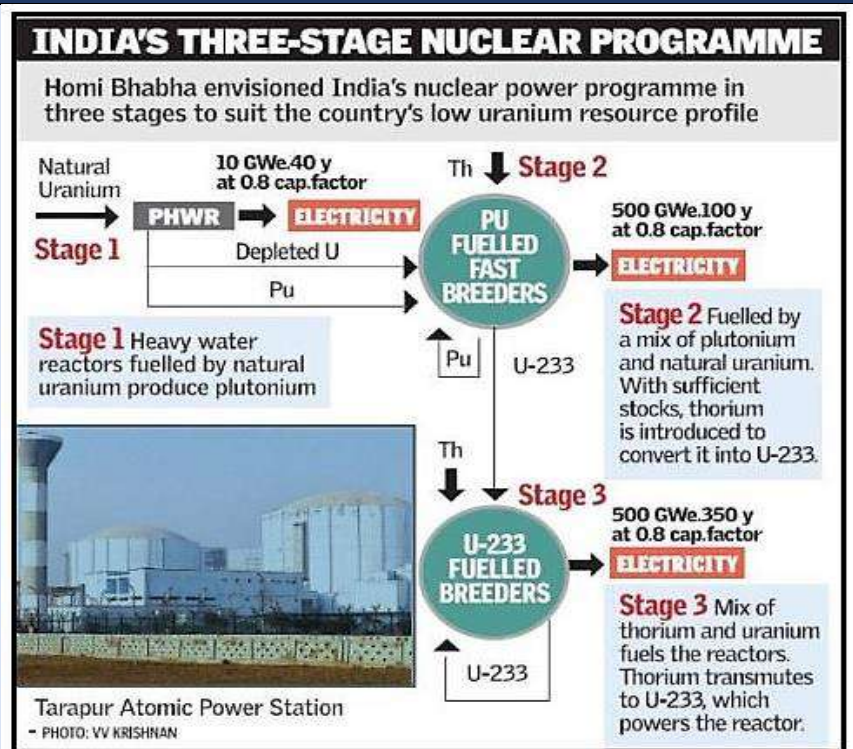
14.2 Stage II of India's 3-stage nuclear programme

Why in news?

Prime Minister of India witnessed the core-loading of the indigenous prototype fast breeder reactor (PFBR) at Kalpakkam, Tamil Nadu marking a significant step in India's nuclear power program.

3 stages of India's nuclear program

- **Formulated by** - Homi Bhabha, who is credited as "father of India's nuclear program".
- **Launch year**- 1954
- **Aim**- To achieve complete self-sufficiency in nuclear energy by leveraging India's significant thorium resources.
- **Closed fuel cycle**- The spent fuel generated from one stage is reprocessed and used in the next stage of the cycle to produce power.
- Thus helps to breed fuel and minimise the nuclear waste.
- **Thorium**- It is viewed as the fuel of the future, Stage-III aims at using thorium as fuel for power generation on a commercial scale.



Stages	Types of nuclear reactor	By-Product
Stage-I	Pressurized Heavy Water Reactors (PHWRs)	Plutonium-239
Stage-II	Fast Breeder Reactor	Energy, Uranium-233 and Plutonium-239
Stage-III	Advanced Heavy Water Reactors (AHWR)	Energy and Uranium- 233

What is PFBR?

- **Developed by-** Bharatiya Nabhikiya Vidyut Nigam Limited (BHAVANI).
- **Design-** Indira Gandhi Centre for Atomic Research (IGCAR).
- **Location-** Kalpakkam, Tamil Nadu.
- **Nuclear Fuel Complex-** It fabricates the core subassemblies for Fast Breeder Test Reactor (FBTR) and 500 MWe PFBR.
- Bhabha Atomic Research Centre – It contributes to the research, development and manufacture of fuels for fast reactors, technology for reprocessing of fuels, waste management and health and safety of the work force.
- The Department of Atomic Energy (DAE) proposed building 4 more FBRs with a capacity of 600 MWe each.
- **Fissile material-** Mixed oxide of Uranium and Plutonium-239 (By-product from stage-I).
- **Coolant- Liquid sodium**, a highly reactive substance used in 2 circuits to transfer heat and produce electricity.
- **Breeder reactor-** It generates more Pu-239 than it consumes.

India has only about 2% of the global uranium reserves but has 25% of the world's thorium reserves, found in the monazite sands of coastal regions of South India.

To know about the history of India's nuclear program click [here](#)

Why PFBR delayed?

- **Impact of sanction-** Sanctions following India's 'Smiling Buddha' nuclear test led to the use of mixed carbide fuel instead of enriched uranium, affecting power output and operating conditions.
- **Loss of expertise-** Many experts involved with the Fast Breeder Test Reactor (FBTR) were retiring by the time PFBR was approved in 2003, leading to a loss of expertise.
- **Fund deficit-** The project faced *cost overruns*, and also needs additional funds and extensions.
- **Procurement Delays-** Due to BHAVINI's dependency on the Nuclear Power Corporation of India.
- **Operational challenges-** The experts expected that the reactor vessel could be preheated to 150°C in about a month based on theoretical calculations and mock tests, but the process took more than a year in reality.
- **Technical difficulties-** The coolant liquid sodium is highly reactive, it requires careful handling.
- **Fukushima Daiichi disaster 2011-** It shifted global public opinion against nuclear power, affecting new facility construction.

Small Modular Reactor (SMR)- An innovative approach to nuclear reactor

- **Capacity-** It can have a maximum capacity of up to 300 MW.
- **Fuel compatibility-** SMRs can operate using low-enriched uranium.
- **Eco-friendly-** They require less land compared to conventional nuclear reactors.
- **Safety-** SMRs can accommodate more safety features.
- **Cost-effective** – It can be installed at reduced cost and time by repurposing infrastructure in brownfield sites.
- India can potentially import this uranium from the U.S. through the 123 Agreement.
- To increase SMRs' contribution, India would need to make amendments to the Atomic Energy Act (1962).
- It would allow private sector participation under the oversight of the Atomic Energy Regulatory Board (AERB).

What are the challenges with PFBR?

- **Safety concerns-** Fast Breeder Reactors (FBRs) are known to be more challenging to handle than other reactor types, raising safety concerns.
- **Regulatory dependency-** The Atomic Energy Regulatory Body (AERB) has faced criticism for lacking independence, there have been calls for an independent statutory atomic regulator to enhance safety oversight.
- **Public reaction-** DAE has faced public skepticism and concerns about its handling of safety issues.
- **Radioactive by-products-** The thorium fuel cycle, while promising for its abundance, produces radioactive byproducts (*caesium-137, actinium-227, radium-224, radium-228, and thorium-230*).

What lies ahead?

- The proposed expansion of FBRs indicates a commitment to advancing nuclear technology in India despite challenges.
- NPCIL announced plans to commission a nuclear power reactor every year suggest a proactive approach to meeting energy demands and contributing to the country's energy transition.

BHAVINI

- **Launched in -** 2003
- **Administrative control-** *Department of Atomic Energy.*
- **About-** It is a **Special Purpose Vehicle**, for implementing India's first prototype 500 MW Fast Breeder Reactor project.
- **Located in -** Chennai, Tamil Nadu.
- **Objective-** To construct and commission the first 500 MWe Fast Breeder Reactor (FBR) at Kalpakkam in Tamil Nadu
- To pursue construction, commissioning, operation and maintenance of subsequent FBRs for generation of electricity under the provisions of the Atomic Energy Act, 1962

14.3 Challenges of Nuclear Waste

Why in news?

Recently India reached [stage II of nuclear program](#), but large scale use of nuclear power highlights the significant challenge associated with nuclear waste.

What is nuclear waste?

- It's the by-product of *fission reactors* where elements like uranium-235 break down into *non-fissile elements* as nuclear waste.
- These by-product *radioactive isotopes* along with unburned fuel, constitute nuclear waste.
- They are hazardous due to its radioactivity and must be managed carefully to prevent harm to the environment and human health.

As per International Atomic Energy Agency report, many countries are taking major steps with more than 80% of all solid radioactive waste volume now in disposal.

How the nuclear waste is handled?

- **Storage-** The fuel loaded into a nuclear reactor eventually becomes irradiated and is referred to as spent fuel.
- It is both hot and radioactive, requiring it to be stored underwater for cooling, sometimes for decades, before being moved to dry casks for long-term storage.
 - U.S., Canada, and Russia having tens of thousands of tonnes of spent fuel.
- **Reprocessing-** It involves chemically separating reusable fissile material from non-fissile waste components in spent fuel.
- Uranium and plutonium are extracted from spent nuclear fuel and other materials including fission products are kept for storage and disposal.
 - While reprocessing increases fuel efficiency, it *also generates additional waste* and poses proliferation risks due to the *production of weapons-usable plutonium* which needs proper regulation.

- **Treatment-** Liquid waste from nuclear plants undergoes treatment to reduce its volume and radioactivity.
- *Low level waste* are released into the environment, like [Japan's discharge from Fukushima](#) into the Pacific Ocean.
- *High level liquid waste* is turned into a solid glass form, through verification process, facilitates long term storage.
 - The challenge lies in liquid waste which can pose accident hazards if mishandled.
- **Disposal-** The ultimate goal is to dispose of nuclear waste safely and permanently.
- *In geological disposal*, the waste is sealed in containers and buried deep underground.
 - While it minimizes human exposure, there are concerns about potential exposure if the containers are disturbed during activities like digging.

What are the challenges associated with nuclear waste management in India?

- **Environmental injustice-** Exporting nuclear waste and hazardous materials disproportionately affects certain regions, the cost of waste management is beared by countries which don't benefit from nuclear power.
- **Emission of CO₂-** Uranium mining, operating nuclear plants and the generated radioactive waste continues to emit carbon dioxide.
- **Impact on environment-** The water coolants used to cool rods are disposed of into water bodies which disrupts aquatic ecosystems.
- Groundwater contamination causes impacts on humans and other living organisms.
- **Mishandling waste management-** The *Waste Isolation Pilot Plant* in US has been hailed as a model for radioactive waste management, but it faced a serious setback in 2014 when an accident led to the release of small quantities of radioactive materials into the environment.
- **High cost-** The nuclear waste management imposes significant financial burden on the overall cost of nuclear energy production.
- **Health concern-** Direct or indirect contact with radioactive waste can lead to genetic mutations, skin cancer, other forms of cancer, cataracts, and tissue and organ damage.
- **Nuclear weapon proliferation-** The process involving uranium pellets and other radioactive elements could potentially be misused to create nuclear weapons.
- **Nuclear accident-** *Chernobyl disaster in 1986* and the *Fukushima Daiichi disaster in 2011* led to the death and displacement of many individuals and properties.
- **Regulatory challenges-** Disputes over site selection for disposal facilities and concerns about transportation of radioactive materials often arise.
- **Long term management-** Nuclear waste remains hazardous for thousands of years, necessitating robust long term management strategies that span generations.

India's nuclear waste management

- **Reprocessing plants-** As per 2015 report of the International Panel on Fissile Materials (IPFM), India has reprocessing plants in *Trombay, Tarapur, and Kalpakkam*.
 - Tarapur and Kalpakkam facilities handle spent fuel from pressurized heavy water reactors (PHWRs).
- **On-site waste management-** The wastes generated during the operation of nuclear power stations, such as low and intermediate-level radioactive waste, are managed on-site.
- **Operational challenges-** The IPFM report suggest that delay in stage II of India's nuclear program is due to poor operation of reprocessing facilities at Tarapur and Kalpakkam
- **New challenges-** If the *Prototype Fast Breeder Reactor* (Stage-II of India's nuclear program) starts functioning, it will introduce new complexities in the distribution of fission products and transuranic elements compared to conventional reactors.

14.4 Significance of Hydrogen Powered Ferry

Why in news?

India recently launched its first indigenously developed hydrogen fuel cell ferry.

What are the special features of hydrogen fuel cell ferry?

- **'Harit Nauka' initiative-** It was launched in 2024 to reduce greenhouse gas emissions as per the Maritime Amrit Kaal Vision 2047.
- **Manufactured-** By Cochin Shipyard Limited.
- **Deployed in service-** At Varanasi in Uttar Pradesh.
- **Features-** It can carry 50 people, air-conditioned passenger area, has five hydrogen cylinders that can carry 40kg of hydrogen and support 8 hours of operations. The vessel is also fitted with a 3-kW solar panel.
- **Fuel cell-** It utilizes utilizes a 50-kW Proton-Exchange Membrane (PEM) fuel cell which is a type of hydrogen fuel cell with Lithium-Ion Phosphate batteries.
- **Hydrogen fuel cell system-** It was developed by KPIT Technologies, Pune in collaboration with CSIR labs.

What is the significance of hydrogen fuel cell ferry?

- **Environment friendly-**It has zero emission, zero noise and is energy-efficient with water being the only by-product.
- **Quick refuelling-** Though it do not require recharging, it must be provided with uninterrupted supply of fuel and oxygen for the continuous operation.
- **Durability-** The passenger area is constructed with high-quality fiberglass reinforced plastic, similar to metro train coaches it enhances durability while keeping the vessel lightweight.
- **Flexibility-** The advantage of using a PEM fuel cell with a Lithium-Ion Phosphate battery is that the system can adjust the power output according to the power demand.
 - When the vessel needs to accelerate, the battery can provide extra power.
 - When the vessel needs to slow down, the battery can store the excess power generated by the fuel cell.
- **Benefits of PEM cell-** They operate at a lower temperature, and are lighter and more compact.
- **Cost effective-** There are no moving parts, hence the ferry requires less maintenance than combustion vessels.
- **Greener fuel -** It is a milestone for the field of nuclear fusion and also boost National Green Hydrogen Mission.

National Green Hydrogen Mission						
<ul style="list-style-type: none"> • Launch year- 2021 • Objective- To make India the Global Hub for production, usage & export of Green Hydrogen and its derivative. • Strategic Interventions for Green Hydrogen Transition (SIGHT)- <ul style="list-style-type: none"> ○ Incentive for manufacturing of electrolyzers ○ Incentive for production of green hydrogen. • Green hydrogen hubs- It will identify and develop regions capable of supporting large scale production and/or utilization of Hydrogen as Green Hydrogen Hubs. 	Hydrogen colour palette					
	Colour code	Brown	Grey	Blue	Turquoise	Green
	Energy source	Coal or lignite	Natural gas	Any non-renewable energy source	Methane	Any renewable energy source
	Process of getting hydrogen	Gasification	Steam methane reformation	Steam methane reformation and carbon capture & storage	Pyrolysis	Electrolysis of water
	Highest to lowest greenhouse gas emissions	←————→				
Lowest to highest acceptance level	←————→					
Harit Nauka Initiative						
<ul style="list-style-type: none"> • It is the 'Guidelines for Green Transition of Inland Vessels'. • Launch- By <u>Ministry of Ports, Shipping, and Waterways</u>. 						

- **Aim-** To embark on a journey towards a sustainable and eco-friendly future for our inland waterway
- All states have to make efforts to use green fuels for 50 per cent of inland waterways-based passenger fleets in the next one decade, and 100% by 2045.
- This is to reduce greenhouse gas emissions as per the Maritime Amrit Kaal Vision 2047.

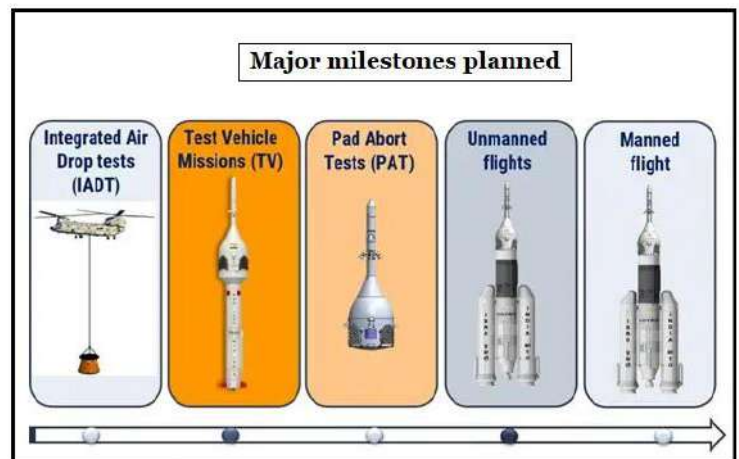
14.5 Mission Gaganyaan

Why in news?

Recently, Indian Prime Minister publicised the final shortlist of candidates to be astronauts on board the maiden human spaceflight mission called Gaganyaan of the Indian Space Research Organisation (ISRO).

What is Gaganyaan?

- **Aim-** To send a team of astronauts into space on a **Low Earth Orbit (LEO) of 400 km** for 3 days and safely return them by landing in the Indian Ocean.
- **Objective-** To demonstrate indigenous capability to undertake human space flight mission to LEO.
- **Origin-** In 2006, India started work on an orbital vehicle mission that was later named Gaganyaan.
- **Mission program-** As a part of this program *two unmanned missions and one manned mission* are approved by Government of India.
- Unmanned mission is to demonstrate the levels of technology preparedness before manned mission.
- Demonstrator missions includes Integrated Air Drop Test (IADT), Pad Abort Test (PAT) & Test Vehicle (TV) flights.
- **Space Capsule Recovery Experiment-** Conducted in 2007, where a satellite previously placed in orbit descended from an altitude of 635 km & safely splashed down into Bay of Bengal.
- **CARE-** Crew Module Atmospheric Re-entry Experiment was successfully conducted in 2014, where ISRO launched a prototype of the crew module onboard on LVM-3 rocket.
- **Domestic development and testing-** Various components developed were rated ensuring their reliability met stringent standards for crewed spaceflight.
- **Second phase of unmanned mission-** It is planned with a pressurized crew module that will carry the robot **Vyommitra** to record all parameters to study the impact of the flight on humans.
- **Manned mission-** Group Captain Prasanth Balakrishnan Nair, Group Captain Ajit Krishnan, Group Captain Angad Pratap, and Wing Commander Shubhanshu Shukla are India's astronauts-designate for Gaganyaan.
- **Launch vehicle-** LVM-3, it is a well proven and reliable heavy lift launcher of ISRO.
 - LVM-3 was earlier called as GSLV Mk-III



Stages of LVM-3	Components
First stage	It comprises of two solid-fuel boosters strapped to the rocket core.
Second stage	It is powered by two liquid-fuelled and clustered Vikas 2 engines.
Third stage	It has the CE-20 indigenous cryogenic engine with liquid hydrogen and liquid oxygen as fuel and oxidiser, respectively.

- **HLVM 3-** All systems in LVM3 launch vehicle are re-configured to meet human rating requirements and christened **Human Rated LVM3**.

- It will be capable of launching the Orbital Module to an intended Low Earth Orbit of 400 km.
- **Orbital module-** It will orbit the Earth which consists of Crew module & Service module

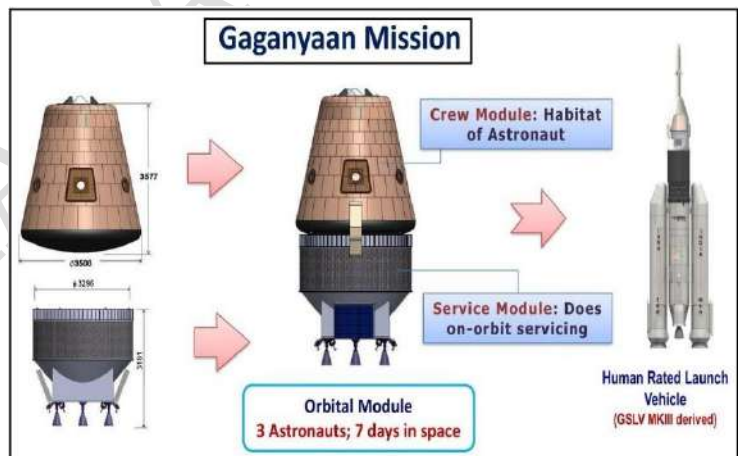
Crew module (CM)	Service module (SM)
It is the habitable space in space for the crew.	It will provide necessary support to CM while in orbit.
It consists of <i>pressurized</i> metallic <i>inner structure</i> and <i>unpressurised external structure</i> with Thermal Protection System (TPS).	It is an <i>unpressurized structure</i> containing thermal system, propulsion system, power systems, avionics systems and deployment mechanisms.
Features- Parachute, Crew Escape System, Environmental Control and Life Support System	It is a regulated bi-propellant-based propulsion system that caters to the requirements of the Orbital Module,
It will also feature a gynoid (feminine robot) named 'Vyommitra' to perform critical tasks.	It performs orbit injection, circularisation, on-orbit control, de-boost manoeuvring and Service Module based abort (if any) during the ascent phase

- **Crew Escape System-** HLVM3 consists of Crew Escape System (CES) powered by a set of quick acting, high burn rate solid motors which ensures that Crew Module along with crew is taken to a safe distance in case of any emergency either at launch pad or during ascent phase.
- **Human space flight centre-** It was launched in 2019 in Bangalore with a primary mandate to spearhead ISRO's Gaganyaan programme, the crew training is provided here.

ISRO signed a MoU with Glavkosmos, a subsidiary of the Russian space agency Roscosmos, for the training of the crew.

What are the benefits of undertaking Gaganyaan Mission?

- **Future explorations-** Towards a sustained and affordable human and robotic programme to explore the solar system and beyond.
- **Job creation-** It provides for an ample scope for employment generation and human resource development in advanced science and R&D activities.
- **Foster scientific temper-** A unique opportunity to inspire and excite Indian youth and steer many students towards career in science and technology.
- **Global leader -**It will strengthen international partnerships and global security through the sharing of challenging and peaceful goals.



What are the challenges in Gaganyaan mission?

- **Space debris management-** Space debris poses a significant threat to spacecraft in LEO, it requires advanced tracking systems and collision avoidance maneuvers to prevent potential collisions with debris.
- **Cabin depressurization risk-** Robust spacecraft design with protective shielding and early warning systems are essential as collision with small debris can pose a risk of depressurization in the crew module.
- **Complexity-** Replicating earth like conditions in a confined space like crew module is challenging.
- **Resource management-** Lightweight and compact systems for life support, food production and waste recycling are essential to optimize the use of available payload capacity.
- **Technological innovations-** To create a reliable, compact and energy efficient systems to sustain human life in the harsh conditions of space.

What lies ahead?

- Gaganyaan is a significant step for India, aiming to achieve self-sufficiency in human spaceflight.
- It will boost India to achieve its vision of an indigenous space station by 2035 and to land an Indian on the moon by 2040.

14.6 Significance of Atmospheric Research Testbed (ART)

Why in news?

Recently the 1st phase of India's Atmospheric Research Testbed in Central India (ART-CI) was inaugurated at Bhopal in Madhya Pradesh.

What is Atmospheric Research Testbed?

- It is an open-field observational and analytical research program.
- **Aim** – To study the vital cloud processes associated with the Indian monsoon, particularly focusing on the Monsoon Core Zone (MCZ) in central India.
- **Funded by** - Ministry of Earth Sciences (MoES).
- **Implemented by** - Indian Institute of Tropical Metrology, Pune.
- **Umbrella scheme**- It is the component under Atmosphere & Climate Research-Modelling Observing Systems & Services (ACROSS), central sector scheme of MoES.
- **Need**- To conduct comprehensive observations of weather and cloud parameters, crucial for understanding monsoon patterns.
- **Location significance**- The selection of *Silkheda in Madhya Pradesh* as the site for ART is strategic as it is positioned directly in the path of major rain-bearing synoptic systems, it facilitates direct monitoring and tracking of these systems.
- **High quality data**- This pristine environment is devoid of anthropogenic pollutants, makes it an ideal location for ensuring high-quality data collection.
- **First phase**- A remote sensing-based and in-situ measurements using 25 meteorological instruments have commenced.
- **Second phase**- It will deploy instruments such as a *radar wind profiler and balloon-bound radiosonde*, and soil moisture and temperature measuring equipment.
- **Data dissemination**- The data collected at this facility will be shared for research to national and international scientific community within the data policy of the Ministry of Earth Sciences.

The core monsoon zone is a region in India that stretches from Gujarat in the west to West Bengal in the east.

At 72 metres, ART will house India's tallest meteorological tower.

How ART-CI is significant to India?

- **Understand monsoon dynamics**- To better understand on processes governing monsoon convection and land atmospheric interactions over the monsoon core region.
- **Improve weather predictions**- To use ART-CI data to test, validate, and constrain numerical models for improving predictions of *intense convective storms and high-impact*

ACROSS scheme

- A central sector scheme that pertains to the atmospheric science programs of the **Ministry of Earth Sciences** (MoES).
- The sub-schemes under the ACROSS scheme are multi-disciplinary in nature and will be implemented in an integrated manner through 4 institutes.
- **Institutes** – The four institutes are:
 - India Meteorological Department (IMD)
 - Indian Institute of Tropical Meteorology (IITM)
 - National Centre for Medium Range Weather Forecasting (NCMRWF)
 - Indian National Center for Ocean Information Services (INCOIS)
- **Sub-Schemes**- Each institute has designated role for accomplishing the tasks through the following schemes:
 - Upgradation of Forecast System
 - Weather & Climate Services
 - Atmospheric Observations Network
 - Numerical Modelling of Weather and Climate
 - Monsoon Mission III
 - Monsoon Convection Clouds and Climate Change (MC4)
 - High Performance Computing System (HPCS)

mesoscale weather events observed predominantly over the Central India region.

- **Study rainfall patterns:** ART helps study the synoptic systems like low pressures or depressions originating in the Bay of Bengal, which significantly influence the monsoon rainfall in the MCZ.
- The rainfall in central India is closely linked to the *overall monsoon performance* across the country, making it a key area for study.
- **Agricultural dependence-** About 45% of India's labour force is employed in agriculture, which relies heavily on rain, especially in the Monsoon Core Zone (MCZ) spanning central India.
- **Adopting to climate change-**With changing climate patterns, understanding monsoon behaviour in this region helps in adapting to erratic rainfall strengthened low pressure systems.

14.7 Role of AI in Elections

Why in news?

The potential of AI in elections cannot be dismissed as the world is going to witness series of elections to be held across in 2024.

What is the significance of AI in elections?

- **Instant responses-** It can enable political campaigns to respond instantly to developments, creating videos, speeches, or press releases in real-time which can influence voter perceptions and campaign dynamics.
- **Precise targeting-** It can analyse vast amounts of microdata to target specific voter demographic with personalised messages which can be crucial in swaying undecided voters.
- It can provide voters with targeted information about candidates and political parties, potentially increasing informed participation.
- **Campaign efficiency-** It helps campaigns to micro-target potential voters, analyse data, and predict outcomes more efficiently, leading to more effective campaign strategies.
- It can speed up and improve the cost-effectiveness of information operations, helping to analyse large amounts of data and predict outcomes.
- **Secure process -** It can assist in securing election process, making it more robust against fraud.

What are the challenges of AI in elections?

- **Deep fake elections-** AI-generated disinformation could *compromise the voters' capacity* to distinguish between what is true and what is false.
- **Misleading voters-** Using AI in fake audio and video would create *misleading propaganda*.
- **Disrupt democracies-** It can disrupt democratic processes through various means, such as the spread of misinformation, *manipulation of public opinion*, and *interference in electoral systems*.
- **Affect election integrity-** It has affected the past elections in Argentina and Slovakia.
- **Unreliability-** It may exhibit *biases, errors or unexpected behaviour* leading to inaccuracies and unintended consequences in their applications.
- **Data driven politics-** Pew survey cited that a majority of Indians support 'authoritarianism,' which could be exploited by those using AI to influence the electorate.
- **Mischief potential-**AI's capability to cause *unintended harm*, known as 'mischief potential,' is a significant concern, especially as reliance on AI solutions grows.
- **AI hallucinations-**Experts warn about AI's 'hallucinations,' where AI systems *fabricate solutions to new problems*, leading to probabilistic and often inaccurate results.
- **Dependability concern-** The current AI models can be unreliable, and overreliance on them may be problematic without suitable mitigation strategies.
- **Lack of regulation-** The Election Commission lacks specific guidelines for addressing deepfake threats, although the government is considering new policies for AI technologies.

World Economic Forum's Global Risks Perception Survey, ranks misinformation and disinformation among the top 10 risks

- **Security risk-** The emergence of adversarial capabilities in AI such as **poisoning** (intentional corruption of training data), **back dooring** (insert malicious functionality in AI) and **evasion** (exploit weakness or blind spots in AI) poses significant security risk.

What are the steps taken to counter the challenges of AI in elections?

- **Advisory-** Recently Ministry of Electronics and Information Technology had issued an advisory that demands the social media intermediaries and platforms must ensure that their AI tools do not allow any bias or discrimination or threaten the integrity of electoral process.
- **Self-censorship-** AI platforms are implementing restrictions on the types of political queries they respond to, aiming to avoid generating responses that could provoke controversy or anger political leaders.
- **Code-level censorship-** The self-censorship is achieved through *algorithmic filters* that prevent AI platforms from generating responses to queries containing specific keywords.
- **Limiting response-** Google's chatbot Gemini is limiting responses to election-related queries in India, providing *standard non-answers* to avoid controversy.

What lies ahead?

- The issues must be addressed holistically by involving multiple stakeholders who can help mitigate the negative impacts of AI while maximizing its potential benefits for the society.
- The Google's AI models Gemini has faced criticism for inaccuracies in historical image generation and varying responses to questions about world leaders highlight the importance of public awareness and the need for scepticism towards AI and AGI (Artificial General Intelligence).
- The regulators must strike a balance between countering AI-linked misinformation and fostering innovation in the AI industry.

14.8 India's Need to Have Stakes in Space Tech

Why in news?

India's pursuit of space technologies particularly its endeavour with the Gaganyaan mission holds significant implications for various aspects of Indian science.

Why India need to have stakes in space technology?

- **Global interest in space-** Over 600 individuals from 50 countries have travelled to space highlighting the global interest in space exploration.
- **Novelty of human spaceflight-** Despite the number of people who have been space, executing a human spaceflight remains a rare achievement for individual countries.
- **Moon exploration-** There is a renewed focus on lunar exploration for resource extraction and potential colonization, leading to an anticipated surge in human spaceflight missions.
- **Strategic importance-** India aims to be an active participant in this new era of space exploration to secure access to emerging technologies and resources, which are vital for future economic growth.
- **Access novel tech-** By actively engaging in space missions, India ensure that it remains at the forefront of technological innovation and maintains its strategic autonomy.
- **Foster spin off technologies-** Space programs often lead to the development of [spin-off technologies](#) with applications beyond space exploration including significant medical advancements like MRI, heart implants and water filtration systems.
- **Cross-sectoral benefits-** The benefits of space exploration extends to various sectors such as healthcare, agriculture, telecommunications, and environmental conservation.
- **Enhance S&T ecosystem-** India's space endeavours can catalyse the development of robust science and technology ecosystem in India fostering collaboration between academia, industry and government institutions.
- **Need technological independence-** India-US civilian nuclear deal aimed to facilitate access to certain technologies, it did not completely eliminate India's dependence on foreign technologies.
 - In the 1990s, the *US denied India access to cryogenic technology*, essential for rocket propulsion, which delayed India's space program by nearly two decades.

Only three countries have executed human spaceflight missions namely United States, Russia and China

What are the new S&T programs announced by India that could foster India's stakes in space program?

- **National Green Hydrogen Mission-** It was launched in 2023 to make India a hub for production and export of Green Hydrogen.
- **National Quantum Computing Mission-** It allows Indian scientists to develop indigenous technology, systems, devices, and materials required to propel research and development in quantum technology.
- **IndiaAI mission-** It will establish a comprehensive ecosystem catalyzing AI innovation through strategic programs and partnerships across the public and private sectors.
- **National Deep Tech Startups Policy-** It is formulated to stimulate innovation, spur economic growth, and promote societal development through the effective utilization of deep tech research-driven innovations.
- **LIGO India-** It aims to improve the detectors' collective ability to pinpoint sources of gravitational waves in the sky, India is the part of LIGO program.
- **Square Kilometre Array-** India has been involved in the SKA project right from its inception in the 1990s which will be the world's biggest and most advanced radio telescope ever constructed.
- **Promote research-** Interim budget, 2024 has announced the setting up of Rs 1 lakh crore fund to provide long-term low-cost or zero-interest loans for research and development.
- **Deep tech in defence scheme-** It aims at bolstering deep tech in the defence sector which was announced during interim budget.

What lies ahead?

- The scientific community has welcomed these initiatives, recognizing their potential to stimulate research and innovation in India.
- However, it also emphasizes that these efforts represent only a fraction of the structural reforms, India needs to significantly improve the quality and quantity of scientific output.

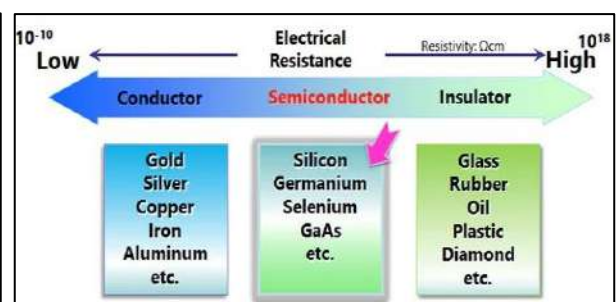
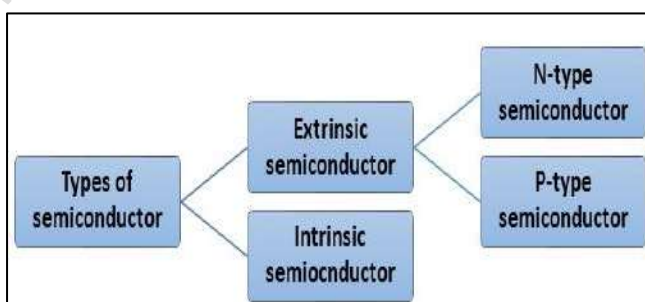
14.9 Fabrication of Semiconductors

Why in news?

The unique property of semiconductors allows it to control the flow of electric currents.

What is a semiconductor?

- Semiconductors are materials with electrical properties lying between conductors and insulators.
- **Binary revolution-** Binary language (1s and 0s) is essential for computing, communication and AI, a critical component of this revolution is semiconductor device.
- **Role of semiconductor-** They control electric currents with precision and are vital for modern electronics, including smartphones and computers.
- **Intrinsic semiconductor-** A pure semiconductor without any impurities or dopants added to it and the number of excited electrons and the number of holes are equal: $n = p$.
- **Extrinsic semiconductor-** The conductivity can be greatly improved by doping (i.e., by adding a small number of suitable substitute atoms known as impurities).
 - **N-type semiconductor-** An impurity mixed semiconductor that uses pentavalent impure atoms like phosphorus, arsenic, antimony, bismuth.
 - **P-type semiconductor-** It contains trivalent impurities such as boron and aluminium, which increases the level of conductivity of a normal semiconductor made purely of silicon.
- **Transistor-** It is the most important type of semiconductor that enable modern electronics.



How are semiconductors made?

- **Silicon wafer-** Silicon sourced from sand, undergoes a meticulous purification process to improve impurities, resulting in an ultra-pure wafer with minimal impurity levels.
- **Photolithography-** It involves coating the wafer with a light sensitive material (photoresist), using a mask to imprint the circuit pattern onto the wafer through light.
- **Etching-** Using chemical and/or physical techniques to remove the uncarved parts of the photoresist, leaving behind the desired circuit structure on the silicon substrate.
- **Doping-** A process where impurities are deliberately added to specific parts of the semiconductor to alter its electrical properties.
- **Deposition-** Thin layers of materials such as metals or insulators are deposited onto wafer's surface.
- **Testing-** The resulting semiconductor product undergoes packaging, where individual chips are separated, encapsulated, and tested to ensure functionality and reliability.
- **Integration-** Finally, the semiconductor chips are integrated into electronic devices, where they contribute to the functionality of the device as a whole.
- **Precision-** Fabrication demands ultra-high precision, utilizing scientific principles like photolithography with light sources emitting at 13.5 nm wavelength.
- **India-** It is prominent in chip design, *especially in Bengaluru* but relies on intellectual property rights owned by parent companies or Arm, limiting its role to that of product user.

Chip 4 initiative includes world's top semiconductor producing countries namely the U.S., Japan, Taiwan, and South Korea that represents more than 70% of the value of the global semiconductor industry.

Semiconductor fabrication is the intricate process used to manufacture semiconductor devices.

What are the benefits of semiconductor industry?

- **Employment generation-** It creates high-paying jobs, and nurture the potential for deep-tech start-ups.
- **Modern computing-** Critical for the operation of smartphones, laptops, and other computing devices.
- **Connectivity-** Used in routers and switches, crucial for the internet infrastructure & global communication.
- **Sustainability-** Used in renewable energy technologies like wind turbines and solar panels.
- **Healthcare-** Used in various medical devices, including implantable devices like pacemakers & insulin pumps.
- **Automotive-** Modern vehicles rely heavily on semiconductors for electronic control systems, security features like remote car keys, safety mechanisms such as anti-lock braking systems, and convenience features like rear-view cameras.
- **Foster innovation-** It contributes to advancements in various fields such as materials science, computer engineering, big data, optics, chemical engineering and chip design.

Steps taken by the government to promote the sector

- **Gujarat-** It will become the first state in India to have a large-scale semiconductor manufacturing facility.
- **India Semiconductor Mission-** It aims to formulate and drive India's long term strategies for developing semiconductors and display manufacturing facilities and semiconductor design ecosystem.
- There are 4 subcomponent schemes announced under India Semiconductor Mission.
- **Scheme for setting up of semiconductor fabs in India-**It provides fiscal support for setting up semiconductor wafer fabrication facilities in the country.
- **Scheme for setting up of display fabs in India-** It provides fiscal support to eligible applicants for setting up of display fabs which is aimed at attracting large investments.
- **Scheme for setting up of Compound Semiconductors / Silicon Photonics / Sensors Fab and Semiconductor Assembly, Testing, Marking and Packaging (ATMP) / OSAT facilities in India -** Extends a fiscal support of 50% of the capital expenditure
- **Semicon India Future Design-Design linked incentive (DLI) scheme -** Offers financial incentives, design infrastructure support across various stages of development and deployment of semiconductor design.

- **SPECS scheme-** It is the scheme for promotion of manufacturing of electronic components and semiconductors and provides financial incentive of 25%.
- **Program for Development of Semiconductors and Display Manufacturing Ecosystem-** The modified programme offers fiscal support of 50% of project cost.
- **Semicon India Conclave 2023-** India will emerge as global hub of semiconductor and chip-making industry.

14.10 Indian Navy's New BrahMos deal

Why in news?

India's decision to acquire 200 BrahMos Extended Range (ER) supersonic cruise missiles for its naval fleet represents a significant development in the country's defense capabilities.

BrahMos Missile

- **BrahMos Aerospace-** A joint venture between India and Russia founded in 1998 with the aim to develop, design, manufacture and market world's only supersonic cruise missile system-BrahMos.
- **Ownership-** India holds a 50.5% stake, while Russia holds a 49.5% share in the venture.
- **Origin-** The BrahMos missile itself is derived from the Russia's P-800 Oniks (also known as Yakhont) missile, which was first tested in 1990s.
- **Brahmos missile-** Brahmos is named on the rivers Brahmaputra (India) and Moskva (Russia).
- **Indian Navy-** The base version of the missile has been part of the Indian Navy's arsenal since 2005.
- **Indian Army-** Since 2007, the Army has utilized the missile's vertical launch configuration for mobile autonomous launchers.
- **Indian Air Force-** Recently inducted, the Air Force has integrated the BRAHMOS-ER missiles onto its *Su-30MKI fighter aircraft*.
- In 2023 Ministry of Defence had signed a deal with BrahMos Aerospace for procuring long range missiles and maritime mobile coastal batteries for the Indian Navy.
- The ***Indian Navy's warships or destroyers*** of the
 - Vishakhapatnam class (Vishakhapatnam, Mormugao, Imphal),
 - Kolkata class (Kolkata, Kochi, Chennai),
 - Delhi class (Delhi, Mysore, Mumbai),
 - Rajput class (Ranvir, Ranvijay) and
- ***Frigates*** of the
 - Shivalik class (Shivalik, Satpura, Sahyadri) and
 - Talwar class (Teg, Tarkash and Trikand) are already equipped with BrahMos missiles.
- **BrahMos Indigenisation plan-** Indian Navy has a 15 year plan in place to boost Indian manufacturing of weapons including the BrahMos missile.
- **Indigenous capacity-** In 1998, the indigenous capacity of the BrahMos project was only 13% which was increased to 75% in 2023.

What is the significance of BrahMos Extended Range Missile?

- **Enhanced naval defence capability-** The BrahMos ER missiles are poised to become the primary surface-to-surface missiles for the Indian Navy, offering enhanced range, capabilities and versatility.
- **Two-stage design-**
 - **First stage-** It features a solid propellant booster which provides initial thrust during launch.
 - **Second Stage-** It employs a liquid-fuel fired ramjet engine which propels the missile beyond supersonic speeds.

- **Speed-** BRAHMOS-ER achieved a remarkable speed of 2.8 Mach, which is nearly three times the speed of sound.
- **Multi-domain launch capabilities-** The BrahMos ER's ability to be launched from sea, land, or air enhances India's operational flexibility and strategic reach.
- **Service integration-** Integration with different branches of the military (Navy, Army, and Air Force) further emphasizes its versatility and adaptability to diverse mission requirements.
- **Extended target capabilities-** While the base version had a range of 290 km, the BRAHMOS-ER has been extended to an impressive range of 800-900 km.
- **Accuracy-** The missile's cruising altitude (up to 15km) and low radar signature.
- **Enhanced precision-** It has an indigenous seeker and booster designed by the Defence Research and Development Organisation (DRDO) which ensures precision and effectiveness in striking distant targets
- **Indigenization-** The project has achieved 75% indigenous capacity, with over 200 Indian industries involved, enhancing self-reliance in defence manufacturing.
- **Compliance with MTCR-** BrahMos ER comply with Missile Technology Control Regime (MTCR) norms demonstrates India's commitment to international agreements.
- **Strategic partnership-** The BrahMos project, a joint venture between India and Russia exemplifies successful international collaboration in defence technology by *strengthening diplomatic ties* between two nations.
- **Successful tests-** The successful tests across various domains (air, sea and land) underscores the missile's reliability and operational readiness.

Special Features

- Universal for multiple platforms
- "Fire and Forget" principle of operation
- High supersonic speed all through the flight
- Long flight range with varieties of flight trajectories
- Low radar signature
- Shorter flight times leading to lower target dispersion and quicker engagement
- Pin point accuracy with high lethal power aided by large kinetic energy on impact



Compared to existing state-of-the-art subsonic cruise missiles, BrahMos has

- 3 times more velocity
- 2.5 to 3 times more flight range
- 3 to 4 times more seeker range
- 9 times more kinetic energy

Missile Technology Control Regime (MTCR)

- **Aim-** To limit the spread of ballistic missiles and other unmanned delivery systems that could be used for chemical, biological, and nuclear attacks.
- **Launch year-** 1987
- **Established by** - G-7 countries (Canada, France, Germany, Italy, Japan, the UK, and the United States).
- **Member countries-** 35
- **India-** It is a part of the regime since 2016.
- **Restrictions-** The regime urges the member countries to restrict their exports of missiles and related technologies capable of carrying a 500-kilogram payload at least 300 kilometers or delivering any type of weapon of mass destruction.
