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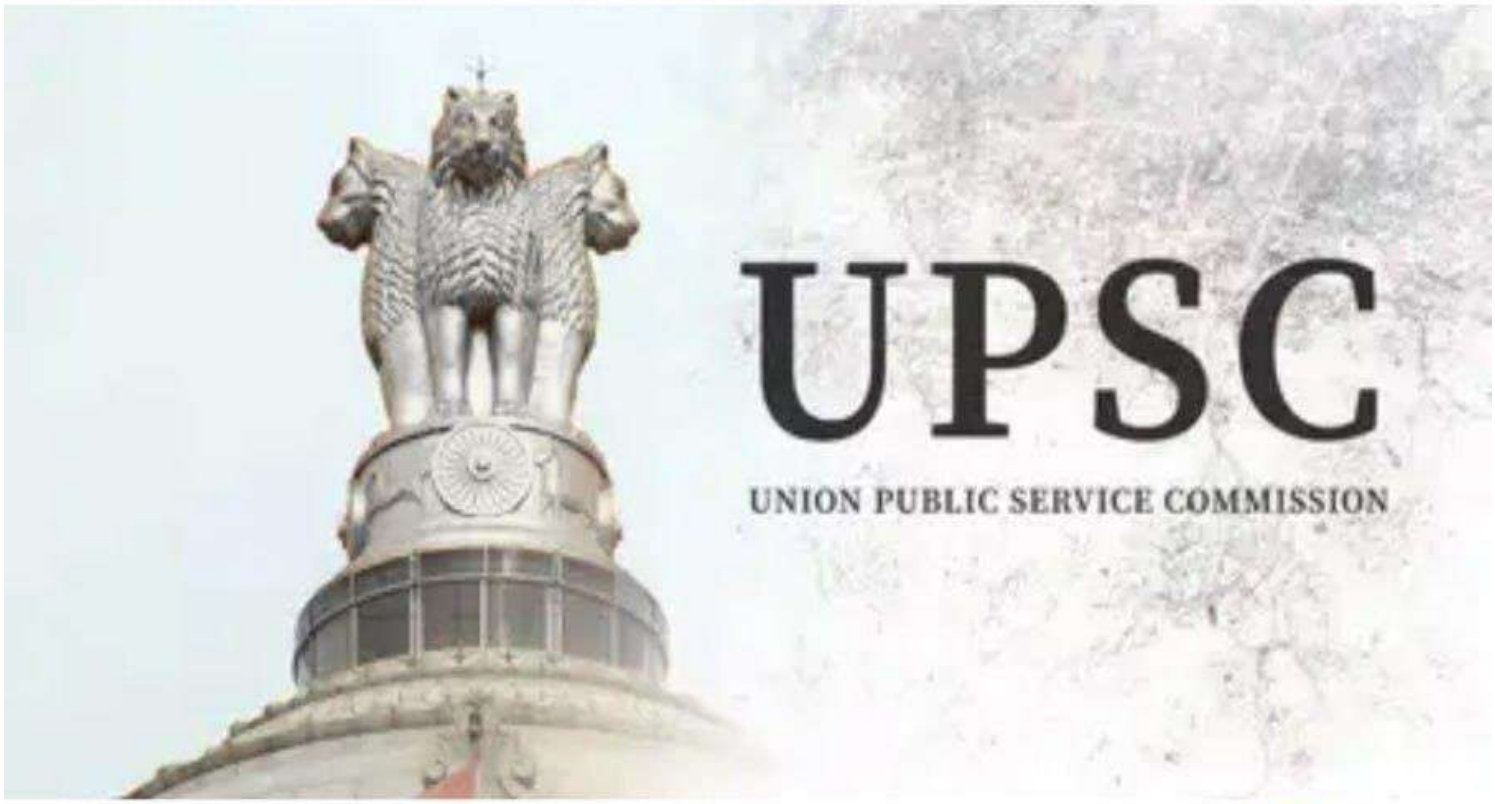
APRIL 2025

News Analysis



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APRIL 2025

1. IMPORTANT TOPICS OF THE MONTH

1.1 Reciprocal Tariffs of USA

Why in news?

Recently, US President Donald Trump celebrated America's Liberation Day on April 2 by announcing reciprocal tariffs against all major trading partners.

What are the tariffs announced by Trump?

- **Reciprocal tariff –** It is a *tax or trade restriction* that one country places on another in response to similar actions taken by that country.
- If one country raises tariffs on goods from another, the affected country might respond by imposing its own tariffs on imports from the first country.
- **USA discounted reciprocal tariffs** – In the context of USA it is termed as USA discounted reciprocal tariffs.
- USA calculates Reciprocal tariff by estimating the tariff each country charges on American imports and then halving that amount.
- There were two sets of tariffs announced,
    - Base tariff
    - Country-specific tariff
- **Base tariff** – It is *10% on all imports* and it is common for all countries that is imposing tariffs on US goods.
- This base rate of tariffs will go into effect on **April 5**.
- **Country-specific tariff** – It is specific for each country and is calculated by estimating tariffs each country charges on US goods.
- It also took account on factors such as currency manipulation, lax pollution and labor laws and harsh regulations that create difficulties for the US in global markets.

Country	Trump estimates of tariffs on US goods	Trump's 'reciprocal' tariffs	US trade deficit in 2024 (with a minus sign) in $ millions	US Trade Deficit as a percentage of the total US Trade deficit	Per capita income (US is at $ 89,680)
Cambodia	97%	49%	-12,300	1.0	$ 2,950
Vietnam	90%	46%	-1,22,071	10.1	$ 4,990
Sri Lanka	88%	44%	NA	NA	NA
Bangladesh	74%	37%	-6,152	0.5	$ 2,770
Thailand	72%	36%	-45,609	3.8	$ 7,750
China	67%	34%	-2,95,402	24.6	$ 13,870
Taiwan	64%	32%	-73,937	6.1	$ 34,920
Indonesia	64%	32%	-17,883	1.5	$ 5,250
Switzerland	61%	31%	-38,463	3.2	$ 1,11,720
South Africa	60%	30%	-8,837	0.7	$ 6,520
Pakistan	58%	29%	-2,989	0.2	NA
India	52%	26%	-45,664	3.8	$ 2,940
South Korea	50%	25%	-66,007	5.5	$ 37,670
Japan	46%	24%	-68,468	5.7	$ 35,610

- These country specific tariffs will be enforced from **April 9 onwards.**
- **Tariff structure on India** – According to US trade department, India imposes a 52% tariff on U.S. imports, and in response, the U.S. ***has levied a reciprocal tariff of 26%*** on Indian goods.

Why is USA imposing such tariffs?

> ***Trade deficit*** *is the gap between the value of a countries imports and exports.*

- **Addressing trade deficit** – The tariffs aim to address a $1.2 trillion trade deficit and revive local manufacturing in the US.
- **Reduce reliance on foreign goods –** It is believed that tariffs will incentivize companies to relocate production domestically.
- **Economic benefits and debt reduction** – The revenue generated by tariffs is expected to help reduce taxes and pay down the national debt, strengthening the U.S. economy.
- **Attracting investment** – It is estimated that tariffs will lead to $6 trillion in investments in USA.
- **Bringing back manufacturing and jobs** – By making foreign goods costlier, the policy aims to encourage both domestic and foreign companies to invest in U.S.-based manufacturing.

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What are the impacts of the tariff for India?

Positive Impacts

• **Relative advantage** – India could remain competitive in the U.S. market as competitors like China (34%), Vietnam (46%), Taiwan, and Thailand (36%) face higher tariffs than India (26%).
  ○ It could potentially boost India's export share.
• **Boost in textile exports** – India may gain a comparative advantage over Vietnam, Bangladesh and China to access the American textile market.
  ○ US accounts for 20% of Bangladesh's total ready-made garment exports.
• **Trade balance flexibility** – India's low electronics imports from the U.S. provide room to adjust tariffs strategically, helping maintain trade balance.
• **Relaxation to pharma** – The US Administration has exempted pharmaceuticals from reciprocal tariffs, highlighting the significance of affordable, life-saving generic drugs.
  ○ India exports USD 8.7 billion pharma products to US annually.

Negative Impacts
• **Challenges to exports** – India's exports will face difficulties ***US is India's 2nd largest trading partner*** in FY24.   ○ U.S. accounts for 18% of India's total goods exports. • **Increased price** - Increased tariffs will increase the price of Indian goods in America. • **Decline in export** - This may result in decline of import of Indian goods in USA. • And the country's exports to the US could fall by 2-3 % points in the current fiscal, according to some experts. • **Domestic industry pressure** – The decline in export to USA could disrupt domestic industries and reduce the profit margins. • **Economic slowdown** – According to some experts, the reciprocal tariff could shave off India's GDP growth rate by up to 50 basis points to 6 % and. • **Financial impact** – If India's export to US declines, it will affect the repatriation of US dollars to India. • This may in turn prevent the strengthening of Indian rupee against US dollar and weaken it.

What are the consequences of tariffs for U.S.A and global economy?

- **Slow down in global growth** – The speed and scale of these tariff hikes could further slow global growth, create market uncertainty, and pressure businesses worldwide.
- **Higher inflation** – Tariffs imposed on goods will be passed on to end user which raises the goods price resulting in inflation.
- Inflation can be avoided only if the dollar strengthens significantly (e.g., by 26% against the rupee, from 85 to 108), keeping import prices stable for U.S. consumers.
- **Disrupts trade flows** – Tariffs will increase the costs for importers in US which affects exporters globally, forcing them to either absorb losses or pass costs to U.S. consumers.
  - It will further reduce demand and alter trade volumes.
- **Stagflation and recession in U.S** – A combination of faltering growth and spiking inflation could lead to stagflation.
- Reduced demand combined with costlier imports, could shrink GDP further, and may lead to recession in US.

> ***Stagflation*** *— stagnant growth with persistent high prices (inflation).*

- **Supply chain reconfiguration** – Exporting countries may seek alternative markets which will disrupt established supply chains.
- **Risk of retaliation** – Countries might retaliate back on US which will create an escalatory spiral that could further complicate global trade environment.

What lies ahead?

- The ongoing Bilateral trade agreement negotiations, provides a platform to address tariff concerns, potentially securing exemptions or reductions by offering U.S. market access in areas like agriculture or services.
- Tariff war needs to be avoided to prevent mutual economic harm as it would be self-defeating and will impose clear costs on both India and the U.S.
- India could de-escalate tensions and foster better trade relations by diplomatic negotiations.

1.2 Delimitation: A case for a fair seat allocation

Why is in news?

In the recent conclave of southern Chief Ministers and other political leaders, including the Chief Minister of Punjab, the Joint Action Committee on Fair Delimitation demanded that the freeze on the number of parliamentary constituencies, based on the 1971 Census, be extended for another 25 years.

What is Delimitation?

- **Delimitation** – It is the process of fixing the number of seats and boundaries of territorial constituencies in each State for the Lok Sabha and Legislative assemblies.
- **Article 81(1)** – It states there can be *no more than 550 members* in the Lok Sabha, 530 from states and 20 from Union Territories.
    - **Article 81(2)(a)** - The ratio of number of Lok Sabha seats allotted to a state and the population of the State shall be same of all states.
    - **Article 81(2)(b)** - Ratio between the population of each constituency and the number of seats allotted to it, shall be the same throughout the State.
- **Article 82** - It states that after every Census is completed, the allocation of Lok Sabha seats to each state must be adjusted based on population changes.
- **Past delimitation exercises** - Delimitation has taken place 4 times - *1952, 1963, 1973 and 2002*, with the number of seats fixed and readjusted during the first 3 exercises.
- **42nd amendment 1976**- It had frozen the number of Lok Sabha seats and put off delimitation for 25 years until the 2001 Census.
- **84th Amendment 2001** - It further delayed delimitation for another 25 years till 2026.
- **87th Amendment 2003** – It provided for only the rearrangement of constituency borders on the basis of 2001 census without changing the number of seats allocated to states.
- **Current status of delimitation** - The present strength of the Lok Sabha(543) was fixed on the basis of the 1971 Census.
- The division of each State into territorial constituencies is readjusted on the basis of the 2001 census.

Delimitation Commission

- **Article 82** – Delimitation shall be carried out by such authority and in such manner as Parliament may by law determine.
- **Delimitation commission**– Consequent to the above provision, the parliament enacts delimitation act to constitute the delimitation commission.
- The Commission is appointed by the *President of India.*
- It comprises
    - A retired judge of the Supreme Court or a high court,
    - The Chief Election Commissioner, and
    - The State Election Commissioner.
- **Power of the commission** - It is a high-power body whose orders have the force of law and cannot be called in question before any court.
- These orders come into force on a date to be specified by the President of India in this behalf.

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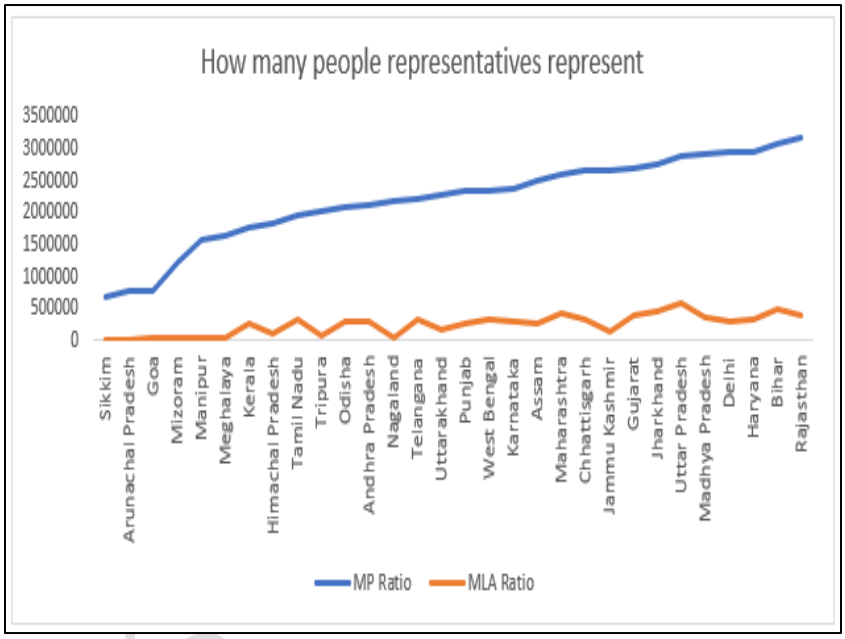
- The copies of its orders are laid before the House of the People and the State Legislative Assembly concerned, but no modifications are permissible therein by them.
- **Functions** - The Commission examines the changes in the population to redraw the constituencies or redraw a new one where it is necessary.
- Once published, the Commission's orders are final and, as per the *Delimitation Commission Act 1952 and Article 329A* of the Constitution.

What is the need for delimitation exercise now?

- **Constitutional mandate** – As per the 84th amendment, the delimitation needs to be carried out following the census conducted after 2026.
- **Rationalizing electoral constituencies** - The main purpose of undertaking the delimitation exercise is to rationalize the structure and composition of the electoral constituencies.
- **Increased population** - The total population of India in 1971 was around 54.79 crore which is estimated to have gone up to 141 crores as of March 2025.
- This has not reflected in the strength of the Lok Sabha, as the number of seats has been frozen at the population level of 1971.



- **Changed representation** - In 1971, the ratio between the number of Lok Sabha seats allotted to a State and its population was almost the same for all the States with 10 lakhs for a constituency.

Largest 5 Parliamentary Constituencies in terms of Number of Electors

Sl. No	State	Parliamentary Constituency	Total No. of Electors
1	Andhra Pradesh	Malkajgiri	29,53,915
2	Uttar Pradesh	Ghaziabad	22,63,961
3	Karnataka	Bangalore North	22,29,063
4	Uttar Pradesh	Unnao	21,10,388
5	NCT of Delhi	North West Delhi	20,93,922

Smallest 5 Parliamentary Constituencies in terms of Number of Electors

Sl. No	State	Parliamentary Constituency	Total No. of Electors
1	Lakshadweep	Lakshadweep	47,972
2	Daman & Diu	Daman & Diu	1,02,260
3	Jammu & Kashmir	Ladakh	1,59,949
4	Dadra & Nagar Haveli	Dadra & Nagar Haveli	1,88,783
5	Andaman & Nicobar Islands	Andaman & Nicobar Islands	2,57,856

- **Ensuring One Vote One value** - To provide representation to different sections of the population and remove gross inequalities in the population size of constituencies.
- **Strengthening Democracy** - To address the disparities in voter representation, ensuring fair and transparent elections that uphold the democratic principle of equality.

- **Reflecting demographic changes** - With shifting population patterns, including migration, urbanization, and uneven growth rates, delimitation updates boundaries to reflect current realities.

In 1971, 73.2% of India's population was residing in rural areas and 26.8% in urban areas. In 2011, the rural share decreased to 68.84 % and the urban share increased to 31.16%.

What are the challenges in conducting delimitation now?

- **Disproportionate representation risk** – Delimitation based on post 2026 census might allocate states like Uttar Pradesh and Bihar more seats due to higher population growth and a smaller number of seats to states like Tamil Nadu and Kerala, with slower population growth.
- **Aggravates federal imbalance** – The unequal increase in the Lok Sabha seats could aggravate the existing federal imbalance in Parliament in favor of few states like Uttar Pradesh, Bihar etc.
- **Threat to cooperative federalism** – This widening inequality might affect the spirit of cooperative federalism and risks weakening national unity and the balance of power among states.
- **Undermines population control** - A purely population-based seat allocation would favor high population growth states such as Bihar, UP.
- It risks undermining states such as Kerala, Tamil Nadu that followed national population control goals.

State	Number of seats at present
U.P.	80
Bihar	40
Rajasthan	25
M.P.	29
Tamil Nadu	39
Andhra + Telangana	42
Kerala	20
Karnataka	28
Punjab	13
Himachal	4
Uttarakhand	5

What can be done?

- **Weighted formula for seat allocation** - A composite index factor with governance quality, health, education, and fiscal discipline can be used for delimitation.
- This rewards states that have promoted development and followed responsible policies.
- **Gradual change** – Number of state legislative constituencies can be increased before changing the Lok Sabha seats to ensure adequate representation.
- **Maintaining the present representation** – Delimitation can be carried out , without affecting the current percentage share of states in Lok Sabha.

States	Number of seats in Lok Sabha	Percentage
Uttar Pradesh	80	14.73%
Maharashtra	48	8.84%
West Bengal	42	7.74%
Bihar	40	7.37%
Tamil Nadu	39	7.18%

- **Strengthening the Rajya Sabha** – Representation of smaller and less population growth states in Rajya Sabha can be increased to compensate their lose in Lok Sabha.
- **Federal consultative body** - A national-level body can be set up to oversee the delimitation process through dialogue and consensus.
- This ensures fairness and transparency in line with constitutional values.

1.3 India's Health Progress

Why in news?

World Health Day, observed annually on 7 April, that highlights global health issues and mobilises action to improve public health outcomes.

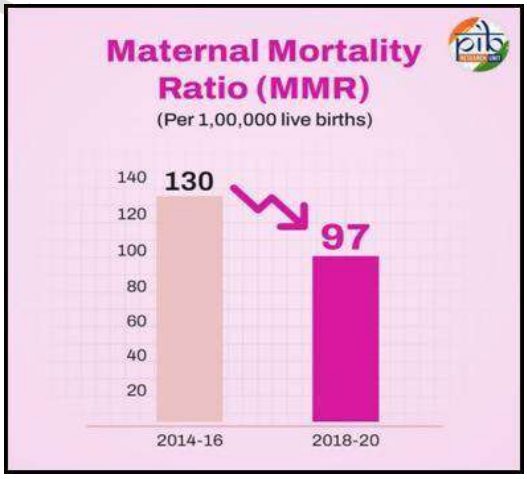
What is the theme of World health day 2025?

- **Initiative by** – *World Health Organization (WHO)* in 1950.

- **Aim** - To highlight pressing global health issues and mobilises action to improve public health outcomes.
- It unites governments, institutions, and communities in addressing critical health priorities each year.
- **Theme of 2025** – Healthy Beginnings, Hopeful Futures.
- **Focus of 2025 – This** year focuses on maternal and newborn health and urges governments and the health community to ramp up efforts *to end preventable maternal and newborn deaths*, and *to prioritize women's longer-term health and well-being*.

What is the progress of India in maternal health and child health?

- **Maternal health improvement** - MMR (Maternal Mortality Ratio) in India dropped from 130 (2014-16) to 97 (2018-20) per 1,00,000 live births.
- Over last 30 years (1990–2020), MMR declined *by 83% in* India whereas Global MMR reduced by 42% in the same period.
- **Child health development**
  - **Infant Mortality Rate (IMR)** – Dropped from 39 (2014) to 28 (2020) per 1,000 live births.
  - **Neonatal Mortality Rate (NMR)** – Dropped from 26 (2014) to 20 (2020) per 1,000 live births.
  - **Under-5 Mortality Rate (U5MR)** - Dropped from 45 (2014) to 32 (2020) per 1,000 live births.



India vs Global Progress (1990–2020)

Indicators	India Reduction (%)	Global Reduction (%)
Maternal Mortality Ratio (MMR)	83%	42%
Neonatal Mortality Rate (NMR)	65%	51%
Infant Mortality Rate (IMR)	69%	55%
Under-5 Mortality Rate (U5MR)	75%	58%

Government Programmes for Maternal and Child Health

- **Maternal Death Surveillance and Response (MDSR)** – To identify causes of maternal deaths and implement corrective actions for improving obstetric care.

- **Reproductive and Child Health (RCH) Portal –** It is a digital platform to track pregnant women and newborns, ensuring timely antenatal, delivery, and postnatal care.
- **Anaemia Mukt Bharat (AMB) –** It is a part of POSHAN Abhiyan to focus on testing, treatment, and prevention of anaemia in adolescents and pregnant women.
- **Birth Waiting Homes (BWH) –** To improve access and promote institutional deliveries in remote and tribal areas.

What is India's progress in affordable health coverage?

- **Universal health coverage** - Under Ayushman Bharat - PM Jan Arogya Yojana (AB-PMJAY) over *55 crore beneficiaries* from India's economically vulnerable population in the *bottom 40% are covered.*
- **Enhanced infrastructure and services** – Health and Wellness Centres are designed to improve primary care, yet challenges such as staff shortages, inadequate diagnostic facilities, and irregular medicine supplies continue to exist.

Government Programmes for affordable health coverage

- **Ayushman Bharat - PM Jan Arogya Yojana (AB-PMJAY)** – Initiated on 2018, in Ranchi, Jharkhand, by Prime Minister Narendra Modi.
    - **Aim** – To provide Insurance up to RS 5 lakh per family per year for secondary and tertiary care hospitalization.
- **Health and Wellness Centres (HWCs)** - Launched in February 2018, to transform 1.5 lakh Sub-Centres and Primary Health Centres into HWCs by 2022.
- **Aim** - To deliver comprehensive primary healthcare, focusing on prevention, promotion, and wellness.

What is India's progress in digital health interventions?

- **Digital health access** - India is experiencing significant progress in digital health and facilitated over 36 crore patients through teleconsultations.

Government Programmes for Digital Health

- **Ayushman Bharat Digital Mission (ABDM)** – It is a unified digital health ecosystem (Health Accounts) to connect patients, healthcare providers, and systems through an interoperable digital infrastructure.
  - 76 crore Ayushman Bharat Health Accounts (ABHA) have been created under the ABDM
- **U-WIN** – It is a digital vaccination platform that streamlines and tracks immunization for pregnant women and children (0–16 years), under the Universal Immunization Programme (UIP).
- **e-Sanjeevani** – It is the world's largest telemedicine platform for primary care to bridge gaps in healthcare access by providing free, equitable, and remote medical consultations, emerging as

What is India's progress in disease elimination & control?

- **Malaria elimination** - As per WHO World Malaria Report 2024, India's moved from WHO's High Burden to High Impact (HBHI) group in 2024.
- **Trachoma elimination** - India has eliminated Trachoma as a public health problem in 2024.
- **TB control** - As per WHO's Global TB Report, TB-related deaths in India declined from 28 to 22 per lakh between 2015 and 2023.
- **Kala-azar Elimination** – India has successfully achieved Kala-azar elimination as of October 2024.

Government Programmes for Disease Control

- **Malaria Elimination Programme** – Launched 2016 to establish National Framework for Malaria Elimination.
- Aims to eliminate malaria by 2030.
- **National Tuberculosis Elimination Programme** – Launched on 2020 to eliminate tuberculosis in India by 2025
- It provoide free diagnosis and treatment of tuberculosis.
- **Pradhan Mantri TB Mukt Bharat Abhiyaan** – Launched on 2022, to provide additional support to TB patients.
- **Kala-azar Elimination Programme** – Started in 1990–91, for elimination by 2023.
- **Trachoma Elimination Programme –** Began 1960s under Blindness Control, eliminated 2024.
- Focused on treatment, surgery, sanitation to end blindness.

What is India's progress in mental wellness health interventions?

- Recent NIMHANS study revealed that *14% of Indians* suffer from some form of mental disorder.
- **Tele-MANAS (National Tele-Mental Health Programme)** – Launched on October 10, 2022, as a flagship digital mental health initiative.
- To provide free, 24/7 mental health support via a toll-free helpline (14416 / 1800-89-14416) in 20 languages.

*National institute of mental health and Neuro Sciences (**NIMHANS**) headquartered at Bengaluru aims to deliver mental health care and shape national policies through research.*

What lies ahead?

- Leveraging the technological innovation like Artificial intelligence in screening and diagnosis.
- Coordinated efforts across government, civil society, and private sectors, to fulfil the vision of 'Health for All'.
- Shifting towards preventive healthcare — through screenings, school-based health programmes, and public health campaigns

*India's health objectives are in line with **Sustainable Development Goal 3**, which emphasises good health and well-being.*

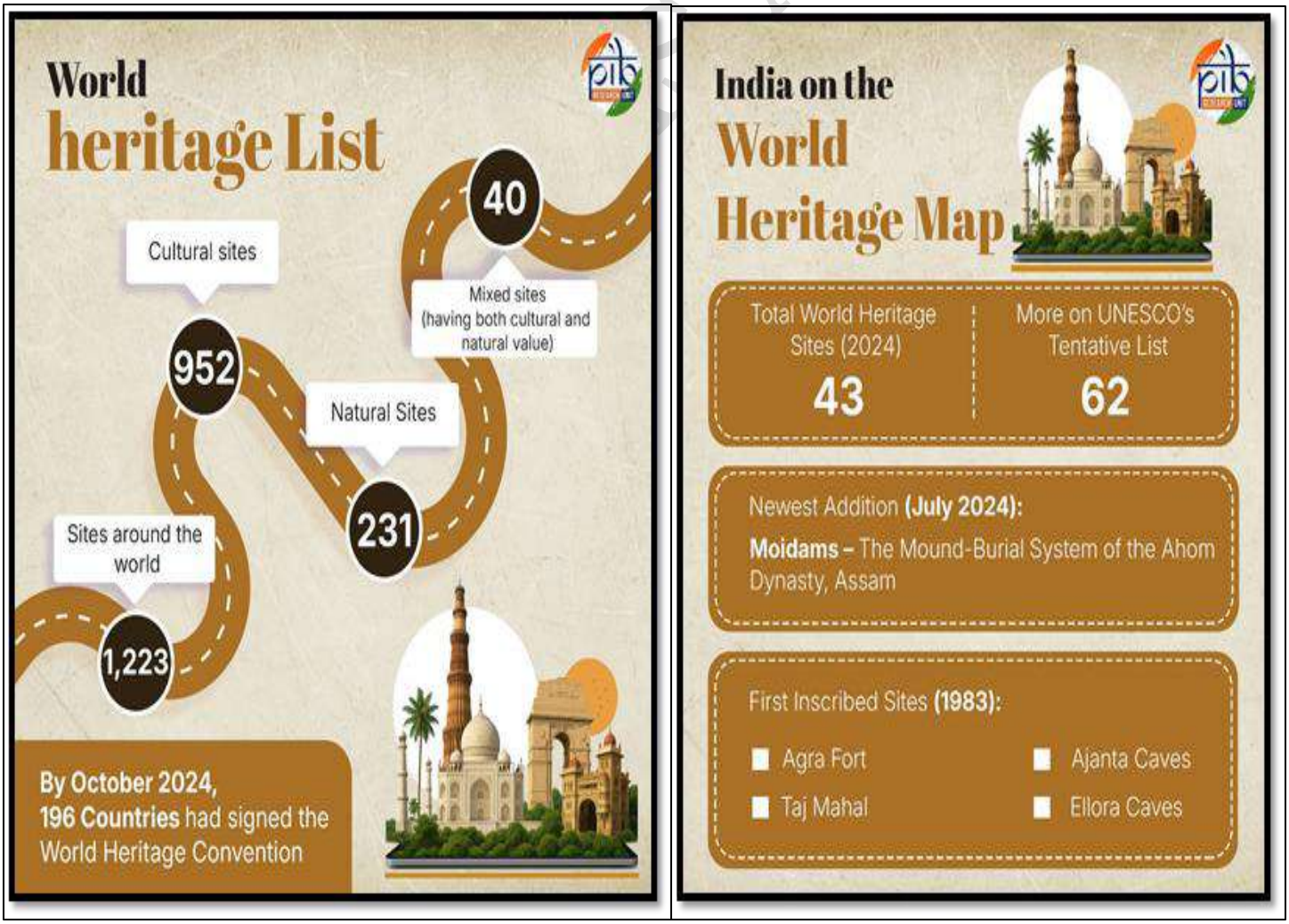
1.4 India's Journey of Heritage Preservation

Why in News?

World Heritage Day is celebrated every year on 18th April to honor and protect cultural and natural heritage.

What is the World Heritage Convention?

- **World Heritage Convention** – It is formally known as the "Convention Concerning the Protection of the World Cultural and Natural Heritage," was adopted by UNESCO in 1972.
- **Aim of the convention** - To identify, protect, and preserve cultural and natural heritage sites of outstanding universal value.
- This agreement explains what countries need to do to find and take care of special sites that can be added to the World Heritage List.
- **Signatories of the convention** - As of October 2024, 196 countries have joined the World Heritage Convention and India became part of this Convention in November 1977.
- **World Heritage Sites** – They are special places on Earth that have great value for all of humanity.
- **Types** - These can be cultural, natural, or a mix of both.
- **Recognition** - UNESCO gives the World Heritage title to places that are culturally, historically or scientifically important.
- **World Heritage List** – It includes 1,223 sites that are considered valuable to all of humanity.
- These include 952 cultural sites, 231 natural sites, and 40 sites that have both cultural and natural importance.
- **World Heritage Sites of India** - India has 43 World Heritage Sites, with Agra Fort, Taj Mahal, Ajanta, and Ellora Caves among the first listed in 1983 and 62 more on UNESCO's Tentative List.



What are the importances of World Heritage Sites?

- **Cultural Identity** - They represent the legacy of humankind, offering insights into past civilizations, artistic achievements, and the natural world.
    - **Ajanta and Ellora Caves (Maharashtra)** - These rock-cut caves feature stunning sculptures, paintings, and monasteries dating back to the 2nd century BCE, representing Buddhism, Hinduism, and Jainism.
- **Education and Research** - They offer invaluable resources for studying history, biodiversity, and sustainable practices.

- **Tourism** - Attracting visitors from around the world, they boost local economies and foster global understanding.
    - **Kaziranga National Park (Assam)** - A UNESCO-listed wildlife haven, famous for the world's largest population of the Indian one-horned rhinoceros, is a famous eco-tourism site of India.
- **International Cooperation** - The World Heritage Convention encourages countries to unite and share responsibility for the world's heritage.
    - **Khangchendzonga National Park (Sikkim)** - A sacred landscape blending biodiversity with Tibetan Buddhist beliefs.
- These sites can become symbols of peace, encouraging countries to work together to protect shared heritage.
- **Conservation** - Protecting these sites ensures the safeguarding of endangered natural habitats and architectural wonders.
    - **Sundarbans National Park (West Bengal)** – It is home to the Royal Bengal Tiger and the largest tidal halophytic mangrove forest in the world.
- **Environmental Protection** - Natural heritage sites are critical for maintaining ecosystems, biodiversity, and combating climate change.
    - **Western Ghats (Maharashtra, Kerala, Tamil Nadu, Karnataka)** - One of the world's eight "hottest hotspots" of biological diversity.

What are the Government's Initiatives to Promote India's Rich Cultural Heritage?

- **Building Monuments of National Importance** - India has 3,697 ancient monuments and archaeological sites declared of national importance.
- The Archaeological Survey of India (ASI) is responsible for their conservation and maintenance.
- **Revival and Redevelopment of Heritage Sites**: - India has revived key heritage sites through conservation and development projects.
    - The Kashi Vishwanath Corridor in Varanasi
    - Mahakaal Lok in Ujjain
    - Ma Kamakhya Corridor in Guwahati
- **Chardham Road Project** – It improves connectivity to sacred sites.
- Projects in Somnath and the Kartarpur Corridor promote cultural heritage and easier access for devotees.
- **Retrieval of Antiquities** - Archaeological Survey of India has retrieved 655 antiquities from foreign countries from the year 1976 to 2024, of which 642 antiquities have been retrieved since 2014.
- **Adopt a Heritage' Scheme** - Launched in 2017 , it allows private and public groups to help develop facilities at protected monuments using their Corporate Social Responsibility (CSR) funds.
- **46th Session of the World Heritage Committee** - Archaeological Survey of India, Ministry of Culture, successfully hosted the session in Delhi in 2024.
- **Must See Portal** - The Archaeological Survey of India (ASI) has created a portal to showcase "Must-See Monuments and Archaeological Sites of India.
- **Digitization of Cultural Heritage in India** - The National Mission on Monuments and Antiquities (NMMA), set up in 2007, works to digitize and document India's heritage and antiquities.
- So far, over 12.3 lakh antiquities and 11,406 heritage sites have been recorded.
- **Indian Heritage in Digital Space (IHDS)** - It aims to use digital technology to preserve and present India's cultural legacy through immersive tools and research support.
- **Classical Languages Recognition** - 11 Indian languages were recognized as classical languages to preserving India's diverse and ancient linguistic heritage.
- **India's first Archaeological Experiential Museum** - It was inaugurated in Vadnagar in 2025 to showcase Vadnagar's 2,500-year-old history with over 5,000 artifacts, including ceramics, coins, tools and skeletal remains.

*In 2024, the Government granted **classical language status** to Assamese, Marathi, Pali, Prakrit, and Bengali, raising the total to 11 classical Indian languages.*

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- **India's Literary Milestone on the MOWCAP Register** - Three of India's literary treasures (Ramcharitmanas, Panchatantra, and Sahrdayāloka-Locana) were inscribed into the 2024 Memory of the World Committee for Asia and the Pacific (MOWCAP) Regional Register.

Conclusion

- World Heritage Day reminds us that protecting our heritage is a shared responsibility.
- From ancient monuments to timeless literature, India continues to preserve its cultural and natural legacy through strong national efforts and global collaboration.
- These efforts ensure that our rich heritage inspires, educates, and unites generations to come.

1.5 Greenhouse Effect of Nitrogen

Why in News?

Global Nitrous Oxide Assessment by United Nations warns that nitrous oxide (N2O), emissions are rising faster than expected, and that immediate action is required to curb the environmental and health impacts of this super pollutant.

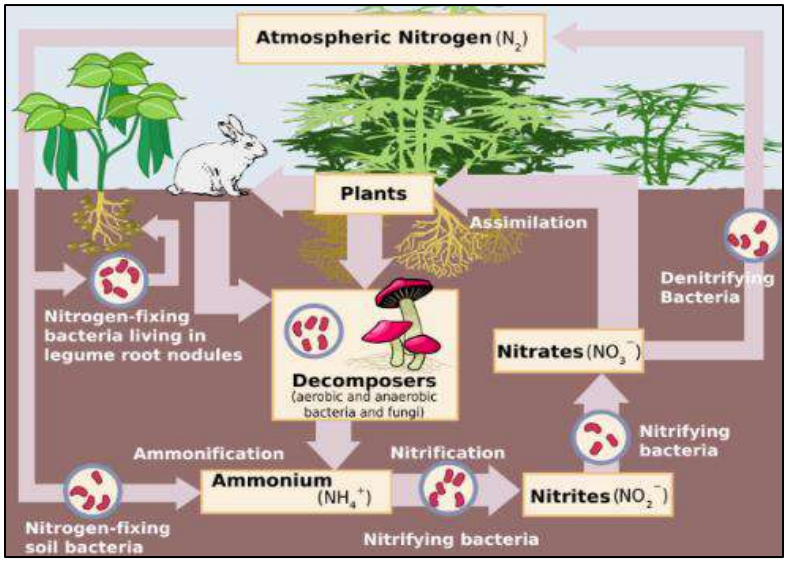
- **What is the significance of Nitrogen?**
- **Nitrogen** – It is the non-metallic element and a colourless, odourless, tasteless, non-combustible and nontoxic gas.
- **Abundance in Universe** - It is the 5th -most abundant gas in the universe.
- **Nitrogen in atmosphere** – About 78% of Earth's atmosphere is nitrogen and it is roughly three times more nitrogen in the air than oxygen.
- **Nitrogen in Bio life** - While it constitutes a mere 3% of our body weight, life, without it, life would be impossible i.e. it is a constituent of all living matter.
- **Nerve signalling** - NO, or nitric oxide, inside your body mediates the efficient transmission of messages among the nerves.
- It dilates arteries easing the flow of blood and improves immunity.
- **Cell energy** - Adenosine triphosphate (ATP), the fundamental currency of energy for cells, is part-constituted of nitrogen.

> ***Knuckle-cracking pop*** *results from the synovial fluid between your joints releasing a small bubble of nitrogen when fingers or toes are twisted or compressed.*

- **Building blocks of DNA (deoxyribonuclease)** - DNA are made up of 4 nitrogenous bases [adenine (A), guanine (G), cytosine (C), and thymine (T)].

What are the components of nitrogen cycle?

- **No direct intake** – Animal kingdom cannot directly consume or absorb nitrogen.
- The lungs, masters at extracting every molecule of oxygen from inhaled air to keep our cells alive, are flummoxed by nitrogen.
- **Symbiosis of plants** - Nearly 20,000 species of plants of the family Leguminosae, which include beans, chickpeas, lentils, soybeans, and peanuts, form an alliance with certain ancient bacteria and archaea called 'diazotrophs' to extracting nitrogen from the air.
- Plants that are non-leguminous, rice, wheat, maize must depend on diazotrophs in the soil.



> ***Diazotrophs*** *are bacteria & archaea capable of converting atmospheric nitrogen (N2) into usable forms like ammonia (NH3) through nitrogen fixation.* ***Nitrification*** *is the process by which bacteria – that usually attach themselves to the root or live in the soil – turn the ammonia and ammonium into nitrites and nitrate.*

- **Transmission to animals** - Plants uses the suitable form of nitrogen to make proteins, chlorophyll, their own proteins, and these make their way into other animals and us.
- **Denitrification** - Not all of the available nitrogen and the manufactured nitrate can be used and a large ecosystem of microbes exists to convert these nitrates back to nitrogen, called denitrification, and the cycle continues.
- **Lightning strikes** - These are the other way that atmospheric nitrogen can be broken down to nitric acid – another natural source of nitrogen.

What is the Green House Gas (GHG) potential of Nitrogen?

- **Nitrous oxide (N2O) -** While atmospheric nitrogen (N2) is not a greenhouse gas itself, Nitrogen in the form of nitrous oxide (N2O) is a potent greenhouse gas with a high Global Warming Potential (GWP).
- **Nitrogen GHG** – It is now the 3rd largest greenhouse gas and Nitrous oxide is believed to be responsible for approximately 10% of net global warming since the Industrial Revolution.
- **GHG effect** - Nitrogen accentuates the greenhouse effect in the same way as CO2 does by capturing re-radiated infrared radiation from the Earth's surface and subsequently warming the troposphere (lower atmosphere).
- **Greenhouse potential of Nitrogen** - For every unit of nitrous oxide emitted there are 1,241 as many CO2 atoms in the atmosphere.
- Nitrous oxide is 300 times more potent than methane and carbon dioxide as a greenhouse gas.
- **Ozone destruction** - Nitrogen is chemically inert in the troposphere and stays in the troposphere for about 120 years before moving into the stratosphere where it ultimately leads to the destruction of stratospheric ozone.

How did Nitrogen become a Green House Gas (GHG) pollutant?

- Agricultural and industrial practices impact the natural nitrogen cycle, leading to increased N2O emissions.
    - A study in 2010 by in 2010 by the Indian Nitrogen Initiative reported that *70% of N2O emissions were from agricultural soils*, 12% from wastewater, 6% from residential and commercial units, 3% from electricity generation and 2% from crop residue burning.
- **Fertilizers** - Composting, manuring, crop rotation were the strategies employed to keep nitrification and denitrification going on manually.
- United Nations Environmental Programme assessment suggests that about 200 million tonnes of reactive nitrogen applied as fertiliser, or about 80%, is lost to the environment leaching into soil, rivers and lakes and emitted into the air.
    - Chemical fertiliser (over 82% of it is urea) accounts for over 77% of agricultural N2O emissions in India.
- Animal and bird excrement, crushed animal bones were the main external sources of fertiliser, being rich sources of nitrate.
- **Saltpetre** – Also known as nitre or nitre, a common name for potassium nitrate (KNO3).
- It's a white, salty-tasting solid that has various uses, including as a fertilizer, an ingredient in gunpowder and other explosives, and a food preservative.
- **Cereals dominated mono Agri pattern** - The overwhelming quantity of fertilisers goes into cereals, such as rice and wheat, which account for most of the N2O emissions from India.
- Before the Green Revolution it was about 60: 40 (cereals: legumes) and now it is close to 90:10 with most of our legumes being imported.

War History of Nitrogen

- King Charles I of medieval England ordered subjects to collect their urine for creating nitrate beds to aid small-scale saltpetre mining.
- The mines in Chile, that manufactured saltpetre and deposits of guano – the nitrogen-rich excrement of birds and bats – in Peru became key sources of fertiliser and gunpowder for Europe.
- The Guano War fought in the 1860s between Spain and its former colonies Peru and Chile revolved around control of nitrate reserves.
- English raiders pillaged the tombs of pharaohs – not for their treasures – but for the nitrogen in the bones of thousands of slaves buried along with the mummified pharaohs.

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- More than three million human skeletons along with the bones of thousands of dead horses of soldiers in the battles of Austerlitz, Leipzig and Waterloo were sent to the port of Hull in north of England.
- There they were ground in the bone-mills of Yorkshire to make nitrate and fertilise fields.

- **Synthesise of ammonia** - In 1907, German chemist, Fritz Haber, figure out the degrees of heat and pressure needed to combine nitrogen from the air with hydrogen and synthesise ammonia.
- **Haber-Bosch process** - Engineer Carl Bosch figure out – most vitally the addition of an iron catalyst – a way to manufacture ammonia on an industrial scale.
- **Industrialization** - The industrial fixing of nitrogen to produce ammonia added excessive nitrogen in the soil.
- **Explosives** – Reactive nitrogen are widely used in modern-day explosives trinitrotoluene (TNT) and nitro-glycerine.
- This adds excessive nitrogen in biosphere and atmosphere.
- **Fossil fuel burning** – Nitrogen oxides (NO_x - NO and NO_2) results from burning fuel in engines.

Reactive Nitrogen *- An atom of nitrogen will prefer pairing up with another nitrogen via three strong bonds but once these bonds are broken by bacteria or industrial methods, it becomes extremely reactive.*

What are the impacts of Nitrogen pollution?

- **Water pollution** - Being extremely soluble, ammonium nitrates are washed away during rains and enter into canals and streams, and stimulate algal blooms.
    - First noted in the Gulf of Mexico, there are large patches of 'dead oceans' where algal blooms resulting from a surfeit of nitrates rapidly multiply, decompose and use up vast quantities of ocean inside the lakes and seas.
- **Respiratory diseases** – Nitrogen oxides NOx forms smog and triggers a host of respiratory ailments.
- **Blue Baby Syndrome** - Water containing elevated levels of nitrate raises the risk of infants developing methemoglobinemia, commonly referred to as "blue baby syndrome", which can be fatal.
- **Acid rain** - Nox can also constitute acid rain if mixed with water vapour, turning into nitric acid.
- **Ground ozone formation** - Nitrogen dioxide will break apart in sunlight and the free oxygen atoms latch onto oxygen molecules forming dangerous ground-level ozone.

Nitrate *is a form of nitrogen resulting from animal waste, plant decomposition and fertiliser run-off.*

- **Economic impact** - According to UNEP's 2018-2019 Frontiers Report, nitrogen costs the global economy between US$340 billion and US$3.4 trillion annually when taking into account its impact on human health and ecosystems.

What needs to be done?

- Urgent action on N2O is critical to achieving climate goals and to limiting warming to 1.5°C in the context of sustainable development as outlined in the Paris Agreement.
- Abating N2O emissions could avoid up to 235 billion tonnes of CO2-equivalent emissions by 2100.
- This is equivalent to six years' worth of current global carbon dioxide emissions from fossil fuels.
- Practical, cross-sectoral abatement strategies that could cut N2O emissions by more than 40% from current levels.
- A sustainable nitrogen management approach not only reduces nitrous oxide emissions but also prevents the release of other harmful nitrogen compounds
- By transforming food production systems and rethinking societal approaches to nitrogen management, even deeper reductions could be achieved.
- Simultaneously reducing nitrogen oxide emissions and ammonia would also significantly improve air quality, the UNEP report notes, potentially avoiding up to 20 million premature deaths globally by 2050.
- India's efforts at insisting on utilising neem-coated urea, the use of nano-urea fertiliser, and organic farming are viewed as important steps to improve such nitrogen use efficiency.

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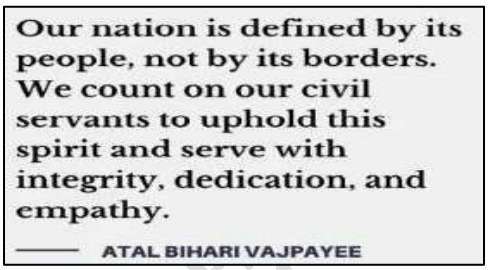
1.6 Role of Civil Services in Democracy

Why in News?

Civil Services Day is celebrated on April 21.

What are the significances of civil services in public administration?

- **Steel frame of governance** – Civil service is a steel frame on which the whole structure of our governance rests, said Lal Bahadur Shastri.
- **Preserving constitutional order** - It is the duty of the civil services to preserve the constitutional order such as democracy, rule of law, national unity and the federal structure.
- **Assisting political executives** - In a democracy, it is the elected government which has the mandate, and it is the duty of the civil servant to assist the government in carrying out its policies.
- **Ensuring free and fair elections** – Election commission of India through it's civil servants have been playing a critical role in ensuring free, fair, and efficient elections, which are the foundation of electoral democracy.



- **Smooth transfer of power** - Unlike other countries in the neighbourhood which have seen military coup and violent overthrow of governments, Civil servants in India have ensured smooth transfer of power whenever a government changes.
- **Handling emergencies** – Civil services play a crucial and frontline role during constitutional crises, national emergencies, and President's Rule in India.
- Their neutrality, administrative experience, and continuity make them essential for maintaining governance and stability in such situations.
    - **During National emergency** - Civil servants, especially the IAS and IPS officers, ensure internal security, manage public unrest, and maintain peace during emergencies like war, external aggression, or armed rebellion.
    - **During President's rule** – During President's rule in a state, the state's political executive is dissolved.
    - With no elected government, civil servants led by the Chief Secretary and other senior officials assist the Governor in ensuring uninterrupted governance and administration.

What are challenges faced by civil servants?

- **Maintaining political neutrality** – Civil servants often face pressure from elected officials to make decisions that benefit them or their allies, rather than following the law or best practices.
- This can create a conflict of interest and make it difficult for officers to do their jobs effectively.
- **Public pressure and expectations** - Civil servants are expected to solve complex problems and meet the needs of a large and diverse population.
- Officers face criticism from the public for unpopular measures which are essential for efficiency in public administration.
- **Lack of infrastructure and resources** - Many Indian districts, particularly in rural areas, lack proper infrastructure and resources.
- This can make it challenging for IAS officers to implement government programs and deliver services effectively.
- **Deficiencies in performance appraisal** - Favoritism, personal rivalry, or political pressure can skew ratings, affecting fairness of annual Performance Assessment Report system.
- Despite the news about many corrupt civil servants, almost all the IAS officers have rating between 9 and 10, as indicated by Cabinet Secretary.
- **Hurdles in promotion** – Despite good performances, some civil servants are not empanelled as Joint Secretary.
- The officer is also not given any feedback on why the empanelment was not done.
- **Low salary structure** – Secretary level officer are equivalent in capacity to the CEOs of esteemed corporates.

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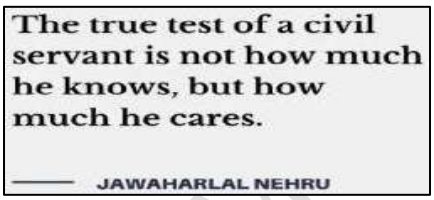
- But their salaries do not account for one tenth of corporate equivalent which disincentivises their performance and leads to corruption.
- **Work-Life Balance** - Civil service careers, especially for IAS and IPS officers in their initial postings, often involve long hours and frequent transfers.
- This can strain personal relationships and make it difficult to maintain a healthy work-life balance.

What lies ahead?

- Officers need to be politically neutral since the respect for AIS officers emanates from a perception that decision making would be neutral and unbiased, and would enable the nation to achieve the objectives outlined in the preamble of the Constitution.
- There is a need for greater competence and subject matter expertise among civil servants which can be addressed with lateral entry expertise.



History of Civil Service in India

Early Civil Service (East India Company Era)

- Lord Cornwallis is considered as 'Father of Civil Services in India'.
- The Charter Act of 1793 established covenanted civil services, which led to a more structured administration and pensions for employees.
- Until the mid-19th century, Directors of the East India Company nominated youth for civil service.
- The Covenanted Civil Service formed the European elite of Indian administration.
- Lord Wellesley founded the College of Fort William in Calcutta in 1800 to educate young recruits for the Civil Services.
- But the directors of the Company, in 1806, replaced it with their own East Indian College at Haileybury in England.
- Entry required passing a simple examination and through a system of patronage for admission to the Company's College at Haileybury.
- Training at Haileybury included 2 years of study in Law, Political Economy, and Indian Languages.
- Appointees were sent to India after training.

Raja Ram Mohan Roy & Civil Service Reform

- Raja Ram Mohan Roy, the father of Indian nationalism was the first Indian to have placed the demand for reform of the civil service in India in a formal manner.
- In his evidence before the select committee of the British Parliament before the grant of Charter in 1832 he asserted that many of the Indians were fully qualified to discharge the duties assigned to them.

Transition to Competitive Examinations & Macaulay's Reforms (1853–1859)

- Before 1853 EIC directors appointed Civil Servants and Board of Control members were allowed to make some nominations.
- Charter Act of 1853 abolished the patronage system and introduced open competitive examinations.
- Reformers like Sir Charles Trevelyan and Robert Lowe supported competitive exams as a way to select candidates with character and ability.
- Macaulay Committee (1855) recommendations: Lord Macaulay's Report introduced a merit-based civil service.
    - Civil servants should be university graduates (preferably from Oxford or Cambridge).
    - Emphasis placed on general academic education, not vocational or legal training.
    - Recommended replacing the patronage system with competitive examinations.
- A Civil Service Commission was established in London (1854).
- Age limit: Minimum 18 years, Maximum 25 years. Syllabus was heavily focused on European Classics, disadvantaging Indian aspirants.

- The first competitive exams for the Indian Civil Services (ICS) were held in London in 1855.

Indian Entry into Indian Civil Services (ICS)

- Indian Civil Services Act of 1861 - Recruitment to civil services was structured to reserve key posts for the British through the Covenanted Civil Service.
- It allowed Indians and Europeans with at least seven years of residence in India to hold certain offices.
- They had to pass an exam in the local vernacular of their assigned district.
- First Indian to clear ICS: Satyendranath Tagore in 1864.
- Despite efforts, simultaneous exams in India were denied for decades. British reluctance aimed at limiting Indian success in ICS

Indian Civil Service Exams in India (Post WWI)

- Due to Montagu-Chelmsford Reforms, simultaneous exams were approved.
- From 1922, ICS exams began in India (initially in Allahabad now Prayagraj, later Delhi).
- Public Service Commission was established on 1 October 1926.
- Exams in London continued alongside.

Judicial and Administrative Reforms (1876–1935)

- 1876: Covenanted Civil Service was restructured into Executive and Judicial branches to enhance justice delivery.
- Judicial training made compulsory for those aspiring to be District Judges.
- Deputy Collectors were appointed by District Collectors in consultation with the Board of Revenue, without competitive exams.
- **The Aitchison Commission** – It was formed in 1886 aimed to enhance Indian participation in public services.
- It recommended the abolition of the Statutory Civil Service, classification of services into Imperial, Provincial, and Subordinate categories.
- It also recommended capping the civil service entry age at 23 years and advised discontinuing simultaneous examinations in England and India.
- **The Islington Commission's report (1917)** - It recommended that 25 percent of the higher government posts should go to Indians.
- 1918: 50 Indians were nominated to the Indian Civil Service by the Secretary of State.
- Lee Royal Commission on Superior Civil Service in India(1923) - The purpose was to consider the ethnic composition of the superior Indian public services of the government of India.
- The Commission recommended the division of main services into three classes.
    - All India Services
    - Central Services
    - Provincial Services
- Government of India Act 1935 established the Federal Public Service Commission.
- Through Public Service Commission for each of the provinces, provisional autonomy was introduced.

Imperial Police Service

- Superior police officers formed part of the Imperial Police.
- First open competition in 1893 in England; top 10 became probationary ASPs.
- Indians allowed entry post-1920.
- Exams held in both India and England from 1921.

- Indianisation was slow, despite Islington and Lee Commissions.
- Till 1931, Indians filled only 20% of SP posts.
- Post-1939, more Indians were recruited due to lack of suitable European candidates.

Imperial Forest Service

- Imperial Forest Department established in 1864.
- Imperial Forest Service (IFS) constituted in 1867.
- Officers trained in France and Germany (1867–1885), then Coopers Hill, London till 1905.
- From 1920, recruitment held in both India and England, and by promotion from provincial services.
- Post-independence, the Indian Forest Service (IFS) was created in 1966 under All India Services Act, 1951.

Post-Independence Developments

- 1947: After transfer of power, the Indian Civil Service was replaced by the Indian Administrative Service (IAS).
- 1950: Federal Public Service Commission was replaced by the Union Public Service Commission (UPSC).

G.S PAPER I

2. HISTORY

2.1 Social Revolution of Jyotiba Phule

Why is in News?

Recently, the 197th birth anniversary of Mahatma Jyotiba Phule was celebrated on April 11th, who is remembered as a pioneering figure in India's social reform movement.

Who is Jyotiba Phule?

- **Personal background** - He was born on April 11, ***1827, in Pune***, into the Mali caste—a backward community traditionally engaged in gardening and floristry.
- Since Jyotirao's father and 2 uncles served as florists under the last of the Peshwas, they came to be known as *'Phules'*.
- **Inspiration** – His early exposure to *Christian missionary schools* and the rationalist thought of *Thomas Paine's Age of Reason* helped shape his revolutionary ideas about religion, equality, and justice.
- **Social emancipator** – His personal experiences with caste-based discrimination began early.
- He worked for the *empowerment of women and for upliftment of lower caste people* and he preferred to work with the British government to improve the conditions of untouchables and depressed castes.

Satyashodhak Samaj (Society of Truth-Seekers)

- **Founded in** – 1873.
- **Aim** – To institutionalize his reformist vision.
- To overcome the inequities and inequalities that the caste system entailed.
- **Focus** – It was dedicated to the *liberation of Shudras and Atishudras (Dalits)* from Brahminical dominance, caste oppression, and gender inequality.
- Unlike elite-led reform movements such as the Brahmo Samaj, Arya Samaj, and Prarthana Samaj, which often remained restricted to upper castes, it was *inclusive and grassroots-driven.*
- It provided a platform for non-Brahmins to challenge hierarchical social norms and claim dignity, rights, and justice.

- **Weekly Deenbandhu** – It was main print medium of this organisation which *articulated the grievances of the peasant's sand workers.*

What are his views on religion and caste?

*Jyotiba Phule was awarded the title "**Mahatma**" for his innumerable social services and reforms*

- In his ***book Sarvajanik Dharma Pustak*** (1891), his views on religious and social issues are given in the form of a dialogue.
- **Rejected sectarianism** – He said that the pernicious practice of caste is a human invention.
- He *condemned the chaturvarna system* because depressed class people faced serious discriminations and atrocities in social, economic, political and cultural realms due to that.
- In ***Gulamgiri (slavery)***, he drew parallels between caste oppression in India and racial slavery in America.
    - In 1868, he decided to give access to the untouchables to a small bathing tank near his house.
- **Denied supremacism** - All human beings on our planet are equipped with similar physical and intellectual facilities.
- **Critiqued senseless scriptures** – In *Sarvajanik Satya Dharma Pustak*, he mentioned that all the religious and revelatory books that man has produced on our planet, one and all, do not contain a consistent universal truth.
- **Followed secular approach** – Naturally the planet earth which we inhabit are *created by one Creator*.
- He wrote an abhang titled ***Manav Mahammand (Muhammad the man),*** which *extolls the prophet of Islam* as having *liberated his people from the yoke of superstition and orthodoxy of his age.*
- His approach was deeply inclusive, advocating harmony over division, and compassion over orthodoxy.
- **Supported voluntary religious conversion** – He believed people should be free to choose their religion.
- In his booklet ***Satsar (The Essence of Truth)***, he defended Pandita Ramabai's right to convert to Christianity.
- Notably, his defense was unique as it was the only one of its kind offered by a non-Christian.

Phule's view on 1857 Revolt

- He could not come to affiliate with the sepoy revolt, seeing it as a retrogression towards the ascendant theocracy of the Peshwa rule.
- He could not see a way to resolve his social revolution with the tempest of 1857.
- He felt that the *obstinacy of the orthodox upper-caste Hindus* would consign the Dalits back into a state of destruction.
- In Gulamgiri (Slavery), he condemned the practice of slavery followed by Brahmins and during the rule of Peshwas.

What is his contribution for women empowerment and education?

- According to him, both men and women were entitled to enjoy equal rights and it was a *sin to discriminate between human beings on the basis of sex.*
- **Against ill practices on women** - He was instrumental in the fight against practices like *female infanticide, child marriage, and the mistreatment of widows.*
- He also condemned men who practice polygamy.
- **Established orphanages** - It was possibly the first such institution founded by a Hindu which gave protection to pregnant widows & assured them that their children would be taken care.
    - It was in this orphanage that a Brahmin widow gave birth to a boy in 1873 and Jyotirao adopted him as his son.
- **Girl schools -** In 1848, Phule and his wife Savitribai Phule co-founded *India's first school for girls in Pune*, an act of radical defiance against the conservative orthodoxy of the time.
- **Night Schools -** By 1855, Phule also started night schools *for working-class men and women*, making education accessible to laborers and farmers.

- **Inducting a taste of learning** - In his '***A Statement for the information of the Education Commission',*** he had recommended various schemes for inculcating education to poorer sections among the lower castes.
    - Increase in the number of schools
    - Special inducements in the shape of *scholarships and half-yearly or annual prizes*
    - Making *primary education of the masses compulsory* up to a certain age, say at least 12 years.

What are his recommendations in economic and environmental sector?

- He was also able to see that economic strengthening of the working poor among the lower castes could be a key to overthrowing the social imbalances.
- **Involving military in civil construction** – *Constructing small dams and bunds* in such a way that this water would seep into the ground, and *only later go and meet streams and rivers*.
- This would make the land very fertile, and the soldiers in general, having got used to working in open air, will also improve their health and become strong.
- **Agricultural and farmers welfare** – Government should allow the *farmer to collect all the silt* and other things extracted from rivers and lakes, as in the olden times.
- It should also return all the *cow pastures to the villages*, which it has included in its 'forest'.
- **Environmental protection** – Government should make sure that no firewood is collected, or land tilled in the areas that belong to it.
- It should also *forbid the cutting of wood for selling* as wood for construction and *destroy the oppressive the Forest Department*.

What are his legacy?

- His vision of an equitable and inclusive society laid the foundation for many social reform movements in India.
- His work inspired generations of reformers, including Dr. B.R. Ambedkar, and played a crucial role in shaping modern India's commitment to social justice and equality.
- His life and legacy remind us of the power of compassion, resilience, and the unwavering pursuit of justice.

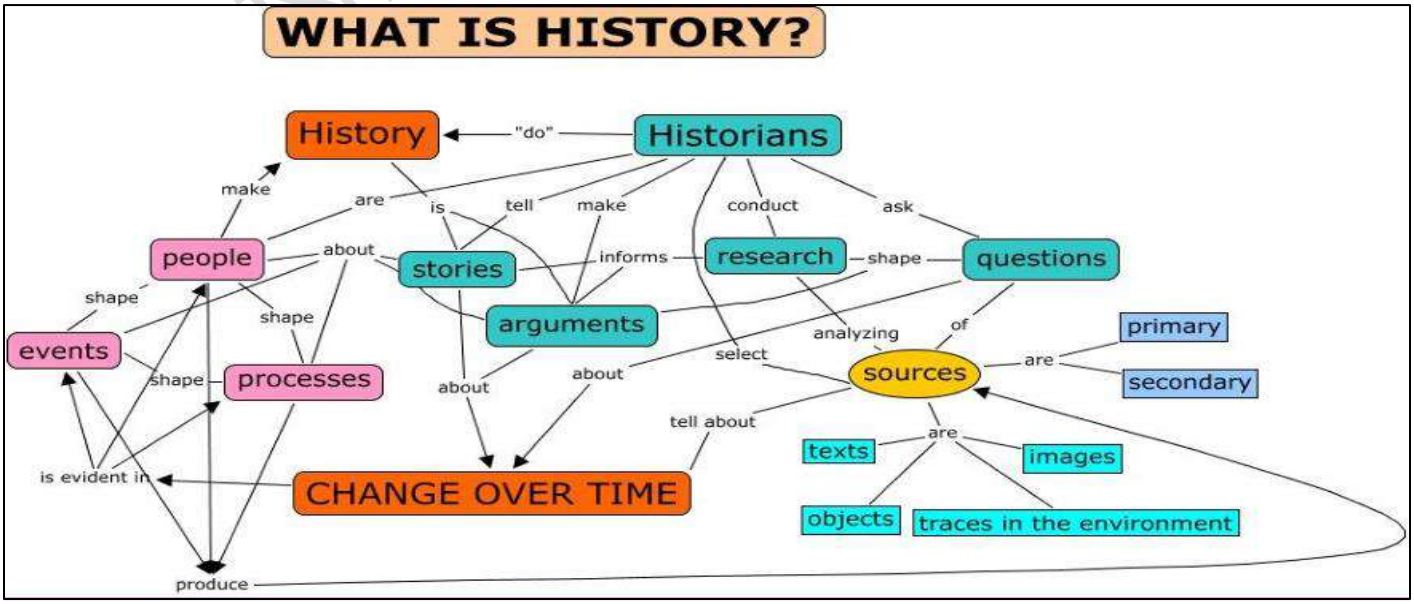
2.2 The Perils of Reversing the Past

Why in News?

In March 2025, a wave of textbook revisions such as omitting or vilifying figures like Babur and Aurangzeb while glorifying select native rulers.

What are the significances of studying history?

- **History** – It is the knowledge of and study of the past and it is not merely a recollection of events but a study of causes, consequences and context.



- **Understanding the past** -It helps us understand how societies, cultures, and civilizations evolved over time.
- By learning about past events, we gain insight into how the world came to be the way it is today.
- **Learning from mistakes** - By studying mistakes made in the past—be it in governance, conflict, or societal choices—we can strive to avoid repeating them.
- **Shaping identity** - It contributes to our sense of identity, both as individuals and communities.
- By learning about our heritage, we strengthen connections to our culture and traditions.
- **Inspiring progress** - Innovations and ideas from the past often serve as inspiration for future advancements.
- For instance, scientific discoveries and inventions build upon historical knowledge.
- **Promoting critical thinking** - It encourages us to question and analyze sources of information critically, fostering a deeper understanding of cause-and-effect relationships.

What are the impacts of revisionism of history?

Reinterpretation of history *is a legitimate academic exercise, where new evidence or perspectives reshape our understanding of the past.*

Revisionist history*, especially in the political sense, seeks to reinterpret the past to justify present-day political agendas, often tied to nationalism, identity politics, or territorial claims.*

- **Renaming or destruction of monuments** – These revision activities coincided with rising public anger demanding the renaming or even destruction of Mughal tombs.
- There were viral campaigns that called for vandalising historical monuments, driven by narratives that paint centuries of India's past in black and white.
- **Polarisation** - While some advocates that such moves correct colonial or biased portrayals, the selective rewriting of history often fuels polarisation, not clarity.
- **Disrupts social harmony** - When history becomes a battleground for ideology rather than a source of reflection, it can fracture society and foster hatred instead of understanding.
- **Divides society** - When history is weaponised in the form of revisionism, especially with an intent to restore a perceived lost glory or correct historical wrongs by reverting to a "status quo ante", it ceases to be a guide for the present and becomes a tool for division.
- **Causes conflicts** - Revisionist exercises are not only dangerous but have been the root of conflicts, wars and prolonged suffering across different parts of the world.

Religious and political conflicts of revisioning history
Crusades • **Crusades** – They were a series of religious wars initiated, supported, and sometimes directed by the Christian Latin Church in the medieval period. • They were sparked by the belief in the sanctity of Christian control over Jerusalem. • **First Crusade (1096–1099)** - It launched to reclaim the Holy Land from Muslim rule, despite the region's diverse religious history. • **Impact of crusades** - Centuries of bloodshed, occupation, and retaliatory campaigns, none of which restored any meaningful peace but, instead, deepened divisions between civilisations.
European Wars of Religion in the 16th and 17th centuries • **The Protestant Reformation** - It began in 1517, challenging the authority of the Catholic Church and led to the emergence of new Christian denominations. • These divisions fueled religious tensions and conflicts across Europe such as - Schmalkaldic War, French Wars of Religion, and Thirty Years' War. • **Schmalkaldic War (1546-1547)** - This war in the Holy Roman Empire was a major conflict between the Protestant Schmalkaldic League and the Catholic Holy Roman Emperor.

- **French Wars of Religion (1562-1598)** - These were a series of civil wars in France between Catholics and Protestant Huguenots, lasting for 36 years.
- **Thirty Years' War (1618-1648)** - This devastating war, fought primarily in Central Europe, involved religious and political conflicts within the Holy Roman Empire and drew in other European powers.
- **Implications** – These wars demonstrate the dangers of historical grievances being revived under the banner of religious or political legitimacy.
- The danger was not in recognising the grievances of the past but in weaponising them to reshape the present based on historical constructs.
- Rather than moving forward with mutual tolerance and understanding, European States plunged backward into a cycle of vengeance, each side justifying their acts through selective memories of the past.

Nazism

- **Dangerous revisionism of Nazi Germany** - Adolf Hitler's ideology rested heavily on the notion of reclaiming the glory of the German Reich and correcting the "humiliation" of the Treaty of Versailles.
- **Manipulation of history** - His rhetoric about the Aryan past, the "stab in the back" theory, and a need for Lebensraum (living space) were all rooted in a highly manipulated version of history.
- **Impact** - The attempt to reverse the outcome of the First World War by restoring German supremacy led to the Second World War and the Holocaust — a catastrophic result of trying to reengineer history through conquest and genocide.

Partition of India in 1947

- **Competing historical narratives** - Hindu and Muslim nationalists invoked centuries of grievances under previous rulers.
- **Impact** - What should have been a peaceful transition into two sovereign States turned into one of the worst episodes of communal violence in history, killing over a million and displacing more than 10 million.
- The violence was not about the future; it was about reclaiming identities and rights rooted in selective versions of the past.

- **Creating chaos** - Much of the chaos in today's world arises not because we forget history but because we seek to relive or reverse it.

Israel-Palestine

- **Clash of History and Geopolitics** - In the contemporary world, Israel-Palestine remains a deeply complex and tragic case of historical grievances clashing with present-day geopolitics.
- **Historical claims** - Both Israelis and Palestinians stake claims based on history — often diverging, irreconcilable, and deeply emotional.
- **Impact** - Efforts to reverse history, whether through settlements, territorial claims, or denial of nationhood, have prolonged a conflict that cannot be resolved by appealing solely to the past.

Russia's invasion of Ukraine

- **Historical unity claim** - In Eastern Europe, Russia's invasion of Ukraine in 2022 was partly justified by revisionist arguments about the historical unity of the Russian and Ukrainian people and the invalidity of Ukraine's post-Soviet independence.
- This attempt to undo post-Cold War borders in the name of historical continuity has led to massive human suffering, economic crises, and a destabilisation of the entire region.

- **Ignorance of Present times** - The obsession with returning to a perceived golden past blinds nations and people to the opportunities of the present and the possibilities of the future.

What lies ahead?

- The discipline of history demands a careful and nuanced discernment of the past.
- While historical wrongs must be remembered to avoid their repetition, they must not be interpreted as mandates to reclaim past statuses or boundaries.
- Philosopher George Santayana aptly put it: "Those who cannot remember the past are condemned to repeat it."

- But equally dangerous are those who remember the past only to relive it, seeking justice through reversal, not reconciliation.
- The greatest service we can do to history is not to rewrite it, but to learn from it — with humility, not hubris.

2.3 Stories of the nation, in films and life

Why in the News?

Recently, a new biopic on Jyotiba Phule, the 19th century leader of the oppressed castes in Maharashtra was released and there was transformation in the representation of national issues in movies.

What were the socio-political themes of cinema during early periods?

- **Cinema** – It is a powerful tool for reflecting and engaging with national issues, acting as a mirror of societal values & concerns and it can explore complex themes, challenge existing beliefs, and shape public discourse on critical topics like politics, social inequalities, and cultural identity.
- **India** - An idea of India and its diverse character was popular in the early decades of the Republic.
- **Nationalism and Patriotism** - Many films subtly or allegorically encouraged pride in Indian identity and resistance to colonial rule.
- Due to British censorship, direct calls for rebellion were rare, so filmmakers used mythological and historical allegories — stories about gods, kings, and ancient heroes — to inspire nationalist sentiment.
    - Lagaan used cricket to symbolise resistance against colonial rule.
- **Communal amity** – It was a recurring theme, and conflicts were depicted in the broader frame of city versus village and east vs west.
    - As Hindu-Muslim tensions grew leading up to Partition, there were conscious efforts in cinema to promote messages of Hindu-Muslim unity.
- **Socio-economic issues** - India's social and development challenges were portrayed within the national frame of poverty and distress.
- Issues like untouchability, caste oppression, women's rights, and poverty were central.
    - Filmmakers like V. Shantaram and others made socially conscious films advocating for progressive changes, often aligning with Gandhian ideals of social upliftment.
- **Economic Struggles and Class Issues** - There was growing attention to the plight of peasants, workers, and the urban poor which influenced cinema and the emergence of parallel cinema.
- **Swadesi** - Early nationalist films portrayed the West and Western values as antithetical to Bharatiyata (Indianness).
    - Dadasaheb Phalke is often called the "*father of Indian cinema*" because he consciously used cinema to promote swadeshi (indigenous) values.

What are the recent changes in the themes of the movies reflecting the current national issues?

- Indian cinema, especially in the last decade, has undergone a noticeable thematic shift, reflected the complexities and transformed character of contemporary India.
- **Decline in antagonising west** – There has been decline in Indian films that portrays the West as antagonists.
- The anti-colonialism of the national movement was targeted at British imperialism, giving strength to nationalist arguments of self-governance and unity in diversity, among other values.
- With the passage of time and generations, British imperialism has become a distant memory, and Western culture is now mainstream in India.
- **Assertive nationalism** - There's been a noticeable rise in patriotic narratives, national pride and military heroism.
    - Films like Uri: The Surgical Strike, Shershaah, Kesari, and The Kashmir Files reflect a militarized, assertive nationalism, often aligned with the current political climate.
- These films often highlight India's stance on terrorism, border security, and historical trauma, resonating with current political discourse.

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- **Increasing shade of religion** – There has been a rise in the direct or subtle references of religion, communalism and religious stereotyping.
- Hindutva, which was a sideline movement during the struggle for independence, has now become the dominant strand of nationalism in India, and often mirrored in movies.
- **Rising caste discussion** - Relatively bolder approach in discussing caste is notable in recent films.
    - Article 15, Jai Bhim, Sairat, and Pariyerum Perumal tackle caste discrimination, police brutality, and systemic oppression.
- These films reflect growing public dialogue on Dalit rights and intersectional justice.
- **Women's Empowerment and Gender Issues** – There's a growing number of films reflecting 3rd and 4th waves of feminism challenging patriarchal norms, gender roles, and toxic masculinity.
    - Thappad, Pink, The Great Indian Kitchen, Chhapaak reflect ongoing national conversations around feminism, consent, domestic violence, and representation of women in public life.
- **Impact of Technology and Media** - Films now portray digital culture, misinformation, social media obsession, and privacy concerns.
    - Movies like Jamtara, Choked, Mumbai Mafia reflect the blurred lines between online and offline lives.

What lies ahead?

- Indian cinema has always been a mirror to its times — from the mythical heroes of early films to today's conflicted, questioning protagonists.
- The medium has shifted from symbolic rebellion to direct confrontation, reflecting India's journey from a colonial subject to a complex modern democracy.

3. GEOGRAPHY

3.1 Wildfire and Earth's Carbon Balance

Why in news?

Multiple states in the U.S. were recently in the grip of tornadoes, wildfires, and dust storms.

What is the recent increase in wildfire events globally?

- **Global trends** - Forest fires are becoming more widespread, with the area burned increasing by about 5.4% annually since 2001.
- In 2023 alone, nearly 12 million hectares of tree cover were lost due to fires.
- **US inferno** – Forest fires have damaged homes, various natural ecosystems in Texas, Oklahoma, Los Angelos, California.
- **Japan's biggest forest fire** - The country's biggest forest fire in three decades has torched more than 5,200 acres around the northern Japanese city of Ofunato.
- **Forest fire in India** - According to the latest India State of Forest Report published on December 21, 2024, Uttarakhand, Odisha and Chhattisgarh recorded the most fires in that year.
- Uttarakhand alone recorded 5,315 forest fires between November 2022 and June 2023.

What are the causes of wildfire events?

- **Increasing land temperature** - India has been experiencing some of its highest land temperatures in recent years.
- Indian Institute of Tropical Meteorology, Pune reported that in India's northwest, northeast, and central regions, land temperature is rising
    - 0.1°-0.3° C per decade in the pre-monsoon season and
    - 0.2°–0.4° C per decade in the post-monsoon season.
- **Increasing heat waves** - Heat waves have also been found to be occurring earlier in the year, moving slower, and lasting longer.

- **Prolonged dry spells** – Heat waves together with prolonged dry spells create conditions ripe for wildfires.
- **Climate Change** - It is contributing to more frequent and intense wildfires by increasing the frequency and severity of droughts and heatwaves, which dry out vegetation and create conditions that are more conducive to wildfires.
- **Spontaneous combustion** - Organic materials like dry leaves or grass can ignite naturally under intense heat or conditions.
- **Agricultural practices** - Slash-and-burn farming methods can sometimes result in uncontrollable fires.
- **Lightning** - Lightning strikes are a major natural cause of wildfires, especially during dry periods, as they can ignite dry vegetation.

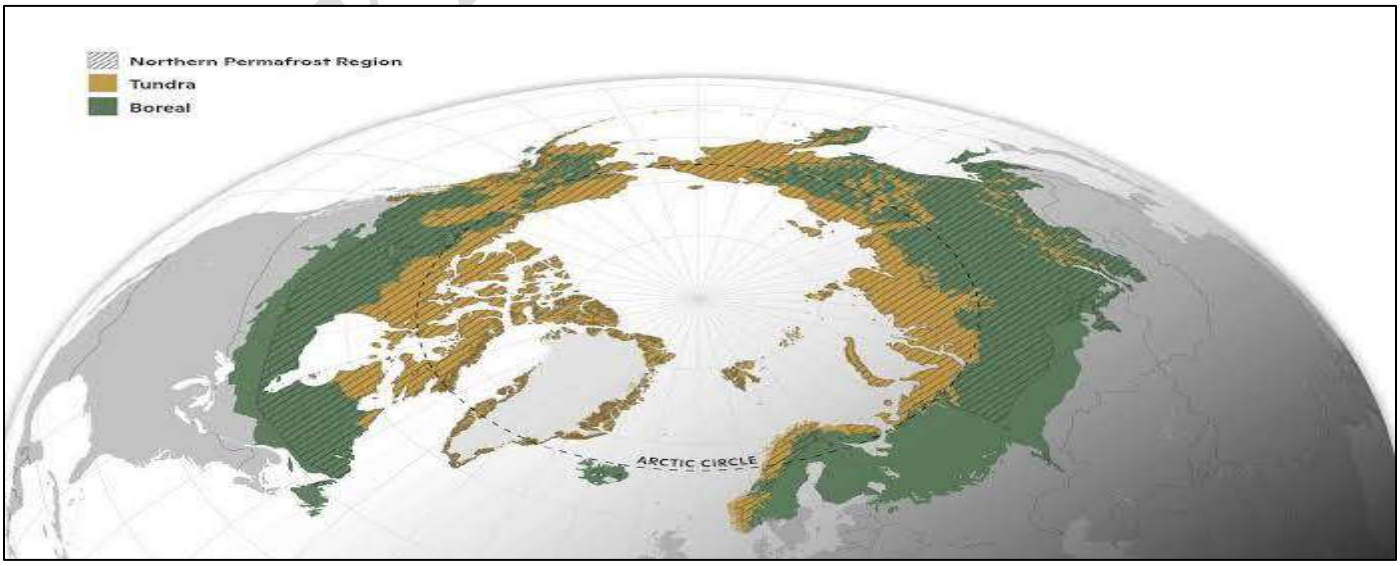
What are the impacts of wildfire on Earth's carbon balance?

- **Radiation** - The radiative power of fire in recent wildfire incidents is 10 times higher than the average between 2003 and 2024.
- **Carbon emissions** - Wildfires release vast amounts of stored carbon into the atmosphere, contributing to climate change.
- According to the Copernicus Air Monitoring Service (CAMS) of the European Union, wildfires released 800,000 tonnes of carbon in January 2025 alone.
- Forest fires in India emit around 69 million tonnes of carbon dioxide every year.
- **Disruption of Carbon Sinks** - Forests, which act as natural carbon sinks, are damaged by wildfires and their ability to absorb carbon is reduced.
- Carbon sources release more carbon than they absorb.
    - Example - burning of fossil fuels or volcanic eruptions.

> ***Carbon sinks*** *absorb more carbon than they release and helps in reducing its concentration in the air. Example - oceans, forests, and soil.*

- **Impact on Arctic Boreal Zone (ABZ)** – According to a recent study, due to wildfires, more than 30% of the ABZ has now stopped capturing carbon and is instead releasing it.
- The regions in ABZ, Alaska accounted for 44% of the 'new' emissions, northern Europe and Siberia accounted for 25% and 13%, respectively.
- **Thawing of tundra permafrost** – Wild fires and the consequent global warming effects have been more pronounced in cooler regions.
- It dries out the soil, increases average temperature of the top soil, changes the type of plants that grow and the organic materials in the soil decompose, releasing carbon dioxide into the atmosphere.

> ***Arctic Boreal Zone (ABZ)*** *coniferous forest is the world's largest land-based biome. Its tundra, coniferous forests, and wetlands around the Arctic Circle have absorbed carbon and sequestered it in the zone's permafrost.*



What lies ahead?

- **Plan better for the long term** – Cities and regions need smart, science-based plans to handle heatwaves and wildfires.

- **Protect carbon sinks** – Saving forests, wetlands, and permafrost areas that naturally store carbon.
- **Work together globally** – Since wildfires can spread across countries, international support and joint action are important.
- **Fix the root problem** – To break the wildfire-warming cycle, we need to reduce pollution, stop deforestation, and fight climate change.

4. SOCIAL ISSUES

4.1 Online Gambling Industry in India

Why in the News?

Recently, gambling addiction among youth is rising, driven by easy access to online platforms.

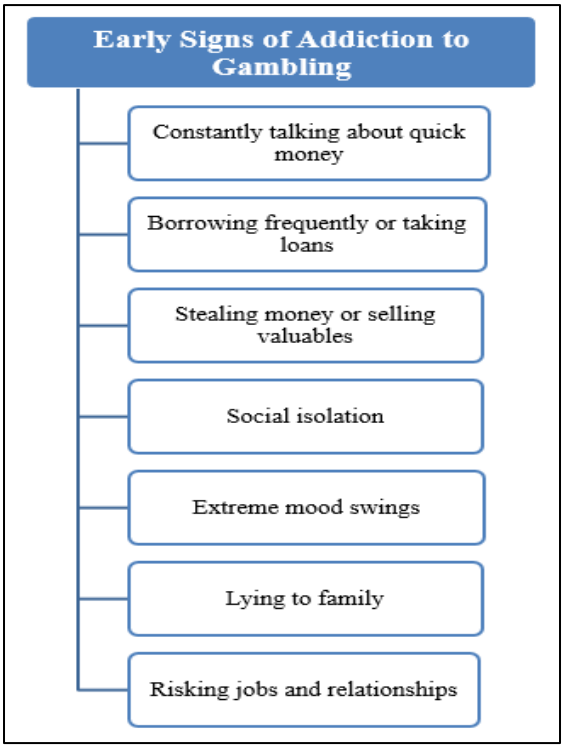
What is online gambling and gaming?

- **Gambling** – It refers to activities where the *outcome is predominantly determined by chance or luck*, with minimal influence from the player's skill.
- **Online gambling** – It involves participating in gambling activities through the internet by *placing bets or wagers on games* and events to win money or prizes.
    - **For example**, casino games like slots, blackjack, and roulette, sports betting, poker, and lottery.
- **Skill gaming** – It Involves games where the outcome primarily *depends on the player's skill, knowledge*, strategy, or expertise rather than chance.

> ***Skill Gaming** is legally recognized as a business activity under Article 19(1) (g) of the Indian Constitution, which protects the right to practice any profession or trade.*

What are the causes for increasing addiction to gambling?

- **Easier access** – Betting now requires nothing more than a smartphone, making it dangerously convenient.
- **Aggressive marketing** – Platforms use deceptive ads and celebrity endorsements to attract users.
- **Greed for money** – The lure of fast money makes gambling seem like an easy solution.
- **Instant gratification** – It is due to the problem to a *digital upbringing.*
    - From birth, they have been exposed to quick rewards — games, social media, entertainment.
- **Addictive medium** – Gambling operates on the same principle of *thrill, anticipation, and the rush of winning*.
    - Their brains are wired to seek these highs, making addiction almost inevitable.
- **Social expectations** – Many chase the latest gadgets, social status or even *family expectations to earn early*.
- This pushes them toward quick money-making methods, and gambling becomes an easy escape.
- **Lack of Awareness** – Families and individuals often fail to recognize the signs of gaming addiction.



Status of Illegal Betting in India

- India's online skill-gaming sector is worth $3 billion.
- **Online gambling** – A study in south India found 19.5% of college students gamble, with 7.4% showing signs of addiction.

- **Daily spending on online gambling** – UNICEF estimates that children in India collectively *spend over USD 1,000 daily* on online gambling.
- **Illegal offshore betting market** – It is valued to USD 20-30 billion annually.

What are its ill impacts?

- **Physical health issues** – Severe physical health issues develop *due to prolonged screen time and stress*.
- They often neglect sleep and nutrition leading to deterioration of health.
- **Mental health deterioration** – It causes depression, anxiety, among the youth and some *turning to nerve-calming drugs*.
- **Social isolation** – They *withdraw from social interactions*, straining relationships with family and friends.
- **Financial problems** – They accumulate *massive debts*, often borrowing from instant loan apps or selling valuables.
- **Economic loss** – The illegal offshore betting market, worth $20-30 billion annually, costs India billions in tax evasion.
- **Loss of life** – The dangers of online gaming leads to *suicides* among youths.

What are challenges in regulating it?

- **Weak enforcement** – Ministry of Electronics and Information Technology amended intermediary rules in 2023 to regulate skill gaming but it *lagged strict enforcements*.
- October 2023 GST mandate requiring offshore betting platforms to register with Indian tax authorities has been ignored.
    - By December 2024, *none had complied*, prompting probe into 658 non-complaint entities for tax evasion.
- **Offshore betting** – Weak enforcement has made India a hotspot for offshore betting, costing the economy billions.
    - These operators run from like Curaçao, Malta, Cyprus, China and Dubai, making them *nearly impossible to track*.
- **Misuse of rules** – These platforms attract users with 'No GST' claims and higher payouts.
- They are exploiting the 28% tax on domestic gaming firms while evading regulations like KYC and responsible gaming.
- **Blurred legal lines** – Without clear regulations, users can't tell the difference between legitimate skill-gaming apps and offshore betting sites.
- **Money laundering** – Illegal operators launder money through mule accounts with Rs2,500 crore in illicit transactions processed monthly.
- **Decentralized digital advertising** – User-generated content disguises gaming promotions, making tracking and removal challenging.

> ***A mule account*** *is a bank account used by criminals to launder illicit funds, often set up by unsuspecting individuals lured by promises of easy money or coerced into participation.*

What are the measures taken by the Government to curb online gaming?

- **Taxing online games** – The Finance Act, 2023 introduced a 30% income *tax on net winnings in online games* from 2024-25.
    - A *28% GST on online gaming* was implemented from October 1, 2023, with mandatory registration under the Integrated Goods and Services Tax (IGST) Act.
- **Statutory provisions** – Online games are regulated by the *Public Gambling Act 1867* and the *Information Technology Act 2000*, which govern online gaming activities in India.
- Integrated Goods and Services Tax Act also direct intermediaries to block unregistered online money gaming platforms.
- **Regulation of platforms** – Ministry of Electronics and Information Technology (MeitY) blocked 1,410 online betting, gaming, and gaming websites during 2022 - 2025.
- Intermediary Rules, 2023 were amended to regulate skill gaming.

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- **Punishments** – Bharatiya Nyaya Sanhita, 2023 punishes *unauthorized betting* with 1–7 years of imprisonment and fines.
- **Cybercrime enforcement** – The Ministry of Home Affairs set up the Indian Cyber Crime Coordination Centre (I4C) to tackle cybercrimes including online gambling and scams.
- A National Cyber Crime Reporting Portal and helpline (1930) enable reporting of cyber financial frauds.
- **Public awareness** – The Ministry of Education issued an advisory for parents & teachers on "Overcoming online gaming downsides" and "Children's safe online gaming".
- The Ministry of Information and Broadcasting mandates gaming ads to carry financial risk disclaimers per Advertising Standards Council of India guidelines.
- **State-level legislation** – Betting and gaming fall under entry 34 of the State List, empowering state to make laws banning it.
    - Telangana Gaming (Amendment) Act, 2017

What lies ahead?

- Government can introduce regulations to *distinguish legal skill gaming from illegal gambling* and close loopholes.
- *Strengthening enforcement* of digital regulations and hold celebrities accountable for endorsements.
- Promoting awareness campaigns to educate youth and families about the dangers of online gambling.
- Certain habits must be monitored from childhood.
- Parents can be encouraged to *use site-blocking tools* and Children must be taught the value of money and the dangers of easy wealth.

4.2 AI Child Sexual Abuse Material (CSAM)

Why in News?

The International AI Safety Report 2025, released by the British Government's AI Security Institute, highlights the risks posed by AI-generated Child Sexual Abuse Material (CSAM).

What is the impact of AI in Child Sexual Abuse Material (CSAM)?

- **CSAM** – It refers to material (audio, video, and images) that depicts a sexually explicit portrayal of a child.
- **AI CSAM** - Artificial Intelligence (AI) tools possess the risk of generation, possession, and dissemination of child sexual abuse material (CSAM).
- **AI impact** - The World Economic Forum (2023) flagged the potential misuse of generative AI to create life-like images of children.
- The Internet Watch Foundation (October 2024) reported the proliferation of CSAM on the open web.
- **Increasing child pornography** - The National Cyber Crime Reporting Portal (NCRP) recorded 1.94 lakh child pornography incidents by April 2024.
- **Increase in cybercrimes against children** - According to the National Crime Records Bureau (NCRB) report, there were a total of 1823 cases of cybercrimes against children in 2022, representing a notable rise from the 1376 cases reported the previous year.
- India has received 69.05 lakh cyber tip-line reports from the National Centre for Missing and Exploited Children (NCMEC), USA (as of March 2024).

> ***A tip line report*** *is a mechanism for the public to anonymously report information about potential criminal activity or suspicious behavior to law enforcement or other relevant authorities.*

What are the measures to prevent CSAM spread?

- **Prevention of CSAM in electronic form -** Section 67B of the IT Act 2000 punishes those who publish or transmit material in electronic form depicting children in sexually explicit acts.
- **Prohibition of child pornography -** Sections of the Protection of Children from Sexual Offences Act, 2012 (POCSO) prohibit using children for pornographic purposes, storing child pornography in any form, and using a child for sexual gratification.

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- **Prevention of obscene materials** - Section 294 of the Bharatiya Nyaya Sanhita penalises the sale, distribution, or public exhibition of obscene materials
- **Prevention of selling obscene objects** - Section 295 makes it illegal to sell, distribute, or exhibit such obscene objects to children.

What are the issues with existing frameworks?

- **Accused-Centric Approach** - The existing laws focus entirely on 'who' has done 'what', placing less or no emphasis on the 'tool/medium' used to commit the said 'act.'
- **Lack of AI-Specific Laws** - Existing Indian laws do not cover AI-generated CSAM, leaving a legal gap in tackling AI-driven digital child abuse.
- **Inadequate definitions** - Terms like "sexually explicit" and "child pornography" need clearer definitions under Indian law.
- **Lack of regulation on digital intermediaries** - Virtual Private Networks (VPNs), Cloud Services, and Virtual Private Servers are not legally bound to prevent CSAM dissemination.

What lies ahead?

- The existing legislative and policy framework needs to adapt to futuristic challenges, by making suitable changes.
- As proposed by the NHRC Advisory in October 2023, the definition of 'child pornography' under the POCSO Act can be replaced with the phrase 'CSAM' to make it expansive.
- The term 'sexually explicit' under Section 67B of the IT Act can be defined to enable the real-time identification and blocking of CSAM.
- The definition of 'intermediary' under the IT Act must expressly include Virtual Private Networks, Virtual Private Servers, and Cloud Services to impose statutory liability on them to comply with the CSAM-related provisions in Indian laws.
- Statutory amendments are needed to integrate the risks arising from emerging technological advancements.
- Adoption of the UN Draft Convention on 'Countering the Use of Information and Communications Technology for Criminal Purposes' can help India to effectively fight against AI CSAM.
- The proposed Digital India Act can draw inspiration from global practices, particularly the UK's upcoming legislation.
    - For example: The possession, creation, and distribution of AI tools that can generate CSAM can be criminalized.

Britain will become the 1st country to introduce laws against AI tools used to generate sexual abuse images.

4.3 Education for Marginalised Communities

Why in news?

Oxfam's latest reports reveal that India's economic growth has been accompanied by widening inequality.

What is the educational status of marginalized communities?

- Students from marginalised communities across India faces systemic barriers in their pursuit of education.
- **Skewed early childhood education** – As per ASER 2023, only 42.5% of SC/ST children aged 3–5 attend any form of preschool.
- Learning gap - As per ASER 2023 data, in rural areas only 43% of std V students can read an std II level text and only 25.6% of children in std V can solve a subtraction problem.
- **Low GER in higher education** - SC and ST student GERs remain lower at ***27.2% and 25.8%, compared to national average.***
- **Underrepresented in premier institutions** – Marginalized communities doesn't make adequate representation in premier institutions like IIT particularly at higher levels like PhD programs and faculty positions.
    - SC students make up only 10% of PhD enrolments
    - ST students 2%
    - Some institutes having no SC/ST faculty

Recent RTI Data shows that over 90% of professors in these institutions come from upper-caste backgrounds.

- **Lack of inclusiveness** – Disabled children rarely complete primary school, and nearly half of the disabled people are still illiterate.

What are the challenges faced by students from marginalised community?

- **Inadequate rural infrastructure** – Government schools in rural areas and urban slums lack basic infrastructure, qualified teachers, and proper learning materials.
- **Economic barriers** – Costly coaching programs to competitive exams like JEE, NEET, and UPSC are unaffordable for most rural and low-income families, effectively locking them out of top institutions.
- Those who manage to qualify, face financial burden of travel, accommodation, and fees when moving from villages to urban centres.
- **Cultural and social exclusion** – Marginalized students face mockery of their accents, clothes, and food habits in urban institutions.
- It creates a psychological burden that makes them feel like outsiders in their own country, leading to drop out.
- **Myth of merit –** The concept of "merit" in exams and admissions ignores unequal starting points, privileges, opportunities and both are judged by the same yardstick.
- **Language disadvantage** – Students educated in regional languages face barrier in higher education and employments.
- **Stigma of reservations** – Reserved category students who clear exams are often labelled as quota students, and they're treated as lesser than their peers, undermining their confidence.
- **Discrimination** – Marginalized students face social exclusion, microaggressions, and casteism, such as segregated hostel rooms or dining tables, taking a mental toll that leads many to abandon their studies.
- **Unequal employment opportunities** – Even after graduation, caste networks determine access to opportunities, leaving marginalized students at a disadvantage despite their qualifications.

What are the reforms required for equitable education for marginalized students?

- **Redefining merit system** – The merit system needs to be redefined to account for the unequal playing field.
- **Strengthening and expanding reservation** – The reservation could be followed strictly for SC, ST, and OBC representation in faculty and administrative roles in IITs.
- **Building robust support systems** – Top institutions needs to establish mandatory mentorship programs for marginalized students to bridge gaps in preparation and free mental health services to address the discrimination.
- **Improving public school infrastructure** – Increasing funding for government schools in rural areas and urban slums to make adequate facilities for marginalised students.
- **Challenge cultural exclusion** –zero-tolerance policies needs to be ensured for caste-based discrimination.
- Awareness campaigns and diversity training could also reduce mockery and foster inclusion.
- **Make competitive exams accessible** – It can be achieved by subsidizing coaching for exams like JEE and NEET for low-income students.
- By creating free, high-quality online preparatory resources in regional languages to level the playing field.

4.4 Risk Society: Towards a New Modernity

Why in the News?

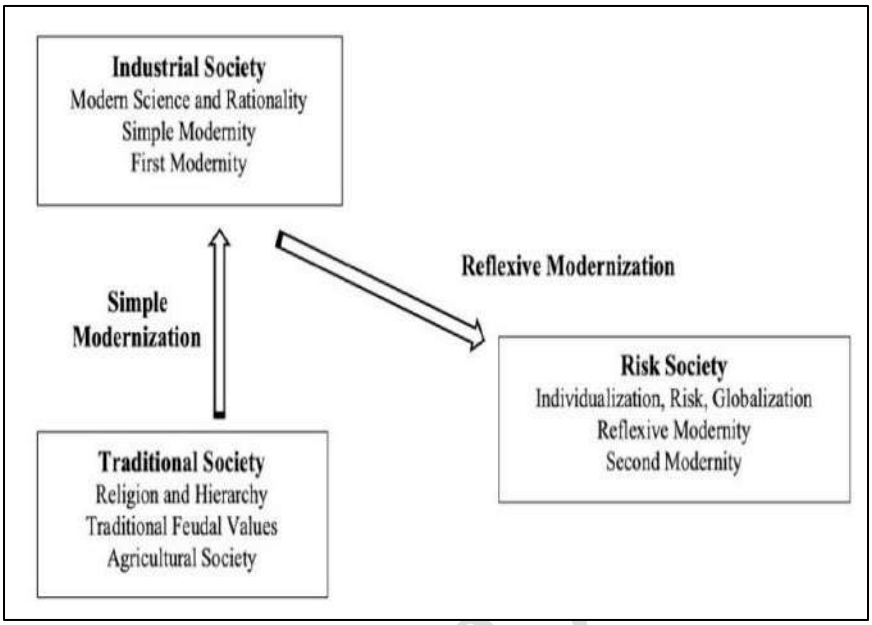
Despite technological advancements and promises of progress, we find ourselves continually facing new, unforeseen risks.

What is a Risk society?

The book "Risk Society: Towards a New Modernity" was written by Ulrich Beck and published in 1986 provide a panoramic analysis of the condition of Western societies.

- **Risk society** - The term "risk society" describes a shift from an industrial society to one increasingly shaped by uncertainty and hazards created by technological and environmental developments.

- **Focus in a risk society** - In such a society, the focus moves from the distribution of wealth to the prevention and management of risks, including health crises, pollution, and environmental degradation, that arise from modernisation itself.
- **Reflexive modernisation** – It is the idea that modern societies must constantly reflect on and adapt to the problems they have created.
- The successes of industrialisation, such as nuclear energy and fossil fuel use, generated new, often unforeseen risks.
- These risks began to overshadow the benefits of progress, proponents of the theory argue, with disasters like nuclear explosions, pandemics, and climate hazards being examples of this.



How have risks transformed in various stages of societal evolution?

- **Risks in pre-industrial society** - In the pre-industrial era, society was characterised by a stable, agrarian economy where risks were largely natural and mostly localised, such as famine and epidemics.
    - **Risk management** - Risks were managed in such societies based on social order and traditional knowledge systems.
- **Industrial society** - The rise of industrialism brought about large-scale production, urbanisation, and technological advancements that transformed both society and the global economy.
- The world became a more open place with increased global transactions.
- **Risks in industrial society** - It also introduced new risks, including pollution, depletion of natural resources, and the development of riskier technologies, which were often global in scale.
- **Risk in modernization period** - The rapid pace of modernisation, without proper checks and balances, has resulted in a risk society, where there is a fundamental shift in how risks are perceived and managed.

Traditional Society	Industrial Society	Risk Society
Incalculable threat: no knowledge of when the next catastrophe will come	Calculable risk	Incalculable risk: uninsurable
Organizational logics: local	Organizational logics: national	Organizational logics: global
Limited specific threats	Temporally and spatially bound threats	Threats unbounded in time and space
Simple understanding of blame and causality	Complex understanding of blame and causality	Incomprehensible in standard terms of blame and causality
Prevailing beliefs anchored in tradition	First modernity: faith in progress and reason	Reflexive modernity: all knowledge and practice called into question
Manufactured risks: insignificant	Manufactured risks: latent	Manufactured risks: dominant
Paradigmatic risk: natural catastrophe	Paradigmatic risk: industrial accident	Paradigmatic risk: radioactive leak
Subjectivity informed by hunger	Subjectivity informed by inequality	Subjectivity informed by fear

- **Change in risk character** - Risks are no longer seen as external threats but are increasingly generated by the very systems intended to ensure development and security.
- **Interconnection of risks** - Environmental disasters, pandemics, and technological failures reveal the interconnected and global nature of the risks we now face, with consequences that often-cross-national borders and remain unpredictable.

What are the manufactured risks?

- **Natural risks** - Earthquakes, floods, and diseases like malaria, are unpredictable and often localised.
- **Manufactured risks** – Arise from human activities, especially technological and industrial developments.
- These include nuclear accidents, environmental degradation, and pandemics.
- **Deeper impact of manufactured risks** - Manufactured risks often have global implications and are typically more difficult to predict, control, or mitigate.
- **Significance of distinguishing risks** - It highlights how modern society, while advancing technologically, has also become more vulnerable to new forms of risk that are a byproduct of its own progress.
- **Disproportionate impact** - Although risks such as climate change, extreme weather events are global, they disproportionately affect poorer countries, which are less equipped to adapt to or mitigate these dangers.

What is the gender dimension in these risks?

- **Unequal burden** - In a risk society, the management of risks is central to both policy and daily life, but the burden is not equally distributed.
- **Role of gender** - Gender roles play a key role in determining who faces the more significant consequences of environmental disasters, health risks, and economic vulnerabilities.
- **Women at the forefront** - Women, especially in developing countries, are often the primary caregivers and household managers, placing them at the forefront of risk mitigation.
- Their work, whether as unpaid domestic labour or in informal sectors, often goes unrecognised, further reinforcing their vulnerability.
- **Historical vulnerability of women** - They are historically more vulnerable due to unequal access to resources, decision-making power, and healthcare services, exacerbating their exposure to these risks.
- **Environmental vulnerabilities of women** - Women are also often more susceptible to health risks associated with environmental hazards, such as water pollution, contaminated air, and ecological imbalances.
    - **Water pollution** - For instance, in many parts of the world, women are primarily responsible for collecting water for their households.
    - If these water sources are contaminated, the health risks extend directly to them.
    - **Air pollution** - Similarly, women in low-income settings may cook using solid fuels like wood or coal, which release harmful pollutants into the air, leading to respiratory diseases.
- **Disproportionate impact** - The impact of natural risks like extreme weather events, soil degradation, and water scarcity also disproportionately affects women's access to food and water, which in turn affects their health.
- **Health impact** - Gender norms frequently result in women eating last or eating less than their male counterparts.
- According to the National Family Health Survey-5 (2019-21), anaemia affects 57% of women in India, compared to 25% of men.

How economic inequality exacerbates women's vulnerability?

- Women's economic position often exacerbates their vulnerability to the consequences of a risk society.
- **Limited access to resources** - In many cultures, women have limited access to financial resources, land, and property, which limits their ability to recover from environmental or economic disasters.
- **Food insecurity** - When climate change leads to crop failure or extreme weather, women in rural areas are often the first to suffer from food insecurity.
- **Gendered responsibilities** - Women's caregiving roles, whether in terms of childcare, eldercare, or managing health, are often undervalued and unsupported.
- These gendered responsibilities mean that women bear the emotional and physical burden of managing risks, even as they face the unequal distribution of resources that would allow them to cope effectively.

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Conclusion

- In a world increasingly shaped by both manufactured and natural risks, the concept of the risk society underscores the importance of reflection and adaptation in addressing the consequences of modernisation.
- The concept also reveals the gendered dimensions of risk, focusing on how women are disproportionately affected by these challenges and play vital roles in managing and mitigating risks.

4.5 Tribal Displacement and Settlement

Why in the News?

The National Commission of Scheduled Tribes (NCST) has ordered a proper survey of the displaced tribal people in Andhra Pradesh, Telangana and Chhattisgarh.

What are the causes of tribal displacements?

- **Security issues** - Around 50,000 tribals were displaced from Chhattisgarh due to left-wing extremism.
- **Development Projects** - Large-scale infrastructure projects like dams and highways often lead to forced relocations.
- The Sardar Sarovar dam on the Narmada River displaced more than 41,000 families in Gujarat, Maharashtra, and Madhya Pradesh.
- **Political Conflicts** -Ethnic tensions, insurgencies, and border disputes can displace tribal communities.
- States like Nagaland, Assam, and Mizoram have seen tribal displacements due to insurgent activities and ethnic conflicts.
- For instance, clashes between Bodo's and other communities in Assam have displaced thousands.
- **Ecological disasters**- Floods, droughts, and cyclones lead to the forced relocation of indigenous communities from their traditional lands.
- For example, the displacement of the Mishing community on Majuli Island in Assam due to river erosion.

How effective was the Strategic Hamlet Program in India?

- **Strategic hamlets –** This counterinsurgency tactic involves relocating the tribal population into fortified areas or "strategic hamlets" to isolate them from insurgents and prevent them from supporting the rebellion.
- **Telangana** – At the end of 1949, the new Government of India also shifted tribals from forests to roadside camps to fight the Telangana communist revolutionaries after Nizam's surrender.
- They had recruited hundreds of tribals as "special police constables" to fight the communist dalams.

> *One such special group of Koya tribals was the **"Tiger Squad,"** which had around 300 members.*

- **Chhattisgarh programme** - In 2005, around 50,000 Gond tribals were forced to migrate to then-undivided Andhra Pradesh (now parts of Telangana) when the Government of India embarked on the 'strategic hamleting' programme to eliminate Maoists in Chhattisgarh.
- The tribals, whom the government had relocated to roadside camps, have long returned home to the deep forests.
- Some, who could not go back in fear of Maoists, joined the security forces.
- **Mizoram** – The Strategic Hamlet strategy was more successful in Mizoram in the 1960s, when the government eventually reached a peace deal with the Mizo fighters.
- **Bru displacement** - In 2019, when the same Mizo tribals started a fight with fellow Bru (Reang) tribals, causing thousands to flee to nearby Tripura

What are the challenges faced by displaced tribals?

- **Lack of national policies** - The absence of any national or international law for Internally Displaced People (IDPs) affects the rehabilitation and resettlement activities of the displaced tribal people.
- **Harassment** – The displaced tribals have been the subject of atrocities over the years — from forest officials, police, and even local tribals who view them as encroachers on their resources.
- **Security issue** - Maoists have not allowed them to go back to their home location.
- **Lack of recognition** - Andhra Pradesh and Telangana are reluctant to treat them as tribals.

- Over the past 20 years, a new generation of Gutti Koya tribals has emerged in Andhra Pradesh and Telangana.
- However, they have been denied State support as tribals because both governments treat them as "migrants who cannot be given tribal status."
- **Non-provision of alternate land**—As per the Forest Rights Act (FRA), if a tribal person is forced to vacate forest land, the State must provide her with alternative forest land.
- Many tribals in Andhra Pradesh, Telangana and Chattisgarh are not compensated with alternate land.
- **Inadequate compensation** – Not providing adequate compensation and rehabilitation under the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013 act.
- **Regressive state actions** - Telangana has taken over the farmlands of many displaced tribals, planting trees there as part of a renewed effort to push them back to Chhattisgarh.
- Andhra Pradesh has discouraged any efforts to build new houses in the forest by violently destroying them.
- **Lack of inter-state cooperation**: States often disagree on taking responsibility for the welfare of the displaced tribals.

What lies ahead?

- A national-level policy on Internally Displaced People (IDPs) specific to tribals is required to provide a framework for inter-state cooperation and tribal rights.
- Existing legislation, such as the Forest Rights Act 2006 and the Land Acquisition Act 2013, needs to be amended for effective implementation.
- Adequate alternative lands with the required infrastructure need to be provided.
- The political & social rights of the displaced people need to be respected in both the new land and the displaced land.

WOMEN

4.6 India's Commitment to Women's Safety

Why in news?

In recent times, women are excelling across all sectors, through the legislative reforms, initiatives, and financial support by the Indian Government to empower them to the full potential.

What are the legal measures to safeguard women security?

- Government has implemented a number of crucial laws to safeguard women's physical and mental security.
- **Bharatiya Nyaya Sanhita 2023 -** It introduced stringent penalties for sexual offenses, including the death penalty for the rape of girls below 18 years of age.
- It *increased minimum sentences* for rape and *expanded the definition of sexual offenses*.
- Harassment related to dowry is also punishable under laws like the Bharatiya Nyaya Sanhita (BNS).
- **Protection of Children from Sexual Offences (POCSO) Act 2012** – The act safeguards children from sexual abuse and offences.
- The Act was further reviewed and amended in 2019 to introduce more stringent punishment including the death penalty for Committing sexual crimes on children.
- **Protection of Women from Domestic Violence Act, 2005 -** In India, domestic violence is governed by the Protection of Women from Domestic Violence Act (PWDVA), 2005.
- The Act applies to women in shared households related by blood, marriage, adoption, or marriage-like relationships.

*The NFHS-5 (2019-2021) report shows **spousal violence** among married women (18-49 years) declined from 31.2% (2015-16) to 29.3%.*

- **Dowry Prohibition Act, 1961 –** It penalizes giving, taking, or demanding dowry.
- Authorities such as Dowry Prohibition Officers, police, and NGOs handle complaints, and awareness programs aim to discourage dowry practices.

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- **Immoral Traffic (Prevention) Act, 1956** – Th is Act focuses on preventing human trafficking and the sexual exploitation of individuals for commercial purposes.
- It provides support by rescue and rehabilitation of victims and prescribes penalties for those involved in trafficking offenses, aiming to combat organized exploitation.

If a woman dies under unnatural circumstances within 7 years of marriage due to dowry harassment, it is considered ***dowry death.***

- **Prohibition of Child Marriage Act, 2006 -** The Prohibition of Child Marriage Act, 2006 (PCMA) was enacted to prevent child marriages and punish those involved.
- Section 16 of the act empowers State Governments to appoint Child Marriage Prohibition Officers (CMPOs) to enforce the Act.
- CMPOs work to prevent child marriages, collect evidence for prosecution, counsel communities, raise awareness, and sensitize the public on its harmful effects.
- **Sexual Harassment of Women at Workplace (Prevention, Prohibition, and Redressal) Act, 2013 –** It mandates employers to create an Internal Committee (IC) in workplaces with over 10 employees.
- For smaller organizations or cases against employers' government sets up Local Committees (LCs).

What are the Government Initiatives for Women Safety?

- **Nirbhaya Fund** – Government has set up a dedicated fund which can be utilized for projects specifically designed to improve the safety and security of women.
- **Launched on** - December 2012
- It is a *non-lapsable corpus fund.*
- **Administered by** – Department of Economic Affairs, Ministry of Finance.
- **Review and monitored by** – Ministry of Women and Child Development (MWCD).
- Under the fund, a total amount of Rs 7712.85 crore has been allocated up to the financial year 2024-25, with Rs 5846.08 crore utilised which is nearly *76% of the total allocation*

Schemes funded under Nirbhaya fund	
Ministry of Women and Child Development (MWCD)	**One Stop Centres (OSCs)**
	• Launched on 2018 • It provides *integrated support to women* affected by violence. • These centres offer medical assistance, legal aid, psychological counselling, and temporary shelter.
	Women Helpline (WHL-181)
	• Launched on 2018. • It provides 24/7 emergency and support services for women facing violence in both public and private spaces. • It offers referrals to police, hospitals, legal aid, and One Stop Centres (OSC). • Sakhi Dashboard updates and regular feedback collection help track cases effectively.
Ministry of Home Affairs (MHA)	**Emergency Response Support System (ERSS-112)**
	• It is an integrated emergency service helpline (112), to handle all types of emergencies • This system unifies all existing emergency numbers, including 100 (Police), 101 (Fire), 108 (Ambulance), and 181 (Women & Child Care).

	• Citizens can seek help through calls, SMS, email, SOS signals, or the ERSS web portal.
	Anti-Human Trafficking Units (AHTUs)
	• To prevent and combat **human trafficking**, especially of women and children. • AHTUs work in coordination with *Interpol and border security forces for cross-border cases.*
	Women Help Desks (WHDs)
	• To create a ***women-friendly support system*** at police stations for lodging complaints. • More than 10,000 WHDs have been established nationwide.
	Cyber Forensic cum Training Labs
	• To strengthen ***cybercrime investigation capabilities*** for offenses against women. • These labs train law enforcement personnel in digital forensic techniques.
	Safe City Projects
	• Aims to create a safe, secure and empowering environment for women in public places. • To enable them to pursue all opportunities without the threat of gender-based violence and/or harassment. • Implemented in 8 major cities, including Delhi, Mumbai, Kolkata, Chennai, Bengaluru, Hyderabad, Ahmedabad, and Lucknow.
	Central Victim Compensation Fund (CVCF)
	• To provide ***financial assistance*** to survivors of rape, acid attacks, human trafficking, and other crimes. • Compensation ranges from Rs1 lakh to Rs10 lakh, depending on the severity of the case.
Ministry of Law and Justice	**Fast Track Special Courts (FTSCs)**
	• ***To speed up the trial process in cases of rape and sexual offenses*** against women and children. • They were set from 2019 under Protection of Children from Sexual Offences (POCSO) Act. • 1,023 FTSCs have been set up across India under the Nirbhaya Fund.
Ministry of Road Transport and Highways & Ministry of Railways.	**Rail and Road Transport Safety Initiatives**
	• To improve ***women's safety in public transport*** through surveillance and emergency response systems. • ***CCTV cameras, panic buttons, and GPS tracking*** are being installed in buses and trains.

- **SHe–Box Portal –** Launched by the Ministry of Women and Child Development.
- To provide a single–window platform for women to register workplace sexual harassment complaints.

- It is accessible to all women, regardless of their work sector (organized/unorganized, public/private).
- **Mission Shakti** – It is an integrated women empowerment programme for the safety, security and empowerment of women for implementation.
- It is launched during the 15th Finance Commission period 2021-22 to 2025-26.
- It has two sub-schemes - 'Sambal' and 'Samarthya'.
    - **Sambal** - Safety and security of women
    - **Samarthya** - Empowerment of women
- **Investigation Tracking System for Sexual Offences** - An online analytical tool launched to monitor and track timely completion of police investigations in sexual assault cases.
- **National Database of Sexual Offenders** - Launched to identify repeat offenders and receive alerts on sex offenders.
- **Cyber Crime Reporting Portal** - This portal facilitates victims' complainants to report cybercrime complaints online.
- **Meri Saheli Initiative** - Indian Railways has launched "Meri Saheli initiative to provide safety and security to lady passengers travelling by trains.
- **Mahila Police Volunteers** – They serve as a bridge between the police and the community, assisting women in distress.

What lies ahead?

- Ensuring better utilization of the Nirbhaya Fund, and expanding One Stop Centres (OSCs) to all districts.
- Government may introduce stricter laws against online abuse and cyber harassment to ensure time-bound investigations and trials.
- Awareness campaigns to encourage reporting of crimes and reduce social stigma

4.7 Beijing India Report

Why in News?

It has been 30 years since the adoption of the Beijing Declaration and Platform for Action.

What is Beijing Declaration?

- **Beijing Declaration and Platform for Action (BPfA)** – It is a landmark international agenda outlining an action plan for gender equality.
- **Adoption** – It was adopted in 1995 at the 4th World conference on women (also 50th year of UN foundation).
- **12 Critical areas** – The declaration focuses on 12 critical areas of concern to advance gender equality globally.

12 Critical Areas of Beijing Declaration	
1. Women and **poverty**.	7. Women in **power** and decision-making.
2. **Education** and training of women.	8. **Institutional mechanisms** for the advancement of women.

3. Women and **health**.	9. Human **rights** of women.
4. **Violence** against women (VAW)	10. Women and the **media**.
5. Women and **armed conflict**.	11. Women and the **environment**.
6. Women and the **economy**.	12. The **girl child**.

- **Reference framework** - It is also one of the reference frameworks to analyse the situation of women around the world and to assess the efforts of States in support of women's empowerment.
- **Participation** - The Platform also sets an agenda for governments, international organizations, civil society and the private sector to safeguard women's human rights.
- **Review** - Progress on implementation of the Beijing Platform for Action (BPFA) is reviewed by the Commission on the Status of Women (CSW) every five years.
- **Beijing+30 Report** - This report reviews the progress made over three decades, highlights ongoing challenges, and outlines priorities for further action.
- **Beijing India report** - It is India's Report on the Implementation of Beijing Declaration and Platform for Action.
- **Declaration's influence on India's action** -It has helped India focus attention on gender perspectives in policies, pass the
    - Protection of Women from Domestic Violence Act
    - Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) or POSH Act
    - and push for the economic empowerment of women.

What is the link between Gender and Climate?

- Gender inequality and the climate crisis are one of the greatest challenges of today.
- **Inequality** - Existing inequalities, especially in India's rural areas, leave women and girls with less access to resources and decision-making power.
- **Climate change and women issues** - Malnutrition caused by droughts, food insecurity, and displacement leading to a higher rate of hysterectomies, infertility and menstrual health concerns is an area of concern.
- **Hampers women services** - Heat stress and/or extreme precipitation affect/s agriculture productivity, human productivity and ecosystem functionality, causing price fluctuations, loss in income, distress migration, damaged infrastructure and hampered services for women.
- 33% losses in income, especially from non-farm livelihood streams.
- **Increased burden of domestic work** - At the household or family level, the increased burden of unpaid care work (water collection, fuel gathering) due to climate-related resource scarcity affects women.
- Without efforts to combat climate change, the time women spend on unpaid tasks could reach 8.3 hours a day by 2050.

*The **daily workload of women** in India exceeds 8 hours, with a staggering 71% unpaid work hours.*

- **Health issues** – Climate change affects the access of healthy food to women further aggravating existing health issues such as anaemia.
- **Domestic violence** - In India, which has the highest rate of intimate partner violence among the countries in the study, there was a clear correlation between temperature rise and abuse.
- For each rise in degree Celsius, physical violence rose by 8% and sexual violence by 7.3%.

*In India, over 50% of pregnant women are anaemic, which is an underlying cause or contributing factor to **maternal deaths** in India.*

What is the role of women in climate adaptation?

- Women play a vital role in climate adaptation and mitigation.
- **Safeguarding ecosystem** – Women's traditional knowledge of sustainable agriculture and natural resource management is crucial in safeguarding the ecosystem in rural areas.

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- **Conservation of indigenous crops** - Rural indigenous women are primarily responsible for preserving traditional climate-resilient seeds suitable for local climatic conditions.
- **Protecting food systems** - Women are responsible for half of the world's food production and have organically adapted to climate change by using sustainable agriculture.
- **Disaster management** – Women are one of the important first responders in disasters and safeguarding the local ecosystems.

What lies ahead?

- **Integrating gender and climate** – The integration is not just an imperative for achieving gender equality but is also essential for India's sustainable and resilient future and human rights.
- **Gender-responsive climate action** - Developing indicators and data related to the gendered impacts of climate change and also building insights.
- **Gender budgets** - It is necessary to design and use gender-audited and gender-responsive climate budgets.
- **Empower decision making** - Women in rural areas can be provided platforms to empower them in climate decision-making.
- **Energy leadership** - Promoting women's leadership in both green energy initiatives and local political leadership on climate action are crucial.
- **Capacity building** - By investing in women's education and capacity in climate action and promoting women-led climate initiatives, the consequences of gender invisibility can be turned around.
- **Closing the gender gap in agricultural resources** – It could significantly increase food production, with potential gains of 20%-30% in farm yields and the capacity to feed 100 million to 150 million more people.
- **Livelihood diversification** - Promoting non-farm livelihoods and skilling opportunities for women to adapt to the impacts of climate change on agriculture.
- **Financing** - Green funds can focus on fostering women-led and women-supportive innovations and ensuring women's participation in a green economic transition.

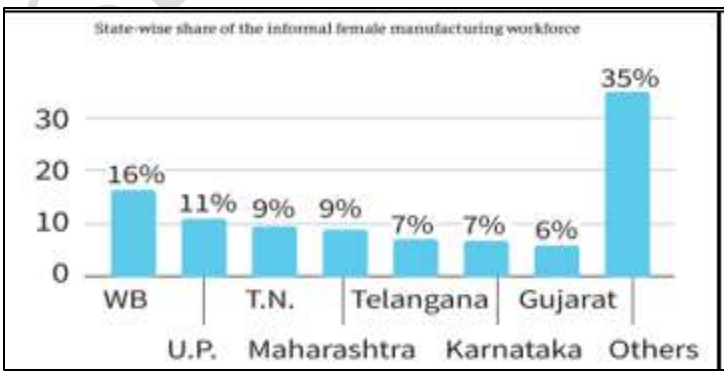
4.8 Female Workforce in Manufacturing Sector

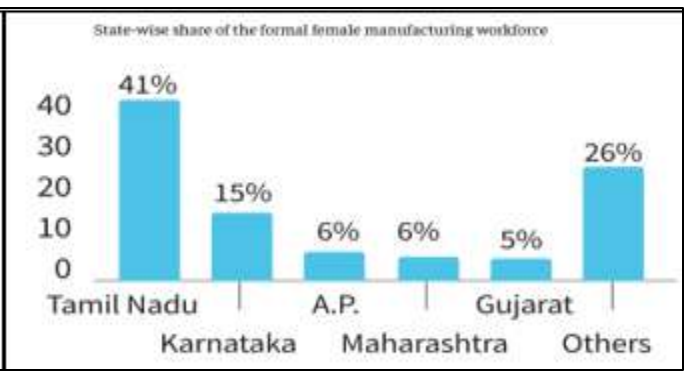
Why in the News?

The share of women in India's formal manufacturing sector fell recently.

What is the status of female labour force in manufacturing sector?

- **Significance of the manufacturing sector** - Manufacturing contributes almost one-fifth of India's GDP and is poised to be a key growth driver.
- **Declined female participation** - The share of women in India's formal manufacturing sector fell from 20.9% in 2015-16 to 18.9% in 2022-23 (1.57 million out of 8.34 million formal workers).
- **Global comparison** - Compared to other developing economies such as Bangladesh and Vietnam, India lags.
- **Dominance of southern states** - West Bengal, Uttar Pradesh, Tamil Nadu, and Maharashtra contribute close to 50% of the informal women workforce in the manufacturing sector.
- Of all the women working in manufacturing, Tamil Nadu alone is employing 41%.
- **High presence in the informal sector** - In informal manufacturing, women form 43% of the workforce.





- **Gender gap in formal workforce** - Bihar, West Bengal, Chhattisgarh, and Haryana have the highest gender gap in the formal manufacturing workforce, with women making up less than 6% of the workforce.

Why female labour force declines in the manufacturing sector?

- **Inadequate skill training**- According to the Periodic Labour Force Survey, about 6% of women in the sector have either formal vocational training or training on the job.
- **Incomplete higher education** - Nearly 47% of men in manufacturing have completed secondary education or higher, compared to just 30% of women.
- **Safety and security issues** - In 2022, the National Crime Records Bureau NCRB data reported 419 cases of sexual harassment at the workplace, representing an increase from previous years.
- **Gender segregation of employment**—There is significant homogeneity across industries in which women are employed in the formal and informal sectors.
- Within the formal sector, 60% are employed in textile, wearing apparel, and food processing.
- This segregation reduces the opportunities for women's participation in the manufacturing labour force.
- **Workplace discrimination** - Gender-based discrimination in wages and promotions discourages women's participation in the labour force.
- **Social norms and gender roles** - Traditional gender roles often prioritize women's responsibilities at home over their participation in the workforce.
- **Technological advancements** - Automation, Robotics and Artificial Intelligence have reduced the demand for labour-intensive jobs, which traditionally employed more women.

What lies ahead?

- It is important to transition women from the informal to the formal sector to ensure a decent pay and work environment.
- Given the high degree of informality and lack of heterogeneity in women's manufacturing workforces, skill training is the first step to boosting participation.
- Upskilling women is imperative to improve both participation and productivity.
- Sectors where women are employed need to be diversified to increase their participation.
- It is salient to make work environments safe to improve workforce participation.
- Specific interventions are needed in each State to address their unique challenges.

G. S. PAPER II

5. INDIAN POLITY

5.1 Committee on Government Assurances

Why in the News?

Since 2014, the Ministry of Home Affairs made 421 assurances in the Lok Sabha and 338 assurances in the Rajya Sabha, but 'dropped' close to 15% and 12% of them, respectively

What is the Committee on Government Assurances?

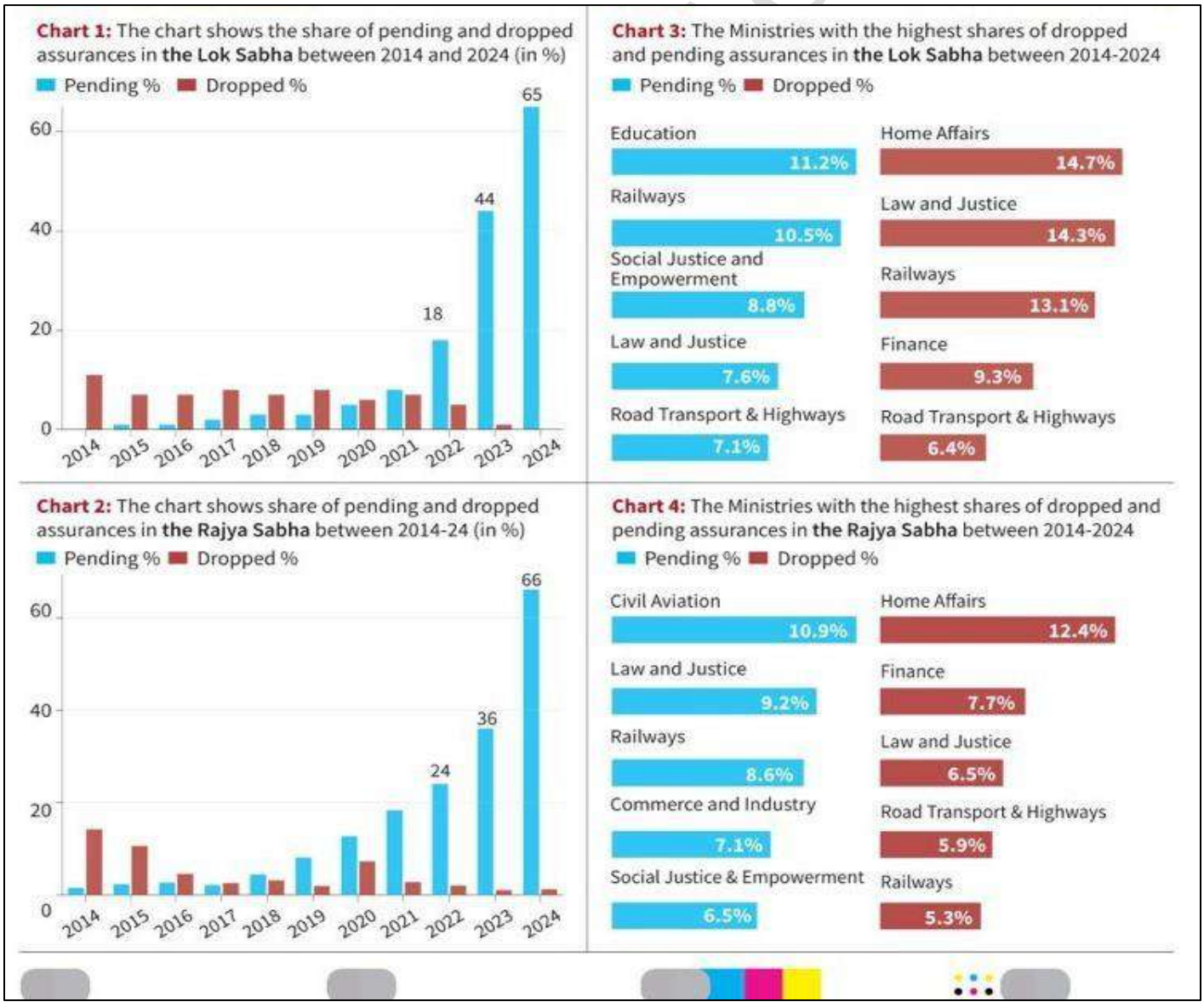
- **Government assurances** – They are promises, undertakings, or commitments made by ministers on the floor of the House, during questions or debates, that involve further action by the government.
- **Committee on Government Assurance** (CGA) – It was formed under Standing Committees of the Parliamentary Committees in the year 1953 in Lok Sabha and 1972 in Rajya Sabha to make sure assurances are being implemented.
- If an assurance is not fulfilled within 3 months of the date commenced, it is made as pending.
    - If there is no extension of that particular assurance is made, then it becomes dropped.

- **Nodal Ministry -** The Ministry of Parliamentary Affairs keeps in record of these assurances and publishes their status on *the Online Assurance Monitoring System (OAMS) Portal*, under the Government of India (Allocation of Business) Rules, 1962.
  - **Composition -** A Chairperson and not more than 15 members (currently 10 members) nominated by the Speaker in Lok Sabha and Chairperson in Rajya Sabha.
  - **Functions - Scrutinizing** the assurances, promises, undertakings etc., discussed on bills, resolutions, motions, etc.
  - Reporting about the status of the assurance whether they are implemented or not.
  - Reports of the committee are presented to the house either by the Chairman of the Committee or any member of the committee in their absence.
  - **Online Assurances Monitoring System (OAMS)** – It is a digital platform aimed at ensuring that assurances made by Ministers in Parliament are systematically tracked, monitored, and fulfilled.

What are the significances of the assurances committee?

- **Ensuring accountability** - The CGA holds the government accountable for its promises and undertakings.
- **Strengthening parliamentary democracy** - By holding the executive accountable, it reinforces the principles of parliamentary democracy.
- **Strengthening legislative oversight** - By tracking ministerial assurances, the Committee reinforces legislative oversight, ensuring that the executive is held accountable for its commitments.
- **Act as Watchdog** – It prevents ministers from making unfulfilled promises without facing scrutiny.

What are the challenges faced by the Committee on Government Assurances?



- **Higher rate of pending & drop rate cases** - 65% and 66% of assurances made in Lok Sabha and Rajya Sabha are pending for 2024.
- Ministry of Home affairs has high drop rate of 14.7% and 12.4% in Lok Sabha and Rajya Sabha respectively.
- **Lack of cooperation from ministries** - The Committee frequently encounters resistance or insufficient cooperation from various ministries.
- This lack of collaboration can obstruct the Committee's ability to track and monitor assurances effectively.
- **High volume of assurances** - The sheer number of assurances given in Parliament presents a daunting task for the Committee.
- Managing and tracking these commitments can overwhelm the Committee's resources and capabilities.
- **Limited technical expertise** - Members of the Committee, primarily parliamentarians, may not possess specialized knowledge required to scrutinize complex issues adequately.
- **Resource constraints** - The Committee often operates with limited resources, including a lack of research support and technical advisors.
- **Non-Binding recommendations** - The advisory nature of the Committee's recommendations means that ministries are not legally obligated to implement them.

What can be done to ensure the assurances?

- More members can be included in the committee for effective implementation.
- Sanctions can be imposed on the ministry if there is high drop rate or pending rate.
- Clearer lines of communication can be established between the Committee and various ministries to ensure timely updates and accountability for assurances.
- The Committee can be equipped with specialized research personnel to assist in analyzing complex issues related to assurances.
- More than including assurances in the question hour, a separate meeting can be conducted for the committee for even more analysis of the assurances

5.2 Role of Parliament in President Rule

Why in news?

Lok Sabha has ratified President's Rule in Manipur amidst ongoing ethnic conflict and administrative breakdown.

What is President's rule?

- **President's rule (State emergency)** - It refers to the suspension of a state government and the imposition of direct rule of the Centre.
- The central government takes direct control of the state and the Governor becomes its constitutional head.
- **Duty of the centre** - Article 355 directs the Centre to ensure that the government of every state is carried on in accordance with the provisions of the Constitution.
- It is this duty in the performance of which the Centre takes over the government of a state under Article 356 in case of failure of constitutional machinery in state.
- **Grounds of imposition** - The President's Rule can be proclaimed under on two grounds
    - **Article 356** – When a state government cannot be carried on in accordance with the provisions of the Constitution.
    - **Article 365** - When a state fails to comply with or to give effect to any direction from the Centre.
- **Effect of proclamation** - when the President's Rule is imposed in a state, the President dismisses the state council of ministers headed by the chief minister.
- The state governor, on behalf of the President, carries on the state administration.
- President either suspends or dissolves the state legislative assembly.

What is the role of Parliament in President's rule?

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- **Holding executive accountability** –Parliament debates the reasons and necessity for imposing President's Rule and discusses the performance of president rule in state.
- **Safeguarding democratic processes** – Parliament protects the democratic process in the state by preventing arbitrary imposition and continuation of President's rule.
- **Approving President's rule** - A proclamation imposing President's Rule must be approved by both the Houses of Parliament within two months from the date of its issue, else it will be revoked.
- If approved by both the Houses of Parliament, the President's Rule continues for 6 months.
- **Extending the rule** – It can be extended for a maximum period of three years with the approval of the Parliament, every 6 months.
- **State legislative work** – When President either suspends or dissolves the state legislative assembly, the Parliament passes the state legislative bills and the state budget.

Every resolution approving the proclamation of President's Rule or its continuation can be passed by either House of Parliament only by a simple majority.

What are the major challenges in implementing President's rule in Manipur?

- **Controlling violence** - May 3 would be three years since the ethnic violence broke out and controlling it will be the major challenge.
- **Unrecovered arms -** Weapons looted during the riots remain untraced and armed groups continue to dominate parts of the state.
- **Lack of coordination -** State police and Assam Rifles lacked operational synergy and has poor coordination.
- **Displacement crisis -** Displaced Kuki-Zo people have lost homes, essential documents such as voter IDs and academic certificates.
- Thousands remain in relief camps without identity or land documents.
- **Building public faith** – The violence and loss of life and property in the sides have eroded people's faith in police system.
- Restoring the confidence of people in the state's ability to protect them will be a difficult task.
- **Connectivity disruption -** Ethnic violence has stalled infrastructure like India-Myanmar-Thailand Trilateral Highway (1,360 km) which is aimed at linking Manipur to Southeast Asia.

What lies ahead?

- **Restoring trust** - Immediate confidence-building measures among communities.
- **Rehabilitation** - Rebuilding homes, schools, and religious institutions destroyed in the violence.
- **Disarmament** - Recover looted weapons and ensure only state forces maintain law and order.
- **Dialogue process** - Initiate inter-community dialogue for long-term peace between communities.
- **Address budgetary imbalance -** Budgetary imbalance between the Imphal Valley (mostly Meitei groups) and hill districts (home to Kuki-Zo tribal groups) which is a major cause of ethnic tensions needs to addressed.
- **Empower local leaders** - Encourage civil society and tribal leaders to participate in peace-building.
- **Regular parliamentary oversight** - Continuous updates and debates in Parliament to ensure national attention.

5.3 Judicial Review of Governor's Response to State Bills

Why in news?

Recently Supreme Court delivered judgement on the State of Tamil Nadu Vs The Governor case which redefines the constitutional parameters of Governor's power in assenting the bill.

What is the background of the State of Tamil Nadu Vs Governor case?

- **State university bills** – Between 2020 and 2023, the Tamil Nadu Assembly passed 10 Bills, related to state university governance.
- Other bills related to public appointments and early prisoner release were also sent to governor for assent.
- **Governor's inaction –** Governor did not give assent to the Bills — some were delayed for years and others were returned only after public and judicial pressure.

- This led to a constitutional deadlock between the elected government and the Governor.
- **The Case** - In 2023, TN government filed a writ petition in the Supreme Court, accusing the Governor of inaction and misuse of power.
- **SC Judgement** – On March 12, 2024, the Supreme Court ruled in favour of the state, stating that Governors cannot delay assent indefinitely, and upheld the legislative supremacy of the Assembly.

What are the constitutional powers of Governor on a state bill?

- **Assent of Governor** - As per Article 200, every state bill, after it is passed by the assembly or by both the Houses in case of a bicameral legislature, is presented to the governor for his assent.
- **Assent to the Bill** - The Governor can give their assent, making the bill a law.
- **Withhold Assent** - The Governor can withhold their assent, effectively rejecting the bill.
- **Return the Bill** - The Governor can return the bill, as soon as possible, to the state legislature with a message suggesting reconsideration of specific provisions or the entire bill.
- The House shall reconsider the Bill accordingly, and if the Bill is passed again by the House or Houses with or without amendment and presented to the Governor for assent, the Governor shall not withhold assent therefrom.
- **Reserve the Bill for the President** - The Governor can reserve certain bills for the President's consideration, if the bill if derogate from the powers of the High Court.
- **President on State bill** - Article 201 provides that When a Bill is reserved by a Governor for the consideration of the President, the President shall grant/withhold the assent or direct the governor to return the bill (except money bill).
- When a Bill is so returned, the House or Houses shall reconsider it accordingly within a period of 6 months.
- **No time limit** – No specific timeframe is defined in the constitution for the Governor to act.

What is the Supreme Court judgement?

- **No absolute/pocket veto** – The court held that the constitutional scheme does not make place for the idea of an “absolute veto” or a “pocket veto”.
- Once a state legislature passes a Bill, the Governor’s role under Article 200 of the Constitution is limited to three clear options
    - Granting assent, withholding assent, or reserving the Bill for the President’s consideration.
- **Aid & advice of cabinet** – Governors, as a general rule, had to abide by the aid and advice of the State Cabinet under Article 200 while deciding on Bills.
- **Returning is withholding** – When a Governor returns a Bill, it is considered part of withholding assent.
- Once the legislature re-passes the Bill, with or without amendments, the Governor is constitutionally bound to grant assent.
- **No president reservation of re-enacted bill** - Governor cannot reserve a Bill for the President’s consideration which is resent by the assembly.
- **Timelines for granting assent on bills** - The Court prescribed time limits for governor action on bills.

Governor’s action	Time limit
Withholding assent on the aid and advice of the State Cabinet	Maximum 1 month
Withholding assent contrary to advice of the State Cabinet	Maximum 3 months to return the Bill with a message specifying reasons.
If a Bill is re-passed and re-presented by the legislature	Maximum 1 month (Must give assent)
Reserving a Bill for the President’s consideration against the advice of the State Cabinet	3 Months

- **Judicial review** - Any failure by a Governor to comply with the timelines would invite judicial review.

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- **Restricted reservation powers** – Bills can only be reserved for Presidential consideration under specific constitutional circumstances.
    - when a proposed law was found "repugnant" or inconsistent with an existing Central law, (or)
    - if a Bill tended to derogate the Constitutional powers of the State High Court.
- **Judicial intervention** – Supreme Court invoked *Article 142 powers* for "complete justice".
- It declared that 10 Bills from the Tamil Nadu Assembly are ***deemed assented to*** given the extraordinary delay by Governor.
- **Governor's Role** - Governor must act in accordance with the "settled conventions of Parliamentary democracy.
- S/He is not a political actor, but a "friend, philosopher and guide" to the state government.
- Governor's decisions must not be coloured by political considerations and must be guided by the sanctity of the constitutional oath.

Article 142

- **Article 142** – It gives the **extraordinary powers** to supreme court beyond ordinary statutory limits to do complete justice.
- **Enforcement of Decrees and Orders** – The Supreme Court can pass any ***decree or order*** to ensure **complete justice** in any case pending before it.
    - Such orders/decrees are **enforceable across India**.
    - Until Parliament makes a specific law on enforcement, the President can prescribe the method of enforcement.
- It has been used in many landmark cases to **fill legislative gaps** or **overcome procedural barriers**.
- **Examples of Use**
- **Babri Masjid-Ram Janmabhoomi case (2019)** – SC used Article 142 to allot alternate land for the mosque.
- **Bhopal Gas Tragedy case (1991)** – Compensation was finalized using this power.

What are the previous judicial interpretations?

- **Nabam Rebia case (Arunachal Pradesh - 2016)** – Governor cannot withhold assent to a Bill indefinitely but must return it to the Assembly with a message, and this could include his recommendation for amendments to the Bill.
- **The State of Punjab vs Principal Secretary case (2023)** - The Governor, as an unelected Head of the State, is entrusted with certain constitutional powers.
- However, this power cannot be used to thwart the normal course of law-making by the State Legislatures.
- If they are withholding assent, then the constitutional path is to ***return the Bill to the legislature*** as per first provision of Article 200.

5.4 India's Political Infodemic

Why in the News?

Across various Indian States, digital tactics have been used and exhibit distinct regional adaptations while retaining overarching strategies.

How are digital technologies are being adopted in political campaigning?

- **Digital campaigns** - With internet penetration in India now reaching about 88 crore users and WhatsApp itself boasting over 59 crore active accounts, digital strategies have become indispensable campaign tools.
- **Digital volunteers** – Political parties use volunteers, party people to manage social media accounts, create digital content, or participate in virtual events to mobilize voters and emphasise voter concerns.
- **WhatsApp groups** - Local political party persons or these digital volunteers frequently compile voter lists, adding unsuspecting citizens into WhatsApp groups cleverly disguised as community forums, Resident Welfare Associations, or hobbyist groups.

- **AI contents** - AI-generated memes and viral content, with each party rapidly disseminating targeted narratives to specific demographic segments.
- **Use of applications** – Mobile applications are used by parties to assign tasks, track volunteer performance, and maintain competitive leaderboards, enhancing volunteer engagement through gamification.

What is the WhatsApp Pramukh Model?

- **WhatsApp Pramukh** - These Pramukhs manage digital communications at local levels, systematically categorising voters based on caste, religion, economic status, and other demographics.
- **Targeted campaigns** - They then distribute carefully crafted content—memes, videos, and doctored images—aligned with party agendas.
- **Monitoring effectiveness** - Local booth workers, often acting as WhatsApp Pramukhs, monitor content effectiveness meticulously, tracking engagement through forwards and responses.
- **Amplification** - Messages that resonate well are swiftly amplified across multiple groups, creating a powerful ripple effect.
- Political leaders leverage these strategies deliberately, ensuring that their talking points penetrate deeply into community dialogues.

How do these trends create political infodemic?

- **Infiltrating community spaces** - Central to the political infodemic is the covert infiltration of private WhatsApp groups, which were initially formed for community or casual interactions.
- These spaces have become prime targets for propaganda and places targeted propaganda directly into users' hands and everyday conversations.

> ***Political Infodemic*** *is the deluge of misleading information, continual onslaught of propaganda, half-truths, and outright falsehoods in political communication.*

- **Pointed propaganda** - These groups gradually disseminate politically charged messages, embedding subtle propaganda into everyday interactions.
- **Spread to mainstream media** - Once they permeate small groups, mainstream media often pick up these trends, amplifying their reach and lending them credibility.
- **Shaping large scale public opinion** - The result is a rapid transition from localised misinformation to national headlines, significantly altering public perception.
- **Data-driven micro targeting and profiling** - Hyperlocal influence hinges significantly on sophisticated voter profiling.
- Parties purchase or obtain voter data, analysing it to identify community affiliations, regional issues, and ideological leanings.

What are the democratic implications of these trends?

- **Manipulative political communication** - Digital platforms have merged irrevocably with traditional electoral campaigning.
- This fusion erodes distinctions between overt advertising and covert propaganda, creating fertile ground for manipulative political communication.
- **Polarization of communities** - Old protest images repurposed against political rivals are circulated and proliferated in WhatsApp groups and effectively polarising local communities.
- **Influencing public perception and electoral outcomes** – Use of digital technologies is shaping public opinion and discourse in unexpected ways, and thereby offering a modern means to electoral victory.
- **Bypassing regulations** - Manipulated images and misleading messages infiltrate local networks rapidly, outpacing fact-checking efforts.
- **Compromises electoral integrity** - When misinformation saturates personal conversations, it skews voter perceptions and potentially compromises electoral integrity, making informed democratic choices challenging.

What lies ahead?

- India's infodemic symbolises a broader global trend where digital micro-targeting increasingly shapes electoral outcomes subtly yet decisively.
- Effective countermeasures depend significantly on civil society vigilance, independent journalism, and informed citizen activism to expose and counter manipulative strategies.

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- Heightened vigilance and proactive intervention are necessary to safeguard electoral integrity.
- Preserving genuine democratic engagement hinges on collective responsibility—by alert citizens, proactive media, and responsive civil society—in mitigating the corrosive effects of unchecked digital propaganda.
- Without widespread watchfulness, the infodemic will continue to flourish, subtly nudging millions of citizens in directions they might never have chosen through genuine, open discourse.

6. GOVERNMENT POLICIES AND INTERVENTIONS

6.1 Aadhaar Voter Id Linkage

Why in the News?

The Election Commission of India (ECI)'s renewed push to link Aadhaar with voter ID.

What are the objectives of linking Aadhaar with Voter ID?

- **Improving efficiency of electoral process** - Integrating the Aadhaar database with the voter registry is expected to streamline electoral verification processes, making them quicker and more cost-effective for electoral officials.
- **Eliminate bogus voters** – Linking Aadhaar with electoral ID will ensure that one voter is registered in only one constituency or only once in the same constituency.
- **Enhancement of Electoral Roll Accuracy** – The linkage helps in updating the rolls efficiently, ensuring that only eligible voters are listed and that outdated or erroneous entries are minimized.
- **Enhanced Voter Authentication** - By integrating digital identity systems, voter verification at polling stations becomes more robust, making it harder for ineligible or fraudulent voters to cast ballots.
- This directly contributes to the credibility and transparency of the electoral process.
- **Strengthening electoral integrity** - By reducing the scope for bogus voting and impersonation, the linkage seeks to uphold the integrity of the electoral process and enhance the credibility of elections in India.
- **Facilitating remote voting** - Aadhaar linkage could enable future initiatives such as remote voting, potentially benefiting migrant workers and citizens living away from their home constituencies.

What are the challenges during and after the linkages?

- **Compulsion in linking** - Presently, Form 6B offers no meaningful opt-out — voters must either submit their Aadhaar number or declare they do not have one, coercing even those unwilling to share it into compliance.
- **Infringements on fundamental right to privacy** - DBT Seeding Data and data collected for the National Population Register are used for the linkages.
- **Judicial challenge** - In 2023, in G. Niranjan v. Election Commission of India, the ECI had assured the Supreme Court that Aadhaar-voter ID linkage is not mandatory.
- But the Latest ECI proposal requires citizen-voters who do not provide Aadhaar to physically appear before an Electoral Registration Officer to justify their decision.

> *The Supreme Court* ***in Justice K.S. Puttaswamy (Retd.) v. Union of India (2018)*** *had limited the use of Aadhaar for welfare programmes paid out of the Consolidated Fund of India per Section 7 of the Aadhaar Act, 2016.*

- **Disproportionate burden** - It will be difficult for the elderly, persons with disabilities, migrant workers, and individuals in remote areas to attend in-person hearing before the Electoral Registration Officer.
- **Lack of appellate mechanism** - Lack of a clear, accessible, and time-bound appellate mechanism for the citizen-voter, if their justification for not submitting Aadhaar is arbitrarily rejected.
- **Inadequacy of Aadhaar** - Multiple High Courts have ruled that Aadhaar is not proof of Indian citizenship.
- Aadhaar Act, 2016, explicitly states that Aadhaar is a residency-based identification system, which means that an Aadhaar holder may not necessarily be an Indian citizen.

> *Non-citizens residing in India for 182 days are eligible for Aadhaar.*

- **Issues in Aadhaar database** - The 2022 Comptroller and Auditor General (CAG) Performance Audit Report identified major deficiencies, including the cancellation of over 4.75 lakh Aadhaar numbers due to their duplication and issuance based on faulty biometric data.

- **Disenfranchisement risks** - Systemic errors and exclusions may create barriers and already weak voter turnout.

*In 2015, the ECI attempted a similar Aadhaar-voter ID linkage under the National **Electoral Roll Purification and Authentication Programme**. As a result, in Telangana and Andhra Pradesh alone, 55 lakh voters were arbitrarily removed from electoral rolls due to Aadhaar mismatches. The ECI was forced to abandon the exercise after the Supreme Court issued a stay through its August 11, 2015 order.*

- **Voter profiling** - Once Aadhaar is linked to voter IDs, it becomes possible to cross-reference electoral data with other databases, allowing ruling parties to monitor voter demographics.
- Political actors could use this data to micro-target voters, suppress opposition strongholds, or even manipulate electoral rolls to achieve predetermined electoral outcomes.
- **Undermines the separation of powers of ECI** - The ECI is a constitutionally independent authority and the UIDAI is a statutory body operating under executive control.
- Entrusting UIDAI with electoral data may undermine the separation of powers, affect the integrity of the electoral process.
- **Arbitrary welfare disentitlements** – Fear of disentitlement from welfare schemes upon not voting in polls.

What lies ahead?

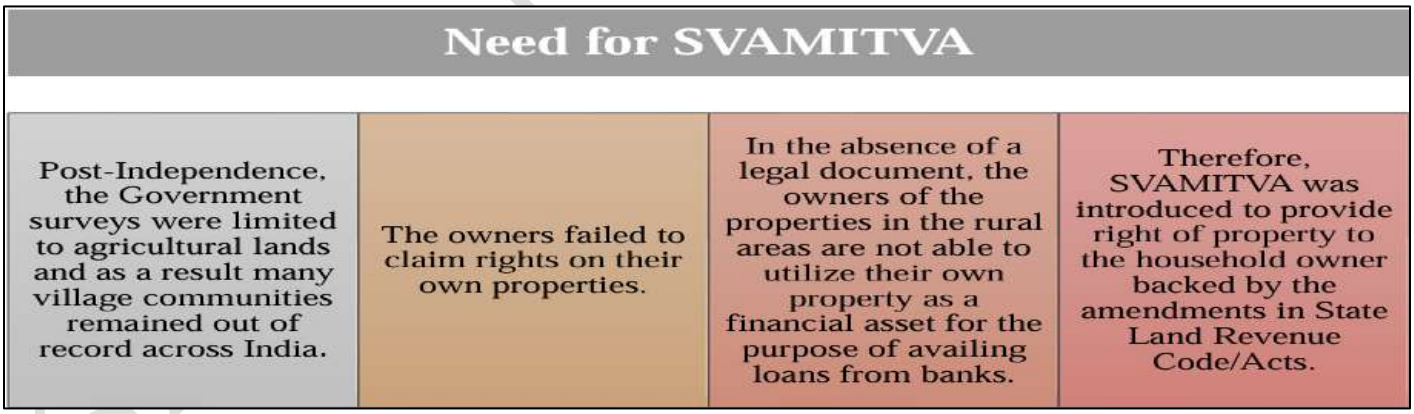
- Ensuring safety mechanisms to prohibit the misuse such as voter profiling using Aadhaar Electoral roll linkage.
- Providing legal guarantee on non-disentitlement of welfare will remove the fear among citizens about the linkage.
- Cleaning the Aadhaar database of errors, exclusions and duplications before linkage with electoral role.
- Regular door-to-door verification by booth level officers, comprehensive independent audits of electoral rolls and functional public grievance to address concerns about alleged duplicate or fraudulent entries.
- Introducing independent oversight through social audits would further enhance accountability and prevent politically motivated manipulations of electoral rolls.

6.2 SVAMITVA Transforming Rural Governance

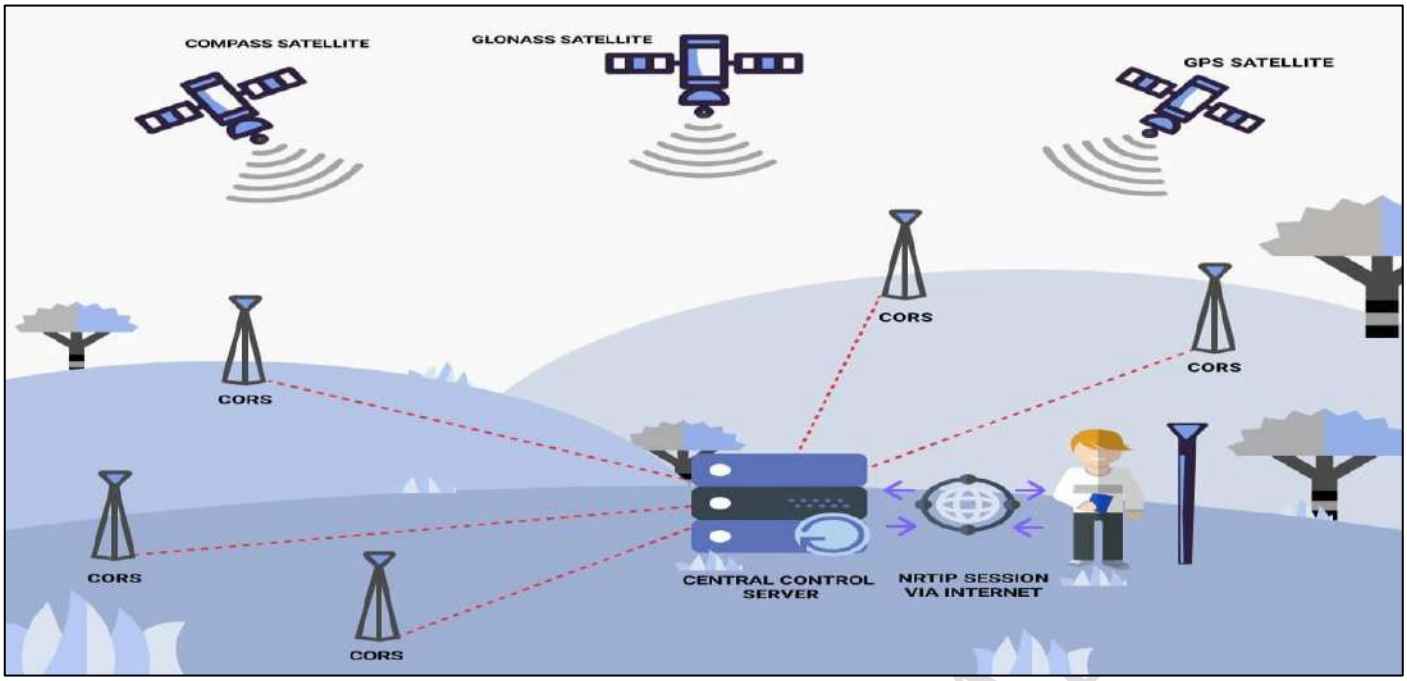
Why in the News?

It has been 5 years since the launch of SVAMITVA scheme.

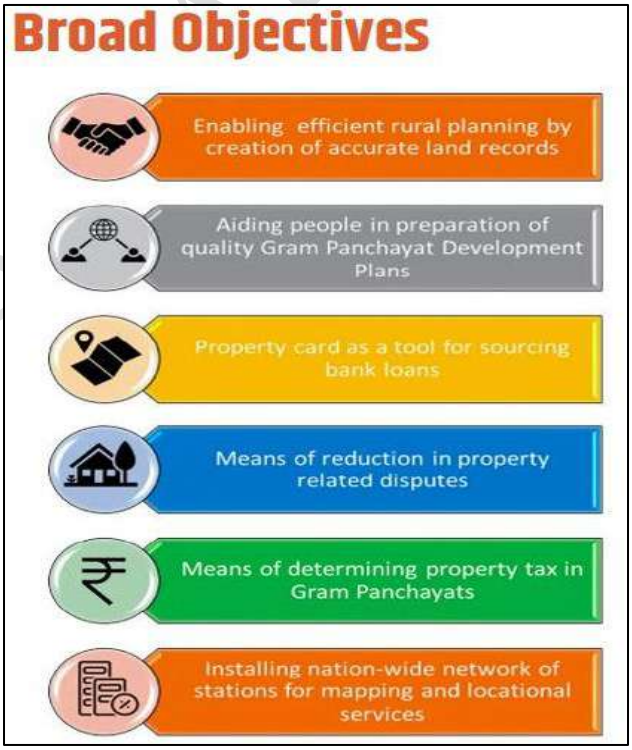
What is the SVAMITVA Scheme?



- **SVAMITVA** - Survey of Villages and Mapping with Improvised Technology in Village Areas.
- **Launched in** – 2020, on National Panchayati Raj Day (April 24th).
- **Nodal Ministry** –Ministry of Panchayati Raj.
- **Implementation** – The scheme is implemented by the Survey of India (SoI) with the National Informatics Centre Services Inc. (NICSI) as the technology partner
- **Aim** – To empower rural citizens with property cards, enabling access to credit, dispute resolution, and better planning.
- **Features** - It uses drones, special mapping tools to transform land governance by clearly marking property boundaries.



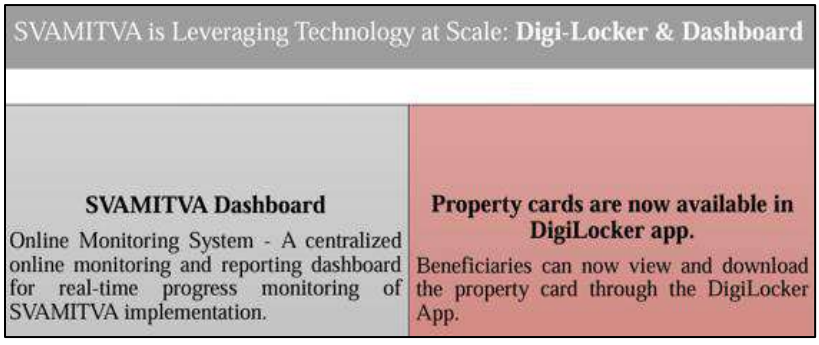
What are the objectives of the scheme?



- **Creation of accurate land records** - For rural planning and reduced property related disputes.
- **Financial stability** - Enabling rural citizens to use their property as a financial asset for taking loans and other financial benefits.
- **Determination of property tax** – To facilitate panchayat local bodies to assess property taxes easily.
- **Creation of survey infrastructure and GIS maps** - To be leveraged by any department for their use.
- **Village planning** - To support in preparation of better-quality Gram Panchayat Development Plan (GPDP) by making use of GIS maps.

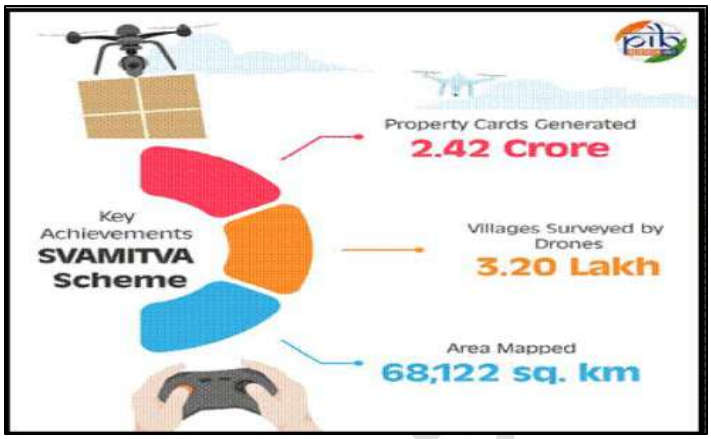
What are the components of the scheme?

- **Continuously Operating Reference Stations (CORS) network** - The CORS network support in establishing Ground Control Points, which is an important activity for accurate Geo-referencing, ground truthing and demarcation of Lands.
- **Mapping using Drones** - Rural inhabited (abadi) area is being mapping by Survey of India using drone Survey.
- It generates high resolution and accurate maps to confer ownership property rights.
- Based on these maps or data, property cards issue to the rural household owners.
- **Information, Education, and Communication (IEC) Initiatives** - Awareness program to sensitize the local population about the scheme methodology and its benefits.
- **Gram Manchitra** – It is a spatial planning application for leveraging digital spatial data/maps created under drone survey for creation of spatial analytical tools to support preparation of Gram Panchayat Development Plan (GPDP).
- **Online Monitoring System** - Dashboard is monitored to track the progress of activities.



- **Project management** - Programme Management Units at the National and State levels for supporting Ministry & State respectively with scheme implementation.

What are the impact areas under the scheme?



- **Inclusive Society** - Throughout history, scholars and development specialists have linked 'Access to Property Rights' with 'Improvement in socio-economic standards of vulnerable population in villages.
- The SVAMITVA Scheme aims to enable the same.
- **Land Governance** - Land is an essential resource for any economic activity aimed at creation of material wealth in the world.
- Lack of clearly demarcated Abadi area has led to high number of land conflict cases.
- As per reports, millions of people suffer the impact of land conflicts across India and the world.
- The SVAMITVA Scheme aims to address the root cause for disputes at local level.
- **Village governance** – The SVAMITVA Scheme is transforming rural governance by providing clear property rights and improving land management.
- **Sustainable Habitats** - High-resolution digital maps for better Gram Panchayat Development Plans (GPDP) leading to improvement across infrastructure like schools, community health centres, rivers, street light, roads etc.
- **Economic Growth** - The key outcome is to help people monetize their property as collateral.
- Furthermore, it gives a boost to India's economic growth through streamlining of property tax in States where it is levied leading to increase in investments and ease of doing business`.

Rural Land & property before and after SVAMITVA

S.no	Primary Objective	Before SVAMITVA	After SVAMITVA
1.	Banks recognize proof of ownership for rural property owners	Dependence on money lenders with exorbitant interest rates	Banks amenable to providing loans as per standard practices
2.	Aiding survey infrastructure	Monitoring of works based on laborious ground work	Panchayats and departments can plan their development easily
3.	Enabler for reduction in property related disputes and legal cases	High disputes due to absence of property card with individuals	Greater social security through title deeds updated using technology
4.	Enabler as determinant of property tax	Low levels of property tax collection by several states	Streamlined levy of property taxes by panchayats leading to empowerment of the villages

7. HEALTH

7.1 Diarrhoea: A public health concern in India

Why in News?

Recent study of to the World Health Organization (WHO) study, reveals that diarrhoeal disease is the leading cause of death among children (1-5 years) annually.

What is Diarrhoea?

- **Diarrhoea** – It is defined as the passage of 3 or more loose or liquid stools per day (or more frequent passage than is normal for the individual)
- Diarrhoea is usually a symptom of an infection in the intestinal tract, which can be caused by a variety of bacterial, viral and parasitic organisms.

- Infection is spread through contaminated food or drinking-water, or from person-to-person as a result of poor hygiene.
- **Types** - There are 3 clinical types of diarrhoea:
    - **Acute watery diarrhoea** – Lasts several hours or days and includes cholera
    - **Acute bloody diarrhoea (Dysentery)** – Bloody stools associated with fever and lasts upto 14 days.
    - **Persistent diarrhoea** – Lasts 14 days or longer.
- **Complication** - During a diarrhoea, *water and electrolytes* (sodium, chloride, potassium and bicarbonate) are lost through liquid stools, vomit, sweat, urine and breathing.
- It leads to dehydration and cause mortality in children.

What are the causes for diarrhoea?

- **Infection** – Pathogens were the leading cause for the diarrhoeal disease.
    - **Viral pathogens** – Rotavirus, norovirus, adenovirus and astrovirus.
    - **Parasitic pathogens** – Cryptosporidium, Giardia and Entamoeba spp.
    - **Bacterial pathogens** – E. coli, Salmonella, and Shigella

Rotavirus *is a top viral cause in kids, leading to 10–20% of cases and severe illness often leading to hospitalization.*

- **Malnutrition -** Malnutrition in children makes them more vulnerable to diarrhoea.
- **Water contamination** – Contamination of water with faecal matters from sewage, septic tanks and latrines, is of particular concern.
- **Poor hygiene -** Diarrhoeal disease can also spread from person-to-person, aggravated by *poor personal hygiene*.
- Food is another major cause of diarrhoea when it is prepared or stored in unhygienic conditions.
- **Unsafe storage -** *Unsafe domestic water storage* and handling are also an important risk factor.
- **Weak immunity** - Kids with malnutrition or HIV are at higher risk.

Treatment
• **Oral rehydration solution (ORS)** - A mix of water, salt, and sugar replaces lost fluids; works for 90% of cases. • **Zinc supplements** - Cuts diarrhoea time by 25% and stool amount by 30%. • **IV fluids** - Used for severe dehydration or shock when kids can't drink. • **Hydration** - Rapid hydration is key since antibiotics don't work on rotavirus. • **Hospital care** - Severe dehydration needs hospital treatment.

What is the burden of diarrhoeal diseases in India?

- **High prevalence** – India has among the highest incidence of diarrhoeal illnesses worldwide, with children under five experiencing an average of 2 to 2.3 episodes per year.
- **High number deaths** – They accounts for *third leading cause of death for children under five*, with 443,832 deaths yearly, and India bears a significant share.
- **Affects nutrition** – Diarrhoea is a leading cause of malnutrition, worsening children's immunity.
- **Sanitation issues** - 780 million lack safe water, and 2.5 billion lack good sanitation worldwide, hitting India hard.
- **Regional differences –** States such as Uttar Pradesh, Bihar, Madhya Pradesh, and Rajasthan experience a higher diarrhoeal burden, primarily due to weaker sanitation infrastructure.
- **Low awareness** - Only 50–60% of Indian kids get ORS and zinc due to poor knowledge.

What is the role of sanitation and vaccination in diarrhoea control?

- **Sanitation prevents deaths** - WHO says better sanitation could stop 60% of diarrhoea deaths in India.

- Better toilets and waste systems stop germs, cutting over half of diarrhoea deaths.
- **Clean water supply** – Piped water across India could prevent 4,00,000 diarrhoea deaths as per WHO's study.
- **Rural focus** - better sanitation in villages could close the gap with cities.
- **Vaccines lower cases** - Following the introduction of rotavirus vaccination in 2016, there has been a noticeable decline in diarrhoeal diseases, particularly those caused by rotavirus.

What lies ahead?

India's national immunisation schedule includes 3 doses of the rotavirus vaccine at 6, 10, and 14 weeks of age.

- Sanitation push through Swachh Bharat for cleaner water and toilets, aims to cut diarrhoea deaths significantly.
- Raising awareness to avail simple treatments like ORT and zinc.
- Promoting personal hygiene practices among citizen through campaigns
- Vaccination of infants before six to eight months, as they are highly susceptible to infections during this period.
- Preventive measures such as exclusive breastfeeding for the first six months, proper hygiene, safe drinking water, and avoiding unhygienic food, could also go a long way.

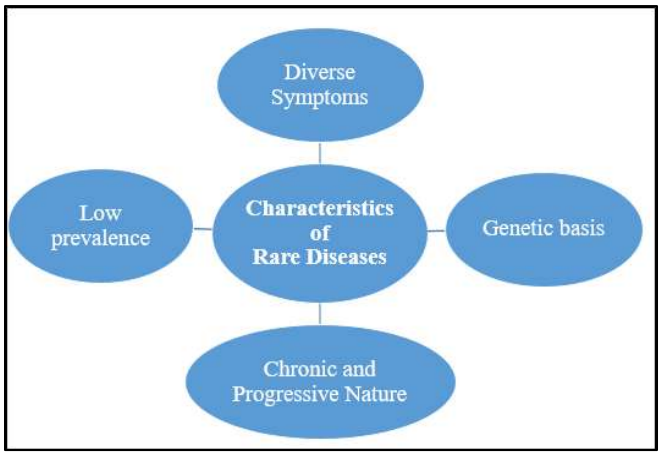
7.2 Management of Rare Diseases in India

Why in news?

Recently, Karnataka government seeks corporate support for treating children battling rare and ultra rare diseases.

What are rare diseases?

- **Definition** – According to World Health Organisation (WHO), Rare disease is a *lifelong disease* with a *prevalence of 10 or fewer per 10,000 population.*
- The Organization of Rare Diseases India (ORDI) defined rare disease as a disease when it affects 1 in 5,000 people.
- A disease is considered rare if it affects fewer than 200,000 people in the U.S. and fewer than 1 in 10,000 people in the European Union.
- **Spread** – It affect approximately *3.5% to 5.9% of the population*.
- **Causes** – *72% of rare diseases are genetic*, with over 7000 characterized by diverse disorders and symptoms.
- **Characteristics** – There are wide range of conditions that differ significantly in their symptoms and manifestations, even among individuals diagnosed with the same disorder.
- **No treatments** – The *absence of definitive treatments* further intensifies the physical and emotional burden on both patients and their families, severely impacting their overall quality of life.



Status of Rare Disease in India

- India lacks a standard definition for rare diseases.
- **Incidences** – India accounts for *one-third of the global rare disease* incidence, with over 450 identified diseases.
- **Population** – India has *over 13,000 registered patients* under the National Registry for Rare and Other Inherited Disorders.
- Estimate suggests that about 8 crore-10 crore Indians suffer from one rare disease or another and over 75% of them are children.

Most Common Rare Disease in India

- Lysosomal Storage Disorders
- Pompe disease (Glycogen storage disease type II)
- Anderson–Fabry disease
- Mucopolysaccharidosis
- Severe Combined Immunodeficiency (SCID)
- Phenylketonuria
- Cystic Fibrosis
- Duchenne Muscular Dystrophy

What are the measures taken by India?

- **National Policy for Rare Diseases (NPRD)** – It was launched by Ministry of Health & Family Welfare in ***2021***.
    - Currently, *63 rare diseases are included* under NPRD on recommendation of Central Technical Committee for Rare Diseases (CTCRD).
- **Centre of Excellence for Rare Disease** – They are institutions identified by the central government under NPRD, 2021.
- **Aim** – *To treat patients* suffering from rare diseases actively.
- **Numbers** – There are 12 such centres.
- **Coverage** – These centres cover with a quota of 2,420 rare disease patients *from 6 categories across 3 groups*.
- These 3 groups are based on the type of treatment they require
    - **Group 1** – Diseases that can be cured with a one-time treatment.
    - **Group 2** – Diseases that require long-term or lifelong treatment, but are relatively inexpensive.
    - **Group 3** – Diseases that have a definitive treatment, but are expensive and require lifelong therapy.
- **Tax exemption** – GST and Basic Customs Duty on drugs imported for Rare Diseases for individual use and through CoE.

> ***Rare Disease Day*** *was observed on the last day of February i.e., 28th February (or 29 in leap years).*

What are the key challenges in India?

- **High cost of treatment** – Treatments for diseases like Spinal Muscular Atrophy (SMA) cost upwards of ₹72 lakh annually.
- **Lower financial support** – The NPRD's *financial cap of ₹50 lakh per patient* is inadequate and gets exhausted early.
- **Inadequate policy implementation** – Despite court directions (Delhi and Kerala High Court), MoHFW has been *slow to implement the National Policy* for Rare Diseases.
- **Patent monopolies** – Pharma companies exploit monopolies by delaying market entry of cost-effective alternatives.
- Drug patents block the manufacturing of affordable generics.
- **Lack of Institutional Coordination** - Inter-ministerial coordination (Health, Pharmaceuticals, Industry) is weak, also a direction to coordinate through a five-member committee was issued only recently.
- **Lack of institutional care at CoEs** – It fails to support sustained treatment for chronic conditions like Lysosomal storage disorders.

What lies ahead?

- **Enhancing financial support** – The current financial ceiling of the NPRD can be increased to ensure sufficient support for patients requiring high-cost treatments.
- **Time-bound disbursement of funds** – A clear timelines and can be defined for disbursing allocated funds to patients and institutions to avoid delays in treatment initiation.
- **Manufacturing generic drugs** – *Indian Patents Act can be invoked to issue compulsory licenses* for patented medicines, particularly when monopoly pricing restricts access.
- Indian pharmaceutical companies can be encouraged to manufacture generic versions of high-cost patented rare disease drugs through *public-private partnerships* and funding support.
- **Quicker regulatory approvals** - Clinical trials, regulatory clearances, and marketing approvals for indigenously developed rare disease medicines can be given in timely manner.
- **Activating oversight committee** – The court proposed *five-member oversight committee under the NPRD* can be made operational to monitor implementation & address emerging challenges.
- **Enhancing inter-departmental coordination** – Institutional collaboration between the ministries of Health, Pharmaceuticals, and Industry can be ensured for better policy alignment and seamless execution of rare disease strategies.

SHANKAR IAS ACADEMY

8. GOVERNANCE

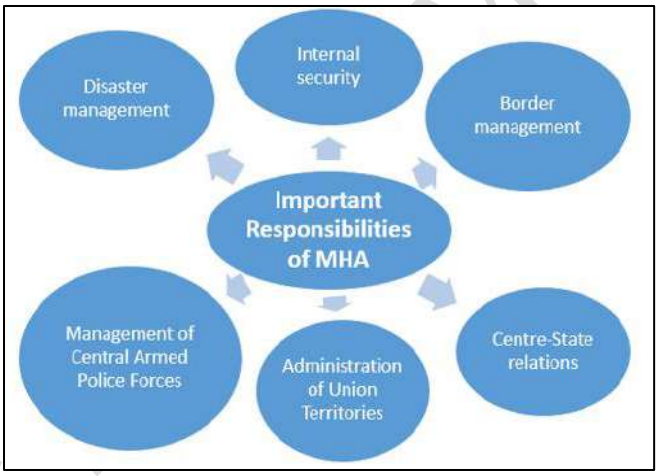
8.1 The Gradual transformation of Ministry of Home Affairs

Why is in News?

The recent transformation of Ministry of Home Affairs by shifting from reactionary interventions to strategic reforms has strengthened India's internal security architecture and built a future-ready governance framework.

What is basis of Ministry of Home Affairs (MHA)?

- **Role** – It is the *backbone of India's internal security and federal governance.*
- Unlike many countries, it integrates security and governance and thereby making it a critical pillar of national stability.
- **Functions** – It discharges multifarious responsibilities dealing with security and interstate relations.



In terms of Entries 1 and 2 of List II 'State List' in the 7th Schedule to the Constitution of India, ***'public order' and 'police'*** *are the responsibilities of States.*

- **Powers in states of India** – The Indian Constitution empowers the MHA through *Articles 355, 256, and 356*, ensuring Centre-State coordination on security matters.
- ***Article 355*** of the Constitution enjoins the Union to protect every State against external aggression and internal disturbance and to ensure that the Government of every State is carried on in accordance with the provisions of the Constitution.
- It continuously monitors the internal security situation, issues appropriate advisories, shares intelligence inputs, extends manpower and financial support, guidance and expertise to the State Governments for maintenance of security, peace and harmony without encroaching upon the constitutional rights of the States.
- **Important priorities** –India's 3 major security hotspots, i.e., Kashmir, the North-East, and Central India (Naxal areas) dominated the MHA's priorities for nearly 4 decades.

What are the factors that led to evolution of MHA's role?

- The MHA's growth has largely been *shaped by security challenges* of the day.
- **Rise of terrorism and insurgency**- It is upward trajectory since the 1980s that led to increased security spending.
- **Incapacity of states** – Punjab's militancy, Kashmir's terrorism, and Maoist violence required direct intervention, *as State police struggled* to contain these threats.
- **Reliance on central forces** - Many States were slow to modernise their police forces, increasing their dependence on the Central Armed Police Forces or the CAPFs
  - Reliance on the Rapid Action Force (RAF) of the CRPF for riot control is one example.
- **Industrial unrest** – The 1970s-80s industrial unrests had some role in the creation of the CISF, particularly in West Bengal and Kerala.
- **Administrative restructuring**
  - **Separation from MHA** - North-east affairs and the Department of Justice.
  - **Addition to MHA** - Disaster Management and the Narcotics Control Bureau (NCB) were added.

Central Armed Police Forces

- Assam Rifles (AR)
- Border Security Force (BSF)
- Central Industrial Security Force (CISF)
- Central Reserve Police Force (CRPF)
- Indo Tibetan Border Police (ITBP)
- National Security Guard (NSG)
- Sashastra Seema Bal (SSB)

What are the challenges of MHA?

- **Narrowed focus** – It mainly dealt with insurgency, terrorism and border security, thereby other critical areas such as police modernisation, agency coordination, narcotics control, technology adoption, disaster management and federal governance have received less attention.
- **Frequent leadership changes** – It have historically affected the Home Ministry's policymaking.
    - Former Indian PM Indira Gandhi's 3rd term and Rajiv Gandhi's tenure saw 4 Home Ministers, leading to instability in internal security reforms.
- **Lack of proactive policies** – On the legislative front as well, its earlier responses were largely event-driven short-sighted and temporary.
- **Crisis ministry** – Earlier it used step in when riots erupted, insurgencies escalated, or States faced governance failures.
- Its interventions were often reactive, tackling unrest rather than preventing it through institutional reforms.
    - The Terrorist and Disruptive Activities (Prevention) Act, or TADA, was enacted after the Punjab insurgency
    - The Prevention of Terrorism Act (POTA) after the 2001 Parliament attack
    - The National Investigation Agency (NIA) was formed after the 26/11 Mumbai attacks.

What are the recent reforms taken of MHA?

- **Increased budgetary allocation** – In 2019, for the 1st time, the MHA budget crossed 1 lakh crore.
- The 2025 Budget allocation *has surged to 2.33 lakh crore*, reflecting the government's focus on internal security and modernisation.
    - The expenditure on the Central Paramilitary Forces has also risen, from Rs.38,000 crore in 2013-14 to Rs.97,000 crore in 2024-25.
- **Legislative reforms** – Start from since 2019, *over 27 legislative reforms have established* a strong security jurisprudence, shaping law enforcement and national stability.
- These include transformative changes in terror jurisprudence, Kashmir integration and the criminal justice system.
- **Strengthened terror jurisprudence** – It was strengthened by amending the NIA Act and the Unlawful Activities (Prevention) Act, or UAPA, by *defining terrorism* in Indian criminal law.
- It also aiming to financially choke terror groups.
- **Complementary reforms** – Strengthening and expanding the NIA, creating technology databases, revamping the Multi-Agency Centre (MAC), and *promoting a 'duty to share' intelligence* culture.
- **Maintaining stability at the MHA** - It is maintained in a reinforcement of a long-term vision for internal security and governance.
- **Reforms in criminal justice system** – 3 new criminal laws (the Bharatiya Nyaya Sanhita, the Bharatiya Nagarik Suraksha Sanhita and the Bharatiya Sakshya Adhiniyam) have been enacted.
- National Forensic Sciences University (NFSU) was established.
- Crime and Criminal Tracking Network and Systems (CCTNS) was fully implemented.
    - It integrates 17,130 police stations, courts, jails and forensic laboratories
- States are now encouraged to separate investigation from forensics, further strengthening the justice system.

What are the significances of recent reforms?

- The dilution of Article 370, peace deals in the North-East, and a dual strategy of a filling up of security and development vacuums in Naxal-affected regions have collectively transformed India's internal security landscape.
- Violence across these 3 major hotspots has *declined by 70%.*
- Incidents of *stone pelting in Kashmir have declined*.
- *Insurgency in the North-East has weakened*.
- Naxal strongholds are witnessing social transformation.
- Political stability and economic growth in conflict-prone areas are observed.

SHANKAR IAS ACADEMY

What lies ahead?

- **Institutional Coordination -** Proper training can be imparted for efficient coordination between Centre, States, police, and judiciary.
- Reforms can be implemented to reduce political influence and improve efficiency.
- **Strengthening federal role –** States can be supported with funds and training.
- Joint command centers can be built to develop a shared, cooperative approach to internal security.

8.2 India's Arbitration Ecosystem

Why in the News?

India's economic rise has, unsurprisingly, triggered many conversations about the potential of Indian arbitration as a significant contributor to the growth.

What is the arbitration process?

- **Arbitration** – Arbitration is a quasi-judicial proceeding and alternative dispute settlement (ADS), wherein the parties in dispute appoint an arbitrator by agreement to adjudicate the said dispute and to that extent it differs from court proceedings.
- **Key aspects of arbitration**
    - **Consensual** - Parties must voluntarily agree to submit their dispute to arbitration.
    - **Binding** - The decision of the arbitrator(s) is legally enforceable.
    - **Private** - Arbitration is often conducted outside of the public eye.
- **Definitive factors of arbitration** - The credibility and the legitimacy of Indian arbitration is primarily defined by two parameters.
    - The efficient conduct of arbitral proceedings
    - The quality of arbitral awards
- **Arbitrators** - They dictate the arbitration's procedural framework, finalise timelines, determine procedural quibbles, and impose monetary sanctions in case either party's conduct is found lacking.
- **Arbitration in India** - It is governed by the Arbitration and Conciliation Act, 1996.
- This Act incorporates the principles of the United Nations Commission on International Trade Law (UNCITRAL) Model Law on International Commercial Arbitration.

Indian Council of Arbitration (ICA)

- The Arbitration and Conciliation (Amendment) Act, 2019 provides for establishment of the Arbitration Council of India (Council) for the purpose of inter-alia framing policies governing the grading of arbitral institutions and recognizing professional institutes' providing accreditation of arbitrators.
- The ICA was established in 1965 as a specialized arbitral body at the national level under the initiatives of the Govt. of India and apex business organizations like FICCI etc.
- It is a registered society under the Societies Registration Act, 1860, operating on a not-for-profit basis with its head office in New Delhi and ten branches in a pan-India network.
- **Objective** - To promote amicable, quick and inexpensive settlement of commercial disputes by means of arbitration, conciliation, regardless of location.
- ICA is not only the leading arbitral institution in India, it is one of the most important arbitration centers in Asia Pacific, handling more than 400 domestic and international arbitration cases each year.
- It also provides Maritime Arbitration services and imparts education and training in alternative dispute resolution mechanisms.
- **ICA Arbitrators** - ICA has distinguished panel of arbitrator of over 2500 arbitrators that comprise of Former Chief Justices of India, Former Judges of Supreme Court, High Courts, District Judges, Chairman of Tribunals, Senior Advocates, Advocates, Former Bureaucrats, Chartered Accountants and other experts.
- **Functions of the council**

- Frame policy governing the grading of arbitral institutions.
- Recognise professional institutes providing accreditation of arbitrators.
- Review of grading of arbitral institutions and arbitrators.
- Hold training, workshops and courses on arbitration in collaboration of law firms, universities and arbitral institutes.
- Frame, review and update norms to ensure satisfactory level of arbitration and conciliation.
- Act as a forum for exchange of views and techniques to make India a robust centre for domestic and international arbitration.
- Make recommendations to the Central Government to make provisions for easy resolution of commercial disputes.
- Promote institutional arbitration by strengthening arbitral institutions.
- Conduct examination and training on various subjects relating to arbitration and conciliation and award certificates.
- Establish and maintain depository of arbitral awards.
- Make recommendations regarding personnel, training and infrastructure of arbitral institutions.

India International Arbitration Centre (IIAC)

- IIAC has been established by the India International Arbitration Centre Act 2019, to create an independent and autonomous regime for institutional arbitration.
- **Objects and Functions of the IIAC**
  - To bring targeted reforms to develop itself as a flagship institution for conducting international and domestic arbitration in India.
  - To promote research and study, providing teaching and training, organising conferences and seminars on arbitration and other alternative dispute resolution mechanisms.
  - To provide facilities and administrative assistance for arbitral proceedings.
  - To maintain panels of accredited arbitrators both at national and international level.
  - To collaborate with other national and international institutions and organisations for ensuring credibility of the IIAC as a specialised institution in arbitration.
  - To facilitate the conduct of international and domestic arbitration in the most professional manner.
  - To provide cost effective and timely services for the conduct of arbitration;
  - To impart training in alternative dispute resolution to those who are handling arbitration.

What is the need for arbitration system?

- **Expansion of Commerce** - An increase in domestic and cross-border commerce has made the occurrence of commercial disputes inevitable.
- **Incapacity of court system** - The Indian court-litigation machinery remains overburdened and inadequately equipped to efficiently decide and dispose of these commercial disputes.
- **Time-sensitive of commercial disputes** – When commercial disputes drags for a long time , it affects the business of both the parties and affect the ease of doing business in the country.
- Hence it is essential to find solution to commercial disputes at the earliest.
- **Technical in nature** – Commercial disputes often involve technical and financial matters which are difficult for judicial system.
- Resultantly, the mechanism of commercial arbitration, especially under the auspices of specialised arbitral institutions, becomes a popular solution.

What are the challenges in arbitration system?

- **Inefficient process** - Lengthy and expensive arbitral proceedings that mimic court-procedures, results in poorly reasoned awards that are frequently challenged and set-aside.
- **Judicial intervention** – The wide use of special leave petition under Article 136 to appeal against the orders of arbitration hinders the effectiveness of arbitration.

- **Inadequate arbitrators** – Indian courts prefer to appoint former judges as arbitrators, especially in high-value disputes.
- Over the years, this tendency has impacted the appointment practices of litigants, lawyers, and arbitral institutions.
- **No international participation of Indian arbitrators** - Indian arbitrators are not appointed in international disputes and are absent from the informal community of repeatedly-appointed elite international arbitrators.
- **Lack of Strong Arbitral Institutions** - India lacks a sufficient number of credible and well-equipped arbitral institutions.
- **Difficulties in Enforcement of Arbitral Awards** - Challenges in enforcing arbitral awards, particularly against government entities, lead to protracted legal battles and can deter investors

What lies ahead?

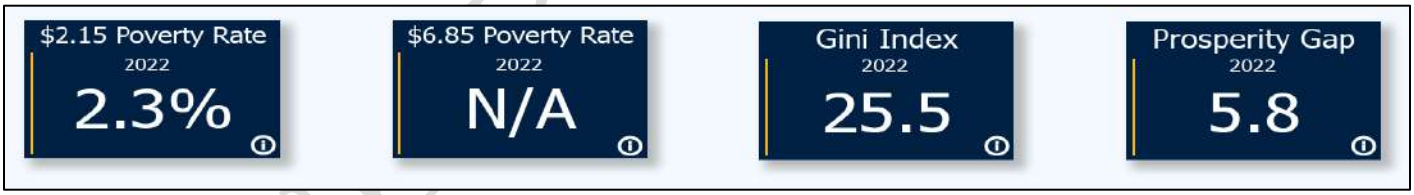
- An arbitrator must not only be legally proficient but also a capable manager of the dispute resolution process who can blend procedural certainty with flexibility and innovation.
- This requires going beyond the rigid frameworks of civil procedure and evidentiary laws in India, and instead adopting global best-practices unique to international arbitration.
- There are important differences between writing a judgment as an appellate judge of a common-law court and the drafting of an arbitral award, where the latter requires a meticulous examination of voluminous documentary evidence and testimonies of fact and expert witnesses, and intricate financial analysis to quantify any compensation or damages.
- The pool of Indian arbitrators needs to be diversified to include candidates specialising in arbitration.
- Each candidate, irrespective of their background, needs to undergo a rigorous training and accreditation process, such as through specialised certificate courses and workshops organised by arbitral institutions or membership of professional arbitration associations.

8.3 India's Triumph in Combating Poverty

- **Why in the News?**

Recently the World Bank has released its "Spring 2025 Poverty and Equity Brief".

- **What is the status of extreme poverty reduction in India?**

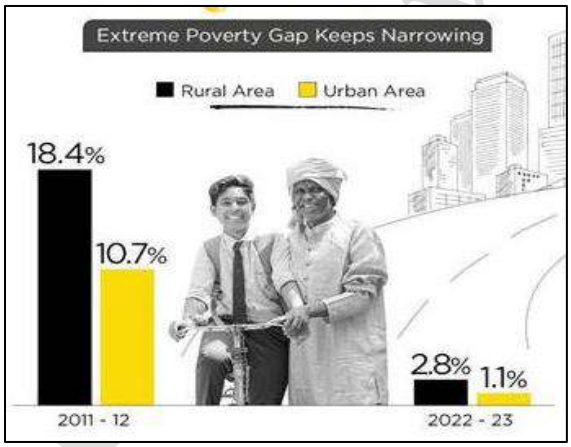


- **Extreme poverty reduction** - According to the report, the proportion of people living on less than ***2.15 US dollars a day***, which is the international benchmark for extreme poverty, fell sharply from 16.2 % in 2011-12 to just ***2.3 % in 2022-23***.

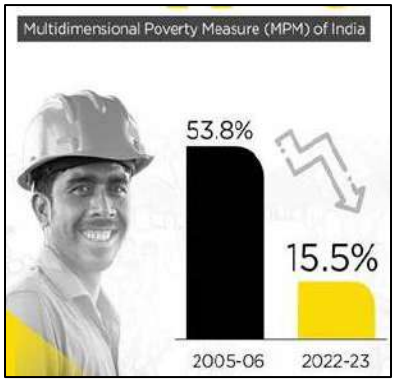
Poverty at Different Lines

Poverty Line	Number of Poor (Thousands)	Rate (%)	Year
International Poverty Line ($2.15/day)	33,485.8	2.3	2022
Lower Middle Income Class Poverty Line ($3.65/day)	400,771.1	28.1	2022
Multidimensional Poverty Measure		15.5	2022

- **Rural and Urban Poverty Reduction** - The sharp reduction in extreme poverty has been broad-based, covering both rural and urban areas.
    - In Rural areas, extreme poverty fell from 18.4 percent in 2011-12 to 2.8 percent in 2022-23.
    - In Urban centres, extreme poverty reduced from 10.7 percent to 1.1 percent over the same period.
    - The gap between rural and urban poverty shrunk from 7.7 percentage points to 1.7 percentage points.



- **Strong Gains at Lower-Middle-Income Poverty Line** - India has made strong gains in reducing poverty at the lower-middle-income level, measured at 3.65 US dollars per day.
    - India's lower- and middle-income poverty fell from 61.8% in 2011-12 to ***28.1% in 2022-23***, lifting ***378 million people out of poverty***.



- **Key States Contributing to Poverty Reduction** - Significant progress has been made in reducing extreme poverty across India, with key states playing a vital role in both the decline of poverty and the advancement of inclusive development.
    - Major poverty states -The five most populous states i.e. Uttar Pradesh, Maharashtra, Bihar, West Bengal, and Madhya Pradesh, represented 65% of India's extreme poor in 2011-12.
    - By 2022-23, these states contributed to two-thirds of the overall decline in extreme poverty.
- **Decline in Multidimensional Poverty** - Non-monetary poverty, as measured by the Multidimensional Poverty Index (MPI), which considers factors like education, health, and living conditions, declined from 53.8% in 2005-06 to 15.5 % in 2022-23.

Group and Multidimensional Poverty

Poverty by Group	Poverty Rate (%)
Urban population	17.2
Rural population	32.5
Males	27.5
Females	28.8
0 to 14 years old	36.2
15 to 64 years old	25.7
65 and older	23.8
Without education (16+)	35.1
Primary education (16+)	29.6
Secondary education (16+)	24.9
Tertiary/post-secondary education (16+)	14.9

Multidimensional Poverty Components	(% of Pop.)
Daily consumption less than US$2.15 per person	2.3
At least one school-aged child is not enrolled in school	N/A
No adult has completed primary education	13.8
No access to limited-standard drinking water	11.2
No access to limited-standard sanitation	29.9
No access to electricity	1.0

*The World Bank's **Multidimensional Poverty Measure (MPM)** is adapted from the OPHI MPI. It includes extreme poverty but excludes nutrition and health deprivation.*

- **Reduction in Income Inequality** - India's consumption-based Gini index improved from 28.8 in 2011-12 to 25.5 in 2022-23, indicating a reduction in income inequality.

- **Employment Growth** - India has witnessed positive trends in employment growth, particularly since 2021-22, with significant improvements in both rural and urban areas.
    - Employment growth has outpaced the working-age population since 2021-22, with rising employment rates, especially among women.
- **Self-employment** -It has risen, particularly among rural workers and women, contributing to economic participation.

Poverty Reduction Measures of India

Affordable Healthcare

- **Ayushman Bharat Yojana**: The scheme provides health coverage of up to Rs. 5 lakh per family per year for secondary and tertiary care hospitalization to over 55 crore individuals.
- This significantly reduces financial burden and ensures timely access to critical treatments, especially for those who were previously unable to afford them.
- **Ayushman Arogya Mandir**: Erstwhile AB- Health and Wellness Centers HWCs, bring quality healthcare closer to rural communities.
- e-Sanjeevani OPD services through these centres, offering telemedicine consultations and bridging the gap for those in remote areas.
- **Making Medicines Affordable**: Recognizing the financial burden of medication, Janaushadhi Kendras were established across the country.
- These pharmacies offer essential medicines at 50-90% cheaper rates compared to market prices, providing significant relief to low-income families by reducing their out-of-pocket expenditures.
- **Maternal Health**: Under Pradhan Mantri Matru Vandana Yojana (PMMVY), cash incentives are provided directly to the beneficiary via Direct Benefit Transfer (DBT)

Food Security

- **Public Distribution System (PDS) / Targeted Public Distribution System (TPDS)** - This system provides subsidized food grains (wheat, rice) and other essential commodities to the poor to reduce hunger, malnutrition and to improve human capital.
- **Antyodaya Anna Yojana (AAY)** - This scheme, within the TPDS, provides highly subsidized food grains to the poorest of the poor families.
- **Mid-Day Meal Scheme**: This program provides free meals to school children, improving their nutritional status and encouraging school attendance.

Social Security and Welfare Programs

- **National Social Assistance Programme (NSAP)** - This program provides financial assistance to vulnerable groups such as the elderly (National Old Age Pension Scheme), widows (National Widow Pension Scheme), and persons with disabilities (National Disability Pension Scheme) who are below the poverty line.
- **Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY) and Pradhan Mantri Suraksha Bima Yojana (PMSBY)** - These schemes provide affordable life and accident insurance coverage.
- **Atal Pension Yojana (APY)** - This scheme provides a guaranteed minimum pension for workers in the unorganized sector.

Employment And Skill Development

- **PM Kaushal Vikas Yojana (PMKVY):** Launched in 2015, It provides industry-relevant skill training and certification and equips individuals with the tools they need to secure better employment opportunities and improve their livelihoods.
- **Skill India Digital Platform**: Launched in September 2023, this platform acts as a one-stop shop for all skill development initiatives in India.

- **National Apprenticeship Promotion Scheme:** NAPS provides valuable hands-on experience and industry exposure to young individuals, bridging the gap between theoretical knowledge and practical skills, and preparing apprentices for successful careers.

Entrepreneurship

- **PM MUDRA Yojana**: The objective of Pradhan Mantri Mudra Yojana (PMMY) is to provide access to institutional finance to new or existing micro units/enterprises up to Rs. 10 lakhs.
- **PM SVANidhi**: Recognizing the vital role of street vendors in the informal economy, PM SVANidhi has sanctioned loans to formalize their businesses, access working capital, and improve their livelihoods.
- **DAY-NRLM Mobilizes Women**: DAY-NRLM fosters financial inclusion, leadership skills, and collective action among women through formation of Self-Help Groups.
- This empowers them to participate in economic activities, generate income, and contribute to community development.

What are the challenges in poverty reduction?

- **Youth Unemployment** - It is 13.3% and increasing to 29% among tertiary education graduates.
- **High Informal Jobs** - Only 23% of non-farm paid jobs are formal, and most agricultural employment remains informal.
- **Gender Disparity** - Despite a female employment rate of 31%, gender disparities remain, with 234 million more men in paid work.
- **Inequality** - Wage disparity remains high, with the median earnings of the top 10 percent being 13 times higher than the bottom 10 percent in 2023-24.
- **Social structures** - Caste, religion, and gender continue to cause discrimination and exclusion, hindering access to education, employment, and economic opportunities for marginalized communities.
- **Climate Change** - Erratic weather patterns, natural disasters, deforestation, and water scarcity disproportionately affect the poor, leading to displacement, loss of livelihoods, and increased poverty.

What lies ahead?

- To further reduce poverty, the ongoing multi-pronged strategy encompassing inclusive economic growth, targeted social programs, and improvements in human capital and governance needs to be further strengthened.
- **World Bank's Poverty and Equity Briefs (PEBs)**
- **Poverty and Equity Briefs (PEBs)** - It highlights trends in poverty, shared prosperity, and inequality for over 100 developing countries.
- Published twice a year for the Spring and Annual Meetings of the World Bank Group and the International Monetary Fund, these briefs offer a snapshot of a country's poverty and inequality context.
- **Key development indicators** - These indicators cover various aspects of poverty, including rates of poverty and the total number of poor, using both national poverty lines and international benchmarks.
- **International benchmarks on poverty:**
  - $2.15 for extreme poverty
  - $3.65 for lower-middle-income
  - $6.85 for upper-middle-income

9. INTERNATIONAL RELATIONS

9.1 China's Dominance in Africa's Nuclear Energy

Why in news?

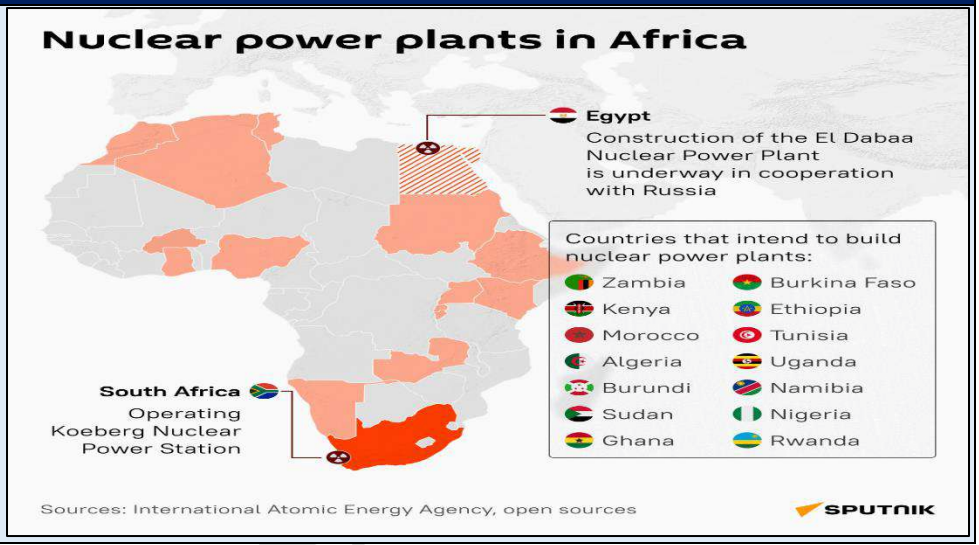
The recent emergence of China as the dominant player in Africa's nuclear energy market poses strategic and energy security challenges for other global players, including India.

What are the countries having nuclear energy stakes in Africa?

- **France** – So far, it had dominated Africa's nuclear market but it is *rapidly losing its influence* and struggling to maintain its relevance, particularly in Francophone Africa.
- **United States** – It has been organised as *US-Africa Nuclear Energy Summit (USANES)* since 2023.
- **Russia** – It had agreements *with Egypt, Mali, Burkina Faso, and Burundi*, but progress of reactor building is slow due to economic issues.
- **South Korea** – It is *showing interest in entering* the market with Korea Hydro and Nuclear Power (KHNP).
- **China** – It is *now leading the market* with aggressive investments and partnerships.

Status of Africa's Nuclear Energy Market

- **Power plants** – *Only 1 nuclear power plant.*
  - Koeberg, South Africa
- Countries like Ghana, Nigeria, Sudan, Rwanda, Kenya, and Zambia are planning nuclear energy expansion.
- **Estimated nuclear energy capacity by 2035** – 15,000 MW.
- **Investment potential** – USD 105 billion.



What are the reasons for China's Dominance in Africa's nuclear market?

- China's nuclear ambition in Africa is a relatively new phenomenon.
- **Energy development programmes** – China Atomic Energy Authority began a ***scholarship programme for students*** from African to develop national nuclear programmes.
- It was launched in 2012, in cooperation with the International Atomic Energy Agency (IAEA) and provided training in Chinese procedures.
- **Higher operational capacity** – Today, China has ***more than 50 operating reactors.***
- **Strong government support** – China's nuclear expansion in Africa is being *spearheaded by 2 large state-owned companies*.
  - China General Nuclear Power Group (CGN) and the China National Nuclear Corporation (CNNC).
- **Nuclear agreement**
  - **In Nigeria** – For design, construction, and operation of nuclear power plants.
  - **In Uganda** – For building a 2 GW nuclear plant, first unit (1 GW) to be completed by 2031.
- **Financial & technical Support** – Assisting African nations in infrastructure, financing, and transmission networks.
  - *West African nations* (Burkina Faso, Niger, Mali) initially approached Russia but may turn to China due to Russia's financial constraints.
- China is *actively building transmission networks* which other countries were lagging behind.

What are its implications for India?

- **Strategic implications** – China's dominance undermines India's strategic influence in the region.
- It could *limit India's access to critical resources*, including uranium.
  - India plans *uranium mining projects in Niger and Namibia*.

India's current nuclear capacity *(as of Jan 2025) is 8,180 MW and its target is to generate 100 GW by 2047 that requires stable uranium supply.*

- **Economic implications** – India's nuclear industry could lose potential business opportunities, revenue, and job creation.
    - India signed a *civil nuclear cooperation agreement with Namibia* (2009).
- **Energy security implications** - India's ambition to increase its nuclear energy mix in the overall energy portfolio might be impacted due to limited access to affordable technology and fuel.
- **Diplomatic implications** – India may need to strengthen ties with other African countries to counterbalance China's influence.
- **Global position** – India's role in global nuclear governance and non-proliferation efforts might be affected by China's expanding nuclear presence in Africa.

What lied ahead?

- India needs to strengthen nuclear cooperation with African nations through strategic partnerships.
- India can expand investments in uranium mining in Africa to secure supply chains.
- Steps can be taken to increase engagement with African nations under frameworks like *International Solar Alliance (ISA) and Global South Initiatives.*
- Developing indigenous nuclear reactor technology for export.

9.2 Rising Tension in West Asia

Why in News?

Recently, the tension in West Asia is rising with Israel growing more aggressive, the Trump administration turning more hostile and Iran retaliating with its diminishing strategic space.

What are the recent issues in West Asia region?

- **U.S. armed force in West Asia** – U.S. has deployed more fighter jets and its *2nd aircraft carrier* to West Asia.
- It had launched waves of *"pre-emptive" air strikes against Ansar Allah* (the Houthis) in Yemen.
- Bombing the Houthis (pro-Iranian group) signals that the U.S. is fully on board in Israel's mini-regional war.
- **Israel's military campaigns** – It resumed its *bombing of Gaza,* killing over 400 Palestinians in overnight attacks and effectively ending the ceasefire that had been in place since January 2025.
- It carried out heaviest *air strikes in Lebanon* since the November 2024 ceasefire, targeting Hezbollah, a key Iranian non-state ally.
- **Iran's Nuclear Programme** – The President of U.S. had sent a letter to Iran to negotiate a deal on Tehran's nuclear programme.
- U.S. *wants Iran to give up its nuclear programme*, restrict its conventional military capabilities and sever ties with the axis.

How regional dynamics in West Asia is changing?

- **Israel's rise** – The *election of Mr. Trump*, who supports Israel's war policies, has given Tel Aviv the confidence to continue its mini-regional war without bothering about external pressure.
- The 2023 attack by Hamas in Israel made it to indulge in continuous *attacks in 2 fronts*
    - One focused on Gaza, and the other targeting Iran.
- It killed an Islamic Revolutionary Guard Corps (IRGC) general in Syria, and then bombed the Iranian embassy in Damascus.
- **Changes in Syrian government** – The *fall of the Bashar al-Assad regime in Syria* has disrupted Iran's regional axis.
- The new regime of Sunni Islamists that is *hostile to the Shia theocratic Iran* taking over Damascus, the supply route has been severed.
- **Iran's growing ambition** – It *stepped up its nuclear programme*, enhanced support for the network, particularly the Houthis, and *expanded its weapons capabilities.*

> *Mr. Bashar al-Assad's Syria, Iran's only state ally in West Asia, had served as a crucial land bridge between Iran (through Iraq) and Hezbollah (in Lebanon).*

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- **Weakening of Hezbollah & Iran** – In Lebanon, *Israel has degraded Hezbollah's militant infrastructure* and decapitated its leadership.
- Its ability to rebuild itself depends on supplies from Iran has been disrupted and so it will remain weak militarily, which would in turn weaken Iran's overall deterrence.
- The Israelis are tightening the *ring of fire around Iran*.

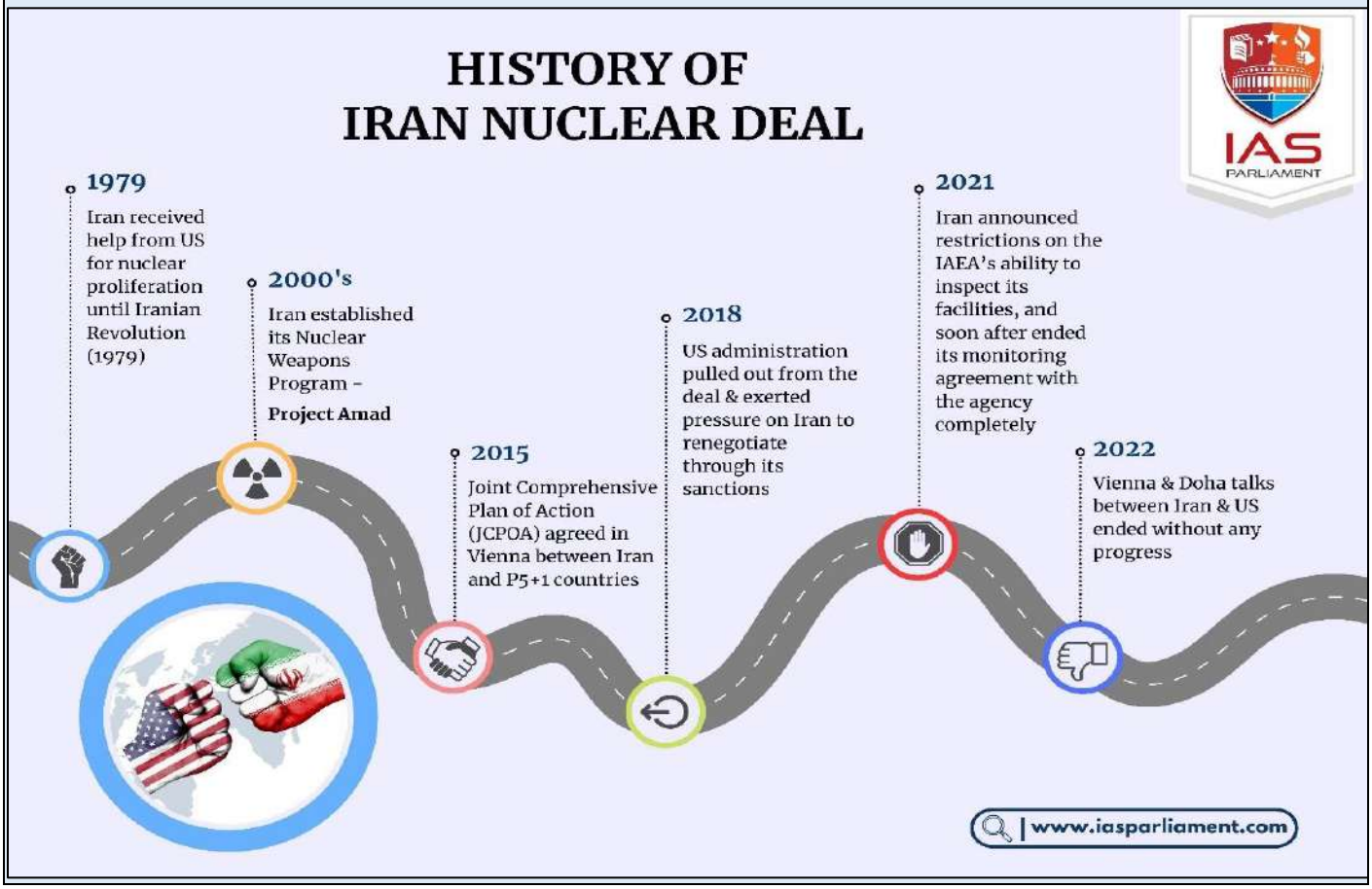
*According to the International Atomic Energy Agency, Iran now possesses enough stockpile of **60% enriched uranium** to make 6 nuclear bombs if further enriched to weapons-grade purity (90%).*

Why destabilising Iran is a challenge?

- **Geographical advantages** – It is ring-fenced by mountains.
- **Safe military infrastructure** – Most of Iran's nuclear facilities are buried underground, some of them beneath mountains.
- Even a joint U.S.-Israeli operation may fail to eliminate them completely.
- **Technical knowledge** – Even if the facilities are damaged, Iran will still possess the *technical know-how to rebuild its military programme*.
- **Relatively stable government** – Iran, despite the occasional mass protests, has *no organised, militarised insurgency*.
- **Strategic advantage** – Its navy ***has the Strait of Hormuz***, a vital oil transit choke point of the world.

Iran's Nuclear Deal

- It is an agreement on the Iranian nuclear program reached in Vienna and is also called as *Joint Comprehensive Plan of Action* (JCPOA).
- **Signed in** – 2015.
- **Signatories** – It is signed between *Iran and P5+1* (China, France, Germany, Russia, UK, USA).
- **Failure of Iran nuclear deal** – While the deal restricted Iran's nuclear programme, it left its nuclear processing capabilities, extensive *ballistic missile programme untouched*.
- In 2018, *U.S. unilaterally withdrew* from the agreement and reimposed sanctions on Iran, effectively sabotaging the agreement.



What lies ahead?

- **Diplomatic engagement** – Iran has expressed willingness to engage in "indirect talks", focusing on the nuclear programme, essentially a return to the 2015 framework.
- **Addressing the Israeli-Palestinian conflict** – Reviving meaningful peace negotiations based on international law and relevant UN resolutions.
- Supporting a two-state solution, if all parties involved are willing to engage in that process.
- **De-escalation of regional conflicts** - Efforts to reduce proxy wars and limit external interference.
- A coordinated international effort is needed to address the complex challenges facing the region.
- **Economic development** – Investing in economic development and creating opportunities for young people.

9.3 Impacts of USAID cuts on Rohingya Refugees

Why in the news?

The abrupt cut down of United States Agency of International Development (USAID) support by US has worsened the conditions of Rohingya people in Cox's Bazaar.

What is USAID?

- It is the ***lead international humanitarian and development arm*** of the US government.
- **Created in** – *1961* under President John F. Kennedy.
- **Objective** – To provide *economic, humanitarian, and development assistance* globally, aiming to promote stability, health, education, democracy, and poverty reduction.
- **Role** – It provides assistance to other countries primarily by funding non-governmental organisations (NGOs), foreign governments, international organisations, or other US agencies.
- **Coverage** – It has provided assistance to ***around 130 countries*** in FY2023.
- **Priority Sectors** – Food security, disaster relief, healthcare, gender equality, and environmental protection.

Significance USAID For India

- The US has provided development and humanitarian assistance to India since 1951, when President Harry Truman signed the *India Emergency Food Assistance Act*.
- **In education** - Economic aid from the US has also *helped establish 8 agricultural universities*, the first Indian Institute of Technology, and 14 regional engineering colleges.
- **In health** – It also strengthened India's national programs on immunization, family planning, maternal and child health, HIV/AIDS, tuberculosis, and polio.
- **Recent decline** – In 2004, the Indian government decided to reject any foreign aid that comes with conditions.
- This has, over time, led to a decline in the quantum of such assistance.

What is the Rohingya crisis?

- **Rohingya –** They are a *Muslim ethnic minority* originating from *Myanmar's Rakhine* State.
- **Issues** – The Myanmar government does *not recognize the Rohingya as citizens,* leaving them stateless and vulnerable.
- **Mass Displacement** – Following brutal *military crackdowns in 2017* involving mass killings, sexual violence, and the burning of villages, over 700,000 Rohingya were forced to flee Myanmar.

- Most of the displaced Rohingya have taken *refuge in Cox's Bazar*, Bangladesh, which has become the ***largest refugee camp*** in the world.
- **Global Condemnation** – The United Nations has labeled the violence against the Rohingya as a "textbook example of *ethnic cleansing."*

How cut down of USAID funds affect Rohingyas?

- **Escalates humanitarian crisis** – Without renewed aid, hunger, disease, and death will surge, pushing the camps toward a humanitarian disaster.
- **Food insecurity** – It forced the World Food Programme (WFP) to slash food rations from USD 12.50 to USD 8/month per refugee, a *36% reduction*, pushing refugees closer to starvation.
- **Dwindling medical aid** – At least *five hospitals shutting down*, and sanitation programmes collapsing.

*With an annual budget of around $40 billion, it is the largest contributor to international organizations like the **World Food Programme**.*

- **Loss of protection services** – It *ended gender-based violence support* and psychosocial care, increasing the vulnerability of women and children in camps.
- **Inadequate global response**- Despite new pledges (e.g., EU: Euro 32.3M), other donors cannot offset USAID's massive withdrawal, leaving critical funding gaps.

What measures can be taken to resolve this?

- **Strengthening multilateral aid** – Boost funding for organizations like WFP for refugees.
- Supporting emergency funds or soft loans from the World Bank and International Monetary Fund.
- Diversifying funding sources from other nations.
- **Encouraging private philanthropy** – Engaging global foundations & wealthy individuals to support through targeted donations.
- **Re-engagement with US** – Diplomatic channels can be used to persuade the U.S. to resume funding.
- **Focussing on long-term solutions** – The international community must intensify diplomatic efforts to push for recognition of Rohingya citizenship and rights.
- **Legal and human rights advocacy**- Support international legal mechanisms to investigate crimes against the Rohingya and advocate for justice and reparations.
- **Livelihood programs** – Investing in vocational training, education, and mental health services to reduce aid dependency and improve the well-being of refugees.

10. BILATERAL ISSUES

10.1 India-Thailand Strategic Partnership

Why in News?

Recently, the India – Thailand relationship has been elevated to Strategic Partnership level.

What are the pillars of India- Thailand relationship?

- **Diplomatic relation** – It was established in 1947 between the two countries and both sides celebrated the 75th anniversary of the establishment of diplomatic relations in 2022
- **Bilateral dialogues** - India and Thailand have institutionalized various dialogue mechanisms such as Joint Working Group on Security Cooperation; on Education; on Visa and Consular matters (ad hoc); and Joint Task Force on Maritime Cooperation.

- The two sides meet regularly to discuss bilateral cooperation and international developments in these areas.
- **Mutual policies** - 'Act West' policy of Thailand complements India's'Act East' policy.
- **Trade** - Thailand is India's 4th largest trading partner within the Association of Southeast Asian Nations (ASEAN) with total bilateral trade of around USD 14.94 billion in Fy 2023-24.

(amount in billion USD)

Year	Total trade	Imports from Thailand	Exports to Thailand
2021-22	15.08	9.33	5.75
2022-23	16.90	11.20	5.70
2023-24	14.98	9.90	5.03

Source: Department of Commerce, India.

- **Defence cooperation** - The Memorandum of Understanding on Defence Cooperation between India and Thailand was signed on 25 January 2012.
- **Cultural cooperation** – An Indian Cultural Centre was opened in Bangkok in 2009 which was renamed as the Swami Vivekananda Cultural Centre.
- Regular visits of Indian cultural troupes to Thailand are organised, in addition to Indian films, food and other festivals.
- **Cooperation in Education** – MoU on Cooperation in the field of Education was signed in 2005 and India offers around 75 scholarships annually under various schemes to Thailand.
- **Indian Diaspora** - The total number of people of Indian origin in Thailand is estimated to be around 4 to 5 lakhs, including more than 25,000 NRIs.

What are the recent developments?

- **High Level Exchanges** - Prime Ministers of both the countries met on the sidelines of 44th and 45th ASEAN and Related Summits.
- **Foreign Ministers Meetings** - Minister of Foreign Affairs of Thailand paid a visit to New Delhi for participating in Raisina Dialogue.
- **Parliamentary Interaction** - Shri Om Birla, Speaker of Lok Sabha met (Mr.) Mongkol Surasajja met the President of the Senate of Thailand on the sidelines of the 149th Assembly of IPU in Geneva in 2024.
- **Asia-Pacific Forum on Sustainable Development (APFSD)** - Vice Chairman of NITI Aayog Shri Suman Bery visited Thailand in 2025 to attend the 12th edition of the Asia-Pacific Forum on Sustainable Development (APFSD) in the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) in Bangkok.
- **Technology partnership** - India and Thailand are focusing on next-generation industries such as electric vehicles, digital payments, fintech, space technology, and the circular economy.
- **India-Thailand Joint Trade Committee** - The 13th Joint Trade Committee (at JS level) meeting took place on 20 April 2023 in New Delhi.
- **Review of AITIGIA** – Both the countries have agreed to review ASEAN-India Trade in Goods Agreement (AITIGA) to make it more user-friendly and conducive to business, with a target for substantial conclusion by the end of 2025.
- **Connectivity** - At the 6th BIMSTEC Summit in Bangkok (April 2025), India and Thailand jointly called for faster implementation of the Motor Vehicles Agreement and enhanced coastal shipping, as well as port-to-port linkages to improve regional mobility and trade flows.
- **Digital cooperation** - An MoU was also signed between the Ministry of Digital Economy and Society of Thailand and the Ministry of Electronics and Information Technology of India on cooperation in the field of digital technologies.
- **Cultural development** - A special commemorative coin to mark the 550th birth anniversary of Guru Nanak Devji and the Thai translation of Tamil book, Thirukkural were released in Thailand.
- On the request of Thai government, Government of India sent the Holy Relics of Lord Buddha, along with two of his principal disciples for public exposition in 2024.
- The India-Thailand Cultural Exchange Programme (CEP) for the years 2022-2027 was signed by Minister of Culture of India.
- **International Ramayana Festival** - A Indian dance troupe led by (Ms.) Ananda S Jayant performed at the opening ceremony of International Ramayana Festival at Sanam Luang ground in Bangkok.

What is the significance of Strategic Partnership with Thailand?

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- The development marks a new chapter of enhanced partnership for realising the full potential of cooperation between the two countries.
- **Aim** - The strategic partnership aims to broaden cooperation across a wide array of sectors - defence, security, cybercrime, maritime safety, trade and investment, innovation, start-ups, renewable energy, education, tourism, and people-to-people exchanges.
- **Increased weightage of Southeast Asia** – The recent elevation to the strategic level indicates the growing weight of Southeast Asia in India's strategic calculus.
- **ASEAN connectivity** - Thailand acts as a gateway to the ASEAN heartland and shares maritime space in the Andaman Sea, offering potential for trilateral and multilateral maritime collaboration.
- **Strengthening regional policies** - Thailand's geopolitical location makes it significant to the success of India's Act East policy and the Indo-Pacific framework.
- **Strengthening regional stability** - Thailand's strategic infrastructure and its participation in regional forums such as ASEAN, BIMSTEC, MGC (the Mekong-Ganga Cooperation), and IORA allow it to function as a stabilising force and a bridge between South and Southeast Asia.
- **Deepening economic integration** - The current global uncertainties call for deeper coordination between the two nations to insulate their economic engagement from external shocks.
- **Countering China influence** - The expanding influence of China through its economic investments and strategic presence in the Bay of Bengal necessitates greater India-Thailand coordination to safeguard maritime commons and regional autonomy.

What are the challenges?

- **Trade deficit** - The widening deficit indicates the need for a more balanced trade relationship.
- India has pushed for increased market access for its agricultural products, generic drugs, and services, while also exploring the feasibility of local currency-based trade settlement mechanisms to mitigate foreign exchange volatility.
- **Delay in connectivity projects** - Infrastructure and bureaucratic delays continue to hinder the completion of vital connectivity projects like the Trilateral Highway.
- **Myanmar factor -** Political instability in Myanmar also poses risks to these initiatives.
- **Regulatory issues** - Regulatory misalignments and gaps in mutual recognition of standards and certifications could obstruct smooth economic engagement.

What lies ahead?

- To sustain and deepen the strategic partnership, India and Thailand will need to focus on implementing the Joint Plan of Action, boosting joint production and technology transfers in defence
- Enhancing investment promotion, reducing non-tariff barriers (such as quotas and technical standards), and aligning regulatory standards will be essential in adapting to the new economic reality.
- India continues to face a significant trade deficit with Thailand and this imbalance needs to be addressed through greater market access for Indian goods and the diversification of trade baskets.
- Engaging the private sector, academia, and youth in collaborative platforms will further enrich this partnership.

G.S PAPER III

11. ECONOMY

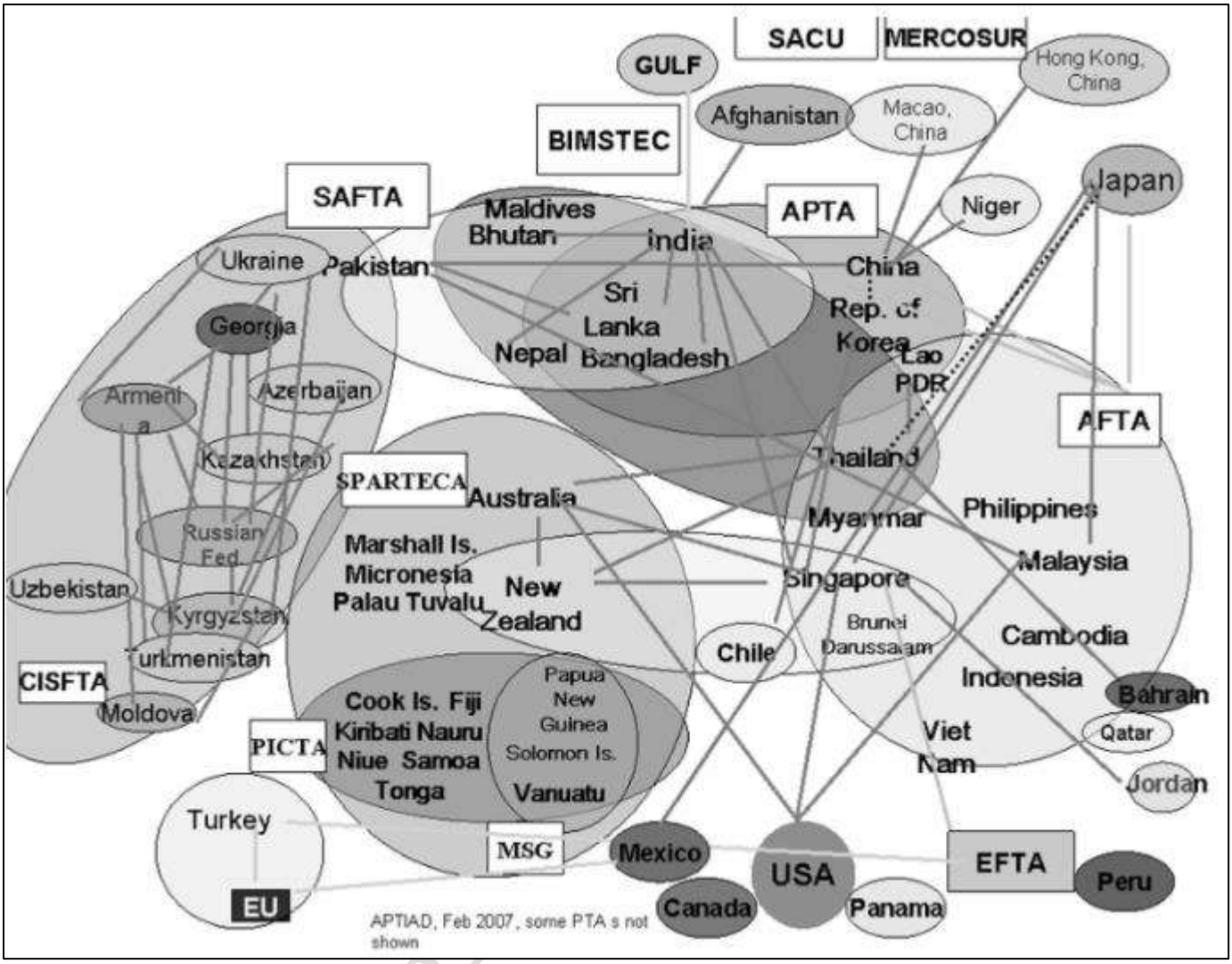
11.1 Spaghetti Bowl Effect

Why in the News?

With the recent new trade tariffs of USA, there is increasing rise in bilateral Free Trade Agreements (FTA).

What is spaghetti bowl effect?

- **Spaghetti bowl effect** - It is an interesting phenomenon in trade economics where the increasing number of Free Trade Agreements (FTAs) between countries slows down trade relations between them.



- **FTA** - In free trade agreements, members agree on a lowered internal tariff to be applied between them, while at the same time each member can have its own external tariff levied on imports from non-member countries.
- **Country of Origin (CoO)** - This introduces the concept of 'country of origin' of the traded product to distinguish products of one country from the other.

What are the issues with spaghetti bowl effect?

- **Overlapping Agreements** - The phenomenon arises from the increasing number of bilateral or regional FTAs, each with its own specific rules and regulations.
- **Conflicting Rules of Origin** - There are rules in international trade known as 'Rules of Origin' (ROO) which set the criteria to determine the country of origin.
- Each FTA typically has its own set of ROO, which determine the country of origin of a product for preferential treatment.
- This can lead to confusion and difficulty in determining which rules apply when a product is traded across multiple FTAs.
- **Trade Diversion** -The existence of multiple FTAs can lead to trade diversion, where businesses are drawn to trade with countries within an FTA rather than those outside of it, even if the latter are more competitive.
- **Complexity and Compliance Costs** - Businesses need to comply with a multitude of different regulations, increasing their administrative and compliance costs.
- **Impact on Trade** - The complexity of the "spaghetti bowl" can hinder trade, as businesses may find it difficult to navigate the various rules and regulations, leading to slower growth in trade volumes.

How did decline in WTO contributed to the effect?

- **Ineffectiveness of negotiation** - The negotiating function of WTO lost its effectiveness since the Doha Round of talks in 2001.
- There is only one multilateral agreement, the fisheries agreement, that has been concluded, and even that has not been fully concluded.
- Consensus or decision making by consensus is proving to be a problem in the negotiation platform.
- **Dysfunction dispute settlement mechanism (DSM)** -U.S. has been blocking appointments to the Appellate body, the ultimate court of appeal for a long time.
- **Trade monitoring challenges** - There is a lot of opacity about trade measures from a number of members, particularly one big member.
- This has affected the trade monitoring function of the WTO.

What lies ahead?

- The WTO is struggling to remain relevant in the face of proliferating bilateral trade agreements, uncertain global development.
- Though the WTO has seen decline in recent times, the need for an international organization to regulate the global trade has never faded.
- FTAs, RTAs (Regional Trade Associations) and PTAs (Preferential Trade Associations) cannot become a substitute for multilateralism and the WTO.
- Structural re-organization and providing adequate powers to WTO is essential to restore confidence in rules based global trade order.
- Convincing US to approach the WTO forum to resolve its trade issues, instead of having individual bilateral talks.

11.2 Indian Labour Market

Why in news?

In recent times India's job market is struggling to keep up with its growing young population, with automation and lack of skills make it challenging to create adequate jobs.

What are the issues in Indian labour market?

- **Job deficit** – Working-age population of India has increased by about 9 crores, while formal sector jobs rose by 6 crores, which is a deficit of 50 lakh jobs annually.
- **Inadequate formal employment** – Most of the recent increase in employment has come either from self-employment in rural areas or from informal services.
- **Lack of skilled labour force** – Less than 10% of our labour force has any formal technical or vocational training.
- The majority of educated youth in India do not possess skills that make them employment ready.
- **Inflated labour cost** – The long-standing issue of labour laws had artificially inflated the cost of labour and encouraged the adoption of capital-intensive technologies by firms.
- **Mismatch in PLI allocation** – The Production Linked Incentive scheme prioritizes high-value sectors like electronics, IT hardware, and drones with over 50% of the budget allocation.
- But most jobs are being created in industries like food processing and pharmaceuticals, not the high-value sectors.
- **Lack of sustainability in job creation** – Short-term subsidies under Employment Linked Incentive (2-3 years) may not ensure durable employment or long-term skilling.

Government Initiatives for Improving Labour Market	
PLI Scheme	• **PLI Scheme** – Production Linked Incentive Scheme • **Launch** - 2020

	• **Objectives** – It aims to boost industrial growth and position India as a major manufacturing hub by focusing on,
	  ○ Attracting investment in high-tech industries.
	  ○ Strengthening domestic manufacturing capabilities
	  ○ Enhancing India's global competitiveness.
	• PLI Schemes focus on 14 critical sectors

ELI Scheme	• **ELI Scheme** – Employment Linked Incentive Scheme • **Launched in** – Union Budget 2024. • **Nodal Ministry** – Ministry of Labour and Employment • **Objectives** – To boost employment in the formal sector. • To provide comprehensive support to both employees and employers To know more about this, click here
Labour Codes	• Code on Wages, 2019 • Industrial Relations Code, 2020 • Code on Social Security, 2020 • Occupational Safety, Health and Working Conditions Code, 2020
Skill India	• National Skills Development Mission was launched in 2015.
PMKVY	• Pradhan Mantri Kaushal Vikas Yojana (PMKVY) was launched in 2015 for recognition and standardisation of skills.
PMEGP	• Prime Minister Employment Generation Programme (PMEGP) is a major credit-linked subsidy programme aimed at generating self-employment opportunities through establishment of micro-enterprises in the non-farm sector.

Why are the challenges in job creation?

- **Rapid technological progress** – Rapid technological progress and advent of AI makes firms to move towards capital intensive production process.
- It leads to persistent and steady decline in the labour intensity of production across sectors.
  - **Capital Intensity of Production** - Machinery dominates and less labour.
  - **Labour Intensity of Production** - Labour dominates and less machinery.
- **Cheaper capital or machinery** – With advancements in technology the relative cost of capital or machinery falls and the firms adopt capital -intensive techniques to boost productivity and value -added at low cost.
- **Devaluing redundant tasks** – Tasks that are repetitive or less specialized become less valuable because machines can perform them more quickly and accurately.
- As technology advances, many tasks that were previously performed by humans are either automated or replaced by machines.
- **Lack of skill upgradation** – There aren't enough skilled workers available to match the demand for specialized jobs with advanced technical skills to work on high-tech machinery.
- **Lack of coordination among ministries** – Each ministry focuses on utilisation of its own PLI budget with little coordination with the ministries of labour and skilling.

What can be done to improve the labour market?

- **Dynamic policy framework** – To focus on creating a workforce for the future to advance the agenda of Viksit Bharat is critical.
- **Linking PLI and ELI** – Policymakers can consider linking the production and labour skilling strategies.
- It will ensure a pipeline of workers with requisite, complementary skills in these sectors.

- **Graded incentives in ELI** – Current structure of ELI incentives could be amended from flat to graded.
- Incentive transfers can be increased with each level of skills that is certified to support on-the-job training and upgrading of skills.
- **Revamp training institutes** – Rewarding the training institutes based on employment and earnings outcomes through skills that are linked to the projected future demand.
- **Investment in workforce** – As we collectively move up the production value chain, we must simultaneously invest in both the quantity and quality of our present and future workforce.
- **Balance capital and labour** – Incentives can be given to firms to adopt labour-complementary technologies and to reduce the relative cost of hiring through subsidies or tax credits.
- **Data-driven policy** - Track ELI interns and PLI outcomes longitudinally to evaluate effectiveness and adapt policies dynamically.

11.3 India's Household Debt Crisis

Why in News?

Household debt has surged dramatically in the years after the pandemic.

What is the status of house hold debt in India?

- **Household debt** – It refers to the total amount of debt owed by households to various financial institutions.
- It is measured as a percentage of GDP (Gross Domestic Product), representing the total borrowings of households relative to the size of the economy.
- **Components of household debt**
  - **Unsecured loans** - Personal loans, credit cards, consumer durables
  - **Secured loans** – Housing, Gold and vehicle loans
  - Retail credit from NBFCs (Non-Banking Finance Companies) and HFCs (Housing Finance Companies)
  - Loans from microfinance institutions
- **Household debt in India** – It has experienced a dramatic surge in the post-pandemic period
  - 2021 - 36.6% of GDP
  - 2023 - 40.2% of GDP
  - 2024 - 42.9% of GDP

> ***Household debt** averaged around 33% of GDP between 2015-2019, indicating a significant increase in recent years.*

- **Credit growth** – Between March 2021 and March 2024
  - Retail credit from NBFCs and housing finance companies grew by 70%
  - Loans from microfinance institutions rose by 67%
- **Shift in borrowing patterns** - There has been a noticeable shift towards unsecured loans for consumption rather than asset creation, particularly among lower-income groups.
- **High share of personal loans** - As of January 25, 2025, the personal loan book of banks was roughly a third of all credit extended.
- It is greater than loans to the services sector, industry and agriculture individually.

What factors contributed to rise in house hold debt?

- **Structural issues in economy** – The surge in household debt is a consequence of structural issues such as,
  - Inadequate job creation
  - Subdued income growth
- **Low-income growth** – Household incomes have not grown at a pace to sustain consumption and savings.
  - Household disposable income growth - 43%
  - Bank personal loans growth - 75%.
  - Consumption growth- 49%

> *To slow down the credit growth and control household debt, RBI has increased risk weights on consumer credit for some segments in November 2023.*

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- **Aggressive lending practices** - Financial institutions, including banks and non-banking financial companies (NBFCs), aggressively expanded unsecured personal loans.
- Between March 26, 2021 and March 22, 2024, personal loans by the banking sector grew by 75 per cent.
- NBFCs' unsecured loan portfolios grew by approximately 130% during this period.

What are the challenges of high household debt burden?

- **Financial stress on households -** Greater indebtedness means a larger portion of disposable income goes toward loan repayment.
- **Low private consumption** – Higher debt servicing ratio leads to lower household disposable income.
- **More unsecured loans** – The unsecured personal loan book of banks rose by 82%, and NBFCs grew by 130%.
- Such loans were mostly availed by low-middle income class people
- This indicates that, post the pandemic, the less well-off went on a credit binge to support their consumption.
- **Multiple loan burden** – Nearly 60% of personal loan customers had more than three active loans.

> ***Credit binge*** *refers to a period of excessive borrowing and spending, often characterized by a surge in credit card usage and debt accumulation.*

- In microfinance, almost 6% of borrowers had loans from four or more lenders.
- **Consumption based credit** - It is a matter of concern when more and more loans are taken for consumption purposes, and not for investment.
- **Expanding income inequality –** The debt burden appears to affect different income groups differently.
- Lower-income households (earning less than Rs.5 lakh annually) are taking *unsecured loans primarily* for consumption needs which may widen existing socioeconomic divides.
- **Long-term financial security –** The shift toward consumption loans rather than investment loans may impact households' long-term financial security.
- **Economic burden on economy –** The banks have been writing off unsecured retail loans, due to increase in NPA in retail loans.
- **Delinquency of loans -** India's microfinance sector faces rising delinquencies due to household over-indebtedness, with 27% of borrowers taking new loans to repay old ones.
- **Risk of debt trap** - When debt reaches unsustainable levels, households may face sudden *drops in living standards*.
- **Other concerns** - Reduced ability to invest in education, healthcare, and other areas that affect social mobility.
- Increased financial *anxiety and stress-related health issues*.
- Greater dependence on credit for basic needs.

What lies ahead?

- A possible solution to deal with could lie in the Indian Bankruptcy Code.
- Government could implement stronger regulations on multiple lending to the same borrower.
- Expanding financial literacy programs to improve household debt management.
- Boosting labour-intensive manufacturing through targeted industry incentives.

Quick facts

Twin Balance Sheet Problem

- The twin-balance sheet problem refers to deterioration in financial health of banks and corporates at the same time.
- Twin balance sheet problem was the primary concern in the previous decade (before the pandemic).
- **Over-leveraged corporate sector –** Companies took excessive debt.
- **Banking system plagued by bad loans** – Financial institutions faced significant non-performing assets as overleveraged corporate sector cannot pay back loans.

- **Economic impact** – This combination held back private investment in the economy
- Post covid the Indian economy has moved away from the twin-balance sheet problem of banks and corporates to twin-balance sheet advantage.

To know more about this, click here

11.4 Creative Economy

Why in the News?

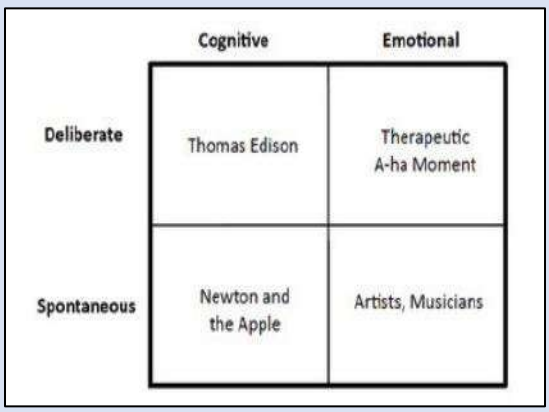
Recently United Nations Trade and Development (UNCTAD) released the Creative Economy Outlook 2024.

What is the size of creative economy?

- **Creative economy** – It encompasses creating, producing, and distributing goods and services that use creativity and intellectual capital as primary inputs.
- It includes diverse activities such as advertising, architecture, arts, design, music and movie production, publishing, and video games.
- **Main sectors of creative economy** – According to the Creative Economy Outlook 2024, three sectors are the main contributors of the creative economy (2022):
  - Software services (41.3%)
  - Research and development (30.7%)
  - Advertising, market research and architecture (15.5%).
- **Global creative economy** – This economy generates annual revenues exceeding $2 trillion and supports nearly 50 million jobs worldwide.
- Globally, in 2022, exports of creative services surged to $1.4 trillion, marking a 29% increase since 2017.
- Creative goods exports also experienced a 19% rise, reaching $713 billion.
- **India's creativity** - India's tryst with creativity and innovation ranges from the arts to science, from metallurgy to medicine, from astronomy and much more.
- **Creative economy of India** - As of 2024, India's creative industry is valued at $30 billion and employs about 8% of the country's working population.
- The design segment alone represented 87.5% of creative goods exports, while arts & crafts contributed about 9%.
- Creative exports grew by 20% in the previous year, generating more than $11 billion.

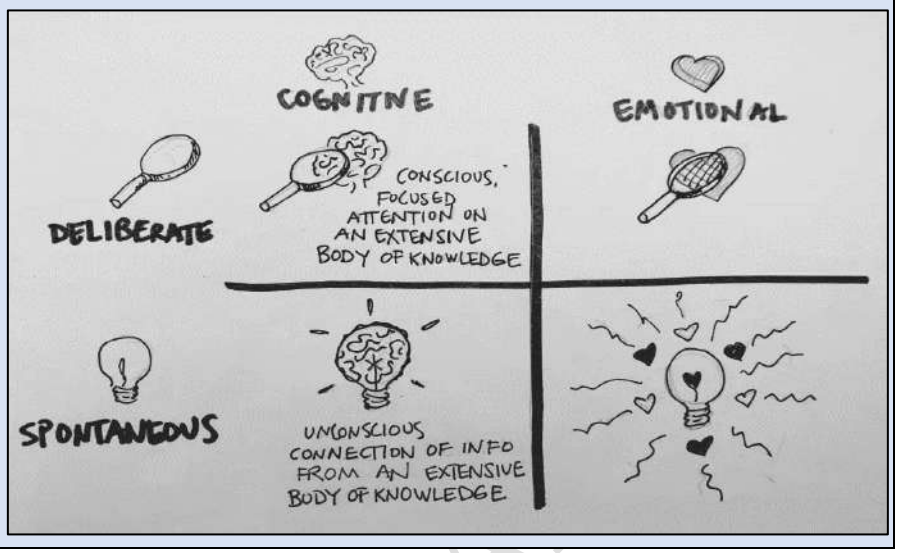
Creativity and Innovation

- Creativity can be segmented into 4 types.
  - **Deliberate and emotional** - It's a process where individuals consciously explore their emotional landscape to deepen creative output and tap into insights from their experiences.
  - **Deliberate and cognitive** - Creativity that is deliberate and cognitive comes from hard work in a particular area.
  - Thomas Edison, the inventor of the electric light bulb (improved from the invention of Joseph Swan) and the telegraph, is a great example of a deliberate and cognitive creator.
  - His work involved doing experiments repeatedly, making tweaks as he did, until something finally worked.
  - **Spontaneous and emotional** – It is characterized by unplanned, instinctive idea generation driven by strong emotional impulses.



- This style is often associated with artists, musicians, and other creative individuals who thrive on flexibility and emotional expression.
- **Spontaneous and cognitive** – It involves a burst of insight or inspiration that leads to a solution, often while the mind is not actively focused on the problem

- **Source of creativity** - Creativity can be endogenous, triggered by one's own thoughts or imagination or exogenous, that is externally induced.
- **Manifestation** - It can be manifested concurrently or only episodically such as in crises or extreme climate events.
- **Innovation** - Creativity precedes innovation. While creativity can be individual-based, innovation can be bootstrapped but needs an institution to support its scale or formalisation.



What are the challenges to creative economy?

- **Market concentration** - Some creative industries are highly concentrated, leading to market concentration and hindering fair competition.
- Dominant players can stifle innovation and limit opportunities for smaller firms.
- **Digitalization** - Digitalization in the creative industries raises new concerns, particularly regarding market concentration and competition challenges.
- **Artificial intelligence** - While digitalization and artificial intelligence offer opportunities for growth and efficiency, they also raise concerns about quality, copyright, privacy, and content monopolization.
- **Transitioning creativity into innovation** - In a country such as India, enormous creativity exists but such creativity is not translated into innovation many a time.
- Creators come up with ideas while innovators translate the ideas into products and services.
- **Inadequate focus on grassroot innovation** - While the climate tech sector in India received $2,853 million in 2023, the investments that grassroots creativity received seems to be very poor.

What does India need to do?

- As India works towards becoming a $5 trillion economy, it needs to rejig its approach to innovations, supported by creativity at all levels.
- While investments into traditional creative economic sectors are booming in a country such as India, we still need to explore ways of being more creative and innovative to take the economic gains to new horizons, especially at the grass-root levels.
- India needs an ecosystem that balances creativity and innovations at all levels, backed by investments to ensure that India's ambitions to improve creative economic conditions are met.
- We need investments and institutional arrangements to bridge the gap between creativity and innovation.
- Pioneering work on identifying and recognising grassroot innovations by organisations such as the Grassroot Innovations Augmentation Network (GIAN) have resulted in popularising hundreds of grassroot creative ideas.
- It is time that India invests more in creative pursuits at all levels — grassroots to technology-intensive ideas.
- Grassroot innovations need more investments to ensure the proof of concept demonstrated is supported by capital investments.
- The innovation and associated intellectual property protection for such innovations, including informal ones, need better protection through adjustments to Indian intellectual property protection policies and regulations.
- The government can invest in 'one district one innovation' modelled after the successful initiative of "one district one product' initiative.

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12. INDUSTRIES & INFRASTRUCTURE

12.1 Electronic Component Manufacturing Scheme

Why in news?

Recently, the Union Cabinet had approved the Electronics Component Manufacturing Scheme to make India Atmanirbhar in electronics supply chain.

What is Electronic Component Manufacturing Scheme?

- It is a *central sector scheme* to expand electronics manufacturing beyond semiconductors, IT hardware, and mobile phones.
- **Nodal agency** - Ministry of Electronics and Information Technology (MeitY).
- **Objectives** – Developing a *robust component ecosystem* by attracting large investments (global/domestic) in electronics component manufacturing ecosystem.
- *Increasing Domestic Value Addition* (DVA) by developing capacity and capabilities.
- Integrating *Indian companies with Global Value Chains* (GVCs).
- **Budget** - Rs.22,919 crore.
- **Tenure** - ***6 years*** with 1 year of gestation period.
- **Targets**
  - Rs59,350 crore in investments
  - Production worth Rs4,56,500 crore
  - Creation of 91,600 direct jobs in the coming years.

Status of Electronics Segment in India

- Electronics is one of the highest-traded and fastest-growing industries globally.
- **Role of electronics** – It is expected to play a pivotal role in shaping the global economy and advancing a country's economic and technological development.
- Since electronics permeates all sectors of economy it has *economic and strategic importance*.
- The electronics manufacturing sector has witnessed remarkable growth in the last decade.
- **Domestic production of electronic goods** – It has *increased* at a CAGR of more than 17% from FY 2014-15 to FY 2023-24.
- **Exports of electronic goods** - It have also *increased* from FY 2014-15 to to FY 2023-24 at a CAGR of more than 20%.

What are its features?

- It provides *differentiated incentives* to Indian manufacturers tailored to overcome specific disabilities for various categories of components and sub-assemblies.
- Thus, manufacturers can acquire technological capabilities and achieve economies of scale.
- **Electronic Component Manufacturing Scheme** – They are classified *under 4 categories*.
  - Sub-assemblies
  - Bare components
  - Selected bare components
  - Supply chain ecosystem & capital equipment for electronics manufacturing
- **Incentives** – *Turnover* linked incentive, *Hybrid* incentive and *capex* incentives.
- Unlike previous schemes, it is *not based on a production-linked incentive*, where manufacturers will be rewarded for incremental manufacturing.

Turnover linked incentives *are based on the total revenue generated by a manufacturing unit from the sale of its products over a specific period.*

- Payout of a part of the incentive is linked with employment targets achievement.

What are the benefits of the scheme?

- **Boosts domestic manufacturing** – It can reduce import dependency by promoting the production of semiconductors, circuit boards, and batteries.
    - It aims for Rs59,350 crore in investments, encouraging factories and R&D centers.
- **Generates employment** – It is expected to create 91,600 direct jobs and more in related sectors.
- **Enhances value addition** – It shifts focus from assembly to component manufacturing, strengthening economic resilience.
- **Supports self-reliance** – It advances Make in India and Secures the Electronics Supply Chain.
- **Strengthens tech leadership** – It can aid AI, Internet of Things, and EV development, boosting India's global tech position.
- **Stable incentives model** – Rewards turnover and employment creation over mere production increases.

Quick Facts

Ministry Of Electronics and Information Technology

- **Establishment** – 2016.
- It is carved out from the Ministry of Communications and Information Technology, based on Narayana Murthy Committee recommendations)
- **Mission** – To advance Digital Governance, foster inclusive growth in electronics and IT, strengthen Internet Governance, promote R&D and innovation, and ensure cybersecurity.
- **Key Objectives**
    - **e-Government** – Develop e-infrastructure for digital services.
    - **e-Industry** – Support electronics manufacturing and IT-ITeS sector.
    - **e-Innovation/R&D** – Build research and innovation infrastructure.
    - **e-Learning** – Promote digital skills and knowledge networks.
    - **e-Security** – Secure India's cyberspace.
    - **e-Inclusion** – Leveraging ICT for Inclusive Growth.

12.2 Undersea Cables

Why in news?

India is expanding its subsea cable network, with the latest addition being Airtel's 2 Africa Pearls system, supported by Meta, to enhance international bandwidth.

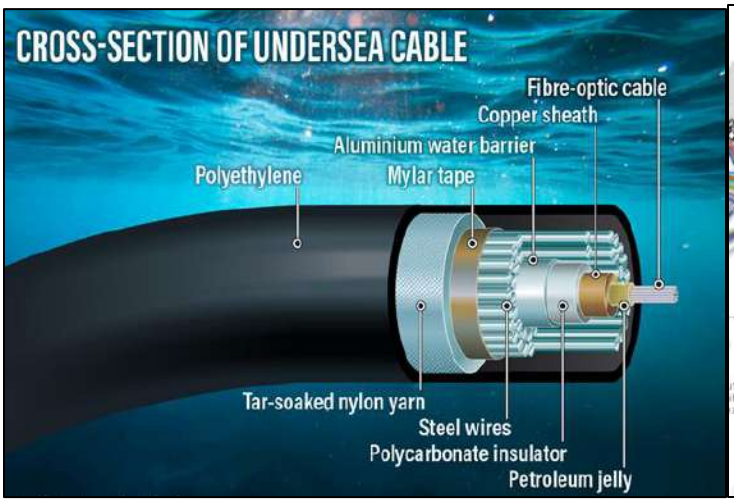
How do they connect internet networks globally?

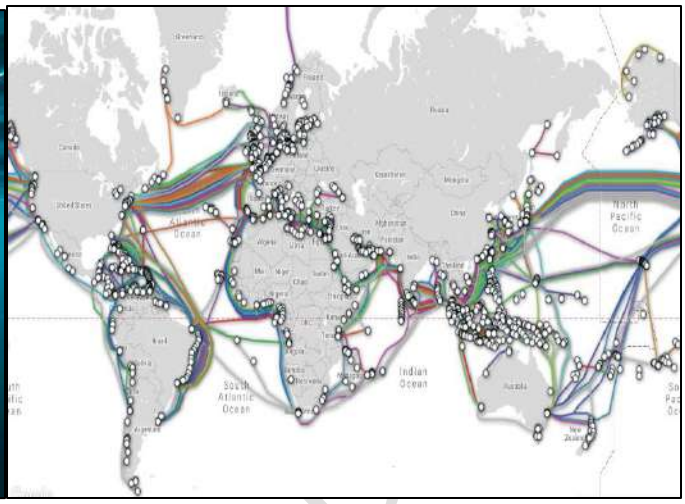
- **Undersea cables** – These are fiber optic cables laid on the ocean floor to transmit vast amounts of data.
- Typically, they are a few inches thick, reinforced to withstand deep-sea pressures and hazards.

In August 1850, John Watkins Brett's English Channel Submarine Telegraph Company laid the first line across the English Channel.

- They connect to 'landing stations' where they integrate into terrestrial internet infrastructure.
- **Global internet connectivity** - With almost 600 cables, they transmit data between continents, linking internet service providers and telecom operators worldwide facilitating global communication and internet connectivity.
- **Global Network** - This global network of undersea cables, spans the Atlantic and Pacific oceans, as well as strategic passages like the Suez Canal.
- **Transmission capacity** - Each modern cable has several hundred gigabits per second of capacity, a nd can support thousands of telecom users.

- **Significance** - They enable high-speed data transfer, supporting economic, security, and technological activities.
- 90% of data, 80% of world trade, and about $10 trillion of financial transactions, as well as secure government information, move through these cables.



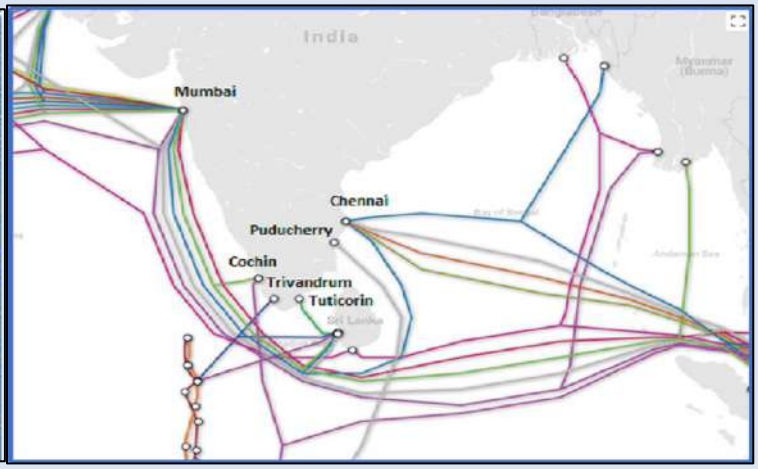


Undersea cables of India

- With 17 undersea cables, India is connected globally through submarine cable systems, such as the Southeast Asia-Middle East-Western Europe (SEA-ME-WE) system, the Bay of Bengal Gateway (BBG) system, and the India-Middle East-Western Europe (IMEWE) system.
- In 2024, India-Asia-Express (IAX), and India-Europe-Express (IEX) were launched.
- Major landing stations are in Mumbai & Chennai, a few in Kochi, Thiruvananthapuram and Visakhapatnam.
- 95% of subsea cables goes into a small six-kilometer patch in Versova, Mumbai.
- **2 domestic cable systems**
  - Chennai Andaman and Nicobar Islands (CANI) cable
  - Kochi Lakshadweep Islands project.
- India's share presently constitutes around 1% and 3% respectively for cable landing stations and subsea cable systems.

Distribution of Cable Landing Stations and providers that own them	Mumbai	Chennai	Cochin	Trivandrum	Tuticorine	Puducherry	Digha	Visakhapatnam
Tata Communications	3	1	1					
Airtel	1	2						
Reliance Jio	1	1						1
Global Cloud Xchange	1			1				
Vodafone	1							
Sify	1							
BSNL					1		1	
IOX						1		

CLS Operational CLS Under Construction



What are the challenges in laying undersea cables in India?

- **Limited infrastructure -** Only 2 major landing sites (Mumbai and Chennai) are in India and a disruption in one location (e.g., Red Sea cable cuts) can significantly impact internet services.
- **Regulatory delays -** Laying cables requires approvals from multiple authorities (DoT, Home Ministry, Environment Ministry, etc.) which causes delays.
- Foreign repair vessels need permission to operate, slowing down maintenance.

- **Geopolitical risks -** Strategic locations such as the Red Sea are vulnerable to conflicts, piracy and disruptions.
- If there is a disruption at the Red Sea, it brings down almost 25% of India's Internet in our estimate.
- **High costs & maintenance issues -** Deploying and maintaining cables involves high costs.
- India lacks adequate repair and maintenance facilities, leading to longer restoration times.
- **Vulnerabilities & risks -** India's internet is highly dependent on a few landing stations, making it prone to disruptions.

What can be done to strengthen India's subsea cable network?

- India's undersea cable network is vital for its digital economy.
- Strengthening infrastructure, streamlining regulations and increasing investments will enhance connectivity, security and resilience in the face of global disruptions.
- **Expanding infrastructure -** More landing stations can be developed across coastal cities.
- **Regulatory reforms -** Approval processes can be simplified for laying cables and maintenance.
- **Enhancing security & redundancy -** Cybersecurity measures can be strengthened to prevent sabotage.
- **Public-Private Partnership & investments -** Collaborations with global tech firms and telecom companies can be enhanced to attract technology and investment in the sector.

12.3 India's Aviation Revolution

Why in the News?

Recently, Parliament passed the Protection of Interest in Aircraft Objects Bill, 2025, aligning India's aviation leasing laws with global standards to reduce leasing costs.

What are the legislative reforms driving systemic transformation of India's aviation sector?

- **Protection of Interest in Aircraft Objects Bill, 2025** – It aligns India's aircraft leasing and financing framework with international standards set by the Cape Town Convention, 2001.

Features and Impacts of the act
• **Reducing leasing cost** - By addressing gaps in legal enforcement, the Bill is strategically designed to reduce aircraft leasing costs for Indian carriers, which were previously 8-10% higher than in other nations. • **Boosting investment** - This is expected to boost investor confidence in India's burgeoning aviation market significantly. • **Intended impacts of the Bill** - Reduced risk premiums, lower interest rates, and lease costs for passengers and shippers. • **Other benefits** - It also aims for better contract enforceability and repossession certainty, fostering the growth of domestic leasing hubs.

To know more about the act, Click here.

- **Bharatiya Vayuyan Adhiniyam 2024** – It replaced the colonial-era Aircraft Act of 1934 to modernize India's aviation sector and came into force on 1st January 2025.

Features and Impacts of the act
• **Aim** – To regulate activities related to aircrafts including manufacturing, possession, use, and trade. • To foster indigenous manufacturing under the 'Make in India' and 'Atmanirbhar Bharat' initiatives. • To align regulations with international conventions such as the Chicago Convention and the International Civil Aviation Organization (ICAO). • To streamline regulatory processes by simplifying license issuance. • **1935 act sets up**   ○ Directorate General of Civil Aviation (DGCA) for overseeing safety and performing regulatory functions.

- Bureau of Civil Aviation Security (BCAS) for overseeing security
- Aircraft Accidents Investigation Bureau (AAIB) for investigating accidents

- The central government will exercise superintendence over these bodies and may review or modify their orders.
- The act retains these provisions.
- The new act removes redundancies and introduces provisions for appeals.
- The new act introduces a provision for a second appeal against decisions related to the imposition of penalties for violating Rules under it.

What are the recent expansions in India's aviation infrastructure?

- **New terminal capacity** - Significant infrastructure development is underway, including the laying of foundations for new terminals at key locations such as Varanasi, Agra, Darbhanga, and Bagdogra.
- **Operationalisation of greenfield airports** - Since 2014, 12 Greenfield Airports have been operationalised out of 21 'in-principle' approved airports.
- These include Durgapur, Shirdi, Kannur, Pakyong, Kalaburagi, Orvakal (Kurnool), Sindhudurg, Kushinagar, Itanagar (Hollongi), Mopa, Shivamogga, and Rajkot (Hirasar).
- **Development of international airports** - Furthermore, development at Noida (Jewar) and Navi Mumbai International Airports is progressing rapidly, with operationalisation targeted for the first quarter of FY 2025-26.
- **Target for further expansion** - The government has set an ambitious target of developing 50 more airports in the next 5 years and connecting 120 new destinations in the next 10 years.
- **Significant capital expenditure in airport infrastructure** - A substantial CAPEX of over ₹ 91,000 crore is planned for airport infrastructure development under the National Infrastructure Pipeline (NIP) during FY 2019-20 to FY 2024-25.

How RCS–UDAN democratised air travel and boosted regional growth?

- **RCS-UDAN connecting India** - The Regional Connectivity Scheme (RCS) – Ude Desh Ka Aam Nagrik (UDAN), launched in 2016, has operationalised 619 routes and connected 88 airports across the country.
- This scheme embodies the government's commitment to affordable air travel and promoting balanced regional development.
- **Expansion of Regional Connectivity** - In 2024 alone, 102 new RCS routes were launched, including 20 in the North Eastern States.
- The scheme has facilitated affordable air travel for 1.5 crore passengers.
- It further aims to extend this to 4 crore more in the next decade through a revamped UDAN initiative to add 120 new destinations.
- **Connecting remote regions** - The scheme also prioritises connecting remote, hilly, and aspirational districts, including the North Eastern region, through support for helipads and smaller airports.
- **Affordable food at airports** - The UDAN Yatri Café initiative, aligned with the Hon'ble Prime Minister's vision of democratising air travel, was launched to provide affordable and quality airport food options.

What is the recent momentum in air passenger traffic?

- **Exponential growth in domestic passengers** - In 2024, domestic air passenger traffic more than doubled to 22 crore comparing 2014.
- India's domestic air passenger traffic reached a historic milestone, surpassing 5 lakh passengers in a single day in 2024.
- **Strong growth in international traffic** - International routes also experienced substantial 11% growth between January and November 2024.

- **India emerges as a top global aviation market** - The total number of air passengers annually has exceeded 350 million, firmly establishing India as the third-largest aviation market globally.
- Over the past decade, domestic air passenger traffic has grown 10-12% annually.

What are the developments in safety and technology for seamless travel?

- **State-of-the-Art DFDR & CVR laboratory** - Digital Flight Data Recorder and Cockpit Voice Recorder (DFDR & CVR) Laboratory was inaugurated at the Aircraft Accident Investigation Bureau (AAIB) in New Delhi.
- It will significantly improve the effectiveness of identifying the root causes of incidents and ensuring accountability, thereby contributing to a safer aviation ecosystem.
- **Expansion of Digi Yatra** - Digi Yatra services to 24 airports have significantly enhanced passenger convenience and security.
- This initiative provides a seamless, contactless travel experience for passengers.
- **Guidelines for seaplane operations** - These Guidelines were launched in 2024 to enhance regional connectivity further.
- These guidelines prioritise safety and security and aim to facilitate the commencement of seaplane operations across the country.

What are the Sustainability and Capacity Building initiatives?

- **Green energy adoption** – To promote sustainable aviation, 100% green energy is adopted in around 80 airports and further aimed at 100 airports.

Bengaluru Airport has achieved the highest Carbon Accreditation Level 5 by Airports Council International (ACI), while Delhi, Mumbai, and Hyderabad airports have achieved Level 4+ accreditation, becoming carbon neutral. Chennai Airport also operates entirely on green energy and houses a 1.5 MW solar power plant.

- **Addressing the growing demand for pilots** - Recognizing the increasing need for trained pilots, the number of Flight Training Organizations (FTOs) and the annual issuance of commercial pilot licenses are being increased.
- **Aviation career guidance for students** - To nurture future talent, a 'Career Guidance Programme in Aviation' for school students has been launched at the Indian Aviation Academy.
- The programme aims to inspire and educate students about diverse career opportunities within the sector.

Additional Milestones in Aviation Growth

- **Maintenance, Repair & Overhaul (MRO)** - A uniform 5% Integrated Goods and Services Tax (IGST) rate has been introduced for aircraft parts to promote India as a competitive global MRO hub.
- **Gender inclusion** - India boasts 13–18% of women pilots, which ranks among the highest globally.
- The Directorate General of Civil Aviation (DGCA) targets 25% representation of women in all aviation roles by 2025.
- **International recognition** - The 2nd Asia-Pacific Ministerial Conference on Civil Aviation was successfully hosted in New Delhi, culminating in the Delhi Declaration.
- **Air cargo infrastructure** - Cargo handling capacity reached 8 million MT in FY24, growing at 10 %+ annually with a new focus on warehousing for perishables and streamlined customs protocols.

What lies ahead?

- The Ministry of Civil Aviation committed to positioning India as a global aviation leader, driving transformative change through visionary policies, world-class infrastructure, and inclusive, sustainable growth.
- As India continues to break records in passenger traffic, expand regional connectivity, and modernise aviation frameworks, the nation is firmly set on an upward trajectory toward becoming a vibrant global aviation hub.
- These concerted efforts enhance travel experiences for millions and bolster economic prosperity, strengthen national integration, and empower India to confidently soar towards its vision of becoming a developed nation—Viksit Bharat @2047.

12.4 Transforming India's Research into Global Innovations

Why in News?

Recently, Dr. Shivkumar Kalyanaraman has been appointed as the first fulltime Chief Executive Officer (CEO) of the Anusandhan National Research Foundation (ANRF).

What are the objectives of Anusandhan National Research Foundation (ANRF)?

- **Anusandhan National Research Foundation** – It was established in 2023 through an Act of Parliament to provide high-level strategic directions for research, innovation, and entrepreneurship in the fields of natural sciences.
- **Promoting Research and Development** - To stimulate innovation in universities and colleges, facilitate industry-aligned translational research.
- **Collaboration** - ANRF facilitates partnerships among industry, academia, government departments, and research institutions.
- It bridges the gap between academic discoveries and industrial applications.
- **Funding** – ANRF funds competitive peer-reviewed grant proposals to eligible persons.
- **Infrastructure** - It enhances research infrastructure, and encourages private sector contributions.

What are the challenges in India's R&D ecosystem?

- **Low R&D investment** – India's Gross Expenditure on R&D (GERD) stands at just 0.7% of GDP, significantly lower than developed nations, which allocate 2.5% or more.
- South Korea dedicates 4 per cent of its GDP to R&D.
- **Structural challenges of CSIR** - CSIR depends heavily on government funding and its impact is limited to national level.
- **Inadequacy of SMEs** - Indian SMEs lack R&D, vocational training, apprenticeship.
- **Limited private sector participation** - Unlike developed nations where private firms contribute 50-70% of R&D spending, India's private sector plays a minimal role, with most funding coming from the government.
- **Inadequate focus on applied Research** - Indian academic institutions prioritize theoretical research over applied research, leading to fewer industry linkages and limited commercialization of innovations.
- **Regulatory and administrative hurdles** - Rigid rules on fund utilization, fragmented coordination among ministries, and outdated approval systems slow down research projects.
- **Weak incentive structures** - Researchers face limited autonomy and risk appetite, which discourages cutting-edge research.
- **Skill gaps** - The education system often lacks alignment with industry needs, resulting in a shortage of skilled professionals in emerging fields like AI and robotics.
- **Infrastructure deficiencies** - Many research institutions lack state-of-the-art facilities, which hampers the quality and scale of research.

What are the significances of core technologies?

- **Core technologies** - They form the foundation for multiple sectors, driving economic and industrial growth.
- **Past core technologies** - Lasers, vacuum technologies, transistors and lithium-ion batteries many of which have led to Nobel Prize-winning breakthroughs.
- **Current core technologies** - Recent Nobel Prize-winning core technologies include neural networks and machine learning, mRNA vaccines and CRISPR-Cas9 gene editing.
- **Potential core technologies** - Optical lithography and low-nanometer node transistors, crucial for semiconductor manufacturing have the potential to win prizes.
- **Commercialization** - While some high-impact technologies emerged from serendipitous discoveries, their refinement and commercialisation involved long-term, deliberate research.

Successful commercialization of Lithium Battery Technology

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- While lithium's energy storage potential was discovered by accident, the development of lithium-ion batteries was a systematic effort spanning decades.
- Nobel Prizes were awarded to Whittingham and Goodenough for the invention of principles and to Yoshino for creating the first commercially viable battery.
- Sony Corporation took the technology to market in 1991, which was later adopted by Tesla, Nissan and Panasonic.
- The Japanese government played a pivotal role by investing heavily in its domestic Li-ion battery industry.

- For a country to lead in core technologies, it must align policy, funding, education, and commercialization strategies.

What India can learn from German innovation ecosystem?

- **Systemic approach** - Germany has a structured approach to identifying and adopting critical foreign innovations.
- **Collaborative planning** - The government, along with industry leaders and research institutions, develops strategic roadmaps to acquire, adapt and commercialise cutting-edge technologies.
- **Institutional set up** - The Fraunhofer Society, established in 1949, has 76 research institutes, over 30,000 researchers and engineers.
- With an annual budget of €3 billion (70 per cent from industry collaborations), it bridges the "valley of death" between research and industry.
- **Strong medium industries** - Germany's Mittelstand, small and medium-sized, family-owned businesses, specialise in niche markets with global demand, prioritise long-term investments in R&D and maintain strong regional and industrial ties.
- Mittelstand firms account for 60 per cent of employment, underpinning Germany's leadership in advanced manufacturing and engineering exports.
- **Government industry collaboration** – The Fraunhofer Society works closely with Mittelstand SMEs, providing them with the necessary technological expertise.

Comparison of Council of Scientific & Industrial Research (CSIR) & Fraunhofer society	
India's Council of Scientific & Industrial Research (CSIR) is comparable to Fraunhofer, as both focus on applied research and collaborate with industry.	
CSIR	**Fraunhofer Society**
CSIR depends heavily on government funding.	Fraunhofer is primarily industry-funded.
CSIR's impact is more national.	Fraunhofer's research is globally competitive.

What lies ahead?

- **Reforming CSIR for greater commercialisation** - CSIR labs could be restructured into market-driven organisations by spinning off applied R&D units into independent research-based start-ups.
- Shifting researchers' focus from publications to patents.
- **Developing India's own Mittelstand for core technologies** - 100 promising SMEs with a high-risk R&D appetite, specialisation in technical products and willingness to collaborate with research institutions — could be identified and supported.
- **Establishing thematic core technology centres** - Exclusive research centres could be established within the IITs, IISc and IISERs modelled after Germany's Fraunhofer.
- **Strengthening vocational and early STEM education** - To foster a culture of innovation, hands-on training in science and engineering could be integrated from an early age.
- Introducing vocational courses in electronics, mechanics and optics by Grade 8.
- **Private-sector collaboration** – It is crucial for increasing R&D investment, promoting industry-academia partnerships and developing start-up ecosystems.

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- **Industry academic partnership** - Ensuring industry experts participate in teaching and expanding Atal Tinkering Labs to 1,000 schools with advanced laboratory facilities.
- **Investing in core technology companies** - Investment in legacy companies with existing capabilities in optics, lasers and semiconductor components could be encouraged.
- By forming industry-research consortia, these companies would be able to develop indigenous core technologies, for atmanirbharta.
- With a coordinated ecosystem involving government, labs, academia and industry, India can transform into a global powerhouse of core technology innovation, critical for a Viksit Bharat by India @ 100.

13. ENVIRONMENT

13.1 Air Pollution

Why in the news?

In the recently held 2nd WHO conference on Air Pollution and Health, India has committed to reduce the health impacts of air pollution by 2040.

What is the status of air pollution in India?

- **India's pollution** - According to the 2024 World Air Quality Report by IQAir, India ranked as the 5th most polluted country and 6 of the world's ten most polluted cities remain in India.
- According to the report, the country saw a 7 % decline in PM2.5 concentrations in 2024, averaging 50.6 micrograms per cubic metre.

According to the WHO, Air pollution is the contamination of the indoor or outdoor environment by any chemical, physical, or biological agent that modifies the natural characteristics of the atmosphere.

- **Air pollution mortality** – Air pollution is causing 2 million early deaths every year in India, as per CleanAirFund.
- **Delhi pollution** - For the first time in six years, the city did not witness even one day of 'good' air quality days (AQI lesser than 50) in 2024.

What are the major causes of air pollution in India?

- **Vehicular Emissions** – Rising vehicle numbers increase CO, NOx, PM2.5, and PM10, worsened by old vehicles, poor fuel quality, and traffic congestion.
- **Industrial Pollution** – Factories and power plants release SO_2, NOx, and particulate matter, with coal-based industries being major polluters.
- **Agricultural Activities** – Stubble burning in Punjab & Haryana emits PM2.5 & CO, while excessive fertilizer use adds NOx to the air.
- **Household Biomass Burning** – Use of wood, cow dung, and coal for cooking emits CO, black carbon, and fine particulates, impacting air quality and climate.
- **Construction & Road Dust** – Cement dust, silica, and unpaved roads contribute significantly to urban air pollution.
- **Other reasons** – Waste burning, stubble burning and deforestation.

What are the major Government Initiatives against air pollution?

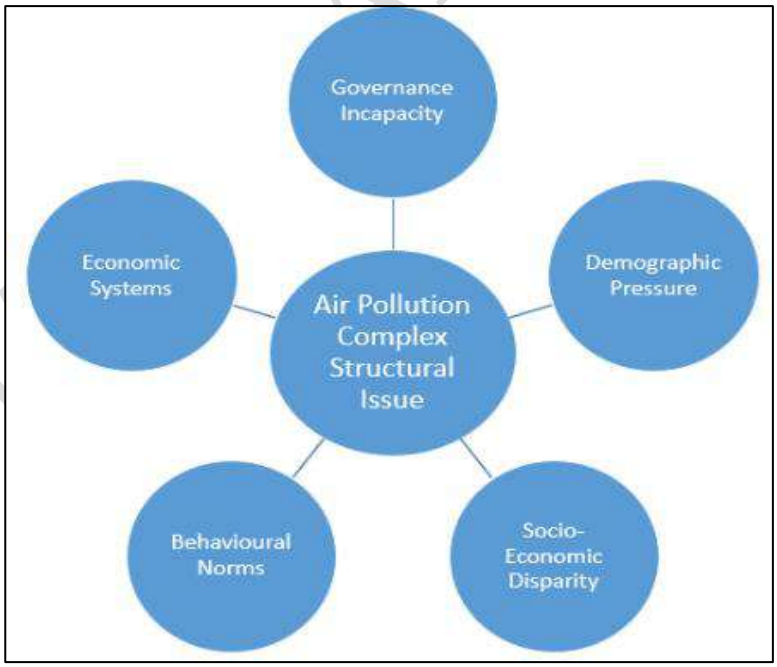
- **National Clean Air Programme (NCAP)- NCAP** target has been revised to achieve up to a 40% reduction in PM10 levels or to meet national standards (60 µg/m³) by 2025-26.
    - Focuses on monitoring, awareness, and pollution control measures at national, state, and city levels.
- **Bharat VI Emission Standards-** Introduced stricter vehicle emission norms to reduce air pollution from transportation.
- **Pradhan Mantri Ujjwala Yojana (PMUY)-** Provided free LPG connections to poor households, reducing indoor air pollution from biomass burning.

- **Faster Adoption and Manufacturing of Electric Vehicles (FAME II)-** Incentivizes the adoption of electric vehicles to reduce vehicular emissions.
- **Swachh Bharat Mission -** Focuses on waste management and reducing the open burning of solid waste, a key pollution source.
- **Coal Phase-Out in National Capital Region (NCR)-**Targeted measures to shut down coal-burning industries to control pollution in Delhi and surrounding areas.
- **Air Quality Monitoring & Digital Tools –** Investment has been made in AI-driven dashboards, smog towers, and pollution tracking systems for enhanced air quality management.

Judicial Ruling on Air Pollution

- **MC Mehta v. Union of India (1986)** – Introduced the "Polluter Pays" principle and Absolute Liability for industrial pollution.
- **Vellore Citizens Welfare Forum v. Union of India (1996)** – Recognized the Precautionary Principle and Sustainable Development as key environmental doctrines.
- **National Green Tribunal (2010)** - Enforced compensation for environmental damage, monitored industrial pollution, and penalized illegal waste disposal.

What are the challenges in combating air pollution?



- **Governance Incapacity** – Local governments, both rural and urban are not, adequately equipped with resources and data such as high-resolution, open-source data on emissions-generating activities to handle air pollution.
- Without such data, air pollution remains an abstract issue, disconnected from daily governance
- **Underutilization of funds** - Between 2019 and 2023, only 60% of the funds released were utilised, reflecting not a lack of intent but institutional misalignment.
- **Demographic pressure** – Increasing population of 1.4 billion and rapid urbanization (about 40% by 2030) strains air quality;
- **Socio-Economic Disparity** – Rural and informal sectors lack pollution control, while urban areas get high-tech solutions, deepening inequality.
- **Behavioral Norms** – Biomass burning and waste incineration persist, with wood, coal, and kerosene driving high PM2.5 and PM10 levels.
- **Economic Systems** – More than 50% of India's energy requirements are met through fossil fuels of coal, crude oil.

What lies ahead?

- India needs a phased, data-driven approach.
    - Phase I: Build local emissions profiles to identify the biggest pollution sources;
    - Phase II: Link funding directly to targeted actions based on that data;
    - Phase III: Track reductions in emissions, not just pollution concentrations, to measure real progress.
- Shifting to activity-based metrics — such as the number of stoves replaced or diesel buses retired — would offer a clearer picture of impact and strengthen accountability.
- To turn national goals into real progress, we need to connect them to the everyday activities that actually drive emissions.

- This shift from passive monitoring to proactive management mirrors how meaningful change happens on the ground.
- Separate funding can be created one for research and another for immediate, on-ground interventions.

13.2 Firecracker Blast

Why in news?

The recent firecracker factory blaze in Gujarat caused fatalities of 21 people including few children's.

What are the causes for recent fire blast incident?

- **Lack of safety mechanisms** – The factory had *no fire safety equipment*, no proper ventilation, and no first-aid equipment.
  - It violates norms under the Factories Act, 1948.
- **Negligent Monitoring** – Though local police had conducted a spot check at the factory just 15 days ago, they *failed to indicate that crackers were being manufactured* based the materials found.
- **Illegal manufacturing** – While the factory had *license only for storage and trading*, it had illegally operated to manufacture firecrackers.
- **Presence of Explosive Substances** – *Aluminium powder and yellow dextrin*, the chemicals used for making explosives were found which might have led to a massive uncontrolled blast.

Status of Fire Blast Related Fatalities in India

- According to the *NCRB's "Accidental Deaths and Suicides in India 2022"* report:
- **Events** – *60 incidents of fires at factories* where combustible materials like crackers and matchboxes are made.
- **Fatalities** – It led to *66 deaths and 32 injured people*.
- **Vulnerable states** – *Tamil Nadu, Bihar, Jharkhand*, Uttar Pradesh, and Rajasthan.
- **Issues** – Many cases involve migrant workers and child labour, but go unreported or untraced.

How India regulates fire blast events?

- **Explosives Act, 1884 & Explosive Substances Act, 1908 –** They *regulate the manufacture, possession, use, sale, transport*, and import of explosives.
- **Factories Act, 1948 –** It has provisions for *health, safety, and welfare of workers* in factories.
- **National Building Code (NBC) 2016:** It *mandates fire safety norms*, including proper ventilation, spacing, and storage standards for industrial units handling explosives.
- **NDMA Guidelines on Chemical and Industrial Disasters, 2007 –** It emphasise *risk assessment, licensing, regular audits*, and disaster response planning for hazardous industries.
- **Child Labour (Prohibition and Regulation) Act, 1986 –** It *prohibits employment of children* in hazardous industries like firecracker manufacturing.
- **Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979 –** It protects migrant workers employed in a firecracker unit when they are injured or killed in an accident.
    - **Section 13 & 16**: The contractor is legally bound to provide *medical aid and timely compensation*.
- The principal employer also shares responsibility to ensure that *insurance coverage and emergency assistance* are in place.

What are the challenges in regulating it?

- **Fragmented oversight** – Licensing, safety, labour laws, and environment regulations are all *handled by different departments*, creating gaps in accountability.
- **Corruption and local nexus –** Units often operate with *political patronage or by bribing* local officials.
- Even when inspections happen, they are just a formality.
- **Poor Inter-State Coordination –** In this incident, migrants from Madhya Pradesh working in Gujarat had *no records or benefits*, exposing a failure in inter-state labour coordination.
- **Outdated laws** – Laws like the Explosives Act (1884) is over 140 years old and they *don't reflect modern industrial risks*.
- **Judicial delays –** Even when FIRs are filed, convictions are rare.
    - Victims' families wait years for justice or compensation.

What lies ahead?

- **Unifying licensing and monitoring** - A *single-window system can be created* for issuing and monitoring explosive-related licences with *geo-tagging and digital audits.*
- **Factory inspections –** Making labour and safety inspections *mandatory even for small-scale or rural units*.
- Surprise checks must be incentivised.
- **Faster penal action** – It can be ensured by *fast-track cases* under Bharatiya Nyaya Sanhita for culpable homicide.
- Officials who overlook violations should be penalised.
- **Support for migrant workers** - Implement *portable social security, digital ID cards, and insurance* for inter-state workers through e-Shram platform.
- **Child labour rehabilitation** – Enforcing and *expanding skill-building & cash transfer schemes* for rescued child workers.
- **Victim compensation & care** - A *Firecracker Accident Victims Fund* and fast-track disbursement through District Legal Services Authorities (DLSA) can be implemented.

Quick facts

Petroleum and Explosive Safety Organisation (PESO)
• PESO, formerly known as *Department of Explosives*, since its inception in *1898.* • It has been serving as a *nodal agency for regulating safety of hazardous substances* such as explosives, compressed gases and petroleum. • **Headquarters –** Nagpur, *Maharashtra,*

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- **Objective** – To provide operational and technical advice and assistance to central government, states, local bodies, law enforcement agencies, industry, trade and end users.
- **Role** – Its major work is to administer the responsibilities delegated under the *Explosives Act 1884* and *Petroleum Act 1934* with the motto ***"Safety First"***.

13.3 Safety of Elephants

Why in news?

A recent poaching incident in Tamil Nadu's Dharmapuri district has revived fears about illegal trade in wildlife products.

What is the current status of Elephants poaching?

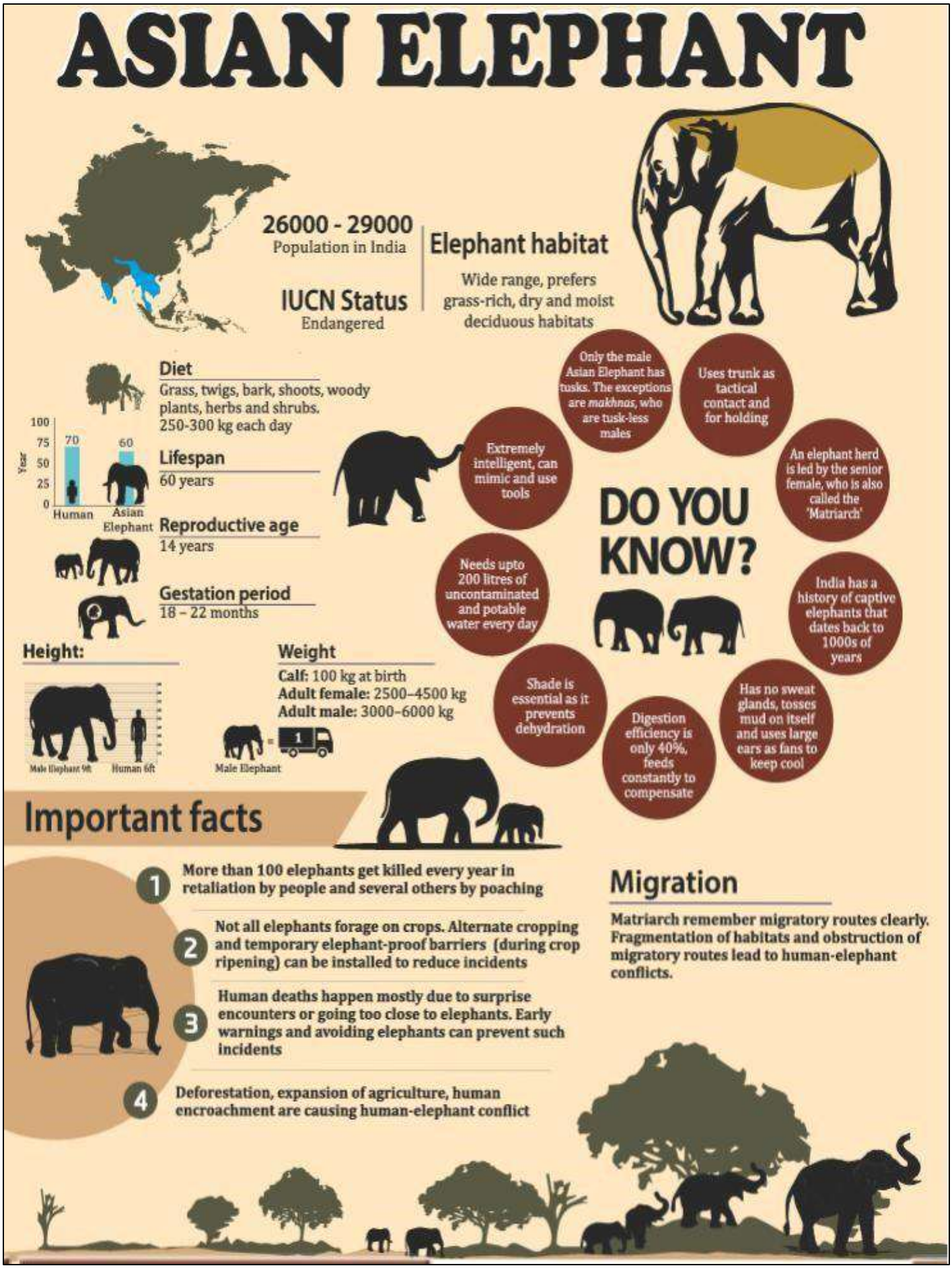
- **Poaching** – It is the *illegal hunting or capture of animals* that are not one's own.
- **Reason for poaching** - In many cases, poaching involves *killing animals* with the intent to acquire their meat, horns, scales, or other body parts.
- **Wildlife trafficking** - In other cases, poaching involves the *live capture of animals*, which are then trafficked for the illegal exotic pet trade, for use in entertainment or tourism, and for other exploitative purposes such as the extraction of bile from bears.
- Elephant poaching is usually driven by a *demand for their tusks*.
- Elephant tusks are *made out of ivory.*
    - Ivory is in high demand in various parts of the world, particularly in Asia, where it is used for *ornaments, jewellery, and traditional medicine.*
- **Status of poaching** - The Forest Department claims that *poaching no longer poses a serious threat* to the wild elephant population.
    - For instances, according to Tamil Nadu's (TN) Elephant Death Audit Framework, poaching accounted for less than 1% of all elephant deaths recorded in Tamil Nadu since 2010.
- **Resurge of population -** According to Ministry of Environment, Forest, and Climate Change, TN's elephant population dropped from over 4,000 (2012) to under 2,800 (2017), but rebounded to 3,000+ by 2024.
    - This indicates better management of poaching incidents.

Distribution of Elephants

- Elephant (Elephas maximus) is the largest terrestrial mammal of India.
- About 60% of the Asian elephant population is in India.
- It is disturbed across South India, North East, Odisha, West Bengal, Jharkhand, Uttarakhand and Uttar Pradesh.
- The requirement of food and water for elephants are very high and therefore their population can be supported only by forests that are under optimal conditions.
- **IUCN Status** – Endangered.
- Schedule I species under the Wildlife Protection Act, 1972, offering it the highest legal protection.

What are the concerns regarding elephants poaching?

- **Resurgence of poaching threat** – Recent killing of an elephant in Dharmapuri indicates that illegal wildlife trade is still active and dangerous.
    - There is fear that poaching gangs may become more active again as elephant populations recover.
- **Underreporting and Investigation Lapses** – Wildlife Crime Control Bureau (2019 report) pointed to failures in investigation of poaching cases in forest divisions.
- **Transparency and accountability** – Although poaching officially accounts for <1% of elephant deaths since 2010, it still forms 7.5% of unnatural deaths.
- **Habitat Vulnerability** - Poaching hotspots like Sathyamangalam Tiger Reserve are ecologically sensitive due to their terrain and connectivity to multiple forest patches.



What are government initiatives to conserve wild Elephants?

- **Elephant Corridors -** Mapped across India to ensure safe migration and reduce human-elephant conflict.

- **Gaj Yatra** - Nationwide awareness campaign celebrating elephants and promoting coexistence.
- **MIKE Programme (CITES)** - Monitors trends in elephant poaching to inform global conservation efforts.
- **Project Elephant (1992)** - Flagship scheme for protection, habitat conservation, and conflict mitigation.
- **Elephant Reserves** - 33 notified reserves across India for long-term conservation.

What lies ahead?

- Encouraging *structural improvements* in the Forest Department could enhance transparency.
    - For example: establishing clear protocols for investigating wildlife deaths.
- *Gentle upskilling of field staff* may support better handling of cases.
- *Strengthening legal procedures* might help avoid undue pressure during investigations.
- *Continued coordination with neighbouring states* can aid in curbing poaching networks.
- Revisiting past cases thoughtfully may help build public confidence.
- Sustained conservation efforts and regular monitoring could further support elephant safety.

13.4 De-Extinction

Why in News?

Recently in April, Colossal Biosciences, a biotechnology company in Texas, U.S. announced that it had "resurrected" a dire wolf, a large predator that went extinct more than 12,000 years ago.

How was the extinct dire wolve brought back?

- **De-extinction** – Also known as resurrection biology or species revivalism, it is the process of reviving extinct species using biotechnology.
- **Genetic Reconstruction** - It involves reconstructing the genetic material of an extinct species and using it to create a similar or identical organism.
- It is often done by modifying the DNA of a closely related living species through techniques like gene editing (like CRISPR), cloning or back-breeding.
- **Dire wolves (Aenocyon dirus)-** They were large canines that dominated southern Canada and the US, they went extinct at the end of the last ice age about 13,000 years ago.
- It could be 3.5 feet tall, more than 6 feet in length, & weigh up to 68 kg.
- **Dire wolf extinction** - When many of the prey species became extinct, the dire wolf may have also gone extinct.

Scientists have estimated that 99.9% of all species that ever lived on the earth are now extinct.

***Back-breeding** involves selective breeding of closely related living species to reintroduce traits lost in the extinct species.*

- **Wolf Genome** – It consists of 2.447 billion base pairs which means there are 2.447 billion positions in the DNA filled by one of the four nucleotides: adenine, thymine, cytosine, and guanine.
- The order in which these four nucleotides appear determines the genetic identity of an organism.
- **Close relative** - They resembled the grey/ gray wolves (Canis lupus) of today, but were larger, with white coats.

Humans and chimpanzees share about 98.77% of their DNA, yet no one would mistake one for the other.

- The genomes of the gray wolf (Canis lupus) and the dire wolf (Aenocyon dirus) are 99.94% identical, meaning 2.445 billion of the 2.447 billion base pairs were in the same places in the two genomes.
- **Gene editing** - To create these 'dire wolf' pups, colossal scientists edited the genome of a gray wolf and implanted embryos with the modified genome into surrogate dog mothers.

What are the advantages of de-extinction?

- **Restoration of Ecosystems** - Bringing back extinct species can help restore ecosystems that have been disrupted by their absence.
- **Environmental Balance** - Revived species can help stabilize ecosystems by reintroducing natural predators or prey.

Revival of Woolly Mammoth & Climate Change Control

- **Wolly Mammoth** - Woolly mammoth, a distant ancestor of the elephant, roamed lush grasslands across the tundra during the Pleistocene Ice Ages.
- **Arctic Tundra -** Until its extinction around 5,000 years ago, the Arctic tundra also supported large populations of bison, wolves, cave lions, and giant deer.
- **Climate Change** - As the climate warmed, these species disappeared, and the grasslands gave way to shrubbery and sheets of snow.
- **GHG Emission** - As temperatures rise, permafrost begins to disappear, resulting in high emissions of methane, a more potent greenhouse gas than carbon dioxide.
- To prevent this, some scientists at a Siberian Park have been transporting large animals that are resistant to cold to see if their foraging can restore the grasslands.
- Grass absorbs less heat than the tall trees in a shrub forest — the dominant species — and therefore decelerates warming, but it cannot stop warming.

- **Biodiversity Enhancement** - De-extinction can increase biodiversity, potentially improving ecological resilience against climate change and habitat loss.
- **Scientific Discovery** - Reviving species helps to study evolution, genetics, and ecological interactions.
- **Ethical Responsibility** - Some proponents argue that humans have a moral obligation to revive species that were driven to extinction due to human activities.

What are the issues with de-extinction process?

- **Ecological risk** - Bringing back animals that lived thousands of years ago, like the dire wolf or woolly mammoth, carries significant ecological risks.
- Reintroducing extinct species may be disrupting current ecosystems rather than restoring ancient ones.
- **Competition for ecological niche** - Reintroduced species may compete for resources such as food and habitat with native organisms, potentially leading to declines in local populations.
- **Unsuitable contemporary environment** - The environmental conditions, plant communities, prey species, and climate that once supported these animals no longer exist.

An ecological niche refers to the specific role and position an organism or species has in its environment.

- **Not a true de-extinction** – Some studies suggest that despite genetic similarities, dire wolves may not be true wolves at all, but grey wolves, with genes modified to produce an animal that resembles a dire wolf.
- **Biological risk** – Their revival may bring back the ancient deadly microbes or the revived species may not be resistant to the current deadly infectious diseases.
- **Affects conservation** – The de-extinction process may slow down the current conservation efforts.
- **Ethical Concerns** - The moral consequences of resurrecting species, questioning whether humans have the right to intervene in natural processes.

What lies ahead?

- The idea of reviving extinct animals is certainly captivating but it seems more prudent to apply this technology to protect and strengthen existing ecosystems.

13.5 Forest Conservation

Why in the News?

Recently, Supreme Court came down heavily on Telangana government for the large-scale felling of trees across 100 acres of land felling of trees in the Kancha Gachibowli area abutting the University of Hyderabad.

What is the status of forest cover in India?

- **Total Tree and Forest Cover** - 25.17 % (8.27 Lakh Sq. Km.) of the geographical area of the country is covered by trees and forest.
    - Forest Cover - 21.76%
    - Tree Cover - 3.41%
- **Increase in forest and tree cover** - There is an increase of 1445 sq km from 2021.
- **Changes in last decade (2013-2023)**
    - Increase in forest cover - 16,630.25 km²
    - Increase in tree cover - 20,747.34 km².
    - Increase in mangrove cover - 296.33 km²
    - Increase in agroforestry tree green cover - 21,286.57 km²

Forest and Tree Cover of India

in km²

Class	Area	Percentage of GA
Forest Cover	7,15,342.61	21.76
Tree Cover	1,12,014.34	3.41
Total Forest and Tree Cover	**8,27,356.95**	**25.17**
Scrub	43,622.64	1.33
Non Forest	24,16,489.29	73.50
Geographical Area of the country	**32,87,468.88**	**100.00**

To know more about India State of Forest Report 2023, Click here.

What are the challenges in forest conservation?

- **Development pressure** - Industrialisation and urbanisation are the primary reasons behind forest degradation.
- India lost around 1,73,300 hectares of forest areas due to development projects between 2014-15 to 2023-24, according to the Union Environment Ministry.
- **Mining** - In mineral-rich states like Chhattisgarh, Jharkhand and Odisha, extensive mining has been the leading cause of substantial forest loss, with over 1 lakh hectares of forestland diverted for around 500 mining projects until 2018.
- **Unsustainable agri practices** - In hilly areas of the northeast, shifting cultivation (Jhum), agriculture expansion, and extensive logging are the primary factors behind the loss of green cover.
- This made Arunachal Pradesh, Manipur, Nagaland, etc., states with the largest loss of forest cover between 2021-2023.
- **Monoculture plantations** - Natural forests are increasingly being replaced by monoculture plantations, raising concerns about weakened ecological resilience and biodiversity loss.
- Plantations are not as effective in bio diversity and soil conservation as natural forest of a region.
- **Invasive species** – Species like Lantana camara and Prosopis juliflora are one of major threats to native forests.
- **Forest cover definition** - ISFR considers as "forest cover" all land over one hectare with a canopy density above 10%, regardless of legal status or ecological value.
- This means it counts plantations, orchards, bamboo, and palm as forests.
- **Natural disasters** - From 2021 to 2023, 94% of tree loss happened in natural forests.
- **Climate Change**-Increasing Forest fire triggered by climate change and human activity and prolonged dry spells, leads to further forest degradation.
- Climate change intensifies this risk by creating warmer and drier conditions.

Between November 2023 and June 2024, the Forest Survey of India recorded 2,03,544 forest fire incidents.

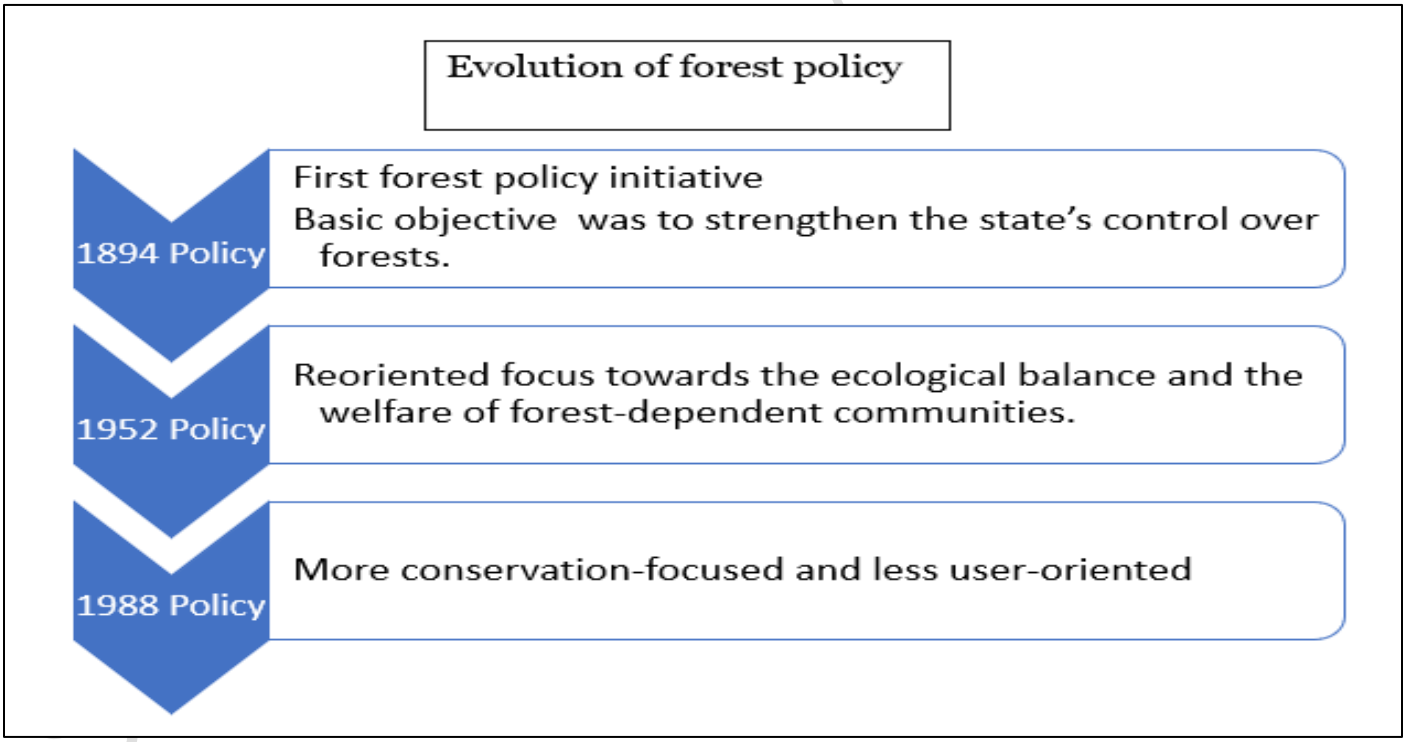
- **Deficiencies in conservation laws** - Restricting the rights of tribal communities and ignoring the conservation aspect of forest governance.

- **Forest conservation act 2023 amendment** – It excludes land recorded as forest before October 25, 1980 but not notified as a forest, and land which changed from forest-use to non-forest-use before December 12, 1996.
- This provision may go against a 1996 Supreme Court judgement on preventing deforestation.
- The amendment also provides blanket exemption for projects like zoos, eco-tourism facilities, and reconnaissance surveys may adversely affect forest land and wildlife.

- **Inadequate community participation** - Despite being the cornerstone of forest conservation policies, community participation remains limited.

What are the legal frameworks of forest conservation?

- **Fundamental Rights** – Right to a healthy environment which also includes Forest, is a fundamental right under Article 21.
- **Directive Principles for State Policy** - Article 48A of the constitution directs the state to protect and improve the environment and to safeguard the forests and wild life of the country".
- **Fundamental duty** - Article 51A (g) states that it shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wild life.
- **Indian Forest Act of 1927** – It is the foundational legislation that classifies and regulates the use of forests without defining it. It enables/allows the government to prepare the record of forest land.
- **Forest Conservation Act (FCA) of 1980** - Renamed in 2023 as Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980), It regulates the diversion of forest land for non-forestry purposes.
- **National Forest Policy of 1988** - It advocates for increasing forest cover to one-third of the country's geographical area.
- It also emphasises community participation through the ***Joint Forest Management Programme***.



- **Wildlife Protection Act of 1972** – It provides for the protection and conservation of wild life flora and fauna managing wildlife habitats.
- The Act also establishes protected areas like sanctuaries and national parks.
- **Environment Protection Act of 1986** – It provides for protecting and improving the quality of the environment including forests.
- Eco-Sensitive Zones (ESZs) around national parks and wildlife sanctuaries are declared under the Environmental (Protection) Act, 1986.
- **Biological Diversity Act of 2002** - It aims to conserve biological diversity, promote its sustainable use.

- **Forest Rights Act (FRA) 2006** - The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, recognizes and vests forest rights and occupation in forest land of Scheduled Tribes and other traditional forest dwellers.
- **Compensatory Afforestation Act of 2006** - To address the issue of forest land diversion for non-forest purposes by establishing a mechanism for managing and utilizing funds to compensate for the loss of forest land.
- **Forest Fire Prevention and Management Scheme (FPM)-** It is a centrally sponsored program that supports state and union territories in preventing and managing forest fires.
- **National Agro Forest Policy, 2014** – It focuses on integrating trees, crops, and livestock on the same land to improve agricultural productivity, livelihoods, and environmental sustainability.

What are the judicial interventions in forest conservation?

- **T.N. Godavarman Thirumulpad v. Union of India (1996)** – In this Forest Conservation case, apex court has expanded the scope of definition of by holding that the word 'forest' must be understood according to its dictionary meaning.
- This expansive definition includes all statutorily recognised forests – whether classified as reserved, protected or otherwise.
- **Doon Valley case (1988)** – In this case, The Supreme Court emphasized the need to balance economic development with environmental conservation and imposed strict guidelines on running quarries in forest areas.
- **Agasthyamalai Landscape Case** - The court emphasized the importance of forests as the "lungs of the ecosystem" and called for a scientific survey to identify encroachments and restore forest areas.
- **Narmada Bachao Andolan (2000)** – It is the Sardar Sarovar Dam case in which SC imposed strict compliance with environmental and forest laws.
- **Orans Judgment (2025)** - The Court recognized Rajasthan's sacred groves, known as "Orans," as forests.
- This judgment highlighted the cultural and ecological significance of diverse ecosystems, including mangroves, wetlands, and scrublands.
- It reinforced the importance of community stewardship in forest conservation.

What lies ahead?

- The forests in India are vital to its ecological balance, climate resilience and socio-economic sustenance of millions of people.
- It is significant to improve the quality and quantity of green cover in India.
- It is essential to provide a clear and inclusive definition of forest.
- Efforts towards enhancing community participation and promoting native species of plants for afforestation purposes might be helpful.
- Centrality of forest conservation in India's sustainable development could help ensure both ecological balance and human well-being.

13.6 Emissions trading scheme (ETS)

Why in News?

A new study found that Gujarat's cap and trade system delivered both environmental and economic benefits.

What is Gujarat's emissions trading scheme (ETS)?

- **Gujarat's ETS** – It is the world's first market for trading in particulate matter emissions, launched in Gujarat's Surat.
- The programme, operational for over five years, was the first of its kind globally for particulate matter and India's first pollution trading scheme of any kind.
- **Developed by** - Gujarat Pollution Control Board (GPCB), in collaboration with the Energy Policy Institute at the University of Chicago.
- **Features of the scheme** - Under the programme, 318 large coal-using industrial plants were required to install Continuous Emissions Monitoring Systems (CEMS).

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- **Real time tracking of pollution** – It allowed thereal-time tracking of particulate matter emissions, shifting from the earlier system of periodic spot checks.
- **Emission cap** - GPCB set an overall cap on the total mass of particulates that could be emitted collectively by all plants over a compliance period.
    - *Initially, GPCB capped total particulate emissions at 280 tonnes per month.*
- Up to 80 per cent of the total cap was distributed for free, proportional to a plant's emissions potential and the remaining 20 per cent were auctioned off weekly.
- **Permit Trade** - The plants could then trade these permits, creating a financial incentive to reduce emissions where it was cheapest to do so.
- **Penalties** - Any firm that failed to hold sufficient permits to cover its emissions at the end of a compliance period faced penalties based on the size of the shortfall.

What are the benefits of emission trading scheme?

- **Environmental impact** - By setting a cap on emissions, ETS ensures that overall pollution levels decrease over time.
- In the Gujarat's pilot project, Particulate emissions were reduced by 20 to 30 %.
- **Cost-effectiveness** - ETS allows businesses to reduce emissions in the most economical way by trading allowances.
- Companies that can reduce emissions at a lower cost can sell their surplus allowances to others.
- Due to the ETS in Surat, Pollution abatement costs dropped by over 10 %.
- **Economic incentives** - Companies are financially motivated to reduce emissions, as they can profit from selling unused allowances.
- **Flexibility** - Businesses have the freedom to choose how they meet their emission targets, whether by reducing emissions directly or purchasing allowances.
- **Encourages innovation** - ETS drives technological advancements as companies seek innovative ways to reduce emissions and stay competitive.
- Improved compliance with environmental regulations - Compliance with environmental laws rose to 99 per cent among participating plants.

What are the challenges in implementing emission trading scheme?

- **Allocation of Allowances**- Establishing the correct emission cap level, deciding on the method for allocating emission allowances (auction vs. free allocation) will be challenging.
- **Monitoring and reporting** - Ensuring accurate and reliable monitoring and reporting of emissions is crucial for the integrity of the scheme and requires significant investment in technology and infrastructure.
- **Price fluctuation** - The market-based nature of ETS can lead to volatile prices for emission allowances, making it difficult for companies to plan and invest in low-carbon technologies.
- **Carbon Leakage** - Companies may relocate production to countries with less stringent emission controls to avoid the costs associated with the ETS, undermining the environmental benefits of the scheme.
- **Diversion of responsibility** - The costs of purchasing emission allowances may be passed on to consumers, potentially leading to higher energy prices and disproportionately impacting low-income households.

What lies ahead?

- Adopting continuous emission monitoring systems and standardized reporting protocols can ensure data accuracy and transparency.
- Enhancing verification processes with third-party audits to maintain market integrity.
- Introducing price floors and ceilings to mitigate volatility and provide investment certainty for low-carbon technologies

India's Carbon Credit Trading Scheme (CCTS)/ Indian Carbon Market

- **India's Carbon Credit Trading Scheme (CCTS)** – It is a market-based mechanism aimed at reducing greenhouse gas emissions by incentivizing industries to reduce emissions and trade carbon credits.

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- The scheme replaces the existing Perform, Achieve, and Trade (PAT) scheme, which focused on energy efficiency improvements.
- **Legal Framework** - The Energy Conservation (Amendment) Act, 2022, provides the legal basis for the CCTS and allows for the issuance of Carbon Credit Certificates (CCCs).
- **Regulatory Body** -The Bureau of Energy Efficiency (BEE) is responsible for implementing and overseeing the CCTS.
- **Carbon credit certificates (CCCs)** - Each CCC will represent one tonne of CO_2 equivalent (tCO_2e) reduction or removal from the atmosphere.
- The BEE will issue the CCCs, which will be traded through the country's power exchanges.
- **Mechanisms** - CCTS incorporates both a compliance mechanism for obligated entities (primarily energy-intensive industries) and a voluntary offset mechanism for other entities.
- **Compliance Mechanism** - CCTS will take the form of an intensity-based 'baseline-and-credit' scheme.
- Obligated entities will be assigned emission intensity targets, and if they exceed their targets, they must purchase carbon credits from those who have reduced emissions below their targets.
- **Offset Mechanism** - Non-obligated entities can participate in the scheme by registering projects that reduce, remove, or avoid GHG emissions and earning carbon credits.
- **Scope** - The CCTS will initially cover carbon dioxide (CO_2) and perfluorocarbons (PFCs), with provisions to expand to other greenhouse gases in the future.
- The scheme will cover both direct (scope 1) and indirect (scope 2) emissions.

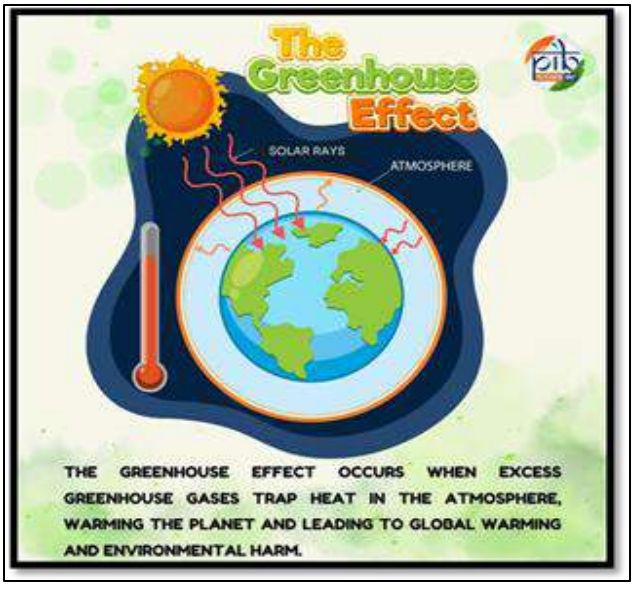
13.7 Greenhouse Gases Emissions Intensity (GEI) Target

Why in the News?

The government has notified draft Rules introducing targets for the reduction of greenhouse gas (GHG) emissions by "obligated entities" in energy-intensive sectors and industries.

What is Greenhouse Gases Emissions Intensity (GEI) Target Rules?

- **Green House Gases** - GHGs are gases that trap heat in the atmosphere and contribute to the "greenhouse effect" that raises surface temperature on Earth.
- The five most abundant GHGs in the atmosphere are water vapour, carbon dioxide, methane, nitrous oxide, and ozone.
- Other GHGs include synthetic fluorinated gases such as chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs).
- **GHG emissions intensity (GEI)** – It is the amount of GHGs that are emitted per unit of product output.
- For example, the amount of GHGs that are released in the production of, say, 1 tonne of cement, aluminium, or paper, etc.
- **tCO_2e Unit** – The emission is measured in tCO_2e/ equivalent output or product" i.e. tCO_2e, or tonnes of carbon dioxide equivalent.



- **GEI Target Rules** - Ministry of Environment, Forest and Climate Change has introduced the draft rules introducing targets for the reduction of greenhouse gas (GHG) emissions by "obligated entities" in energy-intensive sectors and industries.
- **CCTS compliance mechanism** – The rules put in place a compliance mechanism for the Carbon Credit Trading Scheme, 2023 (CCTS).

*The **CCTS** was launched to create a framework for the trading of carbon credits, to facilitate the reduction of emissions in energy intensive industries, and to support India's climate commitments under the Paris Climate Agreement of 2015.*

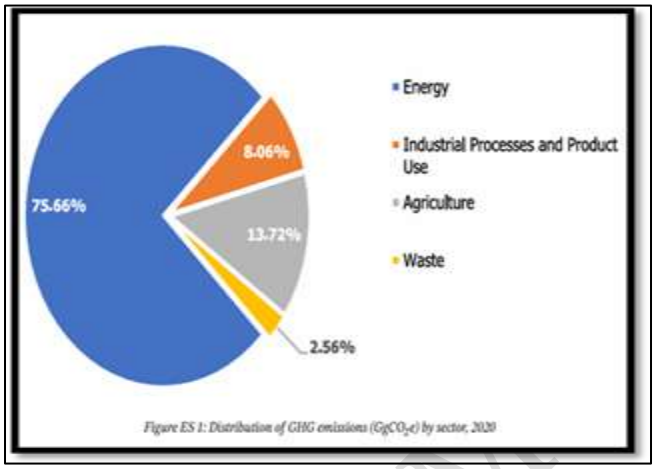


Figure ES 1: Distribution of GHG emissions ($GgCO_2e$) by sector, 2020

- **Emission reduction targets** - The Rules set forth baseline emissions for 2023-24 and define gradual reduction targets for the years 2025-26 and 2026-27.
- **Target industries** - These targets, for a two-year period starting 2025-26, cover 282 entities or industrial units in these industries — 13 aluminium plants, 186 cement plants, 53 pulp and paper plants, and 30 chlor-alkali plants.
- Among the large corporations that have been assigned targets under the Rules are Vedanta, Hindalco, Bharat Aluminium, JSW Cement, Ultratech, Nalco, JK Cement, Dalmia Cement, Shree Cement, Grasim Industries, and JK Paper.
- **Compliance mechanism** - The Rules also lay down the mechanism for industries to comply with these targets, and specify penalties for their failure to do so.
- **Penal provision** - Industries that fail to meet their obligations under the carbon trading scheme would have to buy credits to meet their compliance shortfall, or be penalised by the Central Pollution Control Board.

What are the significances of these target rules?

- **Meeting climate goals** - The introduction of industry-specific targets Rules aim to help India meet a key commitment made under the Paris Agreement.
    - To reduce the emissions intensity of its gross domestic product (the amount of energy used per unit of GDP) by 45% by 2030 compared to 2005 levels.
- **Greening Indian industries** - The ultimate objective is to push industries towards a low-carbon growth trajectory through reduction, removal or avoidance of GHG emissions.
- A cement plant can, for example, reduce its GEI by adopting cleaner and greener processes in the various stages of production.
- It could replace the use of coal with biomass, and adopt cleaner, more energy-efficient kilns.
- **Incentivising industries to decarbonise** - Industries will be issued carbon credits for cutting emissions intensity, which they can trade on India's carbon market.
- Carbon credits are traded through the Indian Carbon Market platform, with oversight of the Bureau of Energy Efficiency under the Union Ministry of Power.
- The availability of credits provides industries with the incentive to decarbonise.
- **Technology upgradation of industries** - The Rules promote the adoption of sustainable, cutting-edge technologies across traditionally high-emission industries, for addressing climate change.
- **Policy clarity** - With the introduction of the GEI targets, industries will know what exactly to achieve in order to earn carbon credits.
- They will also have to create action plans towards achieving those goals.
- **Economic transition** - This would enable sustainable value creation, spur innovation, reallocate capital to efficient players, and drive a new competitiveness rooted in low-carbon advantage.

What lies ahead?

- The rule recognises the need to balance industrial growth with climate commitments, while introducing a clear market mechanism for carbon trading and enforceable penalties for non-compliance.
- The MoEFCC's proposal will require stringent monitoring, reporting, and verification systems to ensure transparency and credibility.
- The success of the GEI rules will depend on the government's ability to set targets that are ambitious yet achievable.
- Overly aggressive mandates could backfire, encouraging non-compliance or evasive practices among companies.
- Equally important is the need to foster a stable, transparent carbon market with reliable pricing signals to drive genuine behavioural change.
- As the global economy accelerates its shift toward sustainable production, India must match ambition with execution.

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- By embedding environmental responsibility into industrial policy, the GEI Target Rules represent a forward-looking move—both for the climate and for India's economic competitiveness on the world stage.

14. SCIENCE & TECHNOLOGY

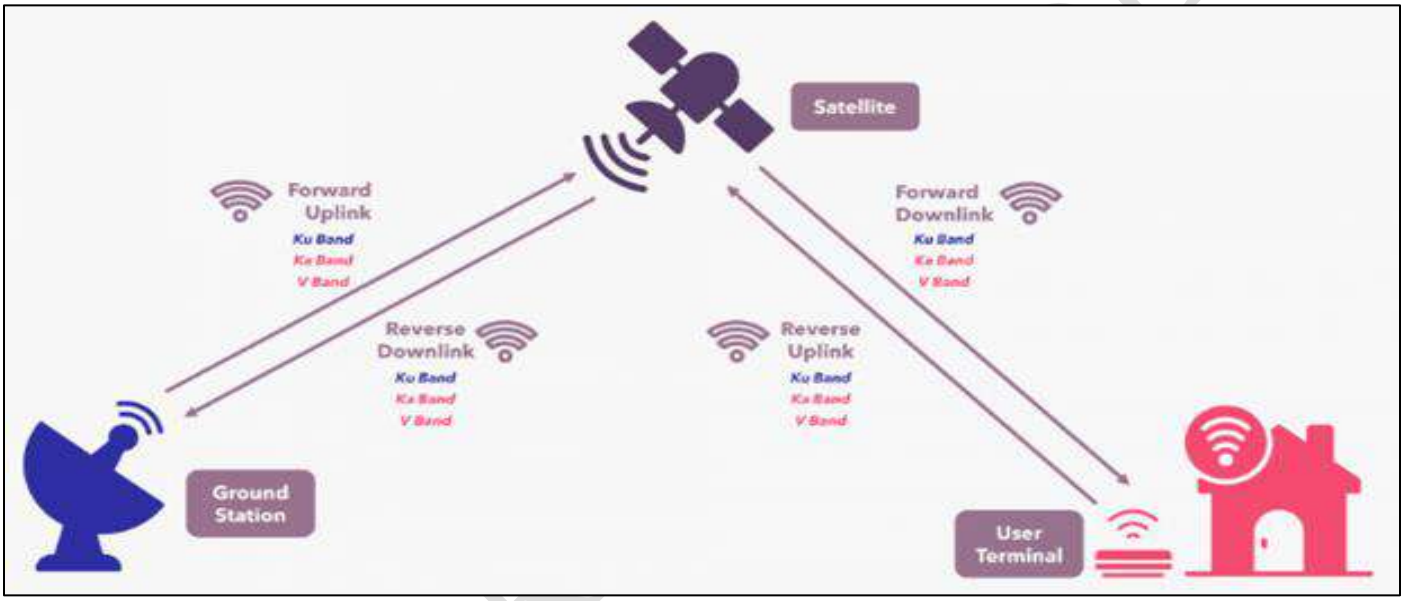
14.1 The Geopolitics of Satellite Net

Why in news?

Recently, SpaceX partnered with Airtel and Jio to expand Starlink services across India.

What is satellite net?

- **Satellite broadband technology** – It is also known as satellite telephony, a satellite communication technology using satellite constellations in the Low Earth Orbit (LEO).
- It is a *high-speed wireless communication* to bring internet traffic to a consumer's home/office via a satellite network in space.



- **Data speeds** – It can go *beyond 300 Mbps*, but initial peak speeds likely 100 Mbps.
- **Working** – A satellite network involves *geostationary or low-earth orbit (LEO) satellites*.
- The heart of the network operation is an *earth station gateway* located in a particular region that links satellite network to the Net.
- Consumer needs a device, called a *user access terminal* (UT) and antenna to connect to a satellite network.

Satellite Constellation Project	Owning Agency
BlueBird satellites	AST SpaceMobile.
Starlink network	SpaceX
Project Kuiper	Amazon
OneWeb	ISRO & Uk's OneWeb Group

What are the aspects of satellite internet with regard to economic and geopolitical conditions?

- **Digital Sovereignty** – It refers to a country's or organization's ability to control its own digital assets, data, and infrastructure, encompassing both
  - **Data sovereignty** – Governing data within its borders
  - **Technological sovereignty** – Controlling its digital environment.
- Here, the nations have both profitable telecommunications and strategic independence.

- **Example**: *China's GuoWang constellation*, where China has high economic value and high geopolitical control.

- **Market Dominance** – It refers to a situation where a company holds a significant share of the market, potentially leading to a monopolistic structure whereby, the host nation depends on a single private entity for essential connectivity services.
  - **Example**: *Starlink*, which currently offers commercial potential but placing control largely outside the host nation's hands.
- It is a scenario of high economic value but low geopolitical control for the host nation.
- **Strategic Asset** – It refers to a satellite capability or infrastructure that is crucial for national security and strategic independence, even if it's not economically viable on its own.
  - **Example**: *India limited indigenous satellites*, like NAVIC System prioritizes strategic independence over immediate economic returns.
  - It is of low economic value and high geopolitical control.

NavIC (Navigation with Indian Constellation) *is a regional navigation satellite system of India, designed with a constellation of 7 satellites providing Standard Position Service (SPS) for civilian users and Restricted Service (RS) for military purposes.*

- **Marginal Presence** – It is the scenario of having limited economic value and strategic influence due to being in a developmental phase or lacking significant global impact.
  - **Example**, *Amazon's Kuiper project*

What are the significances of Starlink-Airtel & Jio partnership?

Starlink
• It is a satellite internet network, the *world's 1st and largest satellite constellation*, a constellation of many satellites that orbit the Earth, at about 550 km, and cover the entire globe. • **Launched in** – 2019, by SpaceX, an American company. • **Coverage** – Over 70 countries • **Objective** – To provide *high-speed internet coverage* to every part of the world and to provide global mobile phone service. • Working – It involves beaming *internet data via radio signals* through the vacuum of space. • Ground stations then broadcast those signals to orbiting satellites, which relay the data back to Earth-side users.

- It could act as a fundamental shift in the conceptions of connectivity, national sovereignty, and economic power in the digital age.
- **Economic benefits**

For Airtel and Jio	Starlink allows them to provide high-speed Internet to India's most remote regions without the infrastructure costs of terrestrial networks.
For SpaceX	It opens up a huge market in India.

- **Administrative advantage** – It also *takes care of India's complex regulatory landscape* by channelling Starlink's technology through domestic players.
- **Geopolitical significance** – This partnership indicates a geopolitical realignment in the Indo-Pacific region.
- It gives the *U.S. an advantage* in the competition for digital influence, particularly as China develops its rival GuoWang constellation.
- **Digital sovereignty** - The partnership model adopted by Airtel and Jio creates a buffer that preserves some measure of sovereignty.
- *Technology transfer provisions and local data storage* requirements could protect India's concerns and also enhance India's long-term capabilities.

What are the challenges in this partnership?

- **Monopolistic concerns** – With around 7,000 satellites already in orbit, SpaceX enjoys first-mover advantages in the low earth orbit internet market.
- **Economic problems** – There are problems of *competition, pricing, and dependency*.
- **Security concerns** – It runs the risk of having *private companies influencing nation-state* over critical infrastructure.
    - SpaceX briefly cut Ukraine's Starlink access during critical military operations in 2022.

> ***OneWeb**, another constellation and closest competitor to starlink, operates fewer than 650 satellites, while Amazon's Project Kuiper remains very small.*

- **Absence of the Bharat Sanchar Nigam Limited (BSNL)** - BSNL could have helped reduce some of India's strategic concerns as it is a state-owned enterprise with extensive rural presence.
- Non-inclusion of it resulted in *losing of more direct government oversight* and broader reach.
- **Governance challenges** – It will include *orbital debris management, and space traffic control*.
- Their transnational nature will require international governance cooperation even amid strategic competition

What lies ahead?

- **Developing indigenous solutions** – Continuing *investment in ISRO's satellite internet* projects to reduce long-term dependency.
- **Following Hybrid model** – It can try to balance technological pragmatism with strategic autonomy.
- **Inclusion of BSNL –** Partnering with BSNL can ensure digital sovereignty of India.
- **Encouraging competition** – Opening up for multiple satellite providers (like OneWeb, Amazon Kuiper) to prevent monopoly.
- **Enhancing accessibility** – Involving some *innovative sales techniques*, such as tiered pricing models and package deals, would be needed.

> ***Tiered pricing models** offer customers different levels of service or features at varying price points, allowing them to choose options that best suit their needs and budgets.*

14.2 Genetic Mapping of Indians

Why in News?

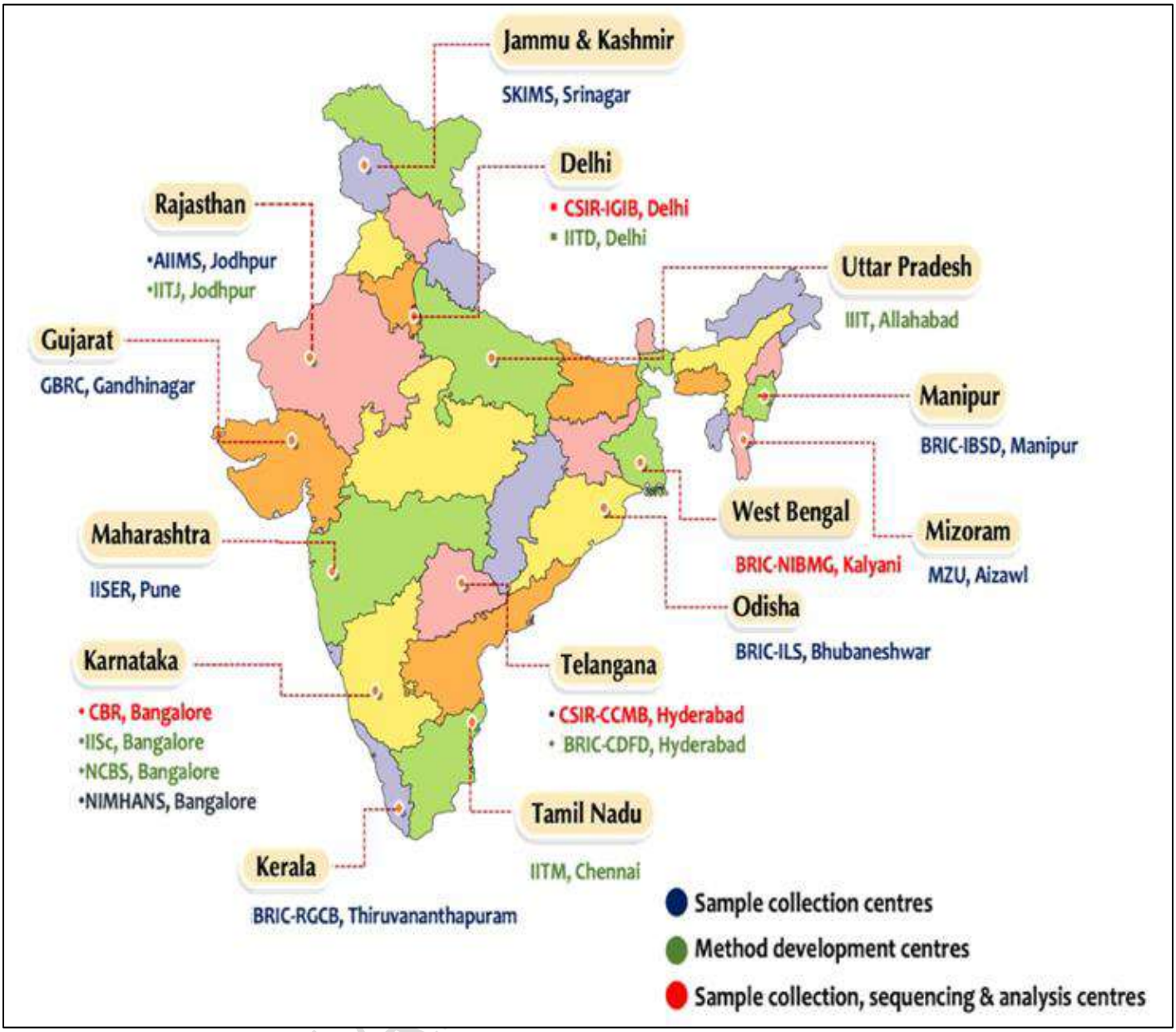
Recently, the preliminary findings of the Genome India project, were published in the journal Nature Genetics.

What is the Genome India Project?

- **A genome** – It is the complete set of genetic information for an organism, encoded in DNA or RNA. It contains all the instructions for an organism's development and maintenance.
- **Genome India** – It is a is a pioneering scientific project funded by the Department of Biotechnology, Ministry of Science and Technology, Government of India.
- **Objective** - To build a comprehensive catalogue of genetic variations that reflect the unique diversity of the Indian population.

> ***Genetic variation** refers to the differences in DNA sequences between individuals within a species or population. These differences are often expressed as variations in genes, which are then passed down to offspring, leading to a range of traits within a population.*

- **Collaborative work** - The project marks a landmark collaboration of 20 academic and research institutions to drive a genomics-based health revolution for India.
- **Sample collection** - A total of 20,000 samples have been collected from 83 diverse populations (30 tribal and 53 non-tribal), cutting across the length and breadth of India.
- **Data collection** - Blood samples and associated phenotype data such as weight, height, hip circumference, waist circumference and blood pressure were collected.
- **Sample diversity** - Samples were collected from inhabitants of over 100 distinct geographical locations to estimate the relatively rare mutations that are important to understand complex diseases.



- **Genomes of five tribes across India** - Tibeto-Burman tribe, Indo-European tribe, Dravidian tribe, Austro-Asiatic tribe, and a continentally admixed outgroup — were sequenced.
- **Genomes of three non-tribes** — Tibeto-Burman non-tribe, Indo-European non-tribe, and Dravidian non-tribe — were also sequenced.
- **Unrelated individuals** - The samples were taken from unrelated individuals to ensure accurate estimation of mutation frequencies across groups.
- **Parent-child pairs** - Three to six parent-child pairs were included in each population group to uncover de novo mutations (mutations that occur randomly in a child but not seen in parents).

> ***Indigen*** *is the genome sequencing project of Council of Scientific and Industrial Research (CSIR) for conducting a "whole-genome sequence" of a 1,008 Indians.*

What do the preliminary findings reveal?

- **Sample sequencing** - Whole genome sequencing has been completed for 10,000 samples and the data for 10,000 individuals have been archived at the Indian Biological Data Centre (IBDC).
- After excluding two populations, the published findings are based on the genetic information of 9,772 individuals — 4,696 male participants and 5,076 female participants.
- **Mutations** - In total, 180 million mutations have been found from the individuals sequenced.
    - *A **mutation*** is a change in the DNA sequence of an organism resulting from errors in DNA replication or from exposure to environmental factors like radiation or chemicals. Mutations can be beneficial, harmful, or have no effect.

- While 130 million variations are in the non-sex chromosomes (22 pairs of autosomes), 50 million mutations are in the sex chromosomes X and Y.
- A large number of the 180 million variants found in the sequenced genomes of 9,772 individuals are very likely to be present in the non-coding regions.

Non-coding DNA refers to the regions of a genome that do not directly code for proteins. While previously thought to have no function, non-coding DNA plays vital roles in various cellular processes and is crucial for gene regulation, genome structure, and evolution.

- **Tracing evolutionary history** - Polymorphisms or variations in the non-coding regions of the human genome, particularly the mutations that are evolutionarily conserved, will help in tracing evolutionary history.
- Many of the "contemporary Indian populations have originated from a few founding groups and have maintained distinct identities through centuries of endogamy.
- **Prevalence of endogamy** - It is highly prevalent in all the 83 population groups under study, though the degree varies.
    - ***Endogamy*** *is the cultural practice of mating within a specific social group, religious denomination, caste, or ethnic group.*
- **Effect of endogamy** - As a result of the centuries-long practice of endogamy, population-specific unique variations, including distinct disease-causing mutations with amplified frequencies, are likely to be seen within specific groups.

What are the significances of these studies?

- **Recognising India's genomic landscape**- While the global genomic landscape is predominantly Eurocentric, and India has been severely underrepresented in these studies.
- The study is therefore important for having captured the genetic diversity of "one of the highly underrepresented populations in the global genomics landscape".
- **Public policy development** - Genetic mutations found associated with endogamous population-specific diseases will help the government to come up with targeted public health policies.
- **Spur further studies** - The 130 million variations identified are expected to spur studies that aim to determine the possible roles of population-specific genetic mutations in various diseases.
- **Medical implications** - Understanding genetic variations can pave the way for precision medicine, ensuring treatments and interventions tailor-made for Indian genetic profiles.
- The data on variants associated with diseases will enable the development of affordable, genomics-based diagnostic tools, facilitating early detection, and prevention and management of diseases in India.

14.3 Technology and the Rise of Great Powers

Why in the News?

Recent tariff war between US and China on electric cars has reignited the talks on role of technology in global power transition.

What is the role of technology in global power transition?

- **Technology & Power** - Transitions in the balance of power in the international system are often driven by technology.
- **Current global power transition** - Technology is at the core of the current great power competition between China and the United States.
- **Sectoral competition** - Countries gain advantage by getting ahead in what are known as the leading sectors.
- **Technology dominance** - They innovate, acquire the lead-in, and then, for a brief period, accrue first-mover advantage or monopoly rents from their dominance in leading technologies.
    - During the Industrial Revolution, Britain acquired a leading edge in critical innovations in industries like textiles.
    - During the Second Industrial Revolution, Germany challenged Britain, by acquiring an edge in leading sectors, like the chemical industry.
    - In the late 1970s, Japan dominated industries like consumer electronics and cars.

- **Economic influence** - Nations that invest in cutting-edge technology, like artificial intelligence, renewable energy, and biotechnology, tend to gain a competitive advantage in global markets.
- **Military dominance** - Technological advancements such as cyber warfare capabilities, drone technology, and advanced surveillance systems significantly impact military power.
- **Global influence** - Robust digital ecosystems, including widespread internet access and data infrastructure enhances country's global influence in sectors such as trade, education, and communication
- **Soft power** - Technology enables nations to project cultural and ideological influence through social media, streaming platforms, and digital content.
- The ability to shape narratives and foster international collaboration strengthens soft power.

What is the role of General Purpose Technologies?

- **General Purpose Technologies (GPTs)** - They are innovations that have widespread applications across various industries and economic sectors.

Examples of GPTs	
Electricity	Revolutionized energy production, distribution, and usage, impacting industries and daily life.
Internal Combustion Engine	Enabled the development of mass-produced vehicles and transformed transportation.
Information Technology (IT)	Includes the internet and computing, fundamentally changing communication, information processing, and business operations.
Artificial Intelligence (AI)	Potentially a transformative GPT, offering numerous applications across various industries.

- **Economic transition** – GPTs can affect an entire economy and are often seen as catalysts for major shifts in economic activity.
- **Sustained growth** - GPTs can be a backbone for sustained economic growth by increasing the efficiency and productivity of various sectors.
- **Waves of innovation**- The development and adoption of GPTs often lead to periods of rapid innovation and productivity growth.
- **Macroeconomic effects** - GPTs can have far-reaching effects on the overall economy, including changes in productivity, employment, and income distribution.

Key Differences between General Purpose Technologies (GPTs) and Dominant Technologies		
Feature	**General Purpose Technologies (GPTs)**	**Dominant Technologies**
Scope of Impact	Economy-wide, cross-sectoral	Specific sector or market
Role	Enable further innovation and productivity gains	Become standard within a product/industry class
Innovation	Spawn complementary innovations across sectors	May limit innovation to incremental improvements
Adoption	Broad, transformative, often leads to new industries	Widespread within a niche, may block alternatives
Persistence	Long-term, due to continuous improvement and adaptability	Due to network effects, interrelatedness, and switching costs
Examples	Electricity, steam engine, internet	QWERTY keyboard, VHS, Windows OS, Electric Car

How had GPTs empowered countries than dominant sectors?

- **Britain's GPT in 1st Industrial Revolution** - Britain's ability to produce and diffuse iron-based machines across a large number of sectors played a crucial role in its power dominance in the 19th century than the it's textile sector.
- **2nd Industrial Revolution** - In the second revolution, Germany was ahead in most leading sectors.
- But the US became the power by being able to diffuse engineering skills and instituting standards that allowed general-purpose technologies like electricity to be adopted far more rapidly.
- **3rd Industrial Revolution** – During this period, though Japan seemingly had the advantage in some leading sectors like consumer electronics, its ability to diffuse GPTs like computerisation was limited.
- The US, by contrast, did not rely on dominance in a few sectors, but greater diffusion of technology that could transform a number of sectors simultaneously.
- **Contemporary GPTs** - A contemporary example might be that AI is a technology that can potentially be adopted across a large number of sectors, leading to productivity gains across the economy.

What is the takeaway for India?

- The basis of national power will have to be the diffusion of GPTs that enhance productivity across the economy and produce a range of accumulated improvements across complementary sectors.
- To become a technology leader, we have to focus more on broad-based policies that allow for the diffusion of GPTs, than getting dominance in specific sectors and more on.
- Diffusion of GPTs requires more systemic change as widespread enhancement of human capital, institutional adaptability and facilitating interoperability of technologies.
- It requires consistent, widespread and foundational investments rather than the creation of technologies in mission mode.

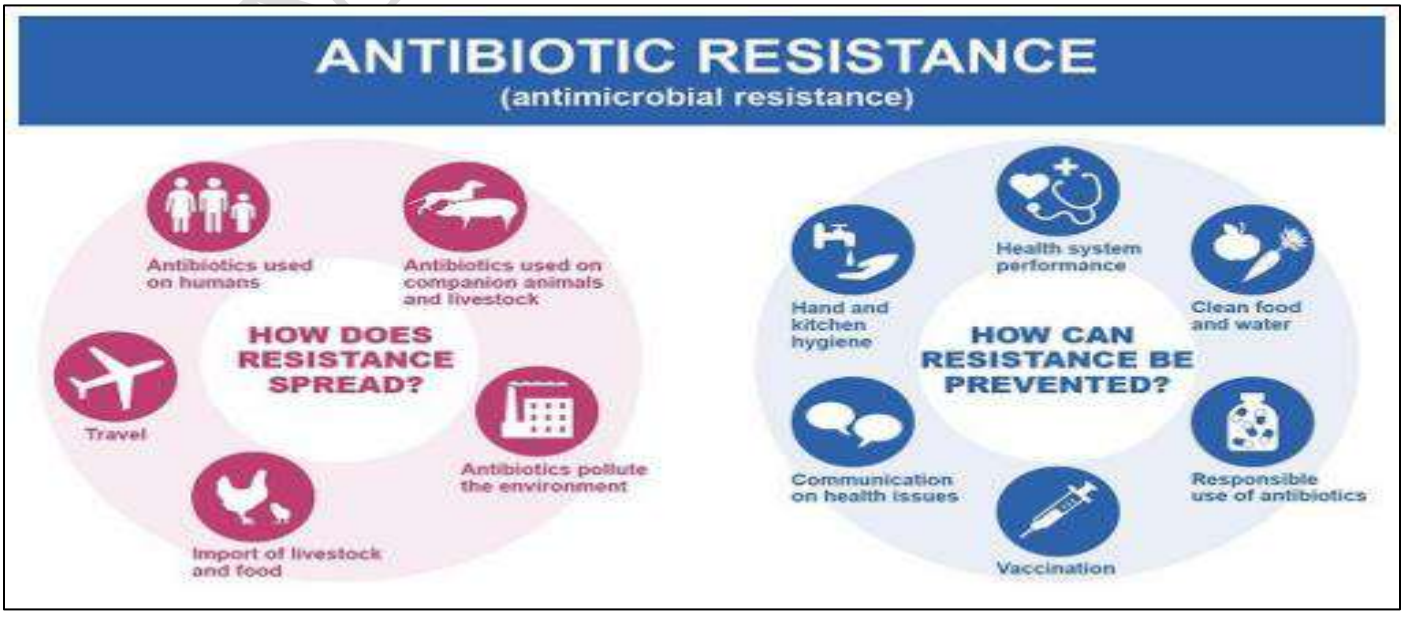
14.4 Antimicrobial Resistance

Why in the News?

A recent study funded by Welcome and the United Kingdom Department of Health and Social Care's Fleming Fund, estimates that bacterial AMR alone will cause 39 million (3.9 crore) deaths between 2025 and 2050.

What is Antimicrobial Resistance (AMR)?

- **Antimicrobials** – These are medicines, including antibiotics, antivirals, antifungals and antiparasitic, used to prevent and treat infections in humans, animals and plants.
- **AMR** - It is defined as resistance of micro-organisms to an antimicrobial agent to which they were first sensitive.
- **AMR in India** - Multiple types of bacteria like E. coli, Klebsiella, Acinetobacter, Staphylococcus aureus, enterococcus have even become resistant to some of the latest generation antibiotics.



- **Causes of AMR**
    - **Natural evolution** - Microbes naturally adapt over time, developing resistance through genetic mutations.
    - **Overuse & misuse of antibiotics** - Excessive or inappropriate use of antibiotics in humans, animals, and agriculture accelerates resistance.
    - **Poor infection control** - Inadequate hygiene and sanitation in healthcare settings and communities allow resistant microbes to spread.
    - **Environmental contamination** - Pharmaceutical waste and improper disposal of antibiotics lead to the spread of resistant genes in soil and water.
    - **Global travel & trade** - Resistant microbes can spread across borders through travel, food, and environmental exposure.

What are the impacts of anti-microbial resistance?

- **Reversing progress in infectious diseases control** - AMR also threatens to undo decades of progress made against infectious diseases such as tuberculosis, typhoid and pneumococcal pneumonia, among others, with new multidrug resistant strains now in circulation.
- **Increase in mortality** - Bacterial AMR alone will cause 39 million (3.9 crore) deaths between 2025 and 2050, which translates to three deaths every minute.
- 30,000 newborns in India die annually in intensive care units as they are resistant to drugs.
- **Longer hospital stays** - Resistant infections require prolonged treatment, straining healthcare systems and increasing costs.
- **Burden on healthcare systems** - AMR increases pressure on already overburdened healthcare systems, especially in developing countries like India
- **Economic burden** - AMR could result in up to $3.4 trillion in GDP losses per year by 2030.
- **Fungal impact during COVID 19** - Only in India did COVID-19 patients' contract 'black fungus', which she pointed out was the direct result of indiscriminate use of steroids.

What are the challenges in controlling AMR?

- **Over-the-counter availability of antibiotics** - In India, antibiotics are often sold without a prescription, making it easy for people to self-medicate.
- This leads to inappropriate use, such as not completing full courses or using antibiotics for viral infections where they are ineffective.
- **High population density** - In densely populated urban areas and slums such as in Mumbai, Delhi, poor sanitation and close human contact accelerate the transmission of drug-resistant pathogens.

Population density of major Indian cities

- The population density of India in 2011 was 382 per sq. km.
- India has some of the most densely populated cities in the world. Here are a few notable ones
- **Kolkata**: Approximately 30,097 people per square kilometre.
- **Mumbai**: Around 20,634 people per square kilometre.
- **Delhi**: One of the highest densities, with 11,320 people per square kilometre.
- **Chennai**: About 2,555 people per square kilometre.

- **Prevalence of infectious diseases** - India has a high burden of infectious diseases like tuberculosis, typhoid, and respiratory infections.
- This leads to heavy antibiotic use, increasing the chances of resistance development.
- **Multidrug-resistant strains** - Diseases like tuberculosis (especially MDR and XDR-TB) are already showing dangerous levels of resistance in India, complicating treatment protocols.
- **Lack of awareness about AMR** – Adequate awareness about the causes and impact of anti-microbial resistance has not been created among people.

- **Weak enforcement** - Although rules like Schedule H1 of the Drugs and Cosmetics Act exist to regulate antibiotic sales, enforcement is inconsistent, especially outside major urban centres.
- **Inadequacy of genomic methods** - while genomic sequencing can help track how pathogens evolve and acquire resistance, it still doesn't have direct utility in helping clinicians make difficult, and urgent, lifesaving decisions.

What are the global and national initiatives against AMR?

- **UN meeting on AMR** - In 2016, the United Nations General Assembly (UNGA) convened its first High-Level Meeting (HLM) to address the root causes of AMR and develop national action plans, regulate antimicrobials, and promote awareness and best practices.
- With this mandate, many countries prepared their national action plans.
- **2nd High-Level Meeting on Antimicrobial Resistance (AMR)** – It was held in 2024 to identify gaps, invest in sustainable solutions, improve R&D, strengthen surveillance, and ensure constant monitoring in the lead-up to the next review in 2029.
- **India's Plan** - National action plan on AMR was launched in 2017, for improving awareness, reducing infections, optimising antimicrobial use, strengthening surveillance, increasing investment, and enhancing India's leadership in AMR.
- **Delhi Declaration on Antimicrobial Resistance (AMR)** – It is an inter-ministerial consensus signed by Indian government ministers in 2017.
- It outlines a commitment to addressing AMR through a One Health approach and emphasizes the need for multisectoral collaboration.
- **2011 H1 Rule** – It is the rule of Indian government to prohibit the sale of all antibiotics — first, second, and third-line — without a prescription.
- It was modified by the Indian government to allow the sale of first-line antibiotics.
- **Capacity building** - Government bodies such as the Indian Council of Medical Research (ICMR), the National Centre for Disease Control (NCDC) and the Indian Council of Agricultural Research (ICAR) have established surveillance networks to focus on priority pathogen groups and communicate critical data to policymakers and researchers.
- **Generating epidemiological data and trends** - At the Christian Medical College, Vellore (CMC), the country's reference AMR institution, researchers are sequencing representative strains to generate important epidemiological data and trends.
- They are also using genomic markers for rapid and robust diagnosis, supporting the national AMR efforts under the mentorship of ICMR.
- **Introduction of novel antibiotics** - Recent breakthroughs from India in antibiotics development such as cefepime-enmetazobactam, cefepime-zidebactam, nafithromycin, and levodifloxacin, mark a significant global advancement in the fight against multidrug-resistant pathogens.
- These drugs offer new therapeutic options that can reduce reliance on carbapenems and last-resort agents like colistin.
- **Use of AI** - A new AI-driven tool, AMRSense, developed by a team of researchers, has been deployed to use routine data that is generated in hospitals to generate accurate and early insights on antimicrobial resistance at the global level, national level and hospital level.

In early January this year, Kerala became the first State in the country to ban the over-the-counter sale of antibiotics without a prescription.

What lies ahead?

- Hospitals should conduct surveillance of infections on their premises, and the results should be made public.
- By analysing water let out by pharmaceutical industries and hospitals, we can get an idea of the level of antimicrobial resistance.
- Genomic testing laboratories set up during the COVID-19 pandemic can be used to measure the level of antimicrobial resistance by analysing effluents from pharmaceutical companies and hospitals.
- Public health experts can use genomic data to anticipate microbial evolutionary trajectories and emerging AMR trends.
- This can inform the most appropriate choice of antibiotics when patients are treated empirically (which is mostly the case).

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- Diagnostic companies should use large-scale population genomics to build precision tools that could be made available at, or near the point-of-care.

- For example, genomic studies on Salmonella enterica serovar Typhi (the bacterium causing typhoid fever) reveal how the H58 lineage has acquired multidrug resistance over time.
- Researchers identified single nucleotide polymorphisms (SNPs) from whole-genome sequencing data, which are now being used to create targeted molecular diagnostics.
- This enables faster and more cost-effective detection of drug-resistant strains, instead of sequencing each circulating strain.

- Given the magnitude of the AMR crisis, genomic surveillance and integrated public health systems can only work efficiently if they are supported by a carefully designed communication strategy to improve awareness.
- Developing antimicrobial stewardship among healthcare professionals, including both physicians, pharmacists and other unorthodox or informal practitioners that form an important pillar of frontline healthcare delivery.
- India has the tools, the talent, and the urgency to lead the world in curbing antimicrobial resistance.
- But all scientific efforts need to be unified and communicated to the general public and experts alike, in ways that resonate with them.

14.5 Generative AI and Copyright Conundrum

Why in the News?

OpenAI sued for copyright infringement by publisher Ziff Davis.

What is copyrights law?

- **Copyright** – It is a legal right granted by the law to creators of literary, dramatic, musical, artistic works and producers of cinematograph films and sound recordings.
- **Objective** - Copyright is aimed at safeguarding the creator's original expressions from unauthorised use, which can include copying, adapting and distributing the copyrighted material without permission.
- **Duration of copyright**- The copyright owner is bestowed with ownership over the work for a limited number of years.
- **In India** – Under Copyright Act, 1957, copyright protection for original literary, dramatic, musical, and artistic works lasts for the author's lifetime plus 60 years from the year following their death.
- For other works like cinematograph films, sound recordings, and photographs, copyright lasts for 60 years from the end of the year of first publication.
- **Post ownership period** - Once the ownership period ends, the work enters the public domain, whereby it becomes common for all to use.
- **Exemptions** - The copyright laws in general provides certain exceptions to infringement such as private use and non-commercial use.

Previous encounters of Copyright law with Technologies

- **Photocopying machine** - when it was invented, it was a common fear among the creative community that copying would become rampant and the law-given monopoly would no longer remain meaningful.
- **Internet** - When the Internet boom occurred, it was again felt that the creative works were open in the virtual space that enabled people to have access to copyrighted work by bypassing the legal route.

Generative AI

- It is a type of artificial intelligence that focuses on creating new content, like text, images, music, or videos, based on patterns and examples from existing data.
- It learns from vast datasets to generate novel outputs, going beyond traditional AI which primarily analyzes and predicts.

What are the copyrights issues with generative AI?

- **Training AI with copyright contents** – Generative AI models are often trained on vast datasets of copyrighted material, including text, images, and music.
- This raises concerns about unauthorized use of copyrighted works and potential infringement.
- **Replacing human author** - The previous technological development(s) only enabled third parties to have access to the copyrighted content, but generative AI models threaten to replace the human author.
- **Loss of creative authenticity** - The rise of AI-generated art, music, and literature raises concerns about the potential for a loss of human creativity and originality.
- **Unfair competition**- AI platforms could create competing products/contents using original material and discourage users from visiting original creators' website.
- **Infringement of personality rights** - Using a singer's voice without permission in AI applications raises significant copyright and personality rights issues, potentially leading to legal action.

Personality rights, also known as publicity rights, are an individual's legal control over their identity, including name, image, likeness, voice, and other recognizable attributes.

*In **Amitabh Bachchan v. Rajat Nagi (2022)**, legal protection was extended to actor Amitabh Bachchan against the misuse of his personality traits.*

- While traditional copyright laws may not explicitly cover a singer's voice, their voice is considered a valuable asset, and unauthorized use can violate their right to publicity and privacy.

What are the challenges in enforcing copyright laws with AI content?

- **Blurred lines** - Generative AI raises complex copyright issues by blurring the lines of authorship and ownership, particularly concerning AI-generated content that is not human-created.
- **Identifying the infringement** - These models are educated on a vast trove of materials available on the Internet.
- It would be difficult to pinpoint the exact occurrence of infringement, as the platform learns the nuances from the existing creation and creates based on prompts given by the user.
- **Defining originality** - Determining whether AI-generated content is sufficiently original and not merely derivative of existing works is a challenge.
- **Determining authorship** - Current copyright laws in most jurisdictions do not explicitly address the ownership of AI-generated content.
- Establishing who is the author of an AI-generated work (e.g., the human prompt, the AI, or the developers) can be complex.
    - In the U.S., even a minimal degree of creativity can be sufficient for copyright protection. However, the EU's standard is higher, requiring a more substantial level of human input and creative expression.
- **Large scale and widespread use** - Identifying and addressing potential copyright infringement on a large scale, as AI-generated content becomes more widespread, is a significant challenge.

What lies ahead?

- Copyright laws need to be updated with the evolving AI technology.
- Training datasets for AI can be put under monitoring and regulation for infringement of unauthorized access and use.
- AI developers should ensure that they are in compliance with the law.
- The emerging technological changes necessitates the reclassification of data accessibility and their different types of usage.
- These changes can be included in the data laws of the country.
- Generative AI will change the nature of content creation, enabling many to do what, until now, only a few had the skills or advanced technology to accomplish at high speed.
- As this burgeoning technology develops, users must respect the rights of those who have enabled its creation – those very content creators who may be displaced by it.

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