



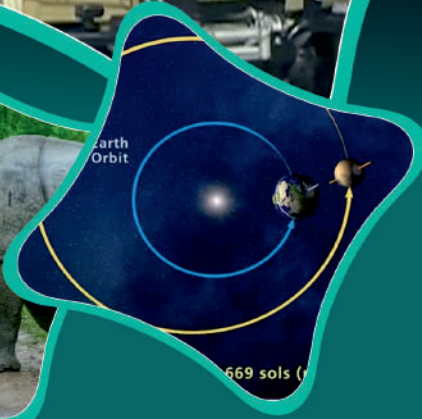
GUIDANCE
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GUIDANCE
G R O U P

April-2024

Current Affairs

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Chapter- 1

HISTORY AND CULTURE

Pandavula Gutta

Syllabus: GS1/History and Culture

Context

- Pandavula Gutta, has been recognised as the sole Geo-heritage site in Telangana.

About

- Pandavula Guttalu is a rock art site which is older than the Himalayan hills, and has been inhabited by humans since prehistoric times.
- There are natural paintings on these rocks, depicting the lifestyle and hunting methods of earlier people.
- The paintings on the hills are of peacocks, lizards, tigers, frogs, fishes, deer etc. There are also geometrical designs and impressions in green, red, yellow and white pigment colors.
- Rock paintings, inscriptions of Rastrakutan times and fresco paintings of the late medieval period were also discovered in these hillocks.

What is rock art?

- Rock art is a form of landscape art that includes designs that have been placed on boulder and cliff faces, cave walls and ceilings, and on the ground surface.
- Rock art includes pictographs (drawings or paintings), petroglyphs (carvings or inscriptions), engravings (incised motifs), petroforms (rocks laid out in patterns), and geoglyphs (ground drawings).



Potti Sriramulu

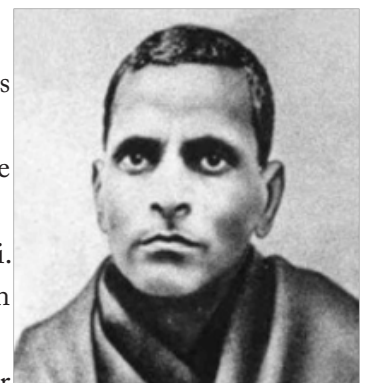
Syllabus: GS1/ Modern History: Personalities

Context:

- Tributes were recently paid to Sri Potti Sriramulu on his 123rd birth anniversary.

Sri Potti Sriramulu

- Sriramulu took part in the Indian Independence Movement and was imprisoned for participating in the 1930 Salt Satyagraha.
- Between 1941 and 1942, he participated in the individual satyagraha and the Quit India movement and was imprisoned on three occasions.
- He was a devout follower, avid supporter and devotee of Mahatma Gandhi. He also joined the Gandhi Ashram established by Yerneni Subrahmanyam, in Komaravolu.
- He undertook three fasts, during 1946:1948, in support of Dalit rights to enter holy places, such as the temples of Nellore.
- He fasted in support of Dalit entry rights to the Venu Gopala Swamy Temple in Moolapeta, Nellore, rights which were eventually secured.



Chausath Khamba

Syllabus: GS1/ Art and Culture

Context:

- Marked by marble pillars and exquisite lattice work, Chausath Khamba (64 pillars) is a structure near the Nizamuddin dargah, the 14th-century shrine built to commemorate Sufi saint Hazrat Nizamuddin Auliya.

About the Chausath Khamba

- Built in 1623–24 AD, the structure houses the tomb of Mirza Aziz Koka, foster brother of Mughal Emperor Akbar.
- The structure also finds mention in Sir Gordon Risley Hearn's book *The Seven Cities of Delhi*.
- “The mausoleum was erected by Mirza Aziz Kokaltash, governor of several provinces under Akbar and is said to be as old as the shrine itself.”
- As per the official conservation document by Aga Khan Trust for Culture:
- The tomb enclosure is entered through a lofty arched gateway and has a large sunken forecourt.
- The mausoleum is unique on account of it being built entirely of marble, with 25 marble domes supporting the flat roof of the structure.
- The plan for Chausath Khamba could have been inspired from the wooden garden pavilions from Persia — such as the Chihil Sutun (Forty Columns), and in turn, the Chausath Khamba seems to have inspired the architectural design for Emperor Shahjahan's Diwan-i-Aam, Hall of Audience.
- According to author and historian Sam Dalrymple, the structure is basically a piece of Gujarati/Ahmedabad style architecture in Delhi. It is the Urs Mahal, where festivals would be held during the anniversary of Nizamuddin's death. It shows how regional architecture travelled across India centuries ago.



Hyderabad Liberation Day

Syllabus: GS1/Post-Independence Consolidation Within the Country

Context:

- Recently, the Union Ministry of Home Affairs (MHA) issued gazette notification to celebrate 17th September as Hyderabad Liberation Day annually.

About the Hyderabad Liberation Day

- It commemorates the integration of the princely State of Hyderabad, encompassing Telangana, Marathwada, and Hyderabad-Karnataka into the Indian Union on September 17, 1948.
- The region was under the rule of the Nizam and did not gain independence for 13 months after India's Independence.

The Role of Freedom Fighters:

- The liberation of Hyderabad was possible due to the swift and timely action by the first Minister of Home Affairs of India, Shri Sardar Vallabhbhai Patel, under Operation Polo.
- It was the codename for the police action against the Princely State of Hyderabad.
- Mir Osman Ali Khan was the ruler of Hyderabad during the operation.
- The struggle is replete with illustrations of struggles in the entire freedom movement, including the fight of Ramji Gond against the British, the fight of Komaram Bheem, and the valour of Turrebaz Khan in 1857.

The People's Movement

- The liberation of Hyderabad transformed into a massive people's movement with the spontaneous participation of people chanting 'Vande Matram' and demanding the merger of the samsthan into the Indian Union.
- The struggle became vociferous after Indian independence.

Sabarmati Gandhi Ashram Redevelopment Project

Syllabus: GS1/Modern History

Context

- The Prime Minister launched a master plan for the Sabarmati Gandhi Ashram redevelopment project and inaugurated the redeveloped Kochrab Ashram in Ahmedabad on the anniversary of the Dandi March.

About

- The central government and Gujarat government are jointly implementing the Gandhi Ashram Memorial and Precinct Development Project.
- The redevelopment and restoration plan is based on an aerial image from 1949 of the ashram and on the ashram's documented accounts.
- A 'Mohan to Mahatma Park', an arboretum that will have trees from "all states and Union Territories", a herbal garden shaped in the famous pose of Gandhi walking with his staff, a meditation hall, and a 'dhyana kendra': these have been proposed.

Historical Importance of the Gandhi Ashram at Sabarmati:

- Setting up of Ashrams: Mahatma Gandhi set up five settlements during his lifetime — two in South Africa (Phoenix Settlement in Natal, and Tolstoy Farm outside Johannesburg), where he lived from 1893 to 1914, and three in India, where he arrived in 1915.
- He set up the first ashram in Ahmedabad in Kocharab in 1915.
- Sabarmati Ashram: In 1917, Gandhiji founded the ashram at Sabarmati — his fourth ashram — on the western bank of the Sabarmati River.
- The location was to the north of the village of Juna Vadaj, beyond the Chandrabhaga rivulet, a tributary of the Sabarmati.
- Time Spent in Ashram: Gandhi spent the most time here, and it was the cradle of eight major movements related to India's struggle for independence.
- Movements Launched: Apart from the Dandi March that Gandhiji began from here on March 12, 1930, he also launched the Champaran Satyagraha (1917), the Ahmedabad mills strike and Kheda Satyagraha (1918), the Khadi movement (1918), the Rowlatt Act and Khilafat Movements (1919), and the Non-Cooperation movement (1920) while living in Sabarmati.

GI Tag to Majuli Mask and Chandi Tarakasi

Syllabus: GS1/Art and Culture

Context:

- Recently, Majuli Masks of Assam and Famed Silver Filigree Work (Chandi Tarakasi) of Cuttack received GI tag.

The Majuli Masks of Assam

- These are handmade masks traditionally used to depict characters in 'Bhaonas', or theatrical performances with devotional messages under the neo-Vaishnavite tradition.
- These are made of bamboo, clay, dung, cloth, cotton, wood, and other materials available in the riverine surroundings of their makers.
- It depicts gods, goddesses, demons, animals, and birds etc.
- It was introduced by the 15th-16th century reformer saint Srimanta Sankardeva.



Do you know?

- **Majuli** is the largest riverine island in the world, located in the vast expanse of **Brahmaputra** in Assam.

Categories:

- Mukha Bhaona: It covers the face;
- Lotokoi: Bigger in size extends to the chest; and,
- Cho Mukha: It is a head and body mask.
- Cultural Significance: The masks are an integral part of the Sankardev tradition, used in traditional performing arts such as Borgeet (Songs), Sattriya (Dance), and Bhaona (Theatre), which are practised in the Sattras.

Silver Filigree Work (Chandi Tarakasi)

- It is a type of super-finely designed art-wire in silver and gold.
- The term ‘Tarakasi’ is a combination of two words in Odia — ‘Tara’ (wire) and ‘Kasi’ (design).
- It is a unique craft that has been practised in Cuttack, the oldest city of Odisha, for centuries.
- As part of Rupa Tarakasi, silver bricks are transformed into thin fine wires or foils and used to create jewellery or showpieces.

**Historical Origin:**

- While the exact origin of the filigree art in Cuttack is not clear, it is known to have existed as far back as the 12th century.
- It received considerable patronage under the Mughals.

Additional Information:

- A GI tag is conferred upon products originating from a specific geographical region, signifying unique characteristics and qualities.
- a. Essentially, it serves as a trademark in the international market.

Approving and Regulating GI Tag:

- GIs are covered as a component of Intellectual Property Rights (IPRs) under the Paris Convention for the Protection of Industrial Property.
- At the International level, GI is governed by the World Trade Organisation’s (WTO’s) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS).
- In India, GIs registration is administered by the Geographical Indications of Goods (Registration and Protection) Act, 1999.
- a. The first product in India to be accorded with GI tag was Darjeeling tea in the year 2004-05.

Savitribai Phule**Syllabus: GS1/ Modern History: Important Personalities****About**

- A pioneer who challenged oppressive social norms in her quest for women’s education, equality and justice, Savitribai Phule is formally recognised as India’s first woman teacher.

About Savitribai Phule

- A Dalit woman from the Mali community, Savitribai was born on January 3, 1831, in Maharashtra’s Naigaon village. Married off at the tender age of 10, her husband Jyotirao Phule is said to have educated her at home.

- Later, Jyotirao admitted Savitribai to a teachers' training institution in Pune. Throughout their life, the couple supported each other and in doing so, broke many social barriers.

Major Contributions

- Country's first girls' school: At a time when it was considered unacceptable for women to even attain education, the couple went on to open a school for girls in Bhide Wada, Pune, in 1848.
- Quality education: One report from 1852 in The Poona Observer states, "The number of girl students in Jotirao's school is ten times more than the number of boys studying in the government schools.
- This is because the system for teaching girls is far superior to what is available for boys in government schools."
- Protectors of women and children: Along with Jyotirao, Savitribai started the Balhatya Pratibandhak Griha ('Home for the Prevention of Infanticide') for pregnant widows facing discrimination.
- Marriage system reforms: Savitribai Phule also advocated inter-caste marriages, widow remarriage, and eradication of child marriage, sati and dowry systems, among other social issues.
- The Phules also adopted Yashwantrao, the child of a widow, whom they educated to become a doctor.
- Satyashodhak Samaj: In 1873, the Phule couple set up the Satyashodhak Samaj ('Truth-seekers' society'), a platform open to all, irrespective of their caste, religion or class hierarchies, with the sole aim of bringing social equity.
- As an extension, they started 'Satyashodhak Marriage' – a rejection of Brahmanical rituals where the marrying couple takes a pledge to promote education and equality.
- Rejection of caste system: Urging women to break free of caste barriers, Savitribai encouraged them to sit together at her meetings.
- Rejection of patriarchal traditions: At her husband's funeral procession on November 28, 1890, Savitribai again defied convention and carried the *titve* (earthen pot).
- Walking ahead of the procession, Savitribai was the one who consigned his body to the flames, a ritual which is still predominantly carried out by men.
- Relief work: Setting an extraordinary example of living a life of compassion, service and courage, Savitribai became involved in relief work during the 1896 famine in Maharashtra and the 1897 Bubonic plague.
- She herself contracted the disease while taking a sick child to the hospital, and breathed her last on March 10, 1897.
- Literary works: Savitribai Phule published her first collection of poems, called *Kavya Phule* ('Poetry's Blossoms'), at the age of 23 in 1854. She published *Bavan Kashi Subodh Ratnakar* ('The Ocean of Pure Gems'), in 1892.
- Besides these works, *Matushri Savitribai Phlenchi Bhashane va Gaani* (Savitribai Phule's speeches and songs'), and her letters to her husband have also been published.

Chapter- 2

POLITY

Digital Governance in India

Syllabus: GS2/Governance

Context:

- Recently, the Prime Minister of India and Bill Gates discussed the role of Artificial Intelligence (AI) for digital governance in key focus areas like health, agriculture and education.

About the Digital Governance:

- It is the application of Information and Communication Technology (ICT) for delivering government services, exchange of information, communication transactions, integration of various stand-alone systems and services between government-to-customer (G2C), government-to-business (G2B), government-to-government (G2G), and also back-office processes and interactions within the entire government framework.
- Data Governance is a crucial aspect of digital governance. The launch of India's Data Empowerment and Protection Architecture (DEPA), a consent management tool, has generated both excitement and concern among stakeholders.
- It is important that the tool is implemented in a transparent, consistent, and secure manner.

Role of Artificial Intelligence (AI) in Digital Governance:

- AI plays a pivotal role in Indian election campaigns by leveraging technology to overcome language barriers, marking a shift towards progressive politics empowering linguistic diversity and inclusive engagement.
- AI is also being used to drive economic growth and improve the lives of citizens.

Key Data: According to the State of India Digital Economy 2024 Report of ICRIER, India as a nation is highly digitalised, the average Indian is not. It noted that nearly 48% of Indians do not access the internet and the quality of fixed line internet services does not match up to other G20 countries. India's gender gap in internet connectivity is, at 10%, higher than the world average of 9%, and the rural-urban divide is at 58%, higher than the world average of 49%. While the digital divide along gender is large, it is declining. According to IAMAI's Internet in India Report (2023): Nearly 52% Indians (~759 million) have access to the internet.

Key Benefits of Digital Governance:

- Efficiency in Administration, Inclusiveness, Time and Cost Effectiveness, Transparency and Accountability, Data-Driven Decision Making, Empowerment of Citizens, Innovation, Improved Public Services, Economic Growth, Sustainable Development.

Digital Governance and Health:

- The 'Digital India' initiative has brought significant changes in the healthcare sector of India. Initiatives like Ayushman Bharat Digital Mission (ABDM), CoWIN App, Aarogya Setu, e-Sanjeevani, and e-Hospital have made healthcare facilities and services reach every corner of India.
- The Ayushman Bharat Health Account (ABHA) Number is a hassle-free method of accessing and sharing one's health records digitally. The Aarogya Setu app has transformed into a National Health App, bringing a whole plethora of digital health services powered by the ABDM.

Digital Governance and Agriculture:

- The National e-Governance Plan in Agriculture (NeGPA) was launched to achieve rapid development in India through the use of ICT for timely access to agriculture-related information to the farmers.
- Realising the significance of new digital & emerging technologies, the NeGPA guidelines were amended in 2020-21 and funds were released for sanctioning projects for customization/shifting of web & mobile applications already developed by the States, to the platform to be developed using digital/emerging technologies.

Digital Governance and Education:

- Digital Empowerment and Online Education are significant components to attain the Gross Enrolment Ratio (GER) of 50% by 2035 as targeted in the National Education Policy (NEP) 2020.
- Digital empowerment in the field of education opens up a plethora of options for the learners of today. Digital advancements have wide-ranging implications on higher education.

Other Key Initiatives:

- Digi-Locker: This initiative assists citizens in storing important documents in a digital format, such as degree certificates, PAN numbers, and mark sheets.
- It makes it easier to share documents and reduces the need for physical documents.
- Mobile Seva: It aims to provide government services via tablets and mobile phones.
- myGov.in: It is a platform for national citizen engagement where people can share ideas and get involved in policy and governance issues.
- UMANG: It is a unified mobile application that gives users access to services offered by the federal and state governments.
- Computerisation of Land Records: It ensures that landowners get digital and updated copies of documents relating to their property.
- e-Office: It received an award for its role in ensuring continuity of Government services and operations during the COVID-19 pandemic.

Potential Threats:

- Cybersecurity Risks: With the increasing dependence on digital systems, the risk of cyber threats has heightened.
- About 91% of Indian companies experienced ransomware attacks in 2022, and about 55% of these companies reported financial implications.
- Data Privacy Concerns: The implementation of tools like India's Data Empowerment and Protection Architecture (DEPA) may pose risks associated with security and privacy.
- If not properly implemented or managed, there is a risk that personal information could be misused or misappropriated.
- Digital Inequality: As the world becomes increasingly digital, there is a risk of digital inequality, where certain sections of the society might not have equal access to digital resources and services.
- Dependence on Service Providers: Remote work has moved digital exchanges from office networks to residential ones, which have a greater variety of connected devices with less protection against cyber intrusion.
- AI-Enabled Threats: With the increasing use of AI in digital governance, there is a risk of AI-enabled threats. AI-powered malware is a top concern for cybersecurity experts.
- Deep Fakes Technology: It can pose serious ethical and social challenges, such as creating fake news, spreading misinformation, violating privacy, and harming reputation.
- Infrastructure Vulnerability: India's critical infrastructure, such as power grids, transportation systems, and communication networks, is vulnerable to cyber attacks that can disrupt essential services and endanger public safety and national security.

Conclusion and Way Ahead:

- Digital governance is transforming the way public services are delivered, making them more efficient, accessible, and transparent.
- However, it also presents new challenges in terms of data security, privacy, and digital literacy.
- As India continues to evolve its digital strategies, it must ensure that they are inclusive, transparent, secure, and conducive to sustainable development.

United Nations on Global Food Waste

Syllabus: GS2/Issues Relating to Hunger

Context:

- Recently, the United Nations released the report, titled ‘Think Eat Save: Tracking Progress to Halve Global Food Waste’.

Key Highlights of the Report:

- Scale of Food Waste: In 2022, the world wasted 1.05 billion tonnes of food, amounting to one-fifth (19%) of food available to consumers being wasted at the retail, food service, and household level.
- Households were responsible for 631 million tonnes of food waste, equivalent to 60% of the total food wasted in 2022.
- Food Insecurity: Food waste occurs while 783 million people are hungry and a third of humanity faces food insecurity.
- Global Problem: Food waste is not just a ‘rich country’ problem.

The Impact of Food Waste:

- Food waste has severe **environmental, social, and economic** impacts.
- Environmentally**, food waste contributes to 8-10% of global greenhouse gas emissions.
- Socially**, it exacerbates food insecurity and hunger.
- Economically**, it costs the global economy over \$940 billion.

- High-income, upper-middle income, and lower-middle income countries differ in observed average levels of household food waste by just 7 kg/capita/year.
- Urban-Rural Disparities: Middle-income countries display variations between urban and rural populations, with rural areas generally wasting less.
- Environmental Impact: Food loss and waste generate 8-10% of global greenhouse gas (GHG) emissions, almost five times the total emissions from the aviation sector.
- Hotter countries appear to have more food waste per capita in households, potentially due to increased consumption of fresh foods with substantial inedible parts and lack of robust cold chain.
- Food Wastage in India: As per the United Nations Food Waste Index Report, 78.2 million tonnes of food every year despite India housing the world’s largest hunger-population. It points out India’s per capita food waste at 55 kg per year. It also underlines rural India waste food less compared to urban areas. In South Asia, Bhutan (19 kg per year) has the lowest per capita food waste in the country while Pakistan has the highest (130 kg per year). As per Global Hunger Index Report (2023), food wastage became a serious issue in India as India housed 233.9 million out of the world’s 783 million populations. India ranked 111 out of 125 countries, indicating a hunger severity level of ‘serious’ for the country.

Solutions Highlighted in the Report

- Measurement: The report emphasises the need for improved data on food waste. Accurate measurement of food waste is the first step towards effective management.
- India, along with Indonesia and the Republic of Korea (South Korea) have only ‘subnational estimates’ regarding food waste.
- India, along with China, South Africa, Indonesia, and Mexico, needs representative national food waste studies given variance in data.
- Policy Interventions: Governments are encouraged to establish national targets, policies, and initiatives to reduce food waste. This includes implementing the UN Sustainable Development Goal (SDG) 12.3, which aims to halve per capita global food waste at the retail and consumer levels by 2030.

- At present, only four G-20 countries (Australia, Japan, U.K., U.S.) and the European Union have food waste estimates suitable for tracking progress to 2030.
- Public-Private Partnerships (PPPs): The report highlights the role of PPPs in reducing food waste. By working together, governments and businesses can develop and implement effective strategies to prevent and reduce food waste.
- Consumer Awareness: Raising awareness among consumers about the impacts of food waste and ways to prevent it is crucial.
- It can be achieved through education and awareness campaigns.
- Innovation and Technology: The report underscores the potential of innovative solutions and technologies in reducing food waste.
- It includes advancements in food storage and packaging, improved supply chain management, and the use of apps to connect consumers with surplus food.
- Sustainable Practices: The report encourages the adoption of sustainable practices at all levels of the food supply chain.
- It includes improving harvesting, storage, processing, and distribution processes to minimise food loss and waste.

Conclusion

- Tackling global food waste requires concerted, collaborative effort. It involves developing national strategies for food waste reduction, creating national public-private partnerships, launching supply chain initiatives, reducing small-holder losses, and shifting consumer social norms.
- By addressing this issue, we can make a significant contribution to mitigating climate change, enhancing food security, and promoting sustainable development.

WHO Coronavirus Network (CoViNet)

Prelims

Syllabus: GS2/Health

Context:

- Recently, the World Health Organisation (WHO) launched the 'CoViNet' — a global laboratory to monitor emerging coronaviruses.

About the CoViNet:

- CoViNet is a network of global laboratories with expertise in human, animal, and environmental coronavirus surveillance.
- The network currently includes 36 laboratories from 21 countries in all 6 WHO regions.
- It expands on the WHO COVID-19 reference laboratory network established during the early days of the pandemic.
- Initially, the lab network was focused on SARS-CoV-2, the virus that causes COVID-19.
- However, the network will now address a broader range of coronaviruses, including MERS-CoV and potential new coronaviruses.

The Objectives of CoViNet:

- It aims to facilitate and coordinate global expertise and capacities for early and accurate detection, monitoring, and assessment of SARS-CoV-2, MERS-CoV, and novel coronaviruses of public health importance.
- It aims to monitor the global circulation and evolution of these viruses, recognizing the need for a 'One Health' approach.
- It aims to provide timely risk assessment for these viruses to inform WHO policy related to a range of public health and medical countermeasures.

White Rabbit Collaboration

Syllabus: GS3/Science and Technology

Context

- The European Organization for Nuclear Research or CERN has launched the White Rabbit Collaboration.

About

- White Rabbit: The technology is developed to synchronise devices in the accelerators down to sub-nanoseconds and solve the challenge of establishing a common notion of time across a network.
- At a scale of billionths of a second, the time light takes to travel through a fibre-optic cable and the time the electronics take to process the signal are no longer negligible. To avoid potential delays, the co-inventors of White Rabbit designed a new ethernet switch.
- Application: White Rabbit is used in the finance sector as well as in many research infrastructures, and it is currently being evaluated for application in the future quantum internet.
- The technology could also play a key role in the future landscape of global time dissemination technologies, which currently rely heavily on satellites.
- White Rabbit Collaboration: It is a membership-based global community whose objective is to maintain a high-performance open-source technology that meets the needs of users and to facilitate its uptake by industry.
- The WR Collaboration will provide dedicated support and training, facilitate R&D projects between entities with common interests and complementary expertise and establish a testing ecosystem fostering trust in products that incorporate the open-source technology.

Source: CERN

Exercise Tiger Triumph

Syllabus: GS 3/Defense

In News

- Exercise Tiger Triumph commenced on the Eastern seaboard.

Exercise Tiger Triumph

- It is India- U.S tri-Service Humanitarian Assistance and Disaster Relief (HADR) exercise
- The exercise is scheduled to include a harbour phase followed by a sea phase where U.S. and Indian forces will practise combined operational manoeuvre, command and control, and joint sustainment operations. Service members will also participate in cultural and athletic events.
- Objectives : The exercise is aimed at developing interoperability for conducting HADR operations and refine Standard Operating Procedures (SOPs) to enable rapid and smooth coordination between forces of both countries.
- It will build trust and confidence in the ability to work together and to respond as an integrated joint force.

Internet Freedom in India

Syllabus: GS2/Polity & Governance

Context

- India has consistently topped the global list of countries imposing internet bans, with approximately 60% of all recorded blackouts worldwide.

About

- State imposed shutdowns in the last decade have cited national security and threats to public order.
- Shutdowns flared up during the protests against the Citizenship Amendment Act in 2019, the abrogation of Article 370 in 2019, and the introduction of Farm Bills in 2020.
- Internet disruptions in India accounted for more than 70% of the total loss to the global economy in 2020.
- Regionally, Jammu and Kashmir saw the highest number of shutdowns in the last 12 years.

Legal Provisions Relating to Internet Shutdown

- Grounds: Indian States and Union Territories can impose an internet shutdown only in case of a “public emergency” or in the interest of “public safety”, according to the Indian Telegraph Act.
- However, the law does not define what qualifies as an emergency or safety issue.
- Till the year 2017, shutdowns were imposed largely under Section 144 of the Code of Criminal Procedure (CrPC).
- Section 144 of CrPC gave the police and the District Magistrate the powers in order to prevent unlawful gathering of people and also to direct any person to abstain from a certain activity.
- However, in 2017 the law was amended and the Government promulgated the Temporary Suspension of Telecom Services (Public Emergency or Public Safety) Rule 2017.

Anuradha Bhasin v. Union of India Case:

– In 2020 the Supreme Court by ruling on Jammu and Kashmir Internet shutdown held that indefinite internet shutdowns by the State is not permissible under Indian Constitution.

– The apex Court further stated that imposition of Section 144 can not be used as a mechanism to avoid genuine protest which is permitted under the Constitution.

a. Section 144 has very specific parameters, only if those parameters are satisfied then only a Magistrate can pass the orders.

– Key Highlights of the orders:

a. Usage of the Internet is the Fundamental Right under Article 19 of the Indian Constitution.

b. Internet shutdowns can be of temporary period but not for indefinite period.

c. Government to publish all orders imposing restrictions under Section 144.

d. The Court had also said that any order with regard to Internet Shutdowns will come under Judicial Scrutiny.

Arguments in Favour of Internet Shutdown by the Government

- National Security: The government suspend internet services as a temporary and targeted measure to prevent the spread of misinformation, coordinate unlawful activities, or address security threats.
- Temporary and Targeted Measures: The internet shutdowns are intended to be temporary and narrowly focused.
- These measures are not meant to infringe on long-term access but rather to address specific and immediate concerns.
- Preventing Unrest and Violence: Suspending online communication helps prevent the organization of protests, riots, or other forms of civil unrest.
- Counteracting Fake News and Disinformation: During times of crisis or conflict, false information circulating online can exacerbate tensions and contribute to misinformation.

Arguments Against the Internet Shutdown by the Government

- Impact on Freedom of Expression: Internet shutdowns infringe upon the freedom of expression guaranteed by the Indian Constitution.
- Global Image and Investment: Frequent internet shutdowns can impact India’s global image, raising concerns among investors and international partners.
- Human Rights Concerns: Internet shutdowns raise human rights concerns, including the right to access information, freedom of speech, and the right to peaceful assembly.
- Economic Disruptions: India has a rapidly growing digital economy, and internet shutdowns can lead to significant economic losses.
- Educational Challenges: With the increasing use of online platforms for education, internet shutdowns can severely affect students’ access to learning resources, online classes, and communication with teachers.
- Lack of Transparency: The government needs to provide clear justifications for such actions and communicate transparently about the duration and reasons for the shutdown.

Conclusion

- In a democracy Governments should provide a rationale for disrupting the internet services in a periodic manner.
- The publications of all the orders must be made to maintain transparency.
- Indiscriminate shutdowns have high social and economic costs and are often ineffective.
- For better internet governance the Indian civil society needs to push for a transparent and accountable system.

POCSO Offence to be Tried as per JJ Act

Syllabus: GS2/Polity and Governance

Context

- The Kerala High Court has held that a child charged under the Protection of Children from Sexual Offences (POCSO) Act, 2012, is to be prosecuted as per the provisions of the Juvenile Justice (Care and Protection of Children) (JJ) Act.

About

- POCSO Act: The Ministry of Women and Child Development introduced POCSO Act, 2012 to effectively address the heinous crimes of sexual abuse and sexual exploitation of children through less ambiguous and more stringent legal provisions.
- The Act defines a child as any person below eighteen years of age, and regards the best interests and well-being of the child as being of paramount importance at every stage, to ensure the healthy physical, emotional, intellectual and social development of the child.
- People who traffic children for sexual purposes are also punishable under the provisions relating to abetment in the Act.
- The Act prescribes stringent punishment graded as per the gravity of the offence, with a maximum term of rigorous imprisonment for life, and fine.
- The Juvenile Justice (Care and Protection of Children) Act, 2015 has come into force in 2016 and repeals the Juvenile Justice (Care and Protection of Children) Act, 2000.
- The Act seeks to achieve the objectives of the United Nations Convention on the Rights of Children as ratified by India in 1992.
- It specifies procedural safeguards in cases of children in conflict with law.
- It seeks to address challenges in the existing Act such as delays in adoption processes, high pendency of cases, accountability of institutions, etc.
- The Act further seeks to address children in the 16-18 age group, in conflict with law, as an increased incidence of crimes committed by them have been reported over the past few years.

Reforming The Bail Law

Syllabus: GS2/Polity and Governance

Context

- Recently, the Supreme Court of India underlined that 'there is a pressing need' for reform in the law related to bail and stressed the government to consider a special legislation on the lines of the law in the United Kingdom.

About

- Bail is a significant aspect of the criminal justice system in India, allowing an accused person to be released from custody under certain conditions.
- The concept of bail can be traced back to ancient times, with references found in Kautilya's Arthashastra.

Types of Bail:

- Regular Bail: Granted to a person who has already been arrested and kept in police custody.
- The person can apply for bail under Section 437 and 439 of the CrPC.
- Interim Bail: A temporary bail granted for a short period before the hearing for the grant of regular or anticipatory bail.
- Anticipatory Bail: Granted under Section 438 of the CrPC, it is a direction to release a person on bail, even before the person is arrested.

Current Bail Laws in India:

- The Code of Criminal Procedure, 1973 (CrPC) governs the terms of bail in India.
- It does not explicitly define 'bail' but it does define the terms 'bailable offence' and 'non-bailable offence' under Section 2(a).

- Sections 436–450 of the CrPC govern the provisions relating to bail.
- However, the Supreme Court has noted that the current bail laws have led to overcrowded jails and hasty arrests.

Bail Provisions in Bhartiya Nagrik Suraksha Sanhita (BNSS):

- It seeks to replace the Criminal Procedure Code, 1973 (CrPC) and brings about significant changes in the bail provisions.

Key Changes in BNSS from CrPC:

- Police Custody: The BNSS allows up to 15 days of police custody, which can be authorised in parts during the initial 40 or 60 days of the 60 or 90 days period of judicial custody.
- It may lead to denial of bail for the entire period if the police have not exhausted the 15 days custody.
- Multiple Charges: The CrPC provides for bail for an accused who has been detained for half the maximum imprisonment for the offence.
- The BNSS denies this facility for anyone facing multiple charges. As many cases involve charges under multiple sections, this may limit such bail.
- First-time Undertrial: The BNSS includes a provision for bail if the accused serves half the maximum punishment during the trial.
- Simplified Bail: The meaning of bail has been simplified throughout the BNSS.
- Bail in acquittal cases is also simplified.
- Relaxed Punishment: First-time offender to be given relaxed punishment (one-fourth and one-sixth of such punishment) in plea bargaining.

Need for Reform

- The Supreme Court, in its *Satender Kumar Antil vs CBI (2022)*, recognised the flaws in the bail system and urged the government to consider introducing a legislation in the nature of a Bail Act to streamline the grant of bail.
- The Apex court also highlighted the dire situation of jails and spoke of overcrowding of undertrial prisoners, indiscriminate arrests, etc.
- Overcrowding in Prisons: Over 75% of India's prison population are undertrials, which is often attributed to the ineffectiveness of India's bail system.
- Presumption of Innocence: The principle of 'presumption of innocence' is often ignored due to the large number of undertrial prisoners.
- The principle that 'bail not jail' should be the norm is often breached rather than observed.
- Socio-Economic Barriers: The current bail law disproportionately burdens those from marginalised backgrounds and is often seen as anti-poor.
- Lack of Empirical Evidence: There is a need for empirical evidence to understand the exact nature of the problem that results in large-scale undertrial incarceration.

Proposed Changes inline with the UK

- The Supreme Court suggested framing the law on the lines of the Bail Act of the United Kingdom (1976) that recognises bail as a 'general right' and focuses on reducing overcrowding of undertrial inmates in prisons.
- One of the key features of the Act is its aim to reduce the size of the inmate population.
- It makes provision for legal aid limited to questions of bail in certain cases and for legal aid for persons kept in custody for inquiries or reports. Its Section 4(1) raises the presumption of bail by stating that the law applies to a person who shall be granted bail except as provided in Schedule 1 to the Act.
- It makes it an offence to agree to indemnify sureties in criminal proceedings.

Conclusion

- The call for bail law reform in India is a significant step towards ensuring justice and upholding the rights of the accused. It is hoped that the government will consider the introduction of a separate enactment in nature of a bail act to streamline the grant of bails.
- The proposed reforms aim to strike a balance between the individual's right to personal freedom and the interest of society at large.

Supreme Court on Preventive Detention

Syllabus :GS 2/Governance

In News

- Recently, the Supreme Court termed preventive detention a draconian provision.

What is preventive detention?

- Preventive detention means detention of a person by the state without trial and conviction by court, but merely on suspicion.
- The detention could be up to a year unless extended
- A pre-trial detention is not the same as preventive detention. While the former is an undertrial accused of a crime, a detainee can be taken into custody just as a preventive measure even if he has not committed a crime.

Prevalence

- In countries such as Britain, United States and Canada, preventive detention is a wartime measure.
- In India, the Constitution itself makes space for preventive detention.
- Part III of the Constitution, which deals with fundamental rights, also gives the state the power to suspend these rights for preventive detention.
- Despite its emphasis on individual liberty, Part III, which forms the basic structure of the Constitution that cannot be amended, also contains provisions for preventive detention under Article 22.

The powers of the state

- Article 22 prescribes protection against arrest and detention but has a major exception.
- It says in Article 22 (3) (b) that none of those safeguards apply “to any person who is arrested or detained under any law providing for preventive detention.”
- The remaining clauses — Article 22(4)-(7) — deal with how preventive detention operationalises.
- First, the state, which would be the district magistrate, would issue an order to detain a person when it is necessary to maintain “public order.”
- The state can delegate this power to the police as well.
- If the detention ordered is for more than three months, under Article 22(4), such a detention requires the approval of an Advisory Board.
- These Boards are set up by states and normally consist of retired judges and bureaucrats.
- A detainee is generally not allowed legal representation before the Board. If the Board confirms the detention, the detainee can move Court challenging the detention order.
- Article 22(5) of the Constitution mandates that the state is required “as soon as may be,” to communicate to the detainee the grounds of detention and “shall afford him the earliest opportunity of making a representation against the order.”
- The grounds have to be read in a language that the detainee understands.
- Among central legislations, the National Security Act, the Conservation of Foreign Exchange and Prevention of Smuggling Activities Act, 1974 (COFEPOSA) are examples of laws under which preventive detention can be ordered.

Concerns

- Preventive detention laws are a colonial legacy and conferring arbitrary powers on the state is one more iteration of the perennial threat to personal liberty that such laws pose.
- There is failure to adhere to procedural safeguards while dealing with the rights of detainees.
- Often, the quashing of detention orders comes several months after they are detained, and in some cases after the expiry of the full detention period.
- Failure to provide proper grounds for detention, or delay in furnishing them, and sometimes giving illegible copies of documents are other reasons.

Conclusion and Way Forward

- Preventive detention is allowed by the Constitution, but it does not relieve the government of the norm that curbing crime needs efficient policing and speedy trials, and not unfettered power and discretion.

- Every procedural rigidity must be followed in entirety by the Government in cases of preventive detention, and every lapse in procedure must give rise to a benefit to the case of the detenu”.
- The act of protecting civil liberties, is not just the saving of rights of individuals in person and the society at large, but is also an act of preserving our constitutional ethos, which is a product of a series of struggles against the arbitrary power of the British state.
- Preventive detention can be ordered only in case of public disorder and not for law and order problems.
- The Advisory Board must consider whether the detention is necessary not just in the eyes of the detaining authority, but also in the eyes of law

Rohingya Refugee Crisis

Syllabus: GS3/Internal Security

Context

- Recently, Dozens of Rohingya refugees were rescued from the Indian Ocean after a wooden boat capsized off the Indonesian coast.

About

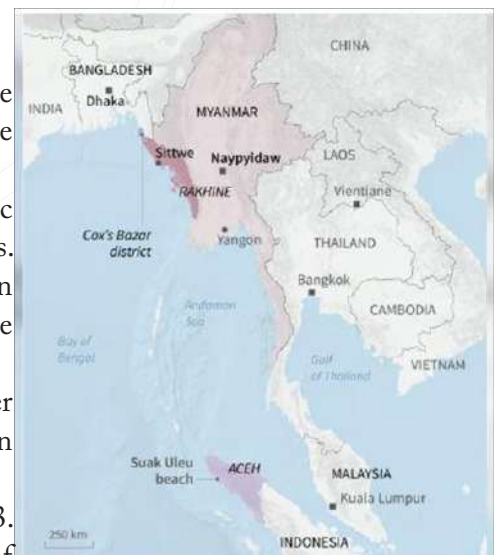
- The UN estimates that one in eight Rohingya who take the sea route die or disappear in the attempt, making the Andaman Sea and Bay of Bengal among the deadliest stretches of water in the world.
- Last year, the number of people embarking on sea journeys increased by 21%. The UNHCR reported a 63% increase in deaths or disappearances compared to 2022.

Who are the Rohingya refugees?

- The Rohingya are a Muslim minority ethnic group with their roots in the Arakan kingdom in Myanmar, formerly known as Burma.
- The Rohingya are culturally and religiously distinct from the majority Buddhist population in Myanmar.
- The Rohingya claim to have lived in Myanmar's Rakhine State for generations, but successive governments in the country have disputed their ties, labelling them illegal immigrants from Bangladesh.
- Myanmar has denied them citizenship since 1982, thus making them the world's largest stateless population.
- Their largest exodus began in 2017 driving more than 7.5 lakh people to seek sanctuary in Bangladesh to escape the brutality of security forces.

Why Sea journeys?

- Overcrowded Camps: Most live near the Myanmar border in the Cox's Bazar, which has grown over the years to house some of the world's largest and most densely populated refugee camps.
- Lack of Basic Amenities: These overcrowded camps lack basic human necessities, forcing the Rohingya to live in harsh conditions.
- There is a shortage of food, access to water is inadequate, sanitation facilities are missing, healthcare is insufficient, and children are growing up without formal education.
- Security Concerns: Security conditions also have deteriorated over the years due to gang violence and an increase in arson attacks in camps.
- Over 60 Rohingya were killed in Bangladeshi camp clashes in 2023.
- Moving towards Muslim Majority Nations: With the option of returning to Myanmar virtually impossible, and worsening conditions in relief camps in Bangladesh, an increasing number of Rohingya have been undertaking dangerous journeys across the Bay of Bengal and the Andaman Sea to Muslim-majority nations of Indonesia and Malaysia.
- Concerns: The human traffickers exploit their desperation, charging exorbitant amounts to ferry them on rickety boats from Bangladesh to Indonesia.
- The boats with inadequate space and in the absence of basic supplies take weeks and sometimes stretch into months.
- Horrifying accounts of abuse during the journey, including violence against women, have been recorded.



India's Policy on Refugees

- India is not a signatory to the 1951 UN Convention relating to the Status of Refugees and the 1967 Protocol.
- All foreign undocumented nationals are governed as per the provisions of The Foreigners Act, 1946, The Registration of Foreigners Act, 1939, The Passport (Entry into India) Act, 1920 and The Citizenship Act, 1955.
- As per the MHA foreign nationals who enter into the country without valid travel documents are treated as illegal immigrants.

India's Stand on Rohingyas

- Operation Insaniyat: In 2017, India launched “Operation Insaniyat” to provide relief assistance for the refugee camps in Bangladesh.
- Due to the growing security concerns and the need for diplomatic balancing between Bangladesh and Myanmar. India presented three points that became the basis to drive its Rohingya approach:
- Restoring normalcy can happen only with the return of the displaced persons to Rakhine state. This position implied that the return of Rohingyas to Myanmar from Bangladesh and elsewhere would also mean the return of Rohingyas from India.
- The socio-economic development in Rakhine State is the only long-term solution. Therefore, there is a need for supporting and mobilising resources for development on its own as well as urging the international community to assist development efforts in Rakhine has been prioritised.
- India stand that it would maintain constructive engagement with both Myanmar and Bangladesh, and that the international community needs to handle the situation with restraint, keeping in mind the welfare of the population.

Global Trade Update Report: UNCTAD

Syllabus: GS3/ Economy

In News

- Global Trade Update report released by the United Nations Conference on Trade and Development (UNCTAD).

Key Points

- Overall, the value of global trade fell by 3% in 2023. For trade in goods, it dropped by 5% but grew by 8% for trade in services.
- Report warned that the logistical challenges such as shipping disruptions in the Red Sea, Black Sea and Panama Canal caused supply chain disruption and high costs.
- Services exports from India grew by 14 percent in 2023.

UNCTAD

- Established in 1964 to promote trade, investment, and development in developing countries.
- It is a permanent organ of the United Nations (UN) General Assembly. UNCTAD has approximately 190 members.
- It is headquartered in Geneva, Switzerland.

Functions:

- Comprehend options to address macro-level development challenges
- Achieve beneficial integration into the international trading system
- Diversify economies to make them less dependent on commodities
- Limit their exposure to financial volatility and debt

SC raises concern over Gagging Media

Syllabus : GS 2/ Polity and Governance

In News

The Supreme Court has highlighted the problem of the affluent getting pre-trial injunctions from courts against the media and civil society, gagging free speech and the public's right to information about important affairs.

Background

- The order is based on an appeal filed by Bloomberg Television Production Services challenging an ex-parte ad interim order passed by a District Court in Delhi in March 2024 directing it to take down an article published on their online platform.

Key Highlights of SC's Order

- The constitutional mandate of protecting journalistic expression cannot be understated, and courts must tread cautiously while granting pretrial interim injunctions.
- The Bench drew the spotlight on the phenomenon of 'SLAPP suits' or 'Strategic Litigation against Public Participation' gaining attention across jurisdictions.
- It is an umbrella term used to refer to litigation predominantly initiated by entities that wield immense economic power against members of the media or civil society, to prevent the public from knowing about or participating in important affairs in the public interest.
- It cautioned judges about how ad-interim injunctions in defamation suits, followed by prolonged litigation, harm free speech and public participation.
- The Bench said courts should grant pre-trial injunctions only in exceptional cases.
- For others, an injunction against the publication of material should be granted only after the conduct of a full-fledged trial.

Freedom of Press in India

- The Constitution of India does not expressly mention in Article 19 about freedom of the press but it has been held to flow from the general freedom of speech and expression guaranteed to all citizens.
- Freedom of speech under Article 19(1)(a) includes the right to express one's views through any medium, which can be by way of writing, speaking, and gesture or in any other form.
- It also includes the rights of communication and the right to propagate or publish one's opinion
- It also gives the State the power to impose "reasonable restrictions" on the exercise of this right in the interests of "public order, decency or morality".

Importance of Media

- The media have played an important role in educating and developing the people.
- From the conservative society to the open-minded one, the role of the media has been immensely important.
- As the fourth pillar of the State, it is an educator of the people.
- The ability of journalists to report freely on matters of public interest is a crucial indicator of democracy.
- A free press can inform citizens of their leaders' successes or failures, convey the people's needs and desires to government bodies, and provide a platform for the open exchange of information and ideas.

Issues and Challenges

- It is condemned stringently these days for their publications, news stuffs and allegations for favoring any particular individual or party for creating a sensation or for achieving their own TRP and Consumer Targets.
- The freedom of the press in India requires critical analysis, as it faces a myriad of challenges that can impact its effectiveness.
- Journalists in India often face threats, intimidation, and violence, particularly when reporting on sensitive issues such as corruption, communal tensions, or government policies.
- Additionally, there is a worryingly high level of media ownership concentration, leading to potential biases and self-censorship.
- The influence of political parties and powerful corporations on media organizations further raises questions about the independence and objectivity of reporting.

- Furthermore, the use of defamation laws and sedition charges against journalists can be seen as attempts to stifle dissent and investigative journalism.

Conclusion and Way Forward

- India has made significant progress in developing a free press, but some challenges underscore the need for continuous efforts to safeguard and strengthen the freedom of the press, ensuring that it can operate without fear or favor, and serve as a robust watchdog in a democratic society.
- The government must introduce laws and regulations that limit control of multiple news organisations by a single business or political entity, thereby encouraging an independent and robust press in the country.

START Programme

Syllabus: GS3/Science and Technology

Context

- The Indian Space Research Organisation (ISRO) is conducting the Space science and Technology Awareness Training (START) 2024 programme.

About

- Objective: To attract the youngsters to the fields of space science and technology.
- Feature: The training modules will comprise introductory level topics on various verticals of space science and technology.
- There will be sessions on Indian space exploration programmes and research opportunities.
- Eligibility: Post-graduate students and final year undergraduate students of physical sciences and technology studying in educational institutes, universities and colleges within India are eligible to be considered for the training.

Krishi Integrated Command and Control Centre (ICCC)

Syllabus: GS2/Government Initiatives; GS3/Agriculture

Context:

- Recently, the Union Agriculture Minister inaugurated a Krishi Integrated Command and Control Centre (ICCC) at Krishi Bhavan in New Delhi.

About the ICCC:

- It is a significant technological advancement in the field of agriculture in India involving multiple IT applications and platforms.
- It is designed to help in making informed decisions.
- It uses state-of-the-art technologies such as Artificial Intelligence (AI), Remote Sensing, and Geographic Information Systems (GIS) to collect and process large amounts of granular data — on temperatures, rainfall, wind speed, crop yields and production estimations — and presents it in graphical format.

Objective of the ICCC:

- It aims to enable comprehensive monitoring of the farm sector by making available at one place geospatial information received from multiple sources, including:
 - Remote sensing;
 - Plot-level data received through soil survey;
 - Weather data from the India Meteorological Department (IMD);
 - Sowing data from Digital Crop Survey;
 - Farmer and farm related data from Krishi MApper (an application for geo-fencing and geo-tagging of land);
 - Market intelligence information from the Unified Portal for Agricultural Statistics (UPAg); and
 - Yield estimation data from the General Crop Estimation Survey (GCES).

Significances:

- There is visual information on crop yields, production, drought situation, cropping patterns (geographic region-wise and year-wise) in map, timeline, and drill-down views.
- The relevant trends (periodic and non-periodic), outliers, and Key Performance Indicators (KPIs), and receive insights, alerts, and feedback on agriculture schemes, programmes, projects, and initiatives.

Archaeological Survey of India will ‘delist’ some ‘lost’ monuments**Syllabus: GS 2 / Governance****In News**

- The Archaeological Survey of India (ASI) has decided to delist 18 “centrally protected monuments” because it has assessed that they do not have national importance.

Meaning of the “delisting” of monuments

- The ASI, which works under the Union Ministry of Culture, is responsible for protecting and maintaining certain specific monuments and archaeological sites that have been declared to be of national importance under the relevant provisions of The Ancient Monuments Preservation Act, 1904 and The Ancient Monuments and Archaeological Sites and Remains Act, 1958 (AMASR Act).
- Delisting of a monument effectively means it will no longer be conserved, protected, and maintained by the ASI.
- Section 35 of the AMASR Act says that “If the Central Government is of opinion that any ancient and historical monument or archaeological site and remains declared to be of national importance...has ceased to be of national importance, it may, by notification in the Official Gazette, declare that the ancient and historical monument or archaeological site and remains, as the case may be, has ceased to be of national importance for the purposes of [the AMASR] Act.
- Under the AMASR Act, any kind of construction-related activity is not allowed around a protected site.
- Once the monument is delisted, activities related to construction and urbanisation in the area can be carried out in a regular manner.
- ASI currently has 3,693 monuments under its purview, which will fall to 3,675 once the current delisting exercise is completed in the next few weeks.

Do you Know?

- The AMASR Act protects monuments and sites that are more than 100 years old, including temples, cemeteries, inscriptions, tombs, forts, palaces, step-wells, rock-cut caves, and even objects like cannons and mile pillars (“kos minars”) that may be of historical significance.
- These sites are scattered across the length and breadth of the country and, over the decades, some, especially the smaller or lesser known ones, have been lost to activities such as urbanisation, encroachments, the construction of dams and reservoirs, or sheer neglect, which has resulted in their falling apart.
- In some cases, there is no surviving public memory of these monuments, making it difficult to ascertain their physical location.
- Under the AMASR Act, the ASI should regularly inspect protected monuments to assess their condition, and to conserve and preserve them. In cases of encroachment, the ASI can file a police complaint, issue a show-cause notice for the removal of the encroachment, and communicate to the local administration the need for demolition of encroachments.

Kerala govt moves SC against President withholding Assent to its Bills**Syllabus: GS 2/Governance****In News**

- Kerala is challenging the legality of President Droupadi Murmu withholding her assent for the Bills that were passed by the Kerala Legislature before the Supreme Court.
- This will open debate for a Constitutional debate on the scope of a judicial review of the decisions of the President of India.

Arguments of state government

- The act of the President in withholding the assent for the four Bills without giving any reason was highly arbitrary and in violation of Articles 14, 200 and 201 of the Constitution.
- Kerala government argued that the Governor should not have referred the Bills to the President as its subject matters were confined to the State List of the Constitution where the State has powers to legislate.
- The actions of the Governor subverted the delicate balance envisaged by the Constitution between the three organs of State.

Constitutional Provisions on withholding Bills

- Article 200 of the Constitution lays down that when a Bill, passed by a State Legislature, is presented to the Governor for their assent, they have four alternatives —
- may give assent to the Bill;
- may withhold assent to the Bill, that is, reject the Bill in which case the Bill fails to become law;
- may return the Bill (if it is not a Money Bill) for reconsideration of the State Legislature; or
- may reserve the Bill for the consideration of the President.
- According to Article 111 in Constitution of India :When a Bill has been passed by the Houses of Parliament, it shall be presented to the President and the President shall declare either that he assents to the Bill, or that he withholds assent therefrom.
- Provided that the President may, as soon as possible after the presentation to him of a Bill for assent, return the Bill if it is not a Money Bill to the Houses with a message requesting that they will reconsider the Bill

Commissions recommendations

- The Sarkaria Commission (1987) has submitted that it is only the reservation of Bills for consideration of the President, that too under rare cases of unconstitutionality, that can be implied as a discretionary power of the Governor.
- Save in such exceptional cases, the Governor must discharge his functions under Article 200 as per the advice of ministers.
- It further recommended that the President should dispose of such Bills within a maximum period of six months.
- In the event of the President 'withholding assent', the reasons should be communicated to the State Government wherever possible.
- The Punchhi Commission (2010): It had recommended that the Governor should take a decision with respect to a Bill presented for their assent within a period of six months.
- However, these recommendations have not been implemented till date.

Supreme Court's Observations

- As held by the Supreme Court in various cases including the Shamsher Singh case (1974), the Governor does not exercise their discretionary powers while withholding assent or returning a Bill to the State Legislature.
- They are required to act as per the advice of the Council of Ministers.

Conclusion and Way Forward

- The Governor acts as an appointee of the Centre who may be required for maintaining the unity and integrity of the nation in critical times.
- However, federalism is a basic feature of our Constitution and the Governor's office should not undermine the powers of elected governments in the States.
- As the Supreme Court observed, it is necessary for the Governors and Chief Ministers to do 'a little bit of soul-searching'.
- The Constitution may be amended to provide that the Chief Ministers shall be consulted before appointment of the Governors.
- The recommendation of the Punchhi Commission that Governors may be removed through an impeachment by the State Legislature can also be considered.

India's fight against TB

Syllabus: GS2/Health

Context

- Globally, and in India, tuberculosis (TB) continues to loom large as a public health challenge impacting millions.

What is Tuberculosis?

- Tuberculosis (TB) is an infectious disease that most often affects the lungs and is caused by the bacteria *Mycobacterium tuberculosis*.
- It spreads through the air when infected people cough, sneeze or spit.
- TB can manifest in two forms: latent TB infection and active TB disease.
- In latent TB infection, the bacteria are present in the body, but the immune system keeps them in check, and the person does not exhibit symptoms.
- However, the bacteria can become active later, leading to active TB disease.
- Symptoms: Prolonged cough (sometimes with blood), chest pain, weakness, fatigue, weight loss, fever, night sweats.
- While TB usually affects the lungs, it also affects the kidneys, brain, spine and skin.
- Treatment: Tuberculosis is preventable and curable.
- Tuberculosis disease is treated with antibiotics.
- The Bacillus Calmette–Guérin (BCG) vaccine remains the only licensed vaccine against TB; it provides moderate protection against severe forms of TB (TB meningitis) in infants and young children.

India's Burden of TB

- India accounts for around 27% of TB cases worldwide – which is the world's highest country-wise TB burden.
- India's aim to eliminate TB by 2025.
- The theme for World Tuberculosis Day (March 24) in 2024 was the same as 2023 "Yes, we can end TB", which reflects the United Nations Sustainable Development Goals (SDGs) to eliminate TB by 2030.

Challenges Faced by India in Eliminating TB

- Drug-resistant TB cases: India has a significant burden of drug-resistant TB, including multidrug-resistant TB (MDR-TB).
- This type of TB is much harder to treat and requires more expensive, specialised drugs and a longer duration of treatment.
- Diagnostics and Case Detection: The accurate and timely diagnosis of TB remains a challenge.
- Some areas lack access to modern diagnostic tools, leading to reliance on older methods with limitations.
- Poor primary health-care and infrastructure: In many parts of India, especially in rural and remote areas, there is limited access to healthcare facilities.
- This can result in delayed diagnosis and treatment, allowing TB to spread within communities.
- Stigma and Awareness: Stigma associated with TB can lead to delays in seeking healthcare, and lack of awareness about the disease may contribute to its persistence.
- Private Sector Engagement: A significant portion of healthcare services in India is provided by the private sector.
- Coordinating efforts between the public and private sectors and ensuring standardized treatment protocols are crucial for effective TB control.
- Treatment Adherence: TB treatment requires a prolonged course of antibiotics, and ensuring patient adherence to the full course is challenging.
- Vulnerable Populations: Certain populations, such as migrant workers, urban slum dwellers, and those living in crowded conditions, are at higher risk of TB.

Steps Taken by Government of India to Eliminate TB

- Revised National Tuberculosis Control Program (RNTCP): The RNTCP, launched in 1997, was the flagship program to control TB in India.

- The program has been continuously revised and strengthened over the years.
- National Tuberculosis Elimination Program (NTEP): The Government of India has developed a National Strategic Plan (2017-25) for Ending TB in the country by 2025.
- Pradhan Mantri TB Mukh Bharat Abhiyan (PMTBMBA): Launched in 2022 for community support to TB patients with the objective to provide nutritional, diagnostic and vocational support.
- Universal Drug Susceptibility Testing (DST): The government has scaled up efforts to provide universal access to drug susceptibility testing, helping to identify drug-resistant strains of TB early and tailor treatment accordingly.
- Earlier, the patients were started on first line treatment and were tested for drug resistance only if the therapy did not work.
- Ni-kshay portal: An online Ni-kshay portal has been set up to track the notified TB cases.
- New Drugs: Newer drugs such as Bedaquiline and Delamanid for the treatment of drug-resistant TB have been included in the government's basket of drugs provided free TB patients.
- R&D for Treatment: Researchers have been studying shorter three- and four-month courses of anti-tubercular drugs, instead of the existing six-month therapy.
- Vaccine Development: Trials are underway to test the effectiveness of a vaccine called Immuvac, which was initially developed to prevent leprosy, in preventing TB.
- Researchers are also testing VPM1002, which is a recombinant form of the BCG vaccine modified to express the TB antigens better.

Suggestions

- Setting norms and standards on TB prevention and care and promoting and facilitating their implementation;
- Developing and promoting ethical and evidence-based policy options for TB prevention and care;
- Monitoring and reporting on the status of the TB epidemic and progress in financing and implementation of the response at global, regional and country levels.

Drop in Fertility Rate in India

Syllabus: GS2/Health

Context

- Recently, a research paper from Lancet has released the forecast of fertility rate in India.

Major Findings

- Drop in Fertility Rate: India's fertility rate has dropped from nearly 6.2 in 1950 to just under 2 in 2021. It is projected to dip further to 1.29 in 2050 and 1.04 in 2100.
- Depleting Working Population: India's total fertility rate (TFR) — the average number of children born per woman — is dipping irreversibly to 1.29, far lower than the replacement rate of 2.1.
- This means a rapidly depleting working age population.
- Increase in Senior Citizens: By 2050, one in five Indians will be a senior citizen while there will be fewer younger people to take care of them.

Reasons for Decline in Fertility Rate in India

- Government Policy: Post-independence, there was a need to restrict the population. So the Family Welfare Programme were intended to convince people to have no more than two children.
- Slowly that behaviour change started showing up.
- Decline in Infant Mortality: Due to various maternal and child health-related programmes and successful immunisation infant mortality declined in India substantially and small families became the norm.
- Rise in Female Literacy: Due to the rise of female literacy and women's participation in the workforce the career consciousness, financial returns and economic independence have increased in India which means that women are reconsidering their options of having a second child.
- Economic Factors: Economic factors such as rising living costs, the need for dual incomes to support households, and the desire for better standards of living have contributed to smaller family sizes.

Consequences

- **Rise in Elderly Population:** The consequences of fertility decline will be that the share of the elderly in the population will increase sharply.
- By 2050 the share of senior citizens in India will be more than 20 percent, that is one five people.
- **Labor Force Decline:** With fewer young people entering the workforce due to a declining fertility rate, this can impact economic growth and industries may face challenges in finding skilled workers.
- **Healthcare Challenges:** As the population ages, there is likely to be increased demand for healthcare services, this can strain healthcare systems and require adjustments in healthcare policies and infrastructure.
- **Challenges for Social Security Systems:** Declining fertility rates can pose challenges for social security systems, including pensions and retirement funds.

Government Initiatives

- **National Health Mission (NHM):** It is aimed at strengthening healthcare systems, including maternal and child health services.
- NHM provides essential healthcare services, including antenatal care, postnatal care, family planning services, and child immunization, which indirectly influence fertility rates by promoting maternal and child health.
- **Family Planning Program:** India has a long-standing family planning program aimed at promoting contraceptive use and reproductive health awareness.
- The program provides various contraceptive methods free of cost or at subsidized rates, conducts family planning counseling, and promotes awareness about the importance of family planning.
- **Pradhan Mantri Matru Vandana Yojana (PMMVY):** Under the scheme financial assistance is provided to pregnant and lactating mothers for their first live birth.
- The scheme aims to improve maternal and child health outcomes and indirectly supports fertility by promoting safe motherhood.

Way Ahead

- The challenges are still a few decades away for India but the country needs to start acting now with a comprehensive approach for the future.
- Models from Scandinavian countries like Sweden and Denmark, which are dealing with these challenges by supporting new families can be replicated.
- They are providing affordable childcare, investing in healthcare and taking on large-scale male-engagement initiatives to build gender equity.
- **Distribution of Household chores:** For women to be able to manage careers with motherhood, it would be crucial for men to take greater responsibility for household and care work.
- Economic policies that stimulate growth and job creation, alongside social security and pension reforms, will also be essential in adapting to and mitigating the impacts of declining fertility rates.

Can CM of the State continue to occupy a public office: Lessons from the Senthil Balaji case

Syllabus:GS 2/Governance

Context

- Questions are being asked about whether the Delhi Chief Minister can continue to occupy a public office as the Rouse Avenue Magistrate remanded him to the custody of the Enforcement Directorate (ED).

Do you know ?

- At the State level, the executive comprises the Governor and the Chief Minister and Council of Ministers
- The Chief Minister is appointed by the Governor.
- a. The person who commands the majority support in the State Legislative Assembly (Vidhan Sabha) is appointed as the Chief Minister by the Governor.
- b. The other Ministers are appointed by the Governor on the advice of the Chief Minister.
- c. The ministers included in the Council of Minister's must belong to either House of the State legislature.
- d. A person who is not a member of the State legislature may be appointed a minister, but he/she ceases to hold office if he/she is not elected to the State legislature within six months of his appointment.
- e. The Council of Ministers is collectively responsible to legislative assembly of the State.

Senthil Balaji case

- Judgments in the Supreme Court and High Courts have previously concluded that constitutional morality, good governance, and constitutional trust are the basic norms for holding a public office.

- A judgment by the Madras High Court in S. Ramachandran versus V. Senthil Balaji referred to arguments made in court on whether a Minister must forfeit his right to occupy a public office that demands a high degree of morality if he is accused of a “financial scandal”.
- Mr. Balaji, a former Tamil Nadu Electricity Minister, was arrested by the ED on money-laundering charges last year.
- He continued to be a State Minister without portfolio while he was in judicial custody.
- The arguments referred to a 2014 Constitution Bench judgment of the Supreme Court in Manoj Narula versus Union of India, which had held that the basic norm for holding a public office was constitutional morality, that is, to avoid acting in a manner contradictory to the rule of law.
- The second norm was good governance.
- It was argued in the Madras High Court that “the government has to rise above narrow private interests or parochial political outlook and aim at doing good for the larger public interest”.
- The third was constitutional trust, that is, to uphold the high degree of morality attached to a public office.

Section 123(3) of the RPA 1951

Syllabus: GS2/Polity and Governance

Context:

- It has been found that the various parties and their leaders have been accused of violating Section 123(3) of the RP Act.

About the Section 123(3) of RPA 1951:

- It provides that appeals by a candidate, or any other person with the consent of a candidate, to vote or refrain from voting on the ground of his religion, race, caste, community, or language is a corrupt electoral practice.
- It denounces any attempt by a candidate to promote feelings of enmity or hatred among citizens on these grounds during elections.
- It aims to ensure that elections are conducted in a free and fair manner, without appealing to the communal or sectarian sentiments of the voters.
- It underscores the principle that the appeal for votes should be based on policies, performance, and public welfare, rather than on narrow communal or sectarian lines.

Key Provisions of the RP Act 1951:

- Conducting of Elections and By-Elections;
- Registration of Political Parties;
- Qualifications and Disqualifications for membership of the Houses;
- Corrupt Practices and Electoral Offences;
 - a. It provides that anyone found guilty of corrupt electoral practice can be debarred from contesting elections for a maximum period of up to six years.
- Dispute Redressal in matters connected to elections;

Guidelines For Online Betting And Gambling Platforms

Syllabus: GS2/Government Policies and Interventions

Context:

- The Ministry of Information and Broadcasting has recently advised all endorsers and influencers on social media to refrain from promoting or advertising offshore online betting and gambling platforms.

About:

- The Ministry has reiterated the advisory by the Central Consumer Protection Authority (CCPA) dated 06.03.2024 which had expressed concerns regarding endorsements of betting/gambling platforms by celebrities and influencers to endorse and promote their betting activities.

Major highlights of the advisory

- Prohibition: The guidelines prohibit the endorsement and advertisement of activities prohibited by law, including betting or gambling, and caution that any such endorsements or advertisements will be subject to rigorous scrutiny.

- The advisories also warn celebrities and influencers to refrain from endorsing and promoting illegal betting and gambling activities.
- Socio-economic implications: The Ministry has said that these advertisements have a significant financial and socio-economic implications of online betting and gambling on consumers, particularly the youth.
- The Ministry has also advised the online advertisement intermediaries not to target such promotional content towards Indian audiences.
- Sensitization drives: Social media intermediaries have also been advised to conduct sensitization efforts among their users to refrain from publishing such content.
- Penalty: The advisory cautions that failure to comply with it may lead to proceedings under the provisions of Consumer Protection Act, 2019 including removal or disabling of social media posts or accounts and penal action under the applicable statutes.
- Applicability: These guidelines apply to all advertisements regardless of the medium and are aimed at protecting consumers, particularly the youth, from the potential harms associated with illegal betting and gambling.

Online Gambling

- Online gambling refers to the practice of participating in gambling activities over the internet. It involves placing bets or wagers on various games and events with the aim of winning money or other prizes.
- It can be played on various devices, including computers, laptops, tablets, and smartphones and involves the use of virtual chips or digital currencies instead of physical cash.
- The global online gambling market size was valued at USD 63.53 billion in 2022 and is expected to grow at a compound annual growth rate (CAGR) of 11.7% from 2023 to 2030.

Major Types:

- Casino games: These include slots, blackjack, roulette, and baccarat, among others.
- Sports betting: This involves placing bets on sports events, such as football, basketball, cricket, and horse racing.
- Poker: This is a card game played against other players online.
- Lottery: This involves purchasing tickets for online lotteries that offer large cash prizes.

Advantages of Online Gambling

- Accessible entertainment: Online gambling provides easy and convenient access to entertainment for millions of Indians who may not have access to traditional land-based casinos or gambling establishments.
- Revenue generation: It can generate significant revenue for the Indian government through taxation and regulation besides creating jobs and business opportunities for Indian entrepreneurs.
- Tourism: It can help promote tourism in India by attracting foreign players who are interested in Indian-themed games or unique experiences that are not available in their home countries.
- Responsible gambling: Online gambling platforms can provide responsible gambling resources and tools to help players manage their gambling activities and prevent addiction through setting deposit limits.

Challenges of Online gambling

- Addiction: Online gambling can lead to addiction causing severe financial and social problems as it is easily accessible, and players can spend hours playing games without realizing the amount of time and money they are spending.
- Lack of Regulation: Online gambling is often unregulated, making it easy for fraudulent activities to take place. This can lead to players losing their money or their personal information being compromised.
- Underage Gambling: Online gambling sites can be easily accessed by minors, leading to underage gambling. This can cause severe psychological and financial problems for children and their families.
- Money Laundering: Online gambling can be used as a means for money laundering, where players can deposit large amounts of cash into online accounts and then withdraw the money in a legitimate form.
- Cybersecurity Risks: Online gambling sites can be vulnerable to cyber-attacks, which can lead to the theft of sensitive personal and financial information of the players.
- Social Isolation: Online gambling can lead to social isolation, as players can spend hours playing games online, leading to a lack of social interaction with family and friends.

Regulation of Online Gambling in India: The laws governing online gambling in India are complex and vary by state however, there are some overarching laws that apply to the entire country:

- Public Gambling Act, 1867: It is a federal law that prohibits operating or visiting a gambling house. However, this law does not specifically mention online gambling.
- Information Technology Act, 2011: It was amended to include provisions related to online gambling which states that any website that offers online gambling services must be located outside of India.
- Many states in India have their own laws related to gambling with some states, such as Goa and Sikkim, having legalized certain forms of gambling and issuing licenses to operators.

Related Supreme Court Judgements:

- Dr. K.R. Lakshmanan vs. State of Tamil Nadu (1996): The Supreme Court of India held that games of skill, such as horse racing and rummy, are not considered gambling under the Public Gambling Act of 1867.
- State of Andhra Pradesh vs. K. Satyanarayana (1968): The Andhra Pradesh High Court ruled that playing rummy for stakes is considered gambling and is therefore illegal.
- Varun Gumber v. Union Territory of Chandigarh (2017): The Punjab and Haryana High Court declared that online fantasy sports games, such as Dream11, involve a substantial degree of skill and are not considered gambling.
- Mahalakshmi Cultural Association v. State of Tamil Nadu (2013): The Madras High Court held that online games of chance, such as poker and rummy, are considered gambling and are therefore illegal.
- Shri Krishna Agrawal vs. State of Maharashtra (1999): The Bombay High Court ruled that the game of poker involves a substantial degree of skill and is therefore not considered gambling.

Way ahead

- Overall, online gambling poses significant challenges that need to be addressed by regulators and policymakers to ensure that players are protected and that online gambling is conducted in a fair and responsible manner.
- The legal landscape surrounding online gambling in India is complex and can vary widely by state thus there is need for individuals to be aware of the laws in their state and to ensure they are only participating in legal and licensed online gambling activities.

SC Stays Centre's Fact Check Unit Notification

Syllabus: GS2/Governance

Context

- The Supreme Court stayed the operation of the amended Information Technology (IT) Rules, which empowered the government to identify fake news through a Fact Check Unit (FCU).

Amended Information Technology (IT) Rules

- The amendment to The Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021 notified in 2023 did two things:
 - they brought in a legal framework for the online gaming eco-system
 - and introduced a legal mechanism for the government to fact-check online content pertaining to “government business”.
- The Rules made it obligatory on intermediaries like social media platforms “to not to publish, share or host fake, false or misleading information in respect of any business of the Central Government”.
- The changes raised concern that the FCU will make the government the “sole arbiter of truth” in respect of any business related to itself.
- Subsequently, the rules were challenged before the Bombay High Court.

Concerns Raised Due to Amended Rules

- IT Rules 2021 as being violative of Article 14, Article 19(1)(a) and (g), and Article 21 of the Constitution, and Section 79 and the Information Technology Act, 2000 (IT Act).
- The amendment essentially expanded the general term “fake news” to include fake news involving government business.
- The petitioners argued before the court that this would have a “chilling effect” upon the freedom of speech and expression.

- Section 69 of the IT Act empowers the government to issue directions to block public access to any information through any computer resource. The Rules were framed essentially in exercise of this power.
- The Bombay High Court examined if these Rules were violative of free speech, and were arbitrary in nature.
- The SC stayed the amended Rules until the Bombay High Court reaches a final conclusion.
- The stay will remain in place till the Bombay High Court finally decides the constitution validity of the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Amendment Rules 2023.

What is the Fact Check Unit?

- It was established under the Press Information Bureau (PIB) and started its operations in 2019.
- It was constituted to flag “fake, false or misleading online content related to the government.
- The FCU would flag off the fake, false, and misleading facts about the business of the government to social media intermediaries.
- Once such a post is flagged off, the intermediary has the option of either taking down the post or putting a disclaimer on the same.
- In taking the second option, the intermediary loses its safe harbour/immunity and stands liable for legal action.
- Recently, The government notified the Fact Check Unit under Information Technology Rules, 2021.

IVF (In Vitro Fertilization)

Syllabus: GS 2 /Health/ GS 3 / S&T

In News

- The Ministry of Health and Family Welfare has sought a report from the Government of Punjab on the in-vitro fertilization (IVF) treatment availed by the late Punjabi singer's mother

About IVF (in vitro fertilization)

- It is a type of fertility treatment where an egg is removed from the woman's ovaries and fertilised with sperm in a laboratory.
- It's a method used by people who need help achieving pregnancy.
- It is an effective form of assisted reproductive technology (ART).

Do you Know?

– ART is defined as all techniques used to obtain a pregnancy by handling the sperm or egg cell outside the human body and transferring the embryo into the woman's reproductive tract. These include – sperm donation, in-vitro-fertilisation (IVF) (where the sperm is fertilized in a lab), and gestational surrogacy (child is not biologically related to surrogate).

Benefits

- IVF can help couples and individuals who are struggling with infertility
- Reduce the chances of miscarriage among females
- High Success Rate of Pregnancy
- Donated Eggs/Sperms Can Be Used

Risks

- IVF involves large amounts of physical and emotional energy, time, and money.
- Many couples dealing with infertility suffer stress and depression.
- A woman taking fertility medicines may have bloating, abdominal pain, and other side effects.
- IVF, surrogacy and egg donation have become a thriving business

Recent Debate

- The late singer's mother is 58 but Under Section 21(g)(i) of the Assisted Reproductive Technology (Regulation) Act, 2021, the age limit prescribed for a woman going under ART Services is between 21-50 years.

- The birth has also sparked a debate on whether an age limit should be implemented in such cases as people are living longer and have better medical facilities to ensure a good quality of life.
- Some experts argue that the age group of 25-35 years is the best time to conceive with 50-years being a reasonable age limit.
- “Aging brings along various ailments, including blood pressure, diabetes and heart diseases, and the child must have reasonable parental support time

View of WHO

- According to the World Health Organization (WHO), infertility is a disease of the male or female reproductive system defined by the failure to achieve a pregnancy after 12 months or more of regular unprotected sexual intercourse.
- Infertility affects millions of people, and has an impact on their families and communities.
- Estimates suggest that approximately one in every six people of reproductive age worldwide experience infertility in their lifetime.
- It is also maintained that every human being has a right to the enjoyment of the highest attainable standard of physical and mental health. Individuals and couples have the right to decide the number, timing, and spacing of their children.

Conclusion

- Infertility can negate the realization of essential human rights.
- Addressing infertility is therefore an important part of realizing the right of individuals and couples to found a family.
- Government policies on IVF treatment can mitigate the financial burden ,emotional impact of infertility on family life.
- Benefits planned around preconception, fewer working hours for women under fertility treatment to manage regular visits to doctors, and the emotional and financial aspects of treatment, would help considerably.

Precision Oncology

Syllabus: GS2/Health

Context

- Developments in precision oncology require cancers to be classified based on their genetic characteristics rather than the organ in which they originate.

About

- Traditional approaches to treating cancer – including surgery and radiation – target the organs in which the tumour is present.
- This practice formed the basis of classifying cancers after the organ in which they originate.
- Development in precision oncology requires cancers to be classified based on their molecular and genetic characteristics rather than the organ in which they originate.
- Significance: It will reduce the time needed to run clinical trials.
- A trial for a drug targeting a particular genetic mutation will cover all cancer types with those mutations.
- Challenges: The proposed change for classifying cancers can't happen unless patients can access tests that reveal molecular alterations in their tumour.
- These tests currently cost Rs 7,000-40,000 in Indian labs and up to Rs 3 lakh abroad.

Haemodialysis

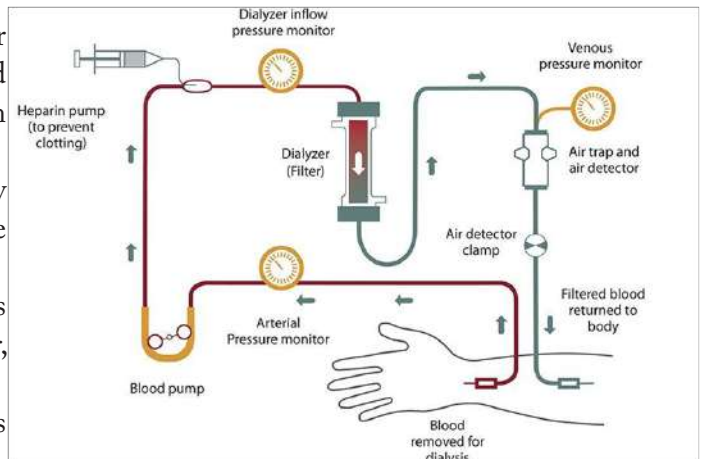
Syllabus: GS2/Health

Context

- Findings from a nationwide private haemodialysis network show that there is a variation in the survival of patients receiving haemodialysis in India and suggested to standardise dialysis care across centres.

Haemodialysis

- Hemodialysis is a medical procedure used to filter waste products and excess fluids from the blood when the kidneys are no longer able to perform this function adequately.
- It is commonly used to treat advanced kidney failure, also known as end-stage renal disease (ESRD).
- During hemodialysis, the patient's blood is circulated through a machine called a dialyzer, which acts as an artificial kidney.
- Hemodialysis is typically performed several times a week, with each session lasting a few hours.
- It is a life-saving treatment for individuals with kidney failure, helping to maintain their overall health and well-being.



Profits and Poverty: The Economics of Forced Labour Report :ILO

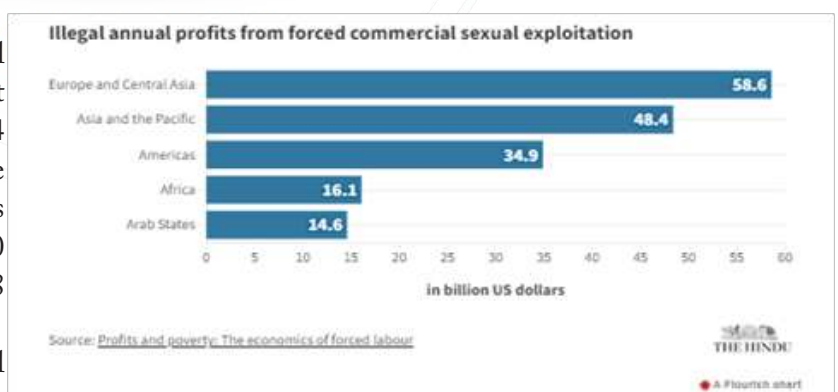
Syllabus :GS 2/International Reports

In News

- Recently, the International Labour Organization (ILO) released a report titled “Profits and Poverty: The economics of forced labour”.

Major Findings

- People engaged in forced labour: There were 27.6 million people engaged in forced labour on any given day in 2021. This figure translates to 3.5 people for every thousand people in the world.
- Amount of illegal profits: Forced labour in the private economy generates US\$236 billion in illegal profits per year.
- The total amount of illegal profits from forced labour has risen by US\$64 billion (37 per cent) since 2014, a dramatic increase that has been fuelled by both a growth in the number of people forced into labour, as well as higher profits generated from the exploitation of victims.
- Traffickers and criminals are generating close to US\$10,000 per victim, up from US\$8,269 (adjusted for inflation) a decade ago.
- Region wise :Total annual illegal profits from forced labour are highest in Europe and Central Asia (US\$84 billion), followed by Asia and the Pacific (US\$62 billion), the Americas (US\$52 billion), Africa (US\$20 billion), and the Arab States (US\$18 billion).
- Sector wise : Forced commercial sexual exploitation accounts for more than two-thirds (73 per cent) of the total illegal profits, despite accounting for only 27 per cent of the total number of victims in privately imposed labour.
- After forced commercial sexual exploitation, the sector with the highest annual illegal profits from forced labour is industry, at US\$35 billion, followed by services (US\$20.8 billion), agriculture (US\$5.0 billion), and domestic work (US\$2.6 billion).



Concerns

- People in forced labour are subject to multiple forms of coercion, the deliberate and systematic withholding of wages being amongst the most common.
- Forced labour perpetuates cycles of poverty and exploitation and strikes at the heart of human dignity.

- Forced labour cases can often be traced back to recruitment abuses as well as the apparent importance of unlawful recruitment fees and costs as a source of illegal profit from forced labour.

Suggestions

- The international community must urgently come together to take action to end this injustice, safeguard workers' rights, and uphold the principles of fairness and equality for all.
- It recommends strengthening legal frameworks, providing training for enforcement officials, extending labour inspection into high-risk sectors, and better coordination between labour and criminal law enforcement.
- Enforcement actions must be part of a comprehensive approach that prioritizes addressing root causes and safeguarding victims.
- Promoting fair recruitment processes is also crucial
- Ensuring the freedom of workers to associate and to bargain collectively is also essential to building resilience to the risks of forced labour.

Ketamine

Syllabus: GS2/Health

Context

- Elon Musk has admitted using the prescription of ketamine to manage a negative chemical state similar to depression.

About

- Ketamine is used to treat pain and depression and in heavy doses is used as a sedative.
- It also carries risks, including hallucinations and potential overdose leading to unconsciousness and slowed breathing.
- Ketamine is often administered in a medical environment, or its close variant, Spravato, is available as a nasal spray specifically for treatment-resistant depression.

Lab Network To Test Food For Pathogens

Syllabus: GS2/Statutory Bodies; GS3/Food Processing

Context:

- Recently, the Food Safety and Standards Authority of India (FSSAI), has taken the 'Lab Network To Test Food For Pathogens' initiative to ensure food safety in the country.

About the Initiative

- It is a network of 34 microbiology labs across the country to test food products for microbial contamination.
- The labs are equipped to test food products for 10 pathogens, including E. coli, salmonella, and listeria. These labs test food samples collected during routine surveillance for microbes.
- It aims to help in the early detection of microbial contamination in food products, thereby preventing foodborne illnesses and ensuring the health and well-being of the public.

Need for the Initiative

- Food poisoning and diarrhoea have become common occurrences in India.
- Data from the National Centre for Disease Control (NCDC) shows that there were over 1,100 outbreaks of acute diarrhoeal disease and nearly 550 outbreaks of food poisoning in the country in the last four years.

About FSSAI:

- It was established under **Food Safety and Standards (2006)**, as an autonomous body under the **Ministry of Health and Family Welfare (MoH&FW)**.
- It is responsible for **promoting and protecting public health** through various regulations and supervisions of food safety.
- It handles food-related issues including ensuring the safe availability of food for human consumption.

- Currently, none of the state food safety labs are equipped to test for pathogens as they require maintaining live reference samples, expensive reagents, and a microbiologist.

Initiatives of FSSAI

- Eat Right Movement campaign: To ensure safe, healthy and sustainable food for all Indians.
- Clean Street Food: Providing training to street food vendors and spreading awareness among them regarding the violations of the FSS Act.
- Diet4Life: Spreading awareness about the different types of metabolic disorders and how to avoid them.
- Save Food, Share Food, Share Joy: FSSAI promoted and encouraged people to avoid food wastage and promote the donation of food.
- Heart Attack Rewind: It is a mass media campaign of FSSAI to support FSSAI's target of eliminating trans fat in India by the year 2022.

Elections in India**Syllabus :GS 2/Polity and Governance****In News**

- The Election Commission announced a seven-phase Lok Sabha election starting April 19.

About Election

- Election is the process by which people choose, by voting, representatives to act on their behalf, to represent them, in a legislative body.
- Elections are held on the basis of universal adult franchise, which means all Indians of 18 years of age and above have the right to vote, irrespective of their caste, colour, religion, sex or place of birth.
- Elections enable every adult citizen of the country to participate in the process of government formation.
- Prevailing Scenario : Elections are held in India frequently.
- These include elections to elect members of the Lok Sabha, Rajya Sabha, State Legislative Assemblies (Vidhan Sabhas) Legislative Councils (Vidhan Parishad) and of, President and Vice-President of India.
- Elections are also held for local bodies such as municipalities, municipal corporations and Panchayati Raj.
- Role of ECI: Election Commission of India is an autonomous constitutional authority responsible for administering election processes in India.
- It is a three-member body.
- The main functions of the Election Commission are to delimit the constituencies, recognise the political parties, allot the symbols, and appoint officials to conduct and supervise the elections,

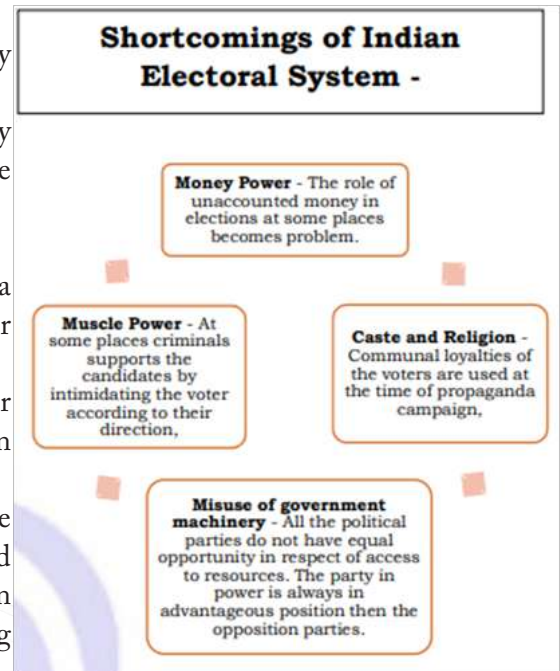
**Article 324: (1)**

The superintendence, direction and control of the preparation of the electoral rolls for, and the conduct of, all elections to Parliament and to the Legislature of every State and of elections to the offices of President and Vice-President held under this Constitution shall be vested in a Commission (referred to in this Constitution as the Election Commission).

Procedures

- Notification for Election: The process of election officially begins when on the recommendation of Election Commission, the President in case of Lok Sabha and the Governor in case of State Assembly issue a notification for the election.
- Filing of Nomination Structure of Government: A person who intends to contest an election is required to file the nomination paper in a prescribed form indicating his name, age, postal address and serial number in the electoral rolls.

- Security Deposit: Every candidate has to make a security deposit at the time of filing nomination.
- Scrutiny and Withdrawal : All nomination papers received by the Returning Officer are scrutinised on the day fixed by the Election Commission.
- The candidates can also withdraw their nominations.
- Election Campaign : Campaigning is the process by which a candidate tries to persuade the voters to vote for him rather than others.
- During this period, the candidates try to travel through their constituency to influence as many voters as possible to vote in their favour.
- Model Code of Conduct : During the campaign period the political parties and the contesting candidates are expected to abide by a model code of conduct evolved by the Election Commission of India on the basis of the consensus among political parties.
- It comes into force the moment the schedule of the election is announced by the Election Commission.
- Polling, Counting and Declaration of Result: In order to conduct polling, large number of polling booths are set up in each constituency.
- Each booth is placed under the charge of a Presiding Officer with the Polling Officers to help the process.
- The candidate who secures the highest number of votes in a constituency is declared elected.



Electoral Reforms

- To restore the confidence of the public in the democratic electoral system, many electoral reforms have been recommended from time to time by the Tarkunde Committee and Goswami Committee, under the chairmanship of the then Chief Election Commissioner, T.N. Seshan
- Some reforms are :voting age has been lowered from 21 years to 18 years.
- increase in the amount of security deposit.
- photo identity cards have been introduced.
- Introduction of Electronic Voting Machine

Conclusion and Way Forward

- There is no doubt that India needs drastic poll reforms but still the fact remains that Indian elections have been largely free and fair and successfully conducted.
- With the acceptance of adult suffrage, freedom to contest elections, and the establishment of an independent Election Commission, India has tried to make its election process free and fair.
- It gives the country the proud distinction of being the largest democracy in the world.
- Still some more steps can be taken like :
- There should be stricter provisions to control the role of money in electoral politics.
- Candidates with any criminal case should be barred from contesting elections
- There should be a complete ban on the use of caste and religious appeals in the campaign.
- People themselves have to be more vigilant, more actively involved in political activities.

Withholding of Presidential assent of State Bills

Syllabus:GS32/Polity and Governance

Context

- Kerala government will challenge before the Supreme Court the legality of the President, withholding her assent for the Bills that were passed by the Kerala Legislature.

Background

- The President had withheld assent to Kerala University Laws (Amendment No. 2) Bill 2022, University Law Amendment Bill, 2022, and the University Law Amendment Bill, 2021 from the seven Bills that were referred to her in 2023.
- Kerala argues that the Governor should not have referred the Bills to the President as its subject matters were confined to the State List of the Constitution where the State has powers to legislate.

Governor's Power with Respect to the Bills

- Article 200 of the Constitution lays down that when a Bill, passed by a State Legislature, is presented to the Governor for their assent, they have four alternatives:
- May give assent to the Bill;
- May withhold assent to the Bill, in which case the Bill fails to become law;
- May return the Bill (if it is not a Money Bill) for reconsideration of the State Legislature; or However, if the bill is passed again by the state legislature with or without amendments, the governor has to give his assent to the bill, or
- May reserve the Bill for the consideration of the President.

Reservation of Bill for President Consideration

- In one case such reservation is obligatory, where the bill passed by the state legislature endangers the position of the state high court.
- In addition, the governor can also reserve the bill if it is of the following nature:
- Ultra-vires, that is, against the provisions of the Constitution;
- Opposed to the Directive Principles of State Policy;
- Against the larger interest of the country;
- Of grave national importance;
- Dealing with compulsory acquisition of property under Article the Constitution.

Sarkaria Commission Recommendations

- The Commission has submitted that it is only the reservation of Bills for consideration of the President, that too under rare cases of unconstitutionality, that can be implied as a discretionary power of the Governor.
- Save in such exceptional cases, the Governor must discharge his functions under Article 200 as per the advice of ministers.
- It further recommended that the President should dispose of such Bills within a maximum period of six months.
- In the event of the President 'withholding assent', the reasons should be communicated to the State Government wherever possible.

Way Ahead

- The constitution empowers the governor to reserve a bill for the President's consideration. This is an important 'discretionary power' which is necessary for the governor to make sure that state's laws fall within the framework of the constitution.
- There cannot be a parallel administration within the state by allowing the governor to go against the advice of the council of ministers.
- There is no doubt that these ought to be changed, either by amending the Constitution or through an appropriate Supreme Court verdict, so that misuse of gubernatorial discretion can be kept in check.

Cinematograph (Certification) Rules, 2024

Syllabus: GS2/Government Policies and Interventions

Context:

- The Union government has notified the Cinematograph (Certification) Rules, 2024, in order to improve the process of certification of films for public exhibition.

About:

- These new rules aim to streamline and modernise the film certification process for the digital age, keeping pace with the emerging technologies and advancement in the film sector.
- A comprehensive revision of the Rules has been done to fully align it with the adoption of online certification processes, which will ensure enhanced transparency, efficiency and ease of doing business for the film industry, said the Ministry of Information and Broadcasting.

Cinematograph (Certification) Rules, 2024

- Age-based indicators: While the 'U' (unrestricted public exhibition), 'A' (restricted to adults) and 'S' (restricted for specialised viewing) categories of certification have been left unaltered, the new age-based indicators within the 'UA' category will be visible on the certificates.
- The existing UA category further subdivided into three age-based categories: seven years (UA 7+), 13 years (UA 13+), and 16 years (UA 16+), instead of 12 years.
- These age-based markers would be only recommendatory, meant for the parents or guardians to consider whether their children should view such a film.
- At least one-third women representation: The Union Government may take such steps as it thinks fit to appoint women members in the Board so that there is due representation for women, where one-third of the members in the Board shall be women and preferably half shall be womens.
- Third parties: The role of third parties in the certification process has been totally done away with in the wake of allegations of bribery against middlemen.
- The applications can only be submitted online: Every application to certify a film for public exhibition shall be made on the online portal of the Board, hereinafter referred to as the e-cinepramaan portal.
- Perpetual Validity: The new rules also provide that a certificate granted by the CBFC will be perpetually valid. As of now, a certificate was only valid for 10 years, after which a film had to be recertified.
- Re-certifying a film: As per the 2024 draft rules, any application to recertify or change the category of a film for exhibition on television or media other than the medium originally certified can be made on the e-cinepramaan portal.
- Accessibility features: In another development, the government has notified the guidelines for the accessibility of persons with hearing and visual impairment to films.
- The guidelines provide at least one accessibility feature each for the hearing impaired and visually impaired viz. closed captioning and audio description.

HbA1C Test**Syllabus: GS2/ Health****Context**

- To diagnose pre-diabetes and diabetes (both type 1 and type 2), the hemoglobin A1C (HbA1C) test, also known as the glycated hemoglobin or glycosylated hemoglobin test is used.

Background

- India accounts for 17% of all diabetes patients in the world.
- Over 35% of Indians suffer from hypertension and nearly 40% from abdominal obesity, both of which are risk factors for diabetes.

How does the test work?

- Sugar or glucose enters the bloodstream from the food it attaches to the hemoglobin in the red blood cells.
- Hemoglobin is a protein that transports oxygen to all the cells of your body.
- Everybody has some sugar attached to their hemoglobin. Those with pre-diabetes and diabetes, however, have more.
- The HbA1C test measures the percentage of the red blood cells that have sugar-coated, or glycated, hemoglobin.

Test Results

- The HbA1C levels are provided as either a percentage or in mmol/mol (which stands for millimoles per mole).

- An Hb1A1C below 5.7% is considered normal; between 5.7 and 6.4% may indicate you are pre-diabetic; and 6.5% or higher can indicate diabetes.

Types of diabetes

– Type 1 diabetes: The body does not make insulin since the immune system attacks and destroys the cells in your pancreas that make insulin.

- Type 1 diabetes is usually diagnosed in children and young adults, although it can appear at any age.
- People with type 1 diabetes need to take insulin every day to stay alive.

– Type 2 diabetes: The body does not make or use insulin well.

- One can develop type 2 diabetes at any age, even during childhood. However, this type of diabetes occurs most often in middle-aged and older people.
- Type 2 is the most common type of diabetes.

Levels and Trends in Child Mortality: UN Report

Syllabus: GS2/Social Justice: Vulnerable Sections: Children

Context

- Global child deaths reached a historic low in 2022, according to the latest estimates by the United Nations Inter-agency Group for Child Mortality Estimation.

About

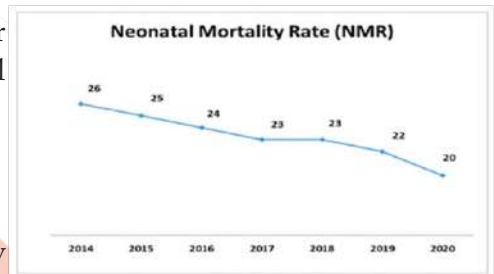
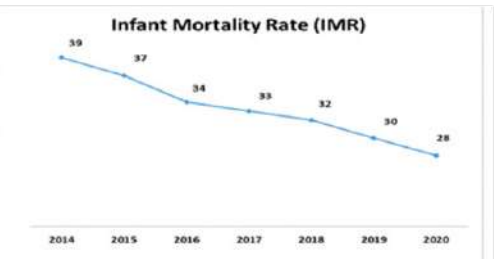
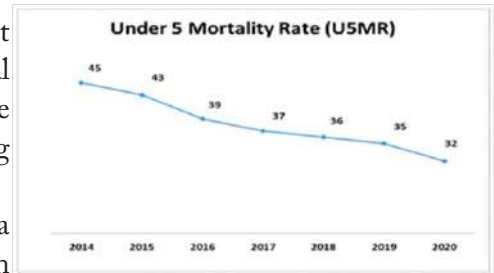
- The report noted the annual number of global under-five deaths in 2022 declined by more than half from the 2000 estimate — from 9.9 million to 4.9 million.
- However, the numbers are still bad. Globally,
- neonatal deaths, or the death of a baby within 28 days of birth, happened every 14 seconds;
- a child aged under five died every six seconds and
- an adolescent (ages 10 to 19) died every 35 seconds in 2022, the report found.

Major Highlights of the Report

- Decline in child deaths: The report noted a 62 per cent decline in child deaths from the 1990 estimates.
- However, it warned that “these averages mask persistent and entrenched inequities among vulnerable populations of children.”
- Neonatal deaths: While the larger trend shows a decline, the trend of under-five deaths has increased in the neonatal period from 41 per cent in 2000 to 47 per cent in 2022.
- The slower decline in neonatal deaths is due to factors like population change and differences in the cause-of-death structure by age.
- Mortality among 1–59-month-olds is generally more responsive to basic public health interventions, while neonatal mortality relates more to complications around the time of birth.
- Sub-saharan Africa: Sub-Saharan Africa, where annual neonatal deaths have stagnated at about 1 million, bears the greatest burden of under-five deaths in the world.
- The mortality rate for children aged 28 days was 46 deaths per 1,000 children in the region, more than two times higher than the global average of 20 deaths per 1,000 children aged 28 days.
- Leading causes: Prematurity, pneumonia, trauma, malaria and diarrhoea are among the leading causes of death for newborns and children, all preventable causes.
- These illnesses could have been prevented with vaccinations, availability of skilled health personnel at birth, support for early and continued breastfeeding.
- Survival factors: The child’s survival largely depends on the place of birth; whether the child belongs to a low-income or high-income country, and also on the inequity within countries.
- On average, children living in rural areas are at a higher risk of death before age 5 compared to their urban counterparts.
- Predictions: The report estimates that 35 million children under the age of 5 will lose their life before 2030 and sub-Saharan Africa will bear most of the death toll.
- It further warned that under current trends, 59 countries will miss the SDG under-five mortality target and 64 countries will miss the neonatal mortality target.

Child Mortality in India: Status and Trends

- As per the Sample Registration System (SRS) Statistical Report 2020 released on 22nd September 2022 by Registrar General of India (RGI), the country has been witnessing a progressive reduction in IMR, U5MR and NMR since 2014 towards achieving the Sustainable Development Goals (SDG) targets by 2030.
- Under 5 Mortality Rate (U5MR) for the country has shown a significant decline of 3 points from 2019 (35 per 1000 live births in 2019) to 2020 against 32 per 1000 live births in 2020.
- It varies from 36 in rural areas to 21 in urban areas and U5MR for females is higher (33) than male (31).
- Infant Mortality Rate (IMR) has also registered a 2-point decline to 28 per 1000 live births in 2020 from 30 per 1000 live births in 2019 (Annual Decline Rate: 6.7%).
- The Rural-Urban difference has narrowed to 12 points (Urban 19, Rural-31).
- Neonatal Mortality Rate has also declined by 2 points from 22 per 1000 live births in 2019 to 20 per 1000 live births in 2020 (Annual Decline Rate: 9.1%).
- It ranges from 12 in urban areas to 23 in rural areas.



Major Causes of Child Mortality in India

- Preterm Birth Complications:** Low birth weight, respiratory problems due to underdeveloped lungs.
- Birth Asphyxia:** Lack of oxygen during delivery, leading to brain damage or death.
- Neonatal Infections:** Sepsis, pneumonia can overwhelm a newborn's weak immune system.
- Pneumonia:** The leading cause, often linked to malnutrition and air pollution.
- Diarrhoea:** Dehydration caused by infectious diseases like rotavirus.
- Malnutrition:** Stunting and wasting weaken a child's immune system and increase vulnerability to infections.

Measures to Reduce Child Mortality

Improving Maternal Health

- Prenatal Care:** Regular checkups, proper nutrition for pregnant women to prevent complications and low birth weight.
- Skilled Birth Attendance:** Deliveries by trained midwives or doctors to ensure safe childbirth.
- Postnatal Care:** Monitoring the well-being of mothers and newborns after delivery.

Combating Childhood Illnesses

- Immunization Programs:** Ensure universal access to vaccinations for preventable diseases like measles, pneumonia, and diarrhea.
- Improved Sanitation and Hygiene:** Promote handwashing with soap, access to clean drinking water, and proper sanitation facilities.
- Pneumonia Control:** Early diagnosis and treatment with antibiotics.
- Diarrhoea Management:** Oral rehydration therapy (ORT) with clean water and electrolytes to prevent dehydration.

Addressing Malnutrition

- Nutritional Programs:** Promote breastfeeding for newborns, provide access to nutritious food for mothers and children, especially during the crucial first 1000 days of life.

Public Awareness

- Educate families:** Importance of good hygiene, breastfeeding, timely medical care for children, and recognizing danger signs of illness.

Additional Measures

- Invest in Healthcare Infrastructure: Equip health facilities, especially in rural areas, with necessary supplies and train healthcare workers.
- Address Social Determinants: Poverty, lack of education, and gender inequality significantly contribute to child mortality.
- Empowering Women: Education and economic empowerment of women lead to better health outcomes for themselves and their children.

Way Ahead

- By tackling causes behind the child mortality and implementing required measures, India can significantly reduce child mortality and ensure a healthier future for its young generation.

Lyme Disease

Syllabus: GS2/ Health

In News

- A case of Lyme disease was reported in Kerala's Ernakulam.

About

- It is caused by the bacterium *Borrelia burgdorferi*.
- It is transmitted by infected ticks of the genus *Ixodes*.
- Erythema migrans rash is the most characteristic symptom and others are headache, fatigue, and muscle aches.
- It is mostly common in the US, Europe & some parts of Asia.

Source: TOI

Pandavula Gutta Designated as a Geo-Heritage Site

Syllabus: GS1/ Art & Culture

In News

- Pandavula Gutta, a geological marvel older than the Himalayan hills, has been officially recognised as the sole Geo-heritage site in Telangana.

About Pandavula Gutta

- They are older than the Himalayas, famous for ancient rock paintings which depict animals like bison, antelope, tiger, and leopard, along with geometric designs and symbols like swastikas, circles, and squares.
- The presence of these paintings suggests the area was inhabited from the Mesolithic period (around 12,000 to 6,000 BCE) up to medieval times.

About Geo-heritage Sites

- Geo-heritage refers to the geological features which are inherently or culturally significant offering insight into earth's evolution or history to earth science or that can be utilized for education.
- In India, the Geological Survey of India (GSI) identifies these special places and designates them as Geo-Heritage Sites (GHS). This helps protect them. It's similar to how UNESCO safeguards world heritage sites around the globe.

Geological Survey of India (GSI)

- The Geological Survey of India (GSI) is a scientific agency of India. It was founded in 1851, under the Ministry of Mines
- It is responsible for conducting geological surveys and the updation of national geoscientific information and mineral resource assessment.

Kovind Panel submitted Report on Simultaneous Election

Syllabus: GS2/Polity and Governance

Context

- A committee led by former President Ram Nath Kovind submitted a report on the 'One Nation One Election' initiative to the President.

Background

- Simultaneous Elections (One Nation One Election) refer to the idea of holding Lok Sabha and State legislative assembly elections together, with the aim of reducing the frequency of elections and their associated costs.
- Simultaneous elections in India to the Lok Sabha and State Legislative Assemblies were held in the years 1951-52, 1957, 1962 and 1967.
- Thereafter, the schedule could not be maintained and the elections to the Lok Sabha and the State legislative assembly have still not been realigned.

Suggestions of the Panel

- Opting Step wise Process: According to the panel, simultaneous polls to Lok Sabha and state assembly elections can be held in the 1st step, followed by local body (municipal and panchayat) polls within 100 days in the second step.
- In case of hung House: No-confidence motion, fresh elections could be held only for the remaining term of the immediately preceding full term of the House.
- Constitution Amendments Needed: The panel has recommended amendments to Article 83 (duration of Houses of Parliament) and Article 172 (duration of State legislatures) of the Constitution.
- This constitutional amendment will not need ratification by the States.
- Ratification of states: The panel also recommended amendments to Constitution which requires ratification by the States;
- Article 324A of the Constitution to allow simultaneous elections in panchayats and municipalities; and
- Article 325 to allow the Election Commission of India (ECI), in consultation with State election authorities, to prepare a common electoral roll and voter ID cards.

HOW, WHAT & WHEN OF JOINT ELECTIONS		
<p>How will elections be synchronised? In 2 stages, says panel report. Step 1: Simultaneous polls to be held for Lok Sabha, state assemblies. Constitutional amendment needed, but no ratification by states required. Step 2: Local body polls to be held within 100 days of LS & assembly elections. Amendment for this will require ratification by at least half the states. How will a cutoff date be fixed and varying assembly tenures adjusted? President will, through a</p>	 <p>Former President Kovind gives report to President Murmu</p> <p>notification, bring simultaneous polls into force on the date of first sitting of Lok Sabha after a general election. This becomes the 'appointed date'. Assemblies for which elections</p>	<p>are held after this date will have tenure only till next Lok Sabha elections (which will be simultaneous)</p> <p>What happens if there is a hung House or governing party loses trust vote? Elections will be held for the remaining period of the five-year term</p> <p>When will simultaneous elections kick in? After legislative changes are undertaken, President will notify the 'appointed date' on the first day the newly elected LS sits</p>

Arguments In Favour of One Nation One Election

- It will reduce the huge expenditure incurred for conducting separate elections every year.
- The problem of frequent elections leads to imposition of MCC over prolonged periods of time which affects the normal governance. Simultaneous elections can overcome such issues.
- Simultaneous elections will free the crucial manpower which is often deployed for prolonged periods on election duties.
- The focus on governance will increase, instead of being constantly in election mode.

Arguments Against One Nation One Election

- All states and the central government face massive logistical challenges including coordinating the schedules, resources etc.
- It may help the dominant national party or the incumbent at the Centre at the cost of regional parties and regions issues can be overshadowed by the national issues.

Way Ahead

- Synchronized polls for all 3 tiers of government will improve governance architecture. It will enhance "transparency, inclusivity, ease and confidence of voters.
- The 22nd Law Commission, examining the simultaneous polls issue, is expected to recommend simultaneous polls from the 2029 general election cycle.

PM SURAJ Portal

Syllabus: GS2/Government Policies and Interventions

Context

- The Prime Minister of India recently launched the 'Pradhan Mantri Samajik Utthan and Rozgar Adharit Jankalyan' (PM-SURAJ) national portal.

PM-SURAJ portal

- Parent ministry: The Ministry of Social Justice and Empowerment.
- Aim: To economically empower people belonging to socially backward classes, scheduled castes, tribes and other disadvantaged sections of the society.
- It will serve individuals from disadvantaged communities, including Scheduled Castes, Backward Classes, and Safai Karamcharis (sanitation workers).
- Objective: The portal streamlines the process of applying for financial assistance schemes offered by the Ministry of Social Justice and Empowerment.

Significance:

- Direct Benefit Transfer: Cuts out middlemen and ensures funds reach beneficiaries directly through bank accounts.
- Reduced Hassle: Simplifies the application process by offering a centralized online platform.
- Economic Upliftment: Aims to empower marginalized communities by providing capital to start or expand businesses.
- Social Upliftment: Furthermore, it will also empower these classes not only economically but also socially.


Karnataka Bans Use of Harmful Dyes

Syllabus: GS2/ Health

In News

- Karnataka bans harmful dyes in Gobi Manchurian, cotton candy, imposing imprisonment of up to seven years and fines of up to Rs 10 lakh for violators.

About Chemical Banned

HARMFUL COLOURS FOUND IN FOOD	
<p>Rhodamine B: It is used as an industrial dye. Because of its low cost, Rhodamine B is often used for food colouring – an illegal practice by all means. It has been classified as a potential carcinogen by the International Agency for Research on Cancer (IARC). Its prolonged use in food can lead to liver dysfunction or cancer</p>	
<p>Sunset Yellow: It is a synthetic dye used in food, drugs, and cosmetics. If consumed alone or in combination with other dyes, Sunset Yellow can cause allergic or pseudo-allergic reactions and severe reactions among asthma and urticaria patients</p>	
	<p>Carmoisine: A synthetic food dye, it is also called Food Red. IARC classifies it as a category 3 carcinogen. Its prolonged consumption can affect liver, kidneys and trigger behavioural changes among children, besides triggering skin rashes, and respiratory allergies</p>
	<p>Tartrazine: A yellow, nitrous derivative compound, it is used as a synthetic food colouring chemical. Prolonged intake can cause angioedema, eczema, bronchitis, and headaches. It affects the thyroid gland and hormones</p>

Trends in International Arms Transfers, 2023: SIPRI

Syllabus: GS3/ Defence

In News

- Stockholm International Peace Research Institute (SIPRI) remarks India was the world's top arms importer for the period 2019-23.

Key Points

India's Arms Trend:

- India ranked as the world's largest arms importer during the period 2019-23, witnessing a 4.7% increase compared to 2014-18.
- Russia remained India's primary arms supplier, the share of deliveries from Russia decreased, marking the first time since 1960-64 that it accounted for less than half of India's arms imports.

Global Trend:

- The five largest arms exporters are the USA, France, Russia, China and Germany, accounting for 75 per cent of all arms exports.
- The top five arms importers are India, Saudi Arabia, Qatar, Ukraine and Pakistan, receiving 35% of all arms imports in the period.
- Nine of the 10 biggest arms importer countries in 2019-23, were in Asia and Oceania or the Middle East.

Analysis

- Geopolitical tensions with Pakistan and China have compelled India to focus on developing a powerful military for defensive purposes.
- Bureaucratic and administrative hurdles create delays in acquiring weaponry, forcing India to rely heavily on foreign imports to fulfill the military requirements.
- India's nascent domestic arms industry struggles to manufacture advanced weaponry, necessitating reliance on imports to fulfill defense needs.
- India is making efforts to diversify its arms suppliers to reduce its dependence on any one country, but this process can be difficult and time-consuming.

About SIPRI

- SIPRI was founded in 1966 by the Swedish parliament as an independent research institute.
- Its main objective is to conduct research on issues related to international peace and security, including arms control, disarmament, and conflict resolution.
- It is funded by a combination of government grants, private donations, and project-based funding.
- SIPRI's flagship publication is the SIPRI Yearbook, which provides comprehensive data and analysis on global military expenditure, arms transfers, and other relevant security issues.
- The institute also produces other reports, briefs, and databases on various topics related to conflict, arms control, and peacebuilding.
- SIPRI is based in Stockholm, Sweden, but has a global reach and influence, with its research and analysis informing policy decisions and public debates in many countries.

Rules Notified for Citizenship Amendment Act (CAA), 2019

Syllabus: GS2/Government Policies and Interventions

Context

- The Ministry of Home Affairs notified the Citizenship Amendment Rules under the Citizenship Amendment Act (CAA) which was enacted in December 2019.

Background

- In December 2019, Parliament passed an amendment to The Citizenship Act, 1955, to include a provision for grant of citizenship to migrants belonging to the Hindu, Sikh, Buddhist, Jain, Parsi, or Christian communities who entered India before December 31, 2014 from Pakistan, Afghanistan, or Bangladesh.

- The law was notified on January 10, 2020 amidst protests around the country, particularly in Assam, but could not be implemented in the absence of the Rules.
- On May 28, 2021, the Union government issued an order under Section 16 The Citizenship Act, 1955, giving district collectors in 13 districts with high migrant populations the power to accept citizenship applications from groups identified in the 2019 amendment.

Citizenship Amendment Act (CAA), 2019

- It seeks to fast-track Indian citizenship to Hindus, Sikhs, Buddhists, Jains, Parsis and Christians – with the exception of Muslims – who migrated to India owing to religious persecution in Pakistan, Afghanistan and Bangladesh.
- In essence, the 2019 amendment relaxed the eligibility criteria for certain classes of migrants (on religious lines) from three neighbouring Muslim-majority countries.
- Exemption: Certain categories of areas, including tribal areas in Assam, Meghalaya, Mizoram, and Tripura, and areas protected by the 'Inner Line' system, were exempted from the purview of the CAA.
- The concept of Inner Line separates the tribal-majority hills of the Northeast from the plains areas. To enter and stay in these areas, an Inner Line Permit (ILP) is needed.

Highlights of the Citizenship (Amendment) Rules, 2024

Eligibility: Who can apply for Citizenship

- An individual of Indian origin seeking registration as a citizen of India
- An individual married to a citizen of India, seeking registration as a citizen of India
- An application from a minor child of an Indian citizen, seeking registration as a citizen of India, etc.

Document to be attached for Citizenship by naturalization

- Form VIII A Submission: The applicant submits Form VIII A, which includes all necessary personal details and information required for the naturalization process.
- Affidavit Verification: The applicant must provide an affidavit verifying the accuracy of the statements made in the application.
- Character Affidavit: Additionally, the applicant must furnish an affidavit from an Indian citizen attesting to the applicant's character. This affidavit acts as a testament to the applicant's reputation and conduct.
- Language Declaration: The applicant is required to declare that they possess adequate knowledge of one of the languages specified in the Eighth Schedule to the Constitution of India.

Process for application submission

- Submission of Application: Applications are to be submitted electronically by the applicant to the Empowered Committee through the District Level Committee designated by the Central Government.
- Acknowledgment: Upon submission, an acknowledgment in Form IX is electronically generated.
- Document Verification: The District Level Committee, led by a Designated Officer, verifies the documents submitted along with the application.
- Oath of Allegiance: The Designated Officer administers the oath of allegiance specified in the Second Schedule to the Citizenship Act, 1955, to the applicant.
- Renunciation Declaration: Every application includes a declaration by the applicant renouncing their citizenship of their current country, irrevocably and without future claim.

Issues/Challenges

- The legal challenge: The 2019 amendment was challenged before the Supreme Court in 2020 by the Indian Union Muslim League (IUML) and others, on the grounds of discrimination.
- The right to equality: The challenge to the CAA rests on the ground that it violates Article 14 of the Constitution, which says that "the State shall not deny to any person equality before the law or the equal protection of the laws within the territory of India".
- The petitioners' argue that using religion as a qualifier or a filter violates the fundamental right to equality.
- Targeted towards Muslims: The petitioners have argued that the National Register of Citizens (NRC) in Assam to identify illegal immigrants, along with the CAA, will result in the targeting of Muslims.
- Secularism: There is also the larger issue of whether making religion a ground for eligibility for citizenship violates secularism, which is a basic feature of the Constitution.

- Section 6A of The Citizenship Act, 1955 and Assam: Section 6A was introduced in the Citizenship Act after the signing of the Assam Accord in 1985 which determines who is a foreigner in the state of Assam and sets March 24, 1971 as a cut off date which contradicts the cut off date given in the CAA 2019.
- Widespread protests: The protest in Assam and other northeastern states turned violent over fears that the move will cause a loss of their “political rights, culture and land rights” and motivate further migration from Bangladesh.

Government’s stand

- The government has said that Muslims have been excluded from the group of “persecuted” minorities because Pakistan, Afghanistan, and Bangladesh are Islamic countries where Muslims are in majority.
- However, it will be tested whether these three countries were picked essentially to keep Muslims out — this is because groups like Tamil Hindus in Sri Lanka, the Rohingya in Myanmar, or minority Muslim sects like Ahmadiyyas and Hazaras are also persecuted minorities in these countries.

What lies ahead?

The court will have to look into two issues:

- Whether the special treatment given to the so-called “persecuted minorities” from the three Muslim-majority neighbouring countries only is a reasonable classification under Article 14 for granting citizenship, and
- Whether the state is discriminating against Muslims by excluding them.
- The Supreme Court has earlier held that the law has to clear two legal hoops to pass the equality test when it is challenged on the grounds of Article 14.
- First, any differentiation between groups of persons must be founded on an “intelligible differentia”, and
- Second, “that differentia must have a rational nexus to the object sought to be achieved by the Act”.
- The SC can strike down a classification if it is found to be arbitrary. The court recently struck down the electoral bonds scheme on the ground that it was “manifestly arbitrary” — that is, “irrational, capricious or without an adequate determining principle”.

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Chapter- 3

GEOGRAPHY

Forest Fires in Tamil Nadu

Syllabus: GS3/Disaster Management

Context

- For almost a week, forest fires have been raging in the Coonoor forest range in the Nilgiris in Tamil Nadu.

About

- Over the past one week, the highest number of forest fires have been reported from Mizoram (3,738), Manipur (1,702), Assam (1,652), Meghalaya (1,252), and Maharashtra (1,215).
- In South India, most forest covered areas of Andhra Pradesh, Karnataka and Tamil Nadu have seen fire incidents over the past week.

Forest fires

- A forest fire, or wildfire, is an uncontrolled fire that rapidly spreads across vegetation and forest areas fueled by dry conditions, strong winds, and an excess of combustible material.

Causes of forest fires:

- Natural causes: Many forest fires start from natural causes such as lightning which set trees on fire. However, rain extinguishes such fires without causing much damage.
- High atmospheric temperatures and dryness (low humidity) offer favourable circumstances for a fire to start.
- Man made causes: Fire is caused when a source of fire like flame, cigarette, electric spark or any source of ignition comes into contact with inflammable material.

Impacts

- loss of valuable timber resources
- degradation of catchment areas
- loss of biodiversity and extinction of plants and animals
- loss of wildlife habitat and depletion of wildlife
- loss of natural regeneration and reduction in forest cover
- global warming
- loss of carbon sink resource and increase in percentage of CO₂ in atmosphere
- change in the microclimate of the area with unhealthy living conditions
- soil erosion affecting productivity of soils and production
- ozone layer depletion
- health problems leading to diseases
- loss of livelihood for tribal people and the rural population.

Forest Fires in India

- November to June is considered to be forest fire season in India, especially from February onward as summer approaches. April-May are usually the worst fire months across the country.
- The biennial India State of Forest Report (ISFR) published by the Forest Survey of India (FSI) reported that more than 36% of India's forest cover was prone to frequent fires.
- About 4% of the forest cover was 'extremely prone' to fire, and another 6% was 'very highly' fire prone.
- Areas Prone to Forest Fires in India: Severe fires break out in dry deciduous forests, while evergreen, semi-evergreen, and montane temperate forests are comparatively less prone to fires.
- The forests of Northeast India, Odisha, Maharashtra, Jharkhand, Chhattisgarh, and Uttarakhand are the most vulnerable to fires during the November to June period.

Forest Fires in Southern India

- Some forest areas in Andhra Pradesh and Telangana are fire-prone.
- However, according to the FSI, forests in southern India are comparatively less vulnerable to fires, as the vegetation type is mainly evergreen or semi-evergreen, but Tamil Nadu has been reporting wildfires in its forests in recent years.
- Reasons: High aridity, above-normal day temperatures, clear sky conditions, and calm winds during the early phase of the summer season are some of the contributory factors for the spike in forest fire incidents in southern India.

Preventive Measures

- Public Awareness Campaigns: Promote responsible behavior when it comes to fire use, such as proper disposal of cigarette butts and campfires.
- Early Detection Systems: Implement surveillance systems like watchtowers, patrols, drones, and satellite monitoring to detect fires as early as possible, allowing for rapid response.
- Community Involvement: Engage local communities in forest fire prevention and management. Train villagers and local volunteers in firefighting techniques and equip them with necessary tools.
- Forest Management Practices: Implement sustainable forest management practices to maintain healthy ecosystems, including thinning out dense underbrush and removing dead vegetation.
- Investment in Firefighting Infrastructure: Equip fire departments with necessary tools and resources for combating forest fires, including fire trucks, water pumps, hoses, and personal protective equipment.

Somalia

Syllabus :GS 1/Places in news

In News

- Somali police and international navies were preparing to attack a commercial ship that was hijacked by pirates .

About Somalia

- It is located in the Horn of Africa.
- It is bordered by Ethiopia to the West, Djibouti to the Northwest, the Gulf of Aden to the North, the Indian Ocean to the East, and Kenya to the Southwest.
- The official languages : Somali and Arabic.
- It is a founding member state of (AU) African Union which was originally the Organization of African Union and in June 1974, Somalia hosted the 11th OAU summit in Mogadishu.



Volcano Eruption In Reykjanes Peninsula

Syllabus: GS1/Geography

Context

- A state of emergency has been declared in Southern Iceland after a volcano erupted in Reykjanes Peninsula In Iceland.

Reykjanes peninsula

- Iceland is located on Mid-Atlantic Ridge, between the Eurasian and the North American tectonic plates. It is a seismic and volcanic hot spot as the two plates move in opposite directions.
- The Reykjanes peninsula is in South West Iceland, characterized by immense lava fields, volcanoes, and heightened geothermal activity.
- The main geothermal areas of Reykjanes are Gunnuhver, Krysuvik, and Svartsengi.



Six Heritage Sites in Tentative UNESCO List

Syllabus: GS1/Culture

Context

- Madhya Pradesh's six heritage sites have been included in the tentative UNESCO list.

About

- The sites are Gwalior Fort, the historical Group of Dhamnar, the Rock Art Sites of Chambal Valley, Bhojeshwar Mahadev Temple, Burhanpur's Khooni Bhandara and the Gond monuments of Ramnagar, Mandla.
- MP is home to three UNESCO heritage sites – Sanchi Stupa, Khajuraho Group of Monuments and Bhimbetka Rock Shelters.

Gwalior Fort

- It is located on the basalt rock hills.
- It was initiated by Raja Sourya Sena who finished the fortification system around the plateau in 773CE.
- The modern-day fort, embodying a defensive structure and two palaces was built by the Tomar Rajput ruler Man Singh Tomar in 1398.
- Ancient Temples in the Gwalior fort includes:
- Teli ka Mandir, dedicated to lord Shiva, Vishnu, and Matrikas.
- The Chaturbhuj temple which has mathematical connection where the second oldest reference to zero in mathematics is seen in a carving.
- The adjoining twin temples are known as Sas Bahu temples, dedicated to Vishnu and have an inscription from 1150 CE.

Historical Group of Dhamnar

- The Dhamnar caves are located on a hill near the village of Dhamnar.
- The rock-cut temple site has 51 caves, stupas, chaityas, passages and dense dwellings and was built in the 7th century AD.
- The site contains a colossal statue of Gautam Buddha in the nirvana pose.

Bhojeshwar Mahadev Temple

- The temple is thousand-year-old and dedicated to Lord Shiva. It is set on a 3-tier sandstone platform in 6 meters square.
- It has architectural grandeur, colossal lingam, and historical significance.
- It was built during the 11th century under the patronage of Raja Bhoj in Bhojpur and represents the zenith of temple architecture during the Paramara period in India.

Rock Art Sites of Chambal Valley

- At Daraki-Chattan in the Chambal basin, a cave in the quartzite buttresses of Indragarh hill.
- The vertical walls of the cave boast more than 500 cupules. On the southern wall of the cave at Daraki-Chattan, small circular cupules show conical depth and are about two million years old.

Khooni Bhandara

- It is an underground water management system comprising eight waterworks built in Burhanpur.
- It is the Mughal period water work following the persian qanat approach.
- It was built by erstwhile ruler Abdurrahim Khankhana in 1615.

Gond Memorial of Ramnagar

- The architectural complexes were built by Gond kings of Garha Mandla, Hirde Shah and located on the bank of the Narmada river in Ramnagar.
- The cluster of monuments include the following:
 - Moti Mahal (Rajmahal), Ramnagar, Mandla
 - Raibhagat ki Kothi, Ramnagar, Mandla
 - Vishnu Mandir (Suraj mandir), Ramnagar, Mandla
 - Begum Mahal, Chaugan Rayotwari
 - Dalbadal Mahal, Chaugan Ryotwari

Cyclone Storm Megan

Syllabus: GS1/ Important Geophysical phenomena: Cyclones

Context

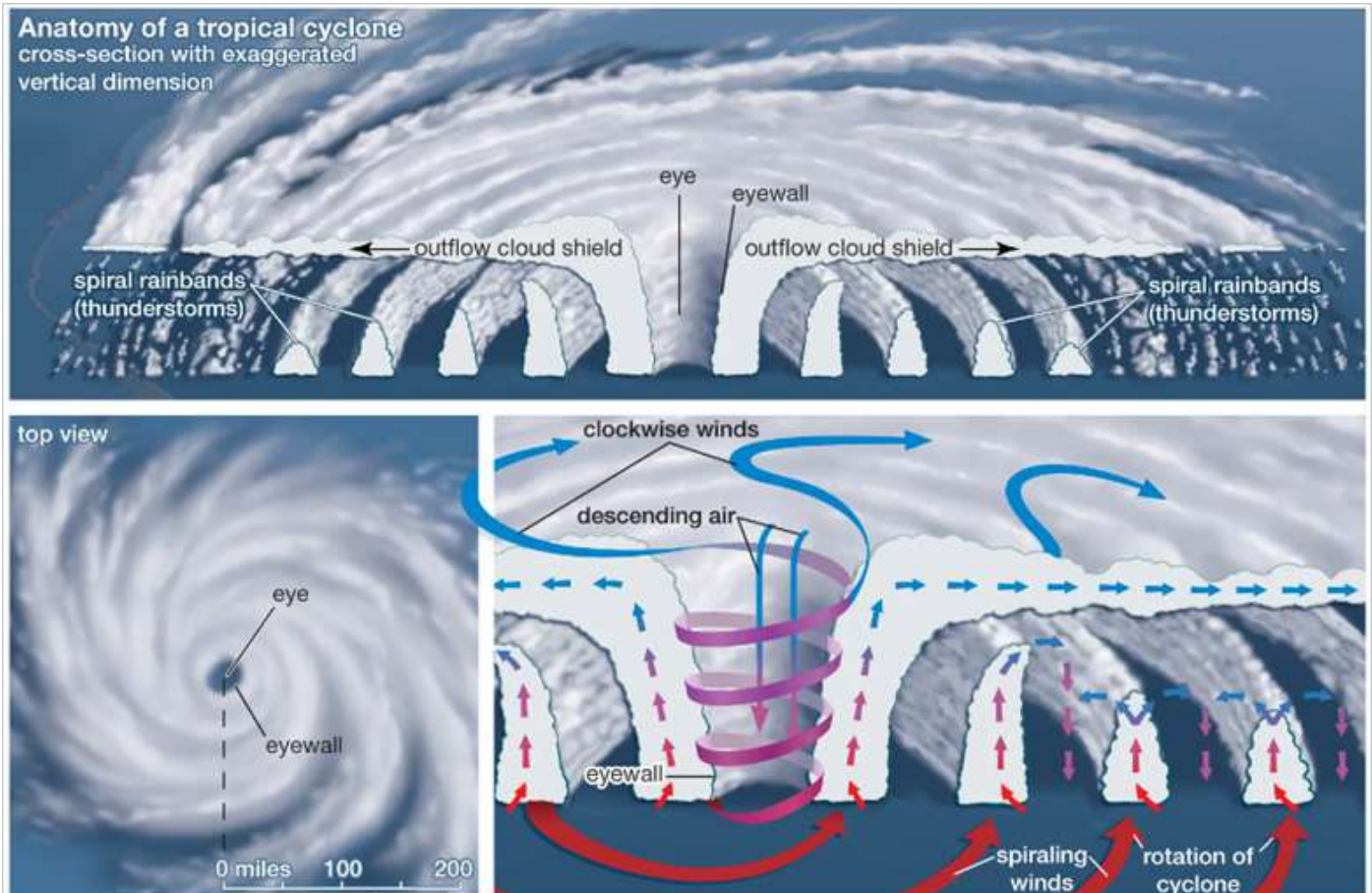
- Cyclone Storm Megan weakened to a tropical low recently while bringing heavy rain and winds to Australia's Northern Territory.

What are cyclones?

- Cyclones are large revolving storms caused by winds blowing around a central area of low atmospheric pressure.
- In the southern hemisphere these storms rotate in a clockwise direction, while in the northern hemisphere rotate in an anti-clockwise direction.
- Cyclones develop over warm waters in the tropical regions of the oceans where areas of very low pressure are created by air being heated by the sun.
- This causes the air to rise very rapidly and becomes saturated with moisture that condenses into large thunderclouds.
- The cyclone is known by different names in different regions of the world:

Region	Indian ocean	USA	Caribbean Sea	Western North Pacific	Japan	Australia	Philippines
Name for cyclone	Cyclones	Tornadoes	Hurricanes	Typhoons	Taifu	Willy willy	Baguio

How Cyclones are formed?



The development cycle of tropical cyclones may be divided into three stages:

1. **Formation and Initial Development Stage:** The formation and initial development of a cyclonic storm depends upon various conditions. These are:
 - A warm sea: a temperature in excess of 26 degrees Celsius to a depth of 60 m.
 - Atmospheric instability: It encourages formation of massive vertical cumulus clouds due to convection with condensation of rising air above ocean surface.
 - Wind shear: One thing in the atmosphere that inhibits the growth of cyclones is called the vertical shear, which refers to rapid change in wind velocity or direction, for up to 10 kilometers or so.
 - Strong vertical shear suppresses cyclones and weak vertical shear increases cyclones.
2. **Mature Tropical Cyclones:** When a tropical storm intensifies, the air rises in vigorous thunderstorms and tends to spread out horizontally at the tropopause level.
 - Once air spreads out, a positive perturbation pressure at high levels is produced, which accelerates the downward motion of air due to convection.
 - With the inducement of subsidence, air warms up by compression and a warm 'Eye' is generated. Generally, the 'Eye' of the storms has three basic shapes: (i) circular; (ii) concentric; and (iii) elliptical.
 - The main physical feature of a mature tropical cyclone in the Indian Ocean is a concentric pattern of highly turbulent giant cumulus thundercloud bands.
3. **Modification and Decay:** A tropical cyclone begins to weaken in terms of its central low pressure, internal warmth and extremely high speeds, as soon as its source of warm moist air begins to ebb, or is abruptly cut off. This happens after its landfall or when it passes over cold waters.

Bomb Cyclone and Bombogenesis

- A Cyclone is called a bomb cyclone when the pressure drops rapidly in the low:pressure mass — by at least 24 millibars in 24 hours.
- This quickly increases the pressure difference, or gradient, between the two air masses, making the winds stronger. This process of rapid intensification is called bombogenesis.

Naming Procedure of Cyclones:

- The WMO/ESCAP Panel on Tropical Cyclones at its twenty seventh Session held in 2000 in Muscat, Sultanate of Oman agreed in principle to assign names to the tropical cyclones in the Bay of Bengal and Arabian Sea.
- According to the approved principle, a list of 64 names in eight columns has to be prepared.
- The name has been contributed by Panel members.
- The RSMC tropical cyclones, New Delhi gives a tropical cyclone an identification name from the above name list.
- The Panel member's name is listed alphabetically countrywise in each column. These lists are used sequentially, and they are not rotated every few years unlike the Atlantic and Eastern Pacific lists.
- Since all the 64 names listed initially got exhausted, a new list comprising 169 names contributed by the 13 Member countries of the WMO/ESCAP Panel has been prepared and put in place since the pre:monsoon season of 2020.

Mitigation Strategies

The mitigation measures as proposed by the UN-HABITAT are given below:

- Hazard Mapping :It maps the pattern of old cyclones using their wind speed, areas affected, flooding frequency etc.
- Land use planning :With the effective implementation of land use planning, the key activities and settlements can be avoided in the most vulnerable areas. For example, a settlement in the floodplains is at utmost risk. Hence, authorities should plan ahead to avoid such risks.
- Engineered Structures :These structures withstand the wind forces and prove to mitigate the losses. The public infrastructure of the country should be designed keeping in mind the hazard mapping of the cyclone.
- Retrofitting Non-Engineered Structures: To enhance houses' resistance to the wind or certain disastrous weather conditions.Eg. Construction of a steep:slope roof to avoid the risk of being blown away.
- Cyclone Sheltering :At national, state and regional level, the construction of cyclone shelters should be taken up to help the vulnerable community from cyclones.
- Flood Management :As the cyclonic storms lead to heavy rainfall that further lead to flooding in various areas; importance should be given to the flood management. The drainage systems should be well:designed to mitigate flooding.
- Vegetation Cover Improvement :Planting trees in rows, coastal shelterbelt plantations, mangrove shelterbelt plantations, etc can help break the wind force and increase the water infiltration capacity.
- Mangrove Plantation :The ecologically:efficient mangroves should be planted more. India has 3 percent of the world's mangroves cover. The root systems of mangroves help in mitigating tsunamis, soil erosion etc.
- Saline Embankment :Along the coast, saline embankments help protect habitation, agricultural crops, and other important installations.
- Artificial Hills and Levees :They act as an obstruction to the wind forces and also provide a shelter during floods.

Initiatives by India

- National Cyclone Risk Mitigation Project (NCRMP): To reduce the loss of life and properties in the event of future calamities,NCRMP has been launched by the Ministry of Home Affairs, with support from the World Bank.
- Apada Mitra Scheme: The NDMA has approved a Centrally Sponsored Scheme focusing on training community volunteers in disaster response in the 30 most flood:prone districts of 25 states in India.
- Integrated Coastal Zone Management Project: It aims at coming out with comprehensive plans to manage coastal areas, which will help in cyclone events.

- **Color: Coding of Cyclones By IMD:** The famous color: coding of natural calamities aims at making people aware of the intensity of calamities prior to the hazards. The colors used by IMD are green, yellow, orange, and red.
- **Cyclone Warning Systems:** In order to cater to the needs of Cyclone Warning Services and Marine weather services, there are seven established Cyclone Warning Centers covering the east & west coasts of the country.

Conclusion

- The Indian subcontinent is one of the worst affected regions in the world. The subcontinent with a long coastline of 8041 kilometers is exposed to nearly 10 percent of the world's tropical cyclones.
- Hence, India with its various agencies like IMD, NIDM and others should constantly improve upon its strategies to deal with this severe threat, which is going to become severe in coming years in the wake of climate change.

Darien Gap

Syllabus: GS1/World Geography

Context

- Darien Gap had become a major route for the illegal migration to US.

Where is Darien Gap?

- The Darien Gap is a stretch of densely forested jungle across northern Colombia located in South America and southern Panama located in North America.
- Roughly 60 miles (97 kilometres) across, the terrain is muddy, wet and unstable.
- The challenging topography of humid, swampy rainforest as well as criminal gangs who control the area, make the route an extremely challenging and deadly one.



Bengaluru's Water Crisis

Syllabus:GS1/Urban Development

Context

- The worsening water crisis in Bengaluru is driving many of its residents to explore various alternative solutions.

Bengaluru's Water Crisis

- **Rainfall:** Bengaluru experienced a rainfall deficit in 2023 led to declining groundwater levels, particularly affecting the city's periphery.
- **Rising Demand:** Bengaluru's demand for freshwater exceeds its available supply from sources like the Cauvery River and groundwater.
- **Degradation of Water Bodies:** Historically, Bengaluru relied on a network of lakes and tanks for water supply. However, rapid urbanization has led to the encroachment and drying out of these water bodies.
- **Lakes are also polluted** due to sewage dumping, further diminishing their potential for rainwater harvesting.
- **Wastewater Management:** Only a fraction of the city's wastewater is treated and reused externally. Most of it flows into lakes or rivers downstream.
- **Arkavathi Reservoir Depletion:** The Arkavathi Reservoir, once a vital water source, is severely depleted and polluted due to uncontrolled development, encroachments, excessive borewell usage, and eucalyptus cultivation.

Water Crisis in India

- India has 18 percent of the world's population, but only 4 percent of its water resources, making it among the most water-stressed in the world.

- A NITI Aayog report, 'Composite Water Management Index' (2018) has said that India is facing its 'worst' water crisis in history, with more than 600 million people facing acute water shortages.

Solution to Water Crisis

- Provide incentives or subsidies to encourage individuals and businesses to adopt rainwater harvesting practices.
- Enforce strict regulations to prevent encroachment and pollution of lakes, tanks, and rivers.
- Invest in the restoration of degraded water bodies, including desilting, dredging, and water quality improvement measures.
- Create buffer zones and green spaces around water bodies to prevent further encroachment and protect their ecological integrity.
- Implementation of decentralized wastewater treatment systems and reuse of treated wastewater for non-potable purposes such as irrigation, industrial processes, and groundwater recharge.

Government Initiatives to tackle water Crisis in India

- Government of India launched Jal Shakti Abhiyan (JSA) in 2019, to improve water availability including groundwater conditions in the water stressed blocks of 256 districts in India.
- Amrit Sarovar Mission to develop and rejuvenate 75 water bodies in each district of the country.
- National Aquifer Mapping Programme (NAQUIM) to delineate and characterize the aquifer system in the country.
- The Jal Jeevan Mission (JJM) was launched in 2019 with the aim to provide a functional tap connection within the premises of each rural household in India by 2024.

Way Ahead

- Public Awareness Campaigns: Educating people about water conservation and sanitation practices is crucial.
- Technological Solutions: Exploring desalination, wastewater treatment, and rainwater harvesting technologies can provide new water sources.
- A circular water economy: To maximize the utility of every liter of water and reduce the city's dependence on external sources.

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New Collective Quantified Goal on Climate Finance

Syllabus: GS3/Environment and Conservation

Context

- A crucial meeting for the post-2025 climate finance goal is to be held in April in Colombia.

About

- Parties to the UN Framework Convention on Climate Change (UNFCCC) have made new submissions on what they want discussed at Colombia and beyond for the New Collective Quantified Goal on Climate Finance (NCQG).

What is Climate Finance?

- Climate finance refers to large-scale investments required for actions aiming to mitigate or adapt to the consequences of climate change.
- Adaptation: It involves anticipating the adverse effects of climate change and taking appropriate action to prevent or minimise the damage they can cause.
- Mitigation: It involves reducing the emission of greenhouse gases (GHG) into the atmosphere so that impacts of climate change are less severe.

Who should Finance?

- Developing countries have argued that developed nations should provide financial assistance to tackle climate change because it was due to the (now) rich world's emissions over the last 150 years that caused the climate problem in the first place.
- The 1994 United Nations Framework Convention on Climate Change (UNFCCC) required high-income countries to provide climate finance to the developing world.
- In 2009, developed countries pledged to provide \$100 billion a year to developing countries by 2020.
- In 2010, the Green Climate Fund (GCF) was established as a key delivery mechanism.
- The 2015 Paris Agreement reinforced this target, and extended it to 2025.
- However, the high income countries are yet to fulfil their pledge.

New Collective Quantified Goal on Climate Finance (NCQG)

- In 2015, the financial assistance goal of collective mobilisation of \$100 billion by developed countries was extended to 2025.
- It was also decided that year that a new climate finance goal to succeed this one would have to be decided prior to 2025, amounting to at least \$100 billion per year, and 'taking into account the needs and priorities of developing countries'.
- This is the NCQG, also called the post-2025 climate finance goal / new goal.

Need of NCQG

- The figure of \$100 billion is inadequate for the climate finance needs of developing countries, which, by varying estimates, range from \$1-2.4 trillion per year until 2030.
- The goal of \$100 billion was not a negotiated one – it was a political one.

India's Stand

- India is the only country that has put forth a figure in this round of submissions, \$1 tn per year, to be considered the quantum of money that developed countries must provide to developing countries as part of the new goal.

- For this, India has suggested a timeframe of 10 years, with separate annual mobilisation targets for each five year period to be in line with the cycles of updating the Nationally Determined Contributions.

The Road Ahead

- The process on NCQG so far has foregrounded what is already known: Developing countries, for serving whom this goal is to be created to begin with, call upon a focus on the actual amount of money, time frame for disbursement and non-debt creating instruments to be the central pillar of the NCQG.
- Developed countries have focused more on who should contribute and on bringing the need to align all financial flows into the conversation.
- These distinctions in approach are reflective of the stark difference between the needs and priorities of countries who have contributed to and are impacted by the climate crisis in very different ways.
- The need to scrutinise the process to ensure it truly considers the principles of equity and justice in its implementation remains significant.

About UN Climate Change Conference

The United Nations Climate Change Conferences, often referred to as COP (Conference of the Parties), are international gatherings where countries come together to discuss and negotiate global efforts to address climate change. These conferences are organized under the United Nations Framework Convention on Climate Change (UNFCCC), an international treaty came into force in 1994 with the objective of stabilizing greenhouse gas concentrations in the atmosphere. The COP meetings are held annually, and each conference is numbered sequentially. The conferences provide a platform for countries to assess progress in dealing with climate change, negotiate agreements, and make decisions on a wide range of issues related to climate action.

Soil Erosion in Western Ghat Region

Syllabus: GS3/Environmental Conservation

Context:

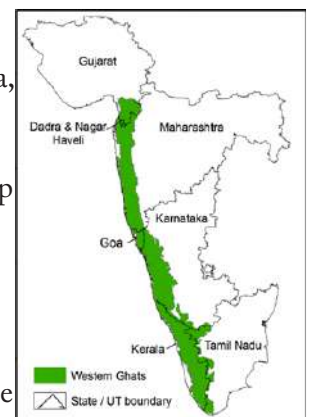
- A recent study by the IIT Bombay reveals a staggering 94% increase in soil erosion in the Western Ghats Region from 1990 to 2020.

The Western Ghats (aka the Sahyadri Mountain Range):

- It is a UNESCO's World Heritage Site and one of the Earth's 36 biodiversity hotspots, and is recognized as one of the world's eight 'hottest hotspots' of biological diversity.
- It includes national parks, wildlife sanctuaries, and reserve forests etc.
- It is spread across six Indian states including Tamil Nadu, Kerala, Karnataka, Goa, Maharashtra, and Gujarat.
- a. Western Ghats in Gujarat begin near the Tapi River.
- Red soils are typically found on the western side of the Ghats where the slopes are steep and the rainfall is high.

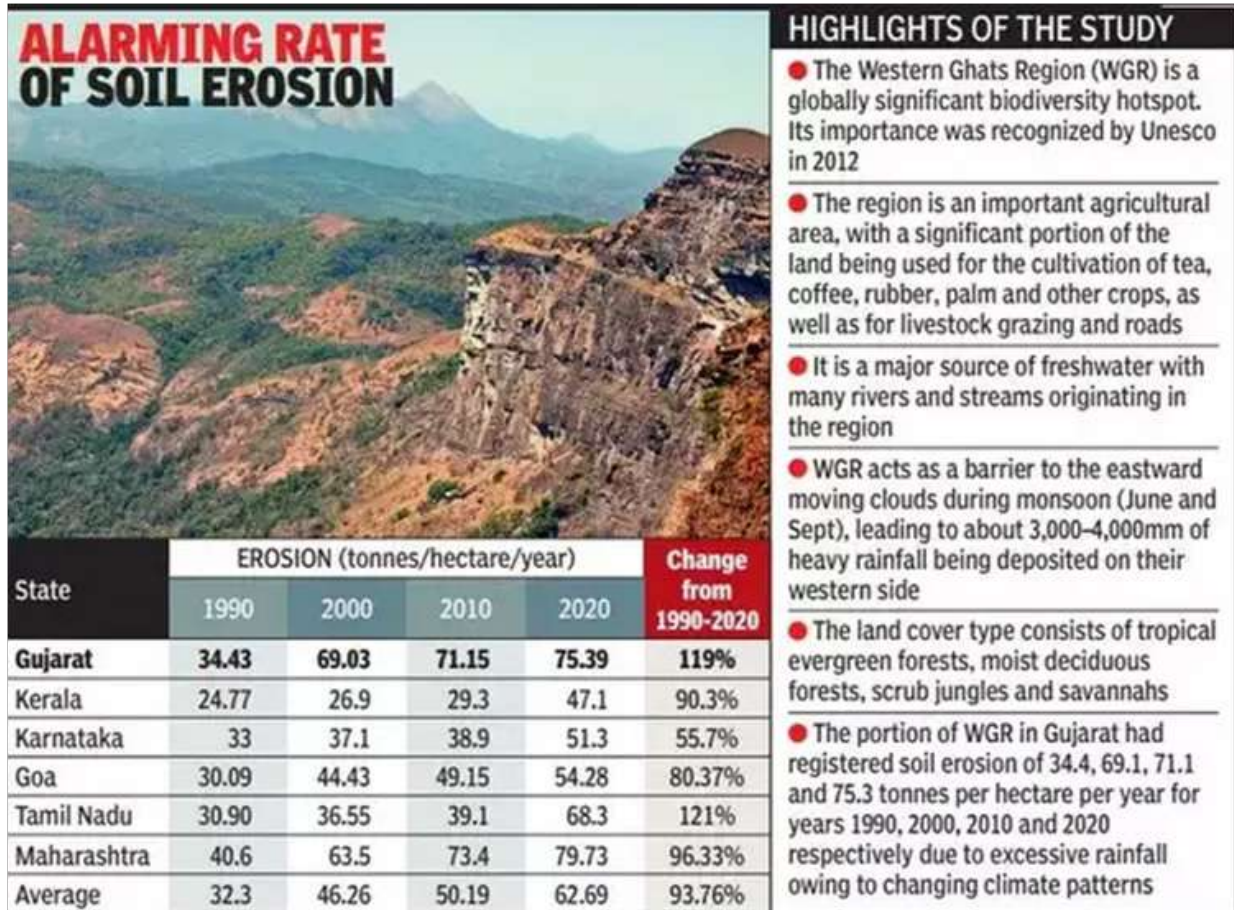
Protection of the Western Ghats:

- The Ministry of Environment and Forests (MoEF) constituted two Committees:
 - a. Western Ghats Ecology Expert Panel (WGEEP) headed by Prof. Madhav Gadgil.
 - b. High Level Working Group (HLWG) headed by Dr. K. Kasturirangan, to review the recommendations of the WGEEP.



Alarming Increase in Soil Erosion

- The study used remote sensing inputs, such as LANDSAT-8, Digital Elevation Model (DEM), and rainfall records to estimate soil loss rates using the Universal Soil Loss Equation (USLE) method.
- The results indicated that the average soil loss for the Western Ghats Region was 32.3, 46.2, 50.2, and 62.7 tons per hectare per year for the years 1990, 2000, 2010, and 2020, respectively.
- It shows a concerning 94% increase, and a consistently increasing trend.
- The state-wise increase is highest in Tamil Nadu (121%), followed by Gujarat (119%), Maharashtra (97%), Kerala (90%), Goa (80%), and Karnataka (56%).
- These high rates of increase in soil loss are unsustainable to support the biodiversity of Western Ghats Region and can lead to permanent destruction.



The Impact and the Need for Conservation:

- The Western Ghats is home to hundreds of globally threatened flora, fauna, bird, amphibian, reptile, and fish species, and is impacted by urbanisation, agricultural expansion, livestock grazing, forest loss, habitat fragmentation, habitat degradation by invasive plant species, encroachment, conversion, and climate change.
- The loss of soil not only affects the fertility of the land but also leads to a decrease in the water-holding capacity of the soil, affecting the overall ecosystem.
- The increasing soil erosion is detrimental to the region's globally important biodiversity.

Conclusion

- The study highlights the importance of considering the long-term effects of land use change on soil erosion and the need for sustainable land management practices.
- The results can be used to sensitise government agencies on the need to protect the natural land cover, which will reduce soil erosion.

Nuclear Energy as Climate Solution

Syllabus: GS3/Energy; Climate Change

Context:

- Recently, it was seen as a series of efforts to pitch nuclear energy as an important solution to global problems like climate change and energy security.

Nuclear Energy & Climate Change

- Low-Carbon Energy Source: Nuclear power plants produce no greenhouse gas emissions during operation, and it remains the second largest source of low carbon electricity globally and has historically avoided around 70 billion tonnes of carbon dioxide.
- According to IAEA, the entire life cycle of nuclear power plants is considered – accounting for activities like reactor construction, uranium mining and enrichment, waste disposal and storage, and other processes – greenhouse gas emissions are only in the range of 5 to 6 grams per kilowatt hour.
- It is more than 100 times lower than coal-fired electricity, and about half the average of solar and wind generation.

Other Benefits:

- **Reliable and Scalable:** Nuclear energy can be deployed on a large scale and is a reliable source of power, providing clean, consistent, and affordable electricity.
- **Substitute for Fossil Fuels:** Nuclear energy can directly replace fossil fuel plants, avoiding the combustion of fossil fuels for electricity generation.
- **Supports Economic Development:** The use of nuclear energy can support global economic development by supplying the large quantities of electricity needed.
- **Contributes to Energy Security:** Nuclear power can contribute to energy security by providing a stable source of energy.
- **Potential for Heat Applications:** Nuclear power plants have the potential to utilise more nuclear capacity for heat applications for future decarbonization efforts.
- **Supports Decarbonization:** Nuclear power can play a key role in the transition to a clean energy future and in achieving carbon neutrality.

Global Efforts:

- **Paris Agreement (2015):** It is to keep the rise in global temperatures to well below 2°C compared to pre-industrial levels, and with the aim to limit the rise to 1.5°C.
- **To limit the impacts of climate change,** the world must rapidly reduce its dependence on fossil fuels to reduce greenhouse gas emissions.
- **Role of International Atomic Energy Agency (IAEA):** It has launched an 'Atoms4Climate' initiative to talk about this and has begun an engagement with the climate community, especially at the COPs or the annual year-ending climate conferences.
- **At COP28 in Dubai,** about 20 countries pledged to work towards tripling global nuclear energy installed capacity by 2050.

The Indian Perspective

– India has 23 operable nuclear reactors, with a combined net capacity of 7.4 GWe.

a. In 2022, nuclear power generated 3.1% of the country's electricity.

– India in 2010 set an ambitious target to have 14.6 GWe nuclear capacity online by 2024.

a. At the end of October 2023 eight reactors were under construction in India, with a combined capacity of 6.7 GWe.

– India has a largely indigenous nuclear power program and is committed to growing its nuclear power capacity as part of its massive infrastructure development program.

a. India's long-term strategy to transition to a 'low emissions' pathway involves more nuclear power.

Future Plans

– India is on the course to increase nuclear energy production capacity to 22,480 MW by 2031. It aims to produce more than three times nuclear power from the current level of 6,780 MW in the coming decade.

Challenges of Nuclear Energy and Climate Solutions

- **Safety Concerns:** Incidents like the Fukushima accident in 2011 have raised safety concerns about nuclear power.
- **The ongoing crisis at the Zaporizhzhya nuclear power plant in Ukraine,** the first nuclear facility to have been caught in a dangerous armed conflict, has also been a source of grave concern.
- **Waste Disposal:** The long-term storage and disposal of radioactive waste is a complex issue that needs to be addressed.
- **In 2021, Japan announced plans to release over one million tonnes of contaminated water from the Fukushima nuclear plant into the sea over the next 30 years.**
- **High Initial Costs:** The initial costs of setting up a nuclear power plant are high.
- **It includes costs for safety measures,** which can make nuclear energy seem less economically viable compared to other energy sources.
- **Public Perception:** There is often public opposition to nuclear power due to fears of radiation and nuclear accidents.
- **It can lead to challenges in constructing new plants.**

- **Regulatory Hurdles:** Nuclear energy is heavily regulated, which can slow down the development and deployment of new reactors.
- **Non-Proliferation Concerns:** There are concerns about the potential misuse of nuclear technology and materials for military purposes.

Conclusion

- Nuclear energy is a clean and environment-friendly source of electricity, which is available 24X7, and can provide the country long-term energy security in a sustainable manner.
- The growth of the Indian nuclear power program is imperative to meet the twin goals of energy security and sustainable development.

Carbon Credit Scheme of Australia

Syllabus: GS3/Environment

Context:

- A recent study found that a world-leading reforestation project under the Australian Carbon Credit Unit (ACCU) Scheme had been an underperforming ‘catastrophe’.

About the ACCU Scheme:

- It is a key part of the Australian carbon market.
- It encourages individuals and businesses to undertake projects that reduce emissions or store carbon.
- Individuals, sole traders, companies, local, state and territory government bodies, and trusts can participate in it.
- It can be achieved by using new technology, upgrading equipment, changing business practices to improve productivity or energy use, and changing the way vegetation is managed.

How Does It Work?

- The participants run projects that reduce or avoid greenhouse emissions (emissions avoidance) or remove and store carbon from the atmosphere (sequestration).
- Participants can earn one ACCU for every tonne of carbon dioxide equivalent (t CO₂-e) emissions their project stores or avoids.
- These ACCUs can then be sold on the secondary market or to the Australian Government by entering a carbon abatement contract.

Criticisms and Controversies:

- The research found that across almost 80% of native forest in the deserts of Australia, forest growth was either stagnant or that woodlands were shrinking.
- On the other hand, it argued that Australia had used these projects to bank millions of tonnes in questionable carbon credits.

Threat of Water Shortage in India

Syllabus: GS3/Environmental Conservation

Context

- India is facing a threat of water shortage as water levels in reservoirs across India have reported lower storage levels than last year.

About

- **Storage Capacity:** The live storage capacity in India’s 150 primary reservoirs stands at just 38% of their total capacity, which is less than the last decade’s average for the same period.
- The total live storage capacity of these 150 reservoirs accounts for about 69.35% of the nation’s total live storage capacity.
- **Southern India:** The Southern region, which includes States like Andhra Pradesh and Telangana (two combined projects in both States), Karnataka, Kerala, and Tamil Nadu, monitors 42 reservoirs.

- The total live storage available in these reservoirs is 23% of their total live storage capacity.
- This marks a decrease compared to the storage levels during the corresponding period last year (39%) and the average storage over the past ten years (32%).
- Cities like Bengaluru are already grappling with a shortfall of around 500 million litres of water per day (MLD), against a demand of 2,600 MLD.

Reasons behind Water Scarcity in India

- Inefficient agricultural practices and excessive groundwater extraction have depleted crucial water sources.
- Climate change further aggravates the situation, causing irregular rainfall patterns and affecting the recharge of rivers and aquifers.
- Poor water management and lack of proper infrastructure also play a significant role in exacerbating the crisis.
- Deforestation and degradation of watersheds lead to soil erosion and reduced infiltration capacity, affecting groundwater recharge and overall water availability.
- Rapid urbanisation and industrialisation have led to increased pollution of water bodies, making them unfit for consumption.

Consequences

- Reduced water availability impacts agriculture, the backbone of the country's economy, leading to lower crop yields and increased food prices.
- Communities suffer from inadequate sanitation and hygiene, resulting in waterborne diseases.
- It leads towards the conflicts over water resources among different sectors and communities.
- Water scarcity can trigger migration from rural to urban areas or from water-stressed regions to areas with better water availability.
- This movement of people can strain urban infrastructure and exacerbate social tensions.
- Reduced water flow in rivers and reservoirs leads to decreased power generation capacity, impacting energy supply and increasing dependence on alternative sources of energy.

Government Initiatives to Tackle Shortage of Water in India

- National Water Mission (NWM): NWM aims to conserve water, minimize wastage, and ensure equitable distribution of water across various sectors.
- It focuses on promoting water use efficiency, groundwater recharge, and sustainable development of water resources.
- Jal Jeevan Mission (JJM): Launched in 2019, the Jal Jeevan Mission aims to provide piped water supply to all rural households by 2024.
- The mission focuses on decentralized water management, community participation, and leveraging technology to ensure safe and sustainable water supply in rural areas.
- Atal Bhujal Yojana (ABHY): Launched in 2019, the Atal Bhujal Yojana aims to improve groundwater management and promote sustainable groundwater use in identified water-stressed areas across India.
- It focuses on community participation, demand-side management, and groundwater recharge measures.
- Pradhan Mantri Krishi Sinchayee Yojana (PMKSY): It was launched in 2015-16 to enhance physical access of water on farm and expand cultivable area under assured irrigation, improve on-farm water use efficiency, introduce sustainable water conservation practices, etc.
- The Atal Mission for Rejuvenation and Urban Transformation (AMRUT): It was launched in 2015 in selected 500 cities and focuses on the development of basic urban infrastructure in the Mission cities in the sectors of water supply, sewerage & septage management, storm water drainage, green spaces & parks and non-motorized urban transport.
- Namami Gange Programme: Launched in 2014, it aims to rejuvenate the River Ganga and its tributaries by addressing pollution, promoting sustainable wastewater management, and restoring the ecological health of the river basin.
- Interlinking of Rivers (ILR): The National Water Development Agency (NWDA) has been entrusted with the work of inter-linking of rivers under the National Perspective Plan (NPP).
- NPP has two components, viz., Himalayan Rivers Development Component and Peninsular Rivers Development Component.
- 30 link projects have been identified under NPP.

Suggestions

- Implementing efficient water management practices, such as rainwater harvesting and watershed management, can help replenish water sources.
- Investing in water treatment systems and improving irrigation techniques can reduce wastage and pollution.
- Raising awareness about water conservation among the public and encouraging responsible water use is vital.
- Additionally, policies that promote sustainable water allocation and management are essential for long-term solutions.
- By using modern technologies, such as IoT, AI, and remote sensing, water consumption can be measured and managed more effectively.

Curbing Black Carbon Emissions

Syllabus: GS3/Environmental Pollution

Context:

- There is growing concern about the black carbon emission in India, and it needs to be curbed.

About the Black Carbon:

- It is a dark sooty material emitted alongside other pollutants when biomass and fossil fuels are not fully combusted, contributes to global warming and poses severe risks.
- It is part of fine particulate air pollution (PM2.5).
- It has been found to have a direct link between exposure to black carbon and a higher risk of heart disease, birth complications, and premature death.

Major Sources of Black Carbon:

- Most black carbon emissions in India arise from burning biomass, such as cow dung or straw, in traditional cookstoves.
- According to a 2016 study, the residential sector contributes 47% of India's total black carbon emissions.
- Industries contribute a further 22%, diesel vehicles 17%, open burning 12%, and other sources 2%.

Related Concerns:

- **Health Risks:** Exposure to black carbon has been linked to a higher risk of heart disease, birth complications, and premature death.
- Recent estimates have indicated that more than 6.1 lakh deaths per year from indoor exposure to air pollution.
- **Environmental Impact:** Black carbon contributes to global warming and poses severe risks to the environment.
- It absorbs solar energy, warms the atmosphere, and when it falls to earth with precipitation, it darkens the surface of snow and ice, reducing their albedo (the reflecting power of a surface), warming the snow, and hastening melting.
- Black carbon deposition on snow contributes up to 39% of total glacier melting and 10% of glacier mass loss due to reduced precipitation as observed over the Tibetan Plateau.
- It disrupts hydrological cycles over monsoon systems and accelerates regional warming, particularly over the cryosphere.
- It fuels the feedback loop driving Arctic amplification, which has broader effects disrupting the Indian monsoon.
- **Climate Change:** Black carbon is the second largest contributor to climate change after CO₂.
- Unlike CO₂, which can stay in the atmosphere for hundreds to thousands of years, black carbon, because it is a particle, remains in the atmosphere only for days to weeks before it returns to earth with rain or snow.
- **Air Quality:** Black carbon affects air quality, visibility, and harms ecosystems. It also reduces agricultural productivity.
- **Socio-Economic Impact:** The health and environmental impacts of black carbon can have significant socio-economic implications, including increased healthcare costs and reduced agricultural yields.

Government Initiatives to Curb Black Carbon:

- Pradhan Mantri Ujjwala Yojana (PMUY): It provides free liquefied petroleum gas (LPG) connections to households below the poverty line.
- The primary objective of PMUY is to make clean cooking fuel available to rural and poor households and reduce their dependence on traditional cooking fuels.
- It has thus been able to play a vital role in reducing black carbon emissions, as it offers a cleaner alternative to traditional fuel consumption.
- Introduction of Cleaner/Alternate Fuels: The government has introduced cleaner/alternate fuels like gaseous fuel (CNG, LPG etc.), ethanol blending.
- Sustainable Alternative Towards Affordable Transportation (SATAT): It has been launched to set up 5000 Compressed Biogas (CBG) production plants and make CBG available in the market for use.
- Promotion of Agricultural Mechanization: It is the Central Sector Scheme on 'Promotion of Agricultural Mechanization for in-situ management of Crop Residue in the States of Punjab, Haryana, Uttar Pradesh and NCT of Delhi', agricultural machines and equipment for in-situ crop residue management are promoted with 50% subsidy to the individual farmers and 80% subsidy for the establishment of Custom Hiring Centres.
- National Clean Air Programme: The Central Government is implementing the National Clean Air Programme as a long-term, time-bound, national-level strategy to tackle the air pollution problem across the country in a comprehensive manner with targets to achieve 40% reduction in particulate matter concentrations by 2025-26.
- Faster Adoption and Manufacturing of Electric Vehicles (FAME): FAME phase-2 scheme has been rolled out to promote the adoption of electric and hybrid vehicles in the country.

Conclusion and Way Forward:

- Curbing black carbon emissions in India requires a multi-pronged approach that includes promoting clean cooking fuels, improving industrial processes, and enhancing public awareness about the harmful effects of black carbon.
- One potential solution to this issue is the local production of compressed biomethane (CBM) gas by composting biomass. CBM is a much cleaner fuel with lower black-carbon emissions and investment.
- Panchayats can take the initiative to produce CBM gas locally at the village level, ensuring every rural household can access clean cooking fuel.
- India pledged to achieve net-zero emissions by 2070 at the COP26 in Glasgow, positioning itself as a frontrunner in the race to carbon neutrality.
- According to the Ministry of New and Renewable Energy, India has installed a renewable energy capacity of over 180 GW by 2023 and is expected to meet its target of 500 GW by 2030.

El Nino and Drought in Southern African Nations

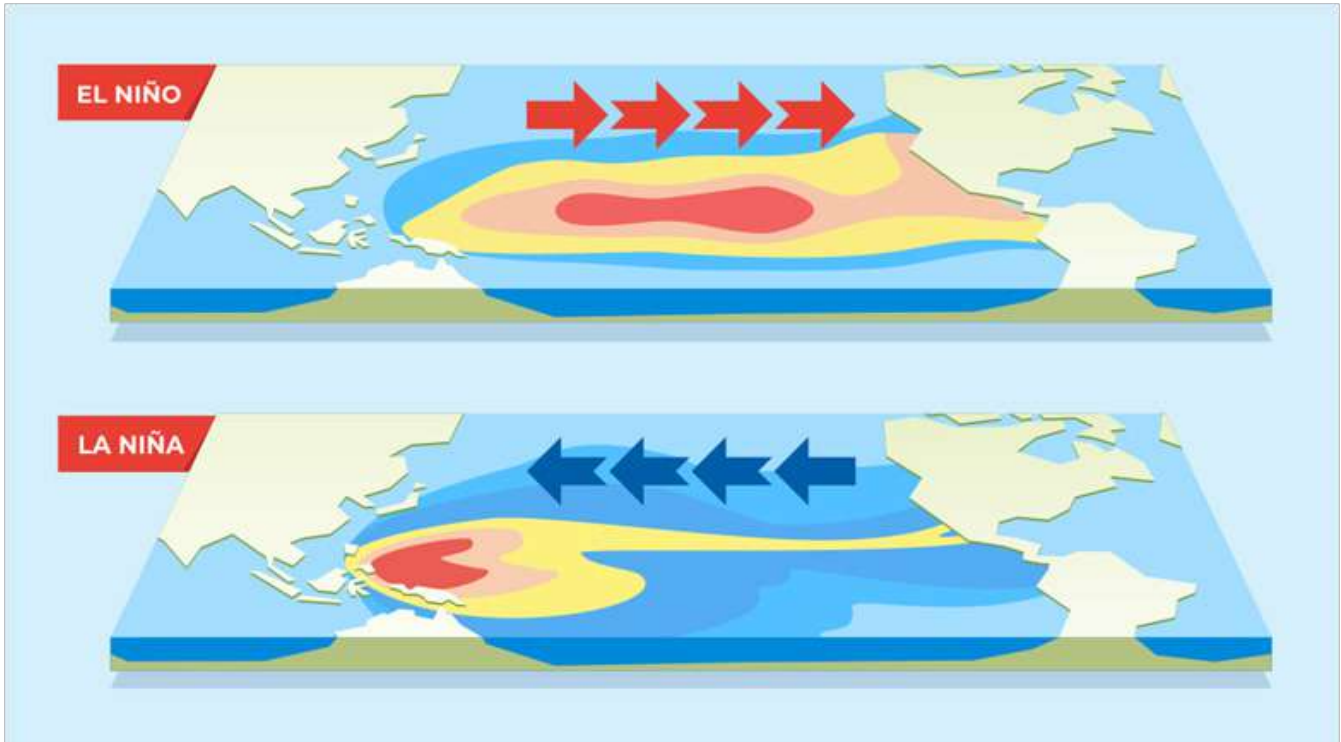
Syllabus: GS1/Geography; GS3/Environment

Context

- Recently, the southern African nations like Malawi, Zambia and Zimbabwe declared a state of disaster due to severe drought conditions because of the impact of the ongoing El Nino weather phenomenon.

About the El Nino:

- It is a naturally occurring climate pattern associated with the warming of the ocean surface temperatures in the central and eastern tropical Pacific Ocean.
- It occurs irregularly at two to seven year intervals.



Current Crisis:

- According to the United Nations World Food Programme (WFP), February 2024 was the driest month in 40 years for Zambia and Zimbabwe, and raised concerns late last year that numerous nations in southern Africa were on the brink of a hunger crisis because of the impact of El Niño.
- Malawi, Mozambique, and parts of Angola had 'severe rainfall deficits'.
- Millions in southern Africa rely on the food they grow to survive.
- Corn, the region's staple food, has been badly affected by the drought.
- The WFP stated that there were already nearly 50 million people in southern and parts of central Africa facing food insecurity even before one of the driest spells in decades hit.

Impact of El Nino on Global Weather:

- It can significantly influence weather patterns, ocean conditions, and marine fisheries worldwide.
- In 2016, the world saw its hottest year on record due to a strong El Nino.
- It brought a severe drought for southern Africa, the region's worst in 35 years in 2015-16.
- Meteorologists expect that this El Niño, coupled with excess warming from climate change, will see the world grapple with record-high temperatures.
- According to a study published in the journal Science, El Niño could lead to global economic losses of \$3 trillion in 2024.

Impact on India:

- In India, El Niño is often associated with weak monsoons and drought-like conditions.
- It can lead to reduced rainfall, dry spells, and heatwaves, resulting in crop failures and water scarcity.
- It is due to extreme weather decimating agricultural production, manufacturing, and helping spread disease.

About La Nina:

– It is a climate pattern that is part of the El Niño-Southern Oscillation (ENSO) cycle.

A. The combination of El Niño, La Niña, and the Neutral state between the two opposite effects is called the ENSO.



- It is characterised by cooler than average ocean surface temperatures in the central and eastern tropical Pacific Ocean.
- During La Niña events, trade winds are even stronger than usual, pushing more warm water toward Asia.
- Off the west coast of the Americas, upwelling increases, bringing cold, nutrient-rich water to the surface.
- These deviations from the normal surface temperatures can potentially have a large-scale impact on global weather conditions.

Impact on Global Weather:

- La Niña has the opposite effect of El Niño.
- It can cause drought in the South American countries of Peru and Ecuador, heavy floods in Australia, high temperatures in the Western Pacific, Indian Ocean, off the Somalian coast.
- It also influences the weather patterns over the Indian peninsula.

Impact on India:

- In India, La Niña is often associated with better monsoon rains that can lead to a good agricultural yield, benefiting the economy.
- However, the heavy floods in Australia can lead to loss of life and property, negatively impacting the economy.-

Rise of Robusta Coffee Prices

Syllabus: GS3/Agriculture

Context:

- Recently, it was found that the Price of Robusta coffee has spiked due to drastic fall in traditional growing regions like Vietnam and Indonesia.

About the Coffee Production in India:

- Production: India is among the top 10 coffee-producing countries, with about 3% of the global output in 2020.
- Types: Arabica and Robusta.
- Arabica has higher market value than Robusta coffee due to its mild aromatic flavour.
- Robusta is the majorly manufactured coffee with a share of 72% of the total production.

Agro-Climatic Conditions for Coffee Production in India:

Factors	Arabica	Robusta
Soils	Deep, fertile, rich in organic matter, well drained and slightly acidic (Ph 6.0 – 6.5)	Same as Arabica
Slopes	Gentle to moderate slopes	Gentle slopes to fairly level fields
Elevation	1000 – 1500 m	500 – 1000 m
Temperature	15°C – 25°C ; cool, equable	20°C – 30°C; hot, humid
Relative Humidity	70-80%	80-90%
Annual Rainfall	1600-2500 mm	1000-2000 mm

- Major Producers: South Indian states like Karnataka, Kerala, and Tamil Nadu contribute 80% of the country's total coffee production.
- Orissa and the northeastern areas also have a smaller proportion of production.

Coffee Board of India

- It was established through Coffee Act VII of 1942.
- Administrative Control: The Ministry of Commerce and Industry.
- Headquarter: Bangalore, Karnataka
- The Board has a Market Intelligence Unit (MIU) functioning from its head office at Bangalore.
 - a. It undertakes various activities related to market information & intelligence, market research studies, crop forecasting and coffee economics aspects.

Role of the Board:

- enhancement of production, productivity & quality;
- export promotion for achieving higher value returns for Indian Coffee and
- supporting the development of Domestic market.

Arsenic Contamination

Syllabus: GS3/Conservation of Environment

Context

- A new study by the University of Sheffield's Institute for Sustainable Food and the Department of Geography, UK underlines the risk of using water contaminated with arsenic to cook rice.

Major highlights of the study

- The study pointed out that some countries still follow the outdated WHO standard of 50 parts per billion as a safe threshold for arsenic in drinking water.
- Also 32 percent of the global population living in low- and middle-income countries do not adhere to the World Health Organization's current recommended limits.
- India is among 40 other countries that adopted 10 parts per billion as its standard. However, 19 other countries have no evidence of any regulations.
- Rice contains more arsenic in comparison to other cereals. The inorganic arsenic (iAs) is a Group 1 carcinogen according to the International Agency for Research on Cancer, a part of WHO.

Arsenic (As)

- Arsenic is a naturally occurring trace element that occurs in many minerals, usually in combination with sulfur and metals.
- It is highly toxic in its inorganic form.

Effects on health

- Long-term exposure to arsenic can cause cancer, skin lesions, cardiovascular disease, diabetes etc.
- In-utero and early childhood exposure have been linked to negative impacts on cognitive development and increased deaths in young adults.
- In Taiwan, arsenic exposure has been linked to "Blackfoot disease". It is a severe disease of blood vessels leading to gangrene.

Permissible Limits

- The World Health Organization's provisional guideline value for arsenic in drinking water is 0.01 mg/l (10 µg/l).
- In India the permissible limit of arsenic in the absence of an alternative source is 0.05 mg/l (50 µg/l).

Status of Arsenic Contamination in India

- The occurrence of Arsenic in groundwater was first reported in 1980 in West Bengal in India.
- Maximum number of the arsenic-affected habitations are in the Ganga and Brahmaputra alluvial plains.

Solar Waste

Syllabus: GS3/Environmental Pollution

Context

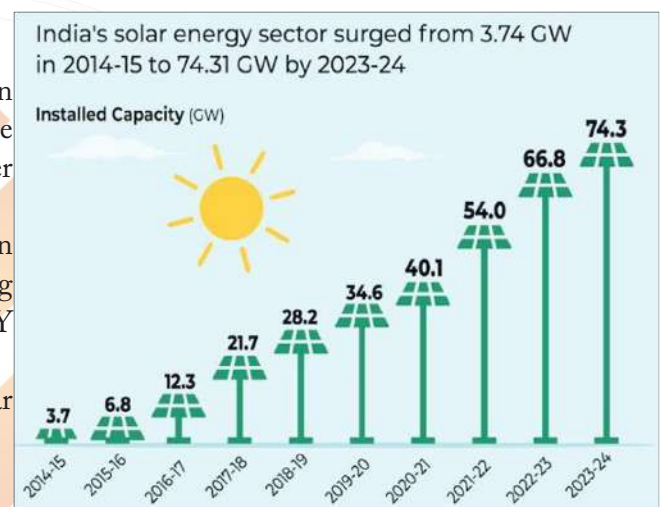
- India's solar waste could reach 600 kilotonnes by 2030 as per a study published by Council on Energy, Environment and Water (CEEW) in collaboration with the Ministry of New and Renewable Energy (MNRE).

Key Findings

- Waste Generation:** India's installed 66.7 gigawatt (GW) capacity, as of FY23, has generated about 100 kilotonnes (kt) of cumulative waste, which will increase to 340 kt by 2030.
- This volume will increase 32 times by 2050 resulting in about 19000 kt of cumulative waste.
- States Contribution:** Around 67 percent of this waste is expected to be generated in five states: Rajasthan, Gujarat, Karnataka, Tamil Nadu and Andhra Pradesh.
- Rajasthan will account for 24 percent of the waste generated by 2030, followed by Gujarat accounting for 16 percent, and Karnataka accounting for 12 percent.

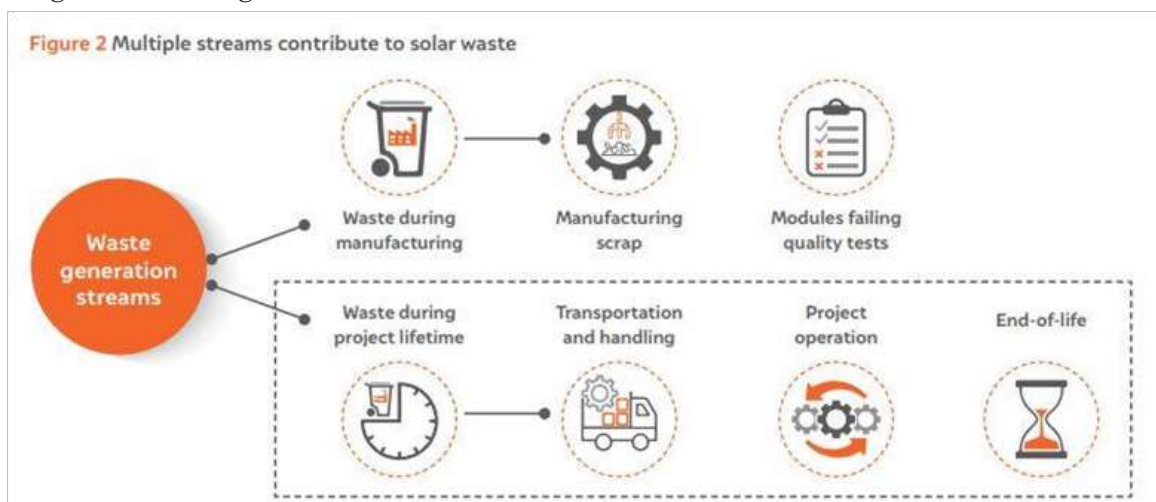
India's Solar Capacity

- Globally, India has emerged as a significant player in renewable energy, ranking fourth in total renewable power capacity additions and fifth in solar power capacity.
- From 2014 to 2024, India also saw an expansion in its installed capacity for energy generation, increasing from 3.74 GW in FY 2014-15 to 74.31 GW in FY 2023-24 (till January).
- It is slated to jump to 292 GW of installed solar capacity by 2030.



Solar Waste

- Solar waste refers to the waste generated during the manufacturing of solar modules and waste from the field (project lifetime).
- Manufacturing involves two streams of waste, including the scrap that's produced and the waste generated from PV modules failing quality tests.
- Waste from the field involves three streams of waste.
- Waste generated during transporting and handling — the damaged modules are considered as waste.
- Waste produced due to the damage incurred by solar modules during their lifetime.
- When the modules reach their end-of-life and are not usable anymore.
- The study only focused on waste from the field (project lifetime) category and excluded waste generated during manufacturing.



Key Recommendations

- The policymakers should maintain a comprehensive database of the installed solar capacity, which would help in estimating solar waste in the following years.
- The MoEFCC should issue guidelines for collecting and storing solar waste.
- Furthermore, it should also promote safe and efficient processing of stored waste.
- Solar cell and module producers should start developing waste collection and storage centres to adhere to the responsibilities assigned in the E-waste Management Rules 2022.
- Policymakers should incentivise recyclers, and push stakeholders to effectively manage the growing solar waste.

Solar Waste Recycling Methods

- Conventional Recycling or Bulk Material Recycling: It involves mechanical processes like crushing, sieving, and shearing of the waste.
- While the majority of recycled materials consist of glass, aluminium, and copper, more valuable materials like silver and silicon cannot be recovered through this method.
- High Value Recycling: It involves the use of a combination of mechanical, chemical, and thermal processes to recycle the modules.
- Unlike conventional recycling, this method can recover silver and silicon also with the help of chemical processes.

India's Solar Waste Management Policy

- The management of waste generated from solar PV modules, panels and cells is part of the Electronic Waste Management Rules 2022.
- The rules mandate solar PV module and cell producers to store the waste generated from solar PV modules and cells up to 2034 – 2035 as per the guidelines laid down by the Central Pollution Control Board (CPCB).
- The rules also mandate the filing of annual returns on the e-waste management portal up to 2034 – 2035.
- Every recycler of solar PV modules and cells shall be mandated for the recovery of materials as laid down by the CPCB.

India's 'protected' basmati varieties renamed & cultivated in Pak

Syllabus: GS3/Major crops- cropping patterns in various parts of the country

Context

- The Indian Agricultural Research Institute (IARI) has recently red-flagged the “illegal” cultivation of its blockbuster varieties in Pakistan.

About

- IARI has demanded initiation of legal action against unscrupulous seed firms in Pakistan “to protect the interests of our farmers and exporters”.
- High-yielding basmati varieties account for roughly 90% of India's projected \$5.5 billion exports of the aromatic rice in 2023-24 (April-March).
- According to IARI, the illicit seed sales and cultivation of IARI varieties in Pakistan started with Pusa Basmati-1121 (PB-1121).
- Pakistan is growing other popular IARI-bred varieties too, such as Pusa Basmati-6 (PB-6) and PB-1509(‘Kissan Basmati’) released in 2010 and 2013 respectively.

Legal Backing in India

- All the varieties that are bred are notified under the Seeds Act, 1966 for cultivation in the officially demarcated Geographical Indication area of basmati rice within India, covering 7 northern states.
- They are further registered under the Protection of Plant Varieties and Farmers' Rights Act, 2001.
- This Act allows only Indian farmers to sow, save, re-sow, exchange or share the seeds of any protected/registered varieties. Even they cannot violate the breeder's rights by selling the seeds in branded, packaged and labeled form.

Key Facts related to Basmati Rice

- India is the leading exporter of Basmati Rice in the World.
- Major Export Destinations (2022-23) : Saudi Arabia, Iran, Iraq, United Arab EMTs and Yemen Republic.
- Areas of Cultivation in India: J & K, Himachal Pradesh, Punjab, Haryana, Delhi, Uttarakhand and western Uttar Pradesh.

Asbestos

Syllabus: GS3/Environmental Pollution

Context:

- Recently, the United States' Environmental Protection Agency (EPA) announced a comprehensive ban on all forms of the deadly carcinogen asbestos.

About the Asbestos:

- It is a naturally occurring mineral, has been widely used in various industries due to its heat and chemical resistance, tensile strength, and insulating properties.
- However, it is a known carcinogen, and exposure to it can lead to serious health issues, including lung cancer, mesothelioma, and asbestosis, and it is linked to more than 40,000 deaths in the US each year.



The Global Scenario:

- Currently, more than 65 countries, including the US, have imposed bans or severe restrictions on its use.
- It continues to be used in many other countries, including India.

The Indian Context:

- India banned asbestos mining in 1993. However, there is no law in the country that prevents its use in construction, import, or trade.
- As a result, asbestos is widely used in everything from cement to brake parts.
- In fact, India accounted for nearly half of global asbestos imports in 2021.
- In India, in the coming decades, more than 6 million people could have an asbestos-related disease, including more than 600,000 cancer cases.

Captive Elephant (Transfer or Transport) Rules, 2024.

Syllabus: GS3/Environment and Conservation

Context

- The Centre has notified a set of rules called the Captive Elephant (Transfer or Transport) Rules, 2024.

About

- The rules liberalise the conditions under which captive elephants may be transferred within or between states.
- Conditions for Transfer: When an owner is no longer in a position to maintain the elephant, the elephant will likely have a better upkeep than in the present circumstances;
- or when a state's Chief Wildlife Warden "deems it fit and proper" in the circumstances of the case for better upkeep of the elephant.
- Transfer within State: Before a transfer within the state, an elephant's health has to be ratified by a veterinarian and the Deputy Conservator of Forests must establish that the animal's current habitat and prospective habitat are suitable.
- The Chief Wildlife Warden on receipt of such documents may choose to reject or approve the transfer.
- Transfer Between States: If the transfer involves moving the elephant outside of a state, similar conditions apply.
- Before a transfer is effected, the "genetic profile" of the elephant has to be registered with the Ministry of Environment, Forest and Climate Change.

The State of the Global Climate 2023: WMO

Syllabus: GS2/International Treaties & Agreements; GS3/Environment

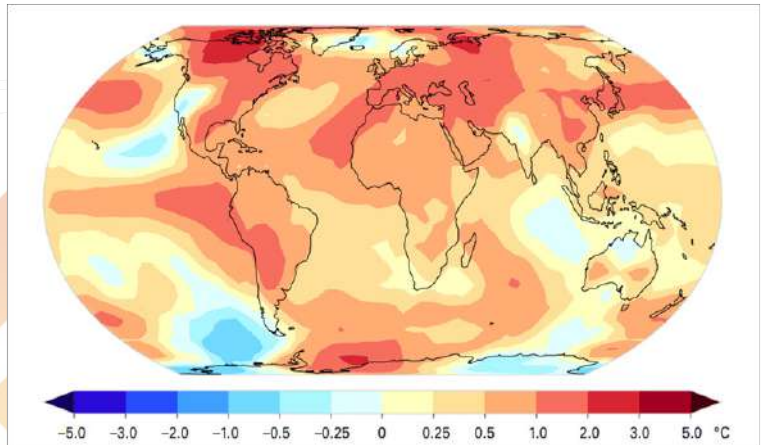
Context

- Recently, the World Meteorological Organization (WMO) released the 'State of the Global Climate' for 2023.

About the State of the Global Climate 2023

Key Findings:

- Hottest Year on Record:** The report confirms that 2023 was the warmest year on record, with the global average near-surface temperature at 1.45°C above the pre-industrial baseline.
- It is significantly higher than the 1.29°C increase from pre-industrial times recorded in 2016.
- The last ten years, 2014 to 2023, was the warmest decade ever.
- Record-Breaking Changes:** Records were broken for greenhouse gas levels, surface temperatures, ocean heat and acidification, sea level rise, Antarctic sea ice cover, and glacier retreat.
- The observed concentrations of three main greenhouse gases — carbon dioxide, methane, and nitrous oxide — also reached new records in 2022.
- Sea Level Rise:** Ocean heat content reached its highest level in the 65-year observational record.
- Global mean sea level reached a record high. The rate of sea level rise in the past ten years (2014–2023) has more than doubled since the first decade of the satellite record (1993–2002).
- Extreme Weather Events:** Heatwaves, floods, droughts, wildfires, and rapidly intensifying tropical cyclones caused significant disruption and economic losses.
- Wildfires in Hawaii, Canada and Europe led to loss of life, the destruction of homes and large-scale air pollution.
- Flooding associated with extreme rainfall from Mediterranean Cyclone Daniel affected Greece, Bulgaria, Türkiye, and Libya with particularly heavy loss of life in Libya.
- Socio-Economic Impact:** Food security, population displacement and impacts on vulnerable populations continue to be of mounting concern in 2023, with weather and climate hazards exacerbating the situation in many parts of the world.
- Cost of Inaction:** The report emphasises that the cost of climate inaction is higher than the cost of climate action.
- The Secretary-General of WMO stated that 'scientific knowledge about climate change has existed for more than five decades, and yet we missed an entire generation of opportunity'.



World Meteorological Organisation (WMO)

- It is an intergovernmental organization with a membership of 193 Member States and Territories.
- It originated from the International Meteorological Organization (IMO), the roots of which were planted at the 1873 Vienna International Meteorological Congress.
- It was established by the ratification of the WMO Convention in 1950, WMO became the specialised agency of the United Nations for meteorology (weather and climate), operational hydrology and related geophysical sciences.
- The Secretariat, headquartered in Geneva, is headed by the Secretary-General.
- Its supreme body is the World Meteorological Congress.

ETHANOL 100

Syllabus: GS3/ Environment

In News

- The Ministry of Petroleum has launched 'ETHANOL 100', a groundbreaking automotive fuel, at the IndianOil Retail Outlet.

About

- Ethanol 100 offers a cleaner, greener fuel option with its blend of 92-94% ethanol, 4-5% motor spirit, and 1.5% Co-solvent higher saturated alcohol. It reduces greenhouse gas emissions by around 63% and is ideal for high-performance engines due to its high-octane rating.

Significance

- With the launch of ETHANOL 100 at 183 IndianOil outlets, India is nearing its target of achieving 20% ethanol blending by 2025-26.
- India's Ethanol Blending Program will enhance farmer incomes and rural employment also contribute to environmental sustainability, with significant reductions in CO2 emissions and foreign exchange savings.

Pobitora Wildlife Sanctuary

Context

- The Supreme Court froze the Assam government's move to de-notify Pobitora wildlife sanctuary.

About

- Pobitora wildlife sanctuary is located in the capital city of Guwahati.
- It is referred as 'Mini Kaziranga' owing to the similarity of landscape, floral, and faunal distribution.
- It has a dense population of the Great Indian one-horned rhinoceros.
- Pobitora was declared a reserved forest in 1971 and a wildlife sanctuary in 1987.

Great Indian one-horned rhinoceros

- Habitat:** It is confined to the tall grasslands and forests in the foothills of the Himalayas.
- Distribution:** The Great one horned rhino is commonly found in Nepal, Bhutan, Pakistan and in Assam, India.
- Indian Habitat:** The Kaziranga National Park and Manas National Park in Assam, Pobitora reserve forest in Assam (having the highest Indian rhino density in the world), Orang National park of Assam, Laokhowa reserve forest of Assam having a very small population and Royal Chitwan National Park in Nepal are homes for this endangered animal.
- Conservation Status:**
- IUCN Status:** vulnerable
- CITES:** Appendix I (I includes species threatened with extinction. Trade in specimens of these species is permitted only in exceptional circumstances).



Rising Global Sea Surface Temperature

Syllabus: GS3/Environment

Context

- The average global sea surface temperature (SST) for February 2024 stood at 21.06 degree Celsius, the highest ever in a dataset that goes back to 1979.
- Sea surface temperature is the temperature of the water at the ocean surface.

Reasons for Rising SST

- **Human Activities:** Since the Industrial Revolution kicked off in the 19th Century, human activities such as burning fossil fuels have released high levels of greenhouse gases (GHGs) in the atmosphere.
- Carbon dioxide, methane, ozone, and nitrous oxide are some of the notable GHGs, which trap heat in the atmosphere and contribute to global warming.
- As a result, the average global temperature has risen at least 1.2 degree Celsius above pre-industrial times.
- **Absorption by Oceans:** Almost 90 percent of the extra heat trapped by GHGs has been absorbed by the oceans, making them steadily warmer over the decades.
- **El Niño:** A weather pattern that refers to an abnormal warming of surface waters in the equatorial Pacific Ocean — has contributed to both ocean warming and rising global surface temperatures.
- **Weaker Winds:** There is also less dust blowing off the Sahara Desert recently due to weaker-than-average winds.
- Typically, the dust forms a “giant umbrella that shades” the Atlantic water and reduces ocean temperatures.
- But now, the umbrella has partially folded and more of the Sun is beating down on the ocean.

Impact of Rising SST

- **Ocean Stratification:** Warmer oceans lead to an increase in ocean stratification — the natural separation of an ocean’s water into horizontal layers by density, with warmer, lighter, less salty, and nutrient-poor water layering on top of heavier, colder, saltier, nutrient-rich water.
- Usually, ocean ecosystems, currents, wind, and tides mix these layers.
- The rise in temperatures, however, has made it harder for water layers to mix with each other.
- Due to this, oceans are able to absorb less carbon dioxide from the atmosphere and the oxygen absorbed isn’t able to mix properly with cooler ocean waters below, threatening the survival of marine life.
- **Threat to Phytoplanktons:** Nutrients are not able to travel up to the surface of the oceans from below. This could threaten the population of phytoplankton — single-celled plants that thrive on the ocean surface and are the base of several marine food webs.
- Phytoplankton are eaten by zooplankton, which are consumed by other marine animals such as crabs, fish, and sea stars.
- Therefore, if the phytoplankton population plummets, there could be a collapse of marine ecosystems.
- **Marine Heat Waves:** Warmer oceans cause marine heat waves (MHWs), which occur when the surface temperature of a particular region of the sea rises to 3 or 4 degree Celsius above the average temperature for at least five days.
- Between 1982 and 2016, such heatwaves have doubled in frequency and have become longer and more intense, according to the UN’s Intergovernmental Panel on Climate Change (IPCC).
- MHWs are devastating for marine ecosystems as they contribute to coral bleaching, and also impact the migration pattern of aquatic animals.
- **Increase in Intensity of Cyclones:** Warmer temperatures lead to a higher rate of evaporation as well as the transfer of heat from the oceans to the air.
- That’s why, when storms travel across hot oceans, they gather more water vapour and heat.
- This results in more powerful winds, heavier rainfall, and more flooding when storms reach the land — meaning heightened devastation for humans.

Conclusion

- In 2023, the concentration of GHG the highest levels ever recorded in the atmosphere.
- The only way to avoid or blunt the aforementioned consequences is to reduce GHG emissions.

Stage-2 of Vikram 1 Space Launch Vehicle

Syllabus: GS3/Space

Context

- Skyroot Aerospace, the leading space-tech company, has successfully test-fired the Stage-2 of Vikram-1 space launch vehicle, called Kalam-250.

About

- Vikram-1 launch is a landmark event for the Indian space sector as it is the first private orbital rocket launch.
- Vikram-1 is a three-stage, solid-fuel based rocket and the testing of the “second stage” is significant because this stage propels satellites from the dense atmosphere of Earth to the deep vacuum of outer space.
- The Kalam-250 is a high-strength carbon composite rocket motor, which uses solid fuel and a high-performance Ethylene-Propylene-Diene terpolymers (EPDM) Thermal Protection System (TPS).

Digital Financial Frauds

Syllabus: GS3/Cybersecurity

Context

- A recent report by the Indian Cyber Crime Coordination Centre revealed that digital financial frauds accounted for 1.25 lakh crore over the last three years.

Rise in Digital Frauds

- According to the National Crime Records Bureau (NCRB), cybercrimes in India in 2023 resulted in a loss of 66.66 crore, with 4,850 reported cases.
- According to the National Cybercrime Reporting Portal (NCRP), in 2023, at least 10,319 crore was reported to be lost by victims of digital financial fraud.

How Digital Frauds Work?

- Convincing the victim to send money, either by impersonation (fake WhatsApp/FB/Insta, social media profiles) or by giving them a false promise of greater return.
- By taking credentials such as Unified Payments Interface ID (UPI), Personal Identification Number (PIN), One-Time Password (OTP) or Internet banking ID/password from the victim and then using the same on other apps/websites and transferring money without the knowledge of the victim.
- By taking card details and convincing the victim to share OTP.

How can Frauds be Prevented?

- Just as Google accounts do not allow logging in from a new device unless permission is granted by the former, financial institutions must be mandated to replicate this feature in their apps.
- The screen share facility must be disabled. Banking and financial apps must disable screen-sharing to run on top of them.
- In the bank statement, all banks/NBFCs/SEs must be mandated to provide comprehensible data.
- Currently only partly printed numbers are shown which even knowledgeable customers are unable to understand.
- The International Mobile Equipment Identity (IMEI) must be recorded.
- All banking and financial apps must be mandated to save IMEI details of the device being used.
- Fraudsters use fake mobile numbers and fake bank accounts which span across different States with the goal of adding layers to increase anonymity and preventing agencies from prosecuting them.

Government Initiatives

- The Digital Intelligence Platform (DIP) is an initiative developed by the Department of Telecommunications to serve as a secure and integrated platform for real-time intelligence sharing, information exchange, and coordination among various stakeholders.
- Chakshu Facility: It is a newly introduced feature on the Sanchar Saathi portal that encourages citizens to proactively report suspected fraudulent communications received via call, SMS, or WhatsApp.
- The Central Government has also launched the National Cyber Crime Reporting Portal, to enable complainants to report complaints pertaining to all types of cyber crimes, including net and online frauds.
- Reserve Bank of India has issued several circulars/ guidelines related to security and risk mitigation measures for securing electronic / digital payment transactions.

Conclusion

- The fintech and telecom industries must be mandated to take certain preventive steps in their technology and provide data in a manner which enables speedier investigation, the prevention, detection, recovery and conviction will be much more effective.
- Faster availability of data will make it easier to identify and convict pan-Indian gangs.

H5N1 Bird Flu

Syllabus: GS3/ S&T

In News

- Since 2020, H5N1 flu has been posing an existential threat to birds and wildlife across the globe.

About

- Bird flu: Also known as avian flu, is an infectious viral illness that mainly infects and spreads among poultry and some wild birds.
- There are different strains of bird flu virus. Depending on the origin host, influenza A viruses can be classified as avian influenza (bird flu, subtypes A H5N1 and A H9N2), swine influenza (swine flu, subtypes A H1N1 and AH3N2). H5N1 is a highly pathogenic flu virus.
- The “H” and “N” in the name of a flu virus stand for hemagglutinin and neuraminidase, two proteins on the surface of the virus that allow it to enter and exit host cells.
- Hemagglutinin and neuraminidase were the first aspects of the flu virus to be identified hence it was named so.

Sickle Cell Anaemia & CRISPR Technology

Syllabus: GS 3/S&T

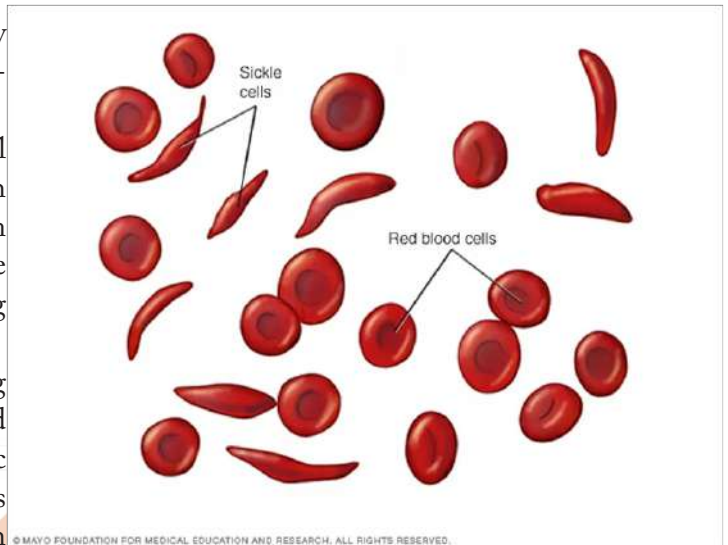
In News

- Marginalised tribal communities face difficulties in accessing basic healthcare and diagnostics of Sickle cell disease (SCD).

About Sickle cell disease (SCD)

- It is an inherited haemoglobin disorder in which red blood cells (RBCs) become crescent or sickle-shaped due to a genetic mutation.
- These RBCs are rigid and impair circulation, often leading to anaemia, organ damage, severe and episodic pain, and premature death.
- India has the third highest number of SCD births, after Nigeria and the Democratic Republic of the Congo. Regional studies suggest approximately 15,000-25,000 babies with SCD are born in India every year, mostly in tribal communities.
- According to the 2023 ‘Guidelines for National Programme for Prevention and Management of Sickle Cell Disease’, of the 1.13 crore persons screened in different states, about 8.75% (9.96 lakh) tested positive.
- It is also one of the 21 “specified” disabilities listed in the Schedule of the Rights of Persons with Disabilities Act 2016.

- Steps : In 2023, the Government of India launched the National Sickle Cell Anaemia Elimination Mission, to eliminate SCD by 2047.
- Challenges: At present treatment and care for SCD remains grossly inadequate and inaccessible.
- Like the (un)availability of the drug hydroxyurea
- Blood transfusion is another important therapy for SCD, but its availability is limited to district-level facilities.
- Bone marrow transplantation (BMT), until recently the other cure for SCD, is out of reach for most SCD patients due to the difficulty in finding matched donors, the high cost of the treatment at private facilities, and long waiting times in public hospitals.
- Solution : the application of the gene-editing technology called CRISPR (short for ‘Clustered Regularly Interspaced Short Palindromic Repeats’) to treat SCD is important — for its novelty and promise but also for the health disparities it makes apparent.
- The U.S. Food and Drug Administration recently approved two gene therapies, Casgevy and Lyfgenia, to treat SCD in people ages 12 and older.
- CRISPR in India: In India, CRISPR’s possible medical applications also pose ethical and legal quandaries.
- The National Guidelines for Stem Cell Research 2017 prohibit the commercialisation of stem cell therapies.
- Gene-editing stem cells is allowed only for in-vitro studies.
- India has approved a five-year project to develop CRISPR for sickle cell anaemia.
- Under its Sickle Cell Anaemia Mission, the Council of Scientific and Industrial Research is developing gene-editing therapies for SCD.
- Adopting and promoting advanced therapies like CRISPR in India requires a comprehensive approach that accounts for inequities and disparities in the country’s overall healthcare access framework.



Project ANAGRANINF

Syllabus: GS3/Science and Technology

Context:

- Recently, the Technology Development Board (TDB) of the Department of Science & Technology and others sanctioned the ‘Project ANAGRANINF’ for the development of a novel class of antibiotics against gram-negative bacterial-infections.
- This initiative aims to foster healthcare innovation through a joint effort between Indian and Spanish companies.

About Gram-Negative Bacteria

- It has built-in abilities to find new ways to be resistant and can pass along genetic materials that allow other bacteria to become drug-resistant as well.
- It causes infections including pneumonia, bloodstream infections, wound or surgical site infections, and meningitis in healthcare settings.
- It is resistant to multiple drugs and is increasingly resistant to most available antibiotics.

Threat:

- Gram-negative bacteria, such as Acinetobacter Baumannii and Pseudomonas Aeruginosa, are associated with severe hospital-acquired infections.
- These bacteria have been acknowledged as ‘red alert’ pathogens due to their exceptional ability to develop resistance to all currently available antibiotics.

Parameter	Gram-positive bacteria	Gram-negative bacteria
Cell Wall	A single-layered, smooth cell wall	A double-layered, wavy cell-wall
Cell Wall thickness	The thickness of the cell wall is 20 to 80 nanometres	The thickness of the cell wall is 8 to 10 nanometres
Peptidoglycan Layer	It is a thick layer/ also can be multi-layered.	It is a thin layer/ often single-layered.
Teichoic acids	Teichoic acids are present.	Teichoic acids are not present.
Lipopolysaccharide	Lipopolysaccharide is not present.	Lipopolysaccharide is present.
Outer membrane	The outer membrane is not present.	The outer membrane is mostly present.
Lipid content	The Lipid content is very low.	The Lipid content is 20% to 30%.
Resistance to Antibiotic	These are very susceptible to antibiotics.	These are very resistant to antibiotics.

Pushpak

Syllabus: GS3/ Space

In News

- ISRO achieved a major milestone in the area of Reusable Launch Vehicle (RLV) Technology after the successful launch of “Pushpak”.
- Pushpak was named after the mythological spaceship from the ancient Indian epic, Ramayana.

About

- The Pushpak was lifted by an Indian Air Force Chinook helicopter and was released from 4.5 km altitude.
- After the release, it autonomously approached the runway along with cross-range corrections.
- The Pushpak is shielded with heat-resistant materials to protect the spacecraft during atmospheric re-entry.

Reusable Launch Vehicle – Technology Demonstrator (RLV-TD)

- RLV-TD is one of the most technologically challenging endeavours of ISRO towards developing essential technologies for a fully reusable launch vehicle to enable low-cost access to space.
- The Project lays the groundwork for future missions, like establishing the Bhartiya Antriksh Station by 2035.

Significance

- Nearly 80 percent of the cost in a space launch vehicle goes into the structure of the vehicle and by using reusable launch vehicles this cost can come significantly down.
- This can also reduce the manufacturing time for building a new vehicle for every launch, thus enabling more frequent launches.

Nuclear Energy

Syllabus: GS 3/Energy

In News

- World leaders gathered in Brussels at the first ever Nuclear Energy Summit to highlight the role of nuclear energy in addressing the global challenges to reduce the use of fossil fuels.

About the summit

- The Summit comes in the wake of the historic inclusion of nuclear energy in the Global Stocktake agreed at the UN Climate Change Conference (COP28) in Dubai in December 2023, which called for accelerating its deployment along with other low carbon energy sources.
- The declaration signed by 22 world leaders mentioned the need to triple nuclear energy capacity by 2050.
- The summit is an initiative in collaboration with the IAEA’s ‘Atoms4Netzero’ programme, and is part of the multilateral approach to decarbonisation.

Nuclear Energy

- Nuclear energy is a form of energy released from the nucleus, the core of atoms, made up of protons and neutrons.
- This source of energy can be produced in two ways: fission – when nuclei of atoms split into several parts – or fusion – when nuclei fuse together.
- The nuclear energy harnessed around the world today to produce electricity is through nuclear fission, while technology to generate electricity from fusion is at the R&D phase.

Importance

- Nuclear power is a low-carbon source of energy, because unlike coal, oil or gas power plants, nuclear power plants practically do not produce CO₂ during their operation.
- Nuclear reactors generate close to one-third of the world's carbon free electricity and are crucial in meeting climate change goals.
- Most importantly, nuclear power has the capacity to supply uninterrupted energy irrespective of geographical constraints making it a crucial component of the wider renewable energy mix.
- Nuclear power plants (NPP) also have low operating costs, smaller land imprint and a longer life cycle compared to all the other renewable energy sources.
- It enhance energy security and boost economic development

Recent Developments

- Recent developments in nuclear technology including Small Modular Reactors (SMR), radiation proofing in existing plants, and extended fuel cycles, have the potential to substantially mitigate nuclear-related risks.
 - The role of technical advancements in reducing carbon emissions is highlighted by an IAEA study, which predicts that while existing technologies will play a significant role, by 2050, half of carbon reductions will come from technologies currently in the prototype stage.
 - There are 440 nuclear reactors in the world, accounting for a quarter of the world's low-carbon energy.
- A. The number of nuclear reactors is increasing, with 60 reactors under construction and 110 in the planning stage, most being in Asia, particularly China, which is soon to overtake the U.S. and the nuclear giant France.

Challenges and Concerns

- An uncontrolled nuclear reaction in a nuclear reactor could result in widespread contamination of air and water.
- However, in spite of technical advancements, Multilateral Development Banks (MDBs) and private investors have not made any significant contribution to the industry.
- The World Bank has not provided financing for a nuclear project since its \$40 million loan to Italy in 1959.
- The operation of nuclear power plants produces waste with varying levels of radioactivity.

Status in India

- India's first commercial NPP in Pahalgah, Tarapur offers reliable energy at 2/kWh lower than solar power tariffs.
- At Kudankulam, Tamil Nadu, a newer power plant offers electricity in the range of 4-6/kWh comparable to coal-fired thermal power plants.
- Despite its versatile nature, nuclear power contributes only 1.6% of the total renewable energy mix in India.
- Stigma, weaponization risk, radiation leak, regulation, high upfront cost, and long project overruns are the reasons for low adoption rate of nuclear energy.

Conclusion and Way Ahead

- The nuclear industry has been undergoing novel liberalisation, with ambitious plans for growth in India and abroad.
- Beginning with the invitation of \$26 billion in private investments, a phase-wise tripling of nuclear capacity from 7,480 MW to 22,480 MW by 2031-2032, and Prime Minister Modi's attendance at the core loading of the Prototype Fast Breeder Reactor (PFBR) all mark a positive future for the industry.
- The PFBR's ability to generate fuel and power at the same time represents a significant advancement in India's mostly self-reliant nuclear industry.

- There is also a pressing need to reassess nuclear financing policies of Multilateral Development Banks (MDBs) to accommodate private capital or blended finance models.
- Financial creativity and market support with low interest rates can unravel the potential of nuclear energy at scale.
- There are successful financial practices that can be replicated, for instance the cooperative funding models of France, South Korea, Russia, and the U.K. where a group of investors raise credit from the market and take full responsibility for project delivery.

Sound Laser

Syllabus: GS3/Science and Technology

Context

- Researchers in China have built a new device that can create a laser beam out of sound particles.

About

- It is an unprecedentedly bright laser that shoots particles of sound instead of light.
- Unlike regular lasers that emit light particles called photons, these machines release particle-like chunks of sounds called phonons.
- Also known as Sound Amplification by Stimulated Emission of Radiation (SASER), these “sound lasers” produce a beam of uniform sound waves on a nanoscale. The first successful SASERs were developed in 2009.
- Significance: These particles can be used in optoelectronics, terahertz-frequency ultrasound, signal modulation and manipulating nanoparticles.
- Laser’s ability to move through liquids without being distorted could prove useful in everything from biomedicine to underwater imaging.

Source: NDTV

Operation Indravati

Syllabus: GS2/International issues

Context

- India launched ‘Operation Indravati’ to evacuate its nationals from Haiti.

Background

- Haiti has been witnessing violence for over two years since the July 2021 assassination of President Jovenel Moise.
- Now various armed groups launched coordinated attacks on key installations in Haiti in an attempt to force the resignation of the country’s de facto leader Prime Minister Ariel Henry.



About Haiti

- Capital: Port-au-Prince
- Haiti, is a country on the island of Hispaniola in the Caribbean Sea, east of Cuba and Jamaica, and south of The Bahamas.

SAKHI App for Gaganyaan Mission

Syllabus: GS3/science and Technology

Context

- Vikram Sarabhai Space Centre (VSSC), the Indian Space Research Organisation (ISRO) facility, has developed the multi-purpose app SAKHI to help astronauts on the Gaganyaan mission.

About

- SAKHI will monitor the health of the astronauts, help them stay connected with Earth and alert them about their dietary schedules.
- It will keep the crew connected with the onboard computer and ground-based stations, guaranteeing a seamless communication link.

Long-Term Challenges to Human Space Exploration

- Outside of Earth's protective magnetosphere, astronauts are exposed to higher levels of cosmic radiation, which can damage DNA and increase the risk of cancer and other health issues.
- Access to medical care is limited during space missions, and emergencies such as injuries or acute illnesses require prompt and effective intervention.
- Sleep disturbances are the major challenge in space due to factors such as environmental noise, changes in light-dark cycles, and discomfort from sleeping in microgravity.

Gaganyaan mission

- The mission aims to demonstrate the capability to launch human beings (three crew members) to low earth orbit and bring them back safely to earth by landing.
- The Launch Vehicle Mark-3 (LVM3) is the launch vehicle for the Gaganyaan mission.
- Crew Escape System (CES): HLVM3 consists of CES powered by a set of quick acting, high burn rate solid motors which ensures that Crew Module along with the crew is taken to a safe distance in case of any emergency either at launch pad or during ascent phase.
- Orbital Module: The Orbiter Module will orbit the Earth, and it consists of Crew Module (CM) and Service Module (SM). It is designed to keep the crew safe during ascent, orbital phase, and re-entry.
- The Crew Module (CM) is the habitable space with the Earth-like environment in space for the crew.
- Service Module (SM): It will be used to provide the necessary support to CM while in orbit. It is an unpressurized structure containing thermal system, propulsion system, power systems, avionics systems and deployment mechanisms.
- This manned mission will be the first of ISRO's human spaceflight missions. The US, Russia and China are the only three countries to have conducted human spaceflights yet.

Private Industry in Space Sector

Syllabus:GS3/Science and Technology

Context

- The Chennai-based space start-up will launch its first rocket Agnibaan Sub Orbital Technology Demonstrator from the Satish Dhawan Space Centre in Sriharikota.

India's share in Space Industry

- India constitutes 2-3% of the global space economy and is expected to enhance its share to more than 10% by 2030.
- With over 400 private space companies, India ranks fifth globally in no. of space companies.

Private players in space industry

- Indian start-ups are taking active interest in the space market, from just 1 start-up in the space sector in 2012 to 189 start-ups in 2023.
- The funding received by these start-ups reached a total of \$124.7 Mn in 2023 from \$67.2 Mn in 2021.
- The Skyroot, have launched India's first privately built rocket, Vikram-S, into space, with plans to revolutionize satellite launches.

% of global market share	
US	40%
UK	7%
India	2%
Global space economy (in 2021)	
India (in 2021)	USD 7.6B
India to grow (by 2025)	USD 50B

Regulation of the Private sector in the Space industry in India

- National Space Promotion and Authorisation Centre (IN-SPACe): It is an autonomous and single window

nodal agency in the Department of Space for the promotion, encouragement and regulation of space activities of both government and private entities.

- NewSpace India Ltd (NSIL): It is mandated to transfer the matured technologies developed by the ISRO to Indian industries.
- All of them are under the purview of the Ministry of Defence.

Steps taken by Government

- SpaceTech Innovation Network (SpIN): SpIN is a one-of-its-kind public-private collaboration for start-ups and SMEs in the space industry.
- The Indian Space Policy 2023 was notified to implement the vision for unlocking India's potential in the Space sector through enhanced private participation.
- Various schemes to encourage the private sector have been implemented by IN-SPACe, i.e., Seed Fund Scheme, Pricing Support Policy, Mentorship support, Design Lab for NGEs, Skill Development in Space Sector, ISRO facility utilization support, Technology Transfer to Non-Governmental Entities (NGEs).

FDI in space sector

- Under the amended FDI policy, 100% FDI is allowed in the space sector. The entry route for the various activities are as follows:
- Up to 74% under Automatic route: Satellites-Manufacturing & Operation, Satellite Data Products and Ground Segment & User Segment.
- Up to 49% under Automatic route: Launch Vehicles and associated systems or subsystems, Creation of Spaceports for launching and receiving Spacecraft.
- Up to 100% under Automatic route: Manufacturing of components and systems/ sub-systems for satellites, ground segment and user segment.

Significance of privatization of space sector

- Private companies operate with a profit motive, which drives them to reduced costs in space missions and satellite launches.
- Privatization introduces competition into the space industry, which can drive efficiency and innovation.
- Private players facilitate the commercialization of space applications and services for agriculture, disaster management, urban planning, navigation, and communication, among other sectors.
- private companies have a greater degree of autonomy in making decisions, which enables them to take up new projects.
- It helps to generate employment, enable modern technology absorption and make the sector self-reliant.

Challenges

- Space technology is expensive and needs heavy investment. This kind of lucrative power is available only with selected rich corporates, thus can lead to monopolization of the sector.
- Building and operating space technology and infrastructure require specialized technical expertise and resources.
- Protecting intellectual property rights (IPR) is crucial for incentivizing innovation and investment in the space sector.
- Indian private companies in the space sector have to face stiff competition from the established players such as SpaceX, Blue Origin etc in the international market.

Way Ahead

- Private entities are now actively involved in crucial aspects of research, manufacturing, and fabrication of rockets and satellites, fostering a vibrant ecosystem of innovation. It is expected to integrate Indian companies into global value chains.
- With this, companies will be able to set up their manufacturing facilities within the country duly encouraging 'Make In India (MII)' and 'Atmanirbhar Bharat' initiatives of the Government.

IceCube: the big, chill neutrino-spotter

Syllabus: GS3/Developments in Science and Technology

Context:

- Scientists reported recently that they have found instances in IceCube's data from 2011 to 2020 that matched the signature of tau type of neutrinos, with more than 99.999999% confidence.

About The IceCube:

- The IceCube neutrino observatory is a device at the earth's South Pole that detects subatomic particles called neutrinos.
- It was built and is maintained by the IceCube Collaboration, which consists of many universities worldwide led by the University of Wisconsin, Madison.
- IceCube consists of thousands of sensors buried more than 1.4 km beneath the ice plus multiple detectors above the surface.



Neutrinos

- Neutrinos are light particles that very rarely interact with matter. This is why they're called "ghost particles".
- Neutrinos come in different types: electron neutrino, Muon neutrino and Tau neutrino.
- By some estimates, a human-sized neutrino detector will have to wait for a century for a single neutrino to interact with a sensor. The larger the detector's collecting area, the higher the chances of spotting neutrinos.

How Icecube detects neutrinos?

- IceCube is the world's biggest 'neutrino telescope'; its sensors are distributed throughout a cubic kilometre of ice.
- When a neutrino interacts with the ice surrounding the sensors, it may produce some charged particles and some radiation.
- The sensors detect the radiation to infer the detection of a neutrino and use the radiation's properties to understand more about the particle.

Scalable Instructable Multiworld Agent (SIMA)

Syllabus: GS3/ Science and Technology

Context

- Google DeepMind revealed its latest AI gaming agent called SIMA or Scalable Instructable Multiworld Agent.

What is SIMA?

- SIMA is an AI Agent, which is different from AI models such as OpenAI's ChatGPT or Google Gemini.
- AI models are trained on a vast data set and are limited when it comes to working on their own. On the other hand, an AI Agent can process data and take action themselves.
- It is a super-smart computer programme that can be thought of as a digital explorer, having the ability to understand what a person wants and help create it in the virtual world.

Features

- It is capable of learning and adapting through the interactions it has with the user. This makes it better at understanding and fulfilling user requests.
- It can follow natural language instructions to perform tasks across video game environments.

India's Atmospheric Research Testbed

Syllabus: GS3/Science and Technology

Context

- The first phase of India's Atmospheric Research Testbed in Central India (ART-CI) was inaugurated in Sehore district, Madhya Pradesh.

About

- It is funded by the Ministry of Earth Sciences (MoES) and will house 25 high-end meteorological instruments.
- The Indian Institute of Tropical Meteorology (IITM), Pune, is in charge of the operations.
- It will study vital cloud processes associated with the monsoons over central India's Monsoon Core Zone (MCZ).

Atmospheric Research Testbed (ART)

- The ART is an open-field, focused observational and analytical research programme.
- Aim: To conduct ground-based observations of weather parameters like temperature, wind speeds, etc. and in-situ (on-site) observations of the transient synoptic systems – like low-pressure areas and depressions that form in the Bay of Bengal – during the southwest monsoon season from June to September.
- Application of the Study: Studying these systems will be used to generate high volumes of data over a long period.
- It will be compared with the existing weather models so that improvements can be made to obtain accurate rainfall predictions.
- The setup at ART will also be used for calibrating and validating various satellite-based observations, part of weather predictions and forecasting.
- First Phase: Under the first phase, remote sensing-based and in-situ measurements using 25 meteorological instruments have commenced.
- In the second phase, ART will deploy instruments such as a radar wind profiler and balloon-bound radiosonde, and soil moisture and temperature measuring equipment.

Why is ART Established in Madhya Pradesh?

- The ART has been established at Silkheda, a location that falls directly in line with the path of major rain-bearing synoptic systems. This will facilitate direct monitoring and tracking.
- The locality is pristine and free of anthropogenic and other pollutants, making it the best site in central India for setting up sensitive, high-end meteorological instruments and observatories for recording data.

Significance of Data about Monsoons over Central India

- Rainfall Forecasts: The India Meteorological Department (IMD) issues rainfall forecasts for the country's four homogeneous regions – north, west, east and south peninsular India.
- In addition, it issues a special rainfall forecast for the Monsoon Core Zone (MCZ), which is considered India's food bowl.
- However, there is still limited understanding about the role of these synoptic systems, their associated cloud physics, cloud properties and their overall role in enhancing the monsoon rainfall.
- Natural Laboratory: Central India, therefore, acts as a natural laboratory for scientists and meteorologists to perform a study of the Indian monsoons.

Hybrid Perovskites

Syllabus: GS3/ Science & Technology

In News

- A new study led by Bharat Ratna Professor C N R Rao highlights how the atoms within lead iodide perovskites shift and rearrange during changes in temperature and pressure.

About

- Hybrid perovskites: They are an exciting new class of semiconductor that combine the advantages of both organic (low cost, solution processable, flexible) and inorganic semiconductors (high performance, electrical conductivity).
- Lead iodide perovskites are a specific type of hybrid perovskite material with lead (Pb) and iodide (I) as key components.
- It has good optoelectrical properties which make them excellent solar cell materials. Their energy conversion efficiency can be higher than even that of commercial silicon-based solar cells.
- A major concern with lead iodide perovskites is their stability. Lead is a toxic element, and the materials can degrade over time, especially when exposed to moisture or heat.
- The lead iodide perovskites is used in solar cells, LEDs, X-ray shielding, and Energy Storage Systems.

Fast Breeder Reactor

Syllabus: GS3/Nuclear Energy

Context:

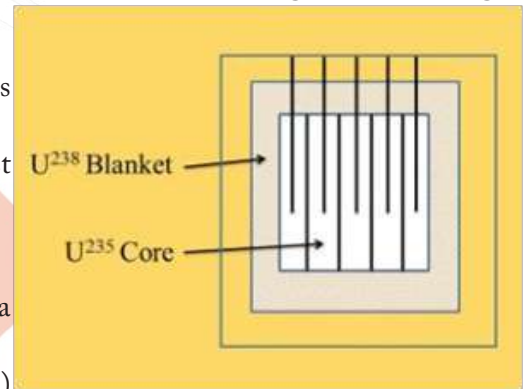
- Recently, India's first indigenous Fast Breeder Reactor at Kalpakkam in Tamil Nadu began 'core loading'.

About the Fast Breeder Reactor (FBR)

- It is a part of India's three-stage nuclear power program, which is designed to produce more nuclear fuel than it consumes.
- Its Prototype (PFBR) at Kalpakkam (500 MWe) is India's first indigenous FBR.

The Three-Stage Nuclear Program:

- It is designed by Homi J. Bhabha, which aims to allow India complete self-sufficiency in nuclear energy.
- First Stage: India used pressurised heavy water reactors (PHWRs) and natural Uranium-238 (U-238), which contains minuscule amounts of U-235, as the fissile material.



Core Loading:

- It is the **process in the FBR** that marks the **entry into the Second Stage** by loading nuclear fuel assemblies into the reactor core.
 - It aims to use the **Uranium-Plutonium Mixed Oxide (MOX)** fuel initially.
 - The **Uranium-238** and **Thorium-232** (*itself is not a fissile material*) 'blanket' surrounding the fuel core undergoes nuclear transmutation to produce more fuel.

- Second Stage: India aims to use Plutonium-239 (Pu-239) together with U-238 in the PFBR to produce energy, U-233, and more Pu-239.
- Third Stage: It aims to combine Pu-239 with Thorium-232 (Th-232) in reactors to produce energy and U-233.

Significance:

- It is an advanced third-generation reactor with inherent passive safety features ensuring a prompt and safe shutdown of the plant in the event of an emergency.
- Since it uses the spent fuel from the first stage, FBR offers a great advantage in terms of significant reduction in nuclear waste generated.

- It symbolises India's entry into the crucial second stage of the country's three-stage nuclear program.
- Once commissioned, India will only be the second country after Russia to have a commercial operating FBR.

Recent AI Projects

Syllabus: GS3/Science and Technology

Context

- South Korean company Hyodol launched AI dolls to combat loneliness for senior citizens.
- US-based startup launched Devin AI, an artificial intelligence software, which alters the way code is debugged, written and deployed.

Devin AI

- Devin AI is a first of its kind and has the ability of taking a simple command and turning it into a functioning website or software program.
- It can also manage the whole process of creating and releasing whole software applications which large language models (LLMs) like Google's Gemini or OpenAI's ChatGPT are unable to do.

Hyodol robot

- To beat loneliness, the company has come up with a robot doll that uses artificial intelligence (AI) to interact with elderly suffering from dementia.
- The doll can hold full conversations and it comes with a companion app and web monitoring platform for caretakers to monitor remotely.

Astronomical Grand Cycles

Syllabus: GS3/Science and Technology

Context:

- Recently, a study found geologic evidence that the earth is warming in a cycle that runs millions of years.

About Astronomical Grand Cycles:

- It refers to the long-term cycles of celestial bodies that have profound impacts on Earth's climate.
- These cycles, particularly the 2.4 Million-Year Cycle, are driven by the gravitational interactions between Earth and other planets, particularly Mars.
- The cycle is characterised by 'giant whirlpools or eddies' (periods of stronger or weaker deep-sea currents) that can reach the abyss (seafloor at the deepest parts of the ocean).
- During periods of stronger currents, these powerful eddies erode away at the large pieces of sediment that accumulate during calmer periods in the cycle.
- It is believed to influence Earth's climate, causing periods of global warming or cooling.

The Role of Mars:

- The 2.4 million-year cycle coincides with the timing of known gravitational interactions between Earth and Mars as the two planets orbit the sun.
- Mars' gravitational pull on Earth may cause our planet to be pulled slightly closer to the sun, resulting in more solar radiation and hence a warmer climate.
- It leads to periods of higher incoming solar radiation and warmer climates in cycles of 2.4 million years on Earth.



Impact on Earth's Climate:

- The increase in solar radiation during the peak of these cycles can lead to warmer oceans, which in turn leads to vigorous deep ocean circulation.
- It could potentially keep the ocean from becoming stagnant even if the Atlantic Meridional Overturning Circulation (AMOC), system of ocean currents, slows or stops functioning.

Thermonuclear Fusion

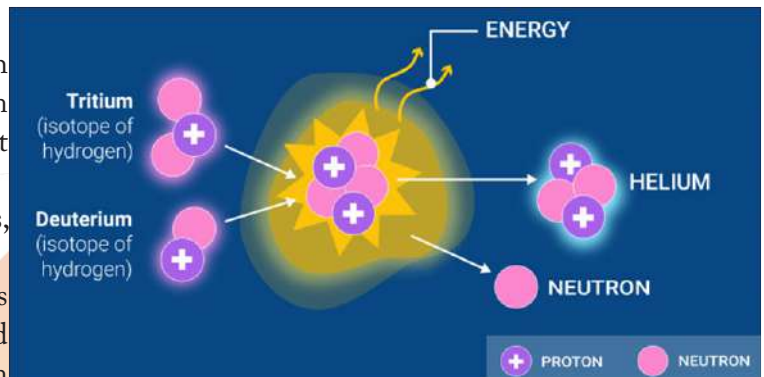
Syllabus: GS3/Science and Technology

Context

- India and Russia are in discussions to collaborate on a range of activities including research on controlled thermonuclear fusion.

Thermonuclear fusion

- Thermonuclear fusion is a process in which two light atomic nuclei combine to form a heavier nucleus, releasing a significant amount of energy in the process.
- This process is the same as what powers stars, including our sun.
- The most common fusion reaction involves the isotopes of hydrogen: deuterium and tritium. When these isotopes fuse, they form helium and release a neutron, along with a large amount of energy.



Challenges

- Thermonuclear fusion requires extremely high temperatures and pressures to occur, typically in the range of millions of degrees Celsius, which is necessary to overcome the electrostatic repulsion between nuclei.
- Sustaining the Reaction: Once the reaction starts, it needs to be self-sustaining (referred to as a burning plasma).
- The fusion reactions currently being run in labs last for barely a few seconds. It is difficult to sustain such extreme high temperatures for prolonged periods.

Recent Development

- Some of the leading fusion research projects include tokamaks, such as ITER (International Thermonuclear Experimental Reactor), and stellarators, as well as alternative concepts like inertial confinement fusion and magnetic confinement fusion.

Samudrayaan Mission

Syllabus: GS3/Developments in Science and Technology

Context

- The minister of Earth Sciences confirmed that the Samudrayaan mission is scheduled to explore the bed of the ocean by 2025 end.
- India is on a path to send its scientists to study the deep ocean 6 km under the sea surface under the mission.

India's Deep Ocean Mission (DOM)

- DOM is implemented by the Ministry Of Earth Sciences (MoES) and was approved in 2021 at a cost of nearly Rs 4,077 crore over a five-year period in a phased manner.

Samudrayaan Mission

- As a part of DOM, India's flagship deep ocean mission, 'Samudrayaan', was initiated in 2021 by the Ministry of Earth Sciences.

- With 'Samudrayaan', India is embarking on a crewed expedition to reach a depth of 6,000 m to the ocean bed in the central Indian Ocean.
- This journey will be accomplished by Matsya6000, a deep-ocean submersible.



Matsya6000

- The Matsya6000 is India's flagship deep-ocean human submersible that aims to reach the ocean bed at a depth of 6,000 m.
- Accompanied by three crew members, called "aquanauts", the submersible carries a suite of scientific tools and equipment designed to facilitate observations, sample collection, basic video and audio recording, and experimentation.
- The submersible will be equipped with a suite of scientific sensors and tools, and have an operational endurance of 12 hours, which is expandable up to 96 hours in the event of an emergency.
- Constructed from a titanium alloy, the sphere is engineered to withstand pressures of up to 6,000 bar.
- It can move at a speed of about 5.5 km/hr using underwater thrusters.

Significance

- So far, countries such as the U.S., Russia, China, France and Japan have carried out successful deep-ocean crewed missions. India is poised to join the ranks of these nations by demonstrating expertise of and capability for such missions.
- The 'New India 2030' document outlines the blue economy as the sixth core objective for India's growth. The years 2021-2030 have been designated by the United Nations as the 'Decade of Ocean Science'.
- DOM is one of nine missions under the Prime Minister's Science, Technology, and Innovation Advisory Council (PMSTIAC).
- The mission is significant for the sustainable extraction of valuable resources, including polymetallic nodules and polymetallic sulfides.

India-led Group of Friends (GOF)

Syllabus: GS2/Global Grouping Affecting India's Interest

Context:

- Recently, the India-led Group of Friends (GOF) deliberated on strategies to strengthen legal frameworks against perpetrators of malicious acts targeting Peacekeepers, focusing on supporting measures for ensuring accountability.

About the India-led Group of Friends (GOF):

- It is a significant initiative launched in 2022 by India during its presidency of the UN Security Council (UNSC).
- It represents the 'political will' of member states, particularly of the troop and police contributing countries, to champion the implementation of the provisions of UNSC Resolution 2589.
- It comprises 40 member states, and India, Bangladesh, Egypt, France, Morocco, and Nepal serve as co-chairs of the GOF.

Objectives and Functions:

- It aims to promote accountability for all acts of violence against United Nations (UN) peacekeepers and provide capacity building and technical assistance to the host state authorities.
- It serves as an informal platform at the UN to exchange information, share best practices, and mobilise resources directed at facilitating accountability for crimes committed against peacekeepers.
- It monitors progress on bringing accountability for crimes against peacekeepers.
- It convenes two meetings of its members per year and organises one event per year involving Permanent Missions and other stakeholders to take the plan forward, thereby ensuring greater safety and security for peacekeepers.

India's Role in UN Peacekeeping: India has been one of the largest contributors to UN peacekeeping operations. Since its first commitment in Korea in 1950, Indian troops have supervised complex, unmanageable peace operations, earning universal admiration for their professional excellence. More than 250,000 Indian troops have served in 49 of the 71 UN peacekeeping operations so far. At present, India is currently the second-largest troop contributor with 5,506 personnel deployed in nine UN peacekeeping missions.

IMT TRILAT 24 EXERCISE

Syllabus: GS3/Defence

Context

- The second edition of IMT TRILAT 24 Exercise was concluded at Nacala, Mozambique.

About

- It is a joint trilateral maritime exercise between India, Mozambique and Tanzania.
- The first edition of the exercise was conducted in 2022.
- The joint operation was conducted in line with the vision of SAGAR (Security & Growth for All in the Region) off the southeast African coast.

Mohiniyattam

Syllabus :GS 1/Art and Culture

In News

- Kalamandalam university allowed boys in Mohiniyattam, breaking gender norms.

About Mohiniyattam

- It is one of the famous classical dances of India that developed and remained popular in the state of Kerala.
- Mohiniyattam dance gets its name from the word 'Mohini' – a historical enchantress avatar of the Hindu god Vishnu, who helps the good prevail over evil by developing her feminine powers.
- Mohiniyattam's roots, like all classical Indian dances, are in the Natya Shastra – the ancient Hindu Sanskrit text on performance arts.
- However, it follows the Lasya style described in Natya Shastra which is delicate, eros-filled and feminine.
- It is traditionally a solo dance performed by women after extensive training.
- The repertoire of Mohiniyattam includes music in the Carnatic style, singing and acting a play through the dance, where the recitation may be either by a separate vocalist or the dancer herself.

Lokpal of India

Syllabus :GS 2/Polity and Governance

In News

Justice Ritu Raj Awasthi sworn in as judicial member, Lokpal.

About Lokpal of India

- The Lokpal is the first institution of its kind in independent India, established under the Lokpal and Lokayuktas Act 2013 to inquire and investigate allegations of corruption against public functionaries who fall within the scope and ambit of the above Act.
- Organizational Structure: The Lokpal consists of a Chairperson and eight Members out of whom 50% are Judicial Members.
- The Chairperson and the Members are appointed by the President of India by warrant under his hand and seal and hold office for a term of five years from the date on which they enter upon the office or until they attain the age of 70 years, whichever is earlier.
- The salary, allowances and other conditions of services of the Chairperson are the same as that of Chief Justice of India. The salary, allowances and other conditions of services of the Members are the same as that of a Judge of the Supreme Court.
- Jurisdiction And Functions Of Lokpal : The Lokpal has jurisdiction to inquire into allegations of corruption against anyone who is or has been Prime Minister, or a Minister in the Union government, or a Member of Parliament, as well as officials of the Union Government under Groups A, B, C and D.
- Also covered are chairpersons, members, officers and directors of any board, corporation, society, trust or autonomous body either established by an Act of Parliament or wholly or partly funded by the Union or State government.
- It also covers any society or trust or body that receives foreign contribution above 10 lakh (approx. US\$ 14,300/- as of 2019).
- A complaint under the Lokpal Act should be in the prescribed form and must pertain to an offence under the Prevention of Corruption Act, 1988 against a public servant.
- The Lokpal is vested with the power of search and seizure and also powers under the Civil Procedure Code for the purpose of conducting preliminary inquiry & investigation and power of attachment of assets and taking other steps for eradication of corruption.
- Lokpal will have power of superintendence and direction over any central investigation agency including CBI for cases referred to them by the Lokpal.

Do you know ?

- India is a signatory to the United Nations Convention against Corruption.
- The commitment of the Government to provide clean and responsive governance is reflected in passing of the legislation and creation of the body of Lokpal, to contain and punish acts of corruption.

Inter-Ministerial Joint Workshop on Blue Economy

Syllabus: GS3/Economy

Context

- The Ministry of Earth Sciences hosted the Inter-Ministerial Joint Workshop on Blue Economy.

About

- MoES has engaged with the World Bank as a knowledge partner to undertake a technical study and prepare a report titled 'India's Blue Economy: Pathways for resource-efficient, inclusive and resilient growth in India'.
- The report is expected to cover the areas related to global best practices in Blue Economy implementation, ocean accounting framework, institutional strengthening and innovative finance mechanisms towards implementing the Blue Economy Policy framework.

What is the Blue Economy?

- It is referred as the sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of the ocean ecosystem.

India's Blue Economy

- India has a 7,517 km long coastline and Exclusive Economic Zone (EEZ) of over two million square km is rich in living and non-living resources.
- India's blue economy accounts for roughly 4% of the GDP and is estimated to increase once the mechanism is improved.
- The coastal economy also sustains over 4 million fisherfolk and other coastal communities.
- Four primary industries in India can fuel its blue economy; fishing, aquaculture, ports, and shipping.



India's Maritime Zone

– India's maritime zone refers to the maritime boundaries and areas under its jurisdiction in the surrounding seas and oceans.

– India has a coastline of 7,517 Km including island territories.

– Territorial Waters (12 Nautical Miles): The territorial waters of India extend up to 12 nautical miles from the baseline.

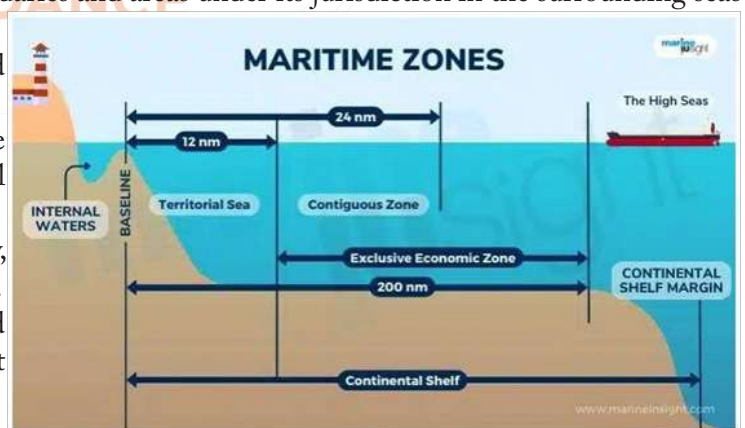
A. Within this zone, India exercises full sovereignty, and it includes the country's coastal areas and ports.

– Contiguous Zone (24 Nautical Miles): Beyond the territorial waters, there is a contiguous zone that extends an additional 12 nautical miles.

A. In this zone, India can take action to prevent or punish infringements on customs, fiscal, immigration, or sanitary laws within its territory or territorial sea.

– Exclusive Economic Zone (EEZ): The EEZ extends up to 200 nautical miles from the baseline.

A. Within this zone, India has the exclusive rights for exploring, exploiting, conserving, and managing natural resources, such as fisheries and hydrocarbons.



Significance of the Blue Economy

- Economic Growth**: The Blue Economy presents significant opportunities for economic growth through sectors such as fisheries, aquaculture, tourism, maritime transport, renewable energy, and biotechnology.

- **Resource Utilization:** It promotes the sustainable utilization of marine resources, including fish stocks, minerals, and energy sources, ensuring their availability for current and future generations.
- **Renewable Energy:** The Blue Economy encourages the development of renewable energy sources such as offshore wind, wave, and tidal energy, reducing dependence on fossil fuels and mitigating climate change.
- **Tourism:** Coastal and marine tourism is a key component of the Blue Economy, generating revenue, employment, and supporting local economies in coastal regions.
- **Climate Change Mitigation:** Healthy oceans play a crucial role in regulating the Earth's climate.
- The Blue Economy promotes conservation efforts and sustainable practices that help mitigate the impacts of climate change, such as preserving coastal ecosystems and reducing carbon emissions.
- **Biodiversity Conservation:** By promoting sustainable practices and responsible management of marine resources, the Blue Economy contributes to the conservation of marine biodiversity and the protection of endangered species and habitats.

Challenges

- **Pollution and environmental degradation:** India's coastal areas face significant pollution from various sources, including industrial discharge, untreated sewage, agricultural runoff, and plastic waste.
- Pollution harms marine ecosystems, affects biodiversity, and undermines the sustainability of fisheries and other marine industries.
- **Overexploitation of marine resources:** Illegal, unreported, and unregulated (IUU) fishing exacerbates the problem, leading to depletion of fish stocks and loss of livelihoods for coastal communities.
- **Climate change impacts:** Rising sea levels, ocean acidification, and changes in ocean temperature and currents due to climate change affect fisheries, aquaculture, coastal infrastructure, and biodiversity.
- **Maritime security challenges:** India's maritime security is threatened by various factors, including piracy, illegal trafficking, maritime terrorism, and territorial disputes.
- **Limited institutional capacity and infrastructure:** Developing and managing the blue economy requires robust institutional frameworks, governance mechanisms, and infrastructure.
- However, India faces challenges related to capacity constraints, inadequate funding, bureaucratic inefficiencies, and regulatory gaps, hindering effective management and sustainable development of marine resources.

Steps Taken by Government of India to Promote Blue Economy

- **National Policy Framework:** Government has formulated a National Policy Framework for the Blue Economy, which provides a strategic roadmap for sustainable development and management of marine resources.
- The framework aims to integrate various sectors such as fisheries, aquaculture, shipping, tourism, and renewable energy to promote holistic growth.
- **Sagarmala Programme:** The Sagarmala Programme is a flagship initiative aimed at modernizing India's ports, enhancing port connectivity, and promoting port-led development.
- It focuses on optimizing logistics efficiency, promoting coastal shipping, and developing coastal economic zones to stimulate economic growth and create employment opportunities.
- **National Marine Fisheries Action Plan (NMFAP):** The plan includes measures to improve fishery resources assessment, enhance infrastructure and technology in the fisheries sector, and promote aquaculture development.
- **Blue Economy Cell:** The Ministry of Earth Sciences has established a dedicated Blue Economy Cell to coordinate research, policy formulation, and implementation of Blue Economy initiatives.
- **Integrated Coastal Zone Management (ICZM):** The government has implemented the Integrated Coastal Zone Management Program to promote sustainable development and conservation of coastal ecosystems.
- **Marine Spatial Planning (MSP):** India has initiated efforts to develop Marine Spatial Planning frameworks to ensure efficient and sustainable use of marine space.

Way Ahead

- The Blue Economy in India is poised for significant growth in the next few years.
- The Blue Economy Mission undertaken by the government can lead to the sector becoming the next economic multiplier, depending on the execution of the policies that have been decided.

- The sector is the sixth dimension of the government's 'Vision of New India by 2030'; with the Blue Economy policies aiming for long-term economic advantages in order to achieve the greater goals of growth, job creation, equity, and environmental protection.

Digital Innovation Board of ITU

Syllabus: GS2/International Organisation

Context

- Recently, India was elected as co-chair of Digital Innovation Board of International Telecommunication Union (ITU).

About the Digital Innovation Board

- It is a part of the Innovation and Entrepreneurship Alliance for Digital Development, an initiative by the International Telecommunication Union (ITU).
- It comprises Ministers and Vice-Ministers of Telecom/ICT from 23 member countries of ITU spanning Asia, Europe, Africa, North and South America.
- It primarily focuses on fostering innovation and entrepreneurship in digital development for a more inclusive digital future.
- It provides strategic guidance, expertise and advocacy regarding its mission of building critical local enablers and fostering innovation and entrepreneurship in digital development, to create a more inclusive and equitable digital future for all.

International Telecommunication Union (ITU)

- It is a specialised agency of the United Nations responsible for issues related to information and communication technologies.
- It has started Innovation and Entrepreneurship Alliance for Digital Development to respond to significant unmet needs of ITU Membership in the area of innovation, as articulated in the Kigali Action Plan adopted at the World Telecommunication Development Conference 2022 and the Outcomes of the ITU Plenipotentiary Conference 2022.
- The Alliance has three main vehicles:
 1. Digital Transformation Lab
 2. Network of Acceleration Centres
 3. Digital Innovation Board

Shanghai Cooperation Organisation Startup Forum

Syllabus: GS2/ International, GS3/Economy

Context

- The fourth edition of the Shanghai Cooperation Organisation (SCO) Startup Forum was organized in New Delhi.

About

- The initiative focused on broadening startup interactions among the SCO Member States.
- It will provide value to startups through mentoring and enabling access to investor and corporate engagement activities.

Shanghai Cooperation Organisation (SCO)

- The SCO is an intergovernmental organization founded in 2001 with six members.
- Objective: To enhance regional cooperation for efforts to curb terrorism, separatism, and extremism in the Central Asian region.
- Members: China, Russia, India, Pakistan, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, and Iran.
- Secretariat: Beijing
- Official languages: Russian and Chinese.
- Observer status: Afghanistan, Belarus and Mongolia.
- The SCO has been an observer in the UN General Assembly since 2005.

Digital Criminal Case Management System (CCMS) Platform

Syllabus: GS2/e-governance; GS3/Security

Context

- Recently, the Union Home Minister virtually launched the unique CCMS Platform of the National Investigation Agency (NIA), and a mobile app ‘Sankalan’ – A compendium of New Criminal Laws by NCRB.

About the Digital CCMS Platform

- It is a user-friendly, easy-to-deploy, customizable and browser-based software, designed to improve coordination and justice delivery in NIA’s operations.

‘Sankalan’ App:

- It has been designed for navigating through **new criminal laws** as a **bridge between old and new criminal laws**.
- It is designed to **work as a comprehensive guide** for all stakeholders.

- It aims to enable NIA personnel to better coordinate in terrorism and organised crime cases, thereby improving justice delivery.

Significance

- It is designed to help the State Police forces in their investigations and prosecution.
- This system aims to help the State forces organise, integrate, and digitalize the data generated during investigations, such as case documents, extracted data, collected evidence, and the charge sheets presented to the court.

National Action Plan for Prevention and Control of Snakebite Envenoming (NAP-SE)

Syllabus: GS2/Health

Context

- The Union Health Ministry launched a National Action Plan for Prevention and Control of Snakebite Envenoming (NAP-SE) in India.

Snakebite Envenoming

- The snakebite envenoming (poisoning from snake bites) was classified by the World Health Organisation (WHO) as a high-priority neglected tropical disease.
- An estimated 1.8 – 2.7 million people worldwide are envenomed annually.

Snake Bites in India

- In India, around 90% of snake bites are caused by the ‘big four’ among the crawlers – common krait, Indian cobra, Russell’s viper and saw scaled viper.
- In India, around 50,000 deaths occur of an estimated 3-4 million snake bites annually which accounts for half of all snakebite deaths globally.
- India accounts for almost 50% of global snakebite deaths.

About NAPSE

- Vision: “To prevent and control snakebite envenoming in order to halve the numbers of deaths and cases of disability that it causes by 2030”
- It aims at systematic reduction of snakebite envenoming risk through sustained availability of anti-snake venom, capacity building, referral mechanism and public education.

- NAPSE provides a broad framework for states to develop their own action plan for management, prevention and control of snakebites through the 'One Health' approach.

One Health Approach

- One Health is an approach that recognizes that the health of people is closely connected to the health of animals and our shared environment.
- It brings different sectors together to solve the health, productivity, and conservation challenges.-

Strategy for Developing Anti-venom

- Antivenoms: Antivenoms are purified antibodies against venoms or venom components. Antivenoms are produced from antibodies made by animals to injected venoms. Antivenom is the only definitive treatment for effective bites by venomous snakes.
- They are included in the WHO Essential Medicines List.
- Antivenoms making process: To make life-saving antivenoms, scientists enlist the help of horses that live on specialized ranches.
- The animals are injected with a tiny, harmless dose of venom, which causes their immune systems to produce antibody proteins that attack and disable the venom toxins.
- Then the antibodies are collected and used to treat people who have been bitten or stung.

Exercise "LAMITIYE-2024"

Syllabus :GS 3/Defense

In News

- Indian Army contingent departed for Seychelles to participate in the Tenth edition of Joint Military Exercise "LAMITIYE-2024"

About Exercise

- It is a Joint Exercise Between the Indian Army and Seychelles Defence Forces (SDF).
- 'LAMITIYE' meaning 'Friendship' in the Creole language is a biennial training event and has been conducted in Seychelles since 2001.
- Features : The 10 days long Joint Exercise will include Field Training Exercise, combat discussions, lectures & demonstrations, which culminates with two days of Validation Exercise.
- Objectives : To enhance interoperability in Sub-conventional Operations in Semi-Urban environments under Chapter VII of the United Nations Charter on Peacekeeping Operations.
- The exercise will also build and promote bilateral military relations in addition to exchanging skills, experiences and good practices between both armies

Foundational Literacy and Numeracy Assessment Test (FLNAT)

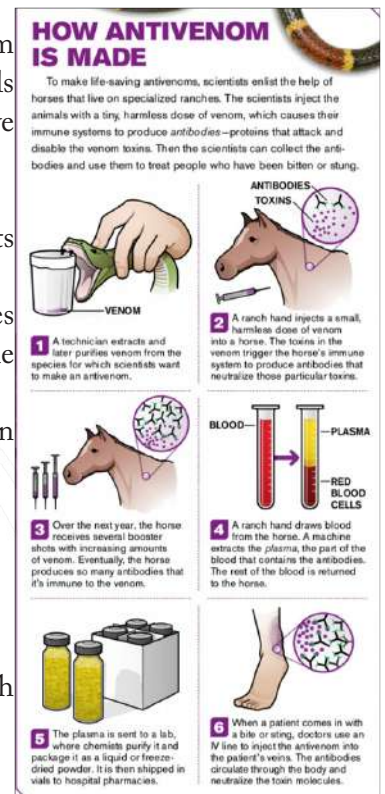
Syllabus: GS2/ Education

In News

- The Department of School Education and Literacy (DoSEL), Ministry of Education recently conducted the Foundational Literacy and Numeracy Assessment Test (FLNAT), under the ULLAS – Nav Bharat Saaksharta Karyakram Initiative.

About FLNAT

- FLNAT is a nationwide assessment test conducted as part of the ULLAS initiative.
- It aims to evaluate the foundational literacy and numeracy skills of registered non-literate learners aged 15 and above.
- The assessment comprises three subjects – Reading, Writing, and Numeracy – each carrying 50 marks, totalling 150 marks. This test is developed to evaluate the foundational literacy and numeracy skills of registered non-literate learners.



ULLAS (Understanding Lifelong Learning for All in Society) Initiative

- It aims to bridge the gap in basic literacy and critical life skills among citizens aged 15 and above.
- The program targets individuals who may have missed formal education opportunities. It equips them with basic literacy skills like reading, writing, and numeracy.
- ULLAS goes beyond basic literacy by imparting essential life skills like digital literacy, financial literacy, and legal awareness. This empowers individuals to navigate the complexities of modern life.

Inter-Governmental Framework Agreement

Syllabus: GS2/International Relations

Context

- The Union Cabinet gave its Ex-post facto approval to the Inter-Governmental Framework Agreement (IGFA).

About

- It was signed in February, 2024 during the High Level visit between India and the United Arab Emirates on Cooperation for the empowerment and operation of the India-Middle East Europe Economic Corridor (IMEC).
- Aim: To enhance the bilateral relations and to further strengthen the relations between the two countries in the Ports, Maritime and Logistics sectors.
- The cooperation will be based on a set of mutually agreed upon principles, guidelines and agreements consistent with the relevant rules and regulations of the countries' jurisdiction.

What is IMEC?

- Members: On the sidelines of the G20 Leaders' Summit, Leaders of India, European Union, France, Germany, Italy, Saudi Arabia, UAE and US announced the India-Middle East-Europe Economic Corridor (IMEC).
- Aim: Integration of Asia, Europe and the Middle East.
- The IMEC will comprise of two separate corridors:
 - The east corridor connecting India to the West Asia/Middle East and
 - The northern corridor connecting West Asia/Middle East to Europe.
- Connectivity: The corridor will provide reliable and cost-effective cross-border ship to rail transit networks to supplement existing maritime routes.



Significance

- Economic Development: By linking Asia, West Asia, the Middle East and Europe through enhanced connectivity and economic integration, the corridor aims to give a boost to economic development in the regions.
- Connectivity: The corridor will include a rail line, which, upon completion, will provide a reliable and cost-effective cross-border ship-to-rail transit network.
- The rail line will supplement the existing multi-modal transport routes enhancing trans-shipment of goods and services from South East Asia through India to West Asia/Middle East and Europe.
- Eco-friendly Infrastructure: It places emphasis on developing environmentally friendly infrastructure.
- Transformative Integration: It intends to increase efficiency, reduce costs, secure regional supply chains, increase trade accessibility, enhance economic cooperation, generate jobs and lower greenhouse gas emission, resulting in a transformative integration of Asia, Europe and the Middle East (West Asia).

MoU between India and Bhutan

Syllabus: GS2/India and its Neighbourhood Relations

Context

- The Union Cabinet recently gave its approval for the signing of Memorandum of Understanding between the Government of India and the Royal Government of Bhutan.

About

- The MoU signed between the two countries is on General Supply of Petroleum, Oil, Lubricants (POL) and related products from India to Bhutan.
- It aims to benefit India and its citizens with improved economic and commercial linkages with Bhutan irrespective of any gender, class or income bias, particularly in the area of hydrocarbon sector.

Expected Benefits of MoU

- The Memorandum of Understanding will promote bilateral trade in the hydrocarbon sector and will ensure secured and long term supply of petroleum products to Bhutan.
- Since, exports play a crucial role in realizing Aatmanirbhar Bharat. The MoU will give thrust towards self-reliant India.
- The MoU will be a strategic fit as Energy Bridge in India's Neighborhood First Policy.

India-Bhutan Relations: An Overview

- Diplomatic relations between India and Bhutan were established in 1968 with the establishment of a special office of India in Thimphu.
- Before this our relations with Bhutan were looked after by our Political Officer in Sikkim.
- The basic framework of India- Bhutan bilateral relations was the Treaty of Friendship and Cooperation signed in 1949 between the two countries, which was revised in February 2007.
- The India-Bhutan Friendship Treaty not only reflects the contemporary nature of our relationship but also lays the foundation for their future development in the 21st century.

Major Areas of Cooperation

Hydropower Cooperation

- Hydropower projects in Bhutan are an example of win-win cooperation, providing a reliable source of inexpensive and clean electricity to India, generating export revenue for Bhutan and cementing our economic integration.
- The ongoing cooperation between India and Bhutan in the Hydropower sector is covered under the 2006 Agreement on Cooperation in Hydropower and the Protocol to the 2006 agreement signed in March, 2009.
- So far, the Government of India has constructed three Hydroelectric Projects (HEPs) in Bhutan totaling 1416 MW (336 MW Chukha HEP, 60 MW Kurichhu HEP and 1020 MW Tala HEP), which are operational and exporting surplus power to India.
- About three-fourth of the power generated is exported and the rest is used for domestic consumption.

Bilateral Trade

- The India-Bhutan Agreement on Trade, Commerce and Transit – which was first signed in 1972 and revised most recently for the fifth time in 2016 – establishes a free trade regime between the two countries.
- India is Bhutan's largest trading partner. Since 2014, India's merchandise trade with Bhutan has almost tripled from USD 484 million in 2014-15 to USD 1422 million in 2021-22, accounting for about 80% of Bhutan's overall trade, with the balance of trade in India's favour.
- In 2021-22, India's bilateral trade with Bhutan was USD 1422 million, of which India's exports to Bhutan amounted to USD 877 million and India's imports from Bhutan were USD 545 million.

Border Management

- There is a Secretary-level mechanism on border management and security related matters. There is also a Border District Coordination Meeting Mechanism between the bordering States and the Royal Government of Bhutan to facilitate coordination on border management and other related matters.

Water Resource Management

- There is a Joint Group of Experts (JGE) on flood management between India and Bhutan to discuss/ assess the probable causes and effects of the recurring floods and erosion in the southern foothills of Bhutan and adjoining plains in India and to recommend appropriate measures to both Governments.

Educational and Cultural Cooperation

- A large number of college going Bhutanese students are studying in India. It is estimated that approximately 4000 Bhutanese are studying in Under Graduate courses in Indian Universities on a self-financing basis.

ITEC Training Programme Scheme

- Every year GoI provides 300 training slots under ITEC programme and a further 60 slots under TCS Colombo Plan in various fields to Bhutanese for upgrading their administrative and technical skills.

Challenges

- **China's Growing Influence:** China's increasing presence near the disputed India-Bhutan-China border and its growing economic ties with Bhutan raise concerns for India's strategic interests.
- **Delay in Projects:** Delays and disagreements regarding revenue sharing from India-Bhutan hydropower projects can create tension.
- **Trade Dependence:** Bhutan's heavy reliance on India for trade makes it vulnerable to economic fluctuations in India.
- **Hydropower Projects and Environmental Risks:** Bhutan has concerns about environmental and social impacts from hydropower projects.
- **Motor Vehicle Agreement:** India's plans for a Motor Vehicle Agreement within the Bangladesh-Bhutan-India-Nepal grouping have faced delays.
- **Power Purchasing Policy:** India's sudden change in its power purchasing policy, rigid rates, and refusal to allow Bhutan to join the national power grid and trade with third countries like Bangladesh has strained relations.

Measures Needed

Strengthening Economic Cooperation: India can invest in infrastructure development, tourism, and other sectors to diversify Bhutan's economy and reduce its dependence.

- **Enhanced Connectivity:** Improved road, rail, and air links will boost trade, tourism, and people-to-people exchanges.
- **Cultural and Educational Exchange:** Programs fostering cultural understanding and educational opportunities can strengthen the bond between the two nations.
- **Strategic Dialogue:** Regular high-level talks on security and border issues can address concerns and maintain transparency.
- **Addressing Bhutan's Concerns:** India must address Bhutan's anxieties regarding China's influence through sensitive diplomacy and economic cooperation.
- **Multilateral Cooperation:** Collaboration on regional projects like hydropower and infrastructure development can be pursued through organizations like BIMSTEC (Bay of Bengal Initiative for Multi-Sectoral Technical Cooperation).

Way Forward

- Maintaining a strong and mutually beneficial relationship with Bhutan is crucial for India's strategic interests in the region.
- By addressing challenges and implementing the measures required, India and Bhutan can ensure a prosperous and secure future for both nations.

Model Code of Conduct (MCC)

Syllabus: GS2/ Polity

News

- The Election Commission of India has announced the dates for the upcoming Lok Sabha Election and it has officially put in place the model code of conduct (MCC).

What is the Model Code of Conduct (MCC)?

- It was first introduced in the 1960 Assembly elections in Kerala. In 1991, T.N. Seshan first codified the MCC.
- It is a set of guidelines issued by the Election Commission to regulate the campaigning of political parties and candidates during elections.
- Its main aim is to conduct free and fair elections by preventing any activities that could influence voters or disrupt the poll process.

Is MCC legally binding?

- The MCC is not enforceable by law.
- However, certain provisions of the MCC may be enforced through invoking corresponding provisions in other statutes such as the Indian Penal Code, 1860, Code of Criminal Procedure, 1973, and Representation of the People Act, 1951.

Digitalisation of Agriculture in India

Syllabus: GS3/Indian Economy, Agriculture

Context

- The Union Government has inaugurated the Agriculture Integrated Command and Control Center.

About

- Aim: To empower the farmers by equipping them with information, services and facilities using digital technology.
- Multifunctional Centre: At the Command Centre, it will be possible to see all the digital innovations being made in the agriculture sector by the Ministry of Agriculture and Farmers' Welfare on a big screen simultaneously at one place.

Digital Infrastructure in Agriculture

- The digitalisation of agriculture describes integrating cutting-edge digital technology into the farm production system, including artificial intelligence (AI), robotics, uncrewed aviation systems, sensors, and communication networks.
- These innovations will increase returns, and enhance the efficacy of irrigation and other inputs.

Role of Digital Public Infrastructure for Agriculture in India

- Assess Soil Health: Technological interventions based on soil sensors, remote sensing unmanned aerial surveying and market insights, etc., will permit farmers to assess crop and soil health conditions at different levels of production.
- Improvement in Crop Yield: The role of technology in digital public infrastructure may take the help of Artificial Intelligence/Machine Learning (AI/ML) algorithms.
- It can help in generating real-time actionable insights for improving crop yield, controlling pests, assisting in soil screening, providing actionable data for farmers, and reducing their workload.
- Use of Blockchain Technology: It will be offering tamper-proof and precise data about farms, inventories, quick and secure transactions, and food tracking.

Benefits of Digital Agriculture

- Increasing agriculture productivity and lowering production cost,
- Inhibits soil degradation,
- Lessening of chemical application in crop production,
- Promoting effective and efficient use of water resources,
- Uplifting socio-economic statuses of farmers,
- Reducing environmental and ecological impacts,
- Augmenting worker safety.

Challenges in Implementation of Digital Agriculture in India

- **Limited Digital Infrastructure:** Rural areas often lack robust digital infrastructure such as internet connectivity and electricity, hindering the adoption of digital technologies by farmers.
- **Digital Divide:** There's a significant digital divide between urban and rural areas in India.
- **Cost of Technology:** Many digital agriculture solutions require huge investments which is unaffordable for smallholder farmers with limited resources.
- **Fragmented Agriculture Sector:** India's agriculture sector is fragmented, with a large number of smallholder farmers and diverse crops grown across different regions.
- **Developing digital solutions that cater to this diversity is challenging.**
- **Capacity Building:** Training farmers to effectively use digital tools and interpret the data generated is a major challenge.

Suggestions

- **Portable Hardware:** Agricultural land leasing is broadly prevalent under several farming arrangements, thus a farmer farming on a specific plot of land may move to another farm plot next season.
- **Renting and sharing platforms for agriculture equipment and machinery:** Owing to both small farm plots and constrained financial resources, the opportunity exists for digital platforms that are offering equipment renting and sharing services rather than outright purchases.
- **Academic support:** Training facilities offered by various academic institutes and agricultural organizations will be improving digital adoption among farmers.

Government Initiatives

- **India Digital Ecosystem of Agriculture (IDEA):** It is a framework designed to lay down the architecture for a federated farmers' database, facilitating innovative agri-focused solutions using emerging technologies to enhance the agricultural ecosystem.
- **National e-Governance Plan in Agriculture (NeGP-A):** Funds are allocated to states/UTs for projects involving modern technologies such as Artificial Intelligence (AI), Machine Learning (ML), Robotics, Drones, Data Analytics, and Blockchain in agriculture.
- **National Agriculture Market (e-NAM):** A pan-India electronic trading portal connecting Agricultural Produce Market Committee (APMC) mandis to create a unified national market for agricultural commodities, providing digital services to traders, farmers, and mandis.
- **PM KISAN Scheme:** Direct transfer of funds to eligible farmers' bank accounts under Direct Benefit Transfer mode, with self-registration available through the Farmers Corner in the portal and a dedicated mobile app for broader access.
- **Integrated Scheme for Agricultural Marketing (AGMARKNET):** Supports the creation of agricultural marketing infrastructure by providing backend subsidy support and offers services through the AGMARKNET portal for stakeholders including farmers, industry, and policymakers.
- **Mobile Apps by ICAR:** More than 100 mobile apps developed by ICAR, State Agricultural Universities, and Krishi Vigyan Kendras offering valuable information to farmers on crops, horticulture, veterinary, dairy, poultry, fisheries, and natural resources management.

Conclusion

- Modernising the agriculture sector by adding cutting-edge technologies can benefit farmers' incomes as well as the nation's food and nutrition security while also being environment- friendly.
- The agricultural sector is ready to be taken over by science and technology to boost output and efficiency so that more people can be fed while growing more food on less land, however, this transition has to be inclusive.

Human Development Report 2023- 24

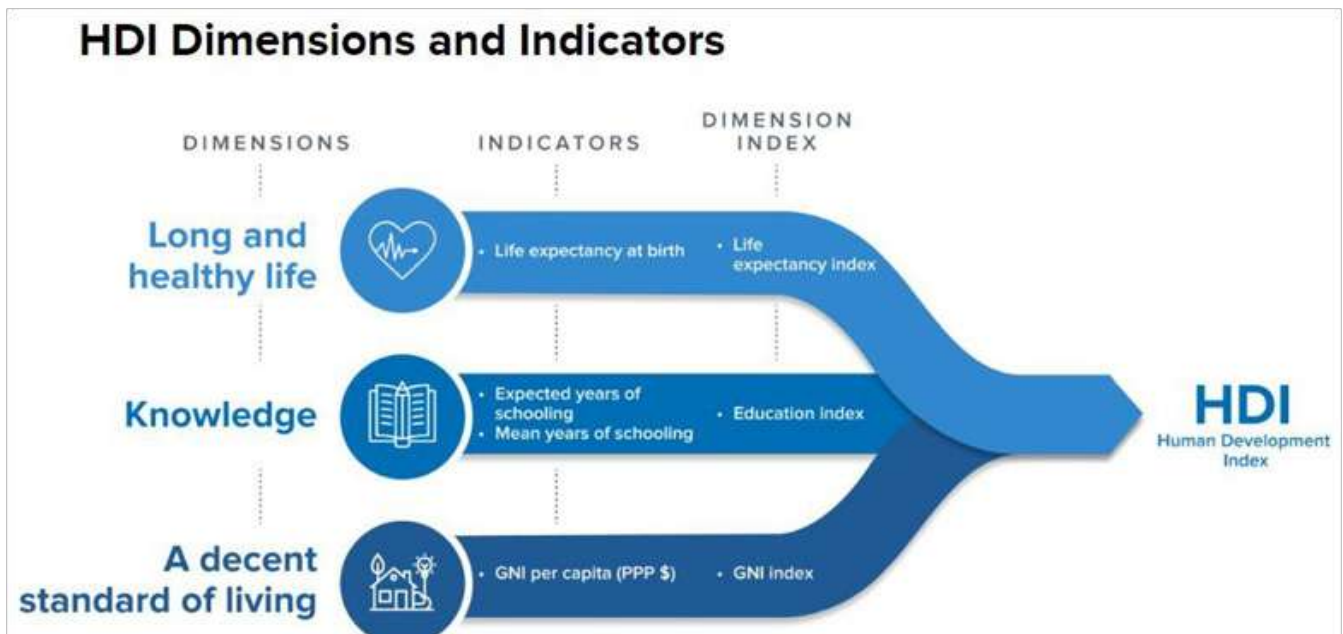
Syllabus: GS3/Economy

Context

- The United Nations Development Programme has released the Human Development Report 2023-24.

About Human Development Index (HDI)

- The HDI is a composite index computed based on three parameters – life expectancy, education, and gross national income (GNI) per capita.



Major Findings

- Rise in Global Inequalities: After 20 years of convergence, the gap between the richest and poorest countries has started to widen from 2020.
- Rich countries are experiencing record levels of human development, while half of the world's poorest countries remain below their pre-covid level.
- SDG Goal: Before the covid crisis, the world was on track to reach an average “very high” HDI by 2030, coinciding with the deadline for the Sustainable Development Goals (SDGs).
- Now it is off track, with every region running below its pre-2019 projections.
- India: India has been ranked 134th out of 193 countries. India's ranking has improved by one position this year.
- India has been placed in the medium human development category.
- India saw improvements across all HDI indicators – life expectancy, education, and Gross National Income (GNI) per capita.
- India demonstrated progress in reducing gender inequality, India's GII value is better than the global and South Asian averages.
- India also has one of the largest gender gaps in the labour force participation rate—a 47.8 percentage point difference between women (28.3%) and men (76.1%).

India's Progress in HDI Since 1990

- India has shown remarkable progress in human development over the years.
- Since 1990, life expectancy at birth has risen by 9.1 years; expected years of schooling have increased by 4.6 years, and mean years of schooling have grown by 3.8 years.
- India's GNI per capita has grown by approximately 287 percent.

- India's Neighbours: Sri Lanka has been ranked at 78, while China is ranked 75, both categorized under the High Human Development category.
- Bhutan stands at 125 and Bangladesh is in the 129th position.
- Nepal (146) and Pakistan (164) have been ranked lower than India.
- Top Ranked: Switzerland has been ranked number one followed by Norway and Iceland.
- Bottom Ranked: Central African Republic (191), South Sudan (192) and Somalia (193) were at the bottom of the Index.

Recommendation as per the Report for Improvement in HDI:

- Planetary public goods for climate stability as we confront the unprecedented challenges of the Anthropocene;
- Digital global public goods for greater equity in harnessing new technologies for equitable human development;
- New and expanded financial mechanisms, including a novel track in international cooperation that complements humanitarian assistance and traditional development aid to low-income countries; and
- Dialing down political polarization through new governance approaches focused on enhancing people's voices in deliberation and tackling misinformation.

Adopt a Heritage 2.0

Syllabus: GS2/Government Initiatives

Context

- Archaeological Survey of India (ASI) unveiled the Revamped Website and Sign MoUs for Monuments Adoption under Adopt a Heritage 2.0.

About

- ASI launched the “Adopt a Heritage 2.0” programme in 2023.
- The programme seeks to foster collaboration with corporate stakeholders through which they can contribute to preservation of the monuments for the next generation.
- ASI has 3696 monuments under protection, which are spread, throughout the country.
- The selected stakeholders will develop, provide and maintain amenities in hygiene, accessibility, safety and knowledge categories.
- The term of the appointment will be for a period of five years initially, which may be further extended up to five years.

Svalbard Global Seed Vault

Syllabus: GS3/Economy, Sustainable Development

Context

- Svalbard Global Seed Vault got seeds from more new contributors than ever before.

About

- The Svalbard Global Seed Vault is situated in permafrost caverns on an island located within the European mainland and the North Pole.
- It is built to preserve global crops from extinction.
- The facility was established 16 years ago through a partnership between the Nordic Genetic Resource Center, the Norwegian Ministry of Agriculture and Food and the Crop Trust.
- It was designed to store over 2 billion seeds and guarantee their availability for future generations.
- It houses over 930,000 varieties of food crops.
- Acting as a massive safety deposit box, it contains the world's largest collection of agricultural biodiversity.
- Svalbard is one of the most remote places on Earth, located far north where commercial airlines reach their limits.

Atmospheric Research Testbed in Central India

Syllabus: Miscellaneous

Context

- The Minister of Earth Sciences inaugurated the first phase of the Atmospheric Research Testbed in Central India (ART-CI) in Sehore district of Madhya Pradesh.

About

- It will help better understand the cloud systems, land-atmospheric systems and tracking of the low pressure systems and depressions.

- Data obtained from the testbed facility will be assimilated and used to improve the forecasts.
- Nearly 25 high-end instruments like the aethalometer for aerosol studies, cloud condensation nuclei counter, laser ceilometer to measure cloud sizes, micro rain radar to calculate raindrop size and its distribution have been installed.

19th Foundation Day of NCPCR

Syllabus: GS2/Indian Polity

Context

- The National Commission for Protection of Child Rights (NCPCR) celebrated its 19th Foundation Day on 12th March, 2024.

About

- National Commission for Protection of Child Rights (NCPCR) was established in 2007 under the Commission for Protection of Child Rights Act, 2005.
- The commission's mandate is to ensure that all laws, policies, programs and administrative systems conform to the vision of the rights of the child as enunciated in the Constitution of India as well as the United Nations Convention on the Rights of the Child.
- A child is defined as a person falling in the age group of 0 to 18 years.
- Functions of NCPCR: NCPCR is constantly broadening the range of activities that can be undertaken such as developing new strategies for better monitoring, developing step-by-step processes to enable the authorities to carry out their duties.
- It also includes preparing policy frameworks, using digital technology for improving the monitoring process, undertaking research studies, and first hand investigation on matters of serious nature.

What Rights do Children Have?

- Child rights elaborate upon the do's and don'ts of dealing with children and matters related to them.
- These needs or requirements of children have been broadly divided into four areas or categories- survival, development, protection and participation.

Right to Survival (this includes all the basic necessities of a child including food, nutrition, health care)	Right to Development (includes all that is required for a child to develop to the fullest and for enhancing the overall well-being such as education, recreation, skill development)
Right to Protection (children are to be protected against any kind of neglect, abuse, harassment, discrimination, exploitation)	Right to Participation (to express their views and opinions in the matters related to children and participate in the decisions concerning children)

Constitutional Rights of Children in India

- The Constitution of India guarantees all children certain rights these include:
- Right to free and compulsory elementary education for all children in the 6-14 year age group (Article 21 A).
- Right to be protected from any hazardous employment till the age of 14 years (Article 24).
- Right to be protected from being abused and forced by economic necessity to enter occupations unsuited to their age or strength (Article 39(e)).
- Right to equal opportunities and facilities to develop in a healthy manner and in conditions of freedom and dignity and guaranteed protection of childhood and youth against exploitation and against moral and material abandonment (Article 39 (f)).

India have Following Major Acts for Children:

- Protection of Children from Sexual Offences Act, 2012
- Juvenile Justice (Care and Protection of Children) Act, 2015
- Rights of Children to Free and Compulsory Education (RTE) Act, 2009
- Child Labour (Prohibition and Regulation) Amendment Act, 2016
- Prohibition of Child Marriage Act, 2006
- Pre-Conception and Pre-Natal Diagnostic Techniques (Prohibition of Sex Selection) Act (PCPNDT) Act, 1994.

United Nations Convention on the Rights Of The Child

- Applies equally to both girls and boys up to the age of 18, even if they are married or already have children of their own.
- The convention is guided by the principles of ‘Best Interest of the Child’ and ‘Non-discrimination’ and ‘Respect for views of the child.’
- It emphasises the importance of the family and the need to create an environment that is conducive to the healthy growth and development of children.
- It obligates the state to respect and ensure that children get a fair and equitable deal in society.

Oath Ceremony of Chief Minister

Syllabus: GS2/Polity and Governance

Context

- Nayab Singh Saini took oath as the new chief minister of Haryana.

Constitutional Provisions

- The Constitution does not contain any specific procedure for the selection and appointment of the Chief Minister.
- Article 163(1) of the Constitution says “there shall be a Council of Ministers with the Chief Minister (CM) at the head to aid and advise the Governor in the exercise of his functions”.
- Article 164(1) says “the Chief Minister (CM) shall be appointed by the Governor and the other Ministers shall be appointed by the Governor on the advice of the CM”.

Appointment of the CM

- In accordance with the conventions of the Parliamentary system of government, the Governor has to appoint the leader of the majority party in the state legislative assembly as the Chief Minister.
- When no party has a clear majority in the assembly, then the Governor may exercise his personal discretion in the selection and appointment of the Chief Minister.
- According to the Constitution, the Chief Minister may be a member of any of the two Houses of a state legislature.
- A person who is not a member of the state legislature can be appointed as Chief Minister for six months, within which time, he/she should be elected to the state legislature, failing which he ceases to be the Chief Minister.

Oath ceremony of CM

- The third Schedule of the Indian Constitution prescribes the “Forms of Oaths or Affirmations”.
- The Oath, usually administered by the Governor, is a formal pledge to discharge the duties of the office faithfully.

Powers and functions of the Chief Minister

- The Chief Minister advises the governor with regard to the summoning and proroguing of the sessions of the state legislature.
- CM is the main link between the Governor and the Ministers and is the head of the State Legislative Assembly.
- The CM can recommend the dissolution of the legislative assembly to the governor at any time.
- CM acts as a vice-chairman of the concerned zonal council by rotation, holding office for a period of one year at a time.

Bharat Shakti Exercise

Syllabus: GS3/Defense

Context:

- Recently, the Prime Minister of India witnessed the Exercise Bharat Shakti in Pokhran, Rajasthan.

About the Bharat Shakti Exercise:

- It is a mega tri-service military exercise, and a synergised demonstration of indigenous defence capabilities in the form of a tri-services live fire and manoeuvre exercise.
- It showcased the ‘shock and awe’ impact that the armed forces seek to achieve in an operational situation with manoeuvre and fighting capabilities.
- It demonstrated the LCA Tejas, ALH Mk-IV, Mobile Anti-drone System, T90 Tanks, Dhanush, K9 Vajra, and Pinaka Rockets and Satellite System.



Significance:

- ‘Bharat Shakti’ displayed an array of indigenous weapon systems, by showcasing the prowess of India’s indigenous defence capabilities and nation’s Aatmanirbharata initiative.
- It was a testament to India’s growing self-reliance in defence manufacturing and its commitment to safeguarding its borders.
- It simulated realistic, synergised, multi-domain operations displaying integrated operational capabilities of the Indian Armed Forces to counter threats across land, air, sea, cyber, and space domains.



Chapter- 7

INTERNATIONAL RELATION

External Affairs Minister's Visit to Malaysia

Syllabus: GS2/IR

Context

- Recently, the External Affairs Minister of India visited Malaysia.

About

- The minister held a bilateral meeting with his counterpart in Malaysia. Both leaders held wide ranging discussions on bilateral cooperation including political, trade and economic, defence, digital, culture and education.
- Malaysia is a key partner for India in ASEAN and Act East Policy.
- The visit to Malaysia provided an opportunity to reiterate commitment to further develop the Enhanced Strategic Partnership.

Overview of India and Malaysia Relations

- Diplomatic Relations:** India and Malaysia established diplomatic relations shortly after Malaysia gained independence from British rule in 1957.
- Both countries are members of various international organizations, such as the United Nations, ASEAN (Association of Southeast Asian Nations), and the Non-Aligned Movement.
- Trade and Economic Relations:** Malaysia is the 13th largest trading partner for India while India stands amongst the 10 largest trading partners globally.
- Furthermore, Malaysia has emerged as the third largest trading partner for India from the ASEAN region and India is the largest trading partner for Malaysia among the countries of the Southeast Asian region.
- Malaysia stands as Both countries have engaged in various economic agreements such as the India-Malaysia Comprehensive Economic Cooperation Agreement (CECA).
- Both countries have agreed to conduct trade settlements in Indian rupees, reflecting an intention to bolster trade relations.
- Defense and Security:** The defense ties have steadily expanded, marked by the signing of a defense cooperation memorandum in 1993, regular defense cooperation meetings, joint military exercises, and Malaysia's interest in acquiring 18 new Indian light fighter jets, indicating potential growth in arms trade between the two nations.
- Strategic Partnership:** India and Malaysia have aimed to strengthen their strategic partnership through various initiatives, including high-level visits, joint commissions, and dialogues.
- Both countries have expressed interests in enhancing cooperation in areas such as defense, counter-terrorism, maritime security, and cultural exchanges.
- Tourism and diaspora:** Over the last two decades, tourism has been a cornerstone in fostering relations between India and Malaysia.
- Various agreements, including the India-Malaysia visa waiver for diplomatic and official passport holders, a tourism-focused memorandum of understanding in 2010, a bilateral agreement on employment and workers' welfare in 2009, and a revised air services agreement in 2017, have significantly contributed to the growth of tourism between the nations.
- Cultural Ties:** Indian influence in Malaysia can be seen in various aspects of Malaysian culture, including language, religion (Hinduism and Buddhism), architecture, cuisine, and festivals.

Challenges:

- Trade Disputes and Imbalances:** Trade disputes and imbalances have been a significant challenge in India-Malaysia relations.

- Issues related to tariffs, non-tariff barriers, and trade restrictions have occasionally strained economic ties between the two countries.
- Geopolitical Considerations: Both countries have diverse foreign policy priorities and engagements with other nations, which can lead to differences in strategic perspectives.

Conclusion

- India and Malaysia completed 65 years of modern diplomatic relations in 2022.
- The relations between India and Malaysia have grown from a Strategic Partnership to an Enhanced Strategic Partnership in the last 10 years, with new cooperation in cultural diplomacy, digital economy, and agricultural commodities forthcoming.

India Supported Philippines on SCS

Syllabus: GS2/International Relations

Context:

- Recently, India's External Affairs Minister firmly supported the Philippines in upholding its national sovereignty during his visit to Manila.

About:

- Historically, Indian influences reached the Philippines through the Srivijaya and Majapahit empires, contributing to the early Philippine culture, religion, and language.
- The presence of numerous words with Sanskrit roots in Tagalog (the local language) and objects such as the Laguna Copper Plate inscription, the oldest artefact discovered in the Philippines derived from Pallava script; the golden statue of Agusan Tara; and the localised version of Indian epic Ramayana (Maharadia Lawana) testify to the historical links between the two countries.
- The bilateral relations between India and the Philippines have diversified into political-security, trade and industry, and people-to-people realms.
- The two countries have agreed to expand their ties in sectors like civil aviation, fintech, education, defence, and security.
- Common Interest in the Indo-Pacific: India and the Philippines share a common interest in the Indo-Pacific, envisioning it as free, open, and inclusive.



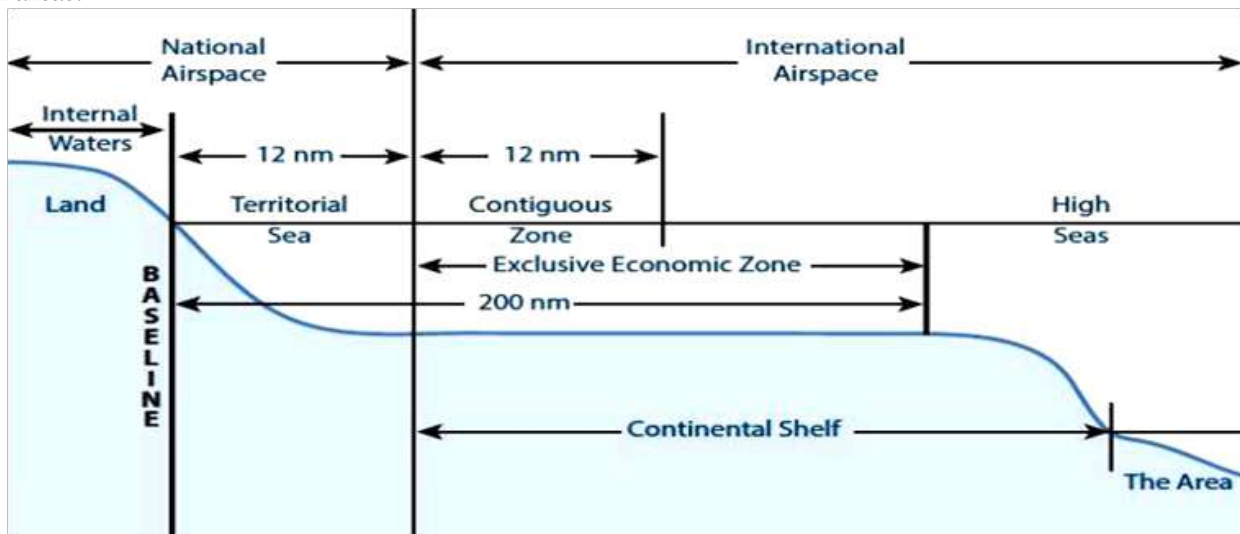
Philippine and South China Sea:

- The South China Sea dispute is a long-standing territorial conflict involving several countries, including the Philippines and China.
- China claims sovereignty over nearly all of the South China Sea, including the disputed Second Thomas Shoal, based on historical records dating back nearly 4,000 years.
- However, the Philippines, along with other countries such as Vietnam, Malaysia, Taiwan, and Brunei, disputed China's claims, and accused China of encroaching upon its territorial waters in the South China Sea.



United Nations Convention on the Law of the Sea (UNCLOS)

– It is also known as the ‘Law of the Sea Treaty’ that was adopted in 1982 to establish jurisdictional limits over ocean areas.



– India has been a signatory to the UNCLOS since 1982.

– Institutions attached to UNCLOS:

- a. International Tribunal for the Law of the Sea;
- b. International Seabed Authority;
- c. Commission on the Limits of the Continental Shelf;

Indian PM Visit to Bhutan Relations

Syllabus: GS3/ International Relations

Context

- Prime Minister Modi is on a two-day state visit to Bhutan as part of India’s ‘Neighbourhood First’ Policy.

Key Highlights

- India and Bhutan inked seven agreements, on cooperation in energy, food safety, sports and research, as well as a space collaboration roadmap.
- PM Modi was awarded the Order of Druk Gyalpo, Bhutan’s highest honor.
- Also India has decided to double Bhutan’s assistance over the next five years, from 5,000 crore in 2019-2024 to 10,000 crore for the period till 2029.

India-Bhutan Relations

- Geographical Connection: Bhutan shares its border with four Indian states,
- Assam, Arunachal Pradesh, West Bengal and Sikkim with a length of 699 km and serve as a buffer between India and China.
- Diplomatic Relations: The formal diplomatic ties were established in 1968, with the cornerstone being the Treaty of Friendship and Cooperation signed in 1949 and subsequently renewed in 2007.
- Trade Relations: India is Bhutan’s top trading partner, and in the last decade, India’s non-hydropower trade in goods with Bhutan has increased from US\$ 484 million to US\$ 1.606 billion.
- Financial assistance: For the 12th Five Year Plan of Bhutan, India’s contribution of In Rs 5000 Cr. constitutes 73% of Bhutan’s total external grant component.

Development Projects

- India has constructed three Hydroelectric Projects (HEPs) in Bhutan: Chukha HEP, Kurichhu HEP and Tala HEP which are operational and exporting surplus power to India.
- Recently, India completed a 720 MW Mangdechhu Hydroelectric Power Project and there are ongoing projects including the 1200 MW Punatsangchhu-1 & 1020 MW Punatsangchhu-2.
- India is supporting the ‘Gelephu Mindfulness City’, which is the “visionary project” of Bhutan.
- India and Bhutan plan to build a 58-km rail link between Gelephu and Kokrajhar in Assam.

The China factor in India-Bhutan relations

- Boundary negotiations: China's growing presence in Bhutan is of concern for India. Bhutan border discussions with China which have seen considerable progress making India wary.
- Threat of swapping Doklam: There are concerns in India that a deal between Bhutan and China could include swapping Doklam for disputed territories in the north.
- The Doklam plateau is close to the strategically important Siliguri Corridor, which connects the Indian mainland to the Northeast. The corridor also links India with Tibet, Nepal, Bhutan, and Bangladesh.
- Claiming Bhutan's territories to pressurize India: In 2020, Beijing asserted a claim on the Sakteng Wildlife Sanctuary, which is situated in eastern Bhutan and borders Arunachal Pradesh.
- China has also allegedly built several villages inside Bhutanese territory.
- India believes China's claim over Sakteng Wildlife Sanctuary is its way of putting pressure on Bhutan to hand over Doklam.



Way Ahead

- India's engagement with Bhutan underscores its pressing strategic considerations in the Himalayas at a time when the two regional nuclear powers are engaged in a border conflict.
- India's development assistance to Bhutan will lead to economic prosperity in Bhutan and in the region and strengthen economic and investment linkages between India and Bhutan.

Insurgency in Balochistan

Syllabus: GS2/IR

Context

- Pakistani security forces repulsed a militant attack on a complex outside its strategic port of Gwadar in Balochistan province.

About Balochistan

- Balochistan is the largest Pakistani province and is sparsely populated and impoverished when compared to the rest of the country.
- Its location as well as abundance of natural resources, especially oil, make it strategically vital for Pakistan.
- The province has been the site of a series of bloody insurgencies, brutal state repression, and an enduring Baloch nationalist movement since 1948.



Background of the Insurgency

- At the dawn of India's Independence in 1947, the region now known as Balochistan was partitioned into four princely states: Kalat, Kharan, Las Bela, and Makaran.
- These states were presented with three options: merge with India, join Pakistan, or maintain their independence.
- Under the influence of Muhammad Ali Jinnah, Kharan, Las Bela, and Makaran chose to become part of Pakistan but Kalat decided to remain Independent.
- On August 4, 1947, a meeting was convened in Delhi, and Jinnah supported Khan of Kalat's decision for independence.

- On August 11, 1947, a treaty was signed between Kalat and the Muslim League, recognising Kalat as an independent state, and promising that the Muslim League would respect Balochistan's independence.
- Despite meetings with Mountbatten and recognition of Kalat's status as an independent sovereign state, the British issued a memorandum stating that the Khan of Kalat was not in a position to undertake the international responsibilities of an independent state.
- On March 26, the Pakistan Army moved into the Baloch coastal region of Pasni, Jiwani and Turbat.
- Khan had no option but to agree to Jinnah's terms to merge with Pakistan.

Insurgency and Discontent

- The forceful integration of Kalat into Pakistan sowed the seeds of discontent and resistance among the Baloch people.
- Many Baloch nationalists viewed the annexation as a betrayal of their autonomy and an infringement upon their cultural identity.
- The region saw many insurgencies for the Independence from Pakistan but Pakistan state managed to suppress the resistance.
- Once a proud sovereign state, Balochistan is now the most-neglected and poverty-ridden province of Pakistan.
- Despite being the largest province and rich in minerals, Balochistan accounts for nearly 4 percent of Pakistan's economy.

India's Stand on Balochistan

- India's position on Balochistan is complex and influenced by various factors including geopolitics, regional stability, and its relationship with Pakistan.
- India and Pakistan have a long-standing conflict over the region of Kashmir, and any overt involvement by India in Balochistan could escalate tensions further.
- India has been accused by Pakistan of supporting Baloch separatist movements, allegations that India has consistently denied.
- India maintains that it supports the right to self-determination for the people of Balochistan but does not interfere in Pakistan's internal affairs.
- Overall, India's stance on Balochistan involves a delicate balance between expressing concerns about human rights violations and maintaining diplomatic relations with Pakistan.
- Any significant shifts in this stance would likely depend on changes in the geopolitical landscape of the region.

Submarine under AUKUS Agreement

Syllabus: GS2/International

Context

- Australia is set to provide 4.6 billion Australian dollars to British industry to support the construction of nuclear-powered submarines under the AUKUS agreement.

About

- AUKUS is a new trilateral security partnership for the Indo-Pacific, between Australia, the UK and the US (AUKUS).
- Under the pact, the US and the UK will help Australia to acquire conventionally armed nuclear-powered submarines.
- The pact also includes cooperation on advanced cyber, artificial intelligence and autonomy, quantum technologies, undersea capabilities, hypersonic and counter-hypersonic, electronic warfare, innovation and information sharing.

India's Plastic Waste Management (Amendment) Rules, 2024

Syllabus: GS3/Environmental Pollution

Context

- The Ministry of Environment and Forests (MoEF) has introduced a new set of amendments to India's Plastic Waste Management (Amendment) Rules, 2024.

About

- It defines biodegradable plastics as not only capable of degradation by biological processes in specific environments such as soil, landfill but also as materials that do not leave any microplastics.
- Rules specify that the makers of disposable plastic ware can label them as biodegradable only when they do not leave any microplastics behind.

Need for the Amendment

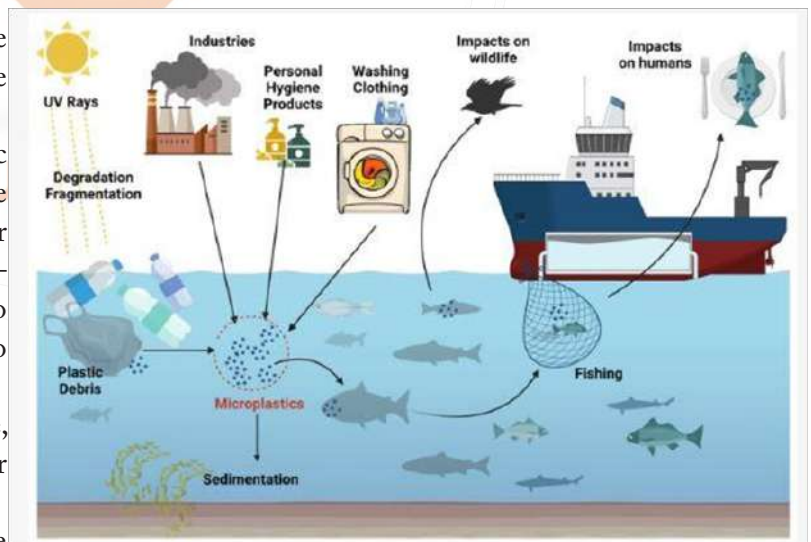
- Ambiguity:** After the Union government banned single-use plastic in 2022, and recommended the adoption of biodegradable plastic, the question of what exactly constituted biodegradable plastic was unanswered.
- The Central Pollution Control Board (CPCB) refused to provide a 'provisional certificate' to licence the products as biodegradable because the CPCB only considers as biodegradable a plastic sample that has 90% degraded, and such a process takes at least two years.

Biodegradable and Compostable Plastics

- Biodegradable plastic involves plastic goods being treated before they are sold.
- When discarded, the material is expected to decompose naturally over time though there are no tests yet to determine if such plastics completely degrade.
- Compostable plastics, on the other hand, do degrade, but require industrial or large municipal waste management facilities to do so.
- Biodegradable plastic and compostable plastic are projected as the two broad kinds of technological fixes to India's burgeoning problem of plastic waste pollution.

What is Plastic and Microplastics?

- The word plastic is derived from the Greek word *plastikos*, meaning "capable of being shaped or moulded."
- Plastic refers to a wide range of synthetic or semi-synthetic materials that use polymers as a main ingredient with their defining quality being their plasticity – the ability of a solid material to undergo permanent deformation in response to applied forces.
- This makes them extremely adaptable, capable of being shaped as per requirement.
- The basic building blocks of plastics are monomers, which are small molecules that can join together to form long chains called polymers through a process called polymerization.



- Microplastics: Plastics break down into their smaller units called microplastics – officially defined as plastics less than five millimetres in diameter.
- These microplastics find their way across the planet, from the depths of the Pacific Ocean to the heights of the Himalayas.
- According to the most recent global estimates, an average human consumes at least 50,000 microplastic particles annually due to contamination of the food chain, potable water, and air.

Environmental Concerns of Microplastics

- **Marine Pollution:** Microplastics enter oceans through various pathways, including direct disposal, runoff from land, and fragmentation of larger plastic debris.
- **Marine organisms** such as fish, seabirds, and marine mammals ingest microplastics, leading to physical harm, blockages in digestive systems, and potential transfer of toxins up the food chain.
- **Freshwater Contamination:** Microplastics are also found in freshwater environments, such as rivers, lakes, and streams.
- **Bioaccumulation and Biomagnification:** Microplastics have the potential to accumulate in the tissues of organisms through processes like ingestion and adsorption.
- As predators consume prey containing microplastics, these contaminants biomagnify, reaching higher concentrations in organisms at the top of the food chain, including humans.
- **Habitat Degradation:** Microplastics presence interfere with nutrient cycling, sediment stability, and the behavior of organisms.
- In some cases, microplastics create microenvironments that favor the growth of harmful bacteria or invasive species, further disrupting ecosystem dynamics.
- **Global Distribution:** Microplastics have been detected in diverse environments worldwide, including remote and pristine locations far from major sources of plastic pollution.
- Their global distribution highlights the pervasive nature of plastic contamination and underscores the need for coordinated international efforts to address this issue.

India's Efforts In Tackling Plastic Waste

- **Ban on single-use plastics:** India has banned the production, use, and sale of single-use plastics such as bags, cups, plates, cutlery, and straws in many states.
- **Extended Producer Responsibility (EPR):** The Indian government has implemented EPR, making plastic manufacturers responsible for managing and disposing of the waste generated by their products.
- **Plastic Waste Management Rules:** India introduced the Plastic Waste Management Rules in 2016, which provide a framework for managing plastic waste through various measures, including recycling and waste-to-energy initiatives.

Plastic Waste Management (Amendment) Rules, 2022:

- The guidelines on EPR(Extended Producer Responsibility) coupled with the prohibition of identified single-use plastic items.
- It banned the manufacture, import, stocking, distribution, sale and use of carry bags made of virgin or recycled plastic less than seventy-five micrometers.
- **Swachh Bharat Abhiyan:** The Indian government launched the Swachh Bharat Abhiyan, a national cleanliness campaign, which includes the collection and disposal of plastic waste.
- **Plastic Parks:** Government has set up Plastic Parks, which are specialized industrial zones for recycling and processing plastic waste.
- **Beach clean-up drives:** The Indian government and various non-governmental organizations have organized beach clean-up drives to collect and dispose of plastic waste from beaches.
- India is a signatory to MARPOL (International Convention on Prevention of Marine Pollution).
- The "India Plastic Challenge – Hackathon 2021"
- It is a unique competition calling upon start-ups /entrepreneurs and students of Higher Education Institutions (HEIs) to develop innovative solutions to mitigate plastic pollution and develop alternatives to single-use plastics.

Multilateral Treaties Required for Indus, Ganga, Brahmaputra Management

Syllabus: GS2/India and its Neighbourhood Relations

Context

- With erratic rainfall and flooding affecting people in south Asia, an integrated river basin management approach for the Indus, Ganga and Brahmaputra rivers can help those living across these river basins.

About

- The recent report on integrated river basins has been authored by Kathmandu-based International Centre for Integrated Mountain Development (ICIMOD) and Australian Water Partnership, a body funded by the Australian government.

Highlights of the study

- Growing challenge: People in India, China, Pakistan, Afghanistan, Nepal and Bhutan depend on these three rivers for their food and water security, the study highlighted.
- The Indus is a lifeline for 268 million people who live in its river basin whereas approximately 114 million people depend on the Brahmaputra for water, electricity, food, agriculture and fishing.
- No multilateral treaty: Even as there are bilateral treaties such as the Indus Water Treaty between India and Pakistan or agreements on Brahmaputra between India and China, no multilateral agreements or treaties exist on this issue.
- The report said 600 million Indians, 29 million from Nepal and millions in Bangladesh live in the Ganga river basin area. However, there is no agreement involving Nepal, India and Bangladesh.
- There were substantial data and knowledge gaps across the Ganga river basin regarding social, economic and environmental realities and even on water usage.

Major recommendations

- Plug data gap: The reports recommended that data gaps on river basins need to be plugged for better water management, early warning and to facilitate disaster management.
- Whole basin research approach: Developing data using a ‘whole basin’ research approach would yield benefits:
- Data-sharing would inform more reliable water accounting, underpin strategic basin planning, increase transboundary understanding of the long-term impacts of climate change, secure more reliable water supply to all users even under uncertain conditions.
- Hydro-solidarity and climate diplomacy: The report also called for greater ‘hydro-solidarity’ and climate diplomacy among researchers to build trust between countries and move towards greater dialogue.
- Importance of harnessing indigenous and local knowledge systems: It holds so many insights into how local communities can act to resolve problems quickly and effectively during a crisis. Governments need to empower local communities with knowledge and technology to nurture their resilience.
- Integrated River Basin Management: A basin-wide approach to river planning, backed by quality data sharing on water availability, biodiversity and pollution between all stakeholders.

Integrated River Basin Management (IRBM)

- IRBM is a comprehensive approach that aims to harmonize the planning and management of water resources, sustainable development, and strategies within a river basin.
- IRBM involves coordinating conservation, management, and development of water, land, and related resources across sectors within a specific river basin.
- It emphasizes the integration of ecological, social, and economic aspects to achieve equitable and sustainable water use.
- The European Union has actively promoted IRBM through two key framework directives:
- Water Framework Directive (WFD) and
- Flood Risk Management Directive (FRMD).



Challenges:

- Cross-Sectoral Coordination: Balancing competing interests across sectors (e.g., agriculture, industry, environment) can be complex.

- Data and Knowledge Gaps: Adequate data on water availability, quality, and ecosystem health are essential.
- Legal and Institutional Frameworks: Harmonizing policies and regulations across administrative boundaries is crucial.
- Climate Change: Adapting IRBM strategies to changing climate conditions is a challenge.
- Public Participation: Engaging communities and ensuring their active involvement is also challenging.

Measures:

To enhance IRBM effectiveness, consider the following measures:

- Holistic Planning: Develop comprehensive river basin plans that integrate environmental, social, and economic considerations.
- Stakeholder Engagement: Involve local communities, NGOs, and industry representatives in decision-making processes.
- Ecosystem-Based Approaches: Prioritize ecosystem health and resilience.
- Monitoring and Assessment: Regularly assess water quality, quantity, and ecosystem status.
- Adaptive Management: Continuously adjust strategies based on new information and changing circumstances.

Conclusion:

- IRBM strives for a balanced and sustainable approach to managing our precious water resources, hence needs to be promoted at every level of planning.

India and Brazil 2+2 Dialogue

Syllabus: GS2/IR

Context

- India and Brazil concluded the first '2+2' defence and foreign ministerial dialogue.

About

- Discussions spanned defence, space, energy, critical minerals, tech, counter-terrorism and regional, multilateral & other issues of mutual interest.
- It was co-chaired by an additional secretary in the external affairs ministry and joint secretary in the defence ministry.

What are 2+2 meetings?

- The 2+2 meetings signify the participation of two high-level representatives, Ministers holding Foreign and Defence portfolios, from each of the two countries who aim to enhance the scope of dialogue between them.
- Having such a mechanism enables the partners to better understand and appreciate each other's strategic concerns and sensitivities taking into account political factors on both sides, in order to build a stronger, more integrated strategic relationship.
- India has held 2+2 meetings with ministers from the USA, Australia, Japan, the United Kingdom and Russia.

Brief on India- Brazil Relations

- Diplomatic Relations: Relations were established in 1948, and the two countries have been Strategic Partners since 2006.
- Both sides also have several Joint Working Groups to take forward sectoral cooperation.
- Trade Relations: In 2022, the bilateral trade expanded by 32% to US\$15.2 billion (India's exports US\$8.8 billion & Imports – US\$6.4 billion).
- India and Brazil have established Trade Monitoring Mechanism as an institutional mechanism to monitor and identify bottlenecks in bilateral trade and take appropriate measures to address them.
- Defence & Security Cooperation: India and Brazil signed an agreement in 2003 for cooperation in defence. Meetings of Joint Defence Committee (JDC) are held as an institutionalized mechanism for defence cooperation.

- Security Cooperation: India and Brazil established a Strategic Dialogue mechanism in 2006 to cover regional and global issues of mutual concern.
- The two countries have an Extradition Treaty, Mutual Legal Assistance Treaty in Criminal Matters and an Agreement of Transfer of Sentenced Persons in place.
- Space Cooperation: India and Brazil signed a framework agreement for peaceful use of outer space in 2004 as well as an Agreement for inter-institutional cooperation between the space agencies.
- Both countries have been collaborating in Data sharing and satellite tracking of Indian satellites.
- Multifora Relations: India and Brazil share a very close and multifaceted relationship both at bilateral level as well as in plurilateral fora such as BRICS, BASIC, G-20, G-4, IBSA, International Solar Alliance, as well as in the larger multilateral bodies such as the UN, WTO, UNESCO, and WIPO.

Challenges in the Relations

- Geopolitical Competition: Both India and Brazil are emerging powers with aspirations for greater global influence. This can sometimes lead to competition, particularly in international forums like the UN, where both countries seek greater representation and influence.
- Trade Barriers: Trade between India and Brazil has not reached its full potential, partly due to various trade barriers and protectionist measures in both countries. These barriers hinder the growth of bilateral trade and investment.
- Infrastructure and Connectivity: Improving infrastructure and connectivity between the two countries remains a challenge.
- Better air and sea connectivity, as well as improved transportation links, are essential for boosting trade and people-to-people contacts.

Way Ahead

- Overcoming the challenges requires sustained diplomatic efforts, enhanced economic cooperation, and a commitment to finding common ground on global issues.
- Despite the obstacles, the potential benefits of a stronger India-Brazil partnership make overcoming these challenges a worthwhile endeavor.

Exercise Tiger Triumph

Syllabus: GS3/Defence

Context:

- Recently, India and the US jointly commenced the Exercise Tiger Triumph-24 in Eastern Seaboard in the USA.

About the Exercise Tiger Triumph-24:

- It is a bilateral tri-service exercise aimed at developing interoperability for conducting Humanitarian Assistance and Disaster Relief (HADR) operations and refining Standard Operating Procedures (SOPs) to enable rapid and smooth coordination between the forces of both countries.
- The first Tiger Triumph exercise took place in 2019.
- Navy, Army and Air Force of both countries are participants in the exercise



Phases of the Exercise:

- Harbour Phase: It involves Training Visits, Subject Matter Expert Exchanges, Sports Events, and Social Interactions among personnel from both navies.
- Sea Phase: Participating ships, with embarked troops, will undertake Maritime, Amphibious, and HADR operations based on simulated scenarios.

Significances:

- It aims to enhance the readiness and cooperation of the forces of both nations by strengthening their ability to respond effectively to humanitarian crises and natural disasters.

Other Exercises (India and USA)

- Yudh Abhyas
- Vajra Prahar
- Cope India
- RIMPAC (Rim of the Pacific)
- Red Flag
- Malabar Exercise

- It underscores the shared commitment of both nations to peace and stability in the region and their willingness to work together towards these common goals.

Nuclear Disarmament**Syllabus: GS3/Internal Security, Defence****Context**

- António Guterres, the Secretary-General of the United Nations has urged States with nuclear arsenals for disarmament.

Nuclear Disarmament

- Disarmament refers to the act of eliminating or abolishing weapons (particularly offensive arms) either unilaterally or reciprocally.
- It may refer either to reducing the number of arms, or to eliminating entire categories of weapons.

Nuclear Powers in the World

- There are nine countries recognized as possessing nuclear weapons.
- These countries are often referred to as “nuclear-armed states” or “nuclear powers.”
- United States, Russia, China, United Kingdom, France, India, Pakistan, North Korea and Israel.

Treaties Related to Nuclear Disarmament

- Treaty on the Non-Proliferation of Nuclear Weapons (NPT): Signed in 1968 and entered into force in 1970, the NPT aims to prevent the spread of nuclear weapons and promote disarmament.
- It divides the world into nuclear-weapon states (NWS), recognized as possessing nuclear weapons at the time of the treaty’s signing, and non-nuclear-weapon states (NNWS), which agree not to develop or acquire nuclear weapons.
- The treaty also requires NWS to pursue disarmament negotiations in good faith.
- Treaty on the Prohibition of Nuclear Weapons (TPNW): Adopted by the United Nations in 2017 and opened for signature in 2018, the TPNW aims to prohibit the development, testing, production, stockpiling, stationing, transfer, use, and threat of use of nuclear weapons.
- It represents a significant step towards nuclear disarmament, although it has not been signed by nuclear-armed states.
- Comprehensive Nuclear-Test-Ban Treaty (CTBT): Opened for signature in 1996, the CTBT aims to ban all nuclear explosions for both civilian and military purposes.
- While the treaty has been signed by 185 countries and ratified by 170, it has not entered into force as nuclear-armed states must ratify it to become operational.
- Outer Space Treaty: This multilateral agreement entered into force in 1967 and bans the siting of weapons of mass destruction in space.
- All nine states believed to have nuclear weapons are parties to this treaty.

Arguments in Favour of Nuclear Disarmament

- Humanitarian Concerns: Nuclear weapons possess unparalleled destructive power, capable of causing immense loss of life, widespread devastation, and long-term environmental damage.
- Global Security: The proliferation of nuclear weapons increases the likelihood of their use, whether intentionally or accidentally, leading to catastrophic consequences for humanity.
- Economic Benefits: Maintaining and modernizing nuclear arsenals incurs substantial financial costs for

countries whereas funds can be redirected from nuclear weapons towards more constructive purposes to improve overall well-being.

- **Non-proliferation and Arms Control:** By demonstrating commitment to disarmament, nuclear-armed states can encourage non-nuclear-weapon states to adhere to non-proliferation agreements and refrain from developing their own nuclear capabilities.
- **Ethical and Moral Imperatives:** Eliminating nuclear weapons is viewed as a moral imperative and a step towards building a more peaceful and just world.
- **Environment Pollution:** Nuclear weapons testing and potential use can have devastating environmental consequences, including radioactive contamination of land, air, and water.

Arguments Against Nuclear Disarmament

- **Deterrence:** Proponents of nuclear deterrence argue that possessing nuclear weapons serves as a powerful deterrent against potential adversaries, preventing conflicts and maintaining strategic stability.
- **National Security:** Possessing nuclear arsenals provides a form of insurance against potential threats and enhances the ability to protect the interests and sovereignty of a country in an uncertain international environment.
- For these countries, relinquishing nuclear weapons could be perceived as weakening their security posture and leaving them vulnerable to external threats.
- **Strategic Stability:** Nuclear weapons are often seen as instruments for maintaining strategic stability between rival nuclear-armed states.
- **Verification and Compliance:** Critics argue that without robust verification mechanisms and effective enforcement measures, countries may exploit disarmament agreements for strategic advantage.
- **Geopolitical Realities:** Deep-rooted mistrust, unresolved conflicts, and strategic competition among states make it difficult to envision a scenario in which all countries would willingly and simultaneously relinquish their nuclear weapons.

Way Ahead

- Nuclear disarmament is seen as a crucial step towards reducing the risks and promoting international peace and stability.
- While achieving complete nuclear disarmament may be a long-term objective, incremental progress can still be made through concerted international efforts and cooperation.
- It requires sustained commitment from all nations to work towards a world free of nuclear weapons, ensuring the security and well-being of future generations.

India's Nuclear Weapon Program

- **Smiling Buddha:** In 1974, India conducted its first nuclear test code-named “Smiling Buddha, and since then, it has developed a nuclear triad consisting of land-based, sea-based, and air based delivery systems.
- **Operation Shakti:** In 1998, India conducted a series of nuclear tests at Pokhran, codenamed “Operation Shakti.” A. These tests included both fission and fusion devices and marked India's formal entry into the nuclear weapons club.
- **International Criticism:** The international community has criticised India's nuclear weapons programme, particularly the United States and its allies.
- **No First Use:** India has a “no first use” policy, meaning it pledges not to use nuclear weapons first in a conflict but reserves the right to retaliate if attacked with nuclear weapons.

India's stance on nuclear disarmament?

- India has argued that any country's possession of nuclear weapons poses a threat to global security, and that the only way to ensure peace and stability is for all nuclear weapons to be destroyed.
- India is not a signatory to the Non-Proliferation Treaty (NPT), and stated that the NPT is discriminatory and perpetuates a two-tiered system of nuclear haves and have-nots by unfairly restricting access to peaceful nuclear technology for non-nuclear weapon states.
- **National Security:** India's nuclear weapons programme is a legitimate expression of its national sovereignty, and that India has the right to defend itself against potential threats.
- A. India's nuclear disarmament and nonproliferation policy is complex and nuanced, reflecting the country's desire for security and recognition, as well as its commitment to global disarmament and non-proliferation.

World Air Quality Report 2023

Syllabus: GS3/Environmental Pollution

Context

- IQAir has released the 6th edition of the World Air Quality Report 2023.

About

- IQAir is a Swiss technology company.
- The data in report was gathered from more than 30,000 air quality monitoring stations across 7,812 locations in 134 countries and regions.

Major Findings of the Report

- A total of 124 (92.5%) out of 134 countries and regions exceeded the WHO annual PM_{2.5} guideline value of 5 µg/m³.
- Top Polluted Countries: Top 5 most polluted countries in the world in 2023 included: Bangladesh, Pakistan, India, Tajikistan and Burkina Faso.
- For the first time in the history of this report, Canada was the most polluted country in Northern America.
- Third Most Polluted: India was declared as the third-most polluted country in 2023, after Bangladesh and Pakistan.
- India has an average annual PM_{2.5} concentration of 54.4 micrograms per cubic metre.
- 96% of the Indian population experience PM_{2.5} levels more than seven times the WHO annual PM_{2.5} guideline.
- Most Polluted Cities: In the top 50 most polluted cities in the world, 42 cities were in India.
- Begusarai was the most polluted metropolitan area of 2023, followed by Guwahati and then Delhi.
- Delhi: Delhi has become the world's most polluted capital city and saw an increase in PM_{2.5} concentration from 89.1 to 92.7 micrograms per cubic meter over between 2022 – 23.
- Least Polluted Cities of India: Silchar in Assam (7th), Aizawl in Mizoram (8th) and Damoh in Madhya Pradesh (15th) were the least polluted cities in the central and south Asia region.
- Countries Meeting WHO standards: Seven countries which met the WHO annual PM_{2.5} guideline (annual average of 5 µg/m³ or less) included Australia, Estonia, Finland, Grenada, Iceland, Mauritius, and New Zealand.



WHO Air Quality Guidelines

- The first release of the guidelines was in 1987.
- The WHO Air quality guidelines are a set of evidence-based recommendations of limit values for specific air pollutants developed to help countries achieve air quality that protects public health.
- The WHO Air quality guidelines recommend levels and interim targets for common air pollutants: PM, O₃, NO₂, and SO₂.

Pollutant	Averaging Time	2005 AQGs	2021 AQGs
PM _{2.5} , µg/m ³	Annual	10	5
	24-hour ^a	25	15
PM ₁₀ , µg/m ³	Annual	20	15
	24-hour ^a	50	45
O ₃ , µg/m ³	Peak season ^b	-	60
	8-hour ^a	100	100
NO ₂ , µg/m ³	Annual	40	10
	24-hour ^a	-	25
SO ₂ , µg/m ³	24-hour ^a	20	40
CO, mg/m ³	24-hour ^a	-	4

Air Pollution and Its Concerns

– When harmful substances (pollutants) – particles, gases, or matter – are released into the air and reduce its quality, the air is polluted.

– Common air pollutants include: Particulate Matter (PM), Nitrogen Dioxide (NO₂), Sulfur Dioxide (SO₂), Ozone (O₃), Carbon Monoxide (CO), Volatile Organic Compounds (VOCs), Lead etc.

– Concerns:

1. Health Related: Respiratory issues, cardiovascular problems, reduced lung function.
2. Environmental: Ecosystem damage, Biodiversity loss, Water pollution, climate change, crop damage.
3. Healthcare Costs: The health impacts of air pollution result in increased healthcare costs, including expenses related to the treatment of respiratory and cardiovascular diseases.

Steps Taken by Government of India to combat Air Pollution

- National Clean Air Programme (NCAP): Launched in 2019, NCAP is a comprehensive initiative with the goal of reducing air pollution in identified cities and regions across India.
- The program focuses on improving air quality monitoring, implementing stricter emission standards, and promoting public awareness.
- Bharat Stage VI (BS-VI) Emission Standards: The government implemented BS-VI emission standards for vehicles nationwide in 2020.
- These standards aim to reduce vehicular emissions by mandating the use of cleaner fuel and more advanced emission control technologies.
- Pradhan Mantri Ujjwala Yojana (PMUY): The PMUY scheme aims to provide clean cooking fuel to households by promoting the use of liquefied petroleum gas (LPG) as an alternative to traditional biomass-based cooking methods.
- FAME (Faster Adoption and Manufacturing of Hybrid and Electric Vehicles) Scheme: The FAME scheme promotes the adoption of electric and hybrid vehicles to reduce air pollution caused by vehicular emissions.
- Incentives are provided to both manufacturers and consumers to encourage the use of electric vehicles.
- Green Initiatives for Sustainable Habitat (GRIHA): GRIHA is an initiative to promote sustainable and environmentally friendly practices in the construction and operation of buildings.
- It encourages the use of energy-efficient technologies and materials to reduce pollution.
- Waste Management Programs: Proper waste management is crucial to prevent the burning of waste, which contributes to air pollution.
- Various waste management initiatives, including the Swachh Bharat Abhiyan, aim to address solid waste issues and promote cleaner disposal methods.
- Commission for Air Quality Management: The Commission has been set up for Air Quality Management in the National Capital Region and Adjoining Areas for better coordination, research, identification, and resolution of problems surrounding the air quality index.
- Graded Response Action Plan (GRAP): It is a set of emergency measures that kick in to prevent further deterioration of air quality once it reaches a certain threshold in the Delhi-NCR region.

- Promotion of Public Transportation: Encouraging the use of public transportation, such as buses and metro systems, helps reduce the number of individual vehicles on the road, consequently lowering vehicular emissions.

Norway to invest almost half of \$100 billion under EFTA

Syllabus: GS2/ IR: Agreements involving India or India's interests

Context

- Switzerland and Norway are likely to contribute most of the \$100 billion free trade pact India recently signed with EFTA.

About

- India signed a four-nation trade pact with EFTA countries, on March 10, 2024, which aims to attract \$100 billion and to create one million jobs in 15 years in exchange for tariff concessions for their pharma, chemical and minerals.

India: EFTA pact: Trade and Economic Partnership Agreement (TEPA)

- Signed on: March 10, 2024
- Involves: India and EFTA member states: Iceland, Liechtenstein, Norway, and Switzerland.
- Goal: Promote investments and exports, particularly in India's IT, audio:visual sectors, and skilled professional movement.
- Investment target: The EFTA states shall aim to increase FDI into India by \$50 billion within 10 years, and another \$50 billion in the five years thereafter.
- Additional provisions: For the first time, the FTA also included a chapter on commitments to human rights and sustainable development.

Potential benefits for India:

- Tariff reduction: After the treaty comes into effect, the EFTA nations will see a reduction in tariffs on most industrial goods exported to India, such as pharmaceutical products, machinery, watches, fertilisers, medicine, chemical products and others.
- Increased trade and investment: EFTA investment already stood at \$10.7 billion in 2022 and Switzerland is India's largest trading partner in this bloc of nations, followed by Norway.
- Job creation: As per the newly signed agreement, the EFTA states shall aim to increase FDI into India by \$100 billion within 15 years. This could facilitate the generation of one million direct jobs in the country.
- Access to the EFTA markets: Markets of these four countries will be opened for Indian products, thereby enhancing the export avenues for Indian products.
- Services sector: The services sector also forms a vital part of this trade agreement. The agreement would help stimulate services exports in areas such as information technology and facilitate the movement of key skilled personnel.

Gender Inequality Index 2022

Syllabus :GS 2/International Reports

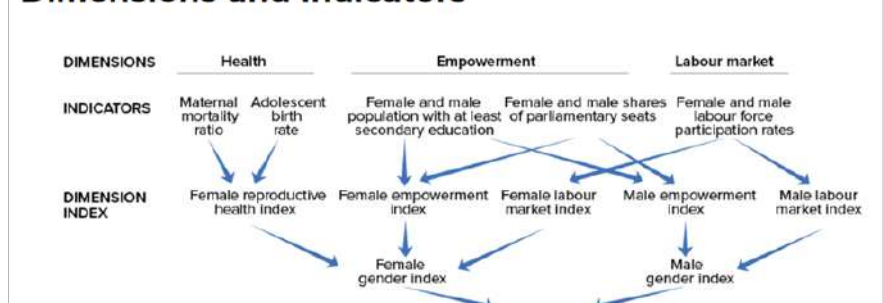
In News

- The Gender Inequality Index 2022 has been released by UNDP in their Human Development Report 2023/2024.

About the Index

- GII is a composite metric of gender inequality using three dimensions:
 - reproductive health,
 - empowerment and the labour market.
- A low GII value indicates low inequality between women and men, and vice-versa.

Dimensions and Indicators



Findings

- Denmark topped the index followed by Norway, Switzerland and Sweden.
- India has registered a significant jump of 14 ranks in Gender Inequality Index 2022.
- It ranked 108 out of 193 countries with a score of 0.437 in GII 2022.
- In 2022, India saw improvements across all HDI indicators — life expectancy, education, and gross national income (GNI) per capita and life expectancy rose from 67.2 to 67.7 years, expected years of schooling reached 12.6, mean years of schooling increased to 6.57 and GNI per capita saw an increase from USD 6,542 to USD 6,951.

India's Progressive Improvement

- Over the last 10 years, India's rank in GII has become consistently better, indicating progressive improvement in achieving gender equality in the country.
- India's adolescent birth rate in 2022 was 16.3 (births per 1,000 women ages 15-19), an improvement from 17.1 in 2021.
- However, the country still has one of the largest gender gaps in its labour force participation rate — a 47.8% difference between women (28.3 %) and men (76.1 %).

Major Initiatives Helping India in Improvement

- Code on Social Security, 2020: Provisions for women's social security across various aspects.
- Mission Shakti: Self-help mission for empowering women through promotion of Women Self Help Groups (WSHGs) to take up various socio-economic activities.
- Others: Beti Bachao Beti Padhao (BBBP), Pradhan Mantri Matru Vandana Yojana, Ujjwala Yojana, reservations and legislative policies etc.

World Monuments Fund

Syllabus: GS2/International Institutions; Places in News

Context:

- Recently, Kazhuveli watershed region in Tamil Nadu was proposed for nomination to World Monuments Fund Watch for 2025.

About the World Monuments Fund (WMF):

- It is a New York-based non-profit organisation dedicated to preserving and protecting endangered ancient and historic sites around the world.
- It works with local partners around the globe to provide financial and technical support.
- It has raised over \$300 million and leveraged more than \$400 million from other agencies.
- Since its inception, the WMF has conserved over 700 sites and advocated for more than 800 treasured places.

World Monuments Watch:

- It is a nomination-based program, launched in 1996, that connects local heritage preservation to global awareness and action.
- To date, the WMF has contributed more than \$110 million toward projects at more than 300 Watch sites, with the visibility provided by the Watch helping communities leverage an additional \$300 million from other sources.

World Monuments Fund (WMF) in India:

The Kazhuveli Watershed Region:

- It is a significant ecological area known for its ancient 'Eri' network, an incredible network of tanks created thousands of years ago.
- It is located in Villupuram district and stretches from Gingee to Marakkanam all the way up to the Auroville plateau in Tamil Nadu.
- If the nomination comes through, pilot projects will be run in Munnur village to develop a heritage toolkit that could be replicated through the watershed and beyond.

Suranga Bawadi:

- It is an ancient water system on the Deccan Plateau in Karnataka, which was included in the World Monument Watch list for 2020.

Help to Die: France's Macron backs Bill allowing Medically Assisted Death

Syllabus: GS2/major international events

Context

- French President Emmanuel Macron recently announced legislation, 'Help to Die'/End of life' bill, to allow eligible patients to administer a lethal substance under 'precise conditions'.

About

- It is a move that is aimed at alleviating patients suffering from incurable diseases, thereby allowing people to 'die at will'.
- This bill could add France to the list of European countries that legally allow euthanasia for the terminally ill.
- Belgium, the Netherlands and Luxembourg, Germany and Spain also permitted assisted dying.

'Active assistance dying' legislation of France

- Under 'active-assistance dying', a lethal substance will be prescribed to the patient, who can administer it themselves or with the help of a third party if they are physically unable to do so.
- The third party can be a volunteer, the doctor, or the nurse treating the patient, according to the text. The substance can be administered at the patient's home, in care homes for the elderly or in care centres.
- The medical team will have 15 days to respond to a patient's request, and only after the approval will 'help to die' be valid for three months, during which the patient can retract at any moment.
- Minors and patients suffering from Alzheimer's disease and other psychiatric or neurodegenerative conditions will not be eligible under the right-to-die bill as the condition may hamper their decision-making abilities.

What is Euthanasia?

- Euthanasia is the act of deliberately ending a person's life to eliminate pain or suffering. Ethicists differentiate between active and passive euthanasia.

Active euthanasia	Passive euthanasia
<ul style="list-style-type: none"> • Also known as assisted suicide, It is the act of deliberately and actively doing something to end a person's life. • It is done through steps such as administering a lethal injection or overdose of medication. • Active euthanasia involves directly causing the patient's death, • This type of euthanasia is illegal in most countries, including India. 	<ul style="list-style-type: none"> • It is defined as intentionally letting a patient die by withholding artificial life support such as a ventilator or a feeding tube • This can include removing a patient from life support or not providing treatment for a terminal illness. • Passive euthanasia is legal in some countries, including India, under certain circumstances and with proper consent.

Status of Euthanasia in India

- It differs between active and passive forms.
- Passive Euthanasia (withdrawing life support): This is legal in limited circumstances. The 2018 Supreme Court judgement in the Common Cause (A Regd. Society) vs. Union of India and Anr, allowed passive euthanasia for terminally ill or permanently vegetative patients with a valid living will.]

- The court further eased norms for this process in January 2023.
- Active Euthanasia (administering lethal medication): This remains illegal in India. The Indian Penal Code criminalizes both causing death (murder) and aiding suicide.

Arguments in Favour of Euthanasia

- End of Pain: Euthanasia provides a way to relieve the intolerably extreme pain and suffering of an individual. It relieves the terminally ill people from a lingering death.
- Respecting Person's Choice: The essence of human life is to live a dignified life and to force the person to live in an undignified way is against the person's choice. Thus, it expresses the choice of a person which is a fundamental principle.
- Treatment for others: In many developing and underdeveloped countries like India, there is a lack of funds. There is a shortage of hospital space. So, the energy of doctors and hospital beds can be used for those people whose life can be saved instead of continuing the life of those who want to die.
- Dignified Death: Article 21 of the Indian Constitution clearly provides for living with dignity. A person has a right to live a life with at least minimum dignity and if that standard is falling below that minimum level then a person should be given a right to end his life.
- Addressing Mental Agony: The motive behind this is to help rather than harm. It not only relieves the unbearable pain of a patient but also relieves the relatives of a patient from the mental agony.

Arguments Against

- Medical Ethics: Medical ethics call for nursing, caregiving and healing and not ending the life of the patient.
- In the present time, medical science is advancing at a great pace making even the most incurable diseases curable today.
- Moral Wrong: Taking a life is morally and ethically wrong. The value of life can never be undermined.
- Vulnerable people will become more prone to it: Vulnerable people would feel obliged to opt for euthanasia as they may see themselves as a burden to society.
- Suicide v/s Euthanasia: When suicide is not allowed then euthanasia should also not be allowed. A person commits suicide when he goes into a state of depression and has no hope from the life. Similar is the situation when a person asks for euthanasia.

Legal Provisions in India and Related Court Judgements

- Section 306 of the I.P.C.: Every act of aiding and abetting the commission of suicide are punished under the section 306 of the Indian Penal Code.
- State of Maharashtra v. Maruti Shripati Dubal, 1987: It was held in this case by the Bombay High Court that 'right to life' also includes 'right to die' and Section 309 (punishes attempt to commit suicide) was struck down.
- The court clearly said in this case that the right to die is not unnatural and also mentioned many instances in which a person may want to end his life.
- Gian Kaur v. State of Punjab, 1996: It was held by the five-judge bench of the Supreme Court that the "right to life" guaranteed by Article 21 of the Constitution does not include the "right to die".
- The court mentioned in this case that Article 21 only guarantees right to life and personal liberty and in no case can the right to die be included in it. In India, like almost in other countries, euthanasia has no legal aspect.
- Naresh Marotrao Sakhre And Another vs Union Of India And Others, 1994: Distinguishing euthanasia from suicide, court observed that, "suicide by its nature is an act of self-killing or self-destruction, an act of terminating one's own act and without the aid or assistance of any other human agency.
- Mercy killing is nothing but homicide, whatever the circumstances in which it is affected. Unless it is specifically accepted it cannot be an offense. Indian Penal Code further punishes not only abetment of homicide, but also abetment of suicide.

Way Forward

- Euthanasia challenges traditional views on death and medicine. Public discourse that considers religious, ethical, and cultural perspectives is crucial.
- If euthanasia or PAS is legalized, strict guidelines and safeguards are needed to prevent abuse or coercion.
- Ensuring access to quality palliative care, which focuses on comfort and symptom relief, should be a priority alongside any discussion of euthanasia.

India's Gaming Sector

Syllabus: GS3/Economy

Context

- The India Gaming Report 2024 has been released jointly by the Interactive Entertainment and Innovation Council and online gaming firm Winzo.

Major Findings

- Annual Revenue: The annual revenue for gaming is projected to reach USD 6 billion by 2028.
- Mobile gaming contributes to 90 percent of the gaming market in India as compared to around 37 percent and about 62 percent in the US and China.
- Among the gaming community, nearly 50 percent fall within the age bracket of 18 to 30 years.
- Job Demand: The Indian gaming sector is presently witnessing a surge in demand for talent, with job openings ranging from 50,000 to 60,000 across various roles, including developers, programmers, testers, artists, and customer support.

India's Gaming Sector

- India is the world's largest mobile gaming market in terms of App downloads.
- The sector is expected to grow by 20% by FY25 to reach INR 231 Bn.
- Indian gaming raised \$2.8 Bn from domestic/global investors in the last 5 years.
- India has produced 3 gaming unicorns: Game 24X7, Dream11 and Mobile Premier League.
- It is widely estimated that AI and online gaming can add up to \$300 billion to India's GDP by 2026-27.

Government Initiatives

- Digital Gaming Research Initiative: The government has started a digital gaming research initiative, and the SERB-INAE Conclave was organised recently to support the Indian digital gaming research space and industry.
- The Science and Engineering Research Board (SERB) of the Department of Science and Technology has identified three main directions for its Digital Gaming Research Initiative – R&D in learning and leisure gaming platforms, immersive game prototypes with an emphasis on Indian culture and values, and a collaborative technical design process, which was made by SERB Game Labs.
- AVGC Promotion Task Force: The Ministry of Information and Broadcasting has established the Animation, Visual Effects, Gaming and Comic (AVGC) Promotion Task Force.
- The government recognizes that the Indian AVGC industry has the ability to carry the "Make in India" and "Brand India" banners.

Regulation of Industry

- At present, there is no uniform federal law regulating the skill gaming industry in India.
- The Public Gambling Act, 1867 and Prize Competitions Act, 1955 currently govern India's online gaming industry at the federal level while varying legislation in different Indian states supersede these Acts.
- This is because state governments in India are empowered by the constitution to legislate on gambling.
- Recently the government decision to appoint the Ministry of Electronics and Information Technology (MeitY) as the nodal ministry for online gaming in India has finally provided legitimacy to the sector.
- The government will shortly draft regulations for intermediaries in the online gambling industry and initiate a public consultation process.

Road Ahead

- In recent times, India has witnessed a genuine uptick in e-sports, console gaming, mobile gaming, and game development, this growth was significantly aided by the pandemic.
- Future growth in the Indian gaming industry will be brought about as a result of rapid digitalisation and change, rising internet usage, and increasing smartphone penetration.
- Gaming experiences will continue advancing and eventually help the Indian gaming industry achieve remarkable heights.

Domestic Systemically Important Insurers (D-SIIs)

Syllabus: GS3/Indian Economy

Context:

- Recently, Insurance Regulatory and Development Authority of India (IRDAI) retained certain insurers in India as Domestic Systemically Important Insurers (D-SIIs).

About the D-SIIs:

- These are perceived as insurers that are 'too big or too important to fail' (TBTF).
- Life Insurance Corporation of India (LIC), General Insurance Corporation of India (GIC), and New India Assurance Co continue to be identified as D-SIIs for the year 2023-24.
- This identification is a continuation from the 2021-22 list of D-SIIs.

The Role of D-SIIs:

- D-SIIs refer to insurers of such size, market importance, and domestic and global interconnectedness, whose distress or failure would cause a significant dislocation in the domestic financial system.
- Therefore, the continued functioning of D-SIIs is critical for the uninterrupted availability of insurance services to the national economy.

Insurance Regulatory and Development Authority of India (IRDAI):

– It is a statutory body formed under an Act of Parliament, i.e., Insurance Regulatory and Development Authority Act, 1999 (IRDAI Act 1999).

a. It was established in 2000 following the recommendation of the Malhotra Committee report in 1999.

– It acts as the regulator of the insurance industry in India and oversees the functioning of the Life Insurance and General Insurance companies operating in the country.

Objectives:

– To protect the interest and fair treatment of the policyholder.

– To regulate the insurance industry in fairness and ensure the financial soundness of the industry.

– To regularly frame regulations to ensure the industry operates without any ambiguity.

T+0 Settlement Cycle (or Same Day Settlement)

Syllabus: GS3/Indian Economy

Context:

- The Indian Stock Market recently introduced the T+0 settlement cycle, marking a significant shift from the existing T+1 settlement cycle.

About the T+0 Settlement Cycle:

- The trades involving shares are settled on the same day they occur in the T+0 system. It means shares are transferred to the buyer's account and funds are deposited in the seller's account on the same day of the trade.
- It is a departure from the current T+1 cycle, where trades are settled by the next day.
- The T+0 settlement will be optional for 25 stocks and will be applicable only for trades executed between 9:15 a.m. and 1:30 p.m.

Phased Implementation:

- The T+0 settlement cycle will be executed in two phases.
- First Phase: Trades executed up to 1:30 pm will be considered for settlement, which must be completed by 4:30 pm.
- Second Phase: It extends trading time till 3:30 pm, discontinuing the first phase.

Impact on Investors and Traders:

- The T+0 settlement cycle is expected to benefit investors and traders by providing immediate liquidity.
- It means there will be increased trading opportunities and reduced settlement risks.
- The current T+1 system, sellers receive only 80% of their cash on the day of sale, with the remaining 20% withheld until the following day.
- However, with the new T+0 settlement system, sellers will have immediate access to 100% of their cash on the day of the transaction.

Source: IE**RBI Norms for Alternative Investment Funds****Syllabus: GS3/Economy****Context**

- The Reserve Bank of India (RBI) has modified norms for regulated entities (REs) concerning their investments in Alternative Investment Funds (AIFs).

About

- AIFs: It refers to any privately pooled investment fund, (whether from Indian or foreign sources), in the form of a trust or a company or a body corporate or a Limited Liability Partnership (LLP).
- Hence, in India, AIFs are private funds which are otherwise not coming under the jurisdiction of any regulatory agency in India.
- Need for the Regulations: There are concerns that some lenders were misusing the AIF route for evergreening loans, a practice where lenders extend new loans to pay off old ones.
- This forced banks and NBFCs to make steep provisions, and tightened capital flows for AIFs.
- Regulations: REs need to only set aside provisions to the extent of their investment in the AIF scheme which is further invested by the AIFs in a debtor's company and not the entire investment in the AIF scheme.
- With a view to ensuring uniformity in implementation among the REs, it is advised that downstream investments shall exclude investments in equity shares of the debtor company of the RE, but shall include all other investments, including investment in hybrid instruments.

Mushk budji Rice**Syllabus: GS3/Economy****Context**

- In a study recently published in Nature Scientific Reports mentioned that altitude and temperature play an important role in the development of aroma of Mushk budji Rice.

About

- It is the indigenous aromatic rice variety from Kashmir.
- It was on the verge of extinction owing to the prevalence of rice blast disease, its low yield, and lack of profitability. But a programme launched in 2007 by SKUAST scientists saw the crop make a slow comeback.
- Mushk budji Rice of Anantnag District in Jammu and Kashmir received the Geographical Indication Tag in 2023.

Employment Scenario in India

Syllabus: GS3/Indian Economy; Employment

Context:

- Recently, the International Labour Organisation (ILO) and the Institute of Human Development (IHD) together released the India Employment Report for 2024.

Key Findings of the India Employment Report (2024):

- Youth Unemployment: India's youth account for almost 83% of the unemployed workforce.
- The share of youngsters with secondary or higher education in the total unemployed has almost doubled from 35.2% in 2000 to 65.7% in 2022.

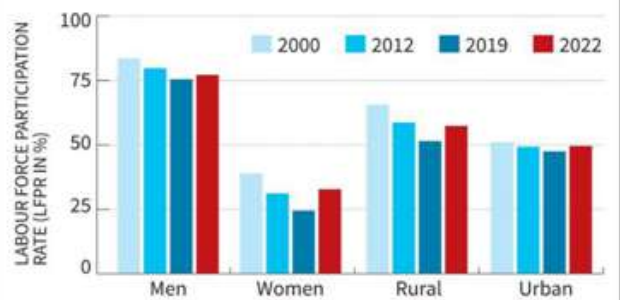
Do You Know?

- Employed:** Individuals who are currently engaged in economic activities.
- Unemployed:** Individuals who are seeking or available for work but are currently without employment.

- Labour Market Indicators:** The key labour market indicators such as the Labour Force Participation Rate (LFPR), Worker Population Ratio (WPR), and the Unemployment Rate (UR) showed a long-term deterioration between 2000 and 2018.
- However, these indicators witnessed an improvement after 2019.
- Employment Conditions:** Despite the improvements in labour market indicators, the employment conditions in India remain poor.
- The slow transition to non-farm employment has reversed, and women largely account for the increase in self-employment and unpaid family work.
- Almost 90% of workers remain engaged in informal work, while the share of regular work, which steadily increased after 2000, declined after 2018.
- There are widespread livelihood insecurities, with only a small percentage being covered with social protection measures.
- Skills Gap:** The report noted that India's large young workforce doesn't appear to have the skills to deliver — with 75% of youth unable to send emails with attachments, 60% unable to copy and paste files, and 90% unable to put a mathematical formula into a spreadsheet.
- Job Market:** India's job market saw a 2% Month on Month (MoM) decline in Nov 2023, with an overall 10% Year on Year (YoY) drop.
- Despite this, the Public Sector Undertakings (PSU) sector is expected to bridge the employment gap.
- Widening Gender Gap:** The lack of quality employment opportunities is reflected in the high level of joblessness among young people, especially among those who have achieved higher education.
- Many highly educated young people are unwilling to take on low-paying, insecure jobs that are currently available and would rather wait in the hopes of securing better employment in the future.

Employment blues

Labour participation for various sections increased slightly in 2022 (compared to 2019) but was still low vis-a-vis 2000



Policy Areas for Action Highlighted in Report:

- Promoting Job Creation:** The report emphasises the need for policies that foster job creation to absorb the large number of youths joining the labour force annually.
- Improving Employment Quality:** The quality of employment in India remains poor, with a large proportion of workers engaged in informal work.
- The report calls for measures to improve employment conditions and provide workers with better job security and benefits.

- Addressing Labour Market Inequalities: The report highlights the need to address persistent inequalities in the labour market, such as those based on gender, caste, and region.
- Strengthening Skills and Active Labour Market Policies: The report notes that a large proportion of India's youth lack the necessary skills for employment.
- It calls for stronger skills development initiatives and active labour market policies to enhance the employability of the youth.
- Bridging the Knowledge Deficits on Labour Market Patterns and Youth Employment: The report underscores the need for more research and data to understand labour market trends and the specific challenges faced by young people in the labour market.

International Labour Organisation (ILO):

- It is a specialised agency of the United Nations.
- It was established in 1919 by the Treaty of Versailles as an affiliated agency of the League of Nations, and became the first affiliated specialised agency of the United Nations in 1946.
- Headquarter: Geneva, Switzerland.
- India is a founder member of the ILO.
- Aim: To promote rights at work, encourage decent employment opportunities, enhance social protection and strengthen dialogue on work-related issues.
- Recognition:
 - a. It is the only tripartite UN Agency that brings together governments, employers and workers of 187 member States, to set labour standards, develop policies and devise programmes promoting decent work for all women and men.
- Nobel Peace Prize (1969): For improving peace among classes, pursuing decent work and justice for workers, and for providing technical assistance to other developing nations.
- Flagship Reports of ILO:
 - a. Global Wage Report;
 - b. World Employment and Social Outlook (WESO);
 - c. World Social Protection Report;
 - d. World of Work Report;

Related Government Initiatives To Boost Employment in India:

- Atmanirbhar Bharat Rojgar Yojana (ABRY): Launched as part of the Atmanirbhar Bharat package 3.0, this scheme incentivizes employers for creating new employment along with social security benefits and restoration of loss of employment during the Covid-19 pandemic.
- Pradhan Mantri Rojgar Protsahan Yojana (PMRPY): This scheme was launched to incentivize employers for the creation of new employment.
- National Career Service (NCS) Project: This project provides a variety of career-related services like job matching, career counselling, vocational guidance, information on skill development courses, apprenticeships, internships, etc.
- Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA): This act provides at least 100 days of guaranteed wage employment in a financial year to every rural household whose adult members volunteer to do unskilled manual work.
- Pradhan Mantri Garib Kalyan Rojgar Abhiyaan (PMGKRA): This initiative was launched to boost employment and livelihood opportunities for returnee migrant workers and similarly affected persons in rural areas.
- Pradhan Mantri Mudra Yojana (PMMY): This scheme facilitates self-employment by providing collateral-free loans up to Rs. 10 lakh to micro/small business enterprises and individuals.
- Garib Kalyan Rojgar Abhiyaan (GKRA): This initiative was launched to provide immediate employment and livelihood opportunities to the distressed and to saturate the villages with public infrastructure and creation of livelihood assets.
- PM GatiShakti: This is a transformative approach for economic growth and sustainable development, driven by seven engines, namely, Roads, Railways, Airports, Ports, Mass Transport, Waterways, and Logistics Infrastructure.

Conclusion:

- The employment situation in India is grim, with high unemployment rates, lack of skills, and gender disparities. The government initiatives such as Make in India, Start-up India, Digital India, Smart City Mission, Atal Mission for Rejuvenation and Urban Transformation, Housing for All, Infrastructure Development and Industrial Corridors are also oriented towards generating employment opportunities.
- However, there is a need for more robust policies and initiatives to improve the employment situation in the country.

EU Digital Markets Act

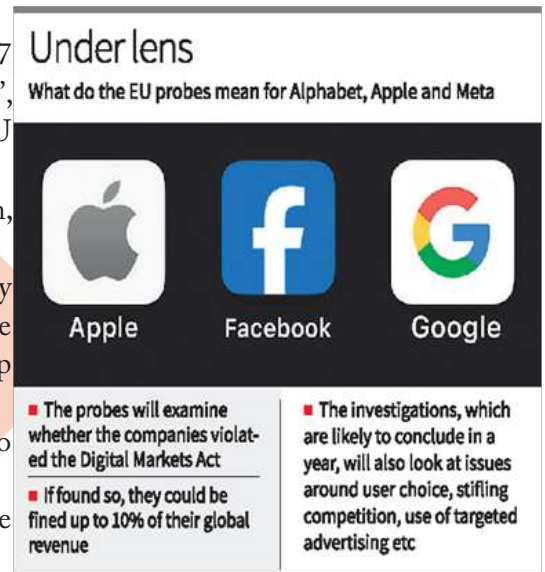
Syllabus: GS3/Economy

In Context

- Apple, Alphabet's Google and Meta Platforms will be investigated for potential breaches of the European Union's new Digital Markets Act.

About

- Came into Force: The DMA fully came into effect on March 7 and seeks to regulate large online companies called 'gatekeepers', whose products and services are used by some 450 million EU users.
- The DMA had designated six 'gatekeepers': Alphabet, Amazon, Apple, ByteDance (owners of TikTok), Meta and Microsoft.
- Aim: It aims to challenge the power of the tech giants by making it easier for people to move between competing online services like social media platforms, internet browsers and app stores.
- That should in turn open up space for smaller companies to compete.
- Fines: Violations could result in fines of as much as 10% of the companies' global annual turnover.



Laws in India Related to Fair Competition

Competition Act, 2002

- The Competition Act, 2002, as amended by the Competition (Amendment) Act, 2007, follows the philosophy of modern competition laws.
- Aim: Promoting and sustaining competition in markets, preventing anti-competitive practices, and protecting the interests of consumers.
- The Act replaced the erstwhile Monopolies and Restrictive Trade Practices Act.
- Abuse of Dominant Position: The Act prohibits entities with a dominant position in a market from abusing their dominance, such as imposing unfair or discriminatory prices, limiting production or supply to the detriment of consumers, or engaging in practices that restrict competition.
- Penalties and Enforcement: The Act provides for penalties for violations, including fines and orders to cease anti-competitive practices.
- It empowers the CCI to conduct inquiries, investigations, and impose penalties on entities found to be violating the provisions of the Act.

About Competition Commission of India (CCI)

- The Competition Commission of India has been established to enforce the competition law under the Competition Act, 2002.
- It comes under the Ministry of Corporate Affairs. It is a quasi-judicial body.
- The primary objective of the CCI is to ensure that there is no abuse of dominance by firms, prevent anti-competitive agreements, and regulate combinations (mergers and acquisitions) that could have adverse effects on competition in India.

- The Commission consists of a Chairperson and not more than 6 Members appointed by the Central Government.

Income and Wealth Inequality in India

Syllabus :GS 3/Economy

In News

- A new working paper, titled “Income and Wealth Inequality in India, 1922–2023: The Rise of the Billionaire Raj” released by World Inequality Lab

About the report

- The World Inequality Lab is a Paris based global research center focused on the study of inequality and public policies that promote social, economic and environmental justice.
- It combines data from national income accounts, wealth aggregates, tax tabulations, rich lists, and surveys on income, consumption, and wealth to arrive at the results.

Key findings

- Growth in average incomes: Between 1960 and 2022, India’s average income grew at 2.6% per year in real terms (that is, after removing the effect of inflation).
- Emergence of very high net worth individuals: The period between 1990 to 2022 witnessed a rise in national wealth and the emergence of very high net worth individuals (those with net wealth exceeding \$1 billion at market exchange rate; this number increased from 1 to 52 to 162 in 1991, 2011 and 2022 respectively).
- Rise in the percentage of income tax payers: The share of the adult population that filed an income tax return — which had remained under 1% till the 1990s — also grew significantly with the economic reforms of 1991.
- By 2011, the share had crossed 5% and the last decade too saw sustained growth with around 9% of adults filing a return in the years 2017–2020.
- Extreme levels of inequality in India: in 2022–23, 22.6% of India’s national income went to just the top 1%, the highest level recorded in the data series since 1922 — this is higher than even during the inter-war colonial period.
- India’s top one percent income share is among the very highest in the world, higher than even South Africa, Brazil, and the US.
- The top 1% wealth share stood at 40.1% in 2022–23 — also at its highest level since 1961 when the data series on wealth began.
- In 2022–23, India’s top 1% wealth share was higher than the US and China and closing in fast on Brazil.
- Poor data leading to likely underestimation of inequality: the quality of economic data in India is notably poor and has seen a decline recently.
- It is therefore likely that results represent a lower bound to actual inequality levels.

Factors

- The Indian income tax system might be regressive when viewed from the lens of net wealth.
- factors, including a lack of education, have trapped some people in low-paid jobs and depressed the growth of the bottom 50 percent and middle 40 percent of Indians.
- Since India, which won its Independence in 1947, opened its markets to foreign investment in 1992, its number of billionaires has surged

Suggestions and Way Ahead

- Implementing a super tax on Indian billionaires and multimillionaires, along with restructuring the tax schedule to include both income and wealth, so as to finance major investments in education, health and other public infrastructure, could be effective measures,” to address the rising inequalities.

Scope of Semiconductors industry

Syllabus :GS 3 /Economy

In News

- It has been argued that India will become a semiconductor manufacturing hub providing vast employment opportunities.

About Semiconductors

- A semiconductor is a material product usually composed of silicon.
- It represents a distinct class of materials that possess some of the electrical properties of both conductors and insulators.
- It can be used to control the flow of electric currents, and with exquisite precision.
- Each step in semiconductor fabrication demands ultra-high precision and harnesses a blend of diverse scientific principles.
- For example, to make the most advanced transistors, the photolithography process requires a light source emitting electromagnetic radiation at a wavelength of 13.5 nm.

Major players

- Dutch company ASML is the sole provider of photolithography machines for cutting-edge semiconductor technology worldwide.
- The American firms dominate the software tools the engineers use to design circuits, while the silicon wafer sector is led by Japan's Shin Etsu.
- The market for the actual task of fabrication is led by Taiwan's TSMC, with fabrication tools provided by Applied Materials and Lam Research, both headquartered in the U.S.
- The majority of intellectual property rights are held by British company Arm.
- The U.S. also imposed sanctions on Chinese tech companies, including bans on the acquisition of cutting-edge ASML equipment and high-end design software, for the same reason.
- In response, China has intensified efforts to bolster its domestic semiconductor production capabilities to meet local demand.

Status of India

- India boasts a leading role in chip design centred in Bengaluru.
- However, most of the intellectual property rights required to execute these designs are retained either by parent companies or by Arm, relegating India to being a mere user of their products.

Benefits

- Computing: The semiconductor industry produces microprocessors and memory chips, which are the primary components in computers, servers, and data centers. These devices are used in various industries, from finance and healthcare to manufacturing and logistics.
- Communications: Semiconductors are used to produce cell phones, satellite systems, and other communication devices. They are also used to create wireless communication systems, network equipment, and other hardware for data transmission.
- Energy: Semiconductors are used in the production of solar cells and other renewable energy systems. Power management applications also use semiconductors, including voltage regulators and power supplies.
- Automotive: Automotive electronics also use semiconductors, including engine control units, sensors, and safety systems. They are also used in electric vehicles and autonomous vehicles.
- Healthcare: Medical imaging, monitoring, and diagnostic equipment, as well as medical implants and devices, use semiconductors.
- Owing to their role in sectors like defence and automotives, semiconductors have also emerged as a focal point of geopolitical interest, with nations vying to establish semiconductor fabrication facilities within their borders and drawing industry leaders in with a plethora of incentives.

Challenge and Issues

- The semiconductor industry faces the challenges and opportunities of increased product demand in the immediate future.

- The growth of artificial intelligence (AI) and the Internet of Things (IoT) and the ongoing demands from the smartphone sector and other high-tech industries will place stress on the semiconductor supply chain.
- The challenge will be further complicated by ongoing international trade disputes, which may drive up the cost of semiconductor materials and interfere with global collaboration within the industry.
- India also currently lacks in original research in semiconductor design, where the future of the chip is decided.

Recent steps of Government

- The Government of India has launched the India Semiconductor Mission to develop a comprehensive semiconductor ecosystem, aiming to position India at the forefront of the global semiconductor industry and bolster youth employment prospects.
- The Union Cabinet recently approved setting up three semiconductor-making units, entailing an investment of Rs 1.26 lakh crore, as part of an attempt to cut India's dependence on imports to meet the requirements of chips
- Several initiatives have been launched to promote semiconductor production, including the Production Linked Incentive (PLI) scheme for the electronics sector.
- Additionally, the government has introduced the Design Linked Incentive (DLI) and other schemes such as Chips to Startup (C2S) and Scheme for Promotion of Electronic Components and Semiconductors (SPECS) to support the industry.
- the government has launched the “Semicon India program” to address the global chip shortage by encouraging manufacturers to establish their semiconductor industry setups

Conclusion

- Setting up semiconductor fabrication units or fabs requires significant investments and expertise.
- India is seeking a collaborative approach, building partnerships with like-minded nations to facilitate sustainable growth in the industry.
- India's talent pool is unparalleled, and the country is currently at a crucial point where manufacturing can grow rapidly and efficiently.
- India has the intellectual capacity, determination, and capability to emerge as a leading global research and development hub.
- It remains focused on its objective of strengthening the semiconductor industry, which, in turn, will stimulate the growth of the country's expanding electronics manufacturing and innovation ecosystem.

Karnataka's Draft Bill for Gig Workers

Syllabus: GS3/ Economy

Context:

- The Karnataka government plans to propose new legislation for the welfare of gig workers.

About:

- While the state government is yet to finalise the Karnataka Gig Workers (Conditions of Service and Welfare) Bill, 2024, it has shared a draft with stakeholders during a meeting last week.
- Major highlights of the draft are:
 - Strict mechanisms to ensure fair terms of contract and ensure income security,
 - Proper dispute and grievance redressal mechanisms,
 - Setting up of a state-level welfare board,
 - A central transaction monitoring system,
 - A provision to impose penalties on aggregators for violations, among others, and
 - Occupational safety and health of workers.
- After Rajasthan, Karnataka will be the second state to have a law for the welfare of gig workers.
- While the central government has included gig workers in the social security code that was passed by the Parliament in 2020, it has not been implemented as the government has yet to frame the rules.

Gig Economy

- The Gig economy, also known as the freelance economy or on-demand economy, refers to a labor market characterized by short-term, flexible work arrangements.
- The gig economy is about individual workers carrying out tasks for clients through the intermediation of a platform on a task-by-task basis.
- Gig workers: NITI Aayog defines ‘gig workers’ as those engaged in work outside of the traditional employer-employee arrangement.
- NITI Aayog’s report titled ‘India’s Booming Gig and Platform Economy’ defines a gig worker as “someone who engages in income-earning activities outside of a traditional employer-employee relationship, as well as in the informal sector”.
- Additionally, it defines those working with platforms such as Ola, Uber, Dunzo, Swiggy, Zomato and Urban Company as platform workers.

Recent trends in India

- In the past few years, especially after the Covid-19 pandemic, there has been a sharp rise in the number of people engaged in gig work, according to labour rights experts and activists.
- According to the NITI Aayog, 77 lakh (7.7 million) workers were engaged in the gig economy in 2020-21 and the workforce is expected to “expand to 2.35 crore (23.5 million) workers by 2029-30”.

Significance of the Sector:

- The gig economy is based on temporary, or freelance jobs, often involving connecting with clients or customers through an online platform.
- The gig economy can benefit workers, businesses, and consumers by making work more adaptable to the needs of the moment and the demand for flexible lifestyles.
- Time flexibility: Workers operating in the gig economy are allowed to work any of the hours they desire.
- Income flexibility: It is an increasingly attractive market due to the sheer flexibility that allows individuals to earn extra income.
- Size of the sector: As per the report, 47 percent of gig work currently is in medium-skilled jobs, 22 percent in high-skilled, and about 31 percent in low-skilled jobs.
- Drivers and sales persons accounted for more than 52 percent of the gig workers in 2019-20.
- When workers are classified by industries, the report said that 26.6 lakh gig workers were involved in retail trade and sales in FY20, and about 13 lakh were in the transportation sector.
- Roughly 6.2 lakh persons were in manufacturing and another 6.3 lakh in the finance and insurance activities.

Challenges/Issues:

- A civil society organisation, Janpahal’s ‘Respect and Integrity of Gig workers; Humanity and Trust in Service (RIGHTS)’ survey, has highlighted the following challenges.
- Long working hours: Almost a third of app-based cab drivers work for over 14 hours a day, while more than 83% work more than 10 hours and 60% work over 12 hours.
- Reflects caste equations: It noted that social disparities make the situation worse, with over 60% of the drivers from Scheduled Castes and Tribes working for over 14 hours a day, while only 16% from the unreserved category work such long hours.
- Low pay: The study report says that over 43% of participants in the study earn less than 500 a day or 15,000 a month, after deducting all their costs.
- The study found that 34% of app-based delivery persons earn less than 10,000 a month, while 78% of them are spending over 10 hours each day at work.
- Demographic trends: Out of 5302 cab drivers and 5028 delivery persons across eight cities participated in a 50-question survey, 78% of the respondents were in the age group of 21 to 40 years.
- Risky business: Due to the demanding work hours, the study found that drivers are physically exhausted, and exposed to an increased risk of road traffic accidents, especially due to the ‘10-minute delivery at the doorstep’ policy of certain e-commerce platforms.
- The report said that 86% of delivery persons found such policies “completely unacceptable”. The lack of social and job security creates additional stress and leads to potential health issues.

- Expenses exceed earnings: While 72% of the cab drivers said that they face difficulty in managing expenses, 76% of the delivery persons are struggling to make their ends meet.
- 68% of cab drivers' responses even show that their overall expenses exceed their earnings, which indicate how a vast number of app-based workers could be in debt-like situations.
- Huge deductions: 35% of the respondents reported the companies are deducting between 31-40% of commission rate per ride, while the officially claimed figure by the companies themselves is 20%.
- Customer misbehavior: Customer behaviour affects a significant majority (72%) of drivers in a negative way, while 68% of delivery persons are reportedly affected by it negatively," the report said.
- Inability to take leaves: It added that 41% of the drivers said they are unable to take even a single day off in a week; 48% of delivery persons too reported their inability to take a weekly off.
- Issue of ID deactivation: A glaring 83% of the drivers reported that the issue of ID blocking affects them negatively, 47% stated that this issue extremely affects them. In the case of delivery persons, this percentage is even higher at 87%.

Suggestions/Recommendations

- Social security measures: Authors of the study recommended stronger social security for app-based workers.
- Social security measures are required like paid sick leave, health access and insurance, retirement/pension plans and other contingency benefits.
- Oversight mechanism: They called on the government to exercise oversight on the fairness of algorithms and mechanisms used by platforms to monitor such workers.
- Skilling: It is recommended that skill gaps be bridged by carrying out assessments periodically and partnering with platform businesses for onboarding skilled women and persons with disabilities.
- It is also suggested to make aggregate data public to enable decision-making.
- Women in the gig economy: Companies should carry out gender sensitization and accessibility awareness programmes for workers and their families, particularly to promote the rights of women and persons with disabilities.

Way Ahead

- The gig economy is a growing trend, with many people attracted to the flexibility and freedom it offers. But an adequate regulatory mechanism in place is the need of hour.
- The gig economy is here to stay, and for many, it offers a desirable work style with flexibility and autonomy. But it also comes with challenges like income insecurity and lack of benefits, which needs to be dealt with collectively by the government, private sector and civil society.

Economic Inequality in India

Syllabus: GS3/Indian Economy

Context

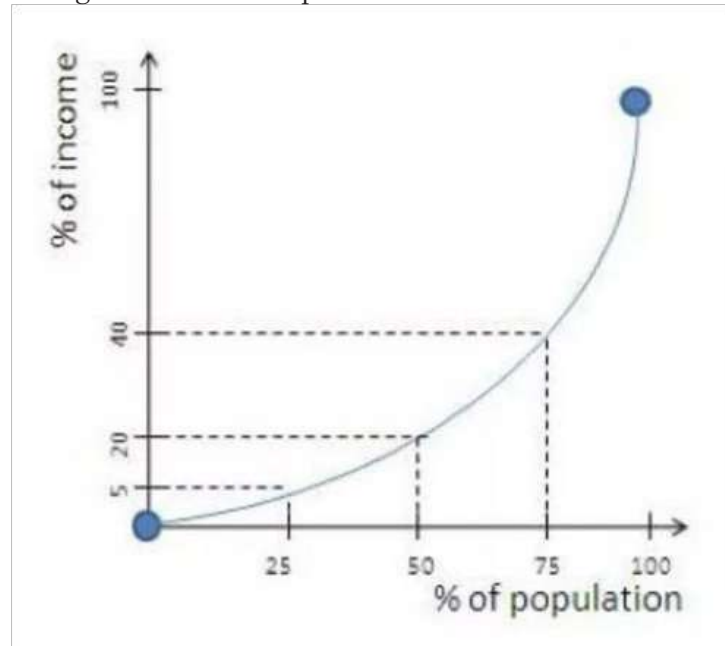
- Inequality is worsening in India with the share of top 1% in total income at new high as per the paper released by World Inequality Lab.

Major Findings

- Concentration of Wealth: Wealth is highly concentrated even within the top 1 percent.
- In 2022-23, the top 1 percent wealth share was 39.5 percent, 29 percentage points went just to the top 0.1 percent, 22 percentage points to just the top 0.01 percent and 16 percentage points to just the top 0.001 percent.
- Rise over the Years: In 1961, bottom 50 percent and top 1 per cent shares were identical; by 2022-23, the top 1 percent share was more than 5 times larger.
- Lack of Data: The quality of economic data in India is notably poor and has seen a decline recently. It is therefore likely that these new estimates represent a lower bound to actual inequality levels.

Do You Know?

- The Gini index is a measure of the distribution of income across a population.
- A higher Gini index indicates greater inequality, with high-income individuals receiving much larger percentages of the population's total income.
- Global inequality, as measured by the Gini index, has steadily increased over the past few centuries and spiked during the COVID-19 pandemic.



Reasons for Economic Inequality in India

- **Historical Factors:** India's history, including colonization and feudalism, has led to the accumulation of wealth in the hands of certain groups.
- These historical inequalities have persisted over time, influencing wealth distribution patterns.
- **Economic Policies:** Economic policies, including liberalization and privatization measures implemented since the 1990s, have spurred economic growth in certain sectors, benefitting those with access to capital and resources.
- However, these policies have also widened income and wealth inequalities, with the gains of economic growth disproportionately accruing to the wealthy.
- **Urban-Rural Divide:** There exists a significant gap in development between urban and rural areas.
- Urban centers tend to attract more investment and offer better job opportunities, leading to the concentration of wealth in these regions.
- **Access to Education and Opportunities:** Disparities in access to education persist, particularly among marginalized communities, exacerbating wealth inequality.
- **Informal Economy:** A significant portion of India's workforce is employed in the informal sector, where workers often lack job security, social protections, and access to formal financial services.
- The informal economy perpetuates economic vulnerability and contributes to income disparities.
- **Globalization and Market Forces:** The benefits of globalization have not been evenly distributed, leading to the concentration of wealth among a select group of individuals and corporations that are well-positioned to capitalize on global market trends.

Suggestions As per the Report

- The paper finds suggestive evidence that the Indian income tax system might be regressive when viewed from the lens of net wealth.
- A restructuring of the tax code to account for both income and wealth, and broad-based public investments in health, education and nutrition are needed to enable the average Indian, and not just the elites, to meaningfully benefit from the ongoing wave of globalisation.
- A "super tax" of 2 percent on the net wealth of the 167 wealthiest families in 2022-23 would yield 0.5 percent of national income in revenues and create valuable fiscal space to facilitate such investments.

- Addressing wealth disparity in India requires comprehensive policy measures aimed at promoting inclusive economic growth, improving access to education and opportunities, addressing social discrimination, combating corruption, and implementing progressive taxation and wealth redistribution policies.

E-Shram Portal

Syllabus: GS3/ Economy

In News

- The Supreme Court directed states and Union territories (UTs) to provide ration cards to all migrant labourers registered with the e-Shram portal within two months.

More about the News

- The authorities have failed to comply with the court's April 20, 2023 directions by which it had granted three months' time to them to provide rations cards to the labourers.
- Out of around 29 crore registrants on the e-shram portal, around 8 crore do not have ration cards and do not receive subsidized food grains under National Food Security Act (NFSA) 2013.

e-Shram portal

- The portal was launched in 2021 with the aim of creating a national database of unorganised workers (NDUW).
- It helps to implement social security services for unorganized workers.
- The portal uses Aadhaar to deliver social security benefits and ensure that the benefits are portable to migrant and construction workers at their workplaces.

Source: PIB

Fact Check Unit (FCU)

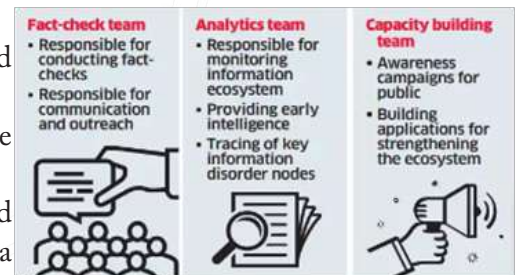
Syllabus: GS2/ Government Policies & Interventions

Context:

- Recently, the Union Ministry of Electronics and Information Technology notified the Fact Check Unit (FCU) under IT Rules of 2021 to monitor online content.

About the FCU:

- It was established under the Press Information Bureau (PIB) and started its operations in 2019.
- It aims to act as a deterrent to creators and disseminators of fake news and misinformation.
- It provides people with an easy avenue to report suspicious and questionable information pertaining to the Government of India for fact-checking.

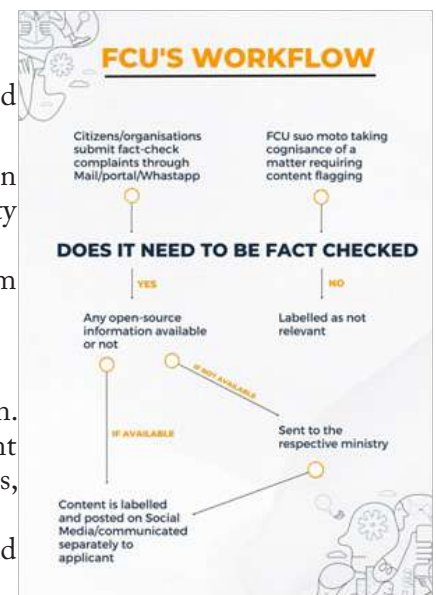


The Role of FCU:

- The FCU is tasked with identifying 'fake news' published online related to the government.
- Content marked by the FCU as 'fake or misleading' will have to be taken down by online intermediaries if they wish to enjoy legal immunity against third-party content.
- However, it raises concerns about potential impacts on press freedom and the government's role as an arbiter of truth.

The Process of Fact Checking:

- The FCU follows a two-step process to evaluate any received information.
- The received complaints are researched against authoritative Government sources like websites, press releases, government social media accounts, etc.
- The FCU then checks complaints with the concerned Ministry and creates content fit for social media.



Negative Interest Rates

Syllabus: GS3/Indian Economy

In News

- Recently, Japan ended its negative interest rate policy, as the Bank of Japan has raised its key interest rates, stepping away from the country's negative interest rate policy.

What are negative interest rates?

- The term negative interest rate refers to interest paid to borrowers rather than to lenders. Negative interest rates are when central banks make their commercial counterparts pay to park their excess cash at the institution.
- This method is usually adopted during deflationary periods when consumers hold too much money instead of spending as they wait for a turnaround in the economy.
- Consumers may expect their money to be worth more tomorrow than today during these periods. When this happens, the economy can experience a sharp decline in demand, causing prices to plummet even lower.
- Experts believe that in order to avoid the charges for parking the cash, banks use the money to lend more to businesses and consumers, which, in turn, helps financial growth.
- These negative interest rates were first introduced by Swedish Riksbank in 2009. This was followed by others such as the central banks of Denmark, Switzerland and then Japan.

Why did Japan introduce negative interest rates?

- It was a new measure introduced by Tokyo in its long battle against deflation, or declining prices.
- The Bank of Japan had hoped that by introducing negative interest rates it would encourage spending and inflation in an ageing society with a negative population growth.
- Moreover, the authorities believed that it would help in keeping the country's debt repayments manageable. Japan's national debt has floated above 100 percent of its GDP, making it the most indebted nation on the planet.

So, did negative interest rates help Japan?

- According to a Bloomberg report, they may have helped prevent deeper deflation in the economy. However, during the COVID-19 pandemic and the fallout from Russia's war in Ukraine, it affected the economy.
- Some experts also note that the prolonged use of such negative interest rates have cut into banks' profitability and helped push down the value of the yen.

Chemicals in Plastic Material

Syllabus: GS3/Environment, Conservation

Context:

- A recently released report from European scientists says there are 16,000 chemicals in plastic materials around the world.
- A quarter of which are thought to be hazardous to human health and the environment.

Key Points

- Health impacts:** Plastic chemicals can leach into water and food and have been linked to adverse health outcomes.
- Full life cycle of plastics:** To robustly solve plastic pollution, there is a need to look at the full life cycle of plastics and you have to address the chemicals issue.
- Recycling and reuse:** While the plastics industry has said any global treaty should promote recycling and re-use of plastic, only addressing plastic waste doesn't go far enough to protect people, the report's authors said.
- Greater transparency:** Scientists flagged the need for greater transparency on what chemicals — including additives, processing aids, and impurities — are going into plastics — including recycled products.
- A quarter of the identified chemicals lack basic information on their basic chemical identity,** the report said.
- Chemical complexity:** At the core of the problem is the chemical complexity of plastics. Often producers don't really know which kind of chemicals they have in their products and that comes from very complex value chains.

- Lack of regulation: Only 6% of the chemicals found in plastics are regulated internationally. Without regulatory pressure, there is no motivation to disclose what's in the plastics, the report said.

Plastic pollution in India: Status

- Huge waste generation: Increased substantially from 15.9 lakh tonnes per annum (TPA) in 2015-16 to 41.2 lakh TPA in 2020-21.
- Inadequate waste management infrastructure: Data from 2019-20 shows that 50% of the total plastic waste in the country (34.7 lakh TPA) remained unutilised, leading it to pollute air, water and soil, and ultimately affect human health.
- Data gap: The Public Account Committee noted a big data gap, observing from CAG's 2022 audit findings that many state pollution control boards (SPCBs) did not provide data on plastic waste generation for the period 2016-18 to the CPCB and there were inconsistencies in data shared by urban local bodies (ULBs) with SPCBs.
- Recycling inefficiencies: The existing recycling system is largely informal and unregulated, leading to low-quality recycled plastic and limited environmental benefits.

Measures required

- Reliable assessment method: Underlining gaps in data, the panel expressed the need to have a "reliable assessment" of the amount of plastic waste being generated and said it should be the first step towards managing the problem efficiently.
- Mandatory reporting: It recommended "mandatory" reporting of data online on the national dashboard.
- Comprehensive policy: A comprehensive policy is required for containing pollution caused by plastics.
- Alternatives: It observed that "finding a cost effective and dependable alternative to plastic" by providing funds for R&D was a prerequisite for its elimination.
- Awareness: Spreading awareness about eco-friendly alternatives and ill-effects of SUP is crucial.
- Other measures: Making implementing agencies accountable, promoting use of recycled plastic content and increasing recycling facilities may be taken to efficiently enforce the ban on SUP on ground.

Indian Government initiatives

- Plastic Waste Management Rules, 2016: This regulation prohibits manufacture, sale, and use of certain single-use plastic items like carry bags, straws, and cups.
- Ban on SUP: The ministry of environment had banned hard-to-collect/recycle, single use plastic (SUP) items with effect from July 1, 2022.
- Prohibition: Prohibited manufacture, import, sale and use of plastic carry bags thinner than 120 microns from December 31 2022.
- National Policy on Solid Waste Management, 2016: This policy emphasizes waste minimization, source segregation, and scientific processing, including plastic waste.
- EPR rules: It also notified extended producer responsibility (EPR) rules to streamline collection and recycling of plastic waste.
- Swachh Bharat Abhiyan: This mission includes promoting waste segregation at source, composting biodegradable waste, and setting up waste processing facilities, contributing to plastic waste management indirectly.
- Indian Swachhata League: It is a unique youth-led, inter-city initiative to promote engagement of young people in the Swachhata related activities.

Way Ahead

- Addressing plastic waste pollution requires a multi-pronged approach involving government, industry, civil society, and individual citizens.
- Effective implementation of existing regulations, technological advancements, and a shift towards a circular economy are crucial for a cleaner and healthier environment.

Why do Global Sea Surface Temperatures Matter?

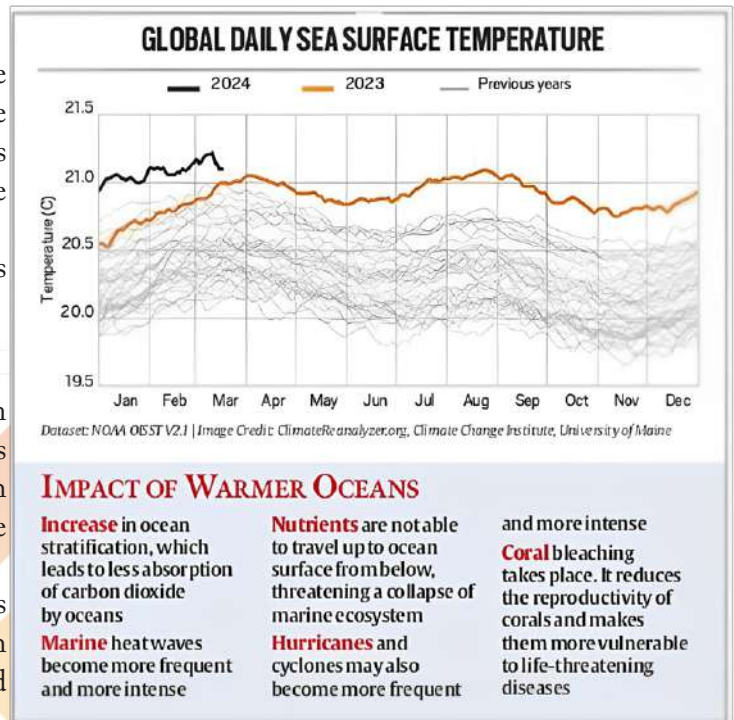
Syllabus: GS3/Environment, GS1/ Geography

Context:

- Almost 90 per cent of the extra heat trapped by greenhouse gases has been absorbed by the oceans, making them steadily warmer over the decades, according to the Copernicus Climate Change Service (C3S).

About:

- The average global sea surface temperature (SST) for February 2024 stood at 21.06 degree Celsius, the highest ever in a dataset that goes back to 1979, as per the Copernicus Climate Change Service (C3S).
- The previous record of 20.98 degree Celsius was set in August 2023.



Why are the oceans getting warmer?

- Human factors: Since the Industrial Revolution kicked off in the 19th Century, human activities such as burning fossil fuels have released high levels of greenhouse gases (GHGs) in the atmosphere.
- Carbon dioxide, methane, ozone, and nitrous oxide are some of the notable GHGs, which essentially trap heat in the atmosphere and contribute to global warming.
- As a result, the average global temperature has risen at least 1.2 degree Celsius above pre-industrial times.
- Warming Rate: The top part of the ocean is warming up about 24% faster than it did a few decades ago, and that rate is likely to increase in the future.
- Absorption by oceans: Almost 90 per cent of the extra heat trapped by GHGs has been absorbed by the oceans, making them steadily warmer over the decades.
- El Niño: A weather pattern that refers to an abnormal warming of surface waters in the equatorial Pacific Ocean has contributed to both ocean warming and rising global surface temperatures.

Why are rising sea surface temperatures a cause of worry?

- Impact on Marine Life: Higher ocean temperatures can have irreversible consequences for marine ecosystems.
- For instance, warmer oceans lead to an increase in ocean stratification — the natural separation of an ocean's water into horizontal layers by density, with warmer, lighter, less salty, and nutrient-poor water layering on top of heavier, colder, saltier, nutrient-rich water.
- The rise in temperatures made it harder for water layers to mix with each other: Due to this, oceans are able to absorb less carbon dioxide from the atmosphere and the oxygen absorbed isn't able to mix properly with cooler ocean waters below, threatening the survival of marine life.
- Effect on nutrient circulation: Nutrients are also not able to travel up to the surface of the oceans from below. This could threaten the population of phytoplankton — single-celled plants that thrive on the ocean surface and are the base of several marine food webs.
- Phytoplankton are eaten by zooplankton, which are consumed by other marine animals such as crabs, fish, and sea stars. Therefore, if the phytoplankton population plummets, there could be a collapse of marine ecosystems.
- Marine heat waves (MHWs): Warmer oceans cause marine heat waves (MHWs), which occur when the surface temperature of a particular region of the sea rises to 3 or 4 degree Celsius above the average temperature for at least five days.
- Between 1982 and 2016, such heat waves have doubled in frequency and have become longer and more intense, according to IPCC.

- MHWs are devastating for marine ecosystems as they contribute to coral bleaching, which reduces the reproductivity of corals and makes them more vulnerable to life-threatening diseases and also impact the migration pattern of aquatic animals.
- Extreme weather events: According to several studies, higher ocean temperatures may also result in more frequent and more intense storms like hurricanes and cyclones.
- Warmer temperatures lead to a higher rate of evaporation as well as the transfer of heat from the oceans to the air. That's why, when storms travel across hot oceans, they gather more water vapor and heat. This results in more powerful winds, heavier rainfall, and more flooding.
- Deoxygenation and Sea-Level Rise: Ocean warming leads to deoxygenation, a reduction in the amount of oxygen dissolved in the ocean and sea-level rise resulting from the thermal expansion of seawater and continental ice melting.

Suggestions/Recommendations

- Adhere to Paris agreement goals: Limiting global warming to 1.5 degrees Celsius would reduce the increase in exposure of agricultural land to drought by between 21% , 80% of the increased human exposure to heat stress can be avoided and also economic damages due to fluvial flooding can be reduced.
- Enhanced efforts: The researchers warned that more effort is needed to reduce global warming, as currently the policies in place globally are likely to result in 3 degrees Celsius of global warming.
- Expansion of protected area: The findings also showed that an expansion of protected area networks is necessary in order to deliver climate resilient biodiversity conservation.
- Mitigation as well as adaptation: Greater emphasis needs to be placed on both climate change mitigation and climate change adaptation to avoid large increases in risk to both human and natural systems.
- Restore ecosystems: A good way to combat the effects of climate change on natural systems and soak up carbon from the atmosphere is to restore ecosystems to their natural state. This has the additional benefit of restoring the natural capital bank in these areas.

Way Ahead

- These disastrous consequences of global warming are set to become worse as the world continues to get warmer.
- The World Meteorological Organisation (WMO) in its 2023 State of Global Climate report said there was a 66 percent chance that at least one of the years between 2023 and 2027 would cross the threshold of 1.5 degree Celsius above pre-industrial levels.
- The way to avoid or blunt the aforementioned consequences is to reduce GHG emissions.

Source: IE

Investments into Startups through Startup Registry

Syllabus :GS 3/Economy

In News

- The government is planning to facilitate investments into startups through a registry called the Bharat Startup Ecosystem Registry.

About Bharat Startup Ecosystem Registry

- It is part of the StartUp India programme and aims to unite and support the diverse stakeholders of India's startup ecosystem
- It aims to help startups attract investments from domestic as well as global players and create a transparent system for these ventures.
- It serves as a comprehensive database encompassing various categories such as investors, incubators, academia, government bodies, mentors, and industry bodies.

Startup Ecosystem in india

- India has emerged as the 3rd largest ecosystem for startups globally with over 1,12,718 DPIIT-recognized startups across 763 districts of the country as of 03rd October 2023.

- India ranks 2nd in innovation quality with top positions in the quality of scientific publications and the quality of its universities among middle-income economies.
- In India, 114,902 entities were recognized as startups under the flagship Startup India initiative
- Of the total, 54,569 DPIIT-recognized startups have at least one woman director.
- The innovation in India is not just limited to certain sectors.
- Various new sectors such as DeepTech, SpaceTech, Artificial Intelligence, and EVs have broadened the Indian startup landscape.

Significance

- The Indian Unicorns are flourishing in the fast-paced and dynamic economy of today.
- These startups are not only developing innovative solutions and technologies but are generating large-scale employment.
- Many startups in India are operating in remote areas with the aim to support the overall local community including the economy.
- Startups are helping the EV space to create a sustainable ecosystem in collaboration with the government to further boost the transition
- There are numerous innovative ideas focused on better patient management, patient data analysis, and insurance claim management that startups are addressing to boost the healthcare sector in India.
- Over the past decade, women played a significant role in driving India's entrepreneurial advancements.
- Former Niti Aayog CEO and India's G20 Sherpa Amitabh Kant called India's start-ups a "national asset" that have grown to be collectively worth \$350 billion in the last eight years.

Initiatives

- Startup India initiative: Launched in January 2016, the Startup India initiative aims to build a strong homegrown startup ecosystem while nurturing innovation and encouraging investments.
- The DPIIT-recognised startups get access to a variety of incentives under schemes including Fund of Funds for Startups (FFS), Startup India Seed Fund Scheme (SISFS) and Credit Guarantee Scheme for Startups (CGSS).
- The Startup India Seed Fund Scheme : It has been approved for four years, from FY22, with an outlay of 945 crore.
- It aims to provide financial assistance to startups for proof of concept, prototype development, product trials, market entry and commercialization.
- Startup Mahakumbh: The government is also organizing a two-day Startup Mahakumbh to showcase India's startup prowess, and foster collaboration and growth within the ecosystem.
- The government's push toward green mobility unlocks enormous opportunities for businesses to explore and create charging infrastructure, battery recycling, and energy storage solutions
- Startup20: With the introduction of the first-ever engagement group, Startup20, under India's G20 presidency, the Indian startup ecosystem is making strides toward global recognition and impact.
- This initiative emphasises the importance of startups in driving economic growth and innovation and the country's commitment to promoting the ecosystem globally.
- The private sector is also playing an increasingly important role in supporting entrepreneurs.
- A policy for start-ups in the deep tech space is in the final stages of inter-ministerial consultations and it could be released soon.
- During her Interim Budget speech, the Finance Minister had announced a Rs 1 lakh crore fund to provide long-term, low-cost or zero-interest loans for research and development.
- Other Steps: Atal Innovation Mission, and Production-Linked Initiative schemes (PLI) create an environment conducive to their success and growth.

Challenges

- Despite initiatives launched by the government, many enterprises still face difficulties navigating the regulatory environment and obtaining the necessary approvals and licences for operation.
- Another challenge is the lack of infrastructure
- A major challenge that businesses face is the need for more skilled talent.

- Startups hitherto exist mostly on the urban landscape
- Social enterprises often face difficulty in securing investment, as many investors are still cautious about investing in untested business models and technologies.
- 2023 was a challenging year for Indian start-ups.
- They raised a total of \$8.3 billion – the lowest they have raised since 2016 when there were much fewer of these firms.

Conclusion and Way Forward

- Indian startups are diverse, encompassing domains ranging from health and climate tech to clean energy and deep tech.
- They are well-positioned to take advantage of the opportunities presented by the sunrise sectors, industries poised for rapid growth and likely to play a significant role in driving the country's economic progress.
- The scope of impact and scalability of sunrise and sustainable startups in the future is enormous.
- While significant steps have been taken in recent years to boost the startup ecosystem, a lot more still needs to be done for India to emerge as a global entrepreneurial hub.
- Incentivisation schemes to fast-track adoption such as Drone and Kisan Shakti should be expanded to include emerging technologies in other sectors as well.

Reserve Bank of India (RBI) integrated Ombudsman Scheme (RB-IOS)

Syllabus: GS 3/Economy

In News

- The number of complaints filed under the Reserve Bank's ombudsman schemes increased by over 68 per cent to 7.03 lakh in the fiscal 2022-23.

About RB-IOS

- The RB-IOS was introduced on November 12, 2021.
- It integrates the erstwhile three Ombudsman schemes of RBI namely, (i) the Banking Ombudsman Scheme, 2006; (ii) the Ombudsman Scheme for Non-Banking Financial Companies, 2018; and (iii) the Ombudsman Scheme for Digital Transactions, 2019
- The Scheme simplifies the grievance redress process at RBI by enabling the customers of Regulated Entities (REs) to register their complaints at one centralised reference point.
- RB-IOS, 2021 covers all commercial banks, Non-Banking Financial Companies (NBFCs), Payment System Participants, most Primary (Urban) Cooperative Banks, and Credit Information Companies.
- The objective of the Scheme is to resolve the customer grievances involving 'deficiency in service' on part of REs in a speedy, cost-effective and satisfactory manner.

Mutual Fund Stress Test

Syllabus :GS 3/Economy

In News

- Mutual fund (MF) houses have started releasing a Sebi stress test report, mentioning the number of days they will require to liquidate 50% and 25% of their mid-and-small-cap schemes portfolio.

What is a stress test?

- It determines the time within which an investor can recover investment in the event of a downturn in the equity market and a subsequent surge in investor redemptions.
- Mutual fund companies conduct these stress tests to assess the liquidity of small and midcap portfolios.
- As part of the test, they check how quickly a fund manager can sell small and mid-company stocks if many investors put in requests to redeem their units.

Importance

- It provides investors with insights into how their mutual fund investments might perform under adverse market conditions.

- By understanding the potential risks and vulnerabilities in the fund's portfolio, investors can make more informed decisions and manage their expectations regarding potential losses during market downturns.

Tobacco Board

Syllabus :GS 3/Economy

In News

- The Tobacco Board has authorised a crop size of 100 million kg for Karnataka during the year 2024-25.

About Board

- the Government of India under the Tobacco Board Act of 1975, established the Tobacco Board, in place of the Tobacco Export Promotion Council.
- It came into existence from 1-1-1976 and opened its headquarters at Guntur in Andhra Pradesh, India.
- Main Activities : Constant monitoring of the Virginia tobaccomarket, both in India and abroad and ensuring fair and remunerative prices to the growers and reducing wide fluctuations in the prices of the commodity.
- Recommending to the Central Government the minimum prices to be fixed for exportable Virginia tobacco with a view to avoiding unhealthy competition amongst the exporters

Do you know ?

- Tobacco is one of the important commercial crops grown in India.
- During 2022-23, India has a prominent place in the production of tobacco in the world.
- During 2021, India stands as 2nd largest country in production (FAO Stat data, 2021) and 4th largest exporter of unmanufactured tobacco in the world (ITC Trademap data 2021). India produces different styles of Flue Cured Virginia tobacco, which vary in their physical and chemical characteristics.

India's First Integrated Oil Palm Processing Unit by 3F Oil Palm

Syllabus: GS3/ Economy

In News

- India's first integrated oil palm processing unit by 3F Oil Palm started its commercial operations.

About

- Situated in Arunachal Pradesh's Roing, this project aligns with Mission Palm Oil under the National Mission on Edible Oils – Oil Palm (NMEO-OP).
- It is a vital step in India's journey towards self-reliance in edible oils.

National Mission on Edible Oils – Oil Palm (NMEO-OP)

- About: Centrally sponsored scheme launched August 2021. Scheme offers financial subsidies to farmers for various activities related to oil palm cultivation.
- Targets to increase area of oil palm to 10 lakh hectares from 3.5 lakh ha during 2019-20 by 2025-26.
- Under NMEO-OP the cost will be shared as 60:40 between the Central and the State Government for General states and 90:10 for NE states and UT.
- Aim & Objectives: Increase India's domestic production of edible oils by promoting the cultivation of oil palm trees, reduce dependence on imports and enhance farmers income and livelihood.

Palm Oil

- It is widely used edible vegetable oil derived from the fruit of the oil palm tree. Around 90% of the world's oil palm trees are grown on a few islands in Malaysia and Indonesia.
- India is the world's largest palm oil importer & second largest consumer of palm oil.
- Indonesia and Malaysia are the two main exporters of palm oil to India at 61% and 32% respectively in 2020.

Vocal For Local Initiative To Promote Grassroots Entrepreneurship

Syllabus: GS3/Economy

Context

- The NITI Aayog launched the ‘Vocal for Local’ initiative as part of the Aspirational Blocks Programme.

About

- The initiative aims to bolster local economies and promote grassroots entrepreneurship.
- It is being implemented in partnership with Government e-Marketplace (GeM) and Open Network for Digital Commerce (ONDC) platforms.

Vocal for Local initiative

- Vocal for Local is a concept that urges Indians to back native products, stimulating economic advancement and self-sufficiency.
- It asks citizens to prioritize and advocate for goods produced locally, thereby strengthening domestic industries.

Benefits of Vocal For Local Initiative

- Encouraging the purchase of locally made products stimulates economic growth by supporting local businesses, artisans, and manufacturers.
- Small and medium-sized enterprises are the backbone of India and Vocal for Local helps in strengthening these enterprises by providing them with increased visibility and market access.
- Local production often implies reduced transportation and carbon footprint, contributing to environmental sustainability.
- Many locally made products in India are deeply rooted in the country’s rich cultural heritage and traditions. The initiative helps preserve indigenous crafts and traditions, safeguarding cultural diversity.
- Vocal for Local fosters a sense of community empowerment by encouraging people to take pride in their local products and businesses.

The Aspirational Blocks Programme (ABP)

- The Aspirational Blocks Programme (ABP) was launched in 2023.
- Objective: ABP focuses on improving governance to enhance the quality of life of citizens in the most difficult and relatively underdeveloped blocks of India.
- 500 blocks from 329 districts across 27 states and 4 Union Territories of India are part of the programme.
- The Programme strategy is based on convergence of existing schemes, defining outcomes, and monitoring them on a constant basis.
- 40 key performance indicators (KPIs) were chosen to measure progress of the blocks which have been grouped into 5 themes.

Government e-Marketplace (GeM)

- GeM is the Public Procurement Portal for procurement of goods and services for all Central Government and State Government Ministries, Departments, Public Sector Units (PSUs) and affiliated.
- GeM endeavors to make the public procurement process transparent, efficient and inclusive.
- It is a 100 percent government owned company set up under the aegis of Department of Commerce, Ministry of Commerce and Industry.
- It provides the tools of e-bidding, reverse e-auction and demand aggregation to facilitate the government users.

Open Network for Digital Commerce (ONDC)

- ONDC is a network based on open protocol and will enable local commerce across segments, such as mobility, grocery etc to be discovered and engaged by any network-enabled application.
- It is an initiative of the Department for Promotion of Industry and Internal Trade (DPIIT) under the Ministry of Commerce and Industry.
- Objective: The platform aims to create new opportunities, curb digital monopolies and by supporting micro, small and medium enterprises and small traders and help them get on online platforms.

Boosting Exports from MSMEs

Syllabus: GS3/Indian Economy

Context

- NITI Ayog has released a report named 'Boosting Exports from MSMEs' which includes measures for boosting e-commerce exports.

About MSMEs

- **Contribution in Economy:** MSMEs are often called the powerhouse of the Indian economy; they account for more than 11 crore jobs and contribute around 27% of India's GDP.
- **Employment Generation:** The sector consists of around 6.4 crore MSMEs, with 1.5 crore of them registered on the Udyam portal and employs around 23% of the Indian labor force, making it the second-largest employer in India after agriculture.
- **Output and Exports:** They account for 38.4% of the total manufacturing output and contribute 45.03% of the country's total exports.

Under-utilized Potential of Exports of MSMEs

- Exports represent an enormous and under-utilized opportunity for the MSME sector.
- Sectors where Indian MSMEs can participate and compete in export markets include handicrafts, handloom textiles, ayurveda and herbal supplements, leather goods, imitation jewellery and wooden products.
- Globally, these sectors constitute substantial markets exceeding USD 340 billion, whereas their domestic market is considerably smaller.

Challenges:

- It proves more challenging for small enterprises to enter foreign markets, adhere to compliance requirements, achieve cost-effective production, and efficiently manage logistics for clients.
- However, the emergence of both broad and niche e-commerce marketplaces addresses many of these barriers.

Recommendations to Boost MSME Exports:

- **Create One Stop Information Channel for Exporters:** India has several portals that help exporters access information, most of which offer incomplete or outdated information.
- Therefore, creating a one stop information data intelligence portal using AI based interface will be essential to impart information to MSMEs.
- **Create National Trade Network (NTN) as Comprehensive Trade Portal:** Currently an exporter needs to navigate multiple portals to get necessary approvals.
- This difficulty can be eliminated by creating an end-to-end national trade portal (NTN) which will provide seamless experience to exporters including answering queries and resolution of any gaps in paperwork.
- **Promote E-commerce Exports:** Access to the market consistently emerges as a significant obstacle hindering MSME exports.
- According to Global Trade Research Initiative's (GTRI) report, in 2022 MSMEs in China are already exporting goods worth over \$200 bn through E-commerce platforms while India's e-commerce export is barely \$2 bn.
- One key reason for this gap is the cumbersome compliance process associated with exports, especially when it comes to payment reconciliation, which is particularly challenging for a new or small exporter.
- **Promote Ease of Merchandise Exports:** Ease of Doing Business should be particularly targeted at MSME exporters.
- For example, MSMEs can be offered relaxation from certain compliance requirements for a period and forgiven on errors as they begin to learn requirements of export markets.
- On the other hand, a process must be created for time bound disbursement of incentives so that working capital is not blocked for MSMEs.
- **Improve Access to Export Finance:** Access to finance is regularly seen as a key bottleneck for MSMEs.
- The current uptake of ECGC schemes is only 10% and the government must create an incentive package to increase it to 50% or more.

- Finally, a single marketplace can be created, like in the case of higher education loans, where all providers of export credit can compete for business and help reduce the cost to MSMEs.
- Ensure Accurate Measurement: Currently, a dependable single data source for MSME exports is lacking.
- Establishing a reliable depiction of MSME exports involves integrating DGFT trade data with GST and income tax data.
- This fusion of datasets, utilizing PAN numbers as the common identifier, will provide an accurate portrayal of MSME exports.

Conclusion

- Overall, the potential of MSMEs to grow exports is enormous.
- This potential can be realized through some pragmatic measures which reduce the cost and friction of doing business for these firms.

India to become upper middle-income country by 2031

Syllabus: GS3/Indian Economy

Context

- The Indian economy is expected to double to USD 7 trillion with a growth trajectory that positions India to attain upper middle-income status by 2031, said ratings agency Crisil recently.

Major highlights of the Crisil India Outlook report

- After a better-than-expected 7.6 per cent this fiscal, India's real GDP growth will likely moderate to 6.8 per cent in fiscal 2025.
- It said that the next seven fiscal years (2025-2031) will see the Indian economy crossing the USD 5 trillion-mark and inching closer to USD 7 trillion.
- A projected average expansion of 6.7 per cent in this period will make India the third-largest economy in the world and lift per capita income to the upper-middle income category by 2031.
- Crisil expects the economy to expand to USD USD 6.7 trillion by fiscal 2031.
- India, with a GDP size of USD 3.6 trillion, is currently the fifth largest economy in the world, after the US, China, Japan and Germany.
- Crisil report said near- and medium-term challenges to growth outlook would come from geopolitics, slowing potential growth from an uneven global recovery, climate change and technological disruptions.

What does upper middle class status mean?

- As per World Bank definition, lower-middle income countries are those with per-capita income of USD 1,000-4,000, and upper-middle income countries are those with per capita income between USD 4,000-12,000.
- Fiscal 2031 will mark the year when India enters the club of upper middle-income countries with per-capita income rising to USD 4,500, Crisil said.

Drivers for the growth

Traditional Growth Engines:

- Young Population: India boasts a large and young population, contributing to a growing workforce and a vibrant domestic market for consumer goods.
- Rising Disposable Income: As the economy expands, people have more money to spend, which stimulates businesses and drives economic activity.
- Agriculture: Though its share of GDP is decreasing, agriculture remains a significant employer and contributes to food security, enabling growth in other sectors.

Emerging Growth Drivers:

- Digitalization: India is experiencing a rapid digital transformation. This includes the growth of e-commerce, digital payments, and a booming startup scene.
- Manufacturing Push: India's manufacturing sector is at a sweet spot due to high capacity utilisation across key sectors and the initiatives like "Make in India" aim to boost domestic manufacturing, creating jobs and reducing dependence on imports.

- **Services Sector:** India has a strong services sector, particularly in IT and business process outsourcing (BPO). This sector is a major source of foreign investment and exports.
- **Infrastructure Development:** Investments in infrastructure like roads, bridges, and ports are crucial for connecting markets, improving logistics, and attracting businesses.

Additional Factors:

- **Private Consumption:** Recent reports highlight a surge in private consumption as a major driver of economic growth, with people spending more on goods and services.
- **Investment:** A gradual rise in private and government investment is another positive indicator.

Challenges on the way

Macroeconomic Issues:

- **Unemployment and Underemployment:** Despite economic growth, a significant portion of the workforce remains unemployed or underemployed. This creates weak demand for goods and services.
- **Inflation:** Rising prices can erode purchasing power and discourage investment.
- **High Fiscal Deficit:** The government's spending may exceed its income, leading to higher debt and potentially impacting social programs.
- **Balance of Payments Concerns:** India's import bill can be high, putting pressure on the rupee's exchange rate.

Structural Issues:

- **Infrastructure Bottlenecks:** Inadequate infrastructure in areas like power, transportation, and irrigation limits business efficiency and discourages investment.
- **Skill Gaps:** The education system might not be producing enough graduates with the skills needed by the modern workforce.
- **Agricultural Distress:** Low farm incomes, coupled with unpredictable weather patterns, can hold back rural development.

Other Challenges:

- **Inequality:** The gap between rich and poor continues to widen, hindering inclusive growth.
- **Red Tape and Corruption:** Bureaucratic hurdles and corruption can impede business activity and investment.
- **Impact of Global Events:** External factors like global economic slowdowns or trade wars can affect India's export-oriented industries.

Measures needed

Investment and Infrastructure:

- **Public & Private Investment:** Increase public and private investment in infrastructure development projects, like the National Infrastructure Pipeline, to improve connectivity and logistics.
- **Ease of Doing Business:** Further streamline regulations and reduce red tape to make it easier for businesses to invest and operate in India.

Human Capital Development:

- **Education & Skill Development:** Focus on improving the quality of education and skilling the workforce to meet the demands of the job market, particularly in high-growth sectors.
- **Healthcare:** Invest in improving healthcare infrastructure and affordability to create a healthier and more productive workforce.

Boosting Manufacturing and Exports:

- **Production Linked Incentive (PLI) Schemes:** Expand successful PLI schemes that incentivize companies to manufacture in India, boosting exports and creating jobs.
- **Free Trade Agreements (FTAs):** Negotiate strategic FTAs to increase access to foreign markets for Indian goods and services.

Rural & Agricultural Development:

- **Agricultural Reforms:** Implement reforms to improve farm productivity, reduce post-harvest losses, and integrate farmers into national and global supply chains.
- **Rural Infrastructure:** Develop rural infrastructure, including irrigation facilities, storage, and transportation networks, to improve agricultural outcomes.

Entrepreneurship and Innovation:

- **Startup Ecosystem:** Foster a vibrant startup ecosystem by providing easier access to funding, mentorship, and co-working spaces.
- **Innovation in Key Sectors:** Promote research and development in key sectors like clean energy, artificial intelligence, and biotechnology.

Fiscal Consolidation and Sustainability:

- **Government Spending:** Maintain fiscal discipline by prioritizing productive government spending and reducing wasteful expenditure.
- **Tax Reforms:** Consider tax reforms to broaden the tax base, simplify the tax structure, and incentivize investment.

Digital Economy:

- **Digital Infrastructure:** Invest in expanding digital infrastructure, including broadband internet access, to accelerate digital adoption across the economy.
- **Digital Literacy:** Enhance digital literacy programs to bridge the digital divide and empower people to participate in the digital economy.

Way Forward

- Continuous reforms, enhanced global competitiveness and moving up the value chain will be required to achieve the desirable goals set by India.



GUIDANCE
G R O U P

Chapter- 9

Yojana April 2024

1: Traditional Art Forms in the Digital Age

Introduction

- Art reflects the creative potential of the human mind.
- India boasts a rich cultural and artistic heritage.
- The country is home to diverse art forms passed down through generations.
- Some forms have adapted to new materials, while others remain largely unchanged.
- Each art form is unique and highly regarded. Traditionally found in murals, these arts are now expressed on various mediums (canvas, paper, linen).

Art Forms of India

1. Bhil Paintings

- Represent an integral part of the Bhil community's artistic expression.
- Characterized by striking use of dots and vibrant natural colors.
- Depict the beauty and serenity of nature.

2. Pattachitra Artwork

- A traditional art form from Odisha and West Bengal.
- Employs cloth-based scroll paintings.
- Features highly detailed and well-designed mythological scenes.

3. Madhubani Paintings

- Also known as Mithila painting, originating from the Mithila region of Bihar.
- Considered one of the earliest and most celebrated art forms of India.
- Traditionally created using rice flour, twigs, and natural colors.
- Depict gods, goddesses, and scenes from daily life.

4. Warli Art Form

- One of India's oldest art forms, originating from the Warli tribes.
- Uses circles, triangles, and squares to depict everyday activities like hunting, fishing, festivals, and dances.
- Paintings typically feature a red ochre or black background with white shapes.

5. Mandana Art

- An ornamental tribal art form practiced throughout India.
- Originated in Rajasthan but found in many parts of the country.
- Traditionally created on walls and floors.
- Expresses the customs and cultures of the people through simple yet beautiful paintings.

6. Tanjore Paintings

- A traditional South Indian painting style originating from Thanjavur (Tanjore) in Tamil Nadu.
- Paintings are embellished with cut glass, precious/semi-precious stones, and gold leaves.
- Primarily depict gods and goddesses, with birds, flowers, and animals as recurring themes.
- The use of gold leaf creates a lasting shine and brilliance.
- Paintings are meticulously crafted using ancient techniques.

2: Popular Music in India

Popular Music in India

- Popular music is a recent genre derived from traditional music.
- It prioritizes mass appeal and entertainment over strict rules.

- Its rise stems from the demand for fresh sounds in contemporary music.
- Popular music integrates lyrics with melodies, aiming to be pleasurable and relatable.

Natyasangeet: The Seed of Popular Music

- Popular music is diverse, encompassing various forms like film music, band music, and devotional songs.
- The decline of royal patronage for classical music led to a shift towards public support.
- To gain popularity, classical music transformed into shorter, more entertaining compositions.
- These compositions were featured in theatre productions, birthing “Natyasangeet” (theatrical music).
- Natyasangeet’s popularity stemmed from its innovative embellishments, melodies, lyrics, and vocal quality.

Film Music: A Driving Force

- The 1980s saw a significant change in film music with advancements in sound technology.
- Pioneering music directors like R.D. Burman and A.R. Rahman revolutionized film music.
- The shift from single-track to multi-track recording opened doors for “new age music” or popular music.
- While single-track recordings relied heavily on talented musicians, multi-track recordings offer more creative freedom.
- Film songs continue to be an integral part of storytelling in modern Indian cinema.

Regional Popular Music

- “Bhavasangeet” (light music) is a popular genre found across various regional languages in India.
- Bhavasangeet prioritizes emotions and lyrics over powerful vocals.
- Popular music’s lighter and shorter format makes it more accessible to a wider audience.
- The diverse range of musical forms contributes to the richness and vastness of Indian music.

Glossary

- Natyasangeet: Theatrical or dramatic music, a popular form of classical music in musical plays.
- Bhavasangeet: Light music emphasizing melody, lyrics, and emotions.
- Abhang: Light classical music with timeless messages, often written by saints.
- Bhajan: Devotional light classical songs or hymns sung in praise of god.
- Bhaktigeete: Devotional light music songs.
- Natyageete: Popular semi-classical songs from musical plays.
- Sangeet Natak: A musical play with semi-classical songs.

3: Folk Art Reimagined in the Digital Age

Challenge and Opportunity

- Integration of technology offers a chance for folk art to evolve:
- Reach wider audiences through digital dissemination.
- Transcend geographical and cultural boundaries.
- The challenge is to adapt these art forms while preserving their cultural significance in a rapidly changing world.

Folk Art: Identity, Change, and Adaptation

- Deeply rooted in cultural specifics of communities.
- Preserves unique customs and fosters social cohesion.
- Shapes cultural identity of communities and regions.
- Reflects collective consciousness and historical legacy.
- Unlike classical art forms, folk art is dynamic and adaptable:
- Responds to contemporary influences and trends.
- Globalization fosters cross-cultural influences.
- Folk traditions are shifting from their original cultural contexts.

The Transformative Power of Live Performances

- Live performances are integral to the artistic experience, fostering connection between artist and audience.
- Concerns exist about virtual mediums adequately conveying the nuances of traditional performances.

- Live performances by skilled artists can:
- Elevate audience consciousness.
- Guide them on a transformative journey.
- Infuse them with wonder and expand their horizons.
- Offer a philosophical and spiritual dimension.

Digital Transition: Preservation and Concerns

- Folk art and music are shifting to digital presentation:
- Opportunity to preserve cultural heritage.
- Reach broader audiences, especially younger generations.
- Concerns about preserving the purity and authenticity of folk art:
- Risk of reducing art to algorithms or digitized templates.
- Algorithmic bias and mass standardization could erase local nuances.
- Difficulty translating historical, symbolic, and cultural elements into the digital realm.

Conclusion: Balancing Innovation and Preservation

- Digital adaptations must remain true to the cultural roots and heritage of folk art forms.
- A thoughtful balance between innovation and preservation is crucial:
- Ensure folk art thrives in the digital age.
- Maintain its essence and cultural significance.

4: The Power of Art for Healing and Self-Expression

Art: A Unique Form of Human Expression

- Art sets humans apart from animals, functioning as a language for self-expression.
- Philosophically, art interprets reality, serving as a response, critique, or idealized model.

The Cathartic Power of Art

- Since cave paintings, humans have utilized art's cathartic power for release and expression.
- Catharsis (free expression) is a valuable therapeutic tool.
- Art therapy leverages art for healing through self-expression.

Art for Children

- Children often express emotions more easily through art than words.
- Art therapists use a child's art to understand their emotional state and thoughts.

Art for People with Special Needs

- Communication challenges are common among those with special needs.
- Art provides a judgement-free space for expression.
- Art therapy benefits all individuals, including neurotypical/neurodivergent and physically challenged people.
- Art therapy improves cognitive and sensory-motor functions (e.g., eye-hand coordination).
- The goal is to achieve a calm and non-judgmental state of mind.

Benefits of Art Therapy

1. Expression: Art helps visualize and analyze emotions.
2. Confidence and Control: Art empowers individuals through choice and a sense of control.
3. Motor Skills and Cognitive Development: Art activities (creating with tools) enhance motor skills and cognitive function, promoting emotional regulation.
4. Creative Outlet: Art fosters self-expression and creativity.

Conclusion

- Anxiety and fear hinder healing and development. Art serves as a response to reality, offering a space for critique, praise, or idealized versions of reality.

5: Impact of Digital Technology and Social Media on Art Museums

Art Museums: Purpose and Collections

- Art museums are public or private institutions dedicated to:
- Collecting art (paintings, sculptures, textiles, etc.)
- Preserving artworks
- Exhibiting art for public education and enjoyment.

Major Art Museums in India

- National Museum, New Delhi: Extensive collection of Indian art and artifacts.
- National Gallery of Modern Art (NGMA), New Delhi: Premier showcase of modern and contemporary Indian art.
- Salar Jung Museum, Hyderabad: One of the world's largest private art and antique collections.
- Chhatrapati Shivaji Maharaj Vastu Sangrahalaya, Mumbai: Impressive collection of Indian art across various periods.
- Indian Museum, Kolkata: Vast collection of art and artifacts, including sculptures, paintings, and archaeological finds.
- Government Museum and Art Gallery, Chandigarh: Diverse collection, including Gandhara sculptures and contemporary Indian art.
- Jehangir Art Gallery, Mumbai: Prominent gallery featuring works by established and emerging Indian artists.

Social Media and Museums

- Powerful tool for museums to connect and engage audiences:
- Increased reach and visibility.
- Enhanced engagement through content sharing, behind-the-scenes glimpses, educational content, and interactive experiences.
- Community building through online interactions, feedback mechanisms, and fostering a sense of belonging.
- Promotion of events, exhibitions, and programs to drive attendance.

Challenges of Social Media for Museums

1. Competition: Standing out in the crowded social media landscape.
2. Content creation: Consistent planning and creation of engaging and relevant content.
3. Accessibility: Ensuring social media presence caters to diverse audiences and learning styles.
4. Measuring effectiveness: Tracking the impact of social media efforts and demonstrating value through specific metrics.

Digital Technologies in Museums

- Virtual tours and experiences: Live video streaming to make collections accessible remotely.
- Collaboration with social media influencers: Broadening reach and attracting new audiences.
- Staying informed about new platforms: Adapting strategies to remain relevant in the evolving digital landscape.

Conclusion

- Art museums are cultural hubs offering curated exhibitions, educational programs, and events to engage visitors with art, history, and diverse cultures.
- They play a vital role in:
- Preserving cultural heritage.
- Fostering creativity.
- Nurturing new ideas.
- Promoting dialogue and understanding among communities.

6 : From Art with Intelligence to Artificial Intelligence

Art and Intelligence: A Timeless Bond

- Art and intelligence have always been intertwined, even before the age of artificial intelligence.
- Art serves as a form of cultural expression, reflecting values, beliefs, and traditions.
- Artists use art to address social issues, advocate for justice, and promote positive change.

The Rise of Digital Art

- Digital technology has birthed new art forms (digital painting, graphic design, animation, interactive media).
- Online platforms offer artists:
 - Wider audience reach.
 - Connection with other creators.
 - Direct sales opportunities.
- Digital preservation techniques ensure accessibility of digital art for future generations (digitization, metadata management, archiving).

Challenges and Considerations

- Digital art creation requires skills in digital tools and software, potentially limiting participation.
- Data privacy concerns exist:
 - Personal information collection and storage.
 - Financial transactions.
 - Sharing creative content online.
- Robust cybersecurity measures and data protection protocols are crucial.

Digital Art: A Transformation

- The fusion of art and digital technology has led to “digital art.”
- Digital art has transformed various art forms:
 - Painting
 - Graphic design
 - Installations
 - Animation
 - Poetry
 - Music
 - Sculpture

The Digital Age: A Double-Edged Sword

- Digital platforms democratize access to art and culture globally.
- New art forms emerge and reach wider audiences.
- However, challenges include:
 - Privacy concerns
 - Digital rights issues
 - Copyright infringement

Conclusion

- While digital technology enhances art forms and accessibility, it can create unrealistic experiences, potentially undermining the true purpose of art.
- Finding a balance between digital integration and preserving the essence of art is essential.

Chapter- 10

Kurukshetra April 2024

1. Digital and Innovative Farming Techniques in India

Digital Agriculture

- Aims to address challenges of agriculture for a growing population
- Potential to increase output, improve efficiency, and benefit the environment
- India is a major producer of various agricultural products

Innovative Farming Practices

- More sustainable, efficient, and resilient techniques
- Examples:
 - Precision Agriculture: data-driven approach using GPS, sensors, and analytics
 - Smart Farming: utilizes IoT devices for data collection and exchange
 - Vertical Farming: maximizes land use and minimizes environmental impact
 - Blockchain Technology: improves transparency and traceability in supply chain

Digital Farming Techniques

- Key characteristics:
 - GPS technology for field planning and resource application
 - Drones for high-resolution field imaging (crop monitoring)
 - Automated equipment for planting, harvesting, and ploughing
 - Variable Rate Technology (VRT) for applying inputs at different rates
 - Smart irrigation systems using soil moisture sensors
 - Data-driven farm management software for planning and decision making
 - Robots for reducing labor and increasing efficiency
 - Machine learning for crop prediction, disease outbreak forecasting, and market trend analysis
 - Blockchain for transparent and secure supply chains
 - Digital twins for virtual farm replicas to improve planning and resource management
 - Digital Divide
- A major challenge for equitable adoption of digital farming techniques
- Disparities exist in access, connectivity, and technological literacy among stakeholders

Conditions for Digital Transformation

- Availability, connectivity, affordability, and ICT integration in education are fundamental
- Supportive policies and programs like e-government initiatives are crucial
- Enablers like widespread internet, mobile phone, and social media use are important

Way Forward

- India's National AI Strategy highlights agriculture as a key sector for AI solutions
- Farmer Producer Organizations (FPOs) offer an opportunity for digital agriculture across the value chain
- FPOs connect farmers, their produce, and the market

Conclusion

- Digital farming uses multiple technologies to improve production, sustainability, and efficiency
- Innovation in agriculture is critical to feed the growing global population

2. Bamboo Farming in India

Bamboo: A Versatile Crop

- Grown as a main or subsidiary crop

- Environment-friendly with low maintenance requirements
- Fast-growing market with high consumer spending potential

Climate Requirements

- Wide adaptability: Valleys, hillsides, near water sources
- Temperature range: 7°C to 40°C (withstands frosts and high temperatures)
- Rainfall: Ideal range 1200 mm to 4000 mm (adapts to 750 mm to 4000 mm)
- Soil pH: Prefers 5.0 to 6.5 (tolerates down to 3.5)
- Nutrients: Needs soil rich in nitrogen, phosphorus, potassium, calcium, and silica

Manuring and Fertilization

- Requires NPK fertilizers (ratio 4:1 or 5:2:1 in normal soil)
- Benefits from organic compost, green manure, and wood ash

Bamboo Uses

- Fabrication: Makes lightweight, lustrous, antibacterial textiles
- Medicine: Treats common illnesses like cold, flu, and nausea
- Utensils: Traditional and eco-friendly cookware
- Others: Musical instruments, cutlery, knife holders, etc.

Economic Contribution

- 35% market share in industrial goods (as of 2020 data)
- 7% annual growth rate (compound interest)
- Considered a fast-growing market
- Dominates bamboo flooring, pulp, paper, and plywood sectors
- Asia-Pacific region leads consumption (75% of global revenue)

3. Mushroom Cultivation in India

Mushrooms: Food and Income Source

- Edible fungi grown naturally or cultivated
- Profitable agricultural venture
- Supplements income and promotes recycling of agricultural waste
- Contributes to nutritional and food security

Global and Indian Production

- Global mushroom production in 2021: 44.2 million tons
- Top varieties: shiitake, oyster, button, black ear
- India's annual production: 0.28 million tons
- Low per capita consumption compared to developed countries

Profitable Venture

- Cultivated indoors, requires minimal space
- Four main varieties recommended in India for year-round cultivation
- Short duration crop (1-3 months) with high yield
- Higher profit margins in bigger units with controlled environments

Government Support

- Financial schemes for establishing mushroom farms: MIDH, NABARD
- Agriculture Infrastructure Fund supports setting up mushroom units
- Banks and institutions offer loans with interest subvention and credit guarantee

Nutritional and Economic Value

- Rich in protein, vitamins, minerals, low in fat and sugar (superfood)
- Good source of quality protein and essential amino acids

- Only vegetarian source of vitamin D
- India's mushroom exports in 2020: 8.65 million USD
- 'Guchhi' (Morchella esculenta) – a valuable species in the Himalayas

4. Apiculture in India: Potential and Challenges

Beekeeping Practices

- Apiculture: science and management of honeybees
- Beekeeping: maintaining honeybee colonies in hives
- Locations with beehives are called apiaries
- India has four main honeybee species:
 - Apis cerana (Indian honey bee)
 - Apis mellifera (European honey bee)
 - Apis dorsata (rock bee) – wild
 - Apis florea (dwarf bee) – wild

Government Initiatives

- National Beekeeping & Honey Mission (NBHM) allocation: Rs. 500 crore (2020-21 to 2022-23)

Honey Production and Exports

- India is a major honey exporter.
- 2022-23 honey exports: 79,929.17 MT, worth Rs. 1,622.77 crore
- Major export destinations: USA, Saudi Arabia, Canada, Qatar

Challenges in Beekeeping

- Access to honey boxes
- Limited marketing facilities
- Insufficient training in apiary management

Market and Scope

- Global apiculture market CAGR (2020-2025): 4.3%
- Indian apiculture market estimated value by 2024: Rs. 33,128 million (CAGR 12%)
- India ranks 6th in natural honey exports

Honey Market Trends

- Indian honey market value in 2020: Rs. 18,836.2 million
- Expected CAGR (2021-2026): 10%
- Projected market value by 2026: Rs. 30.6 billion

Beehive Products

- Honey: energy source, contains sugars, enzymes, minerals
- Royal Jelly: proteins, lipids, carbohydrates, minerals
- Beeswax: used in candle industry
- Propolis: mixture of beeswax and plant resins
- Bee Venom: used in treatments for rheumatism and other conditions
- Pollen: rich in nutrients, amino acids, vitamins

Conclusion

- India is a major honey producer and consumer.
- Beekeeping offers income and employment opportunities in rural areas.
- Sustainable practices, innovation, and knowledge sharing are crucial for the future of beekeeping in India.

5. Organic Farming in India: Benefits, Status, and Future

Need and Benefits

- Promotes biodiversity, soil health, reduces water pollution

- Sustainable agriculture for long-term benefits
- Improves farmer resilience and income through:

Reduced input costs

- Better market access and prices
- Provides consumers with healthier, safer food options
- Higher nutritional value for better public health
- Potential for increased organic product exports

Current Status

- National Programme for Organic Production (NPOP) launched in 2001
- National Centre for Organic Farming (2004) promotes organic practices
- India ranks 6th globally in organic farming area
- As of March 2023:
- 72 lakh hectares under organic certification (2.4% of net cultivated area)
- Chhattisgarh leads with the largest area (32%)
- Sikkim – first fully organic state (since 2016)
- India has the most organic farmers globally (15.99 lakh)

Organic Production

- 2,972.39 thousand metric tonnes produced in 2022-23 (farms & wild areas)
- Organic production includes:
- Edible sector crops
- Organic cotton, fiber, medicinal plants
- Madhya Pradesh is the top organic producer (28% of national production)
- Fiber crops lead in organic production, followed by oilseeds and sugar crops

Organic Product Exports

- India is a major organic product exporter
- Achieved 312,800.51 metric tonnes of exports in 2022-23
- Generated Rs. 5,525.18 crore (USD 708.33 million) in export revenue
- Key export destinations include USA, EU, Canada, and more
- Organic exports projected to reach USD 2,601 million by 2026

Government Initiatives

- National Mission for Sustainable Agriculture (2014-15)
- Promotes water efficiency, organic nutrient management, and climate-resilient practices
- Provides financial incentives, training, and technical support to farmers
- Paramparagat Krishi Vikas Yojana (PKVY) (launched in 2015)
- Encourages organic farming adoption through financial assistance
- Supports groups of farmers with resources for inputs, seeds, etc.
- Promotes community participation and cooperation

Challenges

- Limited awareness about organic production
- High initial certification costs
- Weak market infrastructure for organic products
- Difficulty managing pests and diseases using natural methods
- Issues related to quality control and certifications

The Way Forward

- Rising demand for organic products due to health and environmental concerns
- Increased research and development needed to address low productivity
- Develop resilient crops, explore new organic pest control methods, and enhance soil health
- Continued government policy support is crucial

Conclusion

Educating consumers and addressing challenges are key to sustaining demand for organic products. India has the potential to become a global leader in organic farming and sustainable agriculture.

6. Dairy and Fisheries Sector in India: Opportunities and Growth

Importance and Current Status

- Dairy and fisheries are crucial sectors in the Indian economy.
- Dairy:
 - India is the world's largest milk producer (24.64% global share in 2021-22).
 - Milk production has increased by 58% in the last decade.
 - Employs over 8 crore people directly.
- Fisheries:
 - India ranks 3rd globally in fish production (8% of global share).
 - Second-largest producer of aquaculture.
 - Contributes 1.1% to India's GVA and 6.72% to agricultural GVA.
 - Provides livelihood to over 2.8 crore fishers.

Growth Post-Revolutions

- Operation Flood (Dairy): Increased milk production and per capita consumption.
- Blue Revolution (Fisheries): Launched in 2015 to boost fish production.

Government Initiatives

- Dairy: Rashtriya Gokul Mission, National Programme for Dairy Development, etc.
- Fisheries: Pradhan Mantri Matsya Sampada Yojana (PMMSY) with Rs. 20,050 crore investment.
- Focus on infrastructure, disease control, and technological advancements.

Challenges and Opportunities

- Disruptions in transportation and cold storage limitations.
- Climate change impacts both sectors.
- Opportunities to strengthen sectors through:
 - Improved supply chain infrastructure and technology.
 - Climate-smart practices.
 - Promotion of innovation.

7. Vertical Farming and Hydroponics: Future of Urban Agriculture

What is Vertical Farming?

- Employs soilless cultivation in stacked layers or inclined surfaces.
- Controlled environments (greenhouses, warehouses).
- Maximizes space and efficiency.

Nutrient Delivery Methods

1. Hydroponics: Grows crops in a liquid nutrient solution or inert materials.
 - Uses 60-70% less water than traditional agriculture.
2. Aeroponics: Grows plants in a mist environment with hanging roots.
 - Uses 90% less water than hydroponics.
 - Highly efficient food production system.
3. Aquaponics: Integrates fish and plant production.
 - Fish waste fertilizes plants, plants filter water for fish.
 - Ecological benefits but complex and expensive.

Popular Hydroponic Systems

- Deep Water Culture (DWC)
- Nutrient Film Technique (NFT)

- Ebb and Flow System
- Drip System
- Aeroponics
- Wicking System
- Vertical Tower Systems
- Kratky Method

Crop Management in Hydroponics

- Ideal pH: 5.5 to 6.5
- Neutral water preferred
- Optimum conductivity for each crop
- Favorable temperature: 15-18°C (down to 7°C)

Suitable Crops

- Leafy greens (lettuce, spinach, kale)
- Herbs (basil, mint, cilantro)
- Strawberries
- Tomatoes (cherry tomatoes)
- Peppers

Advantages of Vertical Farming and Hydroponics

- Uses 99% less land than traditional farming.
- Requires less water.
- Enables year-round cultivation.
- Protects crops from pests, diseases, and weather.
- Flexible location setup.
- Access to fresh, reliable food sources.
- Increased plant productivity per unit area.
- Automated monitoring and control systems.
- Environmental and socio-economic benefits in urban areas.

Disadvantages of Vertical Farming and Hydroponics

- High upfront infrastructure costs.
- Shortage of expertise and high labor costs.
- Energy-intensive (lighting, temperature, humidity control).
- Limited crop variety (mostly leafy vegetables).
- Requires continuous attention and maintenance.

The Way Forward

- Utilize cost-effective options like repurposed shipping containers.
- Research on cost reduction and wider crop variety.
- Supportive policies and incentives for investment in urban agriculture.



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