EDGE IAS

Celebrate Learning !

Monthly Current Affairs
January 2023

LET'S

TODAY

LEARN

Great Teachers, Great Content !!

CURRENT AFFAIRS, EDGE IAS

This Document was prepared under the supervision of Mr. Pramod Singh, Director, Edge IAS.

Current Affairs, January 2023

INDEX

1. Polity and Governance

1.1 National Conference of Chief Secretaries

- Prime Minister Shri Narendra Modi will chair the second National Conference of Chief Secretaries in Delhi on 6th and 7th January, 2023. It will be another key step towards further boosting the partnership between the Centre and the State Governments.
- The first such Conference of Chief Secretaries was held in June 2022
- The second Conference of Chief Secretaries will be held in 2023 in Delhi.
- The three day Conference will focus on achieving rapid and sustained economic growth in partnership with the States.
- Focused deliberations would be held on four topics, viz. (i) Vocal for Local; (ii) International Year of Millets; (iii) G20: Role of States; and (iv) Emerging Technologies.

The Chief secretary of state:

- The Chief Secretary is the top-most executive official and senior-most officer of the Indian Administrative Service of the state government.
- It ranks 23rd on the Indian order of precedence.
- The Chief Secretary is the ex-officio head of the state Civil Services Board, the state cadre Indian Administrative Service and all civil services under the rules of business of the state government.

Appointment:

- Appointed by the Chief Minister of state.
- The Chief Minister after short-listing the names can have an opinion of the Union government related to the appointment but this consultation is not mandatory.
- Usually, these three factors are considered: Seniority, service record, and Evaluation of the Chief Minister.

Role:

- The Chief Secretary acts as the principal advisor to the chief minister on all matters of state administration.
- The Chief Secretary acts as an ex-officio secretary to the state cabinet, therefore called “Secretary to the Cabinet“.
- The status of this post is equal to that of a Secretary to the Government of India.
- A Chief Secretary functions as the central point of interdepartmental coordination at the departmental level.

1.2 Article 19

- By ruling that a citizen can seek enforcement of the fundamental rights to freedom of speech not just against the state, the Supreme Court has, effectively, extended the ground for seeking these rights against other citizens.

About Article 19:

Article 19(1) of the Constitution of India guarantees six fundamental freedoms to every citizen of India, namely:

- Freedom of speech and expression;
- Freedom to assemble peacefully and without arms;
- Freedom to form associations, unions or co-operative societies;
- Freedom to move freely throughout the territory of India;
- Freedom to reside and settle in any part of the territory of India, and

- Freedom to practice any profession, or to carry on any occupation, trade or business.

Importance of Article 19

- This freedom is essential because the censorial power lies in the people over and against the Government and not in the Government over and against the people.
- The freedom of speech and expression is required to fulfil the following objectives :
- To discover truth
- Non self-fulfilment
- Democratic value
- To ensure pluralism
- Reasonable Restrictions under Article 19: The State can impose restrictions on the freedom of speech and expression in the interests of Sovereignty And Integrity Of India,
- The Security Of The State,
- Friendly Relations With Foreign States,
- Public Order, Decency Or Morality, Or
- In Relation To Contempt Of Court,
- Defamation, Or
- Incitement to An Offence.
- Key details of the Supreme Court ruling:
- The court took this view while ruling that the right of free speech and expression guaranteed under the Article 19(1)(a) cannot be curbed by any additional grounds other than those already laid down in Article 19(2).
- Article 19 which guarantees freedom of speech and expression is a right invoked against the state.
- The court, extending free speech against private citizens, opens up a range of possibilities in Constitutional law.
- This interpretation could also bring an obligation on the state to ensure private entities also abide by Constitutional norms.
- K S Puttaswamy case: The Court relied on the 2017 verdict in Puttaswamy where a nine-judge bench unanimously upheld privacy as a fundamental right.
- One of the key arguments by the government was that privacy is a right enforceable against other citizens and, therefore, cannot be elevated to the status of a fundamental right against the state.
- Under Indian Constitution, all the Fundamental Rights are available against the State but only 4 fundamental Rights are available against both State and individuals.
- Article 15(2) – no citizen shall be subjected to any form of discrimination based on caste, religion, place of birth, or caste.
- Article 17 – abolition of Untouchability.
- Article 23 – Prohibits trafficking of humans and forced labour.
- Article 24 – Prohibits employment of children in factories and hazardous place.

1.3 National Commission for Protection of Child Rights

National Commission for Protection of Child Rights is celebrating its 18th Foundation Day.

- A Quiz was launched by the Commission on the occasion of National Youth Day (Swami Vivekananda Jayanti) to create awareness among children about child rights.

National Commission for Protection of Child Rights

- The Commission is a statutory body constituted under Section 3 of the Commission for Protection of Child Rights (CPCR) Act, 2005
- It aims to protect the child rights and other related matters in the country.
- The Commission is further mandated to monitor the proper and effective implementation of Protection of Children from Sexual Offences (POCSO) Act, 2012; Juvenile Justice (Care and Protection of Children) Act,

2015 and Right to Free and Compulsory Education (RTE) Act, 2009.

- In one of the functions laid down under Section 13 of the CPCR Act, 2005, the Commission has been assigned with the function to examine and review the safeguards provided by or under any law for the time being in force for the protection of child rights and recommend measures for their effective implementation.
- The Commission also has the powers of Civil Court trying a suit under Section 14 of CPCR Act, 2005 and Code of Civil Procedure, 1908.
- It works under the aegis of Ministry of Women and Child Development

1.4 Delegated Legislation

Recently, the majority ruling of the Supreme Court upheld the validity of the delegated legislation in the Centre's 2016 decision on demonetisation.

About Delegated Legislation:

- Parliament routinely delegates certain functions to authorities established by law since every aspect cannot be dealt with directly by the lawmakers themselves.
- This delegation of powers is noted in statutes, which are commonly referred to as delegated legislation.
- The delegated legislation would specify operational details, giving power to those executing the details.
- Regulations and by-laws under the legislation are classic examples of delegated legislation.
- In 1973, the Supreme Court ruling explains the concept as:
- "The practice of empowering the Executive to make subordinate legislation within a prescribed sphere has evolved out of practical necessity and pragmatic needs of a modern welfare State".

Delegation of power in the demonetisation case

- Section 26(2) of the Reserve Bank of India Act, 1934 essentially gives powers to the Centre to notify that a particular denomination of currency ceases to be legal tender.
- A 1959 landmark ruling in Hamdard Davakhana v Union of India, the Supreme Court had struck down the delegation of powers on the grounds that it was vague.

Supreme Court's recent opinion on Delegation of powers:

- The majority verdict held that since the delegation of power is to the Centre which is anyway answerable to the Parliament, the delegation power cannot be struck down.
- In case the Executive does not act reasonably while exercising its power of delegated legislation, it is responsible to Parliament who are elected representatives of the citizens for whom there exists a democratic method of bringing to book the elected representatives who act unreasonably in such matters.

1.5 Remote Voting Machines

The Election Commission of India (ECI) could not demonstrate a prototype of its new Remote Electronic Voting Machine (RVM), which would allow domestic migrants to vote in national and regional elections.
EVMs started being used on a larger scale in 1992 and since 2000, have been used in all Lok Sabha and State Assembly elections.

About Remote Voting Machines:

- The Multi-Constituency RVM for migrant voting will have the same security system and voting experience as the EVM.
- RVM can handle multiple constituencies (up to 72) from a single remote polling booth.
- For this, instead of a fixed ballot paper sheet, the machine has been modified to have an electronic dynamic ballot display which will present different candidate lists corresponding to the constituency number of the voter read by a constituency card reader.

- The ECI has added a digital public display unit or a monitor to act as an interface between the constituency card reader and the BU display.
- The electronic ballot will be prepared by the Returning Officers (ROs) of home constituencies of voters, and forwarded to the remote RO for uploading in the SLU.

Concerns of RVM:

- Lack of clarity on how these new devices communicate with each other, Whether it is a device with programmable memory
- Question on integrity – would it be possible to mess with the digital display to show a modified list to the voter, since the unit is connected to an external device for symbol loading
- Logistical and administrative challenges – including voter registration in remote locations, how names will be removed from the electoral rolls of the home constituency, how remote voting applications will be made transparent etc.
- Further, the challenges regarding the current EVMs will persist when it comes to the RVMs.

How do existing EVMs work?

- The latest EVM is an M3 model which was manufactured from 2013 onwards.
- It has a Balloting Unit (BU) which is connected to the VVPAT printer, both of which are inside the voting compartment.
- The VVPAT is connected to the Control Unit (CU), which sits with the Presiding Officer (PO) and totals the number of votes cast, on its display board.
- Only once the PO presses the ballot button on the CU, does the BU get enabled for the voter to cast her vote by pressing the key corresponding to the candidate on the ballot paper sheet pasted on the BU.
- The VVPAT, which is essentially a printing machine, prints a slip with the poll symbol and candidate name, once the voter presses the key on the BU.
- This slip is visible to the voter on the VVPAT's glass screen for seven seconds after which it gets dropped off in a box inside the VVPAT.
- Once a vote is cast, the BU becomes inactive till the PO schedules the next vote by enabling it again from the CU

Voter Verified Paper Trail Audit (VVPAT)

- Developed by ECI along with two Public Sector Undertakings (PSU), in 2010
- It is a mechanism that could help verify that the EVM had recorded the vote correctly as intended by the voter
- The use of VVPATs has become universal in elections since mid-2017.
- To create a VVPAT sheet on the laptop, an application is either downloaded from the ECI server or copied from a local device.
- It is then uploaded to another device or the Symbol Loading Unit (SLU) through a nine-pin cable, which in turn is connected to the VVPAT for upload. This process raises questions.

Significance of Indian EVMs

- They are standalone, are not connected to the internet, and have a one-time programmable chip, making tampering through the hardware port or through a Wi-Fi connection impossible.
- As per ECI, EVMs are "robust, secure, and tamper-proof", owing to the technical and institutional safeguards in place.
- Such as the sealing of machines with signatures of polling agents, first-level checks, randomisation of machines, and a series of mock polls before the actual voting, cannot be circumvented.

Concerns about EVMs:

- A 2021 report titled, 'Is the Indian EVM and VVPAT System Fit for Democratic Elections?' highlighted the widely recognised 'democracy principles' to be adhered to while conducting public elections.
- Lack of transparency – Details of the EVM design, prototype, software, and hardware verification are not publicly available for technical and independent review, rendering it available only for a black-box analysis,

where information about its inner workings is not accessible.

- EVM tampering – claim that EVM tampering through a WIFI connection is not possible has been disrepute by multiple computer scientists as it does not take into account 'side-channel', insider fraud, and trojan attacks.
- Besides, the OTP chip which cannot be rewritten, also has a flip side
- Outsourcing – The ECI sends the EVM software to two foreign chipmakers (in the U.S. and Japan) to burn into the CPU and the manufactured chips are then sent to India for assembly into machines by the two PSUs (BEL and ECIL).
- This means that the manufacturers cannot read back the contents of the software to ensure its integrity is intact.
- Functionality tests done by manufacturers can only reveal if the machine is working properly.
- Hacking – A fixed number of votes are casted at the beginning of the polls in each polling station. Thus, a hack can easily bypass the first few votes, thereby preventing detection of foul play as every key press in the EVM is date and time stamped".

Concerns with VVPAT:

- EVM Tampering – Even if the voting machine is tampered, the same should be detectable in an audit.
- Machine dependence – For the voting process to be verifiable and correct, it should be machine-independent, or software and hardware independent, meaning, the establishment of its veracity should not depend solely on the assumption that the EVM is correct.
- Voter verification – The current VVPAT system is not voter verified in its full sense, meaning, while the voter sees their vote slip behind the VVPAT's glass for seven seconds, it does not mean they have verified it.
- Vote cancellation – That would happen if the voter got the printout in their hand, was able to approve it before the vote is finally cast, and was able to cancel if there is an error.
- Former IAS officer Kannan Gopinathan, notes "voter should have full agency to cancel a vote if not satisfied; and that the process to cancel must be simple and should not require the voter to interact with anybody
- Voter penalisation is discouraging – Under the current system, if the voter disputes what they have seen behind the screen, they are allowed a test vote in the presence of an election officer, and if the outcome of the test vote is correct, the voter can be penalised or even prosecuted
- Questionable Assurance – by ECI that the EVM-VVPAT system is not connected to any external device has been questioned by former civil servants.
- Since, for the VVPAT to be able to generate voting slips, the symbols, names and the sequence of the candidates need to be uploaded on it which is done by connecting it to a laptop.
- Opacity regarding communication protocol – If the VVPAT is cleared and loaded with new information for every election, does this mean it has a programmable memory? These questions remain unaddressed.

Way forward

- Ronald Rivest, an MIT professor and the inventor of encryption, defined that "a voting system is software (hardware) independent if an undetected change in software (hardware) cannot lead to an undetectable change in the election outcome"
- Elections should uphold the democratic principles – The election process should not only be free and fair but "also be seen to be free and fair", meaning instead of being told to trust the process the general public should be provided with provable guarantees to facilitate this trust.

1.6 Chargesheet

The Supreme Court bench recently declared chargesheets to be private documents. It said that the state is not obliged to provide the public free access to chargesheets by uploading them on police or government websites.

About Chargesheet:

- A charge sheet refers to a formal police record showing the names of each person brought into custody, the nature of the accusations, and the identity of the accusers. The charge sheet contains majorly 4 parts:
- Information about the accused and the witnesses
- The charges and specifications
- The preferring of charges and their referral to a summary
- For the trial record
- The charge sheet is to be filed within 60 days from the date of arrest of the accused in cases triable by lower courts and 90 days in cases triable by the Court of Sessions.
- No case for grant of bail will be made under section 167(2) of the CrPC if the charge sheet is filed before the expiry of 90 days or 60 days, as the case may be, from the date of first remand.
- The right of default bail is lost, once the charge sheet is filed.
- A charge sheet is distinct from the First Information Report (FIR), which is the core document that describes a crime that has been committed.
- Chargesheet usually refers to one or more FIRs and charges on an individual or organization for the crimes specified in those FIR.
- Once the charge sheet has been submitted to a court of law, prosecution proceedings against the accused begin in the judicial system.

About FIR:

- First Information Report (FIR) is a written document prepared by the police when they receive information about the commission of a cognizable offence.
- It is a report of information that reaches the police first in point of time and that is why it is called the First Information Report.
- Based on the information provided, I.R. can be registered by the Judicial Magistrate by giving direction to the concerned jurisdictional area of the Police Station.
- Zero F.I.R.: With the help of zero F.I.R., a complaint can be lodged at any police station irrespective of the jurisdiction of the Police Station.
- It is an amendment that came after Nirbhaya Rape Case.

1.7 Cohort on Elections Integrity

'Summit for Democracy'

- It was an initiative of USA and was hosted in 2021.
- The Prime Minister of India spoke at the Leaders Plenary Session in 2021.
- A "Year of Action" was proposed with events and dialogues on themes related to Democracy.
- The Summit also developed two platforms – 'Focal Groups' and 'Democracy Cohorts' to facilitate participation in the Year of Action.
- The 2nd Summit for Democracy is scheduled to be held IN 2023 and co-hosted by governments of Costa Rica, Rep. of Korea, Netherlands, Zambia and the US.
- As part of the 'Summit for Democracy' Year of Action, India through the ECI, is leading the 'Democracy Cohort on Election Integrity' to share its knowledge, technical expertise and experiences with other democracies of the world.
- ECI, as its lead, has proposed to also provide training and capacity building programmes to Election Management Bodies (EMBs) across the world and provide technical consultancy as per needs of other EMBs.

Cohort on Elections Integrity:

- It was established as a follow up to the 'Summit for Democracy' held virtually in 2021.
- India through ECI, is leading the Cohort on Elections Integrity
- The first international conference of the Cohort was organized in 2022 on the topic 'Role, Framework and

Capacity of Election Management Bodies' where nearly 50 representatives from the Election Management Bodies (EMBs) of 11 countries participated.

- The Election Commission of India (ECI) is hosting the 2nd International Conference on the theme 'Use of Technology and Elections Integrity'
- The two-day international conference will be inaugurated by Chief Election Commissioner of India
- Invited Greece, Mauritius and IFES to be co-leads for the Cohort. ECI has invited Isnternational Foundation for Electoral Systems and International IDEA, apart from EMBs and Government counterparts dealing with the conduct of elections worldwide.
- Around 43 Participants from 17 Countries/EMBs including Angola, Argentina, Armenia, Australia, Chile, Croatia, Dominica, Fiji, Georgia, Indonesia, Kiribati, Mauritius, Nepal, Paraguay, Peru, Philippines and Suriname and 06 participants from international organisations namely, IFES, International IDEA are expected to join.

1.8 Project 39A

- Even as the Supreme Court has called for reforming death penalty sentencing, trial courts awarded 165 death sentences in 2022, the highest in over two decades, according to the Annual Death Penalty Report, 2022. The report will be released on Monday by Project 39A
- This shift has been sharply influenced by the extraordinary sentencing of 38 persons to death in Ahmedabad in a single bomb blast case, representing the largest number of persons sentenced to death in a single case since 2016

Project 39A

- It is a criminal reforms advocacy group with the National Law University, Delhi.
- It is inspired by Article 39-A of the Indian Constitution, a provision that furthers the intertwined values of equal justice and equal opportunity by removing economic and social barriers
- Project 39A aims to trigger new conversations on legal aid, torture, forensics, mental health in prisons, and the death penalty, using empirical research to re-examine practices and policies in the criminal justice system
- The dismal state and sometimes the absence of record-keeping in the police, prisons and courts along with multiple barriers to accessing records/ data complicates criminal justice research in India.

1.9 Mandatory minimum sentencing:

- A CJI Chandrachud-led bench of the Supreme Court decided to examine a petition challenging the constitutional validity of Section 376 DB of the Indian Penal Code.
- This section describes the punishment for gangrape of a minor under 12 years of age, to the extent that it prescribes a 'minimum mandatory sentence' of life imprisonment for the remainder of the convict's life and even death.

Mandatory minimum sentencing:

- The concept of mandatory minimum sentencing refers to "a sentence which must be imposed without leaving any discretion to the court".
- It means a quantum of punishment which cannot be reduced below the period fixed – the Apex court held in its 2016 ruling in 'Mohd Hashim vs State Of UP And Others'.
- Essentially, this predetermines the minimum punishment or sentence for certain offenses which are considered to be more serious than others, with a view to ensure justice and not let the perpetrator of such an offense go unpunished.
- No matter what the unique, individual circumstances of the offender or the offense might be, the court must mandatorily award this minimum period of sentencing for the offenses which prescribe it.

What provisions award a mandatory sentence

- A concept that comes primarily from the Canadian and American legal systems; in India, such sentences are prescribed for all sexual offenses under the Prevention of Children from Sexual Offences (POCSO) Act except the offense of sexual harassment
- Under Section 8 of the POCSO Act, a punishment of 3-5 years has been prescribed for offenses under Section 7 which deals with offenses of sexual assault against children. However, imposing the minimum punishment in such cases is mandatory.
- When the legislature has prescribed a minimum sentence without discretion, the same cannot be reduced by the courts.
- In such cases, imposition of minimum sentence, be it imprisonment or fine, is mandatory and leaves no discretion to the court," the Supreme Court reiterated in its 2019 ruling in 'State Of Madhya Pradesh vs Vikram Das'.
- However, it was first in the year 1983, following nationwide protests in the wake of the Supreme Court's 1978 ruling acquitting two policemen for the rape of a 16-year-old Adivasi girl in 'Tukaram And Ors v. State Of Maharashtra' that the Criminal Law Amendment Act Of 1983 was passed.
- The 1983 amendment was the first instance of 'mandatory minimum punishment' being prescribed, with seven years for general rapes and ten years for aggravated cases which could include rapes of minors below 12 years, and pregnant women, while the maximum punishment or life imprisonment for both was stipulated as 14 years.
- Years later, in 2012, following the brutal gangrape and death of a medical student in Delhi, the demand for more stringent rape laws with stricter punishments gained widespread momentum.
- This resulted in the Criminal Law (Amendment) Act, of 2013, which expanded the definition of 'rape' beyond penetration to include insertion of objects, anal sex, and oral sex.
- The 2013 reforms also updated the definition of 'life imprisonment' to mean the entire remainder of the convict's life and introduced a minimum sentence of 20 years for gang rape. Following this, even the death penalty could be meted out to those repeatedly indulging in such offenses.

What are the arguments for and against?

- The proponents of minimum mandatory sentencing say that it limits the scope for judicial discretion and arbitrariness, thereby enhancing the cause of justice.
- It is also believed that it acts as a deterrent for serious or harsh offenses by ensuring that the perpetrator doesn't go unpunished.
- On the other hand, critics say that this leads to overcrowding of prisons and is unfair as the convict's mitigating circumstances, such as if they are a first-time offender or the sole breadwinner in the family, are often overlooked.
- Moreover, such provisions can often have unintended consequences as judges might feel the prescribed punishment to be excessively stringent in such cases and acquit the accused altogether

1.10 Sub-categorisation of other backward classes (OBCs)

The Justice G. Rohini-led commission for the sub-categorisation of other backward classes (OBCs) has now been given yet another extension in its tenure by the President
This is the 14th extension in tenure that the commission has been given.

About the commission

- The commission was formed in October 2017
- It was initially given 12 weeks to finish the task of sub-categorising the nearly 3,000 castes within the OBC umbrella and recommend division of the 27% OBC quota among them equitably
- As part of its work, the commission had identified dominant caste groups among all OBC communities in the Central list, finding that a small group of dominant OBC communities were crowding out a large number of communities from the 27% OBC quota.
- Consequently, the commission decided to divide all OBC communities into four broad categories, with the largest share of the quota pie going to the group that has historically been deprived of OBC quota as a

result of being pushed out by dominant OBC groups.

Commission's terms of reference:

- To examine the extent of inequitable distribution of benefits of reservation among the castes or communities included in the broad category of OBCs with reference to such classes included in the Central List.
- To work out the mechanism, criteria, norms and parameters in a scientific approach for sub-categorisation within such OBCs.
- To take up the exercise of identifying the respective castes or communities or sub-castes or synonyms in the Central List of OBCs and classifying them into their respective sub-categories. A fourth term of reference was added on January 22, 2020.
- To study the various entries in the Central List of OBCs and recommend correction of any repetitions, ambiguities, inconsistencies and errors of spelling or transcription.

What is sub-categorisation of OBCs?

- The idea is to create sub-categories within the larger group of OBCs for the purpose of reservation.
- OBCs are granted 27% reservation in jobs and education under the central government, this has been a legal debate for other reservation categories too
- In 2022, a Constitution Bench of the Supreme Court reopened the debate on sub-categorisation of Scheduled Castes and Scheduled Tribes for reservations.
- For OBCs, the debate arises out of the perception that only a few affluent communities among the over 2,600 included in the Central List of OBCs have secured a major part of the 27% reservation.
- The argument for creating sub-categories within OBCs is that it would ensure "equitable distribution" of representation among all OBC communities.
- It was to examine this that the Rohini Commission was constituted on October 2, 2017

Need for subcategorization

- Due to inequalities and further inequalities within unequal entities.
- Reservation in jobs and education did address socio-economic disparities in India to some degree, but, the benefits of reservation have not been distributed equitably
- Large segments of the weaker sections and backward classes continue to have no access to quality education or meaningful employment.
- The relatively rich and dominant sections among the backward castes have tended to take up a disproportionately larger share of the reservation pie.
- Failure in effectively preventing large sections of the creamy layer from taking advantage of the quota system to the detriment of the poorer sections among their own caste groups.
- To ensure a more equitable distribution of reservation benefits by further differentiating caste groups coming under backward classes on the basis of their levels of social and economic backwardness.
- Lacunae in categorisation of the creamy layer led to the need to differentiate among the caste groups.
- Vote-bank politics has caused prioritising of caste-based categorisation over income-based differentiation to identify reservation beneficiaries.
- The reservation pie is limited, and no group, whether rich or poor, dominant or subservient, can hope to gain except at the expense of another socio-economic category.

Findings of the commission

- In 2018, the Commission analysed the data of 1.3 lakh central jobs given under OBC quota over the preceding five years and OBC admissions to central higher education institutions, including universities, IITs, NITs, IIMs and AIIMS, over the preceding three years.
- The findings were: 97% of all jobs and educational seats have gone to just 25% of all sub-castes classified as OBCs; 24.95% of these jobs and seats have gone to just 10 OBC communities; 983 OBC communities — 37% of the total — have zero representation in jobs and educational institutions; 994 OBC sub-castes have a total representation of only 2.68% in recruitment and admissions.
- Total number of Group A to Group C employees (including safai karmacharis) was 5.12 lakh – Of these,

17.70% are SC, 6.72% ST, 20.26% OBC (Other Backward Classes), and 0.02% EWS (Economically Weaker Sections).
- In Group-A, the highest tier among these, the representation of SCs is just 12.86%, of STs 5.64% and of OBCs 16.88%. Reservation for these communities is 15%, 7.5% and 27% respectively.

Challenges

- Disruptions caused by COVID-19 pandemic.
- Different states census underway – Bihar government is in the middle of its caste-based survey in the State and the Uttar Pradesh government is in the process of conducting a fresh survey to assess the need for OBC reservation in its local body elections, with other States like Madhya Pradesh and Maharashtra also looking to form panels to implement OBC reservation in local body polls.
- Government lacks information for data enumeration of OBC
- Data from 2011 Socio-Economic Caste Census were never made public.
- Enumeration of OBC data is administratively complex and the information lacks completeness and accuracy since the State and Central list of OBCs are distinct.
- It may lead to breach of apex court's 50-per-cent ceiling, since many communities have sought separate reservations at the State and Central levels across India.

Way forward

- According to 2018 data, just ten OBC communities have taken the 25 per cent of reserved central jobs and institutional seats. Also, 97 per cent of the reserved jobs and seats have gone to 25 per cent of OBC sub-castes.
- Hence, there is a need to re-establish equity and the task has been handed over to Rohini Commission
- Once completed, the report by Justice G Rohini commission is also likely to undergo judicial review

2. International Relations

2.1 Agreements with Asian Development Bank

Several loan agreements have been signed by the Government and the Asian Development Bank to boost the infrastructure sector in the country.

- A loan agreement was signed worth 350 million US dollars to improve connectivity in Maharashtra
- A loan agreement worth 300 million US dollars will be utilised to upgrade over 300 kilometres of State highways and major district roads in Assam.
- A 220 million dollar loan agreement was signed to improve energy security, quality of supply, efficiency, and resilience of the power sector in Tripura.
- A loan agreement worth 350 million US dollars was signed to build new lines and improve the connectivity of the metro rail system in Chennai.

About Asian Development Bank

- ADB was conceived in the early 1960s as a financial institution that would be Asian in character and foster economic growth and cooperation in one of the poorest regions in the world.
- A resolution passed at the first Ministerial Conference on Asian Economic Cooperation held by the United Nations Economic Commission for Asia and the Far East in 1963 set that vision on the way to becoming reality.
- The Philippines capital of Manila was chosen to host the new institution, which opened in 1966, with 31 members that came together to serve a predominantly agricultural region. Takeshi Watanabe was ADB's first President.
- During the 1960s, ADB focused much of its assistance on food production and rural development.
- In May 2014, plans were announced to combine the lending operations of ADB's two main funds, the Asian Development Fund, and its ordinary capital resources. The merger will boost ADB's total annual lending and grant approvals to as high as $20 billion—50% more than the current level when it takes effect in January 2017.
- From 31 members at its establishment in 1966, ADB has grown to encompass 68 members including India—of which 49 are from within Asia and the Pacific and 19 outside.
- This bank was modelled on the lines of the world bank. As of 31st December 2021, Japan holds the largest share in ADB with 15.677%, followed by U.S.A (15.567%), China (6.473%), and India (5.812%).
- It is headquartered in Manila, Philippines.

Other existing Agreements:

- ADB and India have signed a loan of $206 million to strengthen urban services in 5 Tamil Nadu cities.
- Asian Development Bank (ADB) has listed its 10-year masala bonds worth Rs 850 crore on the global debt listing platform of India INX.
- Asian Development Bank (ADB) had prepared a Conceptual Development Plan (CDP) for Vizag-Chennai Industrial Corridor (VCIC).

2.2 36th India-France Strategic Dialogue

- 36th India-France Strategic Dialogue between National Security Adviser Ajit Doval and Diplomatic Adviser to the President of France, Emmanuel Bonne was held in New Delhi.
- India and France reiterated their commitment to take forward their strategic partnership to ensure peace, stability and security in the Indo-Pacific based on common beliefs in the rules-based international order and strategic autonomy.
- Both sides reiterated that in view of the emerging uncertainties and volatile global security environment, there was a need for closer cooperation between India and France, including in the UNSC and other

multilateral forums.

Bilateral relationship:

- The new French Indo-Pacific strategy advances three key threats to be met by Paris, beyond dealing with North Korean belligerence:
- Transnational terrorism
- Chinese challenges to the multilateral order in the region
- Climate change
- Indo Pacific: France is a preferred partner in the Indo-Pacific and there is now a blueprint for cooperation in this field in the form of a Joint Strategic Vision for cooperation in the Indian Ocean Region concluded by both countries in 2018.

Economic:

- France is the 7th largest foreign investor in India with a cumulative FDI stock of USD 9 billion from 2000 to 2020, which represents 2 % of the total FDI inflows into India.
- In FY 2020-21, bilateral trade stood at $ 9.12 Bn and has increased to $ 9.87 Bn during the period April 2021 – January 2022.
- Launch of Unified Payment Interface (UPI) in France
- "Co-localisation of production" with India as a priority indicates urgency to take steps for ensuring a more diversified and stable Indo-Pacific and global periphery.

Security:

- Bilateral defence ties are in fine fettle and France has largely stuck to the promised delivery of Rafale aircrafts to India.
- The challenge here is to move from a buyer-seller relationship to an investor-investee one by making defence equipment in India accompanied by a transfer of technology.
- Safran Group's decision to set up their largest and first aircraft engine MRO (maintenance, repair, and overhaul) facility in Hyderabad.
- The facility will be set up with an investment of Rs 1200 cr and is expected to create about 1,000 high-skilled jobs in Telangana.
- India and France have conducted joint patrols from the Reunion Island for the first time.
- The patrol was conducted by a P-8I aircraft with French Navy personnel on board.

Bilateral military exercises

- Exercise Shakti (Army)
- Exercise Varuna (Navy)
- Exercise Garuda (Air Force)
- IMEX 22

Technology:

- For the first time, the two countries concluded a Joint Vision for Space Cooperation in 2018.
- The vision document talks of bringing societal benefits of space technology, situational awareness in space domain and cooperation in satellite navigation and related technologies.
- As for nuclear energy, the two leaders must review progress in the joint construction of the world's largest nuclear park in Jaitapur, Maharashtra.
- The French tech services multinational Atos, for instance, provides India with supercomputing hardware and quantum computing simulation software.
- A recent Track 1.5 Dialogue hosted jointly by think tanks — Gateway House in Mumbai and Ifri in Paris — revealed the importance of Bangalore for the French economy, noting the large number of tech engineers from France who are located in the southern city.
- France also has a special tech visa for Indian engineers, enabling robust exchanges.
- Digital cooperation is being stepped up in cyber security and on building standards for public digital infrastructure.

Environment and Ecology:

- India will be the first "country of honour" at the Sea Tech . Week in Brest, France, a major international event bringing together Blue Economy stakeholders.
- France announced its support for Prime Minister Modi's Lifestyle for the Environment (LIFE) initiative, and will seek to work with India on promoting sustainable lifestyles to fight climate change.
- Regarding solar alliance, India has started having annual summits with France and Germany from 2000.
- 2021: Year Of Indo-French Alliance Towards A Greener Planet
- To strengthen Indo-French cooperation in sustainable development, increase the effectiveness of actions in favour of global environment protection and give them greater visibility.
- Based on five main themes: (1) Environmental protection; (2) Climate change; (3) Biodiversity conservation; (4) Sustainable urban development; (5) Development of renewable energies and energy efficiency.

Suggestions for future:

- France holds the rotating presidency of the EU
- In this regard, discussion on FTA and the Investment Agreement that India is negotiating with the EU and persuade France to weigh in favourably with the Brussels bureaucracy and other stakeholders.
- More can be done in the area of digital sovereignty where India is a potential model for France with its use of open platforms and open-source public goods like India Stack and MOSIP; regulation, especially personal data empowerment and protection; health data and health tech.
- France and India must now invest in preventing digital platforms from being weaponised and avert threats to critical infrastructure.
- They must use their unique strengths — India in conceptualising and deploying large-scale open-source platforms, foundational IDs, IT services and fintech, and France in AI, cyber, quantum technologies, data empowerment and protection, to create the next-gen solutions for the world.
- Accelerate investment between two countries in low carbon alternatives like wind, solar PV, biomethane, heat pumps, nuclear and clean hydrogen.
- India has the market, France has the technology and capital, and the EU has the political will and incentives to drive the transition to green hydrogen.
- Major French multinationals such as Air Liquide, Engie and TotalEnergies are already pursuing hydrogen energy, and pilot projects with Indian partners can be planned
- They discussed expanding the scope of defence cooperation to include the co-development of futuristic technologies in line with India's priorities of Make in India and Atmanirbhar Bharat.

Way forward:

- Newer areas of cooperation such as connectivity, climate change, cyber-security and science and technology.
- In these important areas, the two leaders will be briefed by officials about progress made so that roadblocks, if any, can be tackled.
- France has supported India's G20 presidency and it goes a long way in strengthening ties between the two countries.

2.3 Indo-Nepal

- The electoral verdict in Nepal's recent elections reflected a clear emergence of voter preference for more responsive governance and upholding the aspirations of the youth and the disadvantaged.
- It also reconfirmed the successful 'taking root' of democracy in the Himalayan country after great struggle, sacrifices and ideological adjustments across the political spectrum.
- Between the two countries, now is the time for fresh thinking on economic recovery; bilateral cooperation; restructuring supply chains; human as well as conventional security; energy cooperation; people-to-people contacts; and the untapped potential for technology to accelerate inclusive growth, and soft power to maximise mutual advantage.

Bilateral relationship:

- India and Nepal share unique ties of friendship and cooperation characterized by an open border and deep-rooted people-to-people contacts of kinship and culture. There has been a long tradition of free movement of people across the border.
- India's focus towards Nepal has been on non-partisan support for inclusive economic development, interdependence, communication links, people-to-people contacts, and building on the compulsive logic of economic complementarities, especially in hydropower where Nepal has huge but largely unexplored potential.
- The extent of its linkages of history, geography, culture, religion, and economy with Nepal facilitate management of its security concerns within tolerable limits.

Economic:

Trade:

- India is the largest trading partner of Nepal and has a trade surplus with Nepal.
- Total bilateral trade in 2018-19 reached INR 57,858 cr.
- Nepal's main imports from India are petroleum products; motor vehicles and spare parts

Investment:

- Indian firms are among the largest investors in Nepal, accounting for more than 30% of the total approved foreign direct investments.
- There are about 150 Indian ventures operating in Nepal
- Agriculture: In 2018, the 'India-Nepal New Partnership in Agriculture' was launched with a focus on collaborative projects in agricultural research, development and education.
- Water resource cooperation: A three-tier bilateral mechanism established in 2008, to discuss issues relating to cooperation in water resources, flood management, inundation and hydropower between the two countries, has been working well.

Defence and Security:

- India has been assisting the Nepal Army (NA) in its modernisation by supplying equipment and providing training. .
- Several defence personnel from Nepal Army attend training courses in various Indian Army training institutions.
- The 'Indo-Nepal Battalion-level Joint Military Exercise SURYA KIRAN' is conducted alternately in India and in Nepal.
- India and Nepal have been awarding each other's Army Chief with the honorary rank of General in recognition of the mutual harmonious relationship between the two armies.
- The Gorkha regiments: About 32,000 Gorkha Soldiers from Nepal are serving in the Indian Army.
- Defence Wing of the Indian Embassy in Kathmandu arranges the disbursement of pensions and organise welfare programmes for re-training, rehabilitating and assisting ex-Gorkha soldiers and their families.

Connectivity and Development:

- India has been assisting Nepal in development of border infrastructure through upgradation of 10 roads in the Terai area; development of cross-border rail links at Jogbani-Biratnagar, Jaynagar-Bardibas; and establishment of Integrated Check Posts at Birgunj, Biratnagar, Bhairahawa, and Nepalgunj.
- The total economic assistance earmarked under 'Aid to Nepal' budget in FY 2019-20 was INR 1200 crore.
- Further, in 2018 Nepal-Bharat Maitri Pashupati Dharmashala in Kathmandu was inaugrated.
- Government of India has extended Lines of Credit of USD 1.65 billion for undertaking development of infrastructure, including post-earthquake reconstruction projects.

Energy:

- India and Nepal have a Power Exchange Agreement since 1971 for meeting the power requirements in the border areas of the two countries, taking advantage of each other's transmission infrastructure.
- India is currently supplying a total of about 600 MW of power to Nepal

- The first high-capacity 400 kV Muzaffarpur (India) – Dhalkebar (Nepal) cross-border power transmission line, with GoI LoC funding of US$ 13.2 million for Nepal portion of the line, was completed in 2016.
- An Agreement on 'Electric Power Trade, Cross-border Transmission Interconnection and Grid Connectivity' between India and Nepal was signed on 21 October 2014.
- Joint Technical Team (JTT) was formed for preparation of a long-term integrated transmission plan covering projects up to 2035.
- South Asia's first cross-border petroleum products pipeline, constructed and funded by Indian Oil Corporation Ltd., connecting Motihari in India to Amlekhgunj in Nepal was remotely inaugurated by the two Prime Ministers in 2019.

Education and Culture:

- Around 6,00,000 Indians are living/domiciled in Nepal.
- GoI provides around 3000 scholarships/seats annually to Nepalese nationals for various courses.
- The B.P. Koirala India-Nepal Foundation was set up in 1991 to foster educational, cultural, scientific and technical cooperation and to promote mutual understanding and cooperation through sharing of knowledge and professional talents in academic pursuits and technical specialization.
- The Swami Vivekananda Centre for Indian Culture was set up in Kathmandu in August 2007 to showcase the best of Indian culture.
- The Nepal-Bharat Library was founded in 1951 in Kathmandu. It is regarded as the first foreign library in Nepal.
- An Indian Citizens' Association (ICA) of Nepal was formed on 14 September 1990.
- ICA is the only association of resident Indian citizens in Nepal and provides a platform for discussion on matters pertaining to the legitimate interest of resident Indians in Nepal and works for the protection of such interests.

Challenges:

- Hung Parliament in the final results of the recent election created is a recipe for instability and frequent changes of government in the coming years.
- This could easily translate into an inability to deal with the many daunting challenges confronting the country and the continuing unpredictability in the graph of India-Nepal cooperation.
- China's interference in Nepal's polity to promote its own interests and to the detriment of India's interests such as unsuccessfully attempting to prod the left wing in the political spectrum to reunite.
- Traditional irritants such as the 1950 India-Nepal Treaty of Peace and Friendship and the border issue need not be kept festering but should be sorted out in an open and transparent manner.

Solutions:

- Mutual empathy: The will of the political class across party lines, bureaucracies, and civil society on either side of the border to understand what the world looks like from the other side.
- Diverse but balanced and constructive approaches: will contribute to a clearer understanding of the past, better awareness of present trends, and new roadmaps for substantive upgrading of ties in the years to come.
- New and innovative approaches: such as Nepalese yearn for a sense of equality and Indian respect for their identity.

Way forward:

- Public opinion in Nepal is now alert to the reality of Chinese intentions, the risks of falling into a debt trap, and the limitations in terms of Chinese capacities in comparison to India's.
- Nepal is a transforming country. India is a player on the global stage. The world itself is heading towards major transformations, with new challenges, changing priorities and boundless possibilities.

2.4 Y20 summit

On Friday, Union Minister for Youth Affairs and Sports Anurag Thakur launched the themes of the Y20 summit, along with its logo and website in New Delhi.

Y20 summit:

- The first ever Y20 (Youth 20) Summit is to be held in India on the sidelines of the G20 Summit.
- The Y20 Summit is likely to be held in Guwahati.
- It will focus on themes of future of work; climate change and disaster risk reduction; peacebuilding and reconciliation; and youth in democracy.
- The Y20 Summit is a unique opportunity to allow the youth to provide constructive policy inputs and to utilise the platform to voice their opinions for the world audience.
- Y20 will focus on global youth leadership and partnership.
- These priority areas of the summit point to the urgency with which the world has to reconcile with the reality of the changing times in our quest to survive and thrive.

2.5 India and Sri Lanka

- External Affairs Minister S. Jaishankar has said that India is committed to increase investment flows to Sri Lanka to hasten its economic recovery
- India and Sri Lankan discussed cooperation in infrastructure, connectivity, energy, industry and health.
- Dr. Jaishankar's visit to the island nation comes at a crucial time as Sri Lanka has been making efforts to obtain an extended fund facility from International Monetary Fund.

Bilateral Relations:

- India is Sri Lanka's closest neighbour and the relationship between the two countries is more than 2,500 years old built upon a legacy of intellectual, cultural, religious and linguistic interaction.
- In recent years, the relationship has been marked by close contacts at the highest political level such as Bilateral exchanges at various levels

Political relations:

- Developmental assistance projects for the Internally Displaced Persons (IDPs) and disadvantaged sections of the population in Sri Lanka has helped further cement the bonds of friendship between the two countries.
- During the course of the three-decade long armed conflict between Sri Lankan forces and the LTTE(ended in 2009), India supported the right of the Government of Sri Lanka to act against terrorist forces.
- At the same time, it conveyed at the highest levels its deep concern at the plight of the mostly Tamil civilian population, emphasizing that their rights and welfare should not get enmeshed in hostilities against the LTTE.
- The need for national reconciliation through a political settlement of the ethnic issue has been reiterated by India at the highest levels. India's consistent position is in favour of a negotiated political settlement, which is acceptable to all communities within the framework of a united Sri Lanka and which is consistent with democracy, pluralism and respect for human rights
- Prime Minister Wickremesinghe has said that India was the 'only nation' to help out his country through the continuing food, fuel, and pharma crisis.

Commercial relations:

- India and Sri Lanka signed the India-Sri Lanka Free Trade Agreement (ISFTA) in 1998 which came into force in 2000 – provides duty-free access and duty preferences to goods.
- A Joint Study Group (JSG) was set up in 2003 to make recommendations on how to take the two countries beyond trade and achieve greater economic integration through the conclusion of a Comprehensive Economic Partnership Agreement (CEPA).
- Talks have resumed under a new framework called the 'Economic and Technological Cooperation

Agreement' (ETCA) – to boost cooperation in technical areas, scientific expertise and research amongst institutions, boost standards of goods and services able to compete on the global market and improve opportunities for manpower training and human resource development.

Trade

- India is Sri Lanka's largest trading partner with a share of 16 percent in Sri Lanka's total trade with the world.
- Bilateral trade between India and Sri Lanka has increased by around 9 times between 2000-01 and 2018-19.
- India has always had a trade surplus with Sri Lanka
- In 2018-19, India's top 3 exports to Sri Lanka included mineral fuels, ships and boats, and vehicles accounting for 43 percent of total exports to Sri Lanka.
- India's top 3 imports included ships and boats, residues and waste from the food industries, and coffee, tea, mate and spices accounting for 56 percent of total imports.
- India's exports to Sri Lanka are losing their competitiveness vis-a-vis China's exports to Sri Lanka.

Development cooperation

- India's grants to Sri Lanka alone amounting to around USD 570 million, the overall commitment by GOI is to the tune of more than USD 3.5 billion.
- A US$ 100 million LoC for undertaking solar projects in Sri Lanka has been signed between the Government of Sri Lanka and EXIM Bank on June 16, 2021.
- The Indian Housing Project, with an initial commitment to build 50,000 houses in war affected areas and estate workers in the plantation areas, is Government of India (GoI)'s flagship grant project in Sri Lanka.
- The country-wide 1990 Emergency Ambulance Service is another flagship project.
- Some of other notable grant projects which have been completed are the 150-bed Dickoya hospital, livelihood assistance to nearly 70,000 people from fishing and farming community in Hambantota, supply of medical equipment to Vavuniya Hospital and 150 Boats and Fishing gear for Mullaithivu fishermen.
- A modern 1500 – seat auditorium named after Rabindranath Tagore in Ruhuna University, Matara, is the largest in any University in Sri Lanka.
- Under the LOC of USD 318 million, various projects for procurement of rolling stocks for Sri Lankan Railways, upgradation of railway tracks, setting up of railway workshop etc are at different stages of implementation.

Cultural Relations

- The Cultural Cooperation Agreement signed by the Government of India and the Government of Sri Lanka in 1977 forms the basis for periodic Cultural Exchange Programmes between the two countries.
- Buddhism is one of the strongest pillars connecting the two nations and civilizations from the time when the Great Indian Emperor Ashoka sent his children Arhat Mahinda and Theri Sangamitta to spread the teachings of Lord Buddha at the request of King Devanampiya Tissa of Sri Lanka.
- The venerated relics of Lord Buddha from Kapilawasthu discovered in 1970 in India have been exhibited two times in Sri Lanka.
- Prime Minister Shri Narendra Modi during the Virtual Bilateral Summit held between India and Sri Lanka on 26 September 2020, announced a USD 15 million grant assistance for protection and promotion of Buddhist ties between India and Sri Lanka
- In July 2020, the Government of India declared the Kushinagar Airport in India, the place of Lord Buddha's Mahaparinibbana, as an international airport, to allow Buddhist pilgrims from around the world to visit the revered site associated with Lord Buddha with ease – first inaugural flight from Sri Lanka
- Swami Vivekananda Cultural Centre (SVCC) – the cultural arm of the High Commission of India, Colombo, has been playing a key role in strengthening these ties and promoting people-to-people contacts between India and Sri Lanka since its inception in 1998.
- Tourism – India launched the e-Tourist Visa (eTV) scheme for Sri Lankan tourists in 2015.

Security

- Military exercise called Mitra Shakthi and the Naval exercise called "Slinex."
- The defence teams from the two nations recently also met at the Colombo Security Conclave (CSC) meet in Kochi, India to further their defence ties.
- Issues and concerns

- Traditionally, India–Sri Lanka bilateral relations are centered on a few specific issues and concerns—security concerns (now includes security cooperation), ethnic issues, fishers dispute, and investment climate
- Investment atmosphere – Costly investment agreements had been signed with India, under the Rajapaksa regime, amidst heavy criticism from the political opposition such as in power sector.
- Chinese dominance – Sri Lanka's balancing act with India, under the shadow of China's BRI investments in the island to keep both India and China interested has affected Sri Lanka's relations with India, given the latter's antithetical relations with China.
- Fisheries front – on daily-basis Indian fishermen continued to be arrested and their boats and gears impounded on allegations of violating the IMBL and poaching in Sri Lankan waters.
- Four Maritime Boundary Agreements have been signed by the two states between 1974-76 regarding the 12 nautical miles of international waters in the Palk Strait, the terms of the agreement are hardly followed diligently.
- The Sri Lankan Navy continues to accuse India's fishers of violating the decided lines and poaching in their territorial water.
- There is another conflict wherein, Sri Lanka criticizes India's bottom trawler usage in the Palk Strait, which has been a recurring issue for the countries.
- India's China concerns viz Sri Lanka continue to remain real though through the past years, there is nothing to suggest that Chinese commercial investments had led to any military/security tie-up that New Delhi should be worried about.
- China-funded Colombo Port City project any time soon looks suspect at best.
- Ethnic issues including the Tamil proposals and the Sinhala-Buddhist majority social reaction
- Till date, the 13th Amendment to Sri Lanka's Constitution, following the Indo-Sri Lanka Accord, signed on 29 July 1987 has not been honoured.

Way forward

In light of various bilateral issues, the need for national reconciliation through a political settlement of the current issues has been reiterated by India at the highest levels which is consistent with democracy, pluralism and respect for human rights.

3. Economy

3.1 MV Ganga Vilas

Prime Minister Narendra Modi will flag off the 'MV Ganga Vilas' from Varanasi in Uttar Pradesh.

MV Ganga Vilas

- It is the world's longest river cruise.
- The luxury cruise will cover more than 3,200 kilometres across 27 river systems in five States in India and Bangladesh.
- The MV Ganga Vilas cruise is curated to bring out the best of the country to be showcased to the world.
- The 51 days cruise is planned with visits to 50 tourist spots including World Heritage Sights, National Parks, river Ghats, and major cities like Patna in Bihar, Sahib Ganj in Jharkhand, Kolkata in West Bengal, Dhaka in Bangladesh and Guwahati in Assam.
- The MV Ganga Vilas vessel is 62 meters in length, 12 meters in width.
- It has three decks, 18 suites on board with a capacity of 36 tourists, with all the amenities to provide a memorable and luxurious experience for the tourists.
- The ship is equipped with pollution-free mechanisms and noise control technologies.
- The maiden voyage of MV Ganga Vilas will witness 32 tourists from Switzerland relishing the Varanasi to Dibrugarh journey.
- The development of this sector would generate employment opportunities in the hinterland. The river tourism circuits will be developed and integrated with the existing tourism circuits for maximum exposure and rapid development of this sector in the country.

3.2 Cloud Forest Bond

- According to a new report, Cloud Forest Assets Financing is a Valuable Nature-Based Solution released by Earth Security – a global nature-based asset management advisory firm.
- The report is aimed at three stakeholders – national governments, non-profits and communities.

About cloud forests:

- Cloud Forests are montane rainforests
- They refer to the vegetation of tropical mountainous regions where there is heavy rainfall and persistent condensation resulting from the cooling of the moisture being pushed upwards by the mountains.
- They are usually characterized by a persistent, frequent and seasonal low-lying layer of mist and cloud cover usually at the canopy level.
- Cloud forests are rare since the exceptional conditions that create these forests are only found in tropical areas with tall mountains.
- Due to their unique characteristics, cloud forests are usually found along the sides of the mountains at elevations of between 3000 and 10000 feet but as low as 1650 feet in the Tropics between coordinates 23°N and 23°S.
- Only 1% of the global woodlands are considered as cloud forests following a decline from 11% in the 1970s due to interferences by human activities and global warming.
- Just 25 countries hold 90 per cent of the world's cloud forests
- These twenty-five countries are Indonesia, Tanzania, Democratic Republic of Congo, Colombia, Peru, Venezuela, Mexico, Papua New Guinea, Brazil, Ethiopia, Ecuador, Cameroon, Bolivia, China, Laos, Kenya, Malaysia, Angola, Uganda, Madagascar, Philippines, Gabon, Vietnam, Republic of Congo and Myanmar.

Significance:

- Their hydrological function is of existential value to millions of people living downstream.

- They capture moisture from the air, providing fresh and clean water to people and industries below.
- These 25 countries have around 979 hydropower dams and around half of them use water from the cloud forest.
- The total value of hydroelectricity that currently depends on cloud-affected forests across these 25 countries is estimated to be $118 billion over 10 years. This will increase to $246 billion when new hydropower plants that are being developed become operational.

Cloud forest bonds:

- Cloud Forest Bond will incentivise governments to protect their cloud forests — forests that are on top tropical mountains, largely shrouded in mist.
- Cloud forest bonds will provide governments with financial actors like philanthropy, public finance and private investment to capture the economic value of the ecosystem services of the cloud forests.
- Such a tool will encourage carbon storage and provide funding to set up sovereign-level carbon finance schemes as well as payments for ecosystem services
- The report proposes to mobilise financing for cloud forest protection through payments schemes under which hydropower projects and other industrial water users benefiting from cloud forests pay for this service.
- While these investments must conform to rigorous social and environmental impact safeguards, ensuring the protection of these forests upstream should be included as a risk management priority for investors, project developers and policy-makers.
- The Cloud Forest Bonds will allow the developing countries to improve their debt position and fund the creation of new, long-term income streams from services provided by nature.
- These bonds can be in the form of new bond issuances, debt-swaps and results-based financing instruments, which are matched to the circumstances of each of the twenty-five countries.
- Forest protection is highest where land ownership rights of indigenous peoples and local communities are fully recognised and exercised – by providing a fair share of the benefits from forest carbon and water revenues
- A Cloud Forest 25 (CF25) Investment Initiative to establish a collective of all 25 countries that have high cloud forest to accelerate the international application of market templates and aggregate the blended finance and data needed to achieve solutions at scale.

3.3 Bureau of Indian Standards (BIS)

Union Minister for Commerce recently launched many initiatives to improve the quality of standards in India on the occasion of 76th Foundation Day of Bureau of Indian Standards (BIS).

About BIS:

- BIS is the National Standard Body of India established under the BIS Act 2016 for the harmonious development of the activities of standardization, marking and quality certification of goods and for matters connected therewith or incidental thereto.
- BIS has been providing traceability and tangibility benefits to the national economy in a number of ways –
- providing safe reliable quality goods;
- Minimizing health hazards to consumers;
- Promoting exports and imports substitute;
- Control over proliferation of varieties etc. through standardization, certification and testing.
- BIS has its Headquarters at New Delhi and its 05 Regional Offices (ROs) are at Kolkata (Eastern), Chennai (Southern), Mumbai (Western), Chandigarh (Northern) and Delhi (Central).
- Keeping in view, the interest of consumers as well as the industry, BIS is involved in various activities as given below:
- Standards Formulation
- Product Certification Scheme
- Compulsory Registration Scheme

- Foreign Manufacturers Certification Scheme
- Hall Marking Scheme
- Laboratory Services
- Laboratory Recognition Scheme
- Sale of Indian Standards
- Consumer Affairs Activities
- Promotional Activities
- Training Services, National and International level and
- Information Services

New Initiatives launched on the occasion of 76th Foundation Day of BIS:

- Portal for mapping of Industrial Units and Laboratories:
- It is centralized platform for information on industrial units and laboratories across the country.
- It will enable analysis of test facilities and help entrepreneurs in accessing information about testing facilities.

Standards National Action Plan (SNAP) 2022- 27:

- It is a document that serve as foundation for standardization to meet emerging technologies and concerns of sustainability and climate change.
- Its implementation will ensure "Quality Culture" in the Nation.

Revision Exercise of National Building Code of India (NBC 2016):

- NBC is a building Code, and a national instrument that provides guidelines to regulate building construction activities across India to be implemented by all
- agencies involved in building construction.
- Revised exercise includes sustainable city planning norms.

Revised National Electrical Code of India 2023:

- It is a national instrument that provides guidelines to regulate Electrical Installations practices across the country.
- It has proposed requirements of electrical installation as per latest International best practices.

Training Courses on National Building Code of India 2016 and National Electrical Code of India:

- Through its training provided by National Institute of Training for Standardization (NITS), BIS has designed training courses for national capacity building.

3.4 ICAR-NBAGR

In the last one year, the Indian Council of Agricultural Research (ICAR) has registered 10 new breeds of livestock species, including cattle, buffalo, goat and pig. This has taken the total number of indigenous breeds to 212 as of January 4, 2023.

About ICAR-NBAGR:

- The 'National Bureau of Plant Introduction' was renamed as 'National Bureau of Plant Genetic Resources' (NBPGR) in January 1977.
- It is one of the Indian Council of Agricultural Research (ICAR) Institutes.
- ICAR is an autonomous organisation under the Ministry of Agriculture & Farmers' Welfare.
- It is a nodal organisation in India for management of Plant Genetic Resources (PGR).
- It has played a pivotal role in the improvement of various crop plants and diversification and development of agriculture in India through germplasm introduction from various institutes/organizations located in foreign countries and germplasm collection from within the country and abroad and conservation thereof.
- Germplasm is a live information source for all the genes present in the respective plant, which can be

conserved for long periods and regenerated whenever it is required in the future.
- The NBPGR has linkage with National Active Germplasm Sites (NAGS) for the management of active germplasm of field and horticultural crops.
- NAGS are located at NBPGR regional stations, other crop-based ICAR institutes or State Agricultural Universities.
- It is headquartered in Karnal, Haryana.

Registration of new breeds:
- ICAR-National Bureau of Animal Genetic Resources, Karnal (NBAGR) is the nodal agency for the registration of breeds of the country.
- Total number of indigenous breeds is 212 as of January 2023.
- The identification and registration of indigenous breeds started only after 2010.
- Those breeds which are not registered or identified are called 'non-descript'.
- Since 2010, this is the third highest increase in registration of indigenous breeds, after 15 in 2018-19 and 13 in 2019-20 were recorded.
- In 2010, there were only 129 indigenous breeds registered, called 'extant breeds.'

Newly registered breeds:
Cattle breeds:
- Kathani: It is dual-purpose cattle, is also distributed in the region. It possesses good draft ability and is suited to marshy land for paddy cultivation.
- Masilum: It is a small-sized but well-built and sturdy cattle of Meghalaya.
- It is reared by the Khasi and Jaintia communities for sports, manure and socio-cultural festivals.
- Sanchori: It is found in the Jalore district of Rajasthan.

Pig breeds:
- Manipuri Black: It is native to Manipur.
- Banda: It belongs to Jharkhand.
- Wak Chambil: It is from Garo hills of Meghalaya.

Buffalo breed:
- Purnathadi buffalo: It is found in Vidarbha region of Maharashtra.

Goat breeds:
- Sojat, Karauli, Gujari – All three new breeds belong to different regions of Rajasthan.

3.5 Mali Parbat Bauxite mine

- Public hearing on the environment clearance (EC) for Mali Parbat Bauxite Mining by Hindalco Industries in Korapaut on January 7, 2023 was presided over by the district judicial officer.
- Around 2,000 people from the local communities attended the hearing on January 7 and 80-90 of them raised objections to granting EC to Hindalco. Around 90 per cent of the people from the local communities opposed the EC.

Mali Parbat Bauxite mine:
- It is located in Pottangi tehsil of Koraput district of Odisha.
- The bauxite mined out from the Maliparbat mine will be used in existing Hindalco's Alumina refineries located at Renukoot (Uttar Pradesh), Muri (Jharkhand) & Belgaum (Karnataka).
- Some rivers near the mine are Kukurhaghat Nala, Kunduli Nala and Kolab River.
- Hindalco Industries is one of the leading producers of aluminium in the country. The company business involves bauxite mining to alumina refining.
- Hindalco Industries was granted EC for an area of 268.110 hectares of Maliparbat bauxite mine in 2006.

Bauxite mining in India:

- India is rich in bauxite reserves – 3,896 million tonnes as in 2015.
- About 77% resources are of Metallurgical grade.
- There were 157 reporting mines in 2016-17 out of which 56 are major mines.
- The share of Public Sector mines was about 31 % of the total production in 2016-17
- Many indigenous and tribal people live near the mines, which shows the quantity of bauxite in India.

What is Bauxite?

- The raw material of aluminium is known as bauxite ore.
- It is generally found in the region close to laterite rocks.
- Laterite rocks are commonly found in the peninsular and coastal regions – plateaus and hill ranges.

Uses of bauxite ore:

- Bauxite is used as a primary ingredient in making aluminium – It consists of 80% of bauxite. It is used to convert into aluminium and make aluminium products.
- It is also used as a corrector. In the case of any dent or damage, bauxite ore is used in the steel industry to repair the damage.
- Bauxite is also used in the industries of rubber, water purifying machines, plastic, paper making, etc.

The distribution of Bauxite ore in India :

- Bauxite ore is mainly found in the peninsular, coastal and hill ranges.
- Odisha (51%)
- Andhra Pradesh (16%)
- Gujarat (9%)
- Jharkhand (6%)
- Maharashtra (5%)
- Chhattisgarh
- Tamil Nadu
- Madhya Pradesh
- Odisha is the largest bauxite ore-producing state.

The popular mines of bauxite lie in Odisha's districts of Sambalpur, Kalahandi, Sundargarh etc.
There are two famous bauxite ore mines in Odisha – Panchpatmali mines and Gandha Mardan

3.6 National Monetisation Pipeline (NMP)

- According to recent data, the Centre's ambitious National Monetisation Pipeline (NMP) may miss the goal in FY23 by a wide margin.
- After achieving the target for the first year rather comfortably, the Centre's National Monetisation Pipeline (NMP) may miss the goal as railways, telecom and petroleum sector slip on their goals.

About National Monetisation Pipeline (NMP):

- The pipeline has been developed by NITI Aayog, in consultation with infrastructure line ministries, based on the mandate for 'Asset Monetisation' under Union Budget 2021-22.
- NMP estimates aggregate monetisation potential of Rs 6.0 lakh crores through core assets of the Central Government, over a four-year period, from FY 2022 to FY 2025.
- It aims to unlock value in brownfield projects by engaging the private sector, transferring to them revenue rights and not ownership in the projects, and using the funds generated for infrastructure creation across the country.

Framework of NMP:

- The pipeline has been prepared based on inputs and consultations from respective line ministries and departments, along with the assessment of total asset base available therein.
- Monetization through disinvestment and monetization of non-core assets have not been included in the NMP.

The framework for monetisation of core asset monetisation has three key imperatives:

- Monetization of rights and not the ownership, assets headed back at the end of transaction life.
- Brownfield de-risked assets, stable revenue streams.
- Structured partnerships under defined contractual frameworks with strict KPIs and performance standards.

Sector specific data and associated challenges

Telecom:

- As against the target of Rs 20,180 crore, the department of telecom has not been able to monetise any of telecom assets so far and doubts have emerged if it could achieve anything.
- The original plan was to mobilise Rs 15,780 crore by inviting private investors to bid for Bharat Broadband Network's 300,000 km of optical fibre networks to upgrade, operate and maintain across the country, including states.
- Another Rs 4,400 crore was estimated from BSNL/MTNL tower monetisation through rent-operate-transfer (ROT) concession model, but bids are yet to be called for these.

Mining sector:

- Previous year, a sum of about Rs 1 trillion was raised through the monetisation route as against the target of Rs 88,200 crore due to the mining sector.

Natural gas and petroleum product pipelines:

- Monetisation of natural gas and petroleum product pipelines were projected to fetch Rs 9,176 crore in FY23.
- However, oil and gas companies have proposed alternate assets such as monetisation of oil fields (on the lines of mines monetisation) through private participation in exploration and with the inflow of technology.

Road Transport and Highways:

- Monetisation by other sectors including road assets by the National Highways Authority of India (NHAI) are on track.
- NHAI is expected to meet its target of Rs 32,855 crore from the securitisation of toll receivables from

expressways, Infrastructure Investment Trusts (InvITs) and Transfer-Operate-Transfer (ToT) models.

Railways:

- Railways is the biggest component of the Rs 6 trillion NMP in the four years through FY25.
- Railways collected just Rs 800 crore via monetisation through redevelopment of one railway station and some railway colonies in the last fiscal year as against the target of Rs 17,810 crore.
- According to the NMP, railways need to monetise 120 stations, 30 trains and 1,400 km track, among others in FY23.

Significance of NMP:

Innovative way of Private Participation:

- Private sector is well known for its efficiency and technology.
- NMP will provide a way to exploit the strength of the Private sector for infrastructure creation without transfer of ownership.
- Ensure Further investment in Infrastructure Building:
- It will help to properly monetise underutilised brownfield projects
- Revival of the economy and create sustainable demand.
- Spillover effect of infrastructure is high on cycle of demand
- It will create further value for infrastructure creation in the country
- It will enable high economic growth and seamlessly integrating the rural and semi-urban areas for overall public welfare.

Challenges associated with NMP:

- Level of capacity utilisation in gas and petroleum pipeline networks.
- Lack of identifiable revenue streams in various assets.
- Absence of Dispute resolution mechanism.
- Analysts also point to issues such as the lack of independent sectoral regulators as potential impediments.

Way Forward:

- Thus, the Asset Monetisation needs to be viewed not just as a funding mechanism, but as an overall paradigm shift in infrastructure operations, augmentation and maintenance considering the private sector's resource efficiencies and its ability to dynamically adapt to the evolving global and economic reality.

Therefore, New models like Infrastructure Investment Trusts and Real Estate Investment Trusts will enable not just financial and strategic investors but also common people to participate in this asset class thereby opening new avenues for investment.

3.7 RuPay Debit Cards and low-value BHIM-UPI transactions

Union Cabinet gave its nod to the incentive scheme for the promotion of RuPay Debit Cards and low-value BHIM-UPI transactions.

About the scheme:

- The scheme has a financial outlay of INR 2600 crore.
- The decision will help in building a robust digital payment system.

RuPay Debit Cards:

- It is the first of its kind global card payment network of India
- It was conceived and launched by the National Payments Corporation of India (NPCI) in 2012.
- The name, derived from 'Rupee and Payment', emphasises India's very own initiative for Card payments.
- It has wide acceptance at ATMs, POS devices and e-commerce websites across India.
- It is a highly secure network that protects against anti-phishing.

- It fulfils RBI's vision of initiating a 'cashless economy' by establishing a domestic, open and multilateral system of payments.
- It facilitates electronic payment at all Indian banks and financial institutions.
- NPCI maintains ties with Discover Financial, JCB to enable RuPay card scheme to gain international acceptance
- RuPay cards are issued by more than 1100 banks including public sector banks, private, regional banks and cooperatives.
- Its 10 core promoter banks include SBI, PNB, Canara bank, BOB, Union Bank of India, Bank of India, ICICI Bank, HDFC bank, Citibank and HSBC

BHIM UPI:

- Bharat Interface for Money (BHIM) is a payment app that lets you make simple, easy and quick transactions using Unified Payments Interface (UPI).
- Pioneered and developed by National Payments Corporation of India (NPCI), BHIM has been launched in 2016 to bring in Financial Inclusion to the nation and a digitally empowered society.
- One can make direct bank payments to anyone on UPI using their UPI ID or scanning their QR with the BHIM app.
- One can also request money through the app from a UPI ID.

National Payments Corporation of India (NPCI)

- NPCI is an umbrella organisation for operating retail payments and settlement systems in India.
- It is an initiative of Reserve Bank of India (RBI) and Indian Banks' Association (IBA) under the provisions of the Payment and Settlement Systems Act, 2007, for creating a robust Payment and Settlement Infrastructure in India.
- Considering the utility nature of the objects of NPCI, it has been incorporated as a "Not for Profit Company under the provisions of Section 25 of Companies Act 1956 (now Section 8 of Companies Act 2013)
- It aims to provide infrastructure to entire banking system in India for physical as well as electronic payment and settlement systems.
- The Company is focused on bringing innovations in the retail payment systems through the use of technology for achieving greater efficiency in operations and widening the reach of payment systems.
- Initiatives
- With Immediate Payment Service (IMPS)
- National Financial Switch (NFS)
- Cheque Truncation System (CTS)
- Unified Payments Interface (UPI) and Bharat Interface for Money (BHIM)
- Bharat Bill Payment System (BBPS)
- Initiatives in pipeline
- RuPay Credit Card
- National Common Mobility Card
- Tap & Go and Electronic Toll Collection.

3.8 Viscose Staple Fibre

The Association of Man-made Fibre Industry of India (AMFII) has appealed to the Union Finance Ministry to accept the recommendations of the Directorate General of Trade Remedies (DGTR) on levy of anti-dumping duty (ADD) on imports of Viscose Staple Fibre from Indonesia.

About The Association of Man-made Fibre Industry of India (AMFII)

- The AMFII was set up in 1951 as "The Rayon Manufacturers' Association".
- In 1959, its name was changed to "Association of Man-Made Fibre Industry of India" to include all the modern Man-Made Fibres of 20th Century origin thereby expanding its scope and membership.
- Thus, the Membership of the AMFII varied from time to time and included both Synthetic and Cellulosic

Man-Made Fibres and Filament Yarn Manufacturers.

- On 29th April 1987, the AMFII was registered as a Private Limited Company under section 25 A of the Companies Act 1956.
- It was also registered under section 12 of the Income Tax Act as an organization for charitable purpose for "advancement of an object of general public utility".
- The main object of the Association is to help the man-made fibre industry in India to formulate general policy on production and development of the industry.
- The Association also acts as a liaison body on behalf of the industry and communicates with the Chambers of Commerce and other public bodies within and outside India, with a view to promote and protect the man-made fibre industry and trade.
- The Association has its Registered Office in Mumbai.
- It has a Branch Office in New Delhi.

About Viscose Staple Fibre:

- Viscose Staple Fiber (VSF), is a natural and biodegradable fiber which has characteristics that are similar to cotton.
- Due to its versatility, VSF is widely used for manufacturing
- Apparels
- Home textiles
- Dress materials
- Knitted wear and
- Non-woven applications.

About Anti-Dumping Duty:

- Anti-dumping is a protectionist tariff, imposed by a domestic government on foreign imports that are at a price lower than the price it normally charges in its own home market.
- Anti-dumping duty is imposed as a remedy to the distortive trade which arises due to the dumping of goods.
- The use of anti-dumping measures as an instrument of fair competition is permitted by the World Trade Organisation.
- Where dumping occurs, the WTO allows the government of the affected country to take legal action against the dumping country as long as there is evidence of genuine material injury to industries in the domestic market.
- The Government must show that dumping took place, the extent of the dumping in terms of costs, and the injury or threat to cause injury to the domestic market.

3.9 CII Bio-Energy Summit

The Minister of Petroleum and Natural Gas & Housing and Urban Affairs was addressing the 11th edition of CII Bio-Energy Summit.

- India has increased the ethanol blending in petrol from 1.53% in 2013-14 to 10.17% in 2022.
- setting up 2G refineries to make ethanol from Parali (Panipat) and Bamboo (Numaligarh) with the twin objective of reducing pollution along with achieving energy security goals is another milestone in this direction.
- Green Hydrogen Policy with a production target of 5 million tonnes by 2030 and aims to produce 4 MT Green Hydrogen annually & accrue Rs. 1 lakh crore of cumulative fossil fuel import savings by 2030.
- The Confederation of Indian Industry (CII)
- CII is a non-government, not-for-profit, industry-led and industry-managed organization
- It was founded in 1895
- It has 9000 members from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 300,000 enterprises from 286 national and regional sectoral industry bodies.
- With 62 offices, including 10 Centres of Excellence, in India, and 8 overseas offices in Australia, Egypt,

Germany, Indonesia, Singapore, UAE, UK, and USA, as well as institutional partnerships with 350 counterpart organizations in 133 countries, CII serves as a reference point for Indian industry and the international business community.

Aim:

- It works to create and sustain an environment conducive to the development of India, partnering Industry, Government and civil society, through advisory and consultative processes.

Functions:

- CII charts change by working closely with Government on policy issues, interfacing with thought leaders, and enhancing efficiency, competitiveness and business opportunities for industry through a range of specialized services and strategic global linkages.
- It also provides a platform for consensus-building and networking on key issues.
- CII assists industry to identify and execute corporate citizenship programmes.
- Partnerships with civil society organizations carry forward corporate initiatives for integrated and inclusive development across diverse domains including affirmative action, livelihoods, diversity management, skill development, empowerment of women, and sustainable development, to name a few.

3.10 Alternate Investment Fund

The Securities and exchange board of India has allowed alternative investment funds) to participate in credit default swaps (CDS) as protection for both buyers and sellers.
Category I and Category II AIFs may buy CDS on underlying investment in debt securities, only for the purpose of hedging.
Category III AIFs may buy CDS for hedging or otherwise, within permissible leverage
Credit default swap market is very illiquid at present.

Alternate Investment Fund (AIFs):

- In India, AIFs are defined in Regulation 2(1) (b) of Securities and Exchange Board of India (Alternative Investment Funds) Regulations, 2012.
- Meaning – 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).
- They include angel funds, commodities, real estate, venture capital, private equity, etc.

Categories of AIFs

- Category I: Mainly invests in start- ups, SME's or any other sector which Govt. considers economically and socially viable
- Category II: private equity funds or debt funds for which no specific incentives or concessions are given by the government or any other Regulator
- Category III : hedge funds or funds which trade with a view to make short term returns or such other funds which are open ended and for which no specific incentives or concessions are given by the government

Benefits of AIF:

- Security against volatility – These schemes do not put their funds in investment options that trade publicly. Hence, they are not related to the broader markets and do not fluctuate with their ups and downs.
- Excellent portfolio diversification to a wide array of assets
- Profitable returns – as these funds have numerous investment options, They are a better source of passive income. Further, returns are less prone to fluctuations as these schemes are not linked to the stock market.

Credit Default Swap (CDS)

- They are a type of insurance, introduced by JP Morgan

- It is used for hedging counter-party concentration risk and credit risks
- It is a contract between two parties, called protection buyer and protection seller against default risk by a particular company.
- The company is called the reference entity and the default is called credit event.
- Under the contract, the protection buyer is compensated for any loss emanating from a credit event in a reference instrument. In return, the protection buyer makes periodic payments to the protection seller.
- In the credit event, the buyer receives the face value of the bond or loan from the protection seller.
- From the seller's perspective, CDS provides a source of easy money if there is no credit event.
- If the credit event does not occur before the maturity of the loan, the protection seller does not make any payment to the buyer.
- The settlement of the CDS takes place either through cash settlement or physical settlement.
- There are different varieties of CDS, like binary CDS, basket CDS, contingent CDS and dynamic CDS.
- There are different types of credit events such as bankruptcy, failure to pay, and restructuring.
- Asset-backed securities (ABS) is the most common type of CDS.
- CDS can be structured either for the event of shortfall in principal or shortfall in interest. There are three options for calculating the size of payment by the seller to the buyer.
- Fixed cap: The maximum amount paid by the protection seller is the fixed rate.
- Variable cap: The protection seller compensates the buyer for any interest shortfall and the limit set is Libor plus fixed pay.
- No cap: In this case, the protection seller has to compensate for shortfall in interest without any limit.

Calculation:

- The modelling of the CDS price is based on modelling the probability of default and recovery rate in the event of a credit event.
- The value of CDS for the protection buyer = Expected present value of the contingent leg – Expected present value of fixed leg
- In the real world, modelling of the CDS price is difficult because of the problem in computing default probabilities and default correlation.

Uses:

- Although used for hedging credit risks, credit default swap (CDS) has been held culpable for vitiating financial stability of an economy.
- This is particularly attributable to the capital inadequacy of the protection sellers.
- When big protection sellers are inadequately capitalised, the over-the-counter (OTC) CDS market raises its ugly head.

3.11 RBI's Contingency Fund

THE SURPLUS available with the Reserve Bank of India for transfer or the RBI dividend to the Union government is likely to remain low in the current financial year ending March 2023 because of higher expenditure incurred by the central bank due to rising interest rates and higher costs in managing surplus liquidity in the system.

Contingency Fund

- This is a specific provision meant for meeting unexpected and unforeseen contingencies, including depreciation in the value of securities, risks arising out of monetary/exchange rate policy operations, systemic risks and any risk arising on account of the special responsibilities enjoined upon the Reserve Bank.
- This amount is retained within the RBI.

Currency and Gold Revaluation Account (CGRA)

- It is maintained by the Reserve Bank to take care of currency risk, interest rate risk and movement in gold prices.

- Unrealised gains or losses on valuation of foreign currency assets (FCA) and gold are not taken to the income account but instead accounted for in the CGRA.
- Net balance in CGRA, therefore, varies with the size of the asset base, its valuation and movement in the exchange rate and price of gold.
- CGRA provides a buffer against exchange rate/ gold price fluctuations. It can come under pressure if there is an appreciation of the rupee vis-à-vis major currencies or a fall in the price of gold.
- When CGRA is not sufficient to fully meet exchange losses, it is replenished from the CF.

IRA-FS and IRA-RS accounts:

- The unrealised gains or losses on revaluation in foreign dated securities are recorded in the Investment Revaluation Account Foreign Securities (IRA-FS).
- Similarly, the unrealised gains or losses on revaluation is accounted for in Investment Revaluation Account-Rupee Securities (IRA-RS).
- In the Investment Revaluation Account-Foreign Securities (IRA-FS), the foreign dated securities are marked-to market on the last business day of each week ending Friday and the last business day of each month and the unrealised gains or losses are transferred to the IRAFS.

Economic capital framework

- Bimal Jalan-led panel was constituted to review the RBI's Economic Capital Framework (ECF).
- The RBI transfers surplus to the government as per the economic capital framework (ECF) adopted by the RBI board
- The RBI normally pays the dividend from the surplus income it earns on investments and valuation changes on its dollar holdings and the fees it gets from printing currency, among others.
- The RBI should maintain a Contingent Risk Buffer, which mostly comes from the CF, of between 5.5-6.5% of the central bank's balance sheet.
- RBI should put in place a framework for assessing the market risk of its off-balance sheet exposures in view of their increasing significance.
- The surplus distribution policy should move away from targeting total economic capital alone.
- A review of RBI's economic capital framework should be conducted every five years.

Repo and Reverse repo:

- Repurchase Agreements (Repo) are conducted whenever the Central Bank is mopping up excess liquidity from the domestic market.
- A Repo is a collateralized loan involving a contractual arrangement between two parties, whereby one party sells a security at a specified price with a commitment to buy back the same at a later date.
- The repo rate is the interest paid by RBI to Commercial Banks for lending money in the repo market.
- Reverse Repos, on the other hand, are conducted whenever the Central Bank is injecting liquidity into the domestic market.
- Reverse Repo transactions therefore, involve purchase of Government securities by RBI from Commercial Banks.
- The reverse repo rate is the interest paid by commercial banks for borrowing money from the Central bank.
- Under reverse repo, the RBI borrows from banks, while under the repo window, RBI lends to banks.
- The reverse repo rate is 3.35 per cent and the repo rate is 6.25 per cent.

3.12 Financial Services Institutions Bureau (FSIB)

Recently Financial Services Institutions Bureau (FSIB) recommended names for the posts of managing directors of Bank of Baroda and Bank of India.

About Financial Services Institutions Bureau (FSIB):

- It's a government body set up under the department of financial service by central government in 2022.

- The Secretariat of the Bureau currently comprises of Secretary and four officers.
- It replaced Banks Board Bureau (BBB).
- It aims to identify manpower capabilities and ensure proper selection of talent for senior positions at financial institutions owned by the government.
- The board is entrusted to making recommendations of full-time appointment of directors and non-executive chairman of state-run financial services / Public sector organization and on other matters relating to personnel management in the institution.
- It comprises of Ex-Officio members from Government other the Regulatory Bodies and experts from the respective field.

Function of FSIB:

- To advise the Government on matters relating to appointments, transfer or extension of term of office and termination of services of the said directors.
- To advise the Government on the desired management structure at the Board level for Public Sector Bank, Public financial institution and Public Sector Insurers.
- To advice government for performance appraisal system and code of conduct and ethics for the directors.
- To ensure suitable training and development programmes for management in PSBs, FIs and PSIs.
- To Help institution for developing business strategy and raising capital plan.

3.13 Carbon Trading and Carbon Credit

Recently, The Union Ministry of Power has notified the implementation of the Energy Conservation (Amendment) Act, 2022, from January 1, 2023. The amendment empowers the Union government to lay down a carbon credit certificates trading scheme in India.

About Carbon Trading and Carbon Credit:

- Carbon trading is a market-based system that aims to offer financial incentives to persuade enterprises to lessen their environmental footprint.
- In contrast to voluntary offsets, which allow consumers to pay to offset their carbon impact, carbon trading is a legally binding scheme.
- Carbon trading seeks to place a price on CO_2 using the caps and trade principle and is calculated by individual governments and policymakers.
- The amount of emissions that are allowed for each carbon-producing industry, such as the power sector, the automobile industry, and air travel, is capped by the government.

Carbon Credit:

- A carbon credit is a kind of tradable permit that, per United Nations standards, equals one tonne of carbon dioxide removed, reduced, or sequestered from the atmosphere.
- Carbon allowances or caps, meanwhile, are determined by countries or governments according to their emission reduction targets.

Significance of Carbon Credit:

- Carbon credits allow carbon dioxide emissions to be traded as a commodity in the market which compensates sellers for investing in emission reduction practices and thus incentivises the net reduction of carbon dioxide in the atmosphere.
- Corporations that cannot directly reduce their GHG emissions can offset their emissions indirectly by purchasing carbon credits from other individuals and entities.
- As the significance of climate and sustainability increases for countries, investors (especially ESG-driven investments), employees, and customers' demand for these credits is also expected to significantly increase.
- Various practices could be eligible for earning carbon credits, including renewable energy, afforestation, ecological restoration, agriculture, waste management, etc.

Advantages of carbon credit in Agricultural Sector:

- Carbon credits could be generated in agriculture based on carbon dioxide sequestered and stored by the soil from the atmosphere as well as the reduction in carbon dioxide emissions during the cultivation process from ploughing to the management of stubble.
- For instance, various activities related to agriculture such as tilling of fields before sowing seeds, use of chemical fertilizers, stubble burning, etc. result in carbon dioxide emissions.
- Agriculture is also the biggest contributor to GHG emissions within the entire food system.
- Being a major source of emissions, agriculture could also serve as an important sink to store carbon and thus reduce, avoid or sequester carbon dioxide emissions.
- The improvement in the carbon-storing capacity of the soil could improve fertility, crop yields, farmers' income, water conservation, etc., thereby aiding in making agriculture resilient in the long run.
- Use of the direct-seeding method to cultivate rice instead of transplantation of saplings in flooded fields can reduce methane emissions (generated from bacteria in flooded fields) and water consumption, and also improve soil nutrition.
- The promotion of similar practices could help in reducing emissions and providing carbon credits to farmers.
- Farmers can then sell these credits in the market and earn additional income, thus further incentivising them to implement such activities and improve soil carbon.
- Encouraging activities like zero-tilling agriculture, agroforestry, improved water management, crop diversification and reduced use of chemical fertilizers can improve soil health and its capacity to store carbon.
- It is estimated that soil carbon sequestration is a cost-effective measure to mitigate climate change and can sequester around 2.6 gigaton emissions per year.

Challenges before Carbon credit in the Agriculture sector:

- This nascent level of agricultural carbon trading can be attributed to various reasons such as –
- Low level of stakeholder awareness
- Low level of methodology for determination of emissions reduced, avoided, or sequestered due to agriculture activities
- Non-permanence of carbon sequestered in the soil
- Verification of the quality of carbon credits
- Monitoring of underlying projects,
- Determination of the fair value of carbon credits to incentivise farmers to adopt sustainable practices etc.
- The average landholding size of an Indian farmer is just over one hectare.
- Therefore, the amount of carbon credits received may not be enough for a small farmer to adopt regenerative agriculture practices.

Low Participation of Agriculture Sector:

- The carbon credits conceptually seem encouraging for climate change and agriculture but there is low participation of the agricultural sector in carbon trading markets.
- For example, as per the Berkeley Carbon Trading Project, agricultural activities accounted for only 1 per cent of all carbon credits issued for emissions reduction projects in 2021.

Way Forward:

- Farmers need to be made aware of the existence and benefits of carbon credit programmes, so that all farmers practicing regenerative agriculture can benefit from it. Need of a streamlined policy to address these challenges which will help in expanding the currently under-utilized space for carbon credit trading from commercial agriculture.

Thus the governments at the state and central level could attempt to align existing natural farming, regenerative farming, and organic farming schemes so as to nudge farmers to participate in carbon credit programmes along with the associated organizations.

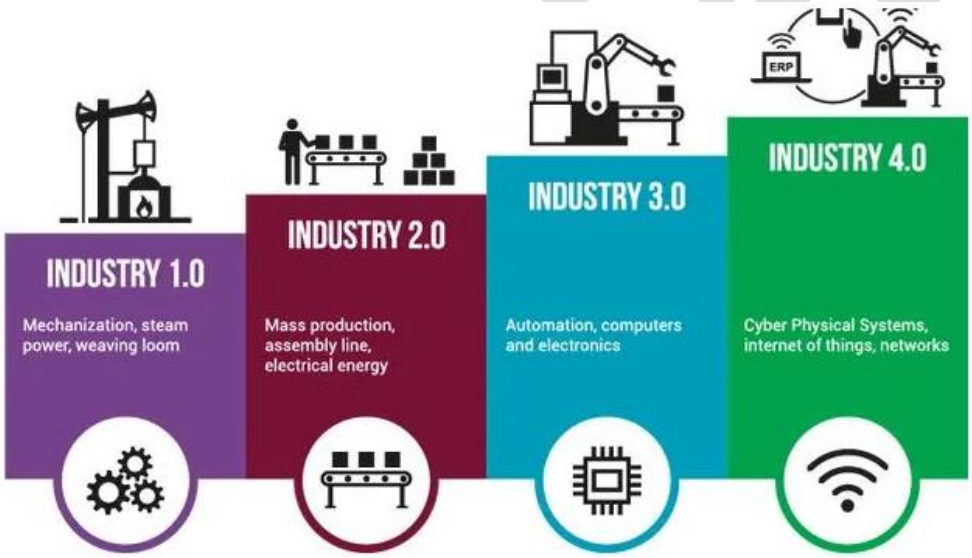
3.14 Loan loss provision

Recently, The Reserve Bank of India (RBI) published a discussion paper on "loan loss provision", proposing a framework for adopting an expected loss (EL)-based approach for provisioning by banks in case of loan defaults.

About Loan loss provision:

- The RBI defines a loan loss provision as an expense that banks set aside for defaulted loans.
- Banks set aside a portion of the expected loan repayments from all loans in their portfolio to cover the losses either completely or partially.
- In the event of a loss, instead of taking a loss in its cash flows, the bank can use its loan loss reserves to cover the loss.
- An increase in the balance of reserves is called loan loss provision.
- The level of loan loss provision is determined based on the level expected to protect the safety and soundness of the bank.
- It will enhance the resilience of the banking system in line with globally accepted norms.
- It is likely to result in excess provisions as compared to a shortfall in provisions as seen in the incurred loss approach.

3.15 Industrial Revolution 4.0



- The World Economic Forum (WEF) has chosen Hyderabad for establishing its Centre for the Fourth Industrial Revolution focused on healthcare and life sciences. C4IR Telangana will be the 18th centre to join WEF's Fourth Industrial Revolution (4IR) network that spans four continents.
- The first industrial revolution used water and steam power to mechanise production (the 1800s).
- The second used electric power to create mass production (the early 1900s).
- The third used electronics and information technology to automate production (the late 1900s).

About Industrial Revolution 4.0:

- The term 'Industry 4.0' was coined by the German government in 2011.
- Industry 4.0 refers to a new phase in the Industrial Revolution that focuses heavily on interconnectivity, automation, machine learning, and real-time data.
- Industry 4.0, which encompasses IoTs and smart manufacturing, marries physical production and operations with smart digital technology, machine learning, and big data .
- Industry 4.0 comes into play when every company and organization operating today is different, they all face a common challenge—the need for connectedness and access to real-time insights across processes, partners, products, and people.

Industry 4.0 Technologies:

Significance of Industrial Revolution 4.0:

- It has the potential to raise global income levels and improve the quality of life for populations around the world.
- It will also lead to a supply-side miracle, with long-term gains in efficiency and productivity.
- Transportation and communication costs will drop, logistics and global supply chains will become more effective, and the cost of trade will diminish, all of which will open new markets and drive economic growth.
- Governments will gain new technological powers to increase their control over populations, based on pervasive surveillance systems and the ability to control digital infrastructure. .
- Advances in technology will create the potential to reduce the scale or impact of violence, through the development of new modes of protection, for example, or greater precision in targeting.

Challenges of IR 4.0:

- The immediate fear is that of job loss, particularly in the informal sector.
- It could yield greater inequality, particularly in its potential to disrupt labor markets.
- Besides all these, there are several other critical concerns surrounding safety, ethics, and the short- and long-term socio-economic impact that remain unanswered.
- There is a growing concern that the existing fallacies in humans might only get more accentuated after 4IR.
- There are several studies that show how facial recognition technologies have a higher chance of misidentifying African and Asian people compared to their Western counterparts. It is also going to be skewed as developing and least developed countries lack the data framework and infrastructure.
- It will also profoundly impact the nature of national and international security, affecting both the probability and the nature of the conflict. This will lead to new fears.
- One of the greatest individual challenges posed by new information technologies is privacy.

Need for India to adopt IR 4.0:

- Advanced data analysis will help its manufacturing capacity and increase the quality of the product.
- Business Analytics will work on the prediction and prevention of production defects.
- Digitization of numerous manufacturing processes will lead to cost reduction with an improved experience for consumers.
- The implementation of automation will reduce manufacturing cycles, decrease cycle time, and will reduce wasteful use of capital.
- IoT and man-machine connectivity will help supply chains to decrease lead times.

Status in India:

- India is moving towards becoming a hub of global manufacturing, 3D printing, machine learning, data analytics, and IoT are key to promoting industrial growth,
- In November 2020, the Modern Coach Factory (MCF) at Raebareli, Uttar Pradesh, rolled out smart railway coaches that are fitted with a battery of sensors to provide a comfortable experience to passengers.
- In May 2020, the Union Ministry of Heavy Industries launched the Smart Advanced Manufacturing and Rapid Transformation Hub (SAMARTH) scheme, which brings together manufacturers, vendors, and customers to make them aware of 4IR technologies.
- In 2022's budget speech, the Union finance minister announced a slew of new 4IR-driven projects, including Drone Shakti, to encourage start-ups that will facilitate the use of drone services.
- India even has a 4IR centre in Mumbai run by WEF, which is closely working with several state governments.
- The Centre has recently come up with the Fourth Industrial Revolution for Sustainable Transformation (FIRST) Cancer Care model in which 4IR technologies would be used to provide better healthcare for cancer patients
- In February 2022, Government launched the pan-India 3D maps programme by Genesys International for the 100 smart cities.

- The company plans to map an entire city in intricate detail so that many 4IR revolution technology-based projects, such as driverless cars, will become easier to implement.

Way Forward:

- Industry 4.0 has started to make an influence in manufacturing and other various sectors in India.
- Data-driven decision-making is getting implemented in numerous fields.
- Though certain steps have already been taken, a lot of work needs to be done.
- Instead of just spending more capital, the emphasis must be on increasing the current asset base.
- The implementation of smart manufacturing, data analytics, and the Internet of Things will give a positive direction to Indian industries.
- To secure India's active involvement in the fourth industrial revolution, it will be necessary to restructure some vital domestic industries and strengthen institutional capability.

3.16 World Economic Forum's 'Global Risks Report 2023'

The World Economic Forum in its 'Global Risks Report 2023' warned that the world could see a poly crisis emerging from the Russia-Ukraine war.

About Polycrisis:

- The term poly crisis was first used in the 1990s by French theorist of complexity Edgar Morin.
- When multiple crises in multiple global systems become causally entangled in ways that significantly degrade humanity's prospects.
- These interacting crises produce harms greater than the sum of those the crises would produce in isolation, were their host systems not so deeply interconnected.
- The 'Polycrisis' was first used by former European Commission president Jean-Claude Juncker to describe Europe's combustible situation in 2016 which combined indebtedness with Brexit, climate change and a refugee crisis.

World Economic Forum on Polycrisis and its Impacts:

- The report has mentioned that the world is facing a set of risks that feel both wholly new and eerily familiar.
- There are older and familiar risks which are getting entangled with the new and emerging risks which collectively can lead to a Polycrisis.
- Older risks: These include inflation, cost-of-living crisis, trade wars, capital outflows from emerging

markets, widespread social unrest, geopolitical confrontation and the spectre of nuclear warfare.
- New developments: These include unsustainable levels of debt, a new era of low growth, low global investment and de-globalisation, a decline in human development, and the growing pressure of climate change.

According to the report, these global risks classified into short term and the long term risks:
- Short term risks: These include the rising cost of living, slow economic growth, and tight global food and energy supplies.
- Long term risks: These are failure to mitigate climate change, failure to adapt to climate change, extreme weather events, and the threat of biodiversity collapse.
- The report further goes on to state that these risks may converge into a Polycrisis by the end of the decade.

Reasons for the risks as mentioned in the report:
- Recent Events: The war in Ukraine sent energy and food prices soaring. The resulting inflationary pressures ignited a global cost-of-living crisis which has led to social unrest.
- Persistent events: Demand for food, water and energy are rising as a result of population growth and socioeconomic advancement.
- The expansion of renewable energy systems is creating an unprecedented demand for rare minerals and metals.
- Reverberating impacts of the COVID-19 pandemic to global wars and conflict, from high inflation and sluggish economic growth to increasingly extreme climate events, the world is facing a remarkably diverse range of crises all at the same time.
- On top of all that, carbon emissions continued to rise as economies reopened after the pandemic.
- The gap between demand and supply of these resources could have catastrophic consequences, including biodiversity loss, ecosystem collapse, trade wars and armed conflict between nations.
- The report describes four potential futures centred around food, water and metals and mineral shortages, all of which could spark a humanitarian as well as an ecological crisis – from water wars and famines to continued overexploitation of ecological resources and a slowdown in climate mitigation and adaptation.

Recommendations made by the Report against Polycrisis: A Way Forward
- Given uncertain relationships between global risks, similar foresight exercises can help anticipate potential connections, directing preparedness measures towards minimizing the scale and scope of Polycrisis before they arise.
- In such a situation, many governments have refocused their priorities towards short-term risks such as countering food shortages or energy shortfalls at the cost of ignoring climate change and global development when they are most needed.
- It asks world leaders to address the issue of erosion of trust. “Addressing the erosion of trust in multilateral processes will enhance our collective ability to prevent and respond to emerging cross-border crises and strengthen the guardrails we have in place to address well-established risks,”.
- It further calls on leaders to act collectively, decisively and with a long-term lens to shape a pathway to a more positive, inclusive and stable world.

3.17 Indian Renewable Energy Development Agency Limited(IREDA)

Ministry of New and Renewable Energy (MNRE), visited IREDA’s corporate office in and reviewed the performance and the future roadmap of IREDA, followed by an interactive session with all employees of the company.

Indian Renewable Energy Development Agency Limited (IREDA)
Aim
- To give financial support to specific projects and schemes for generating electricity and / or energy through new and renewable sources and conserving energy through energy efficiency.
- To maintain its position as a leading organisation to provide efficient and effective financing in renewable

energy and energy efficiency / conservation projects.
- To increase IREDA`s share in the renewable energy sector by way of innovative financing.
- Improvement in the efficiency of services provided to customers through continual improvement of systems, processes and resources.

About:
- It is a Public Limited Government Company established in 1987
- It is a Mini Ratna (Category – I) Government of India Enterprise
- It is under the administrative control of Ministry of New and Renewable Energy (MNRE).
- IREDA has been notified as a "Public Financial Institution" under section 4 'A' of the Companies Act, 1956 and registered as Non-Banking Financial Company (NBFC) with Reserve Bank of India (RBI).
- IREDA's mission is "Be a pioneering, participant friendly and competitive institution for financing and promoting self-sustaining investment in energy generation from Renewable Sources, Energy Efficiency and Environmental Technologies for sustainable development."

Motto: "ENERGY FOR EVER"

3.18 Directorate General of Civil Aviation (DGCA)

The Directorate General of Civil Aviation (DGCA) has imposed a penalty of 10 lakh rupees on Air India for not reporting unruly behaviour of two passengers during the Paris to New Delhi flight on 6th December, 2022.

The Directorate General of Civil Aviation (DGCA)
About:
- It is the statutory and regulatory body in the field of Civil Aviation primarily dealing with safety issues and to regulate civil aviation in India.
- It was formed under the Aircraft (Amendment) Act, 2020.
- It comes under the Ministry of Civil Aviation
- The headquarters are located in New Delhi with regional offices in the various parts of India.

Functions
- It is responsible for formulation of national policies and programmes for the development and regulation of the Civil Aviation sector in the country.
- It is responsible for regulation of air transport services to/from/within India and for enforcement of civil air regulations, air safety and airworthiness standards.
- It also co-ordinates all regulatory functions with International Civil Aviation Organisation.
- The DGCA investigates aviation accidents and incidents, maintains all regulations related to aviation and is responsible for issuance of licenses.
- Keeping a check on aircraft noise and engine emissions in accordance with ICAO Annex 16 and collaborating with the environmental authorities in this matter, if required.
- Approving training programmes of operators for carriage of dangerous goods, issuing authorizations for carriage of dangerous goods, etc.

3.19 T+1 Settlement Cycle

After China, India will become the second country in the world to start the 'trade-plus-one' (T+1) settlement cycle in top listed securities today (January 27), bringing operational efficiency, faster fund remittances, share delivery, and ease for stock market participants.

About the T+1 Settlement Cycle:
- The T+1 settlement cycle means that trade-related settlements must be done within a day, or 24 hours, of

the completion of a transaction.

- Until 2001, stock markets had a weekly settlement system.
- The markets then moved to a rolling settlement system of T+3, and then to T+2 in 2003.
- The United States, United Kingdom and Eurozone markets are yet to move to the T+1 system.

Significance of T+1 plan:

- In the T+1 format, if an investor sells a share, he/she will get the money within a day, and the buyer will get the shares in his/her Demat account also within a day.
- This will also help investors in reducing the overall capital requirements with the margins getting released on T+1 day, and in getting the funds in the bank account within 24 hours of the sale of shares.
- The shift will boost operational efficiency as the rolling of funds and stocks will be faster.

3.20 MSME for Resilient Global Value Chains

Recently, the Union Ministry of Commerce and Industry, Consumer Affairs, Food and Public Distribution and Textiles held the fourth Plenary Session of B20 India Inception Meeting on Building Resilient Global Value Chains in Gandhinagar, Gujrat.

About MSMEs:

- MSMEs or Micro, Small, and Medium Enterprises are businesses that are defined by their investment and turnover levels. They are considered an important sector of the economy as they create jobs, generate income, and promote entrepreneurship.

Classification of MSMEs:

Existing & Revised definition of MSMEs

Existing MSME Classification

Criteria : Investment in Plant & Machinery or Equipment

Classification	Micro	Small	Medium
Mfg. Enterprises	Investment<Rs. 25 lac	Investment<Rs. 5 cr.	Investment <Rs. 10 cr.
Services Enterprise	Investment<Rs. 10 lac	Investment< Rs. 2 cr.	Investment<Rs. 5 cr.

Revised MSME Classification

Composite Criteria : Investment And Annual Turnover

Classification	Micro	Small	Medium
Manufacturing & Services	Investment< Rs. 1 cr. and Turnover < Rs.5 cr.	Investment< Rs. 10 cr. and Turnover < Rs.50 cr.	Investment< Rs. 20 cr. and Turnover < Rs.100 cr.

Based on the nature of activities and sectors

- Manufacturing Enterprise: Manufacturing of goods pertaining to any industry specified in the first schedule of the industries (Development and Regulation) Act, 1951
- Service Enterprise: Providing or rendering of services and covered under 'Services' sector as defined in the Micro, Small and Medium Enterprises Development (MSMED) Act, 2006.
- Advantages of MSMEs: MSMEs play a crucial role in the global value chain and their support and integration is vital for a resilient global supply chain.
- MSMEs flourish around a larger unit or anchor, an example given is that when a large company such as Apple sets up a manufacturing plant, thousands of MSME units flourish in the ecosystem as mini value chain suppliers to Apple.
- Diversification: MSMEs can help diversify an economy by creating new industries and markets.

- Regional development: These are often based in specific regions, which can promote development in those areas.
- Flexibility: MSMEs have more flexibility than larger companies in terms of decision-making and the ability to pivot their business models.
- Economic development: They play a crucial role in the economic development of a country by providing goods and services, generating income, and creating opportunities for people to improve their standard of living.
- Innovation: These are often more adaptable and innovative than larger companies, which can lead to new products, processes, and business models.
- Reduced risk: MSMEs typically have lower startup costs and are less risky investments than larger companies.
- Lower regulatory burden: MSMEs typically have to navigate fewer regulations than larger companies, making it easier for them to start and operate their business.
- Easier access to credit: They have easier access to credit than larger companies.

Issues associated with the MSMEs:

- Lack of skilled labour: MSMEs often struggle to find skilled workers, which can make it difficult for them to grow and expand their businesses.
- Bureaucratic red tape: MSMEs have to navigate a complex web of regulations and bureaucratic procedures, which can be time-consuming and costly.
- Competition from larger companies: MSMEs in India often have to compete with larger, more established companies, which can make it difficult for them to succeed in the market.
- Access to finance: MSMEs often struggles to access capital due to a lack of collateral or credit history or access to formal financial institutions.
- Lack of infrastructure: MSMEs often lack access to basic infrastructure, such as electricity and transportation, which can make it difficult for them to operate their businesses.
- Lack of technological know-how: MSMEs often lack the technical knowledge and expertise to modernize their operations and stay competitive in the market.
- Issues with supply chain and logistics: MSMEs face issues with supply chain and logistics, which can make it difficult for them to get their products to market in a timely and cost-effective manner.
- Lack of formalization: Many MSMEs in India are unregistered or operate informally, which can make it difficult for them to access government support and benefits.
- Lack of marketing and networking opportunities: MSMEs in India often lack the resources and networks to effectively market their products and services, which can make it difficult for them to reach new customers and grow their businesses.

Government of India Initiatives for strengthening MSMEs:

- Comprehensive Economic Partnership Agreement (CEPA): It will help MSMEs of both India and UAE to leverage benefits of the District as export hub initiative of the government.
- Harmonizing value chain: Government to focus on integrating India's value chains with the rest of the world and creating logistics that are easier and faster is crucial to make it easier for international companies to include India in their value chains.
- Quality assurance: Government to focus on creating Quality as the most important factor in the success story of India through steps including- setting global benchmarks, harmonizing Indian standards with global standards, and consumers becoming more demanding of quality.
- Under this initiative, every district for their unique products and identify the specialty of districts by knowing which district exports which products.
- This initiative is expected to help in promoting local products and in turn, boost the local economy.

Pradhan Mantri MUDRA Yojana (PMMY)

- Prime Minister's Employment Generation Programme (PMEGP)
- Stand Up India: The scheme provides financial assistance to scheduled caste (SC), scheduled tribe (ST) and women entrepreneurs for setting up new enterprises.

- Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE): This scheme provides collateral-free credit to micro and small enterprises through a credit guarantee mechanism.

Way Forward:

- Infrastructure development: Improving infrastructure in areas where MSMEs are concentrated, such as by building roads, providing electricity and water supply, and improving transportation.
- Access to finance: The government can work to improve access to finance for MSMEs by providing credit guarantees, offering tax incentives for lending to MSMEs, and encouraging banks and other financial institutions to lend to MSMEs.
- Simplifying regulations: The government can simplify regulations and procedures for MSMEs, such as by streamlining registration and compliance processes and reducing the bureaucratic burden on MSMEs.
- Skilled labor: Taking steps to improve the availability of skilled labor by investing in vocational education and training programs, and encouraging workers to acquire new skills.
- Support for innovation: The government can help MSMEs to innovate by providing funding, mentorship, and other forms of support to help them develop new products and services.
- The government can support the adoption of new technologies by MSMEs by providing subsidies, tax incentives, and other forms of financial assistance to help them modernize their operations. To become a trusted and resilient partner in global value chains, the government is focusing on creating an ecosystem that is simpler, faster, and promotes ease of doing business for MSMEs.

4. Science & Technology

4.1 National Genome Editing and Training Centre (NGETC)

Union Minister of State (Independent Charge) Science & Technology; Minister of State (Independent Charge) Earth Sciences; MoS PMO, Personnel, Public Grievances, Pensions, Atomic Energy and Space will be inaugurating the 'National Genome Editing and Training Centre (NGETC)' and 'International Conference on Food and Nutritional Security-2023 (iFANS-2023)' at NABI, Mohali.

NGETC:

- NGETC is a one-roof state-of-the-art facility that will serve as a national platform to cater to the regional needs to adapt different genome editing methods, including CRISPR-Cas mediated genome modification.
- In the current climatic scenario, improving crops for better nutrition and tolerance to the changing environmental condition is a significant challenge.
- Genome editing could be a promising technology that Indian research could adapt to offer the desired tailor-made traits in crops.
- NABI has shown ability and can expand the genome editing tools to vast arrays of crops, including Banana, Rice, Wheat, Tomato, Maize and Millets.

The International Conference on Food and Nutritional Security:

- iFANS-2023 will be jointly organized by the National Agri-Food Biotechnology Institute (NABI), Centre for Innovative and Applied Bioprocessing (CIAB), National Institute of Plant Biotechnology (NIPB), and International Centre for Genetic Engineering and Biotechnology (ICGEB) at NABI, Mohali.
- The conference envisages bringing together international experts and young researchers in the areas of agriculture , food, and nutrition biotechnology, and genome editing.
- The theme of the conference is pertinent to inspire young students and researchers considering the fact that food and nutrition security is a global demand.
- Advanced biotechnology tool such as genome editing using CRISPR-Cas9 has potential to achieve these goals in a sustainable manner.

National Agri-Food Biotechnology Institute (NABI):

Aim

- Food and nutritional security for all through agri-food biotechnology research and innovation.
- To be a centre of excellence and provide leadership in agri-food biotechnology research
- Improving nutritional quality and availability of affordable agri-food and food products through innovations.
- It is the first Agri-Food Biotechnology Institute, established in India in 2010.
- The institute is part of agri-food cluster in the "Knowledge City" of Mohali (Punjab) along with its neighbouring institutes.

Activities undertaken at NABI:

- Agricultural Biotechnology,
- Food and Nutritional Biotechnology,
- Human Resource Development,
- Meeting and Courses and
- Technology Transfer and Outreach.

4.2 AFB

- The United States Department of Agriculture (USDA) has granted a conditional license for world's first vaccine for honeybees to curb American foulbrood (AFB), a fatal bacterial disease for the insect, reported The Guardian.
- Honeybee populations are declining sharply, spurred by habitat loss, pesticide use and the climate crisis.
- Fewer honeybees mean not just less honey but also less food — honeybees are critical to pollinating up to 95 crops in the US.

AFB

- AFB is caused by the spore-forming bacterium Paenibacillus larvae.
- Infected broods usually die at the pre-pupal or pupal stage.
- It is not a stress-related disease and can infect the strongest to the weakest colony in an apiary.
- Heavy infections can affect most of the brood, severely weakening the colony and eventually killing it.
- The disease cannot be cured, meaning that the destruction of infected colonies and hives or irradiation of infected material is the only way to manage AFB.
- The bacteria Melissococcus plutonius causes another similar disease, European foulbrood. However, the incidence of EFB is generally higher when the colony is under stress.

Vaccine:

- The first such vaccine, developed by biotechnology company Dalan Animal Health, gives hope of a new weapon against diseases that routinely ravage colonies relied upon for food pollination.
- The vaccine technology exposes queen bees to inactive (ie, "dead") bacteria, which enables the larvae hatched in the hive to resist infection.
- The vaccine is mixed in queen candy — the primary food source for both the queen bees and the attendant bees living in cages.
- Worker bees consume the vaccine with the queen candy, which is then digested and transferred to the glands that produce the royal jelly. Worker bees then feed the royal jelly containing the vaccine to the queen bee.
- The queen digests the royal jelly and the vaccine is transferred to her ovaries. She is then released into the hive. The vaccine gets transferred to the developing eggs. The developing larvae get vaccinated and are more immune to infection as they hatch.
- Tests also showed no negative impact on honey.

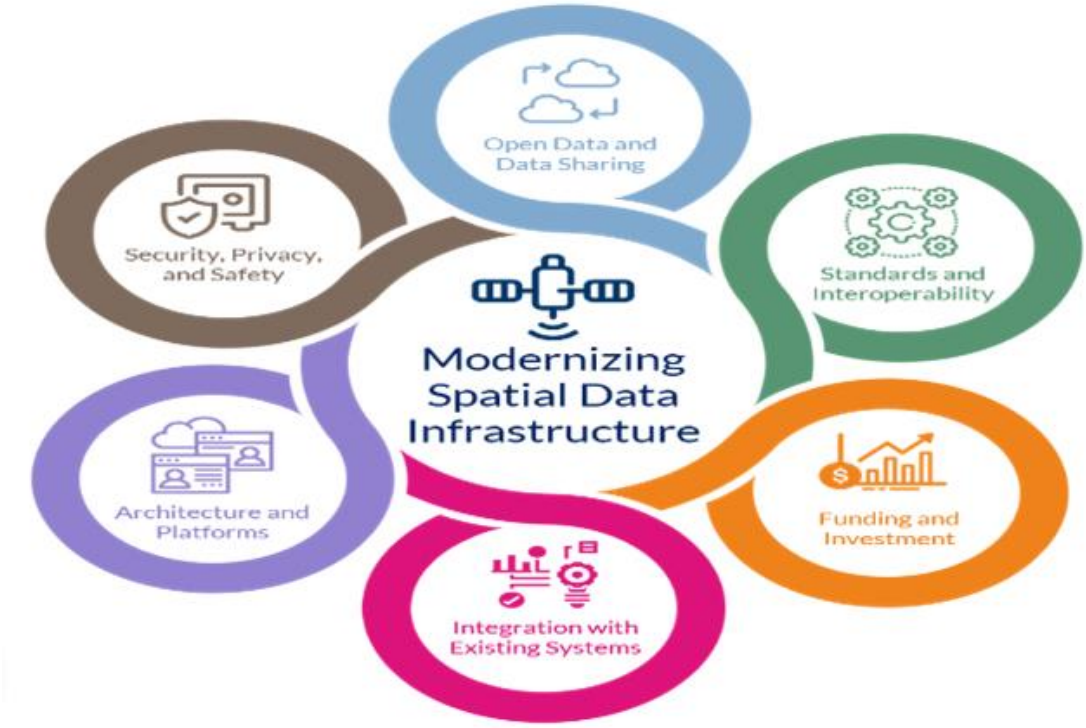
4.3 Geospatial data Infrastructure

Recently, a national database on cooperatives has been initiated by the Ministry of Cooperation for single-point access to information on cooperatives of different sectors and to develop a process for better understanding of cooperatives.

Key Highlights:

- In the first phase of development of the National Cooperative Database, data collection of cooperatives of three sectors – primary agricultural credit societies, dairy and fisheries – is being taken up.
- Maharashtra has the highest number of cooperative societies, followed by Uttar Pradesh.

About Geospatial data Infrastructure:



- A Spatial Data Infrastructure, also called geospatial data infrastructure, is a data infrastructure implementing a framework of geographic data, metadata, users and tools that are interactively connected in order to use spatial data in an efficient and flexible way.

About Cooperative society:

- Cooperatives are organizations formed at the grassroots level by people to harness the power of collective bargaining in the marketplace.
- This can mean different kinds of arrangements, such as using a common resource or sharing capital, to derive a common gain that would otherwise be difficult for an individual producer to get.
- Amul is perhaps the best-known cooperative society in India.
- On July 6, 2021, the government carved out a separate Cooperation Ministry.

Constitutional Provision:

- Cooperatives are a state subject in seventh schedule of the Indian Constitution.
- However, there are many societies whose members and areas of operation are spread across more than one state.
- g. most sugar mills along the districts on the Karnataka-Maharashtra border procure cane from both states.
- Through the 97th constitutional amendment, Part IXB (The Co-Operative Societies) was inserted into the Constitution.
- The right to form cooperative societies was included as Right to Freedom under article 19 (1) under part III of the Indian Constitution.
- Article 43-B (Promotion of Cooperation societies) was inserted as one of the Directive principles of state policy.

Report of the Geospatial Infrastructure in India:

- National Geospatial Policy 2022 provides the framework to develop geospatial infrastructure, skills and knowledge, standards and businesses.
- By 2030, the government will look to establish an Integrated Data and Information Framework, under which a Geospatial Knowledge Infrastructure will be developed.

- A high-resolution topographical survey and mapping as well as a high-accuracy Digital Elevation Model for the entire country will be developed by 2035.
- The national database for cooperatives needs to have geospatial database creation with geo-referencing of cooperative societies to make a decision-support model.

Significance of Geospatial Mapping of Cooperative Societies:

- Understanding of the Heterogeneity and Diversity: The cooperative movement is all set for acceleration of membership.
- The plan of acceleration requires an understanding of the heterogeneity and diversity in spatial distribution.
- Analyzing the Polarisation of Cooperatives: The distribution of cooperative societies reflects polarization of societies in a few States in the west and south while the number of cooperative societies in the east and northern parts is low.
- Geospatial mapping of these cooperatives will help to analyze the reason for such polarization.
- District-wise mapping of cooperatives: District-wise mapping of cooperatives along with database collection is essential to provide a more precise picture of cooperatives at the State and national levels.
- The advanced geospatial tools and technologies will help in predicting, analyzing, modelling, and visualizing spatially explicit information.
- Understanding the Contrasting Diversities: Some contrasts are seen like nil dairy cooperatives in the North-East States of Manipur, Nagaland, Mizoram, Meghalaya, while Sikkim is better positioned.
- Fisheries cooperatives are also formed around inland water resources in contrast to coastal lines in the western and eastern parts of the country.
- It is essential to map these contrasting diversities and analyze the reasons, which could be the resource base of the State.
- It is essential to undertake research on the major parameters that contribute to the development of such societies and their distribution in specific regions.

Way Forward:

- Thematic GIS mapping along with research and analysis of the distribution of cooperative societies is to be committed towards addressing the developmental issues at the grassroots level.
- The proposed database shall facilitate all stakeholders in policy-making and implementation to strengthen the cooperative movement in the country.
- The geospatial mapping of the cooperative ecosystem will generate ease of doing business outcomes and the potential to be utilized to conduct in-depth mapping and analysis which will be of immense help to planners, managers and administrators in quickly storing, retrieving and updating the required information for the management of cooperatives.

4.4 African Swine Fever

- The district administration of Damoh in Madhya Pradesh has killed 700 pigs in the last two days amid fear of African Swine Fever in the area, news agency ANI reported.
- Hundreds of animals including cows, bulls and pigs were found dead in the district's Banawar area within a week.
- In 2021, the northeaster states of Nagaland, Mizoram and Manipur were swept by the disease.
- In December 2022, cases were confirmed in Kerala, Assam and Manipur.

African Swine Fever:

- It is a highly contagious viral disease that attacks pigs and boars
- It is endemic to sub-Saharan Africa but has spread to many other regions of the world, including Asia and Europe.
- It has a high mortality rate.
- It is not known to affect human beings.

- There is no cure or precaution available for the infection yet.
- It can interfere with various cellular signalling pathways resulting in immunomodulation, thus making the development of an efficacious vaccine very challenging.
- In the acute form pigs develop a high temperature (40.5 degrees C or 105 degrees F), then become dull and go off their food. Other symptoms may include vomiting, diarrhoea (sometimes bloody), laboured breathing and coughing, abortion, still births and weak litters and unwillingness to stand.

Miscellaneous:

- Humans can be infected with avian, swine and other zoonotic influenza viruses, such as avian influenza virus subtypes A(H5N1), A(H7N9), and A(H9N2) and swine influenza virus subtypes A(H1N1), A(H1N2) and A(H3N2).
- Human infections are primarily acquired through direct contact with infected animals or contaminated environments, these viruses have not acquired the ability of sustained transmission among humans.

4.5 Earth Radiation Budget Satellite

Recently, a defunct NASA satellite Earth Radiation Budget Satellite (ERBS) has fallen back to Earth after 38 years orbiting Earth.

About Earth Radiation Budget Satellite:

- It was launched in 1984 from space shuttle Challenger.
- It was part of NASA's three-satellite Earth Radiation Budget Experiment (ERBE) mission.
- It carried three instruments to measure– Earth's radiative energy budget and stratospheric constituents that includes ozone.
- The ERBS was designed to investigate how energy from the Sun is absorbed and re-radiated by the Earth.
- Understanding this process helps reveal patterns in Earth's weather.
- Until 2005, data from ERBS helped researchers investigate how Earth absorbed and radiated energy from the Sun.
- It measured ozone, water vapor, nitrogen dioxide and aerosol concentrations in the Earth's stratosphere.
- An instrument on ERBS, Stratospheric Aerosol and Gas Experiment II (SAGE II), collected data that found that ozone layer was declining on a global scale.
- This helped to create Montreal Protocol Agreement, an international agreement signed in 1987 that resulted in a decreased use of ozone-destroying chlorofluorocarbons (CFCs).
- Its observations helped researchers measure effects of human activities on Earth's radiation balance.

4.6 Defence Acquisition Council (DAC)

- Defence Acquisition Council (DAC) accorded Acceptance of Necessity (AoN) for three capital acquisition proposals amounting to ₹4,276 crore.
- It includes Helicopter launched Nag (HELINA), Very Short-Range Air Defence Systems (VSHORAD) and BrahMos cruise missile launcher and Fire Control System (FCS) for naval ships.

About DAC:

- DAC is the highest decision-making body in the Defence Ministry for deciding on new policies and capital acquisitions for the three services – Army, Navy and Air Force, and the Indian Coast Guard.
- The Defence Acquisition Council is headed by the Defence Minister.
- Members: Minister of State for Defence, Chief of Army Staff, Chief of Naval Staff, Chief of Air Staff, Defence Secretary, Secretary Defence Research and Development, Secretary Defence Production, Chief of Integrated Staff Committees HQ IDS, Director General (Acquisition, Dy. Chief of Integrated Defence-Staff Member Secretary.
- It was formed, after the Group of Ministers recommendations on 'Reforming the National Security System', in 2001, post Kargil War (1999).

About HELINA Missiles

- Missile is developed by Defence Research and Development Organisation (DRDO).
- It is helicopter-launched version of the Nag Anti-Tank Guided Missiles (ATGM).
- Air Force variant of NAG missile is known as 'Dhruvastra'.
- It's a third generation 'fire-and-forget' class missile.
- It can be mounted on Advanced Light Helicopter (ALH).

Features of HELINA Missiles:

- Missile system has all- weather day and night operational capabilities.
- It can defeat battle tanks with conventional amour as well as explosive reactive amour (ERA).
- Missile can engage targets both in direct hit mode as well as top attack mode.
- Top attack mode: It requires to climb sharply after launch and travel at a certain altitude then plunge on the top of the target.
- Direct hit mode: It travels at a lower altitude directly striking the target.

About Very Short-Range Air Defence Systems (VSHORAD):

- It is designed and developed indigenously by DRDO's Research Centre Imarat (RCI), Hyderabad, in collaboration with DRDO laboratories and Indian Industry Partners.
- It meant to kill low altitude aerial threats at short ranges.
- India has been in talks with Russia since 2018 to procure the Igla-S air defence missiles at a cost of $1.5 billion under the VSHORAD programme in a bid to replace the Russian Igla-M systems.

Features of VSHORAD:

- It is a man portable Air Defence System (MANPAD).
- It is a robust and quickly deployable system, which will strengthen India's air defence capabilities.
- Missile is propelled by a dual thrust solid motor—incorporates many novel technologies including miniaturized Reaction Control System (RCS) and integrated avionics.

4.7 Doppler Weather Radar Network

Union Minister of State Science & Technology; Minister of State Earth Sciences; MoS PMO, Personnel, Public Grievances, Pensions, Atomic Energy and Space said, Entire Country will be covered by Doppler Weather Radar Network by 2025

According to the Annual Statement on Climate of India 2022 issued by the India Meteorological Department (IMD), 2,227 extreme weather-related deaths in India.

Doppler Weather Radar Network:

- Aim – to predict extreme weather events more accurately.
- Doppler radar is a specialized tracking system that uses the Doppler effect to track weather conditions and calculate information about the location and velocity of a storm or other forms of extreme weather events.
- Forecasting with the help of doppler radar is more timely and accurate which can be critical during safe evacuations in the likelihood of extreme weather events.
- IMD has augmented Doppler Weather Radar network in HP, Uttarakhand, Ladakh and J&K which will help further to predict extreme weather events more accurately.
- Accuracy has increased by about 20-40% for different severe weather events forecast during last five years by making best use of Space based observation of INSAT-3D and 3DR, OceanSat satellites for prediction

Benefits:

- Warning and advisory services are helping farmers and fishermen to improve their economy as found from a latest survey by National Centre for Applied Economic Research. For example, the investment in monsoon mission programme has resulted in return of 50 rupees for investment of each one rupee.

- Farmers below the poverty line specially have benefited immensely as Agromet Advisories at District and Block Levels are used effectively by crores of farmers during various stages of farming and the service is being expanded.
- Climate Services are very important for short and long term planning and strategy development
- Soon a National Framework will be created on priority to provide climate products and information for Sectoral applications.

Other initiatives:

- Flash Flood Guidance in 2021 has been augmented further by increasing the number of watersheds from 30,000 to 1,00,000 of the country in 2022.
- It is being provided every 6 hours to Nepal, Bhutan, Bangladesh and Sri Lanka apart from our national use.
- The web GIS services launched by IMD in 2021 have been augmented further with addition of hazard and vulnerability element in collaboration with other state and central agencies is helping the public, disaster managers and stakeholders to initiate timely response action to mitigate the disasters further

Doppler effect

- Doppler Effect refers to the change in Wave Frequency during the relative motion between a wave source and its observer.
- It was discovered by Christian Johann Doppler who described it as the process of increase or decrease of starlight that depends on the relative movement of the star.
- Doppler Effect works on both light and sound objects.
- For instance, when a sound object moves towards you, the frequency of the sound waves increases, leading to a higher pitch.
- Conversely, if it moves away from you, the frequency of the sound waves decreases and the pitch comes down.
- The drop in pitch of ambulance sirens as they pass by and the shift in red light are common examples of the Doppler Effect.
- Edwin Hubble made the discovery that the universe expands as a consequence of the Doppler Effect. It has important applications in the fields of astronomy and space technology.
- The use of Doppler Effect in astronomy in relation to light waves depends on the fact that the spectra of stars are not constant.
- Different stars exhibit different absorption lines at defined frequencies, but Doppler Effect is identifiable only when these absorption lines are away from these defined frequencies.

There are various applications of Doppler Effect. It is used in:

- Sirens
- Astronomy
- Radar
- Medical imaging and blood flow managemen
- Flow management
- Velocity profile management
- Satellite communication
- Audio
- Vibration measurement

4.8 Deepfakes

- In William Golding's famous novel, Lord of the Flies, Jack emphasises the importance of following rules and establishing a system of governance among the boys.
- Self-regulation or no regulation can be disastrous at times.
- This lesson is particularly relevant in the context of Artificial Intelligence (AI) regulations and deepfakes in India.

Deep synthesis:

- It is defined as the use of technologies, including deep learning and augmented reality, to generate text, images, audio and video to create virtual scenes.
- One of the most notorious applications of the technology is deepfakes, where synthetic media is used to swap the face or voice of one person for another.

Deepfakes

- It leverages powerful techniques from machine learning (ML) and artificial intelligence (AI) to manipulate or generate visual and audio content with a high potential to deceive.

Methodology:

- A neural network needs to be trained with lots of video footage of the person – including a wide range of facial expressions, under all kinds of different lighting, and from every conceivable angle – so that the artificial intelligence gets an in-depth 'understanding' of the essence of the person in question.
- The trained network will then be combined with techniques like advanced computer graphics in order to superimpose a fabricated version of this person onto the one in the video.
- The very latest technology, however, such as Samsung AI technology that has been created in a Russian AI lab, makes it possible to create deepfake videos using only a handful of images, or even just one.

Application examples:

- Deepfake technology will enable us to experience things that have never existed, or to envision a myriad of future possibilities.
- Researchers at Samsung's AI lab in Moscow, for instance, recently managed to transform Da Vinci's Mona Lisa into video.
- Editing video footage without the need for doing reshoots, or recreating artists that are no longer with us to perform their magic, live.
- Produce speech from text and edit it just like you would images in Photoshop
- For example, Adobe's VoCo software
- Deep generative models offer new possibilities in healthcare
- help researchers develop new ways of treating diseases without being dependent on actual patient data

Issues:

- Lack of proper regulations creates avenues for individuals, firms and even non-state actors to misuse AI.
- Legal ambiguity, coupled with a lack of accountability and oversight, is a potent mix for a disaster.
- Policy vacuums on deepfakes are a perfect archetype of this situation.
- Since they are compelling, deepfake videos can be used to spread misinformation and propaganda.
- They seriously compromise the public's ability to distinguish between fact and fiction.
- There has been a history of using deepfakes to depict someone in a compromising and embarrassing situation. For instance, there is no dearth of deepfake pornographic material of celebrities.
- Such photos and videos do not only amount to an invasion of privacy of the people reportedly in those videos, but also to harassment.
- Deepfakes have been used for financial fraud.
- Recently, scammers used AI-powered software to trick the CEO of a U.K. energy company over the phone into believing he was speaking with the head of the German parent company. As a result, the CEO transferred a large sum of money — €2,20,000 — to what he thought was a supplier.
- The audio of the deepfake effectively mimicked the voice of the CEO's boss, including his German accent.

Creating tensions in the neighbourhood:

- There are three areas where deepfakes end up being a lethal tool in the hands of India's non-friendly neighbours and non-state actors to create tensions in the country.
- Influence elections
- Recently, Taiwan's cabinet approved amendments to election laws to punish the sharing of deepfake videos or images due to becoming increasingly concerned that China is spreading false information to

influence public opinion and manipulate election outcomes
- Espionage activities
- Doctored videos can be used to blackmail government and defence officials into divulging state secrets.
- In 2019, the Associated Press identified a LinkedIn profile under the name Katie Jones as a likely front for AI-enabled espionage.
- In March 2022, Ukrainian President Volodymyr Zelensky revealed that a video posted on social media in which he appeared to be instructing Ukrainian soldiers to surrender to Russian forces was actually a deepfake.
- These deepfakes could be used to radicalise populations, recruit terrorists, or incite violence.
- Deny the authenticity of genuine content, particularly if it shows them engaging in inappropriate or criminal behaviour, by claiming that it is a deepfake.
- This could lead to the 'Liar's Dividend,' – This refers to the idea that individuals can exploit the increasing awareness and prevalence of deepfake technology to their advantage by denying the authenticity of certain content.

Legislation and challenges:
- Currently, very few provisions under the Indian Penal Code (IPC) and the Information Technology Act, 2000 can be potentially invoked to deal with the malicious use of deepfakes.
- Section 500 of the IPC provides punishment for defamation.
- Sections 67 and 67A of the Information Technology Act punish sexually explicit material in explicit form.
- The Representation of the People Act, 1951, includes provisions prohibiting the creation or distribution of false or misleading information about candidates or political parties during an election period.
- The Election Commission of India has set rules that require registered political parties and candidates to get pre-approval for all political advertisements on electronic media, including TV and social media sites, to help ensure their accuracy and fairness.
- However, these rules do not address the potential dangers posed by deepfake content.
- There is often a lag between new technologies and the enactment of laws to address the issues and challenges they create.
- In India, the legal framework related to AI is insufficient to adequately address the various issues that have arisen due to AI algorithms.

Suggestions:
- The Union government should introduce separate legislation regulating the nefarious use of deepfakes and the broader subject of AI.
- Legislation should not hamper innovation in AI, but it should recognise that deepfake technology may be used in the commission of criminal acts and should provide provisions to address the use of deepfakes in these cases.
- Antivirus for deepfakes – Sensity, an Amsterdam-based company that develops deep learning technologies for monitoring and detecting deepfakes, has developed a visual threat intelligence platform that uses the same deep learning processes used to create deepfakes, combining deepfake detection with advanced video forensics and monitoring capabilities.
- Social media deepfake policies – For instance, Instagram's and Facebook's policy is to remove 'manipulated media' – with the exception of parodies.

Best practices from the world:
- The European Union's Code of Practice 2018
- It brought together for the first time worldwide industry players to commit to counter disinformation.
- Signed by online platforms Facebook, Google, Twitter and Mozilla, as well as by advertisers and other players in the advertising industry including Microsoft and TikTok.
- If found non-compliant, these companies can face fines as much as 6% of their annual global turnover.

U.S's bipartisan Deepfake Task Force Act 2021
- To assist the Department of Homeland Security (DHS) to counter deepfake technology.

- The measure directs the DHS to conduct an annual study of deepfakes — assess the technology used, track its uses by foreign and domestic entities, and come up with available countermeasures to tackle the same.

China's new policy to curb deepfakes

- The policy requires deep synthesis service providers and users to ensure that any doctored content using the technology is explicitly labelled and can be traced back to its source.
- Further, it requires to take the consent of the person in question

Way forward:

- We can't always rely on the policy of self-regulation hence regulations are much needed in the field of AI such as the proposed Digital India Bill
- In order to minimise deception and curb the undermining of trust, technical experts, journalists, and policymakers will play a critical role in speaking out and educating the public about the capabilities and dangers of synthetic media.
- With increased public awareness, we could learn to limit the negative impact of deepfakes, find ways to co-exist with them, and even benefit from them in the future.

4.9 Shukrayaan I

- P. Sreekumar, the Satish Dhawan Professor at the Indian Space Research Organisation (ISRO) and advisor to its space science programme, said that the organisation is yet to receive approval from the Indian government for the Venus mission and that the mission could as a result be postponed to 2031.
- ISRO had originally hoped to launch Shukrayaan I in mid-2023 but cited the pandemic when it pushed the date to December 2024.
- Optimal launch windows from Earth to Venus occur once around every 19 months.
- But even more optimal windows, which further reduce the amount of fuel required at liftoff, come around every eight years.
- Both the U.S. and the European space agencies have Venus missions planned for 2031 — referring to VERITAS and EnVision

Shukrayaan I or the Venus mission:

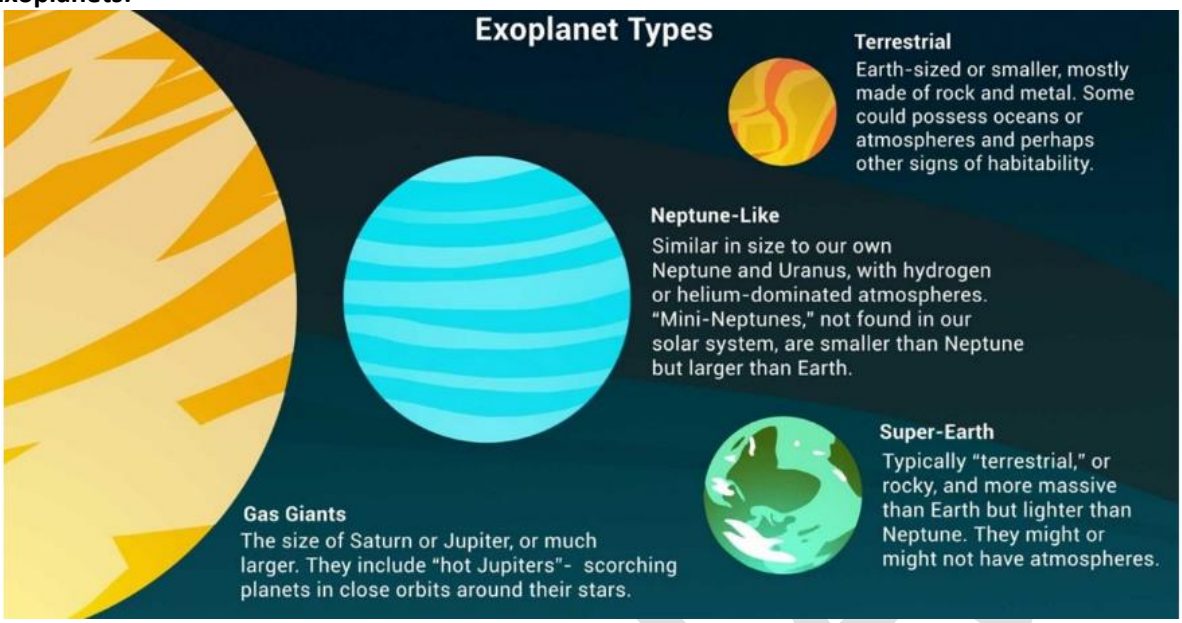
- It will be an orbiter mission i.e. a spacecraft designed to orbit a celestial body without landing on its surface
- The spaceship, GSLV Mark II will be used to launch the mission with a launch mass of 2,500 kg.
- Its scientific payloads currently include a high-resolution synthetic aperture radar and a ground-penetrating radar.
- It will be the first Venus orbiter to carry a sub-surface radar or ground-penetrating radar. It is used for imaging the subsurface of the target, in this case, a planet, using radar pulses. It means that the investigation method for the study of asphalt, metals, etc, of ISRO's Venus orbiter will be non-intrusive.
- The mission is expected to study Venus's geological and volcanic activity, emissions on the ground, wind speed, cloud cover, and other planetary characteristics from an elliptical orbit.
- It will help uncover the mysteries hidden beneath the sulfuric acid clouds that surround the planet and explore the surface and atmosphere of Venus in relation to the Sun and the Earth.
- In the year 2020, scientists announced that they have detected Phosphine (a life-friendly element indicative of possible life on the planet) in the atmosphere of Venus. 'Shukrayaan-I' will also bring with it some instruments that will examine infrared, ultraviolet and submillimeter wavelengths to study the claims more deeply.

4.10 Exoplanets

The National Aeronautics and Space Administration (NASA) recently announced that the James Webb Space

Telescope has discovered its first new exoplanet.
Researchers have labelled the planet as LHS 475 b, and it's roughly the same size as Earth.

About Exoplanets:



An exoplanet is any planet beyond our solar system.

- Most orbit other stars, but free-floating exoplanets, called rogue planets, orbit the galactic centre and are untethered to any star.
- They can be gas giants bigger than Jupiter or as small and rocky as Earth.
- They are also known to have different kinds of temperatures — boiling hot to freezing cold.
- Scientists rely on indirect methods for discovering exoplanets, such as the transit method, which is measuring the dimming of a star that happens to have a planet pass in front of it.

About red dwarf stars:

- Such types of stars are the most common and smallest in the universe.
- As they don't radiate much light, it's very tough to detect them with the naked eye from Earth.
- However, as red dwarfs are dimmer than other stars, it is easier to find exoplanets that surround them.
- Therefore, red dwarfs are a popular target for planet hunting.

4.11 Antimicrobial-resistant gonorrhoea

A strand of antimicrobial-resistant gonorrhoea outbreak has hit Kenya, according to researchers at the Kenya Medical Research Institute (Kemri).

Gonorrhoea

- Gonorrhea is a sexually transmitted disease (STD) caused by infection with the Neisseria gonorrhoeae bacterium.
- N. gonorrhoeae infects the mucous membranes of the reproductive tract, including the cervix, uterus, and fallopian tubes in women, and the urethra in women and men. N. gonorrhoeae can also infect the mucous membranes of the mouth, throat, eyes, and rectum.
- Gonorrhoea is the second-most common disease to be sexually transmitted across the world after chlamydia, according to the World Health Organization (WHO).
- Transmitted through sexual contact with the penis, vagina, mouth, or anus of an infected partner.
- Gonorrhea can also be spread perinatally from mother to baby during childbirth.
- Ejaculation does not have to occur for gonorrhea to be transmitted or acquired.
- Symptoms – urethral infection in men include dysuria or a white, yellow, or green urethral discharge,

testicular or scrotal pain, etc.

- In women it includes dysuria, increased vaginal discharge, or vaginal bleeding between periods.
- People who have had gonorrhea and received treatment may be reinfected if they have sexual contact with a person infected with gonorrhea.
- CDC now recommends a single 500 mg intramuscular dose of ceftriaxone for the treatment of gonorrhea.

Antimicrobial-resistant gonorrhoea

- Overuse of antibiotics, genetic mutations of the bacteria and repeated use of poor-quality drugs makes it drug-resistant
- Drug-resistant super gonorrhoea was first detected in samples taken from sex workers in the capital city, Nairobi, and other urban areas like Kiambu County.
- The incurable infection that is asymptomatic in some cases, can cause significant health challenges, including permanent damage to their reproductive systems.
- Other diseases that medics have expressed concern over due to total antimicrobial resistance include various strains of SARS-CoV-2, ebola virus disease, Crimean-Congo hemorrhagic fever, Lassa fever and marburg virus disease.

4.12 ChatGPT

In 2022, OpenAI opened its most recent and powerful AI chatbot, ChatGPT, to test its capability.
It amazed netizens across the world by answering questions, fixing broken code, etc.
Some users have been testing the bot's capability to do nefarious things – Illicit actors have tried to bypass the tool's safeguards and write malicious code.

ChatGPT:

- ChatGPT is a 'conversational' AI based on OpenAI's GPT 3.5 series of language learning models (LLM).
- This is a kind of computer language model that relies on deep learning techniques to produce human-like text based on inputs.
- It has gone viral is because of the kind of responses it gives, being seen as a replacement for much of the daily mundane writing, from an email to even college-style essays.
- The model is trained to predict what will come next, and that's why one can technically have a 'conversation' with ChatGPT.
- It is trained using "Reinforcement Learning from Human Feedback (RLHF)."
- OpenAI uses Microsoft Azure's cloud infrastructure to run these models.
- Users have the option of downvoting or upvoting a response.

Applications:

- It will answer queries just like a human would.
- Such as tips on how to set up a birthday party, write an essay on why parliamentary democracy is better, and even a fictional meeting between two well-known personalities.
- It can answer follow-up questions and can also admit its mistakes, challenge incorrect premises, and reject inappropriate requests.
- It is being seen as a replacement for the basic emails, party planning lists, CVs, and even college essays and homework.
- It can also be used to write code, solve math equations, and even spot errors in code.
- It can write fiction but not at the level of a human.

Ethical Challenges:

- Biased content – Since in case of machine learning, artificial intelligence is developed based on input of information, incorrect or biased information can create "biased" content
- The chatbot displayed clear racial and sexist biases
- Lack of objectivity – Its knowledge of the world and events after 2021 is limited and may give inaccurate

results.

- Lack of authenticity- It could give "plausible-sounding but incorrect or nonsensical" data that raises issues of credibility such as it can sometimes overuse certain phrases
- Lack of relevance – Although the chatbot gives grammatically correct answers, these lack context and substance.
- Write Malware– ChatGPT is programmed to block obvious requests to write malicious Code for amateur coders looking to build malware.
- However, the more seasoned ones could trick the bot into correcting or enhancing malicious code they have partially developed.
- They could get through the system by phrasing their request in an innocuous way.
- Phishing emails – OpenAI notes that asking its bot for illegal or phishing content may violate its content policy. But for someone trespassing such policies, the bot provides a starting point.
- Cybersecurity firm Check Point's researchers tested the bot by asking it to draft a phishing email for a fictional webhosting firm – ChatGPT gave an impressive 'phishing email' in reply.
- The response section included a warning that read: "This content may violate our content policy. If you believe this to be in error, please submit your feedback – your input will aid our research in this area."
- Plagiarism chokepoint
- In education sphere, the bot could be used to turn in plagiarised essays that could be hard to detect for time-pressed invigilators since GPT models write in a statistically vanilla way.
- New York City's education department banned ChatGPT in its public schools.
- Privacy and security concerns – Large language models (LLM) can be easily automated to launch complicated attack processes to generate other malicious artifacts.
- Inherently buggy code
- Stack Overflow, a forum for software programmers, banned its users from using any AI-generated code on the platform.

Suggestions for future:

- Provide a universal framework of values, principles and actions to guide States in the formulation of their legislation, policies or other instruments regarding AI, consistent with international law.
- Protect, promote and respect human rights and fundamental freedoms, human dignity and equality, including gender equality; to safeguard the interests of present and future generations; to preserve the environment, biodiversity and ecosystems; and to respect cultural diversity in all stages of the AI system life cycle
- Promote equitable access to developments and knowledge in the field of AI and the sharing of benefits, with particular attention to the needs and contributions of LMICs, including LDCs, LLDCs and SIDS
- In education sphere – where the answers coming from a human and ChatGPT are in a similar zone, a different kind of pedagogy could help such as looking beyond summarisation and reporting based on what is available on the Internet can help.
- Proportionality and Do No Harm – none of the processes related to the AI system life cycle shall exceed what is necessary to achieve legitimate aims
- Right to Privacy, and Data Protection – Data for AI systems be collected, used, shared, archived and deleted in ways that are consistent with international law and in line with the values and principles
- Human oversight and determination – it is always possible to attribute ethical and legal responsibility for any stage of the life cycle of AI systems to physical persons or to existing legal entities.
- Human oversight refers thus not only to individual human oversight, but to inclusive public oversight

Way forward

- National and international governmental and non-governmental organizations, as well as transnational corporations and scientific organizations must collaborate to generate universal ethical values for AI.
- In education sphere, helping educators think through the different types of prompts to best assess students to help them stay away from using ChatGPT is important

4.13 Giant Metrewave Radio Telescope(GMRT)

A radio signal originating from atomic hydrogen in an extremely distant galaxy was detected by the Giant Metrewave Radio Telescope (GMRT) located in Pune, as per the scientific journal Monthly Notices of the Royal Astronomical Society.
This is the largest astronomical distance over which such a signal has been picked up.

Giant Metrewave Radio Telescope (GMRT):

- GMRT is a low-frequency radio telescope that helps investigate various radio astrophysical problems ranging from nearby solar systems to the edge of the observable universe.
- It is located in Pune, India
- Using GMRT data, scientists have detected a radio signal from atomic hydrogen in a distant galaxy at redshift z=1.29.
- The signal detected by the team was emitted from this galaxy when the universe was only 4.9 billion years old; in other words, the look-back time for this source is 8.8 billion years.
- The atomic hydrogen mass of this galaxy is almost twice as high as its stellar mass.
- These results demonstrate the feasibility of observing atomic gas from galaxies at cosmological distances in similar lensed systems with a modest amount of observing time.

Redshift:

- Redshift represents the signal's wavelength change depending on the object's location and movement; a greater value of z indicates a farther object.

Atomic hydrogen:

- It is the basic fuel required for star formation in a galaxy. When hot ionised gas from the surrounding medium of a galaxy falls onto the universe, the gas cools and forms atomic hydrogen. This then becomes molecular hydrogen and eventually leads to the formation of stars.
- Understanding the evolution of galaxies over cosmic time requires tracing the evolution of neutral gas at different cosmological periods.
- Atomic hydrogen emits radio waves of 21 cm wavelength, meaning the wavelength is a direct tracer of the atomic gas content in nearby and distant galaxies.
- However, this radio signal is feeble and nearly impossible to detect the emission from a distant galaxy using current telescopes due to their limited sensitivity.
- Until now, the most distant galaxy detected using 21 cm emission was at redshift z=0.376, corresponding to a look-back time – the time elapsed between detecting the signal and its original emission – of 4.1 billion years.

5. Environment & Ecology

5.1 Carbon Sequestration

Forest is the second largest land use in India next to agriculture In 2021, the total forest and tree cover in India is 80.9 million hectares, which is 24.62% of the geographical area of the country, ranging from the Himalayan Temperate to Dry Zone forests.
Being a mega-bio diversity country, the nation possesses high level of endemism.

Carbon Sequestration:
There are two types:

- Geologic
- Biologic
- Carbon capture from power plants and industrial facilities is called Geologic Carbon sequestration.
- It is pressurized into liquid and then stored in porous rock formations underground.
- Atmospheric carbon is captured by natural processes like photosynthesis.
- It is stored in soil, plants and trees or the entire forest ecosystem.

Role of forests in carbon sequestration:

- Create carbon pools – Forests absorb carbon dioxide from the atmosphere and store it in different repositories, called carbon pools, which include trees (both living and dead), root systems, undergrowth, the forest floor and soils.
- Currently existing forests store ~45% of the organic carbon on land in their biomass and soils
- Live trees have the highest carbon density, followed by soils and the forest floor. Harvested wood products and landfills also store carbon.
- Prevent Global warming – When a carbon pool decomposes or is burned, it releases carbon as carbon dioxide back into the atmosphere and causes Greenhouse Gas (GHG) emissions.
- In past 40 years, forests have absorbed 25% of human carbon emissions. This slows the rate of climate change.
- Regulate rate of carbon sequestration and storage – However, invasive insects and diseases, drought, wildfires and urban development can affect this regulation.

Other significant benefits:

- Purifies air and water – One tree can take 10 pounds of pollution and produce enough oxygen for two people.
- Flood control – it moderates river run offs and reduces erosion
- Protection of ecosystem services – resources such as medicinal plants, herbs, timber, Minor forest produce and landscaping materials is found in forests.
- Prevents desertification – too few trees can increase severity of sun exposure.
- This can lead to dry soil, dead organisms and more release of carbon

Carbon trading mechanisms:

- Carbon trading – Carbon trading is the process of buying and selling permits and credits in the market that allow the permit holder to emit carbon dioxide.
- The right to emit a tonne of CO2 is often referred to as a carbon ‘credit’ or carbon ‘allowance’.
- Clean development mechanism under Kyoto protocol – Financially-reliant nations offer incentives towards developing countries to put into place projects which reduce greenhouse gases such as carbon dioxide, while at their own expense, they earn what are called CER credits or Emission Reduction Units that are equivalent to 1 tonne of CO2.
- European Union’s Emissions Trading System(ETS) – is the key tool for reducing greenhouse gas emissions, such as carbon dioxide (CO2), from electricity generation and industry.

Challenges in current system:

Additionality

- It refers to carbon sequestration that can happen even in the absence of targeted action.
- Forests can grow back on agricultural land abandoned by households moving to industrial jobs. This is known as the Forest Transition.
- This transition has been underway in India since the mid-90s, with steady net-positive growth.

Leakage

- While protecting one forest, emission generating activities that can be deflected to other neighbouring forests.
- Counting negative emissions from this forest will be fraudulent.
- For example, in rural India, the fuelwood has to come from somewhere, and all that changes is that the women have to walk farther, spend more time, and face more harassment but total emissions remain the same.

Permanence

- With climate change, we can expect more heat waves, dry spells, and more frequent and intense forest fires.
- Example – The Bootleg fire in Oregon burned through 90,000 acres of forest set aside as carbon offsets for Microsoft and BP. This forest, and the carbon it holds, were expected to live for at least 100 years.
- Cost and logistical challenges and biophysical limitations (e.g., poor water availability constrains growth and increases mortality

Suggestions:

- To protect and restore, our forests, we must create incentives and build equity for local communities to reap a fair share of benefits.
- Forests will be protected and restored when communities living near these forests expect to derive direct material benefits.
- India's Forest Rights Act 2006 allows communities to own and manage their forests. Chhattisgarh, Odisha, and Jharkhand have already recognised this opportunity to create jobs and wealth. But this opportunity requires the private sector to step up and support the process.
- By engaging directly with communities, the informal forest economy can be transformed into business transactions that are fair and transparent and incentivise sustainable protection, management, and restoration of India's forests.
- If communities protect forests because they get better prices for Sal seeds, Mahua flowers, or Tendu leaves, they will protect them from fires as well as any other threats that come along. Carbon sequestration will be a side benefit.
- The rising demand for forest based products and resultant deforestation and encroachment has led to a severe loss of natural resources and destruction of habitat

Way forward:

- The Living Planet Report 2006 ranked India as the third highest gross foot print nation, followed by US and China.
- India is presently 4th largest economy in terms of purchasing power parity and is growing at 8-9 per cent per annum. This fast growth coupled with the needs and aspirations of more than one billion people is a challenge for conservation of forests unless environmentally responsible policies are in place.
- In this regard, the new initiative apart from cabin sequestration such as Payment for Forest Ecosystem Services (PES), Ecological Footprint Analysis and Forest Certification, must be explored.

5.2 Ozone Layer

A recent United Nations scientific assessment report has suggested that the ozone hole is now expected to be

completely repaired by 2066.

About Ozone Layer:

- The ozone layer is a layer of the stratosphere, the second layer of the Earth's atmosphere.
- The stratosphere is the mass of protective gases clinging to our planet.
- The Ozone layer is present in Earth's atmosphere (15-35 km above Earth) in the lower portion of the stratosphere and has relatively high concentrations of ozone (O3).
- The ozone layer normally develops when a few kinds of electrical discharge or radiation splits the 2 atoms in an oxygen(O2) molecule, which then independently reunite with other types of molecules to form ozone.
- Ozone is only a trace gas in the atmosphere – only about 3 molecules for every 10 million molecules of air.
- It is critical for planetary life, since it absorbs ultraviolet rays coming from the Sun.
- UV rays are known to cause skin cancer and many other diseases and deformities in plants and animals.

Important outcomes of the Report:

Major achievements of the Montreal Protocol:

- Actions taken under the Montreal Protocol continued to decrease atmospheric abundances of controlled ozone-depleting substances (ODSs) and advance the recovery of the stratospheric ozone layer.
- The atmospheric abundances of both total tropospheric chlorine and total tropospheric bromine from long-lived ODSs have continued to decline since the 2018 Assessment.
- New studies support previous Assessments in that the decline in ODS emissions due to compliance with the Montreal Protocol avoids global warming of approximately 0.5 — 1 °C by mid-century compared to an extreme scenario with an uncontrolled increase in ODSs of 3 – 3.5% per year.
- Actions taken under the Montreal Protocol continue to contribute to ozone recovery.
- Recovery of ozone in the upper stratosphere is progressing.
- Total column ozone (TCO) in the Antarctic continues to recover, notwithstanding substantial interannual variability in the size, strength, and longevity of the ozone hole.
- TCO is expected to return to 1980 values around 2066 in the Antarctic, around 2045 in the Arctic, and around 2040 for the near-global average (60°N–60°S).
- Compliance with the 2016 Kigali Amendment to the Montreal Protocol, which requires phase down of production and consumption of some hydrofluorocarbons (HFCs), is estimated to avoid 0.3 – 0.5°C of warming by 2100.

About Montreal Protocol

- The Montreal Protocol is an international treaty designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion.
- It was agreed on 16 September 1987, and entered into force on 1 January 1989.
- Since then, it has undergone nine revisions including the latest one in 2016 (Kigali).
- On 1 January 2019 the Kigali Amendment to the Montreal Protocol came into force.
- Under the Kigali Amendment countries promised to reduce the use of hydrofluorocarbons (HFCs) by more than 80% over the next 30 years.

Future Policy Considerations under the protocol:

- If ODS feedstock emissions as currently estimated were to be eliminated in future years, the return of mid-latitude Equivalent Effective Stratospheric Chlorine (EESC) to 1980 abundances could be advanced by almost 4 years.
- Eliminating future emissions of methyl bromide (CH3Br) from quarantine and pre-shipment applications currently allowed by the Montreal Protocol would accelerate the return of mid-latitude EESC to 1980 abundances by two years.
- Emissions of anthropogenic very short-lived chlorine substances, dominated by dichloromethane (CH2Cl2), continue to grow and contribute to ozone depletion.
- A 3% reduction in anthropogenic N2O emissions, averaged over 2023–2070, would lead to an increase in annually averaged global TCO of about 0.5 DU over the same period.

- Global emissions of long-lived HFC-23, which are largely a by-product of HCFC-22 production, are as much as eight times larger than expected and are likely to grow unless abatement increases during HCFC-22 production or feedstock use of HCFC-22 decreases.

Vienna Convention for the Protection of the Ozone Layer

- It is a Multilateral Environmental Agreement that was agreed upon at the 1985 Vienna Conference and entered into force in 1988.
- It is one of the most successful treaties of all time in terms of universality.
- It has been ratified by 197 states (all UN members as well as the Niue, Holy See and the Cook Islands) as well as European Union.
- It acts as a framework for the international efforts to protect the ozone layer.
- These are laid out in the accompanying Montreal Protocol.

Concerns associated with depletion of Ozone layer:

- Replacements available: The use of ODSs, though extensive, was restricted to some specific industries.
- Their replacements were readily available, even if at a slightly higher cost initially.
- The impact of banning these ozone-depleting chemicals was therefore limited to these specific sectors.
- With some incentives, these sectors have recovered from the initial disruption and are thriving again.
- Carbon footprints: Emission of carbon dioxide is inextricably linked to the harnessing of energy.
- Almost every economic activity leads to carbon dioxide emissions. Even renewable energies, like solar or wind, have considerable carbon footprints right now, because their manufacturing, transport, and operation involves the use of fossil fuels.
- Greenhouse gas emissions: The emissions of methane, the other major greenhouse gas, comes mainly from agricultural practices and livestock.
- The impact of restraining greenhouse gas emissions is not limited to a few industries or economic sectors, but affects the entire economy, and also has implications for the quality of life, human lifestyles and habits and behaviours.

Govt of India's Efforts and Achievements

- Montreal Protocol: India has played a proactive role in the phase-out of production and consumption of Ozone Depleting Substances.
- India phased out Chlorofluorocarbons, Carbon tetrachloride, Halons, Methyl Bromide and Methyl Chloroform for controlled uses as on 1 January 2010, in line with the Montreal Protocol schedule.
- India is among the countries which has stated that the country's sustainable development will be such that net zero is achieved by 2070.
- Phasing out of Hydrochlorofluorocarbons: Currently, Hydrochlorofluorocarbons are being phased out as per the accelerated schedule of the Montreal Protocol.
- Hydrochlorofluorocarbons Phase-out Management Plan (HPMP) Stage – I has been successfully implemented from 2012 to 2016 and Hydrochlorofluorocarbons Phase-out Management Plan (HPMP) Stage – II is under implementation since 2017 and will be completed by 2023.
- Stage III of the HPMP, the last of the HPMPs to phase out remaining HCFCs, will be implemented from 2023 – 2030.
- The phase-out of HCFCs in all manufacturing sectors, comprising refrigeration and air-conditioning manufacturing sectors, will be completed by 1.1.2025 and the activities relating to the servicing sector will be continued till 2030.
- Kigali Amendment: India played a key role in the finalization of the Kigali Amendment.
- After ratifying the same in September 2021, the central government is working towards developing a national strategy, in close consultation with the industry stakeholders, for phasing down Hydrofluorocarbons (HFCs).
- Greenhouse Gas (GHG) emissions: The study on reduction of Greenhouse Gas (GHG) emissions through phase-out of Ozone Depleting Substances (ODS) was carried out by the Ministry of Environment, Forest and Climate Change (MoEF&CC).
- It estimates that the reduction of GHG emissions due to phase-out of ODS till 2022 is 465 million tonne

CO_2 equivalent.

- It is expected that the reduction of GHG emissions till 2030 is expected to be 778 million tonnes of CO_2 equivalent.
- India Cooling Action Plan (ICAP): The goal is to provide socio-economic and environmental benefits related to reduced refrigerant use, climate change mitigation and Sustainable Development Goals over the period 2037-38.
- This will significantly contribute to India's climate action in achieving the net zero emissions by 2070, through the 'Panchamrita', committed by the Prime Minister of India, at the Climate Change Conference of Parties in 2021.
- Research and Development: The Environment Ministry will soon be entering into collaboration with eight Indian Institutes of Technology (Bombay, Roorkee, Hyderabad, Kanpur, Guwahati, Banaras, Madras and Delhi) to promote research and development of chemicals with low global warming potential, including blends.

Way Forward:

- The world is facing a climate crisis because of wasteful use of energy, calling for adopting the mantra of L.I.F.E (Lifestyle for Environment) which was coined by the Prime Minister of India. The mantra is in line with the concept of sustainable lifestyle, encouraging us to adopt mindful and not mindless consumption and utilization of resources.

5.3 National Clean Air Campaign

- Four years since the Centre launched the National Clean Air Campaign (NCAP), analysts found that progress has been slow and pollution only incrementally reduced in most cities.

About National Clean Air Campaign:

- It was launched by the Ministry of Environment Forest and Climate Change in January 2019.
- It is the first-ever effort in the country to frame a national framework for air quality management with a time-bound reduction target.
- It seeks to cut the concentration of coarse (particulate matter of diameter 10 micrometre or less, or PM10) and fine particles (particulate matter of diameter 2.5 micrometre or less, or PM2.5) by at least 20% in the next five years, with 2017 as the base year for comparison.
- The plan includes 103 non-attainment cities, across 23 states and Union territories, which were identified by the Central Pollution Control Board (CPCB) on the basis of their ambient air quality data between 2011 and 2015.
- Non-attainment cities: These are those that have fallen short of the National Ambient Air Quality Standards (NAAQS) for over five years.

About National Ambient Air Quality Standards (NAAQS):

- National Ambient Air Quality Standards are the standards for ambient air quality set by the Central Pollution Control Board (CPCB).
- The CPCB has been conferred this power by the Air (Prevention and Control of Pollution) Act, 1981.
- Ambient Air Quality Standards contains 12 pollutants.
- The pollutants that are covered under the NAAQS include: Sulphur dioxide (SO_2), Nitrogen dioxide (NO_2), PM10, PM2.5, Ozone, Lead, Carbon monoxide (CO), Arsenic, Nickel, Benzene, Ammonia, and Benzopyrene.

About Central Pollution Control Board (CPCB):

- The Central Pollution Control Board (CPCB), statutory organisation, was constituted under the Water (Prevention and Control of Pollution) Act, 1974.
- Further, CPCB was entrusted with the powers and functions under the Air (Prevention and Control of Pollution) Act, 1981.
- It serves as a field formation and also provides technical services to the Ministry of Environment and

Forests of the provisions of the Environment (Protection) Act, 1986.

- Principal Functions of the CPCB, as spelt out in the Water (Prevention and Control of Pollution) Act, 1974, and the Air (Prevention and Control of Pollution) Act, 1981,
- to promote cleanliness of streams and wells in different areas of the States by prevention, control and abatement of water pollution, and
- to improve the quality of air and to prevent, control or abate air pollution in the country.
- The National Air Monitoring Programme (NAMP) has been established with objectives to determine the present air quality status and trends and to control and regulate pollution from industries and other source to meet the air quality standards. It also provides background air quality data needed for industrial siting and towns planning.

5.4 Saltwater crocodile

- As per Saltie census 2023, The population of saltwater crocodiles in the water bodies of Bhitarkanika National Park and its nearby areas in Odisha's Kendrapara district has marginally increased in 2023.
- Bhitarkanika is the abode of 20 whitish estuarine crocodiles
- In 2006, the Guinness Book of World Records recorded a 23-foot long salt-water crocodile in Bhitarkanika as the largest crocodile in the world.

Saltwater crocodile:
Crocodylus porosus

- The saltwater crocodile is the largest of all crocodilians, and the largest reptile in the world.
- The species has a relatively large head, with a pair of ridges that run from the eye along the centre of the snout.
- Adults are generally dark in colour, with lighter tan or grey areas, and dark bands and stripes on the lower flanks.
- The juvenile is usually pale tan, with black stripes and spots on the body and tail, which gradually fade with age, although never disappear entirely.
- Female saltwater crocodiles are smaller in size than their male counterparts, normally reaching a maximum length of 2.5 to 3 m.
- As in all crocodilians, the eyes, ears and nostrils are located on top of the head, allowing the crocodile to remain almost totally submerged when lying in water, helping to conceal it from potential prey, while a special valve at the back of the throat allows the mouth to be opened underwater without water entering the throat.
- The saltwater crocodile is considered to be more aquatic than most crocodilians, and is less heavily armored along the back and neck.
- Juveniles are restricted to small insects, amphibians, reptiles, crustaceans, and small fish. Adults feed on crabs, turtles, snakes, birds, buffalo, wild boar, and monkeys.
- Saltwater crocodiles hide in the water exposing only their eyes and nose. They lunge at prey, often killing it with a single snap of the jaws, then drag the prey under water where it is more easily consumed.
- The total length of a crocodile is 7.5 times the length of the animal's head.

Distribution:

- Apart from the eastern coast of India, the saltwater crocodile is extremely rare on the Indian subcontinent
- The saltwater crocodile is also found in Bangladesh.
- A large population is present within the Bhitarkanika Wildlife Sanctuary of Odisha while smaller populations occur throughout the Sundarbans.
- Populations are also present within the mangrove forests and other coastal areas of the Andaman and Nicobar Islands in India.
- Saltwater crocodiles were once present throughout most of the island of Sri Lanka.

Major Threats:

- Illegal hunting for its meat and eggs, as well as for its commercially valuable skin.
- Habitat loss and habitat alterations.
- Negative attitude towards the species make conservation measures difficult to implement.

5.5 Dolphins

A new study has found that noise generated by human activity makes it harder for dolphins to communicate and coordinate with each other.

Highlights of the study:

- Dolphins are social mammals that communicate through squeaks, whistles and clicks.
- They also use echolocation in order to locate food and other objects.
- As the levels of underwater noise increase, these mammals have to "shout" to each other.
- Echolocation occurs when an animal emits a sound wave that bounces off an object, returning an echo that provides information about the object's distance and size.
- Therefore, anthropogenic noise coming from large commercial ships, military sonars or offshore drilling can severely impact their well-being.

About Dolphins:

River Dolphins:

- There are only six extant species of river dolphins left in the world today and they are all endangered or critically endangered.
- This is because pollution, dams, shipping and bycatch have taken their toll on this iconic species.
- There are currently 42 species of dolphins and seven species of porpoises.
- Dolphins are marine mammals.
- They must surface to breathe air and give birth to live young.
- A dolphin pregnancy last between nine and 16 months.
- The mother feeds her offspring on milk.
- The sons and daughters of resident orcas stay with their maternal family for life.
- Dolphins eat fish, squid and crustaceans.
- They do not chew they food but may break it into smaller pieces before swallowing.
- All dolphins have conical-shaped teeth.
- A Risso's dolphin has 14 while a spinner dolphin can have 240.
- The orca (killer whale) is the largest dolphin.
- Hector's dolphin and Franciscana are two of the smallest.
- The four river dolphin species inhabit the large waterways of Asia and South America.
- Dolphins have an array of vocalisations such as clicks, whistles and squeals which they use for their well-developed communication and echolocation skills.
- Lifespan varies from around 20 years in the smaller dolphin species to 80 years or more for larger dolphins such as orcas.
- Maui's dolphin (a sub-species of the New Zealand dolphin) is the most endangered dolphin.

Consequences of noisy oceans:

- Marine animals are known to use sound to navigate, find food and protect themselves.
- As sound travels faster in water than air, it makes for an important mode of communication because it can convey a lot of information quickly and over long distances.
- Scientists believe that fish species rely on sounds during reproductive activities, including mate attraction, courtship and mate choice.
- Sounds made by drilling, commercial ships and military operations lead to disruption of marine life.

5.6 Carbon Trading and Carbon Credit

Recently, The Union Ministry of Power has notified the implementation of the Energy Conservation (Amendment) Act, 2022, from January 1, 2023. The amendment empowers the Union government to lay down a carbon credit certificates trading scheme in India.

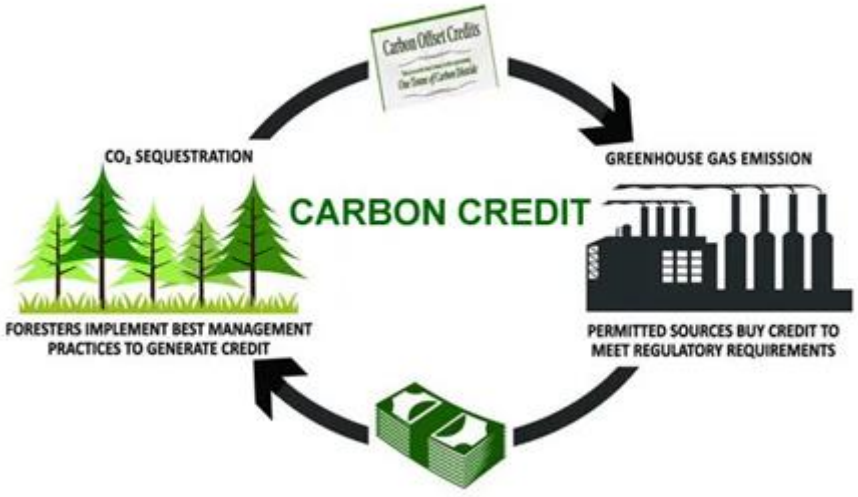
About Carbon Trading and Carbon Credit:

- Carbon trading is a market-based system that aims to offer financial incentives to persuade enterprises to lessen their environmental footprint.
- In contrast to voluntary offsets, which allow consumers to pay to offset their carbon impact, carbon trading is a legally binding scheme.
- Carbon trading seeks to place a price on CO2 using the caps and trade principle and is calculated by individual governments and policymakers.
- The amount of emissions that are allowed for each carbon-producing industry, such as the power sector, the automobile industry, and air travel, is capped by the government.

Carbon Credit:

- A carbon credit is a kind of tradable permit that, per United Nations standards, equals one tonne of carbon dioxide removed, reduced, or sequestered from the atmosphere.
- Carbon allowances or caps, meanwhile, are determined by countries or governments according to their emission reduction targets.

Significance of Carbon Credit:



- Carbon credits allow carbon dioxide emissions to be traded as a commodity in the market which compensates sellers for investing in emission reduction practices and thus incentivises the net reduction of carbon dioxide in the atmosphere.
- Corporations that cannot directly reduce their GHG emissions can offset their emissions indirectly by purchasing carbon credits from other individuals and entities.
- As the significance of climate and sustainability increases for countries, investors (especially ESG-driven investments), employees, and customers' demand for these credits is also expected to significantly increase.
- Various practices could be eligible for earning carbon credits, including renewable energy, afforestation, ecological restoration, agriculture, waste management, etc.

Advantages of carbon credit in Agricultural Sector:

- Carbon credits could be generated in agriculture based on carbon dioxide sequestered and stored by the soil from the atmosphere as well as the reduction in carbon dioxide emissions during the cultivation process from ploughing to the management of stubble.

- For instance, various activities related to agriculture such as tilling of fields before sowing seeds, use of chemical fertilizers, stubble burning, etc. result in carbon dioxide emissions.
- Agriculture is also the biggest contributor to GHG emissions within the entire food system.
- Being a major source of emissions, agriculture could also serve as an important sink to store carbon and thus reduce, avoid or sequester carbon dioxide emissions.
- The improvement in the carbon-storing capacity of the soil could improve fertility, crop yields, farmers' income, water conservation, etc., thereby aiding in making agriculture resilient in the long run.
- Use of the direct-seeding method to cultivate rice instead of transplantation of saplings in flooded fields can reduce methane emissions (generated from bacteria in flooded fields) and water consumption, and also improve soil nutrition.
- The promotion of similar practices could help in reducing emissions and providing carbon credits to farmers.
- Farmers can then sell these credits in the market and earn additional income, thus further incentivising them to implement such activities and improve soil carbon.
- Encouraging activities like zero-tilling agriculture, agroforestry, improved water management, crop diversification and reduced use of chemical fertilizers can improve soil health and its capacity to store carbon.
- It is estimated that soil carbon sequestration is a cost-effective measure to mitigate climate change and can sequester around 2.6 gigaton emissions per year.

Challenges before Carbon credit in the Agriculture sector:

- This nascent level of agricultural carbon trading can be attributed to various reasons such as –
- Low level of stakeholder awareness
- Low level of methodology for determination of emissions reduced, avoided, or sequestered due to agriculture activities
- Non-permanence of carbon sequestered in the soil
- Verification of the quality of carbon credits
- Monitoring of underlying projects,
- Determination of the fair value of carbon credits to incentivise farmers to adopt sustainable practices etc.
- The average landholding size of an Indian farmer is just over one hectare.
- Therefore, the amount of carbon credits received may not be enough for a small farmer to adopt regenerative agriculture practices.

Low Participation of Agriculture Sector:

- The carbon credits conceptually seem encouraging for climate change and agriculture but there is low participation of the agricultural sector in carbon trading markets.
- For example, as per the Berkeley Carbon Trading Project, agricultural activities accounted for only 1 per cent of all carbon credits issued for emissions reduction projects in 2021.

Way Forward:

- Farmers need to be made aware of the existence and benefits of carbon credit programmes, so that all farmers practicing regenerative agriculture can benefit from it. Need of a streamlined policy to address these challenges which will help in expanding the currently under-utilized space for carbon credit trading from commercial agriculture.
- Thus the governments at the state and central level could attempt to align existing natural farming, regenerative farming, and organic farming schemes so as to nudge farmers to participate in carbon credit programmes along with the associated organizations.

5.7 Neelakurinji

The Ministry of Environment, Forest and Climate Change (MoEFCC) has listed Neelakurinji (Strobilanthes kunthiana) under Schedule III of the Wildlife (Protection) Act, 1972, including it on the list of protected plants.

About Neelakurinji:

- It is a shrub that is found in the shola forests of the Western Ghats in Kerala, Karnataka and Tamil Nadu.
- Locally known as Kurinji, the flowers grow at an altitude of 1,300 to 2,400 metres.
- Nilgiri Hills, which literally means the blue mountains, got their name from the purplish blue flowers of Neelakurinji that bloom only once in 12 years.
- Kurinjimala Sanctuary of Kerala protects the Kurinji in approximately 32 km2 core habitat in Kottakamboor and Vattavada villages in Idukki district.
- Kurinji Andavar temple located in Kodaikanal of Tamil Nadu dedicated to Tamil God Murugan also preserves these plants.
- The Paliyan tribal people living in Tamil Nadu used it as a reference to calculate their age.
- Karnataka has around 45 species of Neelakurinji and each species blooms at intervals of six, nine, 11 or 12 years.
- Besides the Western Ghats, Neelakurinji is also seen in the Shevroy in the Eastern Ghats, Sanduru hills of Bellary district in Karnataka.

5.8 Carbon trading

Parliament passed the Energy Conservation (Amendment) Bill-2022 that enables the Union government to set up a carbon credit trading scheme and specify the minimum amount of non-fossil sources to be used by designated energy consumers.

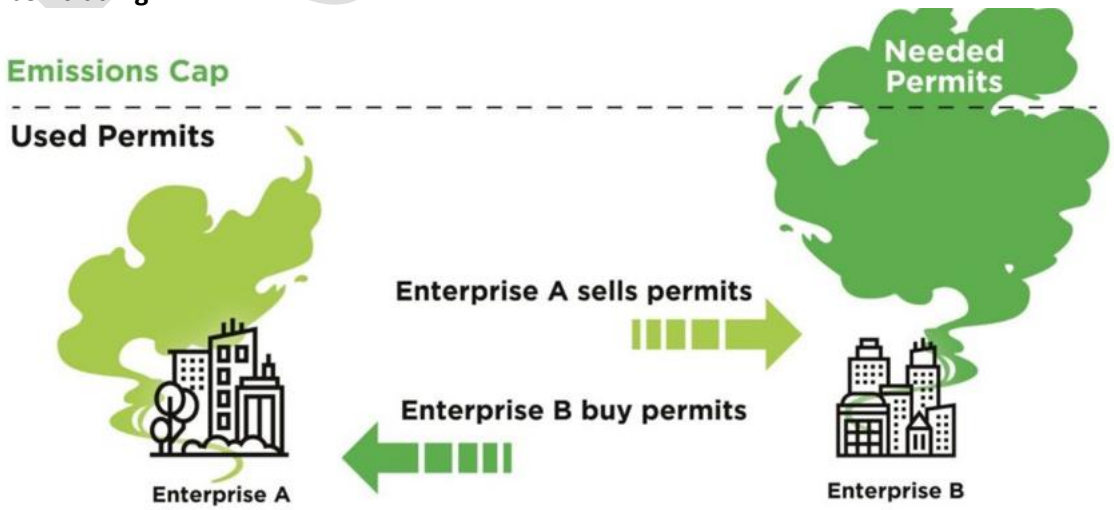
Context:

- India had taken the lead when it came to energy transition.
- As per India's commitments under the UNFCCC as given by the PM at COP-26 last year, the goal is to cut emission intensity by 45% and achieve 50% of the installed capacity of electricity generation from non-fossil fuel sources.

Energy Conservation (Amendment) Bill-2022

- The Bill amends the Energy Conservation Act-2001.
- The Central Electricity Regulatory Commission (CERC) would be the regulator and that the carbon price would be determined by the market.
- The Bill covers large buildings — those with connected load of 100 kilowatt and above — for compliance with energy conservation and sustainability codes.
- States had been empowered to lower the threshold to include a wider section of buildings.
- The Bill did not make a provision for those under the 100KW threshold who want to voluntarily submit to the energy conservation mechanism.

What is carbon trading:



- Carbon trading is the process of buying and selling permits and credits that allow the permit holder to emit carbon dioxide.
- It is a market-based system aimed at reducing greenhouse gases that contribute to global warming, particularly carbon dioxide emitted by burning fossil fuels.
- An emissions trading scheme (cap-and-trade system) sets a regulatory ceiling or 'cap' on greenhouse gas emissions being regulated under the scheme.
- The right to emit a tonne of CO2 is often referred to as a carbon 'credit' or carbon 'allowance'.
- There are broadly two types of carbon markets: compliance and voluntary.
- Examples – European Union's Emissions Trading System(ETS)
- The Clean Development Mechanism (CDM), adopted under the Kyoto Protocol in 1997.
- Emission-reduction projects in developing countries have generated carbon credits used by industrialized countries to meet part of their emission reduction targets.

Significance:

- Help achieve current and future climate ambitions by tapping existing markets.
- Bring about development co-benefits: improve air quality and health outcomes and ensure energy security.
- trading in sulphur dioxide permits helping to limit acid rain in the US.
- Carbon trading is much easier to implement than expensive direct regulations, and unpopular carbon taxes.
- If regional cap and trade schemes can be joined up globally, with a strong carbon price, it could be a relatively pain-free and speedy method to help the worlds decarbonise.
- Boost competitive advantage of businesses by reducing risk of stranded assets.

Open low carbon opportunities for MSMEs through

- Technology transfer
- Spur clean innovation
- Provide liquidity to Indian credits
- Unlock climate finance

Challenges:

- Creating a market in something with no intrinsic value such as carbon dioxide is difficult.
- Need to promote scarcity – and you have to strictly limit the right to emit so that it can be traded.
- In the world's biggest carbon trading scheme, the EU ETS, political interference has created gluts of permits.
- On account of corruption, carbon credits have often been given away for free, which has led to a collapse in the price and no effective reductions in emissions.
- Another problem is that offset permits, gained from paying for pollution reductions in poorer countries, are allowed to be traded as well.
- The importance of these permits in reducing carbon emissions is questionable and the effectiveness of the overall cap and trade scheme is also reduced.
- Greenwashing – in which companies falsely market their green credentials, for example, misrepresentations of climate-neutral products or services
- Double-counting of GHG emission reductions

Suggestions:

- Carbon taxes – Taxes on energy content or production are in place in many European countries.
- Taxes exist in India, Japan and South Korea and they have been imposed then repealed in Australia.
- Direct regulations – Governments have tried to regulate their way to lower emissions.
- This approach is being tried in the US, where President Obama has imposed a Clean Power Plan on energy producers, designed to reduce emissions from this sector by 32% by 2030.

Way forward:

- As per latest IPCC report, developing countries will need up to US$6 trillion by 2030 to finance not even half of their climate action goals (as listed in their Nationally Determined Contributions, or NDCs).
- Carbon finance will be key for the implementation of the NDCs, and the Paris Agreement enables the use of such market mechanisms through Article 6.
- 83 percent of NDCs state the intent to make use of international market mechanisms to reduce greenhouse gas emissions.

5.9 Katarniaghat Wildlife Sanctuary (KWS)

Recently forest officials of Katarniaghat division says it has plan for the financial inclusion of the Tharu people that live near the Katarniaghat Wildlife Sanctuary (KWS).

About Katarniaghat Wildlife Sanctuary (KWS):

- The Sanctuary is a protected area in the Upper Gangetic plain in Uttar Pradesh.
- It was brought under the purview of the 'Project Tiger' in 1987.
- KWS with the Kishanpur Wildlife Sanctuary and the Dudhwa National Park it forms the Dudhwa Tiger Reserve, which was established in 1975.
- Katerniaghat Forest provides strategic connectivity between tiger habitats of Dudhwa and Kishanpur in India and the Bardia National Park (Nepal).
- The Gairwa river flows in the sanctuary area is declared as a sanctuary for Mugger and Gharials.
- Fauna: Endangered species including, tiger, rhino, swamp deer, hispid hare, Bengal florican, the white-backed and long-billed vultures.
- It is among the few places in India where Gangetic dolphins (fresh water dolphins) are found in their natural habitat.
- Flora: Its fragile Terai ecosystem comprises a mosaic of sal and teak forests, lush grasslands, numerous swamps and wetlands.

About Tharu People/tribe:

- The word Tharu is believed to be derived from sthavir, meaning followers of Theravada Buddhism.
- Community belongs to the Terai lowlands, amid the Shivaliks or lower Himalayas in India and Nepal.
- They live mostly in Uttarakhand, Uttar Pradesh, and Bihar in Indian terai region.
- They speak various dialects of Tharu, a language of the Indo-Aryan subgroup, and variants of Hindi, Urdu, and Awadhi.
- In central Nepal, they speak a variant of Bhojpuri, while in eastern Nepal, they speak a variant of Maithili.
- Tribe worship Lord Shiva as Mahadev, and call their supreme being "Narayan".
- They believe "Narayan" is the provider of sunshine, rain, and harvests.
- Tharu women have stronger property rights than is allowed to women in mainstream North Indian Hindu custom.

5.10 Methane emissions

Microsoft co-founder Bill Gates has invested in an Australian climate technology start-up that aims to curtail the methane emissions of cow burps, according to a report in the BBC.

About Methane:

- Methane (CH_4) is a hydrocarbon that is a primary component of natural gas.
- Methane is also a greenhouse gas (GHG), so its presence in the atmosphere affects the earth's temperature and climate system.
- Methane (CH_4) is a colourless, odourless and highly flammable gas.
- Methane is the second most abundant anthropogenic GHG after carbon dioxide (CO_2), accounting for about 20 percent of global emissions.

- China, the United States, Russia, India, Brazil, Indonesia, Nigeria, and Mexico are estimated to be responsible for nearly half of all anthropogenic methane emissions.
- Because methane is both a powerful greenhouse gas and short-lived compared to carbon dioxide, achieving significant reductions would have a rapid and significant effect on atmospheric warming potential.

Sources of Methane:

- Globally, 50 to 65% of total methane emissions come from the following human-caused activities:
- Raising livestock: Ruminants such as cows, sheep, goats, and buffaloes have a special type of digestive system that allows them to break down and digest food that non-ruminant species would be unable to digest.
- Livestock emissions (from manure and gastroenteric releases) account for roughly 32 per cent of human-caused methane emissions.
- Leaks from natural gas systems
- Landfills and waste from homes and businesses
- Agriculture is the predominant source.
- Paddy rice cultivation in which flooded fields prevent oxygen from penetrating the soil, creating ideal conditions for methane-emitting bacteria – accounts for another 8 per cent of human-linked emission.

Consequences of Methane:

- Potency: Methane is about 80 times more powerful at warming the atmosphere than carbon dioxide over a 20-year period.
- Ozone formation: Methane also contributes to the formation of ground-level ozone a hazardous air pollutant and greenhouse gas.
- Global warming: Methane has accounted for roughly 30 per cent of global warming since pre-industrial times and is proliferating faster than at any other time since record keeping began in the 1980s.
- Global and Indian Initiatives to tackle Methane Emissions

India Greenhouse Gas Program:

- This Program is an industry-led voluntary framework aiming to help Indian companies monitor progress towards measurement and management of GHG emissions using tools and methodologies from WRI's (World Resources Institute) GHG Protocol.

Harit Dhara:

- The Harit Dhara is an anti-methanogenic feed supplement prepared from the Natural Phyto-sources.
- It is found very effective in reducing the enteric methane emission upto 17% to 20% when incorporated in the livestock feed.

Methane Alert and Response System:

- UNEP's International Methane Emissions Observatory launched the Methane Alert and Response System (MARS) at COP27, a new initiative to accelerate implementation of the Global Methane Pledge by transparently scaling up global efforts to detect and act on major methane emissions sources.

Global Methane Initiative:

- It was launched in 2004.
- It is an international public-private initiative that advances cost-effective, near-term methane abatement and recovery and use of methane as a valuable energy source in three sectors: biogas (including agriculture, municipal solid waste, and wastewater), coal mines, and oil and gas systems.
- It focuses on collective efforts and a cost-effective approach to reduce greenhouse gas (GHG) emissions and increase energy security, enhance economic growth, improve air quality and improve worker safety.
- GMI includes 46 Partner Countries, which together represent approximately 75 percent of the world's estimated man-made methane emissions.
- Active involvement by private sector entities, financial institutions, and other non-governmental

organizations is essential to build capacity, transfer technology, and promote private investment.

Global Methane Pledge:

- The Global Methane Pledge was launched at COP26 in November 2021 to catalyse action to reduce methane emissions.
- Led by the United States and the European Union, the Pledge now has 111 country participants who together are responsible for 45% of global human-caused methane emissions.
- By joining the Pledge, countries commit to work together in order to collectively reduce methane emissions by at least 30% below 2020 levels by 2030.

5.11 Lake Victoria

One of the largest lakes in the world, Lake Victoria, has been suffering from a variety of unsustainable human activities over the last five decades. Delhi-based non-profit Centre for Science and Environment and National Environment Management Council (NEMC), Tanzania have jointly released a report on managing its water quality.

About Lake Victoria:

- Lake Victoria and its flora and fauna support the livelihoods of about 45 million people.
- The ecologically unique water body is shared by three countries — Tanzania (51 per cent), Uganda (44 per cent) and Kenya (5 per cent).
- Africa's largest lake by area, the world's largest tropical lake, and the world's second-largest freshwater lake by surface area after Lake Superior in North America.
- Occupies a shallow depression in Africa.
- The lake was renamed after Queen Victoria by the explorer John Hanning Speke, the first Briton to document it in 1858, while on an expedition with Richard Francis Burton

Findings & Suggestions of the Report

- Identified Mwanza city as a hotspot, contributing a substantial pollution load in the form of industrial effluents, domestic sewage and dumping of solid waste.
- It also recognised two rivers — the Mirongo and the Nyashishi — as the major water bodies carrying domestic and industrial pollution loads, respectively.
- Results of the sampling exercise showed substantial pollutant load in the rivers, which may be getting discharged in the lake.
- The water from the Nyashishi is extensively used for agricultural purposes before it meets the lake.
- The focus on the Nyashishi should now be doubled as any pollutant in the river, along with affecting the water quality of Lake Victoria, may also adversely impact crops and human health.

5.12 Renewable energy transition

- Livelihoods powered by clean energy are major outliers in the country that's the third-largest emitter of planet-warming gases in the world
- India missed its target to install 175 gigawatts of renewable energy to its overall power production by 2022.
- To meet its 2030 renewable energy target of installing a total of 450 gigawatts, India needs to build out clean energy at a far greater rate than it is doing now.

Role of coal in India's Energy mix

- Coal is by far the largest share of dirty fuels.
- Nationwide fossil fuels generate more than 70% of India's electricity and have been doing so for decades.
- The Indian government has repeatedly defended its use of coal and its energy transition strategy, stating that the fuel is necessary for the nation's energy security.
- In 2021, India announced its biggest-ever auction for coal mines inviting bids for 141 mines spread across

12 states in the country
- It will contribute to its target of producing 1 billion tons of coal by April 2024.
- From 2001 to 2021, India installed 168 gigawatts of coal-fired generation, nearly double what it added in solar and wind power combined, as per Ember data.
- Coal India limited, a government-owned company, is the largest state-owned coal producer in the world.
- It is responsible for about 82% of the total coal produced in India.
- The country's coal-fired power plants have an average age of 13 years and India has 91,000 MW of new proposed coal capacity in the works, second only to China
- According to the Draft National Electricity Plan 2022, coal's share in the electricity generation mix will decrease to 50% by 2030, compared to the current contribution of 70%

Status of Renewable energy

- Contribution It currently contributes about 10% of India's electricity needs.
- Price of renewable energy has plummeted.
- The cost of solar power has dropped roughly sixfold from 12 rupees (14 cents) per kilowatt-hour in 2011 to 2.5 rupees (0.03 cents) per kilowatt-hour.
- Economic savings The planned buildout of 76 GW of solar and wind power by 2025 will avoid the use of almost 78 million tons of coal annually and could lead to savings of up to 1.6 trillion rupees ($19.5 billion) per year.
- Coal's share in producing electricity for Gujarat fell from 85% to 56% in the last six years, according to analysis by London-based energy think tank Ember
- The share of renewable energy for Gujarat grew from 9% to 28% in the same period.
- Gujarat is one of four of India's 28 states that met their renewable energy targets for 2022.
- Other states Most states have installed less than 50% of their targets and some states such as West Bengal have installed only 10% of their target.

Challenges in transition

- Reducing the share of coal in the electricity generation mix is particularly acute because the sector is growing rapidly
- Development goals India's quickly developing economy and growing electricity consumption per capita is causing rising demand
- Historically, countries that have achieved substantial and rapid transitions away from coal-fired power tend to have had either slowly growing or stagnant or even slightly declining electricity demand
- Growing demand India's federal power ministry estimates that its electricity demand will grow up to 6% every year for the next decade.
- Acquiring land for clean energy projects in tough due to resistance from local communities.
- While longstanding contracts with coal plants also make it easier for state-run electricity companies to buy coal power instead of clean power.
- Inefficiency of DISCOMS As of December 2022, Indian state-owned electricity distribution companies owed power generators $3.32 billion in overdue payments.
- Their poor financial health has dampened their ability to invest in clean energy projects
- Skewed Lending scenario 60% of lending to the mining sector was for oil and gas extraction, while one-fifth of manufacturing sector debt is for petroleum refining and related industries.
- High-carbon industries — power generation, chemicals, iron and steel, and aviation — account for 10% of outstanding debt to Indian financial institutions. However, these industries are also heavily indebted, and therefore have less financial capacity to respond to shocks and stresses.

Suggestions for future:

- Planning It is great that India has a 2070 net zero target, but changes need to happen now for us to achieve this.
- Building renewables capacity and energy storage– electricity distribution companies need to allow for more rooftop solar installations even if it results in short-term economic losses for them.
- Investing in modernizing and building new wind energy projects will also speed up the transition.

- India needs $223 billion to meet 2030 renewable capacity goals
- Enacting more progressive policies — such as the $2.6 billion government scheme that encourages making components required to produce solar energy — and ensuring these policies are being implemented is essential to speed up a move toward renewables
- New laws such as the energy conservation bill as well as updated mandates issued by the federal government that make it necessary for electricity companies to purchase renewables provide hope
- Investment in new technology such as clean fuels like green hydrogen may improve battery storage for renewables to provide uninterrupted electricity
- Sovereign green bonds India is expected to launch its first-ever sovereign green bonds auction, with the Reserve Bank of India

Way forward

- A report by the Global Energy Monitor ranks India among the top seven countries globally for prospective renewable power.
- At the end of the day what is needed is speeding up the installation of renewables and associated infrastructure
- Ultimately in India, renewable energy is a highly cost-effective technology. The perception that coal is cheap is changing

5.13 Simplipal National Park

Similipal National Park has turned out to be the hunting ground for animal poachers over the last few years. Most recently, the carcass of a male elephant was found in the Talabandha wildlife range

Simplipal National Park

- Located in northern part of Odisha's Mayurbhanj district
- Similipal derives its name from 'Simul' (Silk Cotton) tree
- It is a national park and a Tiger Reserve
- The tiger reserve is spread over 2750 sq km and has some beautiful waterfalls like Joranda and Barehipani.
- The park is surrounded by high plateaus and hills, the highest peak being the twin peaks of Khairiburu and Meghashini (1515m above mean sea level).
- At least twelve rivers cut across the plain area, all of which drain into the Bay of Bengal – Burhabalanga, Palpala Bandan, Salandi, Kahairi and Deo.
- Prominent tribes – Kolha, Santhala, Bhumija, Bhatudi, Gondas, Khadia, Mankadia and Sahara.
- The vegetation is a mix of deciduous with some semi-evergreen forests
- Sal is the dominant tree species

Biodiversity in the park:

- An astounding 1078 species of plants including 94 species of orchids find their home in the park.
- These forests boast of many plants that have medicinal and aromatic properties.
- The park is known for the tiger, elephant and hill mynah.
- It holds the highest tiger population in the state of Odisha.
- Apart from the tiger, the major mammals are leopard, sambar, barking deer, gaur, jungle cat, wild boar, four-horned antelope, giant squirrel and common langur.
- Grey hornbill, Indian pied hornbill and Malabar pied hornbill are also found here.
- The park also has a sizeable population of reptiles, which includes the longest venomous snake, the King cobra and the Tricarinate hill turtle.
- The Mugger Management Programme at Ramatirtha has helped the mugger crocodile to flourish on the banks of the Khairi and Deo Rivers
- Similipal has turned out to be the haven for hunters and poachers as the region has witnessed several killings of elephants, tigers and leopards

Threats:

- About 20 adult breeding male elephants die each year, mostly to unnatural causes like poaching and electrocution.
- The dwindling breeding male population and the isolated populations due to fragmented forests is weakening the gene pool due to mating among immature individuals and inbreeding.
- There is a link between poaching and trading of elephant tusks, tiger skins and leopard skins since these fetch a huge price in the international market despite the global ban
- Even though Elephants are protected under Schedule 1 of the Wildlife Protection Act, 1972, there is a rise in poaching cases
- While tiger population has gone up in most Indian states, in Odisha it has come down or remained static

6. Security Issues

6.1 Submarine Vagir

The Indian Navy is set to commission the fifth of its diesel-electric Scorpene-class submarine Vagir.

About Submarine Vagir:

- Vagir is among the six submarines being built in India by the Mazagon Dock Shipbuilders Limited (MDL) Mumbai, in collaboration with the French M/s Naval Group under Project 75.
- INS Vagir is the fifth submarine of the first batch of six Kalvari-class submarines for the Indian Navy.
- It is a diesel-electric attack submarine based on the Scorpène class.
- It is named after the Sand Fish of the Indian Ocean.
- It is designed to operate in all theatres of operation.
- It can launch attacks with both torpedoes and tube launched anti-ship missiles, whilst underwater or on surface.
- The Kalvari class is capable of offensive operations across the entire spectrum of naval warfare including:
- anti-surface warfare,
- anti-submarine warfare,
- intelligence gathering,
- mine laying and
- area surveillance

6.2 National cyber security strategy

The National Security Council Secretariat (NSCS) has formulated a draft National Cyber Security Strategy which looks at addressing the issue of security of national cyberspace.

About National Security Council:

- The National Security Council (NSC) of India is an executive government agency tasked with advising the Prime Minister's Office on matters of national security and strategic interest.
- It was established by the former Prime Minister of India Atal Bihari Vajpayee on 19 November 1998, with Brajesh Mishra as the first National Security Advisor.
- Prior to the formation of the NSC, these activities were overseen by the Principal Secretary to the preceding Prime Minister.

Members:

- Besides the National Security Advisor (NSA), the Deputy National Security Advisors, the Ministers of Defence, External Affairs, Home, Finance of the Government of India, and the Vice Chairman of the NITI Aayog are members of the National Security Council.
- Prime Minister can chair the meeting of NSC (for e.g. – PM chaired the meeting of NSC Post Pulwama to discuss heightened tension with Pakistan). Other members may be invited to attend its monthly meetings, as and when it is required.

Organisational structure

- The NSC is the apex body of the three-tiered structure of the national security management system in India.
- The three tiers are the Strategic Policy Group, the National Security Advisory Board and a secretariat from the Joint Intelligence Committee.

About National Cyber Security Strategy:

- Aim: It proposes a separate legislative framework for cyberspace and the creation of an apex body to address threats, responses and complaints.
- The policy will focus on both threat assessment and response.
- Need: The existing legal and regulatory frameworks do not address the evolving threat scenarios or processes to combat the cyber incidents.
- There is no dedicated body to look after cyber security at present and no one that you can hold accountable.
- Currently, the response to cyber security threats can be taken under the information technology act and the Indian Penal Code.

Other provisions:

- It aims to create a comprehensive system with both state-owned and private companies having to comply with cybersecurity standards.
- It provides for a periodic cyber audit and recommends annual reviews by the apex body that will be created.
- A centre of excellence will also be set up in Bangalore to further innovations in the area.

Key facts:

- Till November 2022, a total of 12,67,564 cyber security incidents were reported.
- In 2021, the authorities had recorded 14,02,809 such events compared to 11,58,208 in 2020 and 3,94,499 in 2019.
- Ransomware attacks jumped 51% in 2022. Maharashtra was the most targeted state in India facing 42% of all ransomware attacks.
- Cyber thieves also exploited legitimate tools like “AnyDesk” used for remote administration.

Reasons for increasing Cyber Attacks:

- Adverse relations with China: China is considered one of the world leaders in information technology.
- Therefore, it is expected to have capabilities to disable or partially interrupt the information technology services in another country.
- Combined with the recent border standoff and violent incidents between the armies of the two countries, the adversity in relations is expected to spill over to attacking each other’s critical information infrastructure.
- Asymmetric and covert warfare: Unlike conventional warfare with loss of lives and eyeball to eyeball situations, cyber warfare is covert warfare with the scope of plausible deniability, i.e., the governments can deny their involvement even when they are caught.
- Similarly, even a small nation with advanced systems and skilled resources can launch an attack on a bigger power, without the fear of heavy losses.
- Increasing dependency on technology: As we grow faster, more and more systems are being shifted to virtual space to promote access and ease of use.
- However, the downside to this trend is the increased vulnerability of such systems to cyber-attacks.

Issues with Cyber Security:

- Vulnerable points in the system: sometimes the third-party apps have built-in back door entry or may have malware attached to their installation file. Such issues can be addressed by effective user account control and careful monitoring of the system.
- State-sponsored Cyber Attacks: The problem with such state-sponsored attacks is the unlimited funding received by the hackers to break into the foreign systems.
- Low digital literacy among the public: While India is considered the world leader in the technology industry, the general level of awareness in India about internet etiquette is low.
- It is a continuous process: Cyber-attacks, by their very nature, are innovative and creative. They continue to evolve, and the next attack is more advanced than its previous version.
- Novel issues: Because of the ever-changing and fast evolving nature of technology, new issues keep

creeping up in the IT sector.

- Steps taken by the Government: The government aims at ensuring an open, safe, trusted and accountable Internet for the users.
- The Indian Computer Emergency Response Team (CERT-In) issues alerts and advisories regarding latest cyber threats/vulnerabilities and countermeasures to protect computers and networks on an ongoing basis.
- CERT-In operates the Cyber Swachhta Kendra (Botnet Cleaning and Malware Analysis Centre) to detect malicious programmes and free tools to remove the same, and to provide cyber security tips and best practices for citizens and organisations.
- Security tips have been published for users to secure their desktops and mobile phones and to prevent phishing attacks.
- CERT-In and the Reserve Bank of India [RBI] jointly carry out a cyber security awareness campaign on 'Beware and be aware of financial frauds' through the Digital India Platform.
- The Indian Cyber Crime Coordination Centre (I4C) under the Ministry of Home Affairs (MHA) has been designated as the nodal point in the fight against cybercrime.
- Pursuant to the United Nations General Assembly resolution 75/282: an ad-hoc committee to elaborate a 'Comprehensive International Convention on Countering the Use of Information and Communications Technologies for Criminal Purposes' was established with all the member states.
- India being the member of the committee has proposed criminalisation of cyber terrorism under the said Convention.
- The MHA has issued National Information Security Policy and Guidelines to the Central Ministries as well as State governments and Union Territories with the aim of preventing information security breaches and cyber intrusions in the information and communication technology infrastructure.

Way Forward:

- The need of the hour is to come up with a futuristic National Cyber-Security Policy which allocates adequate resources and addresses the concerns of the stakeholders.
- Similarly, there is a need for quicker up-gradation of the existing infrastructure as information technology is a fast-evolving field and there is a need to stay ahead of the competition.
- There is a need to enhance the general awareness levels of the government installations as well as the general public to counter such threats.
- Often the private sector is seen as a key innovator and their help can be crucial in securing cyberspace.

7. Social Issues

7.1 Kala-azar

- Around 99.8% endemic blocks in India have achieved elimination status
- Kala-azar cases in India fell to 834 in 2022 from 44,533 in 2007 — a 98.7 per cent decline.
- As many as 632 endemic blocks (99.8 per cent) spread across Bihar, Uttar Pradesh, Jharkhand and West Bengal have received elimination status (less than one case per 10,000).
- Only one block (Littipara) of Pakur district, Jharkhand is in the endemic category (1.23 cases / 10,000 population)

Globally:

- Visceral leishmaniasis or kala-azar is the most serious form of the disease and as of November 2022, about 89 per cent of the global cases were reported from eight countries: Brazil, Eritrea, Ethiopia, India, Kenya, Somalia, South Sudan and Sudan
- India contributes 11.5 per cent of total cases reported globally.
- The disease mainly affects poor people in Africa, Asia and Latin America, and is associated with malnutrition and poor housing, population displacement, weak immune system and lack of resources

Kala-Azar

- After malaria, kala-azar is the deadliest parasitic disease in the world.
- It is one of the three conditions in the disease group called leishmaniasis caused by the protozoa parasite Leishmania.
- The parasite is transmitted to humans by the bite of an infected female phlebotomine sandfly, a tiny 2-3 mm long insect vector.
- This type of leishmaniasis affects the internal organs, usually the spleen, liver and bone marrow.
- Some people have no symptoms. For others, symptoms may include fever, weight loss and swelling of the spleen or liver.
- Medication exists to kill the parasites. If left untreated, severe cases are typically fatal.
- Up to 20% of the patients who are correctly treated and cured, develop a skin condition called Post-Kala-Azar Dermal Leishmaniasis (PKDL) which surfaces within months to years after treatment.
- These patients can contain large amounts of parasites in their skin lesions, making them an important source of transmission.

Steps being taken by India to Eliminate this Disease

- Development of a plan for the “unreached poorest” or underprivileged sections in endemic areas.
- Leveraging of Kala-azar elimination programme within POSHAN Abhiyaan for maximum benefit at community level.
- Exploration of the opportunity of providing improved housing under the flagship program of the Prime Minister Awas Yojana-Gramin (PMAY-G), along with rural electrification, testing, treatment and periodic high-level review, incentivising through award distribution.
- Exploration of the opportunity of providing improved housing under State Schemes.
- Involvement of Rural Health Practitioners (RHPs)
- Co-ordination with the rural development department and engage with Panchayati Raj functionaries for awareness, community engagement, environment management and social empowerment.
- Supporting the states in active case detection, surveillance, treatment as well as supply of diagnostic kits, medicines, sprays.

7.2 Sexual harassment at workplace

- Several top Haryana-based World and Olympic medallist wrestlers, including Vinesh Phogat, Bajrang Punia

and Sakshi Malik, began a protest in Delhi, alleging sexual harassment of young wrestlers by Mr. Singh and financial misappropriation by the WFI.

- Union Sports Minister announced that six-time World champion and Olympic medallist boxer M.C. Mary Kom will head a government-appointed five-member Oversight Committee (IOA panel) to investigate the charges levelled by some prominent wrestlers against Wrestling Federation of India (WFI) president Brij Bhushan Sharan Singh.

Definition of Sexual harassment

- As per Sexual Harassment of Women in the Workplace Act 2013, "sexual harassment" includes any one or more of the following unwelcome acts or behaviour
- physical contact and advances; or
- a demand or request for sexual favours; or
- making sexually coloured remarks; or
- showing pornography; or
- any other unwelcome physical, verbal or non-verbal conduct of sexual nature;
- Additionally, the Act mentions five circumstances that amount to sexual harassment —promise of preferential treatment in her employment, threat of detrimental treatment, threat about her present or future employment status, interference with her work or creating an offensive or hostile work environment and humiliating treatment likely to affect her health or safety.

Vishaka guidelines

- These were laid down by the Supreme Court in a judgment in 1997.
- This was on a case filed by women's rights groups, one of which was Vishaka.
- They had filed a public interest litigation over the alleged gang-rape of Bhanwari Devi, a social worker from Rajasthan.
- In 1992, she had prevented the marriage of a one-year-old girl, leading to the alleged gang-rape in an act of revenge.
- Legally binding, these defined sexual harassment and imposed three key obligations on institutions — prohibition, prevention, redress.
- The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act
- It was passed in 2013.
- It defines sexual harassment, lays down the procedures for a complaint and inquiry, and the action to be taken.
- It broadens the Vishaka guidelines as follows:
- It mandates that every employer constitute an Internal Complaints Committee (ICC) at each office or branch with 10 or more employees.
- It lays down procedures and defines various aspects of sexual harassment, including aggrieved victim — a woman "of any age whether employed or not", who "alleges to have been subjected to any act of sexual harassment", which means the rights of all women working or visiting any workplace, in any capacity, are protected under the Act.

Procedure for complaint

- The Act says the aggrieved victim "may" make, in writing, a complaint of sexual harassment.
- If she cannot, any member of the ICC "shall" render "all reasonable assistance" to her for making the complaint in writing.
- The complaint of sexual harassment has to be made "within three months from the date of the incident
- Section 10 of the Act deals with conciliation – The ICC "may", before inquiry, and "at the request of the aggrieved woman, take steps to settle the matter between her and the respondent though conciliation" — provided that "no monetary settlement shall be made as a basis of conciliation".
- After the recommendations, the aggrieved woman or the respondent can appeal in court within 90 days
- Section 14 of the Act deals with punishment for false or malicious complaint and false evidence. The Act, however, makes it clear, that action cannot be taken for "mere inability" to "substantiate the complaint or provide adequate proof".

Priya Ramani case

- In February 2021, a trial court acquitted Priya Ramani in the criminal defamation case filed by her former boss and editor-turned-politician, MJ Akbar for accusing him of sexual harassment during the #MeToo movement in 2018.
- Judge Ravindra Kumar Pandey made significant observations in the judgment – the woman cannot be punished for raising voice" as the "right of reputation cannot be protected at the cost of the right of life and dignity of a woman

Suggestions for future:

- IOA panel formed to probe the allegations of sexual misconduct, harassment and intimidation, financial irregularities and administrative lapses – Mary Kom heads the IOA panel as well.
- Attitudinal shift – Organisations must take institutional responsibility for an attitudinal shift.
- Institutional accountability requires employers to institute a Complaint Mechanism and a Complaints Committee as per Vishakha guidelines, reiterating the importance of its independence by having an external member, conversant with the issue of sexual harassment.
- Role of judiciary – the Supreme Court of India in Medha Kotwal Lele and ors. Vs. Union of India recognised that "women still struggle to have their most basic rights protected at workplaces"
- The Medha Kotwal judgment accepted that a woman has reasonable grounds to believe that her objection would disadvantage her at work or create a hostile work environment.
- Regulatory framework – Sexual harassment has been brought under the ambit of the Indian Penal Code (IPC) which is an important step in understanding the gravity of its impact on women.
- A significant amendment to the Indian Evidence Act of 1872, stated that where the question of consent is an issue, "evidence of the character of the victim or previous sexual experience shall not be relevant".
- This amendment would necessitate a transformational change in how survivors are treated in court, emphasising the need to stop re-victimisation.

Way forward

- Despite these watershed moments in our legal history that demand a cultural shift in the treatment of survivors, they continue to fear for their physical safety, their job security and their mental health for rejecting an unwelcome sexual advance or reporting it.
- Evidence shows that due processes meant to protect survivors and help them access justice, leave survivors feeling betrayed.
- Shifting blame on the survivor or making veiled accusations during the inquiry process coerces them into silence and unjustifiably puts the burden of proof back on the victim.
- As Ramani expressed upon her acquittal in the defamation suit against her, that despite being a victim of sexual harassment, she had to stand in Court as the accused.

Celebrate Learning !

EDGE IAS

India's only classroom program with complete online backup and support.

Salient Features

- Personal Mentoring 1 to 1
- Small Batch Size
- Special Classes - Thought process and Writing Skills Development
- Structured Class Schedule (time Bound)
- Personaity Development and Brain-storming Session
- English Development Classes

Contact: 9910922241 / 9999114095

Center 1: 71, 1st Floor, Near GTB Metro Station Gate No 1, Kingsway Camp, GTB Nagar, New Delhi - 110009

Center 2: 57/17, 2nd Floor, Old Rajinder Nagar Market, Bada Bazaar Marg, New Delhi - 110060

www.iasedge.in