



UPDATED CLASSROOM STUDY MATERIAL

February - April 2022



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PT 365 UPDATION

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Note:

- As the date of Prelims examination has been deferred to 10th October, 2021, we will cover current affairs in PT 365 documents till the month of August in the following manner:
 - PT 365 Updated 1: Current affairs for the months of February, March and April, 2021.
 - PT 365 Updated 2: Current affairs for the months of May and June, 2021.
 - PT 365 Extended : Current affairs for the months of July and August, 2021

- In our endeavour to further enhance the document in the interest of the aspirants, following additions have been incorporated:
 1. Different colours have been used in the document for easy classification and recollection of a variety of information.
 2. QR based Smart quiz has been added to test the aspirant's learnings and understanding.
 3. Infographics have been added to ease understanding, provide for smoother learning experience and ensure enhanced retention of the content.

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1. POLITY

1.1. ISSUES RELATED TO CONSTITUTION

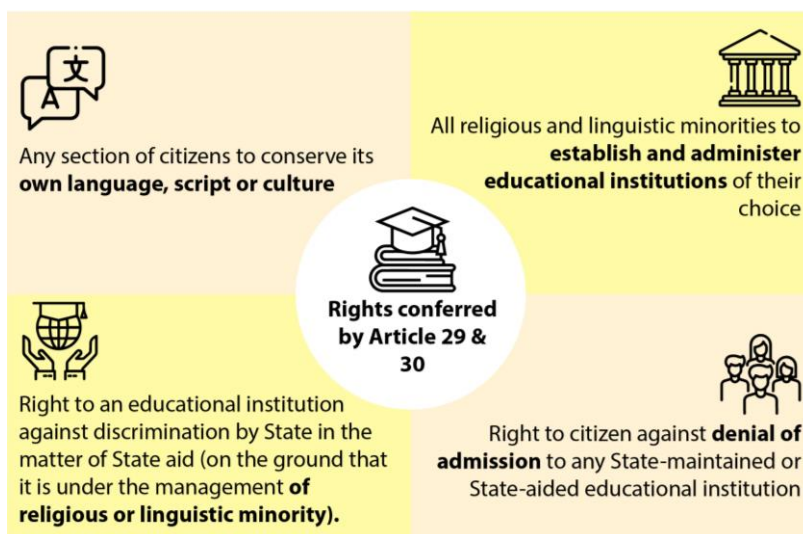
1.1.1. IDENTIFICATION OF MINORITIES

Why in news?

Supreme Court expressed displeasure that the **Centre has not yet filed its counter affidavit** on a plea seeking **minority status for Hindus** in states where their numbers are low.

More about news

- This relies on the majority judgment of Supreme Court in the **2002 TMA Pai case**, which lays down that for the purposes of **Article 30**, the religious and linguistic minorities must be **considered state-wise**. Thus, it has sought **direction to the Centre** to lay down **guidelines for identification of minority at the state level**.



About minorities and related constitutional provisions

- The Constitution of India uses the word **‘minority’** or its plural form in some **Articles – 29 to 30 and 350A to 350 B** – but **does not define** it anywhere. It conceives **‘minority’** as an **open category** to protect the interests of various religious, linguistic and culturally distinctive groups.
 - Article 29** has the word “minorities” in its marginal heading but speaks of **“any sections of citizens”**. The Supreme Court held that the scope of this article is **not necessarily restricted to minorities** only, as words ‘section of citizens’ in the Article include **minorities as well as majority**.
 - Article 30** speaks specifically of **two categories** of minorities – **religious and linguistic**.
 - Together, these two articles confer **four distinct rights on minorities** (Refer infographic).
 - The remaining two Articles (**350A and 350B**) relate to **linguistic minorities only**.
 - ✓ **Article 350A**: Facilities for instruction in mother tongue at primary stage.
 - ✓ **Article 350 B**: Special Officer for linguistic minorities.
- Other constitutional safeguards** that have a bearing on the **status and rights of minorities** are:
 - Freedom of conscience and free profession, practice and propagation of religion (**article 25**);
 - Freedom to manage religious affairs (**article 26**);
 - Freedom as to payment of taxes for promotion of any particular religion (**article 27**);
 - Freedom as to attendance at religious instruction or religious worship in certain educational institutions (**article 28**);
 - Special provision relating to language spoken by a section of the population of a State (**article 347**);

Minority Educational rights

- Recently, SC refused to intervene in a petition challenging **constitutional validity of Sections 1(4) and 1(5) of Right to Education (RTE) Act of 2009**.
 - Section 1(5)**: Exemptions to **madrasas, Vedic pathshalas and educational institutions primarily imparting religious instruction** from the ambit of the Act.
 - Section 1(4)**: Provisions of this Act shall be subjected to the **Articles 29 and 30** of the Constitution.
- Supreme court views on regulation of minority educational institutes**:
 - TMA pai foundation case (2002)**: Rights of minorities under Article 30(1) was **neither absolute nor above the law**. A regulation framed in the **national interest** must necessarily **apply to all institutions**.
 - SK Md Raffique case (2020)**: **Regulation** is permissible if it is **intended to ensure excellence** in minority institution.
 - In 2014, **Pramati judgement** made **entire RTE Act non-applicable** on minority schools.

- Language to be used in representations for redress of grievances (**article 350**);

Important Supreme Court judgements guiding the way forward

- **The Kerala education bill (1958):** In this case, the question of **ascertaining the status of a minority community** first arose in front of the Supreme Court. While the Court stated that a **minority simply means a community** which is **numerically less than 50% but remained unclear** regarding ‘50% of what’. Whether such numerical inferiority is limited to the **entire country**, or an **entire state or a part thereof** was not stated.
- **DAV College case of 1971:** It was held that “Religious or linguistic minorities are to be determined **only in relation to the particular legislation** which is sought to be impugned.” If a **Central legislation** like the National Commission for Minorities Act, 1992 is challenged, “minority” would have to be **calibrated with reference to the population of the whole of India**, not any one state.
- **Bal Patil case (2005):** It treats **religious minorities and linguistic minorities differently**. While linguistic minorities are to be identified on the basis of their population **within a particular state** of India, **calibrating religious minority status** on the basis of their population at the **state level** would **militate against the integrity and secular fabric** of India.

1.1.2. ONE NATION ONE LANGUAGE

Why in news?

Recently, Union Home Minister urged the **use of Hindi as the lingua franca**, rather than English, in inter-State communication.




About Hindi Language

- Hindi belongs to the **Indo-Aryan branch of the Indo-European family of languages**. It is a descendant of Sanskrit, which is an ancient Indian language.
 - **Every year September 14** is observed as **Hindi Day** throughout India.
- Hindi was **adopted by Indian leaders as a symbol of national identity** during the struggle for freedom.
 - **Mahatma Gandhi used Hindi to unite India** and hence the language is also known as the **“Language of Unity”**.

- In 1949, **Constituent Assembly adopted Hindi**, along with English, as the **Official Language of Union of India**.
- In 1950, Constitution of India **declared Hindi in Devanagari script** as Official language of India **under Article 343**.
- In 1963, **Official Languages Act was passed**, which provided that English ‘may’ still be used along with Hindi for official communication.
- At present, **Eighth Schedule** of the Constitution **specifies 22 languages including Hindi**.

Key statistics

- **Widely spoken:** As per **2011 linguistic census**, Hindi is most widely spoken by **52.8 crore individuals, or 43.6% of the population**, followed by Bengali and Marathi.
 - Also, Hindi is **3rd most spoken language of the world in 2019** with 615 million speakers.
- **Medium of instruction:** As per Unified District Information System for Education Plus (USIDE+), nearly **42% of children in the country study in Hindi-medium schools**, followed by English (26 percent) and Bengali (6 percent).

Constitutional provisions to Promote Hindi	
 Article 120 and 210	<ul style="list-style-type: none"> ■ Language to be used in Parliament and state legislature respectively gives the option of transacting business in Hindi as well in English.
 Article 344 (1)	<ul style="list-style-type: none"> ■ Constitution of a parliamentary committee or commission every 10 years to recommend to President regarding progressive use of Hindi language for official purposes of Union and restrictions on use of English.
 Article 351	<ul style="list-style-type: none"> ■ Spread of the Hindi language to develop it, so that it may serve as a medium of expression for all elements of composite culture of India.

1.1.3. PHONE TAPPING

Why in news?

Recently, an IPS officer was under probe for tapping the phones of political leaders in 2019.

About phone tapping

- **Definition:** Phone tapping refers to the monitoring of internet-based communications and phones by a third party by secret means. The word ‘phone tapping’ also means wiretapping or line bugging or interception of the phone.
 - It was first commenced in the USA in the 1890s after the invention of the telephone recorder.
- **Legal provisions:** Phone tapping is regulated by the Indian Telegraphic Act, 1885.

The Indian Telegraphic Act, 1885

- **Power for phone tapping:** Both, the **Central and the State Governments** have a right to tap phones under Section 5(2) of Indian Telegraphic Act, 1885.
 - In the states, police have the powers to tap phones.
 - At the Centre, 10 agencies are authorised to do so: Intelligence Bureau, CBI, Enforcement Directorate, Narcotics Control Bureau, Central Board of Direct Taxes, Directorate of Revenue Intelligence, National Investigation Agency, R&AW, Directorate of Signal Intelligence, and the Delhi Police Commissioner.
 - **Tapping by any other agency would be considered illegal.**

Common phone tapping technologies			
Attributes	Integrated Network (ISDN)	Digital Services	Leased line
Process of tapping	<ul style="list-style-type: none"> • A mediation server intercepts a call and then transmits it through a Primary Rate Interface (PRI) line to the office of a government agency. • Also, the police can listen to the phone on their PRI line and store the recording to attached computers. A sound file of the intercepted call is also recorded and stored in the mediation server, simultaneously 		The service provider gives the agency direct access to its backbone network through a dedicated fast speed fibre optic cable connection.
Time lag	<ul style="list-style-type: none"> • The transfer of call-related data doesn't happen in real time. • A slow 64 kbps speed results in a time lag of two to three minutes. 		The call-related data is not only transmitted in real time , at the speed of 2 mbps , the chances of missing any call are minimal.
Advantage	Cheaper		Costly, as cost of laying a fast-speed fibre optic cable connection is higher.
Utility	State agencies are more dependent on ISDN as it is cheaper		

- **Grounds for phone tapping:** Phone tapping can be done by the Centre or states if they are satisfied that it is necessary in the interest of **“public safety”, “sovereignty and integrity of India, the security of the State, friendly relations with foreign States or public order or for preventing incitement to the commission of an offence”.**
 - **Exception for the press:** Press messages intended to be published in India of correspondents accredited to the Central Government or a State Government shall not be intercepted or detained, unless their transmission has been prohibited under this sub-section.

- **Power to issue the order for phone tapping:** According to the Rule 419A of the Indian Telegraph (Amendment) Rules, 2007, phone tapping orders could be issued only by the **Secretary, Union Ministry of Home Affairs or his State Counterpart.** The order has to be conveyed to the service provider **in writing**; only then can the tapping begin. The competent authority **must record reasons for tapping in writing.**
 - However, in the **exceptional cases**

Constitutional provisions on phone tapping

- **Schedule 7th:** Telephones along with other **communication devices** find mention under **Entry 31 of the Union List.**
- **Right to privacy:** Telephone conversation is an important facet of a person's private life. Telephone-tapping would, thus, infract Article 21 of the Constitution of India unless it is permitted under the procedure established by law.
- **Freedom of speech:** If, a person is talking on the telephone, She/he is exercising his or her right to freedom of speech and expression. Thus, telephone tapping would also infringe Art 19(1)(a) unless it came within the restrictions on this right set out in Art 19(2).

- However, in the **exceptional cases** **the order may be issued by the lower authorities** also which may include officer, not below the rank of a Joint Secretary, to the Government of India or the head or the second senior-most officer of the authorised law enforcement agency at the central level, and by authorised officers, not below the rank of Inspector General of Police, at the state level.
- Such order has to be communicated to the competent authority within a specified time period.

Checks against misuse of power of phone tapping

- **Last resort:** The law is clear that interception must be ordered only if there is no other way of getting the information.
- **Time limit:** The directions for interception remain in force, unless revoked earlier, for a period not exceeding 60 days. They may be renewed, but not beyond a total of 180 days.
- **Review committee:** Any order issued by the competent authority is reviewed by a committee headed by the Cabinet Secretary with the Law and Telecom Secretaries as members. In states, it is headed by the Chief Secretary with the Law and Home Secretaries as members. The review committee may set aside the directions and orders for destruction of the copies of the intercepted message or class of messages
- **Destructions of records:** Records pertaining to such directions shall be destroyed every six months unless these are, or are likely to be, required for functional requirements. Service providers too are required to destroy records pertaining to directions for interception within two months of discontinuance of the interception.
- **Procedural transparency:** There are multiple provisions aimed at keeping the process transparent:
 - **Written direction to service provider:** The directions for interception have to be conveyed to designated officers of the service providers in writing by an officer not below the rank of SP or Additional SP or equivalent.
 - **Disclosure of information:** Directions for interception are to specify the name and designation of the officer or the authority to whom the intercepted call is to be disclosed
 - **Responsibility of service providers**
 - ✓ The designated nodal officers of the service providers are supposed to **issue acknowledgment letters** to the security/law enforcement agency within two hours on receipt of an intimation.
 - ✓ They are to forward every 15 days a list of interception authorisations received to the nodal officers of the security and law enforcement agencies for **confirmation of authenticity**.
 - ✓ They shall put in place adequate and effective **internal checks to ensure that unauthorised interception of messages does not take place** and extreme secrecy is maintained.
 - ✓ In case of **unauthorised interception**, the service provider may be **finned or even lose its licence**.

IMPORTANT CASES ON PHONE TAPPING



PUCL v. UOI (1996)

Held: Telephone tapping infringed the **fundamental right to privacy**, and **created safeguards** against arbitrariness in the exercise of the state's surveillance powers.



K.L.D Nagasree v. Government of India (2006)

Held: the occurrence of any public emergency or the existence of a public safety interest is the **sine qua non** under Section 5(1) & (2).



Rayala M. Bhuvaneshwari vs Nagaphanender Rayala (2008)

Held: Act of tapping conversation of **wife by husband illegal**.



Recourse against illegal phone tapping

- Unauthorized tapping is in violation of the right to privacy and the aggrieved person can file a **complaint in the Human Rights Commission**.
- **An FIR can be lodged** in the nearest Police Station when unauthorized phone tapping comes into the knowledge of the person.
- Additionally, the aggrieved person can move the Court against the person/company doing the Act in an unauthorized manner **under Section 26 (b) of the Indian Telegraphic Act which provides for 3 year imprisonment for persons held for tapping**. The person (s) can also be prosecuted for authorized tapping but sharing of the data in an authorized manner.

1.2. IMPORTANT LEGISLATIONS/BILLS

1.2.1. CRIMINAL LAWS AMENDMENT

Why in news?

Recently, the Centre has initiated the process for **comprehensive amendment of criminal laws** in consultation with all stakeholders.

About Criminal Laws in India

- **Criminal law and criminal procedure fall under the Concurrent List** while matters relating to Police and Prisons fall under the State List.
- The laws that govern criminal law in India are:
 - Indian Penal Code 1860;
 - Indian Evidence Act, 1872;
 - Criminal Procedure Code, 1973 (CrPC).



Indian Penal Code (IPC), 1860

- › IPC is the main document that governs all criminal acts and the punishments they ought to be charged with.
- › The objective of enacting the IPC was to provide a **general and exhaustive penal code** for crime in India.
- › The IPC extends to the **whole of India**.
- › Punishments under the IPC can be extended both to **offences committed within India as well as offences committed beyond**, but which by law may be tried, within India.



Criminal Procedure Code, 1973

- › CrPC is a procedural law that states how the police machinery is to function as far as **investigation and procedure** is to be followed by courts during investigation and trial.
- › The CrPC classifies criminal offences into **several categories such as bailable, non-bailable, cognizable and non-cognizable offences**.
- › The procedural treatment of **different offences is different**.
- › The various steps at the time to filing a complaint such as **filing a First Information Report (FIR), gathering evidence and initiating an enquiry** are all governed by the CrPC.



Indian Evidence Act, 1872

- › This act contains a **set of rules and regulations regarding the admissibility of the evidence** in a court of law.
- › These provisions speak about **both procedure and rights**, as it provides the procedure as to how to proceed to the court or **how to establish our claim before the court**.

Earlier amendments to Criminal law

- **Criminal (Amendment) Act, 2013:** The Act was introduced to make the rape laws in India more stringent. This amendment widened the definition of rape by including oral sex and the infiltration of other objects into women's bodies as a crime. Stalking had also been criminalized under this act.
- **Criminal (Amendment) Act, 2018:** This Act was furthered to strengthen the rape laws. The quantum of punishment was increased from at least 7 to 10 years. Provisions for punishment for rape of a girl under 12 years and 16 years were also added under it.

Recent landmark Criminal Law judgments:

There were many judgements where the Supreme Court has tried to either give clarity regarding the sections of Criminal laws as per contemporary times or played a key role in evolution of sections of criminal laws.

- **Amish Devgan v. Union of India (2020):** In this case of hurting religious sentiments of community, sections concerned included Section 153B and Section 295A of the Indian Penal Code, 1860.
 - Supreme Court held that it is important to make a **difference between free speech and hate speech**. While free speech does comprise the right to criticize government policies, hate speech refers to the spreading of hatred against a group or community.
- **Anuradha Bhasin v. Union of India (2020):** One of the issues in the case was regarding the **excessive imposition of Section 144 of the Code of Criminal Procedure, 1973**.
 - Supreme Court held that **Section 144 CrPC cannot be used as a tool to prevent legitimate expression of opinion**. The court further held that Section 144 CrPC is not only remedial but also preventive and shall be exercised only in cases where there is danger or apprehension of danger.
- **Navtej Singh Johar Vs. Union of India 2018:** Section 377 of the Indian Penal Code (IPC) criminalised consensual sexual intercourse between persons of the same sex for being "against the order of nature".
 - However, the Court **upheld the right to equal citizenship of all members of the LGBTQI** community in India. Thus, it read down Section 377 to exclude consensual sexual relationships between adults, whether between same-sex individuals or otherwise.
- **Joseph Shine v. Union of India, 2018:** The Supreme Court struck down Section 497 of IPC which criminalised adultery while treating = a married woman as the commodity of her husband.
 - The court held that the provision was based on gender stereotypes and hence violated Article 14 (equal protection of laws) and Article 15 (non-discrimination on grounds of sex) of the Indian Constitution.

1.2.1.1. THE CRIMINAL PROCEDURE (IDENTIFICATION) ACT, 2022

Why in news?

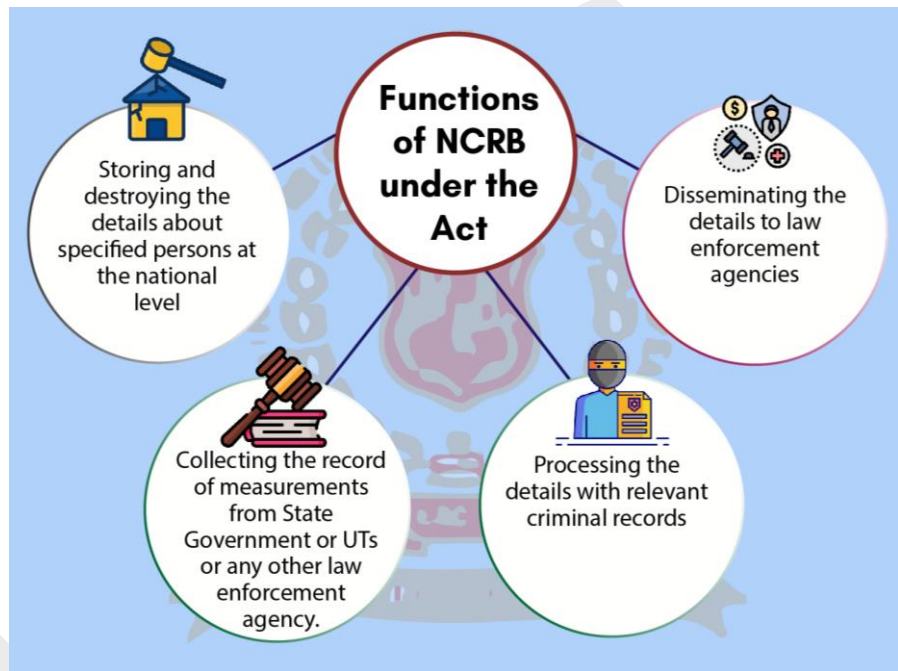
Recently, the **Criminal Procedure (Identification) Act, 2022** received the assent of the President.

About the Act

- The Act seeks to **replace the Identification of Prisoners Act, 1920**.
- **Need for such Act:**
 - New “measurement” techniques being used in advanced countries are **giving credible and reliable results**.
 - In 1980, the **Law Commission of India** noted the need to revise the act to bring it **in line with modern trends** in criminal investigation.
 - In 2003, the **Malimath Committee** recommended amending the Act to **empower the Magistrate to authorise** the collection of data such as blood samples for DNA, hair, saliva, and semen.
- **Objective:** To expand the **scope and ambit of the “measurements”** which can be taken under the provisions of law that will help in **unique identification of a person** involved in any crime and will **assist the investigating agencies** in solving the criminal case.

Key Features of the Act

- **Expands the ambit (Refer infographic):** The Act expands the **type of data** that may be collected, **persons from whom such data** may be collected, and the **authority that may authorise** such collection.
- **Retention of details:** The Act requires the details collected to be **retained in digital or electronic form for 75 years** from the date of collection. The record may be **destroyed** in case of persons who have **not been previously convicted**, and who are **released without trial, discharged, or acquitted** by the court, after exhausting all legal remedies.
- **Resistance to giving details:** As per the Act, resistance, or refusal to give details will be **considered an offence under the Indian Penal Code, 1860**. In case of such resistance or refusal, police officers or prison officers **may collect details** in the manner prescribed **under rules made by the state government or the central government**.
- **Powers of Magistrate:** Under the Act, a Magistrate may **direct a person to give details** for the purpose of an investigation or proceeding under the CrPC (Code of Criminal Procedure).
- **Rule-making power extended to the central government:** The Act vested rule-making power **only in the state government**. The Act extends this power to the **central government as well**. The central or state government may make rules on **various matters** like the manner of **collecting details**.



DO YOU REMEMBER?

National Crime Records Bureau (NCRB)

NCRB, part of the Ministry of Home Affairs (MHA) was set up in 1986 to function as a **repository of information on crime and criminals** so as to assist the investigators in linking crime to the perpetrators.

It was **recommended by Tandon Committee, National Police Commission (1977-1981), and the MHA's Taskforce (1985)**.

Recently, 37th Foundation Day celebrations NCRB was observed.

Its major publications:

- Crime on India
- Accidental Deaths & Suicides in India
- Prison Statistics India
- Finger Prints in India
- Report on missing women and children in India

1.3. IMPORTANT CONSTITUTIONAL BODIES

1.3.1. NATIONAL COMMISSION FOR SCHEDULED TRIBES (NCST)

Why in news?

Standing Committee on Social Justice and Empowerment highlighted that **National Commission for Scheduled Tribes (NCST)** has been **dysfunctional** for the last four years and has **not delivered a single report** to Parliament.

DO YOU REMEMBER?

National Commission for Scheduled Tribes (NCST)

NCST was established by amending Article 338 and inserting a new Article **338A** in the Constitution through the Constitution (89th Amendment) Act, 2003.

By this amendment, the **erstwhile National Commission for Scheduled Castes and Scheduled Tribes** was replaced by **two separate Commissions** namely National Commission for Scheduled Castes (NCSC), and the National Commission for Scheduled Tribes (NCST) w.e.f. **19 February 2004**.

Functions of the commission (as per Sub-clause (5) of the Article 338A)

- To **investigate and monitor** all matters relating to the **safeguards provided** for the Scheduled Tribes and to **evaluate the working** of such safeguards.
- To inquire into **specific complaints** with respect to the **deprivation of rights and safeguards** of the STs.
- To participate and **advise on the planning process** of socio-economic development of the Scheduled Tribes and to **evaluate the progress of their development**.
- To present to the President, annually and at such other times as the Commission may deem fit, **reports upon the working of those safeguards**.
- To make recommendations as to the **measures that should be taken for the effective implementation** of those safeguards and other measures for the protection, welfare and socio-economic development of STs.
- To discharge **such other functions** as the President may, subject to the **provision of any law** made.

Educational & Cultural Safeguards

- » **Article 15(4)**:- Special provisions for **advancement of other backward classes** (which includes STs);
- » **Article 29**:- Protection of **Interests of Minorities** (which includes STs);
- » **Article 46**:- State shall promote, with special care, the **educational and economic interests** of the weaker sections of the people, and in particular, of the **Scheduled Castes, and the Scheduled Tribes**, and shall protect them from **social injustice** and all forms of exploitation;
- » **Article 350A**:- Instruction in **Mother Tongue**.

Social and Economic Safeguards

- » **Article 23**:- Prohibition of **traffic in human beings** and begar and other similar form of forced labour;
- » **Article 24**:- Forbidding **Child Labour**.
- » **Article 244**:- Clause(1) Provisions of Fifth Schedule shall apply to the administration & control of the Scheduled Areas and Scheduled Tribes in any State other than the states of **Assam, Meghalaya, Mizoram and Tripura** which are covered **under Sixth Schedule**, under Clause (2) of this Article.
- » **Article 275**:- **Grants in-Aid** to specified States (STs&SAs) covered under Fifth and Sixth Schedules of the Constitution.

Constitutional Safeguards available to STs

Political Safeguards

- » **Article 164(1)**:- Provides for Tribal Affairs Ministers in Bihar, MP and Orissa;
- » **Article 330**:- Reservation of seats for STs in Lok Sabha;
- » **Article 337**:- Reservation of seats for STs in State Legislatures;
- » **Article 334**:- 10 years period for reservation (Amended several times to extend the period.);
- » **Article 243**:- Reservation of seats in Panchayats.
- » **Article 371**:- Special provisions in respect of NE States and Sikkim.

Safeguards under Various laws

- » Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Act, 1989 and rules framed there under.
- » Bonded Labour System (Abolition) Act 1976 (in respect of Scheduled Tribes);
- » The Child Labour (Prohibition and Regulation) Act 1986;
- » States Acts & Regulations concerning alienation & restoration of land belonging to STs;
- » Forest Conservation Act 1980;
- » Panchayat raj (Extension to Scheduled Areas) Act 1996;
- » Minimum Wages Act 1948.

1.4. OTHER IMPORTANT NEWS

Issues Related to Constitution	
Essential Religious Practice	<ul style="list-style-type: none"> Karnataka High Court has ruled that Wearing Hijab is not essential religious practice in Islamic faith and is not protected under right to freedom of religion under Article 25 of Constitution. Ruling has come in the backdrop of petition seeking the right to wear hijabs or head scarves along with uniforms inside classrooms. About essential religious practice test <ul style="list-style-type: none"> It was evolved by Supreme Court (SC) in 'Shirur Mutt' case (1954) to protect only such religious practices which were essential and integral to the religion. Court held that term "religion" will cover all rituals and practices "integral" to a religion, and took upon itself the responsibility of determining essential and non-essential practices of a religion. This attempt to differentiate essential and non-essential practices was taken up in various judgments. <p>Related Terminology: Reasonable Accommodation</p> <ul style="list-style-type: none"> It has been argued that recent Karnataka verdict on wearing the hijab overlooked the principle of reasonable accommodation. About Reasonable accommodation: <ul style="list-style-type: none"> It is a principle that promotes equality, enables the grant of positive rights and prevents discrimination based on disability, health condition or personal belief. The general principle is that reasonable accommodation should be provided, unless some undue hardship is caused by such accommodation. Its use is primarily in the disability rights sector. In India, the Rights of People with Disabilities Act, 2016, defines 'reasonable accommodation'.
Legal Entity Status	<ul style="list-style-type: none"> Invoking 'parens patriae jurisdiction', the Madras HC bestowed 'legal entity' status upon 'nature' and directed the State and Central governments to protect it. <ul style="list-style-type: none"> Earlier, in 2017 Uttarakhand HC, granted the Ganga and Yamuna rivers had the same legal status as human beings, however Supreme Court overruled this order. Also, in 2018, Uttarakhand HC declared the "entire animal kingdom including avian and aquatic" as legal entities. Significance: <ul style="list-style-type: none"> The court ruled that Mother Nature will have rights, duties and liabilities enjoyed by a living person. <ul style="list-style-type: none"> ✓ The court further observed that natural environment is part of basic human rights, of 'right to life' itself. Expansion of environmental law and attitudinal & behaviour change in utilisation of natural resources. Parens Patriae in Latin means "parent of the nation". It allows the guardianship of the State of the rights of entities that are unable to fight for their own rights.
Reservation in promotions for SCs and STs	<ul style="list-style-type: none"> The DoPT has asked all departments of central government to collect the data on inadequacy of representation of Scheduled Castes and Scheduled Tribes before implementing the policy of reservation in promotion in government offices. About Reservation in promotion <ul style="list-style-type: none"> Article 16 (4A): Empowers State to make provisions for reservation in matters of promotion to SC/ST Nagaraj v. Union of India, 2006: SC laid down 3 criterion to be followed for implementing reservation in promotion. <ul style="list-style-type: none"> ✓ The collection of quantifiable data regarding the inadequacy of representation of SCs and STs. ✓ The application of this data to each cadre separately. ✓ The cadre being the unit of operation of the promotion roster Jarnail Singh v L.N. Gupta (2018): SC held that states need not be required to collect quantifiable data on the backwardness of the SCs and STs.
One Rank, One Pension (OROP) Scheme	<ul style="list-style-type: none"> SC ruled that there was "no constitutional infirmity" in the way government had introduced OROP among ex-service personnel. The Koshiyari Committee has defined OROP as a uniform pension be paid to the Armed Forces Personnel retiring in the same rank with the same length of service regardless of their date of retirement. <ul style="list-style-type: none"> Thus, any hike in the pension rates to be automatically passed on to past pensioners.

<p>Denotified, nomadic and semi-nomadic tribes (DNTs)</p>	<ul style="list-style-type: none"> • A parliamentary standing committee has asked government to fix a deadline for categorising these tribes as Dalits or tribals or backwards. • DNTs were once notified under the Criminal Tribes Acts, 1871, during the British rule. <ul style="list-style-type: none"> ○ Under the act, millions of nomadic and semi-nomadic communities were declared criminals and put under continuous surveillance. • Act was repealed in 1952 and these communities were "De-Notified" (based on Kalelkar Commission recommendations). • Historically, these communities never had access to private land or home ownership. These tribes used forests and grazing lands for their livelihood and residential use.
<p>Judiciary and Justice Delivery</p>	
<p>Inter-Operable Criminal Justice System (ICJS) Project</p>	<ul style="list-style-type: none"> • Ministry of Home Affairs has approved implementation of ICJS project Phase II during 2022-23 to 2025-26, as a Central Sector Scheme. <ul style="list-style-type: none"> ○ ICJS is an initiative of e-Committee of Supreme Court to enable seamless transfer of data and information among different pillars of criminal justice system. • ICJS is a national platform for enabling integration of the main IT system used for delivery of Criminal Justice in the country by five pillars namely: <ul style="list-style-type: none"> ○ Police (Crime and Criminal Tracking and Network Systems) ○ e-Forensics ○ e-Courts ○ e-Prosecution for Public Prosecutors ○ e-Prisons • Phase-II is built on the principle of 'one data one entry' whereby data is entered only once in one pillar and the same is then available in all other pillars. <ul style="list-style-type: none"> ○ Under Phase-I, individual IT systems have been implemented and stabilized; search of records has been enabled. • National Crime Records Bureau will be responsible for the implementation of ICJS in association with National Informatics Center, in collaboration with States and UTs. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>About e-Committee of Supreme Court</p> <ul style="list-style-type: none"> • e-Committee is governing body charged with overseeing e-Courts Project conceptualized under "National Policy and Action Plan for Implementation of Information and Communication Technology (ICT) in the Indian Judiciary-2005". • e-Courts is a pan India project to transform the judicial system of the country by ICT enablement of courts. </div>
<p>Capital Punishment</p>	<ul style="list-style-type: none"> ○ In a recent judgment, SC said trial judges should not be swayed in favour of death penalty merely because of the dreadful nature of the crime and its harmful impact on society. They should equally consider the mitigating factors in favour of life imprisonment. ○ Judges referred to the evolution of the principles of penology. ○ Principles of penology have "evolved to balance the other obligations of the society, i.e., of preserving the human life, be it of accused, unless termination thereof is inevitable and is to serve the other societal causes and collective conscience of society". ○ Recently, Supreme Court in Chhannu Lal Verma vs. State of Chhattisgarh held that, before awarding death sentence, a proper psychological/psychiatric evaluation is to be done by courts to assess probability and possibility of reform of the criminal. <p>Important judgements/provisions related to Capital Punishment:</p> <ul style="list-style-type: none"> ○ Bachan Singh v. State of Punjab, 1980: SC propounded the dictum of rarest of rare cases according to which death penalty is not to be awarded except in the rarest of rare cases when the alternative option is unquestionably foreclosed. ○ Kehar Singh v. Union of India, 1989: Pardoning power of executive is subject to judicial review. ○ Bhagwan Das v. State, 2011: Consideration of death penalty in cases of honour killings. ○ Shatrughan Chauhan v. Union of India, 2014: Regarding the delay in execution. ○ Law Commission (262nd Report) recommended that death penalty be abolished for all crimes other than terrorism related offences and waging war.
<p>'Sentinel on the Qui Vive'</p>	<ul style="list-style-type: none"> • It is usually translated as watchful guardian. Qui vive means watchful or alert. • Supreme Court recognised this phrase in State of Madras v. VG Row. Union of India & State (1952), where the Court has been given the role of "Sentinel on the Qui Vive" with regards to the "fundamental rights".
<p>Use of AI in Judiciary</p>	<ul style="list-style-type: none"> • Government has pitched the need to adopt new, cutting-edge technologies of Machine Learning (ML) and Artificial Intelligence (AI) to increase the efficiency of the justice delivery system. <p>Steps taken so far</p> <ul style="list-style-type: none"> • SUVAS (Supreme Court Vidhik Anuvaad Software) is a language learning application being used to translate judgments of English into regional language.

	<ul style="list-style-type: none"> • SUPACE (Supreme Court Portal for Assistance in Court Efficiency) for improving efficiency and reducing pendency by encapsulating judicial processes that have the capability of being automated through AI. • SCI-Interact a software by SC, to make all its 17 benches paperless by making judges access to files, annexures to petitions, etc.
Parliament, State Legislature and Laws	
Motion of Thanks	<ul style="list-style-type: none"> • Under Article 87 of the Constitution the President addresses both the Houses of the Parliament at the commencement of the first session after each general election to the Lok Sabha and also the first session of each year (highlighting the policy and legislative announcements). • Following this the next day, a 'motion of thanks' is moved in the two Houses thanking the President for his/her address, which is then put to vote. • MPs can express their disagreement by moving amendments to the motion. • Defeat of 'Motion of thanks' is seen as a 'defeat of the government'.
Census Rules	<ul style="list-style-type: none"> • Union government has amended Census Rules, 1990, to include "electronic form" and "self-enumeration" in the schedule of questions to be asked during census enumeration. <ul style="list-style-type: none"> ○ It will allow online self-enumeration in the upcoming Census and National Population Register (NPR). <ul style="list-style-type: none"> ✓ NPR is a Register of usual residents of the country. Its objective is to create a comprehensive identity database of every usual resident in the country. ○ Section 8 of Census Act, 1948, gives powers to the enumerator to ask questions regarding the Census and makes it obligatory for respondents to answer, with certain exceptions. • Also, "print media, electronic media, social media", have been added to the list of modes for ensuring wide publicity for the exercise. Earlier list only included radio, audio-visuals and posters. • Population Census is process of collecting, compiling, analyzing, disseminating demographic, economic and social data pertaining, at a specific time, of all persons in a country or a part of a country. <ul style="list-style-type: none"> ○ Conducted by: Office of the Registrar General and Census Commissioner under Ministry of Home Affairs. <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p style="text-align: center;">DO YOU REMEMBER?</p> <p style="text-align: center;">Census History</p> <ul style="list-style-type: none"> ↑ ↑ ↑ A systematic and modern population census, in its present form was conducted non synchronously between 1865 and 1872 in different parts of the country. 🔗 This effort culminating in 1872 has been popularly labelled as the first population census of India. 🔄 However, the first synchronous census in India was held in 1881. Since then, censuses have been undertaken uninterruptedly once every ten years. </div>
Chief Commissioner for Persons with Disabilities	<ul style="list-style-type: none"> • Minister of Social Justice & Empowerment inaugurated the new office of Chief Commissioner for Persons with Disabilities (Divyangjan). • About Chief Commissioner for Persons with Disabilities <ul style="list-style-type: none"> ○ Set up under erstwhile Persons with Disabilities Act 1995 and continues to function under Right of Persons with Disabilities Act, 2016. ○ Mandate: <ul style="list-style-type: none"> ✓ Coordinate the work of the State Commissioners for Persons with Disabilities, ✓ Monitor utilization of funds disbursed by the Central Government and • Take steps to safeguard the rights and facilities made available to the persons with disabilities.
Prime Minister's National Relief Fund (PMNRF)	<ul style="list-style-type: none"> • Prime Minister has approved an ex-gratia from PMNRF for the victims of stampede at Mata Vaishno Devi Bhawan. • About PMNRF: <ul style="list-style-type: none"> ○ It was established in 1948 with public contributions to assist displaced persons from Pakistan. ○ Resources of PMNRF are utilized to render immediate relief to families of those killed in natural calamities like floods, earthquakes, etc. <ul style="list-style-type: none"> ✓ It does not get any budgetary support and it accepts voluntary contributions from Individuals, Organizations, Trusts, Companies etc.
National eVidhan Application (NeVA)	<ul style="list-style-type: none"> • NeVA (Paperless Assembly or e-Assembly) is a concept involving electronic means to facilitate the work of Assembly. • e-Vidhan is re-designated as NeVA and Ministry of Parliamentary Affairs is Nodal Ministry for rolling out NeVA in all States/ UTs with Legislatures.

	<ul style="list-style-type: none"> ○ e-Vidhan is a Mission Mode Project included in Digital India Programme. ● NeVA aims to bring all the legislatures of the country together, in one platform thereby creating a massive data depository. ● Bihar Legislative Council became first House in country to transit to NeVA platform by conducting Winter Session, 2021 in paperless mode completely.
Zonal Council	<ul style="list-style-type: none"> ● Eastern Zonal Council, comprising the states of Bihar, Odisha, West Bengal and Jharkhand, will hold a meeting in Kolkata. ● Idea of zonal council was mooted by the first Prime Minister of India to “develop the habit of cooperative working” among these States. ● Five Zonal Councils were set up vide Part-III of the States Re-organisation Act, 1956. <ul style="list-style-type: none"> ○ Chairman - Union Home Minister ○ Members- Chief Minister and two other Ministers as nominated by the Governor from each of the States and two members from Union Territories included in the zone.
President's Colour	<ul style="list-style-type: none"> ● It is bestowed upon a military unit in recognition of exceptional service rendered to the Nation, both in peace and in war. <ul style="list-style-type: none"> ○ The Indian Navy was the first Indian Armed Force, to be awarded the President Colour by Dr Rajendra Prasad on 27 May 1951. ○ It has recently been awarded to INS Valsura.
Animation, Visual, Gaming and Comics (AVGC) Promotion Task Force	<p>Ministry of Information and Broadcasting (I&B) constituted an AVGC (Animation, Visual, Gaming and Comics) Promotion Task Force.</p> <ul style="list-style-type: none"> ● The task force will be headed by Secretary, I&B with representation from Industry, Academia and State Governments. ● Based on its Terms of Reference (ToR), it will work to attract FDI and enhance exports to lead ‘Create in India’ and ‘Brand India’; to capture 5% (~\$40 billion) of the AVGC global market by 2025 with a growth of 25-30% and over 1.6 lakh new jobs creation annually. ● Its objectives include- <ul style="list-style-type: none"> ○ Framing of a national AVGC policy. ○ Recommend national curriculum framework for AVGC related courses. ○ Boost employment opportunities.
Broadcast Seva Portal	<p>It is launched by Ministry of Information & Broadcasting.</p> <ul style="list-style-type: none"> ● It is an online portal solution for speedy filing and processing of applications of broadcasters for various kinds of licenses, permissions, registrations, etc ● It is a simple and user-friendly web portal that provides a broadcaster with an end-to-end solution and would bring Transparency, Accountability & Responsiveness in the ecosystem. ● It will reduce the turnaround time of applications and at the same time will help applicants track the progress.
Election Freebies	<ul style="list-style-type: none"> ● Recently, the 15th Finance Commission chairperson raised concerns over growing political election freebies with the need to contemplate adopting the concept of sub-national bankruptcies. ● About Election Freebies <ul style="list-style-type: none"> ○ Election Freebies are the offerings/distribution of irrational freebies from political parties as part of electoral promises. These include Free electricity, Free Water, Free Rides, Loan Waivers, Allowances, laptops etc. ○ Some of these ‘freebies’ help to meet basic needs of people and uplift their living standard, helping to temporarily address other issues as well such as unemployment, rising cost of living, economic inequalities etc. ○ But it goes against the roots of free and fair election in a democracy and gives rise to several issues. ○ According to the EC, offering or distribution of any freebies either before or after an election is a policy decision of the party concerned and whether such policies are financially viable or have adverse effect, has to be decided by the voters of that State. ● Steps taken by Election Commission of India to check freebie politics <ul style="list-style-type: none"> ○ In Subramaniam Balaji Vs State of Tamil Nadu (2013), SC observed the lack of provisions and directed ECI to frame guidelines to check freebies in consultation with political parties. ○ To ensure electoral process integrity, in 2016 guidelines to check freebies were included under Part VIII of Model Code of Conduct (MCC). ○ Allowing welfare measures (as part of DPSPs), under these guidelines political parties should promise only what they can fulfil in order to gain electoral trust on feasible promises by: <ul style="list-style-type: none"> ✓ Reflecting the rationale behind the promises, and ✓ Clarify the Ways and Means to meet the expenses.

Constitutional and Non-Constitutional Bodies	
NITI (National Institution for Transforming India) Aayog	<ul style="list-style-type: none"> Government appointed Suman Bery as NITI Aayog vice-chairman. NITI Aayog is premier policy think tank of the Government of India, providing directional and policy inputs. <ul style="list-style-type: none"> It is an executive body which replaced Planning Commission, which had been instituted in 1950. Composition <ul style="list-style-type: none"> ✓ PM as Chairperson ✓ Governing Council comprising CMs of all States and LG of UTs. ✓ Vice- chairperson- appointed by PM in rank of Cabinet Minister. ✓ Regional Councils for specified tenure. ✓ Chief Executive Officer- appointed by PM for fixed tenure. Experts, specialists and practitioners with relevant domain knowledge nominated by PM
Telecom Regulatory Authority of India (TRAI) Act, 1997	<ul style="list-style-type: none"> A seminar on 25 years of TRAI Act was held recently. About TRAI Act <ul style="list-style-type: none"> Need was felt as entry of private sector necessitated an independent regulatory body. Act established TRAI which was also empowered to adjudicate upon disputes among Service Providers or between the Service Providers and a group of Consumers. In 2000, act was amended and TDSAT (Telecom Disputes Settlement and Appellate Tribunal) was set up to adjudicate disputes and dispose of appeals.
Miscellaneous	
India stays out of global declaration on future on Internet	<ul style="list-style-type: none"> Aiming to keep the Internet open, free, and neutral, it is a political commitment among the partners to advance a positive vision for the Internet and digital technologies. <ul style="list-style-type: none"> Around 60 countries have signed the declaration include the US, European Union, United Kingdom, Canada and France. India, China and Russia are among the large nations that are not part of this declaration. Key principles of Declaration <ul style="list-style-type: none"> Commitments to protect human rights and fundamental freedoms of all people, Promote a global Internet that advances the free flow of information, advancing “inclusive and affordable” connectivity, Promote trust in the global digital ecosystem, including through protection of privacy, Protecting and strengthening the multi-stakeholder approach to governance. India also did not sign the Budapest Convention on Cybercrime, 2001. <ul style="list-style-type: none"> The data sharing provisions of Budapest Convention infringes on national sovereignty. Presently, it is the only legally binding multilateral convention on cybercrime and electronic evidence.



फाउंडेशन कोर्स सामान्य अध्ययन

प्रारंभिक एवं मुख्य परीक्षा 2023

इनोवेटिव क्लासरूम प्रोग्राम

- प्रारंभिक परीक्षा, मुख्य परीक्षा और निबंध के लिए महत्वपूर्ण सभी टॉपिक को विस्तृत कवरेज
- मौलिक अवधारणाओं की समझ के विकास एवं विश्लेषणात्मक क्षमता निर्माण पर विशेष ध्यान
- एनीमेशन, पॉवर प्वाइंट, वीडियो जैसी तकनीकी सुविधाओं का प्रयोग
- अंतर - विषयक समझ विकसित करने का प्रयास
- योजनाबद्ध तैयारी हेतु करंट ओरिएंटेड अप्रोच
- नियमित क्लास टेस्ट एवं व्यक्तिगत मूल्यांकन

- सीसैट कक्षाएं
- PT 365 कक्षाएं
- MAINS 365 कक्षाएं
- PT टेस्ट सीरीज
- मुख्य परीक्षा टेस्ट सीरीज
- निबंध टेस्ट सीरीज
- सीसैट टेस्ट सीरीज
- निबंध लेखन - शैली की कक्षाएं
- करंट अफेयर्स मैगजीन

DELHI: 5 APR, 9 AM | 1 FEB, 1 PM

LUCKNOW: 17 MAY | 9 AM JAIPUR: 10 MAY | 4 PM

लाइव/ऑनलाइन कक्षाएं भी उपलब्ध

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2. INTERNATIONAL RELATIONS

2.1. INDIA AND ITS NEIGHBOURHOOD

2.1.1. INDIA- SRI-LANKA

Why in news?

India announced a USD 1 billion LoC to Sri Lanka as part of its financial assistance to help the island nation deal with its economic crisis.

More on news

- Sri Lanka **has been going through a severe economic crisis caused in some measure** by a shortage of foreign exchange resulting in lengthy power cuts, price spirals and a shortage of essential items.
- \$1-billion LoC was the **key component of a four-pillar economic cooperation arrangement** finalised by two sides in December 2021.

Reasons for the Sri-Lanka crisis

- **Default on foreign debt:** Economic mismanagement has **depleted most of Sri Lanka's foreign reserves**. Sri Lanka's **high dependency on imports for essential items like sugar, pulses, and cereals may result further in the economic meltdown**
- **Debt Trap Diplomacy:** It is claimed that Sri Lanka was caught in a **vicious web of money lending by China** for infrastructure projects (Hambantota Port) and were unable to pay them back.
- **Fall in tourism:** The rise of the Covid-19 pandemic and **Easter bomb blast 2019** led to a **fall in tourism revenues**.
- **Agriculture crisis:** In 2020, due to **ban on chemical fertilizers** and switching overnight to make agriculture 100% organic had a negative impact on the economy, especially in rice and sugar production.
- **War-induced inflation:** The ongoing Russia-Ukraine war resulted in **steep price inflation**.
- **Weak currency:** In 2022, Sri Lankan Rupee **depreciated by more than 50 percent** against the US dollar, 31.6 percent against Indian Rupee.

Impact of Sri Lanka crisis on India

- **Refugee crisis:** Due to lack of comprehensive refugee policy, an influx of refugees in India can **increase supply-side shock and competition** in labor market, strain healthcare services due to emergence of vector-borne and infectious diseases if refugee camps lack proper sanitation.
- **China's influence:** Sri Lankan has asked for USD 2.5 billion emergency aid from China, there is threat that China may gain its **influence in the island country**.
- **Impact on trade:** Any disruption in Colombo port operations makes India vulnerable to an increase in costs and congestion issues.
- **Rise of rebel groups:** Tamil rebels and dissident group like **Sinhalese population can take up arms** in the time of crisis and can lead to civil war in island nation.
- **Investment:** Ongoing crisis pauses **threat to investment and operations of multiple Indian companies** like Indian oil, Airtel, Tata communications etc. which in turn can impact the revenues of these vis a viz negatively impact Indian economy.



Related News

External Debt Crisis

Facing its worst economic crisis, the Sri Lankan government has suspended its normal debt servicing of external public debt pending an IMF bailout package due to its critically low forex reserves.

About External Debt Default

- **External debt** refers to the **portion of a country's debt** which is **borrowed from foreign lenders** such as commercial banks, governments, or international financial institutions (IMF, World Bank etc.).
- Government can take it to finance **excess expenditures, build additional infrastructure, financial recovery from natural disasters, or to repay previous external debt.**
 - When a nation fails to make **required interest or principal repayments** on a debt (loan or a security), it is known as **External Debt Default** or **sovereign default.**
- External debt is at **higher risk for sovereign default** as it is to be paid back in the currency in which it is borrowed and the government **cannot inflate or print its way out** of the debt.
- It is **usually caused** by a combination of reasons such as **economic mismanagement, high debt burden, economic stagnation, political instability, or a banking crisis.**

Maritime Rescue Co-ordination Centre (MRCC)

- **India and Sri Lanka have signed a MoU** for the Bharat Electronics Ltd (BEL) **to set up a state of the art MRCC in Colombo.**
- MRCCs are **part of an international network under the UN's International Maritime Organisation to monitor the sea lanes** with the objective of swift response to emergencies, such as vessels in distress, rescue and evacuation of people, and prevention of and containing environmental disasters such as oil spills etc.
- MRCC is **co-ordinated by the Navy or Coast Guard** in each country.

2.2. INDO-PACIFIC AND INDIAN OCEAN REGION

2.2.1. INDIA-JAPAN

Why in news?

- Recently, Prime Ministers of India and Japan held **14th India Japan Annual Summit in New Delhi.**
- Also, year **2022 marks the 70th anniversary** of the establishment of their **diplomatic relations.**

Key Highlights of the summit

Initiative/cooperation	Features
Clean Energy Partnership (CEP)	<ul style="list-style-type: none"> • Launched under the overall ambit of the 'India-Japan Energy Dialogue' established in 2007 for cooperation towards achieving sustainable economic growth, addressing climate change and ensuring energy security.
Joint Crediting Mechanism (JCM)	<ul style="list-style-type: none"> • Established for implementation of Article 6 of the Paris Agreement related to private capital flow to developing countries. <ul style="list-style-type: none"> ◦ Article 6 of Paris Agreement recognizes that some Parties choose to pursue voluntary cooperation in the implementation of their nationally determined contributions to allow for higher ambition in their mitigation and adaptation actions.
Sustainable development	<ul style="list-style-type: none"> • Both countries signed Memorandum of Cooperation (MoC) on Sustainable Urban Development such as decentralized domestic wastewater management, intelligent transport management system etc.
Climate initiative	<ul style="list-style-type: none"> • Japan would be joining the Indian-Swedish climate initiative LeadIT to promote heavy industry transition. <ul style="list-style-type: none"> ◦ LeadIT (Leadership Group for Industry transition) is a voluntary initiative for promoting low-carbon transition especially in the hard-to-abate sectors like Iron & Steel, Aluminium, etc.
Development of Northeast India	<ul style="list-style-type: none"> • Both sides agreed to launch 'Sustainable Development Initiative for the Northeastern Region of India' which includes both ongoing projects and possible future cooperation in connectivity, healthcare, new and renewable energy, as well as initiative for strengthening bamboo value chain.
Seat at UNSC	<ul style="list-style-type: none"> • Indian Prime Minister reiterated India's support for Japan's candidature for a non-permanent seat at the UNSC for the term 2023-2024.
Investment	<ul style="list-style-type: none"> • Japan to invest Rs. 3.2 lakh crores in India over next five years. Both sides are working as 'One team -One project' on Mumbai-Ahmedabad high-speed rail corridor.
Cybersecurity	<ul style="list-style-type: none"> • MoC signed in the field of cybersecurity for information sharing, capacity building programs and cooperation.

India- Japan relations

- **Multilateral cooperation:** Both countries are part of the **Quad, G-20 and G-4** and expressed their commitment to promote peace, security, and prosperity at global level.
- **Economic cooperation:** Japan is the largest **Official Development Assistance (ODA) partner** for India.
 - In 2011, two countries signed a **Comprehensive Economic Partnership Agreement (CEPA)** to facilitate growth in bilateral trade.
 - India and Japan signed **currency swap agreement**.
- **Defence cooperation:** Both countries engage in **bilateral exercises**- Dharma Guardian (Army), Shinyuu-Maitri (Airforce), JIMEX (Navy).
 - Since 2015, in **Malabar exercises**, Japan has also become a permanent participant along with India and US.
 - Both countries signed **Acquisition and Cross-Servicing Agreement (ACSA)** to exchange supply and services during bilateral exercises and training, UN Peacekeeping Operations, and other Humanitarian activities.
- **Strategic Cooperation:** Japan welcomes the **Indo-Pacific Ocean's Initiative (IPOI)**.
 - To **counter China's dominance of supply chain in Indo-Pacific region**, both countries launched the Supply Chain Resilience Initiative (SCRI).
 - **Asia-Africa Growth Corridor (AAGC)** between both countries is characterized as a response to China's Belt and Road Initiative (BRI).
- **Science & technology:** India-Japan Digital Partnership for **digital transformation**.
- **Historical ties:** Exchange between Japan and India is said to have begun in **6th century when Buddhism was introduced to Japan**.

2.2.2. INDIA-AUSTRALIA

Why in news?

Prime Ministers (PMs) of India and Australia held 2nd India Australia Virtual Summit.

- **Key Highlights of the summit**
 - Both countries **agreed to establish annual summits between PMs** under the Comprehensive Strategic Partnership (established during 1st Virtual Summit 2020).
 - **Australian investment** to drive collaboration in areas such as **clean technologies, space, and innovation**.
 - ✓ Also both countries will aim to finalise a **comprehensive economic cooperation agreement (CECA) at the earliest**.
 - During the Summit, **PM Modi thanked his counterpart for returning 29 ancient artefacts to India** that include 12th century Chola bronzes, 11th-12th century Jain sculptures from Rajasthan, 12th-13th century sandstone Goddess Mahisasuramardini from Gujarat etc.
- **India-Australia areas of Cooperation**
 - **Geostrategic:** Both countries shared common interests of a free, open, inclusive, and prosperous Indo-Pacific and are members of QUAD grouping.
 - **Trade and investment:** Bilateral trade was US\$12.3 billion in 2020-21 while total value of two-way FDI was valued at US\$1.04 billion in 2020.
 - **Defence and Security Cooperation:** Strategic Partnership, Joint declaration on security cooperation, Civil Nuclear Cooperation Agreement, regular military exercises (like AUSINDEX; AUSTRALIND etc.)

Related news

India Australia signed the Economic Cooperation and Trade Agreement (ECTA)

- **Key Highlights**
 - India will **eliminate tariffs on more than 85%** of Australian goods exports to India; to **cover 91%** of its exports by value over **10 years**.
 - **Provide zero-duty access to 96 percent of India's exports to Australia** including shipments from key sectors such as engineering goods, gems and jewelry, textiles, apparel and leather.
 - Zero-duty access for Indian goods is **set to be expanded to 100 percent over five years**.
 - **Indian graduates from STEM** (Science, Technology, Engineering and Mathematics) will be **granted extended post-study work visas**.
 - Australia agreed to **amend its domestic tax law to stop taxation of offshore income of Indian firms** providing technical services in Australia.

2.3. INDIA, CENTRAL ASIA AND RUSSIA

2.3.1. RUSSIA-UKRAINE WAR

Why in News?

Started on 24th February, the Russia-Ukraine war is becoming more violent, taking the number of refugees from Ukraine to **11.4 million** with increasing **sanctions** on Russia.

About Ukraine and the present Russia-Ukraine War

- Russia-Ukraine ties go back to **late 1700s**, when **Catherine the Great** (last reigning Empress of Russia) brought most of the present Ukrainian territory under the Russian empire.
- After a brief period of **autonomous existence** (1917-20), Ukraine became part of the **Soviet Union**.
- Finally, in **1991** it declared its independence as the **Soviet Union** collapsed.
- The present-day war traces its root to above three points, i.e.
 - Attempts **by Ukraine** to end cultural ties built with **Russia**,
 - Protect the **autonomous existence of Ukraine**, and
 - **Growing influence of North Atlantic Treaty Organization (NATO)** in erstwhile Soviet Union region with Ukraine as a major remaining territory between direct Russia-NATO faceoff.

<p>Major Places in News</p> <ul style="list-style-type: none"> • Donetsk and Luhansk Regions <ul style="list-style-type: none"> ○ Donetsk and Luhansk regions are collectively known as the Donbas. ○ Its main industries are coal mining and steel production. • Mariupol <ul style="list-style-type: none"> ○ It is the biggest Ukrainian port on the Azov Sea. • Kherson, Ukraine <ul style="list-style-type: none"> ○ It is situated on the Dnieper River that flows into the Black Sea. ○ It is an important port city that provides an important economic trade route to the Mediterranean Sea. 	
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2.3.1.1. RELATED NEWS AND DEVELOPMENTS

<p>North Atlantic Treaty Organisation (NATO) Membership</p>	<p>Procedure for membership is as following:</p> <ul style="list-style-type: none"> • Following formation of Consensus amongst NATO members, applicant country joins Membership Action Plan which is a preparatory stage. • NATO then moves an amendment to make the invitees party to the Washington Treaty (also called NATO Treaty). • Finally, the new member accedes to the NATO treaty. • Membership's eligibility criteria include, functioning democratic political system, market economy; fair treatment of minority populations etc. • North Atlantic Treaty Organization (NATO) is military alliance between 27 European countries, 2 North American countries, and 1 Eurasian country. • NATO was created in 1949 by the United States, Canada, and several Western European nations with the aim to provide collective security. <p>Related News: Major non-NATO ally (MNNA)</p> <ul style="list-style-type: none"> • US has designated Qatar a MNNA. • About MNNA: <ul style="list-style-type: none"> ○ Nations with MNNA designation are eligible to, among other things, host U.S. war reserve stockpiles of material inside their countries.
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	<ul style="list-style-type: none"> While MNNA status provides military and economic privileges, it does not entail any security commitments to the designated country. India is not a MNNA of US. 																
Minsk agreement 1 and 2	<p>The agreements relate to peace seeking settlement signed between Ukraine and Russia and are named after the Belarusian capital where the agreements were first settled.</p> <ul style="list-style-type: none"> Minsk 1 - Signed in 2014, it was a 12-point ceasefire deal signed between Russia, Ukraine, Organisation for Security and Cooperation in Europe (OSCE) and the pro-Russia leaders from Donetsk and Luhansk at Belarus. However, it could not stand. Minsk 2 - Also known as Normandy Four, it was signed in 2015 between France, Germany, Ukraine, and Russia after failure of Minsk Agreement-I. 																
Geneva Conventions and the Russia-Ukraine war	<p>Russian troops have been accused of violating Geneva conventions in ongoing war.</p> <ul style="list-style-type: none"> Geneva Conventions are a set of four treaties (formalised in 1949) and three additional protocols, the first two of which were formalised in 1977 and the third in 2005, which codify widely accepted ethical and legal international standards for humanitarian treatment of those impacted by any ongoing war. <ul style="list-style-type: none"> Geneva Conventions have been ratified by 196 states, including all UN member states. Three Protocols have been ratified by 174, 169 and 79 states respectively. <table border="1"> <thead> <tr> <th>Geneva Convention</th> <th>What it Covers?</th> </tr> </thead> <tbody> <tr> <td>First</td> <td> <ul style="list-style-type: none"> Protects wounded and sick soldiers on land during war. Also extends to medical and religious personnel, medical units, and medical transport. </td> </tr> <tr> <td>Second</td> <td> <ul style="list-style-type: none"> Protects wounded, sick and shipwrecked military personnel at sea during war. Also extends to hospital ships and medical transports by sea. </td> </tr> <tr> <td>Third</td> <td> <ul style="list-style-type: none"> Applies to prisoners of war, including a wide range of general protections such as humane treatment, maintenance and equality across prisoners etc. </td> </tr> <tr> <td>Fourth</td> <td> <ul style="list-style-type: none"> Protects civilians, including those in occupied territory. </td> </tr> <tr> <td colspan="2">Three Additional Protocols</td> </tr> <tr> <td>Protocol I and II</td> <td> <ul style="list-style-type: none"> They strengthen the protection of victims of international (Protocol I) and non-international (Protocol II) armed conflicts and place limits on the way wars are fought. </td> </tr> <tr> <td>Protocol III</td> <td> <ul style="list-style-type: none"> Created an additional emblem, the Red Crystal, which has the same international status as the Red Cross and Red Crescent emblems. </td> </tr> </tbody> </table>	Geneva Convention	What it Covers?	First	<ul style="list-style-type: none"> Protects wounded and sick soldiers on land during war. Also extends to medical and religious personnel, medical units, and medical transport. 	Second	<ul style="list-style-type: none"> Protects wounded, sick and shipwrecked military personnel at sea during war. Also extends to hospital ships and medical transports by sea. 	Third	<ul style="list-style-type: none"> Applies to prisoners of war, including a wide range of general protections such as humane treatment, maintenance and equality across prisoners etc. 	Fourth	<ul style="list-style-type: none"> Protects civilians, including those in occupied territory. 	Three Additional Protocols		Protocol I and II	<ul style="list-style-type: none"> They strengthen the protection of victims of international (Protocol I) and non-international (Protocol II) armed conflicts and place limits on the way wars are fought. 	Protocol III	<ul style="list-style-type: none"> Created an additional emblem, the Red Crystal, which has the same international status as the Red Cross and Red Crescent emblems.
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War crimes	<p>International Criminal Court (ICC) has announced to open an investigation into possible war crimes in Ukraine.</p> <ul style="list-style-type: none"> About war crimes: <ul style="list-style-type: none"> It is a serious violation of humanitarian laws during a conflict (derived from the 1949 Geneva Conventions). Examples: Taking of hostages, willful killings, forcing children to fight etc. International humanitarian law lays down three principles to decide whether an individual or a military has committed a war crime: <ul style="list-style-type: none"> ✓ Proportionality: Prohibits armies from responding to an attack with excessive violence. ✓ Precaution: Requires parties to avoid or minimize the harm to the civilian population. ✓ Distinction: To distinguish between civilian and belligerent populations and objects. About ICC <ul style="list-style-type: none"> ICC is court of last resort for the prosecution of serious international crimes, including genocide, war crimes, and crimes against humanity. <ul style="list-style-type: none"> Governed by an international treaty called the Rome Statute, world's first permanent ICC. It is an independent international organisation and is not part of the United Nations system. Headquartered at The Hague in the Netherlands. Also has temporary field offices in areas where investigations are being conducted. India has neither signed nor ratified the Rome Statute of the ICC. 																

2.4. INTERNATIONAL ORGANISATIONS/INSTITUTION

2.4.1. BENGAL INITIATIVE FOR MULTI-SECTORAL TECHNICAL AND ECONOMIC COOPERATION (BIMSTEC)

Why in news?

The **fifth summit** of the regional grouping, the **Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)**, held virtually in **Colombo, Sri Lanka**.

Important outcome of the Summit

- **Adoption and signing of the BIMSTEC Charter** presents BIMSTEC as “an **inter-governmental organization**” with “**legal personality.**” The grouping now views itself **not as a sub-regional organisation** but as a **regional organisation**.
- To **re-constitute and reduce the number of sectors of cooperation** from 14 to a more **manageable seven**. Each member-state will **serve as a lead for a sector (Refer table)**.
- Adoption of the **Master Plan for Transport Connectivity** applicable for 2018-2028 which lays out a guidance framework for connectivity related activities in the region in the future.
- **Three new agreements** signed by member states:
 - BIMSTEC Convention on **Mutual Legal Assistance** in Criminal Matters;
 - BIMSTEC Memorandum of Understanding on Mutual Cooperation in the field of **Diplomatic Training**;
 - Memorandum of Association on Establishment of BIMSTEC **Technology Transfer Facility**.

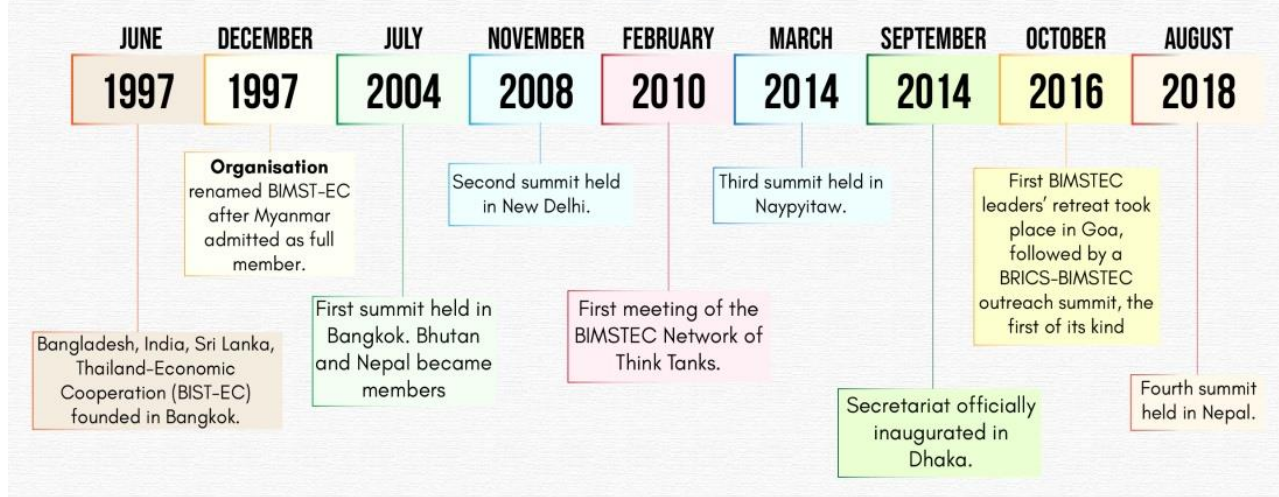
Lead	Sector
Bangladesh	Trade, investment and development
Bhutan	Environment and climate change
India	Security, including energy
Myanmar	Agriculture and food security
Nepal	People-to-people contacts
Sri Lanka	Science, technology and innovation
Thailand	Connectivity

About BIMSTEC

- BIMSTEC is an **inter-regional grouping** that seeks to foster **regional and economic cooperation** among its **7 member nations** in the **littoral and adjacent areas** of the Bay of Bengal — India, Thailand, Myanmar, Nepal, Bangladesh, Sri Lanka and Bhutan.
- The Bay of Bengal (BoB) region is home to **1.68 billion people**, accounting for **almost 22 percent** of the world population, with a **combined GDP of US\$ 3.7 trillion**.
- **BIMSTEC’s principles:** Respect for **sovereign equality, territorial integrity, political independence, non-interference** in internal affairs, **peaceful co-existence, and mutual benefit**.
 - Cooperation within BIMSTEC will constitute **an addition** to and **not be a substitute for bilateral, regional, or multilateral cooperation** involving the Member States.
- **Objectives of BIMSTEC**
 - To create an **enabling environment** for rapid **economic development** and to accelerate the **economic growth and social progress** through joint endeavors,
 - To promote **active collaboration and mutual assistance** on matters of common interest,
 - To provide **assistance to each other** in the form of training and research facilities in the **educational, professional and technical spheres**,
 - To cooperate **more effectively** in joint efforts that are supportive of and complementary to national development plans of Member States,
 - To maintain **close and beneficial cooperation** with existing international and regional organizations,



BIMSTEC's Major Milestones



2.4.2. OTHER IMPORTANT NEWS

<p>Economic and Social Council (ECOSOC)</p>	<p>India gets elected to four UN Economic and Social Council (ECOSOC) bodies.</p> <p>About ECOSOC</p> <ul style="list-style-type: none"> • ECOSOC is one of the six principal organs of the UN System established by the UN Charter in 1945. <ul style="list-style-type: none"> ○ The 54-member ECOSOC is at the heart of the United Nations system to advance the three dimensions of sustainable development – economic, social and environmental. ○ It is elected by the General Assembly. • India was elected to the UN ECOSOC for the term 2022-24, last year, in the Asia-Pacific States category along with Afghanistan, Kazakhstan and Oman. • Four bodies of ECOSOC are: <table border="1"> <thead> <tr> <th>Body</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>Commission for Social Development</td> <td>To advise ECOSOC on social policies of a general character and, in particular, on all matters in the social field not covered by the specialised inter-governmental agencies.</td> </tr> <tr> <td>Committee on Non-Governmental Organisations</td> <td>Consideration of applications for consultative status and requests for reclassification submitted by NGOs and consideration of quadrennial reports submitted by NGOs.</td> </tr> <tr> <td>Commission on Science and Technology for Development (CSTD)</td> <td>Holds an annual intergovernmental forum for discussion on timely and pertinent issues affecting science, technology and development.</td> </tr> <tr> <td>Committee on Economic, Social and Cultural Rights (CESCR)</td> <td>Monitors implementation of the International Covenant on Economic, Social and Cultural Rights by its state parties.</td> </tr> </tbody> </table>	Body	Function	Commission for Social Development	To advise ECOSOC on social policies of a general character and, in particular, on all matters in the social field not covered by the specialised inter-governmental agencies.	Committee on Non-Governmental Organisations	Consideration of applications for consultative status and requests for reclassification submitted by NGOs and consideration of quadrennial reports submitted by NGOs.	Commission on Science and Technology for Development (CSTD)	Holds an annual intergovernmental forum for discussion on timely and pertinent issues affecting science, technology and development.	Committee on Economic, Social and Cultural Rights (CESCR)	Monitors implementation of the International Covenant on Economic, Social and Cultural Rights by its state parties.
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<p>International Telecommunication Union (ITU)</p>	<ul style="list-style-type: none"> • India secured leadership position in ITU's Council Standing Committee on Administration and Management and signed Host Country Agreement (HCA) for the establishment of an Area Office & Innovation Centre of ITU. <ul style="list-style-type: none"> ○ Area office is expected to give impetus to R&D in telecommunication technologies in South Asia. • About ITU <ul style="list-style-type: none"> ○ ITU is UN specialised agency for information and communication technologies (ICTs). Membership includes member states as well as universities, and international and regional organizations ○ It was founded in 1865 to facilitate international connectivity in communications networks ○ ITU allocates global radio spectrum and satellite orbits, develop technical standards that ensure networks and technologies seamlessly interconnect, and strive to improve access to ICTs to underserved communities worldwide. 										

<p>Organisation of Islamic Cooperation (OIC)</p>	<p>India has hit out at the OIC for inviting the Hurriyat chief to attend its foreign ministerial meeting in Islamabad.</p> <p>About OIC</p> <ul style="list-style-type: none"> • It is 2nd largest inter-governmental organisation after the United Nations. • It endeavors to safeguard and protect the interests of the Muslim world in the spirit of promoting international Peace and harmony among various people of the world.. • Membership: 57 states. • Headquarters: Jeddah, Saudi Arabia. • India is not its member. 																		
<p>League of Arab States (Arab League)</p>	<p>In a UNSC meeting Indian foreign secretary called for greater policy alignment between the U.N. and the LAS (League of Arab States).</p> <p>About League of Arab States or Arab League:</p> <ul style="list-style-type: none"> • It is an intergovernmental organization (IGO), a voluntary association of independent African and Middle East countries whose peoples are mainly Arabic speaking. • Purpose: To strengthen ties among the member states, coordinate their policies, and promote their common interests. • Founded in 1945 <p>Headquarters: Cairo, Egypt</p>																		
<p>India-US</p>	<p>Fourth Annual U.S.-India 2+2 Ministerial Dialogue held in Washington DC</p> <ul style="list-style-type: none"> • 2+2 dialogue is a format of meeting of foreign and defence ministers of India and its allies on strategic and security issues. • Key highlights <ul style="list-style-type: none"> ○ Maritime cooperation (MC): Ministers look forward to India's co-hosting of Indo-Pacific Armies Chiefs Conference (IPACC) and Indo-Pacific Armies Management Seminar (IPAMS) in 2023. ○ Trade: 12th Ministerial-level meeting of India-U.S. Trade Policy Forum (TPF) and renewal of Working Group discussions to expand bilateral trade, remove market access barriers, and improve ease of business. ○ Space: Signed MoU on Space Situational Awareness (SSA) to protect the satellites of the two countries. <ul style="list-style-type: none"> ✓ Discussed NASA-ISRO Synthetic Aperture Radar (NISAR) satellite, planned for launch from India in 2023. ○ New defence domains: Deepening collaboration in science and technology in the India-US Joint Technical Group (JTG) and in evolving new defence domains, including space, artificial intelligence (AI), and cyber. <ul style="list-style-type: none"> ✓ Cooperation in defence cyber and special forces field, including LEMOA (Logistics Exchange Memorandum of Agreement). ✓ To revitalise the Defence Technology and Trade Initiative (DTTI) with joint projects on advanced, emerging and critical military technologies. ✓ India, US to advance ties in Quantum Science, Biotech and Chips. ○ Global Health: Expansion of the USAID-supported COVID-19 Learning. <div style="background-color: #fff9c4; padding: 5px; text-align: center; margin-top: 10px;"> <p>India-USA Major Agreements and Mechanisms</p> </div> <table border="1" style="width: 100%; background-color: #fce4d6;"> <tr> <td style="text-align: center;"></td> <td>2019 Counter Terrorism Cooperation Initiative</td> </tr> <tr> <td style="text-align: center;"></td> <td>2012 Defence Technology and Trade initiative</td> </tr> <tr> <td style="text-align: center;"></td> <td>2015 Framework for the India-U.S. Defense Relationship</td> </tr> <tr> <td style="text-align: center;"></td> <td>2015 Joint Strategic Vision for the Asia-Pacific and Indian Ocean Region</td> </tr> <tr> <td style="text-align: center;"></td> <td>2016 Logistics Exchange Memorandum of Agreement</td> </tr> <tr> <td style="text-align: center;"></td> <td>2016 Framework for the US-India Cyber Relationship</td> </tr> <tr> <td style="text-align: center;"></td> <td>2018 Communications Compatibility and Security Agreement,</td> </tr> <tr> <td style="text-align: center;"></td> <td>2019 Industrial Security Annex</td> </tr> <tr> <td style="text-align: center;"></td> <td>2020 Basic Exchange and Cooperation Agreement</td> </tr> </table> 		2019 Counter Terrorism Cooperation Initiative		2012 Defence Technology and Trade initiative		2015 Framework for the India-U.S. Defense Relationship		2015 Joint Strategic Vision for the Asia-Pacific and Indian Ocean Region		2016 Logistics Exchange Memorandum of Agreement		2016 Framework for the US-India Cyber Relationship		2018 Communications Compatibility and Security Agreement,		2019 Industrial Security Annex		2020 Basic Exchange and Cooperation Agreement
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India-France	<p>India, France sign roadmap on the Blue Economy and Ocean Governance</p> <ul style="list-style-type: none"> Objective is to enhance bilateral exchanges on blue economy and forge a common vision of ocean governance based on rule of law and cooperate on sustainable and resilient coastal and waterways infrastructure. Key highlights of the roadmap <ul style="list-style-type: none"> Setting up an India-France Partnership on the blue economy and ocean governance. Institutional: Organise an annual bilateral dialogue to exchange views on their priorities, share best practices and support ongoing and future cooperation. Economic: Make the blue economy a priority in the development of their economic exchanges. Infrastructure: Cooperation on sustainable and resilient coastal and waterways infrastructure. Scientific & Academic: Research in marine science and technology for monitoring, protection and sustainable use of marine resources and biodiversity India-France major areas of cooperation <ul style="list-style-type: none"> Defence: India purchased Rafale aircraft and signed a contract for 6 Scorpene submarines (P-75 Project) from France. Space: Signed an agreement for cooperation for India's first human space mission Gaganyaan. Civil Nuclear: Both signed a civil nuclear agreement in 2008.
India-UAE	<p>India and the United Arab Emirates (UAE) signed a Comprehensive Economic Partnership Agreement (CEPA).</p> <ul style="list-style-type: none"> With the conclusion of the CEPA, India and UAE aim to increase bilateral goods trade over the next five years to \$100 billion. Around 90% of products exported from India to UAE will attract zero duty with implementation of the Agreement. It also obliges the UAE to offer 1.4 million work visas for highly skilled professionals from India. It also has stringent 'rules of origin' reflecting requirements for substantial processing of up to 40% value addition. Rules of origin (ROOs) are used to determine if products are eligible for duty-free or reduced duties under the FTA rules. UAE is already India's third-largest trading partner with bilateral trade in 2019-20 valued at \$59 billion. India ranks as the UAE's number one trading partner for non-oil exports, accounting for nearly 14 percent of the UAE's total non-oil exports globally.
India-Vietnam	<ul style="list-style-type: none"> Sharing historical roots of Buddhism and struggle for liberation from colonial rule, India and Vietnam complimented each other on the 50th anniversary of bilateral diplomatic ties. <ul style="list-style-type: none"> Buddhist Monks- Mahajavaka and Kalyanacuriare- are credited with establishment of Buddhism in Vietnam during 2nd centuryBC. Mahatma Gandhi and Ho Chi Minh, regarded as the Father of Nation in India and Vietnam respectively, led people in their heroic struggle.
Indo Bangladesh Protocol Route (IBPR)	<p>Brahmaputra gets connected with Ganga via Indo Bangladesh Protocol Route (IBPR)</p> <ul style="list-style-type: none"> Ministry of Ports, Shipping and Waterways has successfully conducted the maiden voyage of foodgrains via inland waterways jointly covering National Waterway (NW) 1 (River Ganga) and 2 (River Brahmaputra) via the IBP route. About the IBP route <ul style="list-style-type: none"> Indo-Bangladesh Protocol on Inland Water Transit & Trade was signed in 1972, under which inland vessels of one country can transit through the specified routes of the other country. It was last renewed in 2015 for five years with a provision for its automatic renewal for a further period of five years. It is under the overall ambit of Inland Waterways Authority of India (IWAI). Currently, there are a total of 10 protocol routes and 11 port of calls on each side.
Trilateral Development Corporation (TDC)	<p>Ministry of External Affairs has recently launched a platform TDC Fund that would involve private sectors with state support for huge investments in the Indo-Pacific region.</p> <ul style="list-style-type: none"> Its aim is to provide an alternative to the Chinese development partnership model that has pushed parts of the developing world to a debt trap. India's Global Innovation Partnership (GIP) launched with the UK will provide a template to use the TDC Fund for trilateral projects with other countries like Japan, Germany, France and the EU. India's contribution to GIP will be channelized through the TDC Fund.
Raisina Dialogue 2022	<p>It is a multilateral conference committed to addressing the most challenging issues facing the global community, held annually in New Delhi since 2016.</p>

	<ul style="list-style-type: none"> ○ It takes its name from Raisina Hill- the seat of the Indian government. • It is hosted by the Observer Research Foundation (an independent think tank) in collaboration with the Ministry of External Affairs. • It has emerged as India's flagship conference on geopolitics and geo-economics. • It brings together global leaders in policy, business, media, civil society, defense and foreign policy.
Inter-Ministerial Coordination Group (IMCG)	<ul style="list-style-type: none"> • The first meeting of IMCG on India's neighbourhood outreach has been convened by Indian foreign secretary. <ul style="list-style-type: none"> ○ All countries of the South Asian Association for Regional Cooperation (SAARC), as well as Myanmar are included in the initiative. ○ It focussed on construction of cross-border infrastructure for enhancing trade with Nepal, expanding railway connectivity with Bangladesh, addressing special needs of Bhutan and Maldives besides humanitarian assistance to Afghanistan and Myanmar, and fisheries issue with Sri Lanka. <p>About IMCG</p> <ul style="list-style-type: none"> • IMCG has been setup as a high-level mechanism (Secretary level) towards mainstreaming of India's 'Neighbourhood First' policy. <ul style="list-style-type: none"> ○ IMCG is supported by Inter-Ministerial Joint Task Forces (JTF) convened by the concerned Joint Secretaries in the MEA. ○ IMCG will improve institutional coordination across government and provide comprehensive direction to whole-of-government approach. • It aims to promote better connectivity, stronger inter-linkages and greater people-to-people connect on India's relations with its neighbouring countries.
Kafala System	<p>Hosting 2022 Football World Cup, organisers in Qatar are condemned for its treatment of migrant workers.</p> <p>About Kafala System</p> <ul style="list-style-type: none"> • Many Middle East Countries, including Qatar, follow Kafala System- a sponsorship system which defines the relationship between migrant workers and their local sponsor or Kafael. • Under it, local sponsors get almost total control over migrant workers' employment and immigration status. <ul style="list-style-type: none"> ○ E.g. sponsor permission is required to leave or change jobs, enter or exit the host country etc. • Primarily used to meet cheap labour demand, it is used by them for widespread human rights abuses and exploitation of workers.

2.5. WEAPONS OF MASS DESTRUCTION (WMD)

Why in news?

Weapons of Mass Destruction and their Delivery Systems (Prohibition of Unlawful Activities) Amendment Bill, 2022 to ban funding of weapons of mass destruction was recently passed in Lok Sabha.

About the bill

- The **Weapons of Mass Destruction and their Delivery Systems (Prohibition of Unlawful Activities) Amendment Bill, 2022** amends the Weapons of Mass Destruction and their Delivery Systems (Prohibition of Unlawful Activities) Act, 2005.

- The 2005 Act **prohibits unlawful activities (such as manufacturing, transport, or transfer) related to weapons of mass destruction**, and their means of delivery. The **recent amendment extends the scope of banned activities** to include financing of already prohibited activities.

Weapons of Mass Destruction and their Delivery Systems (Prohibition of Unlawful Activities) Act, 2005.

- Its primary objective to **provide an integrated and overarching legislation** on prohibiting unlawful activities in relation to all three types of WMD (i.e. Nuclear, Chemical and Biological), their delivery systems and related materials, equipment and technologies.
- It instituted **penalties for contravention** of these provisions such as imprisonment for a term not less than five years (extendable for life) as well as fines.
- The Act was passed to meet an international obligation enforced by the **UN Security Council Resolution (UNSCR) 1540** of 2004.
 - UNSCR 1540 established binding obligations on all UN member states to take and enforce effective measures against proliferation of WMD, their means of delivery and related materials to non-state actors.

- It empowers the central government to freeze, seize or attach financial assets and economic resources of people engaged in such activities.

About Weapons of Mass Destruction (WMD)

- There is **no single, authoritative definition of a WMD in international law** and the expression is usually understood to cover nuclear, biological, and chemical (NBC) weapons.
- According to the **United States Department of Homeland Security**, “A weapon of mass destruction is a nuclear, radiological, chemical, biological, or other device that is intended to harm a large number of people.

Global efforts to outlaw several classes of WMDs

Treaties/Conventions/Codes	Purpose	Has India signed and ratified it?
Biological and Toxic Weapons Convention (BWC) , 1972	Prohibits the development, production, acquisition, transfer, stockpiling and use of biological and toxin weapons. <ul style="list-style-type: none"> • It supplements the 1925 Geneva Protocol, which had prohibited only the use of biological weapons. 	Yes
Chemical Weapons Convention (CWC) , 1992	Prohibits the development, production, acquisition, stockpiling, retention, transfer or use of chemical weapons. <ul style="list-style-type: none"> • It led to the establishment of Organisation for the Prohibition of Chemical Weapons (OPCW) headquartered at Hague, Netherlands. 	Yes
Treaty on the Non-Proliferation of Nuclear Weapons (NPT) , 1970	To prevent the spread of nuclear weapons and weapons technology, to promote cooperation in the peaceful uses of nuclear energy and to further the goal of achieving nuclear disarmament.	No. India opposes NPT’s discriminatory nature and argues for the universal ban of nuclear weapons.
Treaty on the Prohibition of Nuclear Weapons (TPNW) , 2017	Prohibits participating in any nuclear weapon activities. These include undertakings not to develop, test, produce, acquire, possess, stockpile, use or threaten to use nuclear weapons and also to provide assistance to any State in the conduct of prohibited activities.	No. India believes that this Treaty does not constitute or contribute to the development of customary international law; nor does it set any new standards or norms.
Comprehensive Nuclear-Test-Ban Treaty , 1996	It bans all nuclear explosion tests on Earth. It also establishes a CTBT Organization (CTBTO), located in Vienna, to ensure the implementation of its provisions. <ul style="list-style-type: none"> • It is yet to enter into force. 	No. India opposes CTBT’s discriminatory nature and supports universal ban of nuclear weapons
Hague Code of Conduct (HCOC) formerly known as “ The International Code of Conduct ” (ICOC), 2002	To regulate access to ballistic missiles which can potentially deliver weapons of mass destruction.	Yes
Multilateral Export Control Regimes (MECR)	Voluntary and non-binding agreements created by the major supplier countries to co-operate in their effort to prevent transfer of certain military and dual use technology that support proliferation of Weapons of Mass Destruction (WMD). There are currently four such regimes under MECR: <ul style="list-style-type: none"> • Nuclear Suppliers Group (NSG) for the control of nuclear related technology. • Australia Group (AG) for control of chemical and biological technology that could be weaponized. • Missile Technology Control Regime (MTCR) for the control of rockets and other aerial vehicles capable of delivering weapons of mass destruction. • Wassenaar Arrangement for Conventional Arms and Dual-Use Goods and Technologies. 	India is member of three of the four MECRs, except the Nuclear supplier Group.

Treaties and initiatives establishing nuclear-weapon-free zones in Asia and the Pacific:

- **Treaty of Rarotonga** (South Pacific Nuclear Free Zone Treaty, 1986):
- **Bangkok Treaty** (Southeast Asian Nuclear-Weapon-Free Zone Treaty, 1995),
- **Central Asia Nuclear-Weapon-Free-Zone** (2006).
- **Mongolia declared itself the first single-State nuclear-weapon-free zone (SS-NWFZ) in 1992**, which was later recognized by P5 (five nuclear-weapon states) as well. This has set a precedent for other states to follow in declaring themselves SS-NWFZs.

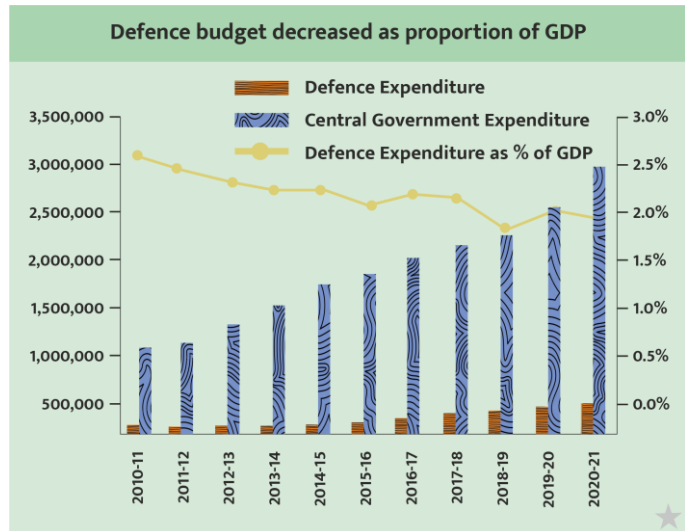
2.6. DEFENCE INDIGENISATION

Why in News?

Recently, a parliamentary panel has **expressed concern over India's spending on defence research** showing low Defence Indigenisation.

Key trends highlighted by the report

- India's defence expenditure has **remained less than 1% of its GDP** in the last five years.
- India is **funding 6% on defence Research & Development (R&D)** of the Defence Budget whilst, USA and China are spending approximately 12% and 20%, respectively.
- In Defence Research and Development Organisation (DRDO), there is a **shortfall of 808 scientists** which is slightly more than 10% of sanctioned strength.
- In 2021-2022, against an allocation of Rs 31,250 crore, **only Rs 11,821 crore was utilised** by December end 2021 which would compromise operational needs and R&D.



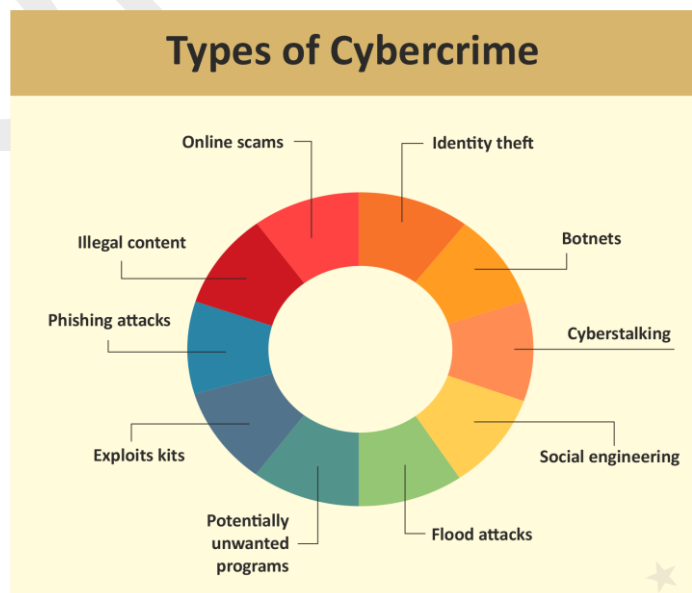
2.7. CYBERCRIME

Why in news?

According to the recent National Crime Records Bureau (NCRB) data, India reported an 11.8% jump in cybercrime in 2020.

Cybercrime in India

- It is defined as an **unlawful act wherein the computer is tool or target or both**. It is a criminal activity that uses computer as instrument for perpetuating crimes.
 - **Information Technology Act, 2000** provides legal recognition for electronic communication, electronic commerce, and cybercrimes etc.
- **Status of cybercrime:**
 - As per NCRB data from "Crime in India, 2020", Cybercrimes have **increased four times** or 306 percent in the past four years and **rate of cybercrime** (incidents per lakh population) **increased** in 2020.
 - India has **jumped 37 places to 10th position** in **Global Cyber Security Index (GCI) 2020** which showcases country's commitment towards cyber security.



What is the present cyber security architecture in India?

- **National Cyber Security Policy, 2013:** It was the first comprehensive document brought out by government to **create a secure and resilient cyberspace ecosystem and strengthen the regulatory framework**.

- **National Cyber Security Strategy 2020:** It was conceptualized by the National Security Council Secretariat to ensure a **safe, secure, trusted, resilient and vibrant cyberspace for Nation’s prosperity.**
- **Other initiatives to combat cyber-crime:**
 - **Indian Cyber Crime Coordination Centre (I4C):** It was rolled out by **Ministry of Home Affairs for the period 2018-2020** to combat cybercrime in the country, in a coordinated and effective manner.
 - **Indian Computer Emergency Response Team (CERT-In):** It serves as **national agency** for responding to cyber security incidents as per provisions of **IT Act, 2000.**
 - **National Cyber Coordination Centre (NCCC):** It is multi-stakeholder cyber-security and e-surveillance agency, under CERT-In.
 - **National Critical Information Infrastructure Protection Centre (NCIIPC):** It is created under IT Act, 2000 (amended 2008) and designated as **National Nodal Agency** to facilitate safe, secure and resilient information infrastructure for critical sectors of the Nation.
 - **Cyber Swachhta Kendra (Botnet Cleaning and Malware Analysis Centre):** It has been launched for detection of malicious programs and provide free tools to remove the same.
 - **National Cyber Crime Reporting Portal:** It caters to complaints pertaining to cybercrimes only with special focus on cybercrimes against women and children.
 - **National Cyber Security Incident Response Exercise (NCX India):** NCX India **aims to train senior management and technical personnel** of Government/Critical Sector organisations **on contemporary cyber threats and handling cyber incidents** and response. It is being **conducted by the National Security Council Secretariat (NSCS).**

Related News

Indian Computer Emergency Response Team (CERT-In) has issued **directions** relating to information security practices and reporting of cyber incidents under provisions of **section 70B of Information Technology (IT) Act, 2000.**

- **Key guidelines**
 - All government and private agencies will **mandatorily have to report all cyber breach incidents to CERT-In within six hours.**
 - All service providers, intermediaries, data centres, and government organisations shall **mandatorily enable logs of all their ICT systems and maintain them securely for a rolling period of 180 days** and same shall be **maintained within Indian jurisdiction.**
 - Virtual private server (VPS) providers, cloud service providers need to **register accurate information related to subscriber names, customer hiring services, etc and maintain them for five years or longer duration as mandated by law.**

Hermetic Wiper

- It is a **data-wiper malware** that has been detected **in computers in Ukraine.**
- When downloaded, it **can erase all the data on a device it targets,** in a manner that data becomes irretrievable.
- Malware is **collective name for a number of malicious software variants,** including viruses, ransomware and spyware.

2.8. OTHER IMPORTANT NEWS

Splinternet	<ul style="list-style-type: none"> • Russia-Ukraine war has threatened to splinter the internet. <ul style="list-style-type: none"> ○ Splinternet refers to ‘Internet that is increasingly fragmented due to nations filtering content or blocking it entirely for political purposes’. • Example: <ul style="list-style-type: none"> ○ China’s ‘Great Firewall’ keeps American tech giants out while pushing online services developed indigenously. ○ Russia, in 2019, passed the sovereign internet law — or the online Iron Curtain — that enabled the country to disconnect its internet from the rest of the world.
Global Security Initiative from China	<p>With an eye on the Pacific Ocean, the Chinese President has proposed a new Global Security Initiative.</p> <ul style="list-style-type: none"> • According to China, the new Global Security Initiative will work against the Cold War Mentality or hegemonism, power politics and bloc confrontation. • It will counter the US Indo-Pacific Strategy, Quad (the India, US, Australia and Japan grouping) and AUKUS (Australia, UK and US).
Vibrant village programme	<ul style="list-style-type: none"> • In recent budget, government announced ‘vibrant village programme’ to improve social and financial infrastructure in remote habitations, primarily along the border with China. <ul style="list-style-type: none"> ○ Piloted by Ministry of Home Affairs, it is developed in the backdrop of the Chinese setting up model villages along India and Bhutan borders. • The scheme would have twain objectives of

	<ul style="list-style-type: none"> ○ strengthening infrastructure along the border and ○ ensuring that residents don't abandon their villages in search of economic opportunities in other areas. ● Activities will include construction of village infrastructure, housing, tourist centres, road connectivity, direct-to-home access for Doordarshan and educational channels, and support for livelihood generation. ● Other government steps to improve border villages: <ul style="list-style-type: none"> ○ Border Area Development Programme, launched in 1986-87 to meet developmental needs of people living in remote and inaccessible areas situated near the international border. ○ Union Budget 2022-23 has increased capital outlay for Border Roads Organisation, by a record 40 percent, as compared to FY 2021-22.
<p>Border Infrastructure & Management (BIM)</p>	<p>Government to Continue Central Sector Umbrella Scheme of Border Infrastructure & Management (BIM) From 2021-22 To 2025-26</p> <ul style="list-style-type: none"> ● BIM scheme will help in the creation of infrastructure such as border fence, border flood lights, technological solutions, border roads and border outposts (BOPs) and company operating bases to secure India's borders with Pakistan, Bangladesh, China, Nepal, Bhutan and Myanmar. ● Other initiatives for border management: <ul style="list-style-type: none"> ○ Integration of communication and surveillance equipment to monitor activities on Jammu border thereby integrating technology in border management. ○ Comprehensive Integrated Border Management System improves the capability of Border Security Force in detecting and controlling the cross- border crimes. ○ Border Area Development Programme was launched by Ministry of Home Affairs as part of comprehensive approach to Border Management. ○ Project BOLD-QIT (Border Electronically Dominated QRT Interception Technique) to equip riverine areas along Indo-Bangladesh borders.
<p>Extradition</p>	<ul style="list-style-type: none"> ● Supreme Court asked Union Home Secretary to explain the government's stand on gangster Abu Salem's contention that he cannot be sentenced beyond 25 years in prison as per the solemn sovereign assurance given to Portugal authorities for his extradition. <ul style="list-style-type: none"> ○ He was arrested in Portugal and extradited to India. He was sentenced to life imprisonment in the 1993 Mumbai serial blasts case. ● Extradition in India <ul style="list-style-type: none"> ○ SC defined extradition as the delivery on the part of one state to another of those whom it is desired to deal with for crimes of which they have been accused or convicted and are justifiable in the courts of the other state. <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Extradition proceedings</p> <ul style="list-style-type: none"> ● Extradition proceedings are initiated upon receipt of a request for extradition through following modes: <ul style="list-style-type: none"> ○ directly through diplomatic channels between India and the requesting country; ○ a red notice received by the INTERPOL; or ○ other settled modes of communication. </div> <ul style="list-style-type: none"> ○ Extradition Act 1962 governs the extradition of a fugitive from India to a foreign country, or vice versa. <ul style="list-style-type: none"> ✓ Under the Act, if no extradition treaty exists with a foreign country, central government may deem any international convention to which India and that foreign country are common parties as an extradition treaty in respect of offences specified in that convention. ○ Ministry of External Affairs is the central authority that handles all extradition requests.
<p>Prevention Of Money Laundering Act (PMLA)</p>	<ul style="list-style-type: none"> ● According to SC, any activity connected with the proceeds of crime, that may be inclusive of use, concealment, or possession is encompassed within the expression of Section 3 of the PMLA legislation. <ul style="list-style-type: none"> ○ Petition argued that Section 3 of PMLA has to be read down saying that mere use and possession of proceeds of crime does not tantamount to money-laundering. ○ Section 3 of PMLA says whosoever directly or indirectly attempts to indulge or knowingly assists or knowingly is a party or is actually involved in any process or activity connected with proceeds of crime and projecting it as untainted property shall be guilty of laundering. ● PMLA was enacted to fight against the criminal offence of legalizing the income/profits from an illegal source. <ul style="list-style-type: none"> ○ It enables authorities to confiscate the property earned from illegally gained proceeds. ○ Enforcement Directorate under Ministry of Finance, is responsible for investigating the offences of money laundering under the PMLA.

<p>Civil Liability for Nuclear Damage (CLND) Act, 2010</p>	<ul style="list-style-type: none"> • Money laundering is the process of making illegally-gained proceeds appear legal. <p>New India Assurance (NIA) is to insure Kudankulam Nuclear Power Plant (KKNPP) with global participation.</p> <ul style="list-style-type: none"> • A nuclear plant has two covers: a property cover and a liability cover. <ul style="list-style-type: none"> ○ Liability cover for a nuclear plant is always covered by Indian Nuclear Insurance Pool (INIP), formed by the general insurers and managed by state owned reinsurer General Insurance Corporation of India (GIC-Re). • INIP provide insurance to cover the liability as prescribed under Civil Liability for Nuclear Damage (CLND) Act, 2010. • CLND Act was enacted with a view to provide prompt compensation to the victims for damage caused by a nuclear incident through a no-fault liability regime. <ul style="list-style-type: none"> ○ Act facilitates India becoming a State Party to Convention on Supplementary Compensation for Nuclear Damage (CSC). • Key features of CLND Act: <ul style="list-style-type: none"> ○ Exclusive jurisdictional competence and a mechanism to provide compensation. ○ Channelling liability to the Operator <ul style="list-style-type: none"> ✓ Operator means the Central Government or any authority or corporation established by it or a Government company who has been granted a licence pursuant to the Atomic Energy Act, 1962. ○ Limiting liability of the operator in amount and time ○ Mandatory coverage by the operator through financial security or insurance. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>About Convention on Supplementary Compensation for Nuclear Damage (CSC)</p> <ul style="list-style-type: none"> • CSC established in 1997 is a worldwide liability regime to increase the amount of compensation available to the victims of nuclear accidents. <ul style="list-style-type: none"> ○ A State which is a party to either the 1963 Vienna Convention on Civil Liability or the 1960 Paris Convention on Third Party Liability in the Field of Nuclear Energy can become a party to the CSC. • A State which is not a party to either of these conventions could also become a party to the CSC if its national law on nuclear liability is in compliance with the provision of the CSC and its Annex. <ul style="list-style-type: none"> ○ India, not being party to the Vienna or Paris Conventions, signed the CSC in 2010 on the basis of the CLND Act. </div>
<p>Critical Infrastructure</p>	<p>Hackers reportedly used the Chinese Government trojanShadowPad, to target State Load Despatch Centres (SLDCs) responsible for real time grid control and electrical dispatch but did not succeed because safeguards for critical infrastructure were in place to thwart such intrusions.</p> <p>About Critical Infrastructure</p> <ul style="list-style-type: none"> • Critical Infrastructure (CI) refers to those essential physical and information technology facilities, networks, services, and assets, which, if disrupted, would have a serious impact on the health, safety, security, economic or social well-being, or effective functioning of government. <div style="text-align: center; margin: 10px 0;"> <p>CRITICAL SECTORS</p> <p>Power & Energy Government Transport Telecom Bank, Finance & Insurance Strategic & Public Enterprises</p> </div> <ul style="list-style-type: none"> • Measures to protect CIs <ul style="list-style-type: none"> ○ Policy Measure: National Cyber Security Policy 2013 to build a secure and resilient cyberspace for citizens, businesses and Government. ○ Institutional Measure <ul style="list-style-type: none"> ✓ National Critical Information Infrastructure Protection Centre (NCIIPC) to regulate and protect the nation's Critical Information Infrastructures (CIIs). ✓ Indian Computer Emergency Response Team (CERT-In) as National nodal agency for responding to computer security incidents. ✓ National Cyber Security Coordinator (NCSC) to coordinate with different agencies at the national level for cyber security matters. ○ Other Initiatives: Guideline on Cyber Security in Power Sector by Central Electricity Authority for all power sector utilities and plans to build firewalls and a specialised computer security incident response team (CSIRT) to thwart attempts to cripple power infrastructure.

<p>Armed Forces Special Powers Act (AFSPA)</p>	<p>Recently, the Union Government has partially withdrawn the Armed Forces Special Powers Act (AFSPA), 1958 from parts of three Northeast states— Assam, Nagaland and Manipur.</p> <p>About AFSPA</p> <ul style="list-style-type: none"> AFSPA grants extra-ordinary powers and immunity to the armed forces to bring back order in the “disturbed areas”. <ul style="list-style-type: none"> A disturbed area is one which is declared by notification under Section 3 of the AFSPA. An area can be disturbed due to differences or disputes between members of different religious, racial, language or regional groups or castes or communities. <ul style="list-style-type: none"> ✓ The Central Government, or the Governor of the State or administrator of the Union Territory can declare the whole or part of the State or Union Territory as a disturbed area. Section 4 of the AFSPA empowers armed forces with provisions like legal immunity for their actions, arrest anyone without warrant, stop and search any vehicle etc. Presently, AFSPA is operational in Assam, Jammu and Kashmir and Ladakh, Nagaland, Manipur (except Imphal Municipal area) and parts of Arunachal Pradesh. <ul style="list-style-type: none"> Jammu and Kashmir and Ladakh were brought under the Act by way of The Armed Forces (Jammu and Kashmir) Special Powers Act, 1990. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Did you know? The AFSPA was first enacted as an ordinance in the backdrop of the Quit India Movement in 1942 by Viceroy Linlithgow which gave the Armed Forces a “license to kill” when faced with internal disturbances.</p> </div>		
<p>Interstate Disputes in NorthEast</p>	<p>Arunachal-Assam</p> <ul style="list-style-type: none"> Both states agreed to set up district-level committees headed by cabinet ministers to end the dispute in a time-bound manner—a move similar to the one agreed upon by Assam and Meghalaya. States of the Northeast were largely carved out of Assam, which has border disputes with several states. Border dispute between Arunachal and Assam arose when Arunachal Pradesh refused to accept the 1951 notification (on the recommendations of the Bordoloi Committee) as the basis of boundary delineation. Dispute between both states is pending in the Supreme Court. <p>Meghalaya-Assam border dispute</p> <ul style="list-style-type: none"> Assam and Meghalaya signed an agreement to resolve part of their five-decade-old interstate border dispute. <ul style="list-style-type: none"> It brought closure in 6 out of 12 disputed sectors, which comprised nearly 70% of their total 885-km boundary. Further for delineation and demarcation, a survey will be conducted by the Survey of India with both states' involvement, and put up in Parliament for approval. In 2021, both States had adopted a “give-and-take” policy to start the process of resolving the boundary dispute by constituting three regional committees based on five mutually agreed principles: historical perspective, ethnicity of local population, contiguity with boundary, peoples' will and administrative convenience. Assam-Meghalaya border dispute is attributed to different readings of the demarcation of the boundaries from the agreement inked at the time of creation of Meghalaya as a separate state from Assam in 1972. <ul style="list-style-type: none"> Beside Meghalaya, there are border disputes in other states largely carved out of Assam-Nagaland (1963), Arunachal Pradesh (1987) and Mizoram (1987). Tripura and Manipur, erstwhile princely states not annexed to the Assam Province by the British, don't have border issues with it. 		
<p>DefConnect 2.0</p>	<p>Minister of Defence rolled out schemes for defence start-ups during DefConnect 2.0.</p> <ul style="list-style-type: none"> DefConnect aims to attract innovators and investors from India's leading industries in the defence sector. Following schemes were launched: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; padding: 5px;"> <p>Innovations for Defence Excellence (iDEX) Prime</p> </td> <td style="padding: 5px;"> <ul style="list-style-type: none"> iDEX-Prime aims to support projects, requiring support beyond Rs 1.5 crore up to Rs 10 crore, to help ever-growing start-ups in the defence sector. Core objective of iDEX is to create an ecosystem, essentially to foster innovation, entrepreneurship and technology development, specifically in the Defence and Aerospace sector. iDEX is the operational framework of the Defence Innovation Organization (DIO), a special purpose vehicle under Ministry of Defence (MoD). </td> </tr> </table>	<p>Innovations for Defence Excellence (iDEX) Prime</p>	<ul style="list-style-type: none"> iDEX-Prime aims to support projects, requiring support beyond Rs 1.5 crore up to Rs 10 crore, to help ever-growing start-ups in the defence sector. Core objective of iDEX is to create an ecosystem, essentially to foster innovation, entrepreneurship and technology development, specifically in the Defence and Aerospace sector. iDEX is the operational framework of the Defence Innovation Organization (DIO), a special purpose vehicle under Ministry of Defence (MoD).
<p>Innovations for Defence Excellence (iDEX) Prime</p>	<ul style="list-style-type: none"> iDEX-Prime aims to support projects, requiring support beyond Rs 1.5 crore up to Rs 10 crore, to help ever-growing start-ups in the defence sector. Core objective of iDEX is to create an ecosystem, essentially to foster innovation, entrepreneurship and technology development, specifically in the Defence and Aerospace sector. iDEX is the operational framework of the Defence Innovation Organization (DIO), a special purpose vehicle under Ministry of Defence (MoD). 		

	<p>Sixth Defence India Start-up Challenge (DISC 6)</p>	<ul style="list-style-type: none"> DISC is aimed at supporting Startups/MSMEs/Innovators to create prototypes and/or commercialize products/solutions in the area of National Defence and Security. DISC has been launched by MoD in partnership with Atal Innovation Mission.
	<p>Third edition of Innovate4Defence internship (i4D)</p>	<ul style="list-style-type: none"> i4D is a two-months-long acceleration program for students of Higher Educational Institutions (HEIs) of India.

2.9. PLACES IN NEWS

1. Nord stream 2 Pipeline
 Germany has **suspended** the certification process of Nord Stream 2 gas pipeline from Russia.

- Nord Stream 2 is **1,230-kilometer-long natural gas pipeline** run from **Ust-Luga in Russia to Greifswald in Germany** through the **Baltic Sea**, and will carry 55 billion cubic metres of gas per year.
- It is designed to **double Russia's gas exports to Germany.**



2. Falkland Islands
Argentina acknowledges Indian support for resolving Falklands dispute issue.

- Falklands remains the subject of a sovereignty dispute between Britain and Argentina, who waged a brief but bitter war over the territory in 1982.
- Location:** It is located in the south Atlantic Ocean off the coast of Argentina.



3. Tanzania (Capital: Dar es Salaam (administrative capital), Dodoma (legislative capital))
Samia Suluhu Hassan became the **first female President** of Tanzania.

- Tanzania, country in East Africa, **includes the islands of Zanzibar, Pemba, and Mafia.**
- Geographical features:** East African Rift System runs in two north-south-trending branches through mainland Tanzania.
 - Volcano:** Mount Kilimanjaro is the highest point in Africa.
 - Lakes:** Lake Victoria (the world's second-largest freshwater lake) in the north, Lake Tanganyika in the west, and Lake Nyasa in the southwest.



Updated Classroom Study Material

4. Turkmenistan (Capital: Ashgabat)
 In the aftermath of the Russia-Ukraine conflict, EU countries are looking towards Central Asian countries particularly Turkmenistan as an alternative for the supply of gas.

- **Political Boundaries:** Located in the southwest of the Central Asia region.
- **Geographical features:** Two broad divisions:
 - an **oasis region** having adequate water supply, cultivated lands,
 - a **desert region** occupying nine-tenths of Turkmenistan's territory.
- **River:** Amu Darya (ancient Oxus River), which flows along its north-eastern border toward the Aral Sea.
- Turkmenistan specializes in **cotton growing** and in the extraction of **oil and natural gas**.



5. Red Sea

- Red Sea is the **world's northernmost tropical sea** between **Asia and Africa**.
- Part of the **Great Rift Valley**, **Egypt, Sudan, Eritrea, Djibouti** lies on its Western Shore, and **Yemen and Saudi Arabia** lies on the Eastern Shore.
- Due to **high heat and lack of precipitation**, it has **high salinity**.
- It is part of **Global 200** ecoregions from World Wildlife Fund (WWF).



6. The Horn of Africa

The Horn of Africa is facing its worst drought in 40 years says the UN.

- **Political boundaries:** The Horn is home to **four Eastern Africa countries, Somalia, Ethiopia** (the largest country), **Djibouti, Eritrea**.
- **Geography:** Diverse land features, including the Somalian and Eritrean coast, Ogaden desert, and Ethiopian highlands.
- **Main rivers:** Nile and Juba–Shabelle river.



7. Turkey (Capital: Ankara)

- Turkey is a **large peninsula** that **bridges continents of Europe** (via. Eastern Thrace) and **Asia** (via. Anatolian Plateau).
- **Geographical Features:**
 - **Largest lake:** Lake van
 - **Main Rivers:** Euphrates, Kizilirmak and Sakarya
 - **Highest Peak:** Mt Ararat



2.10. MILITARY EXERCISES IN NEWS



Updated Classroom Study Material

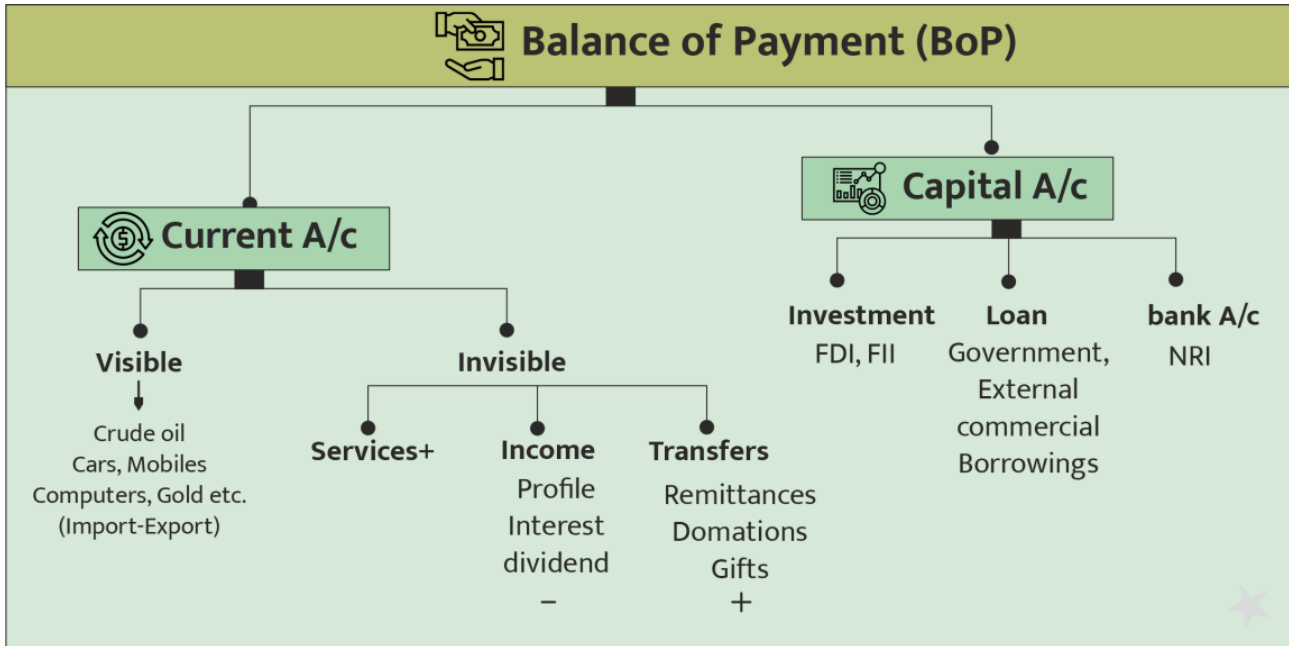
3. ECONOMY

3.1. FISCAL POLICY

3.1.1. CURRENT ACCOUNT DEFICIT (CAD)

Why in News?

In the December quarter of FY2022 India's Current Account Deficit (CAD) reached \$23 billion (2.7% of GDP), a nine-year high since the CAD touched \$31 billion during the December quarter of 2012.

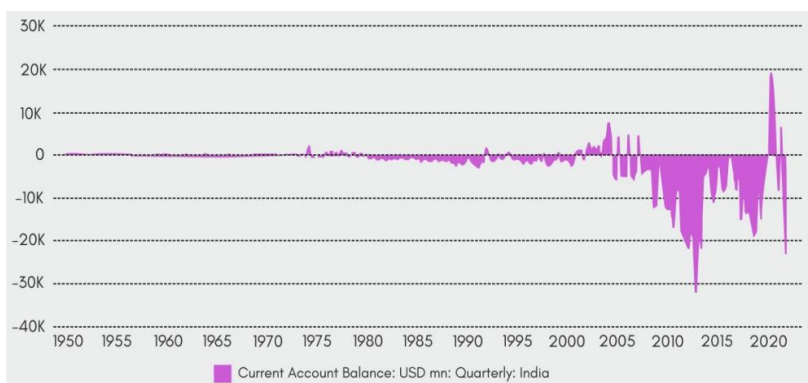


Current Account Deficit (CAD)

- The transactions in goods, services, and assets between residents of a country with the rest of the world for a specified time period, typically a year, are recorded by **Balance of Payments (BoP)**.
 - When viewed from the perspective of investment-savings dynamics, the current account can also be expressed as the difference between national (both public and private) savings and investment.
- CAD is one of the two main accounts in the **Balance of Payments (BoP)** recording exports and imports in goods and services and transfer payments of a country.
 - When exports exceed imports, there is a **trade surplus** and when imports exceed exports there is a **trade deficit**.
 - Transfer payments** are receipts received by the residents 'for free', without any present or future payments in return. It includes remittances, gifts and grants.
- Capital account** is the second account, recording all international purchases and sales of assets such as money, stocks, bonds, etc. for a specified time, usually a year.

India's CAD trend

- Recent trend:** In the last few years, it recorded few isolated quarters of **Current Account surplus** such as **Q1 of 2021-22** after more than a decade gap but failed to sustain it (see image).
- Trends in merchandise and services trade:** Behind the continued CAD of India is its **trade deficit in Merchandise Goods** as it has **trade surplus in services**, and it is the **world's largest recipient of remittances** (US\$ 87 billion).



Primary reasons behind India's CAD	Potential threats from increasing CAD
<ul style="list-style-type: none"> Increased domestic demand/consumer spending. Uncompetitive exports due to unfavorable policies, exchange rate or lack of essential goods exports. Increased Energy imports due to increasing demand and lower domestic production. Rise in Global Commodity Prices, especially high import commodities. 	<ul style="list-style-type: none"> Pull out of foreign institutional investors or limited capital flow. E.g., the Taper Tantrum of 2013. Costly macroeconomic adjustments due to free fall in currency exchange rate. Inflationary concerns leading to further reduction in domestic savings and consequently lower investments. Payment imbalances, leading to BoP crisis as observed in the Asian Financial Crisis (1997).

3.1.2. TAXATION ON VIRTUAL DIGITAL ASSETS

Why in News?

Taking account of the phenomenal increase in transactions in virtual digital assets, the government has provided for a specific tax regime on taxation of virtual digital assets in **Budget 2022-23**.

Proposed Taxation Framework on Virtual Digital Assets

Definition of Virtual Assets	Under clause 47A of the Section 2 of Income Tax Act the virtual digital assets means: <ul style="list-style-type: none"> any information or code or number or token (not being Indian currency or foreign currency), generated through cryptographic means or otherwise, by whatever name called, providing a digital representation of value exchanged with or without consideration, with the promise or representation of having inherent value, or functions as a store of value or a unit of account including its use in any financial transaction or investment, but not limited to investment scheme; and can be transferred, stored or traded electronically; a non-fungible token or any other token of similar nature, by whatever name called; The Central Government, by notification in the Official Gazette, may include or exclude any other digital asset from the definition of virtual digital asset.
Tax on income from virtual digital assets	To take effect from 1st April, 2022 , under Section 115BBH of the Income Tax Act, any income from transfer of any virtual digital asset shall be taxed at the rate of 30% . <ul style="list-style-type: none"> No deductions are allowed in respect of any expenditure or allowance while computing such income except cost of acquisition. Loss from transfer of virtual digital assets can't be set off against any other income. Gain from transfer of virtual digital assets is non-deductible. Gift of virtual digital assets is also proposed to be taxed in the hands of the recipient.
Payment on transfer of virtual digital asset	<ul style="list-style-type: none"> Effective from 01 July 2022, 1% TDS (Tax Deducted at Source) will be deducted under Section 194S on payment made above a monetary threshold in relation to transfer of virtual digital assets

Benefits of proposed Taxation Framework

- Dynamic Definition** to include or exclude any new virtual digital assets as and when needed.
- Steep tax rate** and **inability to offset losses** against any other sources of income will dissuade people from investment due to high volatility and speculative nature of income.
- Regulation over Digital Assets** to pave the way for classifying virtual digital assets as a separate asset class.
- Resource Mobilization** to generate additional revenues for growth and reduce the fiscal deficit.

3.1.3. OTHER DEVELOPMENTS AND CONCEPTS IN FISCAL POLICY

Asset Monetization	<ul style="list-style-type: none"> Recently, the government has set up a National Land Monetisation Corporation (NLMC) to fast-track monetization of land and non-core assets of public sector entities. Incorporated as a 100% Government of India owned entity, NLMC will have an initial authorized share capital of ₹5,000 crore and subscribed share capital of ₹150 crore.
Strategic Disinvestment	<ul style="list-style-type: none"> According to new guidelines released by Department of Investment and Public Asset Management (DIPAM), State government or public sector enterprises (PSEs) will not be allowed to buyout another PSU. <ul style="list-style-type: none"> Also, in strategic sectors, bare minimum presence of existing public sector commercial enterprises at holding company level will be retained under government control. Strategic disinvestment implies the sale of substantial portion of the Government shareholding of a central public sector enterprise (CPSE) along with transfer of management control.

Ways and Means Advances (WMA)	<ul style="list-style-type: none"> Considering COVID-19 related uncertainties, RBI had raised WMA limit in 2021. WMA was introduced in 1997 and the practice of issuing ad hoc Treasury Bills to replenish Central Government's cash balance was discontinued. Under RBI Act 1934, WMAs are temporary advances given by the RBI to Centre and States to tide over any mismatch in receipts and payments. <ul style="list-style-type: none"> Such advances are repayable within three months from the date of making that advance. Interest is charged at existing repo rate (rate at which RBI lends short-term money to banks). WMA is not part of the Fiscal Responsibility and Budget Management Act (FRBM) because they get paid within the year itself. Two types of WMA –special and normal <ul style="list-style-type: none"> Special WMA or Special Drawing Facility is provided against the collateral of the government securities held by the state. After the state has exhausted the limit of SDF, it gets normal WMA. The interest rate for SDF is one percentage point less than the repo rate. There is a State-wise limit for the funds that can be availed via WMA. These limits depend on factors such as total expenditure, revenue deficit and fiscal position of the State. <ul style="list-style-type: none"> Limits for WMA are decided by the government and RBI mutually and revised periodically.
Shrinkflation	<ul style="list-style-type: none"> Shrinkflation is basically a form of hidden inflation that involves reducing the size of a product while maintaining its sticker price. <ul style="list-style-type: none"> Rather than increase the price of a product, the company simply offers a smaller package for the same sticker price. Raising the price per given amount is a strategy employed by companies, mainly in the food and beverage industries, to stealthily boost profit margins.

3.2. BANKING AND MONETARY POLICY

3.2.1. STANDING DEPOSIT FACILITY (SDF)

Why in News?

In its **first bimonthly policy review (FY23)**, the **Monetary Policy Committee (MPC)** has introduced **Standing Deposit Facility (SDF)** as the floor in the **Liquidity Adjustment Facility (LAF) corridor**.

Standing Deposit Facility (SDF)

- SDF is a **liquidity management instrument** to absorb liquidity (deposit) from Scheduled Commercial banks (SCBs) **without any collateral/government securities** in return.
- It was first recommended in 2014 by the **Urjit Patel Committee**- 'Expert Committee to Revise and Strengthen the Monetary Policy Framework' as a tool to manage liquidity.
- From 2022, SDF will replace the **Fixed Rate Reverse Repo (FRRR)** as the **floor** of the **LAF corridor** and its interest rate will be 3.75%.
- Deposits under the SDF won't be eligible for the **Cash Reserve Ratio (CRR)** maintenance under **Section 42** of the **RBI Act, 1934**, but they will be an eligible asset for maintenance of the **Statutory Liquidity Ratio (SLR)** under **Section 24** of the **Banking Regulation Act, 1949**.

Benefits of SDF	Potential issues with SDF
<ul style="list-style-type: none"> Absorbing Surplus Liquidity from banks flushed with excess money at higher interest rates to control inflation. Strengthening Operating Framework of monetary policy by removing the binding collateral or government security constraint on the RBI. Restoration of the LAF corridor by narrowing the LAF width to 50 basis point. Increased discretion of banks to access SDF and MSF unlike other LAF tools such as repo/reverse repo which are available at the RBI discretion. 	<p>As a non-collateral open-ended instrument, it could lead to-</p> <ul style="list-style-type: none"> Arbitrage Opportunity for banks to deploy surplus liquidity with RBI via SDF rather than going for risks in lending to the private sector. Not a long-term instrument and needs to be supplemented by market related instruments like OMO during large capital net inflows to absorb durable liquidity. Potential issues of SDF in relation to impact on the balance sheet of RBI, impact on other instruments such as OMO and the Market Stabilization Scheme (MSS) etc.

Differences between the Terms associated with Liquidity Management

Differences between the Terms associated with Liquidity Management			
Term (Rate)*	Meaning	Collaterals	Function
Reverse Repo rate (3.35%)	It is the rate which RBI pays to SCBs to park their excess funds with RBI. (It is available at RBI's discretion.)	Yes (From RBI to Banks)	Tool to control inflation by absorbing liquidity.
Standing Deposit Facility (4.15%)	Newly introduced facility for SCBs to park their excess funds with RBI. (It is available at Bank's discretion)	No	Tool for liquidity management and financial stability .
Repo rate (4.40%)	It is the rate at which RBI lends money to SCBs.	Yes (From Banks to RBI)	Tool to regulate liquidity in the economy
Marginal Standing Facility or MSF (4.65%) * Subjects to changes by the MPC	It is a short-term borrowing window for SCBs to get overnight funds from RBI in case of serious cash shortage or the asset-liability mismatch. Its maximum limit is 2% of Banks Net Demand and Time Liabilities (NDTL).	Yes (From Banks to RBI)	Short-term loans from RBI to help SCBs.

3.2.2. BAD BANK

Why in news?

Chairman of the **National Asset Reconstruction Company Limited (NARCL)** (popularly known as India's Bad Bank) had to resign as the Reserve Bank of India (RBI) approval for his appointment did not arrive on time.

What is a Bad bank?

- The term '**bad bank**' may be used to represent any structure which enables a **segregation of performing assets from the non-performing**, either on- or off- balance sheet.
- **On-balance sheet models** are those where bad assets are placed in a **separate internal unit**. They help increase transparency and work as a **signalling mechanism** for the market, showcasing the **bank's commitment** to clean its balance sheet.
- The **off-balance sheet models**, on the other hand, can take the form of a **special-purpose entity structure**, wherein bad assets are **offloaded, securitized, and sold** to a diverse set of investors. Alternatively, the bad assets can be **shifted to an external asset management or reconstruction company (AMC/ARC)**.
- The latter model, though **complex and expensive**, ensures **maximum risk transfer** in comparison to the others.

India's Bad Bank

The plan to set up a bad bank in India was first announced in the **Union budget for FY22**. Two separate entities have been setup for the same: **National Asset Reconstruction Company Limited (NARCL)** and **India Debt Resolution Company Limited (IDRCL)**.

- **NARCL**: It has been set up to **aggregate and consolidate stressed assets** for their subsequent resolution. PSBs will maintain **51% ownership** in NARCL. NARCL will pay up to **15 per cent of the agreed value** for the loans in cash and the remaining 85 per cent would be **government-guaranteed security receipts**.

- The Gol's guarantee shall be **valid for five years** and can be invoked for **meeting the shortfall between the face value of the SR and the actual realization** upon resolution/liquidation. Additionally, the NARCL shall be liable to **pay an annual guarantee fee**.
- The NARCL is expected to **buy out Rs 2 lakh crore of bad assets over time**, about 45 per cent of what all ARCs (asset reconstruction companies) have **collectively acquired till March 2021 (about Rs 4.5 lakh crore)**.
- **IDRCL:** It will **manage the asset** and engage market professionals and turnaround experts. Public Sector Banks (PSBs) and Public FIs will hold a maximum of 49% stake and the rest will be **with private sector lenders**.

Relationship between two entities

- NARCL and IDRCL will have an exclusive arrangement that will be as per the scope defined in the **'Debt Management Agreement'** to be executed between these two entities. This arrangement will be on a **'Principal-Agent' basis** and **final approvals** and ownership for the resolution shall lie with **NARCL as the Principal**.
- So, even though IDRCL is majority-owned by private banks, the **final authority will rest with NARCL**, which is **majority-owned by public sector banks**. This has been done possibly to **address regulatory concerns** around the bad bank structure.

3.2.3. DIGITAL BANKING UNITS

Why in News?

Reserve Bank of India (RBI) released Guidelines on Establishment of Digital Banking Units (DBUs).

More on News

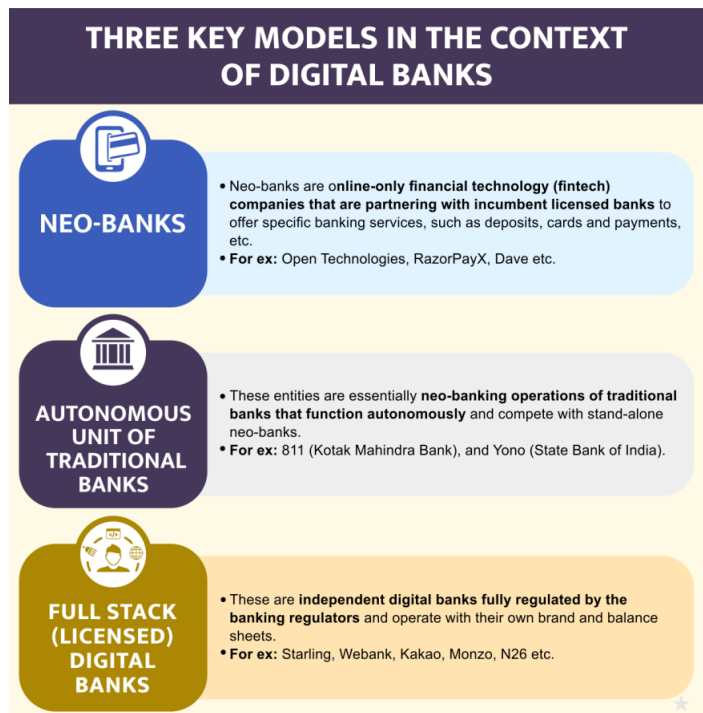
- This is part of the **announcement made in the Union Budget 2022-23** to set up 75 DBUs in 75 districts to commemorate the 75 years of independence of our country (Azadi ka Amrit Mahotsav).
- In pursuance of the budget announcement a **'Committee for establishment of Digital Banking Units (DBUs)'** was set-up by RBI to outline a roadmap for establishment of DBUs.
- **Based on the recommendations of the Committee**, the guidelines have been finalized by RBI.

Key features of RBI's guidelines on DBU's

What are DBUs?	<ul style="list-style-type: none"> ● DBUs are specialised fixed point business unit / hub housing certain minimum digital infrastructure for delivering digital banking products & services as well as servicing existing financial products & services digitally.
Who is permitted to start DBUs?	<ul style="list-style-type: none"> ● All scheduled commercial banks (except Regional Rural Banks, Payment Banks and Lead Area Banks) with past digital banking experience are permitted to open DBUs in Tier 1 to Tier 6 centres without having the need to take permission from the central bank in each case. ● These DBUs will be treated as Banking Outlets (BOs).
Infrastructure and resources	<ul style="list-style-type: none"> ● Each DBU shall be housed distinctly, with the separate entry and exit provisions. They will be separate from an existing BO with formats and designs most appropriate for digital banking users. ● Banks are free to adopt an in-sourced or out-sourced model for operations of the digital banking segment including DBUs.
Products and services	<ul style="list-style-type: none"> ● Each DBU should offer a certain minimum digital banking products and services such as ● Liability Products and services: Account opening, Digital Kit for customers and merchants etc. ● Asset Products and services: Making applications for and onboarding of customer for identified retail, MSME or schematic loans etc. ● Digital Services: Cash withdrawal and Cash Deposit only through ATM and Cash Deposit Machines respectively, Internet Banking Kiosk, Lodging of grievance digitally etc.
Other features	<ul style="list-style-type: none"> ● Banks will have the options to engage digital business facilitator /correspondents to expand the virtual footprint of DBUs. ● DBUs to offer hands-on customer education on safe digital banking products and practices for inducting customers to self-service digital banking services. <ul style="list-style-type: none"> ○ The district where the DBU is located will be the catchment area for the purpose. ● There should be adequate digital mechanism to offer real time assistance and redress customer grievances, directly or through Business Facilitators / Correspondents.

What are Digital Banks?

- Digital Banks principally **rely on the internet and other proximate channels to offer their services** (like deposits, extend loans), and not physical branches.
 - Globally, digital banking licenses go by different names: **‘virtual banks’ in Hong Kong, ‘internet-only banks’ in Korea and Taiwan** and **‘digital banks’ in Singapore.**
- It, essentially, **combines online and mobile banking services** under one umbrella.
 - **Online banking** means accessing banking features and services via your bank’s website from your computer.
 - **Mobile banking** means using an app to access many of those same banking features via mobile devices such as smartphones or tablets.
- Overall, **three key models emerge in context of digital banks**



3.2.4. OTHER DEVELOPMENTS AND CONCEPTS IN BANKING AND MONETARY POLICY

<p>Non-Banking Financial Company (NBFC)</p>	<ul style="list-style-type: none"> • RBI tightens Non-Banking Financial Company (NBFC) Lending and Disclosure Guidelines • It builds on the RBI’s scale-based regulations whereby NBFCs are graded into 3 layers. • Aggregate exposure of an upper layer NBFC to any entity must not be higher than 20% of its capital base, although the board can approve an additional 5%. <ul style="list-style-type: none"> ○ However, for infrastructure finance companies, the aggregate limit will be 30% to a single entity. • To a group of connected entities, aggregate exposure will be limited to 25% of the capital base for all upper layer NBFCs apart from infrastructure finance companies where it will be 35%. • Unless sanctioned by the board, mid-layer and upper layer NBFCs shall not lend more than Rs 5 crore to directors, CEO or relatives of directors. <ul style="list-style-type: none"> ○ They also cannot lend to any firm in which any of their directors or their relatives are interested as a partner, manager, employee or guarantor. • Loans can be provided to the real estate sector after the borrowers have obtained prior permission from the government or other statutory authorities for the project.
<p>Reserve Bank Innovation Hub (RBIH)</p>	<ul style="list-style-type: none"> • It has been inaugurated in Bengaluru. • Set up as a Section 8 company under Companies Act, 2013, with an initial capital contribution of Rs 100 crore. • RBIH aims to encourage and nurture financial innovation in a sustainable manner through an institutional set-up. <ul style="list-style-type: none"> ○ It creates an ecosystem that focuses on promoting access to financial services and products for the low-income population in the country. • Hub would bring convergence among various stakeholders (BFSI Sector, Start-up ecosystem, Regulators and Academia) in the financial innovation space.
<p>Nidhi Companies</p>	<ul style="list-style-type: none"> • Central Government Amends Nidhi Rules, 2014 • Key amendments <ul style="list-style-type: none"> ○ A public company set up as a Nidhi with share capital of Rs. 10 lakhs needs to first get itself declared as a Nidhi from Union government. Earlier, there was no such need for a company to get declaration. ○ Promoters and Directors of company have to meet the criteria laid down in rules. • About Nidhi company <ul style="list-style-type: none"> ○ Similar to a Non-Banking Financial Company, a Nidhi is formed to borrow and lend money to its members. It inculcates saving habits among its members and works on the principle of mutual benefit. ○ Not required to get an RBI licence but need approval under the Companies Act.

	<ul style="list-style-type: none"> ○ Ministry of Corporate Affairs regulates its operational matters and RBI has the power to issue directions for its deposit-taking activities. ○ Can't deal with chit funds, hire-purchase finance, leasing finance, insurance or securities business. It is strictly prohibited from accepting deposits from or lending funds to, any other person except members. ○ Only individual members are allowed in Nidhi companies.
Marginal Cost of Funds Based Lending Rate (MCLR)	<ul style="list-style-type: none"> ● State Bank of India has raised the MCLR for the first time in three years. ● MCLR instituted by RBI with effect from April 1, 2016. ○ It is the lowest interest rate that a bank or lender can offer. ○ It brings transparency in financial institutions while determining interest rates. ○ Calculated based on four components: marginal cost of funds, negative carry-on account of cash reserve ratio, operating costs, and tenor premium. ✓ Tenor means that the amount of time left for the repayment of a bank loan.
Counter-Cyclical Capital Buffer (CCCB)	<ul style="list-style-type: none"> ● Recently, the RBI had decided not to activate CCCB. ● The framework on CCCB was put in place by RBI in 2015. ● Following Basel-III norms, central banks specify certain capital adequacy norms for banks in a country. CCCB is a part of such norms and is calculated as a fixed percentage of a bank's risk-weighted loan book. ● Aim of CCCB regime is two-fold <ul style="list-style-type: none"> ○ It requires banks to build up a buffer of capital in good times which may be used to maintain flow of credit to the real sector in difficult times. ○ Restricting the banking sector from indiscriminate lending in the periods of excess credit growth that have often been associated with the building up of system-wide risk.
Core Banking System (CBS)	<ul style="list-style-type: none"> ● Government plans to bring the entire post office network (1.5 lakh) under CBS in 2022, allowing easier transfer of funds and interoperability with the banking network. ● CBS can be defined as a back-end system that processes banking transactions across the various branches of a bank. ● Currently, post offices provide savings account services and payments bank services through the India Post Payments Bank.

3.3. FINANCIAL SYSTEMS AND FINANCIAL MARKETS

3.3.1. DEVELOPMENT FINANCIAL INSTITUTIONS (DFIS)

Why in News?

With government backed **National Bank for Financial Infrastructure and Development (NaBFID)** to start operation from Q1 of FY23, **₹1 trillion** infrastructure lending target is set for the year.

More on News

- **NaBFID (HQ: Mumbai)** is established as a **Development Financial Institution (DFI)** under the National Bank for Financial Infrastructure and Development Act, 2021.
- It has **authorized share capital of ₹1 lakh crore**.
- RBI will regulate and supervise it as an **All-India Financial Institution (AIFI)** under **Sections 45L and 45N** of the **Reserve Bank of India Act, 1934**.
 - It will be the **5th AIFI** after **EXIM Bank, NABARD, NHB** and **SIDBI**.

DEVELOPMENT FINANCIAL INSTITUTIONS (DFIS)

MEANING

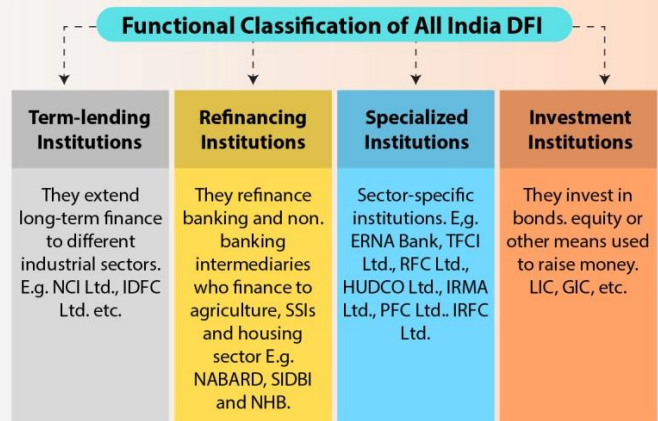
Also known as **Development Bank** or a **Development Finance Company**, DFI is an institution that provides **medium to long term project finance**.



CATEGORIES OF DFI'S

Based on the **Geographical Coverage of operation**, they are categorized into:

- All India DFIs,
- State DFIs, and
- Regional DFIs



FUNDING SOURCES OF DFI'S

- Government Grants,
- Borrowing from Government and RBI (e.g. DFIs use Long Term Operation)
- Loans from Multilateral Institutions such as World Bank
- Issuance of Bonds from DFIs (Banks can invest in them to meet SLR requirements).



Significance of DFIs

- **Financing:** They provide funds to projects from **Medium to Long Gestation periods**
- **Support Function:** Many DFIs provide managerial, and technical advice and consultancy to business firms.
- **Building Goodwill:** Loan from DFIs help companies in building goodwill, helping them to borrow from capital market and other sources as well.
- **Crisis Funding:** DFIs help companies even in crisis or times of recession when other sources are not available or have high costs attached.
- **Lesser Repayment Burden:** Through moratorium and easy repayment options for loan, the loan repayment burden on businesses is lesser than from other sources of funds.

3.3.2. CONCEPTS IN NEWS VIS-À-VIS THE EQUITY MARKETS

Co-location facilities	<ul style="list-style-type: none"> • There are dedicated spaces in National stock exchange building, right next to the exchange servers, where high-frequency and algo traders can place their systems or programs. • With the co-location facilities being extremely close to stock exchange servers, traders here have an advantage over other traders due to the improvement in latency. • It was in news because of unearthing of co-location facilities scam whereby a trading member was provided unfair access between 2012 and 2014 that enabled him to log in first and get the data before others.
Market Infrastructure Institution (MII)	<ul style="list-style-type: none"> • SEBI noted that National Stock Exchange (NSE), country's largest equities and derivatives exchange, was a systemically important MII. • Stock exchanges, depositories and clearing houses are all MIIs and constitute a key part of the nation's vital economic infrastructure. <ul style="list-style-type: none"> ○ MIIs provide infrastructure which is necessary for the smooth and uninterrupted functioning of the securities market. • Their systemically important nature was also highlighted by Jalan committee (2010) report stating MII's phenomenal growth in terms of market capitalisation of listed companies, capital raised and the number of investor accounts with brokers and depositories.
Employee Stock Ownership Plan (ESOP)	<ul style="list-style-type: none"> • ESOP is a type of employee benefit plan which is intended to encourage employees to acquire stocks or ownership in the company for which they are working. • It aimed at improving the performance of the company and increasing the value of the shares by involving stock holders, who are also the employees, in the working of the company. • It provides companies with tax benefits, thus incentivizing owners to offer them to employees.
Collective investment schemes (CIS)	<ul style="list-style-type: none"> • The Securities and Exchange Board of India (Sebi) has tightened the norms pertaining to CIS bringing them on a par with the mutual fund (MF) regulations and removed "regulatory arbitrage". • A CIS is an investment scheme where various individuals come together and pool their money in order to invest their whole fund collection in a particular asset. <ul style="list-style-type: none"> ○ The returns and profits arising from this investment would be shared as per the agreement finalised amongst the investors prior to the act. ○ Scheme by a co-operative society are not considered CIS.

3.3.3. BONDS IN NEWS

Zero-coupon bonds	<ul style="list-style-type: none"> • The Central Board of Direct Taxes has amended the Income Tax rules to allow infrastructure debt funds (IDFs) to issue zero-coupon bonds. • A zero-coupon bond is a debt security instrument that does not pay interest. • It is traded at deep discounts, offering full face value (par) profits at maturity. The difference between the purchase price of a zero-coupon bond and the par value indicates the investor's return. • Its value is inversely related to the rise in the interest rates.
Oil Bonds	<ul style="list-style-type: none"> • An oil bond is a promissory note issued by the government to the oil marketing companies (OMCs), in lieu of cash that government owes them. • Need - When fuel prices are high for consumers, government directs oil marketing companies (OMCs) to charge consumers less prices and the balance is to be paid by the government. • However, if government pays in cash, it would have to tax the same people to collect the money to pay.

Negative Yield Bond	<ul style="list-style-type: none"> Negative-yielding bonds are bonds that cause bondholders to lose money when they mature. Negative-yielding bonds are purchased as safe-haven assets in times of turmoil like Covid-19 disruption. This is because, in an era of extremely low interest rates, many large institutional investors accept a negative return on their investment for the safety and liquidity that high-quality government and corporate bonds offer.
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3.3.4. OTHER DEVELOPMENTS AND CONCEPTS IN FINANCIAL SYSTEMS AND MARKETS POLICY

Unified Payments Interface (UPI)	<ul style="list-style-type: none"> Indian travellers In UAE can now use Unified Payments Interface (UPI) for payments. NPCI International Payments Ltd (NIPL), an International arm of National Payment Corporation of India (NPCI) has announced that BHIM UPI is now available at NEOPAY terminals, across the UAE. <ul style="list-style-type: none"> Globally, UPI is accepted in Bhutan and Nepal (first foreign country to accept it), and is likely to go live in Singapore later 2022. UPI is an instant real-time payment system developed by NPCI facilitating inter-bank transactions. <ul style="list-style-type: none"> BHIM (Bharat Interface for Money), pioneered and developed by NPCI, enables fast, secure, reliable cashless payments through mobile phone. UPI Lite: It is a new UPI service from NPCI which will allow making faster near real-time small value payments without an internet connection via the money added in the wallet with an Upper limit of Rs 200 and total limit of UPI Lite balance of Rs 2,000.
Central Bank Digital Currency (CBDC)	<ul style="list-style-type: none"> CBDC, or Central Bank Digital Currency, is a digital form of currency issued by the Central Bank of a country. It is pegged to the value of that country's fiat currency and adds digital form to existing physical form of bank note (Finance Bill 2022). <ul style="list-style-type: none"> Under the RBI Act (1934), RBI has the sole right to issue bank notes in India. Only coins, under the Coinage Act (2011) and ₹1 note are issued by central government.

3.4. EXTERNAL SECTOR

3.4.1. GLOBAL BOND INDICES

Why in News?

India's inclusion in the global bond indices pushed ahead as the Union Budget 2022-23 remained silent on necessary reforms due to rising economic fragmentations and other risks.

Global Bond Indices

- Global Bond Indices are the **indices** representing the **market value-weighted measure** of the public debt of investment grade sovereign issuers, issued, and denominated in their own market and currency.
- These are **multi-currency benchmarks** tracked by global benchmark providers with factors such as **liquidity, ratings, capital controls, tax and market access** deciding the inclusion.
- Globally, there are **three main bond indices** and India is not part of any of these indices due to reservations on factors such as:
 - Capital controls** which make India a **partially convertible capital account country.**
 - Challenges of **taxes and market access.** E.g., the capital gain tax and the foreign ownership limit of 9% in domestic bonds. These constraints hinder India's participation in such markets.

Capital Controls in India

- Capital controls are the direct or administrative and indirect or market-based measures from government or central bank to **regulate the inflow and outflow** of foreign capital. It includes:
 - Control measures such as **taxes, tariffs, volume limits or outright legislation.**
 - Time durations such as **short-term, medium-term or long-term.**
- They can be applied to the **whole economy, be sector specific or industry-specific**, leading to different impacts on various asset classes.
- Used as **prudent measures** by some countries, it prevents the **mass exodus** or entry of capital which might cause fluctuations in currency, bonds or equity.
- India has been reducing capital controls gradually since the 1990s. Recently, RBI proposed **Fully Accessible Route (FAR)** to liberalize **FPIs** debt flows in specified benchmark securities by removing limits on non-resident investment.

Benefits of India's Inclusion in Global Bond Indices	Concerns/challenges in India's inclusion
<ul style="list-style-type: none"> • Increase Indian Bond market Investor Base by promoting participation from Foreign Portfolio Investors (FPIs). • Increase Liquidity with likely \$170-250 billion of bond inflows over the next decade, increasing depth of bond markets and reducing deficit. • Increase Indian Bond Prices and reduce the borrowing costs. • Reduce pressure on banks to absorb government securities. • Build Goodwill among FPIs by lowering of regulatory constraints, helping to raise money for infrastructure. • Benefit for Investors as India is the 2nd highest stock of outstanding government securities. 	<ul style="list-style-type: none"> • Structural Challenges such as capital gain tax as investors want Indian bonds on international clearing platforms such as Euroclear to settle securities transactions and Euroclear demands tax exemptions to avoid compliance issues. • Limited Capital Flow: Unlike China who benefitted from it with Chinese Yuan as part of IMF Special Drawing Rights (SDRs), Indian rupee is not part of it, limiting likely reserve flows. • Increased Power of Rating Agencies: Higher capital flow in bonds will increase the risk of capital flight and currency volatility in the event of rating downgrades. • Exports Challenge: It favors the domestic sector at the cost of exporters as rupee below 70 against US dollar will hurt India's export competitiveness.

3.4.2. OTHER DEVELOPMENTS AND CONCEPTS IN THE EXTERNAL SECTOR

Foreign Exchange Management (Non-debt Instruments) (Amendment) Rules, 2022	<ul style="list-style-type: none"> • New rules allow foreign investment of up to 20 per cent in LIC and other such corporate bodies. <ul style="list-style-type: none"> ○ Presently, the foreign inflows' ceiling for public sector banks is 20 per cent under government approval route. • Foreign Exchange Management Act (FEMA), 1999, under Finance Ministry, consolidates and amend laws relating to foreign exchange for facilitating external trade and payments and for maintenance of foreign exchange market in India. • It replaced the Foreign Exchange Regulation Act (FERA) and extends to whole of India
RNOR (Resident but Not Ordinarily Resident)	<ul style="list-style-type: none"> • It is a class of residential status under the Income-tax law. RNOR represents a person who does not qualify as an ordinary resident. • It includes person who <ul style="list-style-type: none"> ○ Spends over 120 but less than 182 days, and ○ Earns ₹15 lakh or more from assets in India.
Export Import (Exim) Bank	<ul style="list-style-type: none"> • Exim Bank plans to raise around \$3 billion in 2022-23 (FY23) via overseas bonds to support fresh lending and refinance a portion of the old debt. <p>About EXIM</p> <ul style="list-style-type: none"> • Established by the Government of India, under the Export-Import Bank of India Act, 1981. • It extends Lines of Credit (LOCs) to overseas financial institutions, regional development banks, sovereign governments, and other entities overseas. • Objective of the bank is to enable buyers in those countries to import developmental and infrastructure projects, goods and services from India, on deferred credit terms.
WTO Global Trade Model (GTM)	<ul style="list-style-type: none"> • World Trade Organization (WTO), based on its GTM, has lowered its 2022 global trade forecast to 3 percent, from 4.7 percent, due to ongoing conflict between Russia and Ukraine. <ul style="list-style-type: none"> ○ The WTO GTM can be used to generate global trade projections and to assess the medium and long run effects of a wide range of global and national trade policies. • WTO, established in 1995, is the only global international organization dealing with the rules of trade between nations.

3.5. LABOUR, EMPLOYMENT, SKILL DEVELOPMENT AND ENTREPRENEURSHIP

3.5.1. DEVELOPMENTS AND CONCEPTS IN LABOUR, EMPLOYMENT, SKILL DEVELOPMENT AND ENTREPRENEURSHIP

Airport as Venue for Skilled Artisans of The Region (AVSAR) scheme	<ul style="list-style-type: none"> • Recently, AVSAR scheme was launched by the Airport Authority of India (AAI). • Objective is to allocate space to Self Help Groups at its airports for selling or showcasing products of their region. • The space at each AAI operated airport will be allotted to the self- help groups, turn on turn basis, for a duration of 15 days.
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<p>'Ambedkar Young Entrepreneur-Mentor'</p>	<ul style="list-style-type: none"> Objective is to assist entrepreneurs belonging to SCs and OBCs who are unable to take advantage of the venture capital fund (VCF) scheme devised for them by Ministry of social justice and empowerment. <ul style="list-style-type: none"> VCF for SCs and OBCs was launched under the Social Sector Initiatives to promote entrepreneurship among the scheduled castes and to provide concessional finance to them. Under the scheme, the VCF manager, will empanel established businessmen or head of companies or veterans of banking and financial institutions, as 'mentors' who will help the 'mentees' in building prototypes and in investment advice.
<p>Special Entrepreneurship Promotion Drive for Women - "SAMARTH"</p>	<ul style="list-style-type: none"> Launched by Minister of Micro, Small & Medium Enterprises, it aims to provide women an opportunity to be self-reliant and independent by undertaking self-employment opportunities. Under Samarth, following benefits will be available to women entrepreneurs: <ul style="list-style-type: none"> 20% Seats in free Skill Development Programs will be allocated for Women. Special Drive for registration of women-owned MSMEs under Udyam Registration. 20% of MSME Business Delegations sent to exhibitions under schemes for Marketing Assistance will be dedicated to women owned MSMEs.

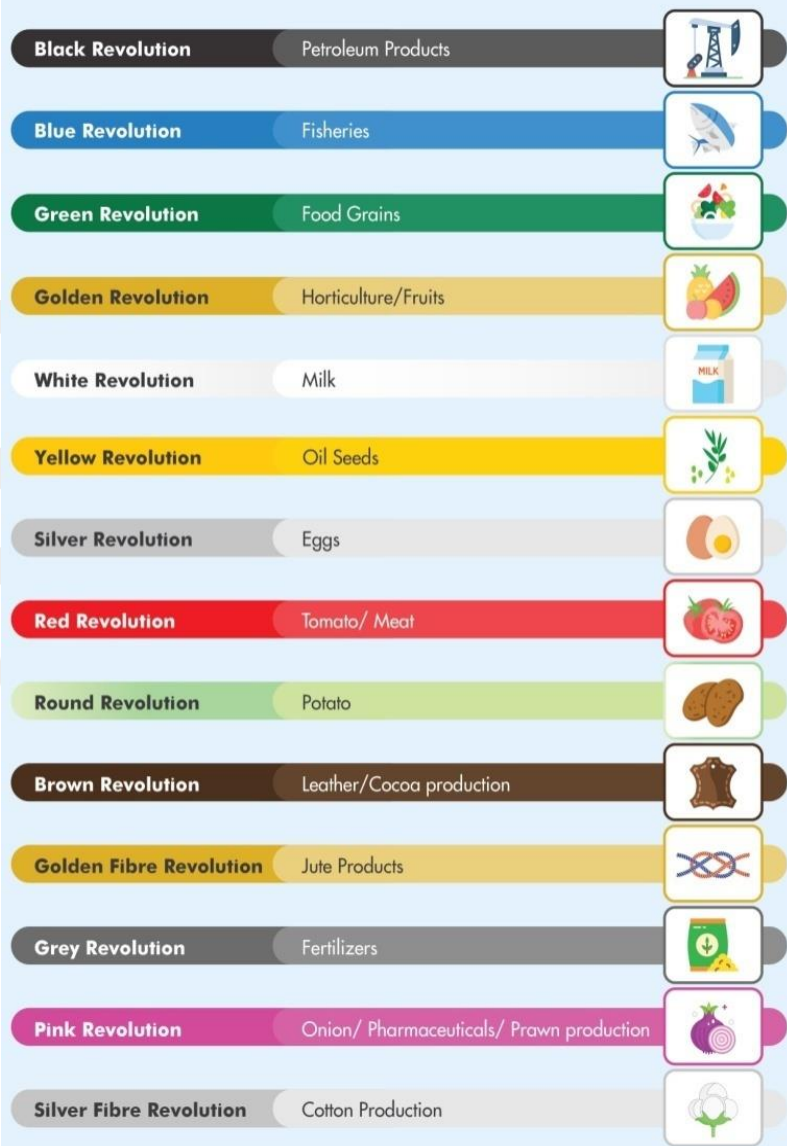
3.6. AGRICULTURE

3.6.1. ALLIED SECTOR

3.6.1.1. LAVENDER CULTIVATION

- Lavender Cultivation under CSIR-IIIM's Aroma Mission in Ramban was recently done as part of Purple Revolution.
- Purple or Lavender Revolution was launched by the Ministry of Science & Technology through the Council of Scientific & Industrial Research's (CSIR) Aroma Mission, which aimed at increasing lavender cultivation in Jammu and Kashmir.
 - Lavender cultivation is practiced in almost all the 20 districts of J&K.
 - However, the crop is native to Europe.
- Lavender water, which separates from lavender oil, is used to make incense sticks. Hydrosol, which is formed after distillation from the flowers, is used to make soaps and room fresheners.
- Aroma Mission is envisaged to bring transformative change in the aroma sector through desired interventions in the areas of agriculture, processing and product development for fuelling the growth of aroma industry and rural employment.

IMPORTANT REVOLUTIONS & ITS RELATED SECTORS



3.6.1.2. SAFFRON BOWL PROJECT

- Efforts are being made by North East Centre For Technology Application & Reach (NECTAR) to expand saffron bowl of India (earlier confined to Kashmir) to parts of the North East.

- NE saw the successful cultivation of saffron for the first time in **Yangang village of South Sikkim**.
- **About Saffron bowl project:**
 - Under the project NECTAR has identified **few locations in Arunachal Pradesh and Meghalaya** for saffron cultivation.
 - Sites identified in Meghalaya under the said project are **Barapani, Cherrapunji, Mawsmoi, Shillong, and Lalingtop**.

3.6.2. OTHER DEVELOPMENTS AND CONCEPTS IN AGRICULTURE SECTOR

International Crops Research Institute for The Semi-Arid Tropics (ICRISAT)	<ul style="list-style-type: none"> ● PM started 50th Anniversary Celebrations of ICRISAT. <ul style="list-style-type: none"> ○ He also inaugurated ICRISAT’s Climate Change Research Facility on Plant Protection and ICRISAT’s Rapid Generation Advancement Facility. ● ICRISAT, founded in 1972, is a non-profit, non-political organization that conducts agricultural research for development in the drylands of Asia and sub-Saharan Africa. <ul style="list-style-type: none"> ○ It is headquartered in Hyderabad, Telangana with two regional hubs (Nairobi, Kenya and Bamako, Mali) and country offices in Niger, Nigeria, Zimbabwe, Malawi, Ethiopia and Mozambique.
‘J Form’	<ul style="list-style-type: none"> ● Punjab will be the first state in the country to provide “digitized form J” in real-time to farmers from this Rabi procurement season. ● ‘J form’ is the sale receipt of a farmer’s agricultural produce in mandis (grain market) which acts as an income proof for a farmer who sells his crop. <ul style="list-style-type: none"> ○ These forms were earlier issued manually by arthiyas (commission agents). ○ It can be used for raising finance, IT waivers, subsidy claims, farmers’ insurance etc. ○ It will act as a record of land under cultivation for both the wheat and paddy crops in state. ● J Forms can also be stored in DigiLocker.

3.7. INDUSTRY AND ASSOCIATED ISSUES

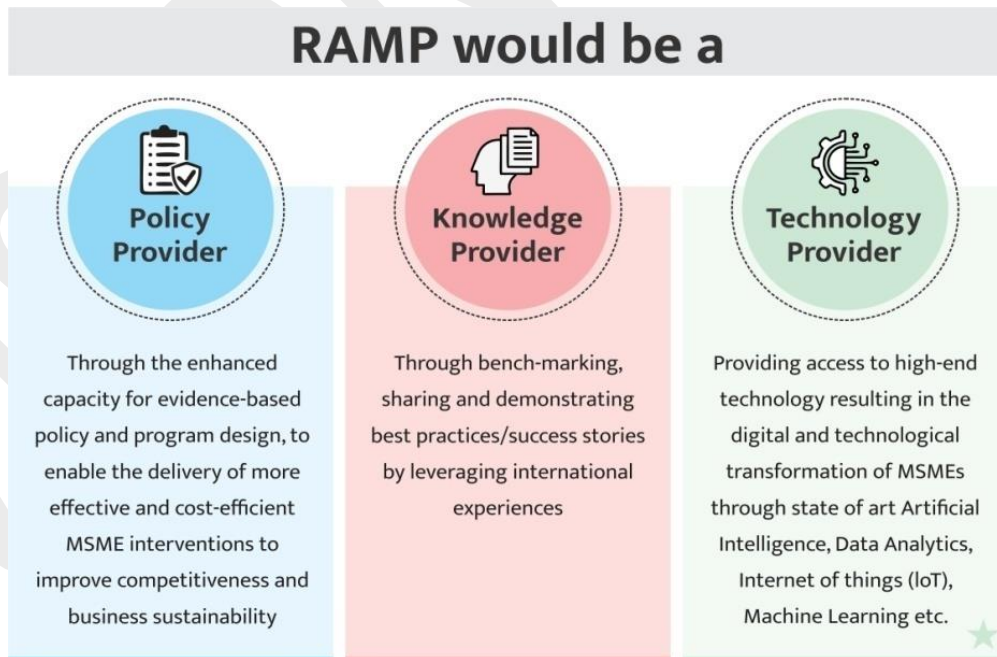
3.7.1. MICRO, SMALL & MEDIUM ENTERPRISES (MSMES)

Why in news?

The Union Cabinet has approved a World Bank assisted Central Sector Scheme “Raising and Accelerating MSME Performance” (RAMP).

About the Scheme

- The scheme is being launched under the Ministry of Micro, Small and Medium Enterprises (MoMSME) for



supporting various COVID-19 Resilience and Recovery Interventions.

- It was formulated and proposed by the Government of India, for strengthening MSMEs in line with the recommendations made by **U K Sinha Committee, KV Kamath Committee** and Economic Advisory Council to the Prime Minister (PMEAC).
- **Aim:**
 - Improving **access to market and credit, strengthening institutions** and governance at the Centre and State.
 - **Improving Centre-State linkages** and partnerships.
 - Addressing issues of delayed payments and greening of MSMEs.

- **Outlay:** The total outlay for the scheme is Rs.6,062.45 crore out of which **Rs.3750 crore would be a loan from the World Bank** and the remaining Rs.2312.45 crore Million would be funded by the Government of India (GoI).

About MSMEs

- In India they are defined/classified as follows

MSMEs definition in India			
Classification	Micro	Small	Medium
Manufacturing Enterprises and Enterprises rendering Services	Investment in Plant and Machinery or Equipment: Not more than Rs.1 crore and Annual Turnover; not more than Rs. 5 crore	Investment in Plant and Machinery or Equipment: Not more than Rs.10 crore and Annual Turnover; not more than Rs. 50 crore	Investment in Plant and Machinery or Equipment: Not more than Rs.50 crore and Annual Turnover ; not more than Rs. 250 crore ★

- **Economic contribution:**
 - It contributes: **Close to 1/3rd of the Indian GDP.**
 - **It employs largest employer after agriculture.**
- However, their viability remains questionable due to various chronic and modern challenges:
 - 5,907 businesses registered with the Union Ministry of MSME as MSMEs were shut during financial years 2020-21 and 2021-22 (till March 9, 2022) in the country. Of this. **99.1 per cent were micro enterprises**, 0.75 per cent were small businesses.
 - This number could be **higher if one takes into account entities that are not registered as MSMEs.**

Related news

Ministry of Micro, Small & Medium Enterprises launched MSME Innovative Scheme (Incubation, Design and IPR)

- The scheme is a holistic approach that **combines innovation in incubation, design intervention and protect IPR** to create awareness amongst MSMEs about India’s innovation and motivate them to become MSME Champions.
 - **CHAMPIONS (Creation and Harmonious Application of Modern Processes for Increasing the Output and National Strength)** is basically for making the smaller units big by helping and handholding, in particular, by solving their problems and grievances.

• **Details of MSME Innovative Scheme**

Incubation	<ul style="list-style-type: none"> • Objective: To promote and support untapped creativity and to promote adoption of latest technologies in MSMEs. • Financial assistance: Up to Rs. 15 lakh per idea and up to Rs. 1.00 crore for relevant plant and machines.
Design	<ul style="list-style-type: none"> • Aim: To provide expert advice and cost-effective solution on real time design problems for new product development, its continuous improvement and value addition. • Financial assistance: Up to Rs. 40 lakh for design project and up to Rs. 2.5 lakh for student project.
IPR (Intellectual Property Rights)	<ul style="list-style-type: none"> • Objective: To improve the IP culture in India with a view to enhance the awareness of IPRs amongst the MSMEs. • Also aims to take suitable measures for the protection of ideas, technological innovation and knowledge-driven business strategies developed by MSMEs. • Financial assistance will be provided for Foreign Patent, Domestic Patent, GI Registration etc.

3.7.2. SEMICONDUCTOR MANUFACTURING IN INDIA

Why in news?

The Ministry of Electronics and Information Technology (MeitY) announced the formation of an **advisory committee** to steer and guide the government’s Rs 76,000 crore **semiconductor mission**.

More about news

- The Committee will be **chaired by the Minister of MeitY** with members from Government, industry and academia. The Minister of State (MeitY) will be the Vice-Chairperson.
- To develop a sustainable **semiconductor and Display ecosystem** in India, committee shall provide **key inputs** for-
 - Building a **resilient supply chain**, promoting investments,
 - **Financing mechanisms**, global engagement,
 - **Research & innovation**, and intellectual property generation for the semiconductors etc.



About Semiconductor

- A Semiconductor can be defined as a material that has the **characteristics and ability to conduct a small amount of electrical current**.
 - **Basic Electronic Components** such as Diodes, transistors, and many photovoltaic cells contain **semiconductive materials**.
- The **electrical conductivity** of a semiconductor device **can be controlled** over a wide range, either permanently or dynamically. The basic requirement of a semiconductor is that it should **not be a very good conductor of electricity, nor should it be a very bad conductor** of electricity.
- Semiconductors works due to **imbalance of electrons** that carry negative charge. This imbalance of electrons **generates positive charges** (WHERE THERE ARE EXCESS PROTONS) and **negative charges** (WHERE THERE ARE EXCESS ELECTRONS) at two **ends of surfaces** of the semiconductor material.

3.7.3. PRODUCTION-LINKED INCENTIVE (PLI) SCHEME

Why in news?

NITI Aayog has commenced work on evolving a set of **objective criteria to track value addition** by companies which avail financial rewards under **Production-Linked Incentive (PLI) scheme**.

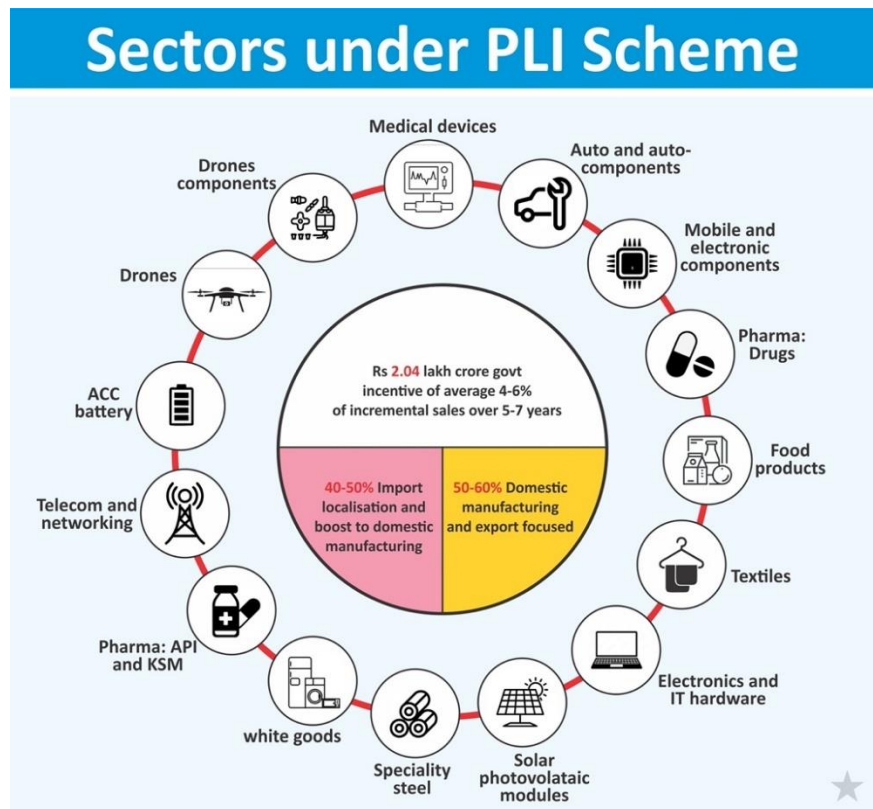
More about news

- NITI Aayog plans to rope in an external agency (state-owned IFCI Ltd or SIDBI) to **design and prepare the database** that will capture **value addition, actual exports** against commitments made, and **job creation**.
- The government has also planned to **undertake a two-stage review** of the PLI scheme, where its **progress and implementation** across various sectors will be discussed.

About PLI scheme

- PLI are essentially **the incentives** to companies to **boost product**. They could be in the form of **tax rebates, import and export duty concessions**, or maybe easier **land-acquisition terms**.
- PLI schemes were first introduced in **India in March 2020**, targeting **three industries** – **mobile manufacturing** and electric components, **pharmaceutical** (critical key starting materials/active pharmaceutical ingredients), and **medical device manufacturing**.
- The PLI concept has **since been expanded** with schemes rolled out for multiple sectors and is currently **operational for 15 sectors** such as electronics and mobile manufacturing, solar equipment, pharmaceuticals, medical devices, automobiles and auto components, among others.
- The government has set **aside Rs 1.97 lakh crore** under the PLI schemes for various sectors and an **additional allocation of Rs 19,500 crore** was made towards PLI for solar PV modules in **Budget 2022-23**.

- The incentive amount offered **varies across sectors** and the savings generated from PLI of one sector can be **appropriated towards other sectors** in order to maximize returns.
- The incentives, calculated on the **basis of incremental sales**, range from as low as **1 per cent** for the electronics and technology products to as high as **20 per cent** for the manufacturing of critical key starting drugs and certain drug intermediaries.
- In some sectors such as advanced chemistry cell batteries, textile products and the drone industry, the incentive to be given will be calculated on the basis of **sales, performance and local value addition** done over the **period of five years**.



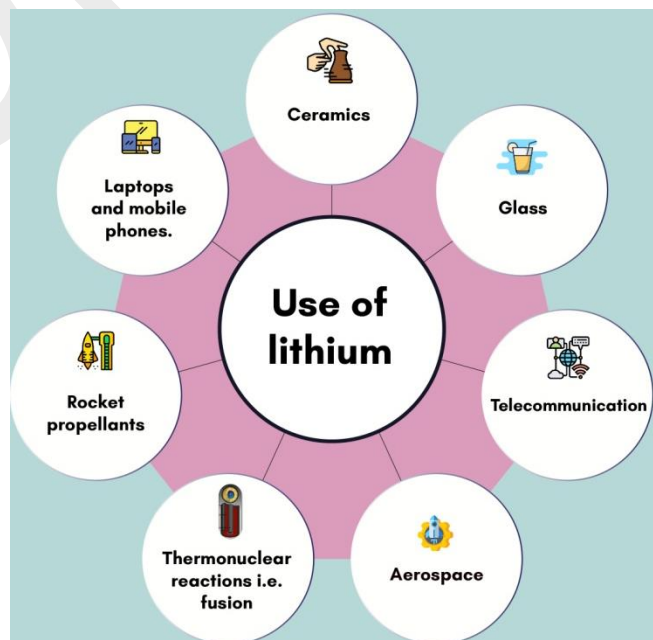
3.7.4. LITHIUM SUPPLY

Why in news?

Lithium has been among the **most sought-after mineral** during the past few years, largely on the back of its usage in battery manufacturing.

About Lithium supply

- **Global Production and Demand:** Lithium is currently produced from **hard rock or brine mines**. **Australia** is the **world's biggest supplier**, with production from **hard rock** mines. **Argentina, Chile and China** are mainly producing it from **salt lakes**.
 - Total global production, measured as **lithium carbonate equivalent**, was forecast in December 2021 at 485,000 tonnes which will grow to **821,000 tonnes in 2023**.
 - Overall, the global lithium battery market is **projected to grow substantially** in coming years, from 30 billion U.S. dollars in 2017 to over **100 billion U.S. dollars by 2025**.
 - GLOBAL PRODUCTION HAS SO FAR NOT FULFILLED THE GLOBAL DEMAND, causing a global **supply shortage** of the metal.
- **Lithium in India:** The ancient igneous rock deposits in the **Karnataka's Mandya district** holds the **first traces of Lithium ever to be discovered** in India. The preliminary find is relatively small: a mere 1,600 tonnes of lithium deposits.
 - The presence in Mandya's rocks is also **mere inference** at this point, with **mining and extraction many months away**.



- India currently **imports all its lithium needs**. Over **165 crore lithium batteries** are estimated to have been imported into India between 2016-17 and 2019-20 (up to November 30, 2019), at an estimated **import bill of upwards of \$3.3 billion**.

3.7.5. OTHER DEVELOPMENTS AND CONCEPTS IN INDUSTRY

Mining Sector	<ul style="list-style-type: none"> Recently, mining of new minerals opened up to reduce import dependence. Union Cabinet approved the proposal of Ministry of Mines for amendment of Second Schedule of the Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act) for specifying rate of royalty in respect of Glauconite, Potash, Emerald, Platinum Group of Metals (PGM), Andalusite, Sillimanite and Molybdenum. <ul style="list-style-type: none"> Glauconite and potash are used as fertilizers in agriculture. The platinum group of metals and andalusite and molybdenum are high-value minerals, which find use across different industries. Royalty is not a tax. It is the rent of the land on which the mine is situated or the price of privilege of winning minerals from the land parted by the government.
Footwear and Leather Sector	<ul style="list-style-type: none"> Recently, the Government has approved continuation of Indian Footwear and Leather Development Programme (IFLDP) till 2026. IFLDP (earlier Indian Footwear Leather and Accessories Development Programme (IFLADP)) aims at development of infrastructure for leather sector, address environmental concerns specific to leather sector, facilitate additional investments, employment generation and increase in production. <ul style="list-style-type: none"> Leather industry in India accounts for around 13% of the world's leather production of hides/skins. India accounts for 9% of the world's footwear production.

3.8. SERVICES SECTOR

3.8.1. OPEN NETWORK FOR DIGITAL COMMERCE (ONDC)

Why in News?

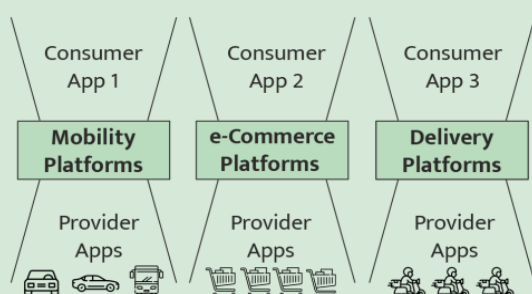
Recently, Department of Promotion of Industry and Trade (DPIIT) launched the pilot phase of open network for digital commerce (ONDC).

More on News

- The pilot **aims to test end-to-end transactions on the ONDC architecture** across different platforms, including ordering, payment, and delivery.
- This will be done across five cities — Delhi, Bengaluru, Coimbatore, Bhopal, and Shillong. Thereafter, it will be scaled up and launched in 100 cities over a period of six months.

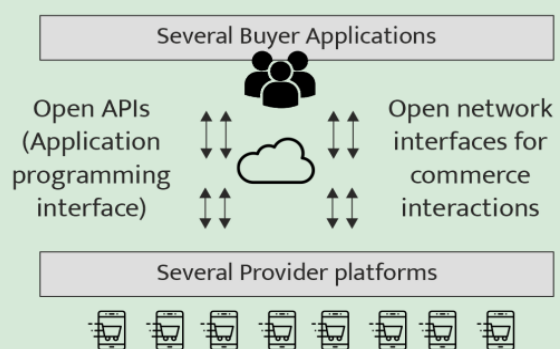
GOVT HOPES TO REPLICATE UPI MODEL'S SUCCESS

Existing: Platform-Centric Model



In the current platform-centric digital commerce model, buyers and sellers must use the same platform/application to do a business transaction

Future: Open Network Model



In ONDC's network-centric model, buyers and sellers can transact no matter what platform/ application they use through an open network

About open network for digital commerce (ONDC)

- It is aiming at **promoting open networks for all aspects of exchange of goods and services** over digital or electronic networks.
- ONDC **goes beyond the current platform-centric digital commerce model** where the buyer and seller have to use the same platform or application to be digitally visible and do a business transaction
 - So under ONDC, a buyer registered on Amazon, for example, may directly purchase goods from a seller who sells on Flipkart.
- ONDC is to be **based on open-sourced methodology**, using open specifications and open network protocols independent of any specific platform.
- ONDC project is **modelled around the Unified Payments Interface (UPI) project** to ensure that buyers and sellers of goods in the e-commerce market can transact regardless of the platforms on which they are registered.
 - UPI project **allows people to send or receive money irrespective of the payments platforms** on which they are registered.
- It is an **initiative of DPIIT** under the Ministry of Commerce and Industry. **Quality Council of India will provide the integration** of the e-commerce platform for it.

What does open-source mean?

- To make a process or software 'open source' implies that the **technology or code deployed for the process is freely made available for everyone** to use, redistribute, and modify.
 - For instance, while the **operating system of iOS is closed source** (it cannot be legally modified or used), the **android operating system is open source, making it possible** for smartphone manufacturers, such as Samsung, Nokia, Xiaomi, etc., **to modify it** for their respective hardware.

3.9. INFRASTRUCTURE SECTOR

3.9.1. MULTIMODAL LOGISTICS PARKS

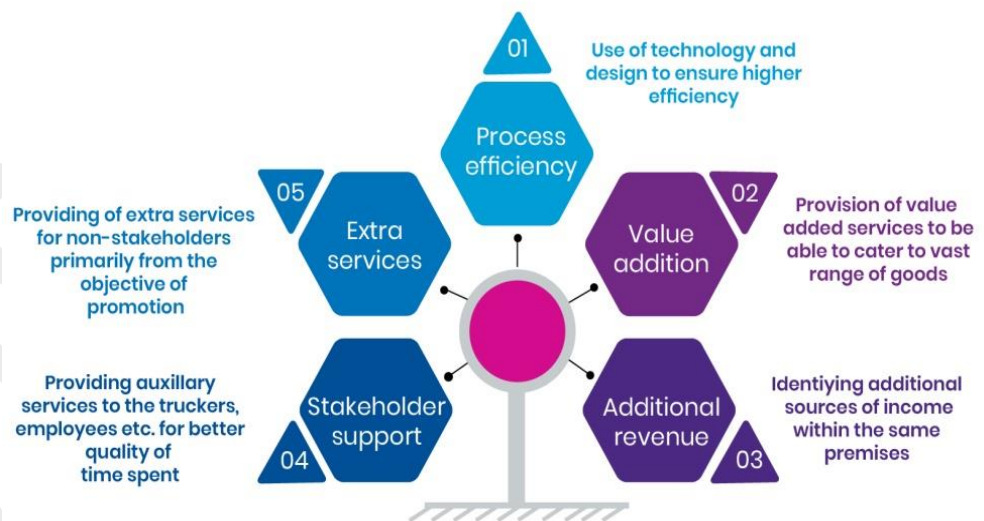
Why in news?

Finance Minister announced that contracts for implementation of Multimodal Logistics Parks at four locations through PPP mode will be awarded in 2022-23.

More on news

- 100 PM Gati-Shakti Terminals** for multimodal logistics facilities will be developed during the **next three years**.
- The data exchange among all mode operators** will be brought on a **Unified Logistics Interface Platform**, designed for Application Programming Interface.
- This will provide for efficient movement of goods through different modes, reducing logistics cost and time, assisting just-in-time inventory management, and in eliminating tedious documentation.

Characteristics of modern MMLPs



Background

- The MMLPs to be set up under the **Logistics Efficiency Enhancement Program**.
 - LEEP was proposed in 2015 under the Ministry of Road Transport and Highways (MoRTH) to improve India's logistics efficiency
- The MoRTH and the National Highways Authority of India (NHAI) are planning to establish a total of **35 MMLPs across the country** over the next few years.

- The government has invited **Asian Development Bank (ADB)** to provide the necessary support as a lead partner.
- The first MMLP would be constructed in Assam, a project of US\$ 407 million.

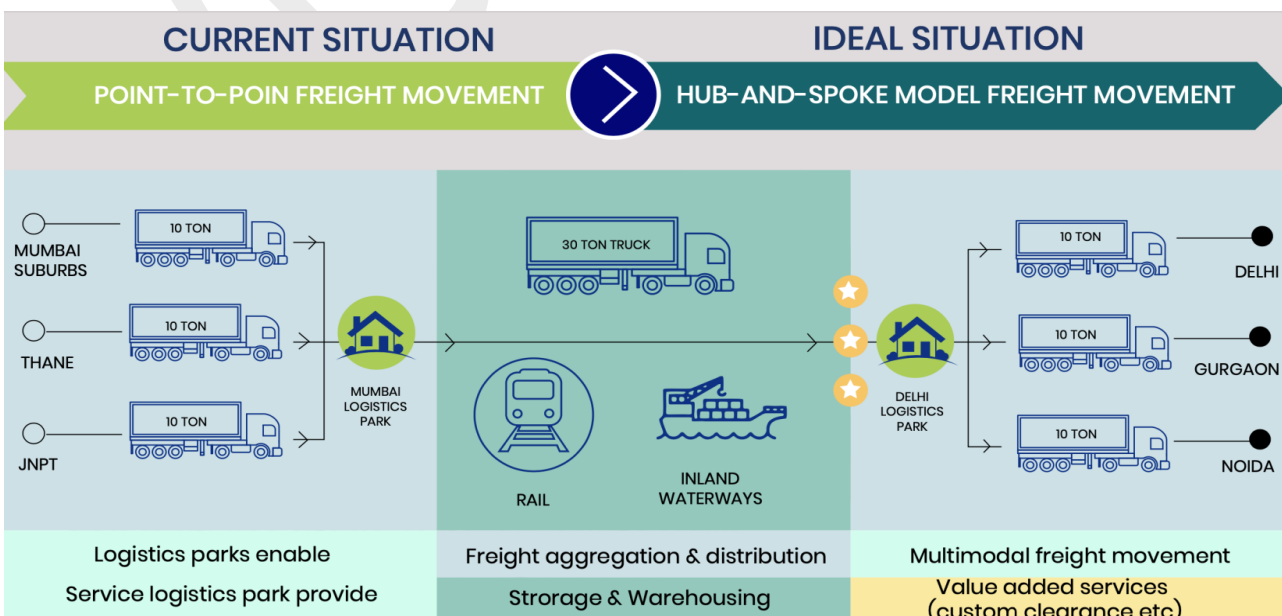
About MMLP

- A Multi-Modal Logistics Park (MMLP) as an **inter-modal freight-handling establishment** comprising warehouses, dedicated cold chain facilities, freight or container terminals and bulk cargo terminals eases and optimizes merchandise movement via road, rail, waterway and air, consequently, rationalizes the cost of logistics and improves the competitiveness of logistics.
- **Need:** There are inefficiencies and limitations in connection with modal transportation mix, material handling infrastructure and fleet combination. Also, there are operational constraints present due to the existing obsolete service model and disintegrated institutional mechanism. The MMLPs can address them and facilitate logistics movement.

LOGISTICS COST DISTRIBUTION

About Logistics

- Logistics is a support activity **connecting the production and consumption centres** of the economy.
- **India's logistics cost is 14% approximately. In developed economies** such as the US, logistics cost accounts for **only 8%–10% of GDP.**
- India suffers **clogged transport networks**, a skewed mix of transport modes, insufficient storage and handling facilities for in-transit commodities, and regulatory hurdles.



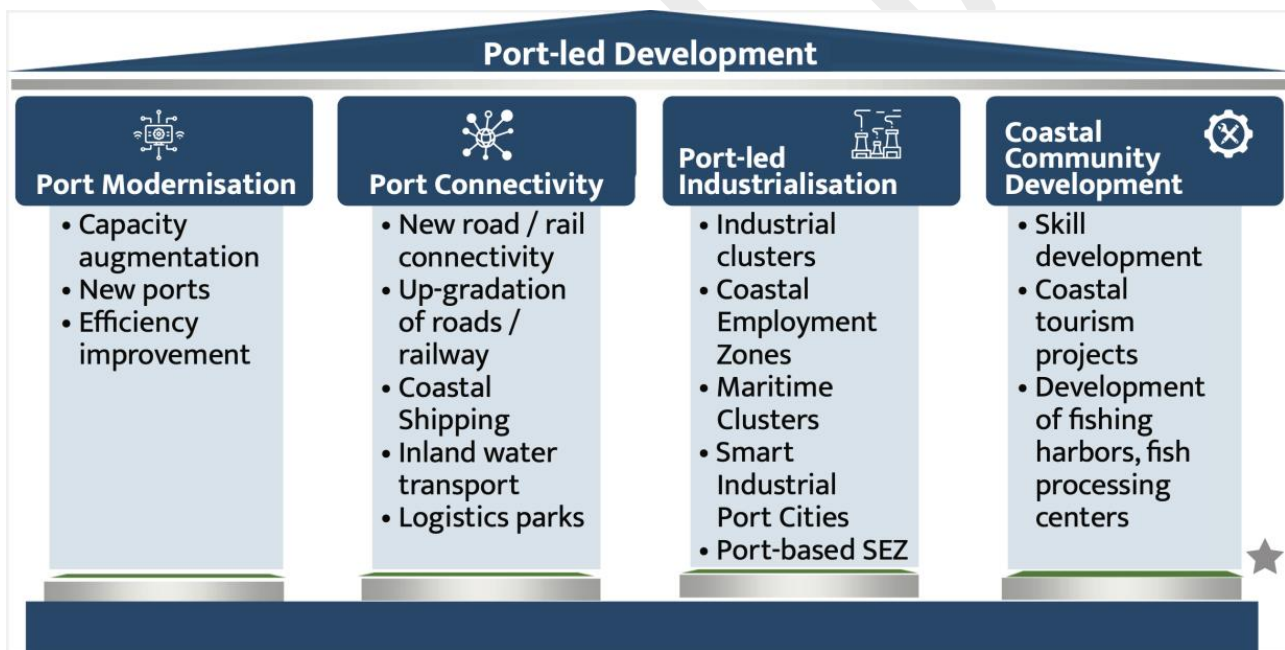
3.9.2. SAGARMALA PROGRAMME

Why in News?

Sagarmala, the flagship programme of the Ministry of Ports, Shipping and Waterways completed seven years.

About Sagarmala

- The Sagarmala is a series of projects to leverage the country’s coastline and inland waterways to drive industrial development.
- The concept of Sagarmala was approved by the Union Cabinet on March 25, 2015. As part of the programme, a **National Perspective Plan (NPP) for the comprehensive development of India's 7,500 km coastline, 14,500 km of potentially navigable waterways** and the maritime sector was prepared which was released in April, 2016, at the Maritime India Summit 2016.
- It aims to achieve
 - port modernization and new port development
 - port connectivity enhancement
 - port-led industrialization
 - coastal community development
- Implementation of the projects identified under the Sagarmala Programme will be taken up by the relevant Ports, State Governments / Maritime Boards, Central Ministries, mainly through private or **Public Private Partnership (PPP)** mode.
- The **financial assistance is provided to State Government and other MoPSW agencies** for port infrastructure projects, coastal berth projects, Road and Rail projects, fishing harbours, skill development projects, cruise terminal and unique projects such as Ro-Pax ferry services etc.



3.9.3. OTHER DEVELOPMENTS AND CONCEPTS IN INFRASTRUCTURE

National Rail Plan (NRP)	<ul style="list-style-type: none"> • To fulfil the objective of NRP, Indian Railways has revised its freight target for 2022-23 to 1,700 MT. • Under NRP the government has planned a future ready Railway System with 45% modal share of railways in Freight and sustain it. <ul style="list-style-type: none"> ○ This includes strategies for Operational Capacities and Commercial Policy initiatives to increase modal share and reduced freight transit time.
e-Detailed Action Report (e-DAR) Portal	<ul style="list-style-type: none"> • It is a web portal from the Ministry of Roads, Transport and Highways (MoRTH) in consultation with insurance companies for integrated data and instant information on road accidents. • The portal will bring relief to victims’ families, check fake claims etc. through Digitalised Detailed Accident Reports (DAR).

	<ul style="list-style-type: none"> It will be linked with Vahaan and the Integrated Road Accident Database (iRAD)- to act as an e-version of IRAD. Also, it will alert PWD/Local Body to examine and record details, helping in identifying the accident hotspots for necessary solutions to avoid future accidents.
National Industrial Corridor Development Program (NICDP)	<ul style="list-style-type: none"> NICDP is a pan India infrastructure programme with the aim to develop new industrial cities as 'Smart Cities' and converging next generation technologies across infrastructure sectors. National Industrial Corridor Development Corporation (NICDC), a Special Purpose Vehicle, helps in NICDP development, helping in employment generation and overall socio-economic development.
National Logistics Portal (NLP) is to be integrated with Unified Logistics Interface Platform (ULIP)	<ul style="list-style-type: none"> NLP was to ensure ease of trading in international and domestic markets linking all the stakeholders of EXIM, domestic trade and movement etc. on a single platform. ULIP brings all mode of transportation under a single window by connecting all logistics stakeholders spread across multiple ministries, associations. <ul style="list-style-type: none"> Objective is to bring down the logistics cost which is currently at 13-14% of GDP. It has 3 key components - Integration with existing data, Data exchange with private players and Unified document reference in the supply chain.
Parvatmala	<ul style="list-style-type: none"> Union Finance Minister in Union Budget for 2022-23 announced National Ropeways Development Programme - "Parvatmala", a preferred ecologically sustainable alternative in place of conventional roads in difficult hilly areas. <ul style="list-style-type: none"> The idea is to improve connectivity and convenience for commuters, besides promoting tourism. It is being presently started in regions like Uttarakhand, Himachal Pradesh, Manipur, Jammu & Kashmir and other North Eastern states.
Pre-cast Concrete Policy	<ul style="list-style-type: none"> Ministry of Road Transport & Highways has made mandatory to use factory manufactured pre-cast concrete elements in projects within 100 km radius of Pre-cast factory. Precast concrete is a form of concrete that is prepared, cast and cured off-site in controlled factory environment, using reusable moulds. <ul style="list-style-type: none"> Pre-cast factory shall be certified by Quality Council of India (QCI)/IITs and shall have minimum facility of fully automatic RMC (Ready Mix Concrete) plant for better quality.

3.10. ENERGY SECTOR

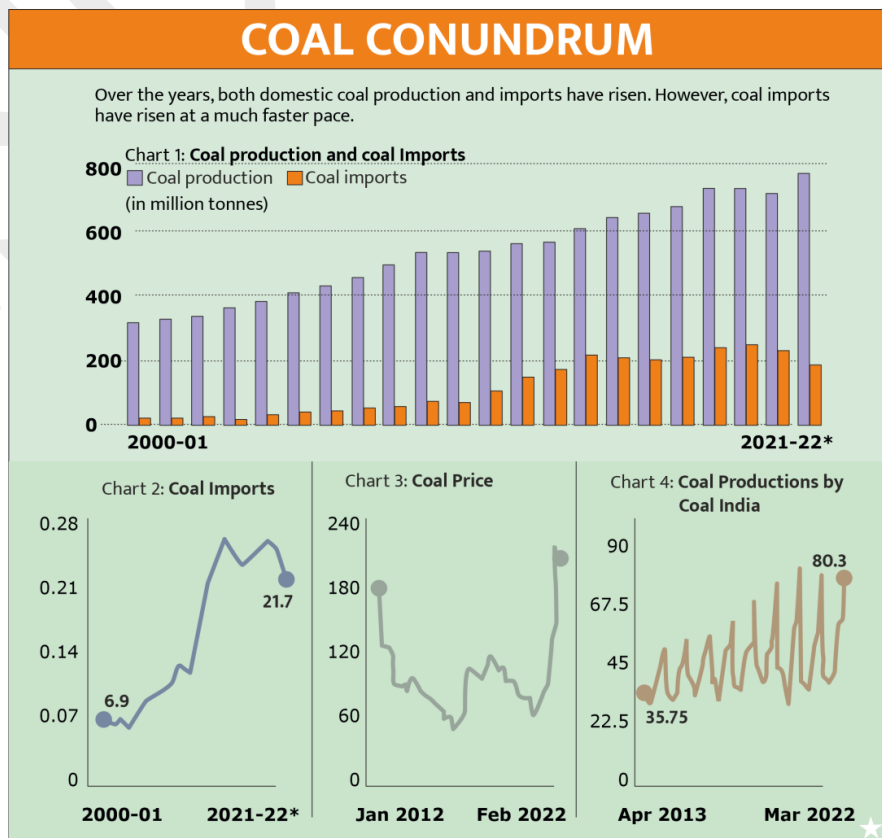
3.10.1. COAL SECTOR IN INDIA

Why in News?

Union Cabinet recently approved the policy for land acquired under the Coal Bearing Areas (Acquisition & Development) Act, 1957 (CBA Act).

More on the news

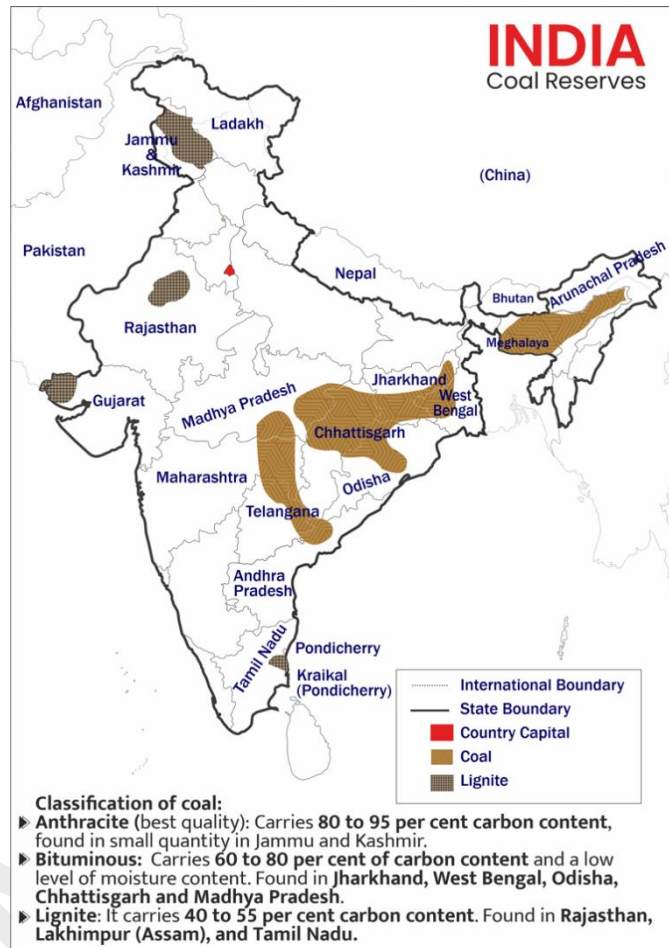
- CBA Act provides for **acquisition of coal bearing land and its "vesting in a government company"**, free from any encumbrance.
- The approved policy provides clear policy framework for **utilisation of following types of lands acquired under the CBA Act:**
 - Lands **no longer suitable or economically viable** for coal mining activities; or



- Lands from which coal has been mined out / de-coaled and such land has been reclaimed.
- Government coal companies, such as Coal India Ltd. (CIL) and its subsidiaries shall remain owner of these lands acquired under the CBA Act and the policy allows only leasing of the land for the specified purposes given in the policy.

Coal sector in India

- India has the fifth (when only proven reserves are accounted) largest coal reserves in the world. A cumulative total of 319.02 billion tons of Geological Resources of Coal have so far been estimated in the country.
- The Coal resources of India are available in older Gondwana Formations of peninsular India and younger Tertiary formations of north-eastern region.
- India is the second largest importer of coal. Coal accounts for almost 50% share in total installed generation capacity in India.
- As per the Draft National Energy Policy of NITI Aayog, the demand for coal is expected to rise in the range of 1.3-1.5 billion tonnes by 2030.



3.10.2. OTHER DEVELOPMENTS AND CONCEPTS ENERGY SECTOR

<p>Gobar-Dhan (Bio-CNG) Plant</p>	<ul style="list-style-type: none"> ● Recently, the PM inaugurated Asia's biggest Bio-CNG plant - the Gobar-Dhan plant - in Indore. <ul style="list-style-type: none"> ○ Government is working to build such plants in 75 major municipal bodies in the next 2 years. ○ Municipal solid waste based Gobar-Dhan plant is in line with "garbage-free cities" under the Swachh Bharat Mission Urban 2.0. ● Galvanizing Organic Bio-Agro Resources Dhan (GOBAR-DHAN) scheme focuses on managing and converting cattle dung and solid waste in farms to compost, biogas and bio-CNG. ● It was launched by Ministry of Drinking Water & Sanitation (Now Ministry of Jal Shakti) in 2018 as part of the SBM (Gramin).
<p>Integrated Bio-refineries Mission (IBM)</p>	<ul style="list-style-type: none"> ● Recently, mission innovation launched Integrated Bio-Refineries mission (IBM) to accelerate clean energy solutions through public-private alliances. ● Mission Innovation is a global initiative to catalyze action and investment in research, development, and demonstration to make clean energy affordable, attractive and accessible to all this decade. <ul style="list-style-type: none"> ○ It consists of 22 countries and EU. India is a founding member. ● About IBM <ul style="list-style-type: none"> ○ It is launched with the goal of replacing 10% of fossil-based fuels, chemicals, and materials with bio-based alternatives by 2030. ○ This is the 6th Mission launched by Mission Innovation. <ul style="list-style-type: none"> ✓ Other 5 missions includes: Clean Hydrogen, Green Powered Future, Zero-Emission Shipping, Carbon Dioxide Removal and Urban Transitions. ○ Mission aims to: <ul style="list-style-type: none"> ✓ Support the development and commercialization of biorefineries to de-risk new and emerging technologies and ✓ Improve cost competitiveness through international collaboration.

3.11. MISCELLENOUS

3.11.1. SOVEREIGN CREDIT RATINGS

Why in News?

Recently, the Finance Secretary accused rating agencies of 'double standards' on **Sovereign Credit Ratings** when assessing emerging markets and developing economies.

About Credit Ratings and Rating Agencies

- Credit ratings are **forward looking opinions** on the **relative ability** of an entity to meet its **financial commitments**, i.e., the **credit risk** or **relative creditworthiness** of a borrower.
- **Sovereign Credit Ratings (SCR)** represents an **objective** and **independent assessment** of a country's or sovereign entity's ability to meet debt obligations.
- They issue ratings based on country's **overall economic** and **political stability**, showing whether a country, equity or debt is financially stable and whether it is at low/high default risk.
 - This includes publicly available data and the confidential information given by entities such as foreign currency reserves, capital market transparency, etc.
- Based on it, SCR broadly rate countries under two grades as:
 - **Investment Grade:** Starting from highest credit ratings to moderate credit risk.
 - **Speculative Grade:** Higher level of default risk or a default has already occurred.
- **Rating agencies** also provide a **rating outlook** indicating the potential for change in the rating as **stable**, **positive**, or **negative**.

Interpretation	Fitch and S&P	Moody's
Highest quality	AAA	Aaa
High quality	AA+	Aa1
	AA	Aa2
	AA-	Aa3
	A+	A1
Strong payment capacity	A	A2
	A-	A3
	BBB+	Baa1
Adequate payment capacity	BBB	Baa2
	BBB-	Baa3
	BB+	Ba1
Likely to fulfill obligations, on going uncertainty	BB	Ba2
	BB-	Ba3
	B+	B1
High-risk obligations	B	B2
	B-	B3
	CCC+	Caa1
Vulnerable to default	CCC	Caa2
	CCC-	Caa3
Near or in bankruptcy or default	CC	Ca
	C	C
	D	D

Source: IMF (2010)

India's Sovereign Credit Ratings (SCR)

- India's SCR and outlook from three global rating agencies is as given in **image** (This is subject to revision by the respective agencies).
- Presently, India is World's **6th largest economy** (**3rd on Purchasing Power Parity**, or PPP). But it's SCR is at the bottom of investment grade or just above the speculative grade.
 - China and India are exceptions in the history of SCRs with the fifth largest economy in the world being rated in the lower rung of the investment grade.
- **Impact of Poor Rating**
- **Reduced Investors' confidence:** Poor rating acts as a deterrence against investment in emerging and developing economies like India.
- **Increased Borrowing Costs:** Poor rating increases the credit risk perception, forcing emerging countries to offer greatest interest on securities to get investors interest.
- **Financial Market Instability:** Often, rating agencies do rating upgrades after market rallies and downgrades after downturns. It carries risk to trigger market jitters as many institutional investors can hold only investment-grade instruments.
- **Isolation from Capital Markets:** Poor ratings for commercial banks and corporate debt to sub-investment grade makes it-
 - Costly for banks to issue internationally recognized letters of credit for domestic exporters and importers.
 - Firms face difficulties in issuing debt on the international capital market.

Rating Agency	India's Rating	Outlook
Standard & Poor's (S&P)	BBB-	STABLE
Moody's	Baa3	STABLE
Fitch's	BBB-	NEGATIVE

- **Policy Implications:** Poor rating carries risk of country's policy being beholden by SCR rather than considerations of growth and development.

3.11.2. CORPORATE SOCIAL RESPONSIBILITY

Why in news?

Companies in India have been mandated to submit a **comprehensive report on their corporate social responsibility (CSR) activities** in a new form – **CSR-2**.

More about news

- CSR-2 will require, among various **information parameters**, reporting about the constitution of the company's **CSR committee, its meetings, as well the disclosure of details** of the CSR committee, CSR policy, and **approved CSR projects** on the company's website.
- The company will also need to submit details on its **CSR project investments and the CSR funds** that have gone **unspent**.
- While it is likely to **add some compliance burden** on corporates, it will enhance the **transparency and disclosures around CSR activities** and provide **better oversight**. The additional information can be used by the corporate affairs ministry in **drafting effective policies for CSR**.

About Corporate Social Responsibility (CSR)

CSR is a management concept whereby companies **integrate social and environmental concerns** in their business **operations and interactions** with their stakeholders.

- Prior to **Companies Act 2013**, CSR in India was seen as a **philanthropic activity**. In keeping with the Indian tradition, it was believed that every company has a **moral responsibility** to play an active role in discharging the **social obligations**, subject to the financial health of the company.
- The **Companies Act 2013** introduced far-reaching changes that affect company **formation, administration, and governance**, and incorporates an additional section i.e., **Section 135** – clause on CSR for companies listed in India. The clause covers the **essential prerequisites** pertaining to the **execution, fund allotment and reporting** for successful project implementation.
 - With this, India became the **first country to legislate** the need to **undertake CSR activities** and **mandatorily report** CSR initiatives.
- **Applicability:** A company **satisfying any of the following criteria** during the **immediately preceding financial year** is required to comply with CSR provisions:
 - **Net worth** of rupees five hundred crore or more, or
 - **Turnover** of rupees one thousand crore or more, or
 - **Net profit** of rupees five crore or more.
- These companies are required to spend a **minimum 2% of its average net profit for its preceding three financial years' amount** on CSR activities.
- These companies are also **required to form a CSR committee** to oversee the entire CSR activities of the Company.
 - **Role of CSR committee:** **Formulate CSR policy**, recommend the **amount of expenditure** to be incurred and **monitor CSR policy** of the company from time to time. They must also **oversee the systematic development** of a **set of processes**
- **Suggested Areas of Activities** (as per **Schedule VII of the act**) include, inter alia: **Eradicating hunger, poverty, and malnutrition**, promoting education, promoting gender equality, ensuring **environmental sustainability**, protection of **national heritage, art and culture**, Rural development projects and Slum area development.

3.11.3. IPRS IN INDIA

Why in news?

Domestic patent filings surpass international ones after 11 years.

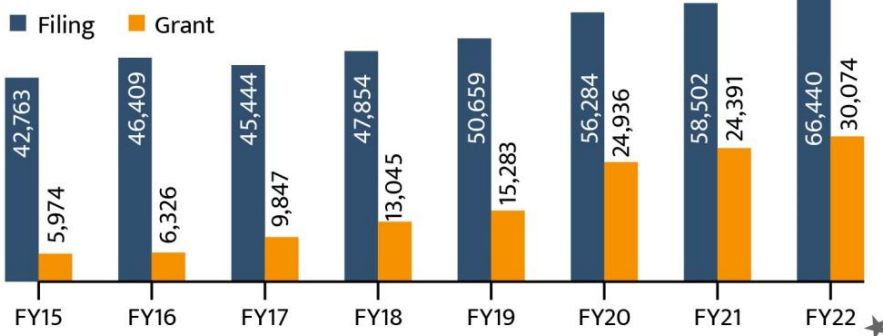
More on news

- Total of 19,796 patent applications filed **54% were filed by Indian applicants**.
- Similarly, **patent examination time has reduced to 5-23 months** now from 72 months in December 2016.

- All these efforts would take India a step closer to its ambition of **being in the top 25 nations of Global Innovation Index.**

PATENT POWER

Filing and grant of patent applications



- India's ranking in Global Innovation Index has climbed 35 ranks - from 81st in 2015-16 to 46th in 2021. This is remarkable progress, but the **number of patents granted in India is still a fraction compared to patents granted in China, USA, Japan, and Korea.**
- This shows India still has to resolve various issues to ensure a vibrant IP ecosystem in the Country.

IPR and its implementation in India

- As per the **Paris Convention for the Protection of Industrial Property, 1883**, the IP represents patents, utility models, industrial designs, trademarks, service marks, trade names, copyrights, geographical indicators and confidential information.
- Intellectual Property Rights (IPR) are the **rights given to persons over the creations of their minds** and are critical in fostering innovation and creativity. Hence, the rights provide the creator or innovator an exclusive right over the use of his/her creation for a certain period of time.
- India has a **Trade Related Aspects of Intellectual Property Rights (TRIPS) compliant**, robust, equitable and dynamic IPR regime.
 - The WTO Agreement on TRIPS is the most **comprehensive multilateral agreement on intellectual property**
- Department for Promotion of Industry and Internal Trade (DPIIT)**, Ministry of Commerce and Industry, is the Nodal body for IPR related laws in India which include
 - The Patents Act, 1970;
 - The Trade Marks Act, 1999;
 - The Copyright Act, 1957;
 - The Geographical Indications of Goods (Registration & Protection) Act, 1999;
 - The Designs Act, 2000;
 - The Semiconductor Integrated Circuits Layout-Design Act, 2000.
- National IPR Policy, 2016**: it is a comprehensive IPR policy to stimulate innovation and creativity across sectors, and provide a clear vision regarding IPR issues.

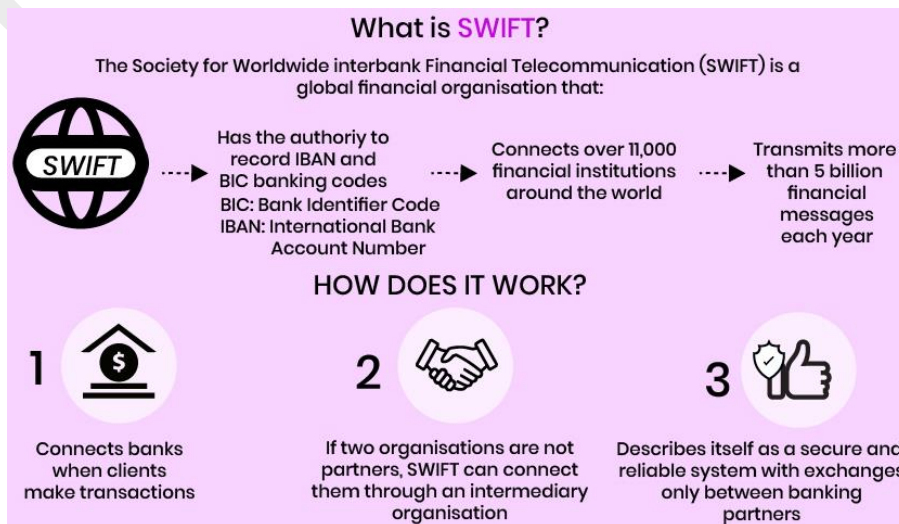
3.11.4. SOCIETY FOR WORLDWIDE INTERBANK FINANCIAL TELECOMMUNICATION (SWIFT)

Why in news?

Recently, few Russian banks have been disconnected from SWIFT amidst Russia-Ukraine crisis.

About SWIFT

- Founded in 1973, SWIFT is a **messaging network used by banks and financial institutions globally that provides safe and secure exchange of information** pertaining to financial transactions.



- It works by assigning **each member institution a unique eight-digit SWIFT ID code or a Bank Identification Code** that identifies not only the bank name but the country, city, and branch.
 - If a person, say, in New York with a Citibank account, wants to send money to someone with an HSBC account in London, the payee would have to submit to his bank, the London-based beneficiary's account number along with the eight-digit SWIFT code of the latter's bank. Citibank would then send a SWIFT message to HSBC. Once that is received and approved, the money would be credited to the required account.
- SWIFT is merely **a platform that sends messages and does not hold any securities or money.**

What happens if one is excluded from SWIFT?

- If a country is excluded from the most participatory financial facilitating platform, its **foreign funding would take a hit, making it entirely reliant on domestic investors.**
 - A SWIFT ban would **make exports and imports from and to Russia almost impossible, and Russia would have to look for alternative means to transfer money.**
 - Russian banks will find it harder to communicate with peers internationally, slowing trade and making transactions costlier.

SWIFT provide services to the following:

- Banks
- Brokerage institutes and trading houses
- Securities dealers
- Asset management companies
- Clearinghouses
- Depositories
- Exchanges
- Corporate business houses
- Treasury market participants and service providers
- Foreign exchange and money brokers

3.12. INDICES, REPORTS AND SURVEYS IN NEWS

<p>First Crisis, then catastrophe Report</p>	<ul style="list-style-type: none"> • Released by Oxfam International. • Report has highlighted that 263 million more people could be pushed into extreme poverty in 2022, due to the combined impact of COVID-19, inequality and food and energy price inflation, accelerated by the war in Ukraine. 				
<p>Food and Agriculture Organization (FAO) Food Price Index (FFPI)</p>	<ul style="list-style-type: none"> • The FFPI measure of the monthly change in international prices of a basket of food commodities. <ul style="list-style-type: none"> ○ It consists of the average of five commodity group price indices (cereal, sugar, meat, vegetable oil, and dairy) weighted by the average export shares of each of the groups in 2014-2016 (base year). • FAO is a specialized agency of the United Nations that leads international efforts to defeat hunger. 				
<p>Export Preparedness Index (EPI)</p>	<ul style="list-style-type: none"> • EPI, prepared by NITI Aayog in partnership with Institute of Competitiveness, is a comprehensive analysis of India's export achievements of states and union territories and identifies challenges and opportunities. • EPI is a data-driven endeavour to identify fundamental areas critical for sub-national export promotion. <ul style="list-style-type: none"> ○ EPI ranks states and UTs on 4 main pillars—Policy; Business Ecosystem; Export Ecosystem; Export Performance and 11 sub-pillars. (Refer infographic) <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p style="text-align: center; background-color: #4a4a8a; color: white; padding: 5px;">Pillars of the EPI 2021</p> <table style="width: 100%; text-align: center;"> <tr> <td style="width: 25%; vertical-align: top;"> <p>20%</p> <p>Policy</p> <ul style="list-style-type: none"> • Export Promotion Policy (10%) • Institutional Framework (10%) </td> <td style="width: 25%; vertical-align: top;"> <p>40%</p> <p>Business Ecosystem</p> <ul style="list-style-type: none"> • Business Environment (10%) • Infrastructure (10%) • Transport Connectivity (10%) • Access to Finance (10%) </td> <td style="width: 25%; vertical-align: top;"> <p>20%</p> <p>Export Ecosystem</p> <ul style="list-style-type: none"> • Export Infrastructure (10%) • Trade Support (10%) • R & D Infrastructure (10%) </td> <td style="width: 25%; vertical-align: top;"> <p>20%</p> <p>Export Performance</p> <ul style="list-style-type: none"> • Growth & Orientation (10%) • Export diversification (10%) </td> </tr> </table> </div>	<p>20%</p> <p>Policy</p> <ul style="list-style-type: none"> • Export Promotion Policy (10%) • Institutional Framework (10%) 	<p>40%</p> <p>Business Ecosystem</p> <ul style="list-style-type: none"> • Business Environment (10%) • Infrastructure (10%) • Transport Connectivity (10%) • Access to Finance (10%) 	<p>20%</p> <p>Export Ecosystem</p> <ul style="list-style-type: none"> • Export Infrastructure (10%) • Trade Support (10%) • R & D Infrastructure (10%) 	<p>20%</p> <p>Export Performance</p> <ul style="list-style-type: none"> • Growth & Orientation (10%) • Export diversification (10%)
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Commodities Market Outlook	<ul style="list-style-type: none"> • It is a report released by the World Bank. Key findings are <ul style="list-style-type: none"> ○ Increase in energy prices over the past two years has been the largest since the 1973 oil crisis. ○ Price increases for food commodities and fertilizers, which rely on natural gas as a production input, have been the largest since 2008. • Global food and fuel price shocks linked to the war are set to last until at least the end of 2024 and raise the risk of stagflation.
Industrial Outlook Survey	<ul style="list-style-type: none"> • 96th round of the Industrial Outlook Survey of the Manufacturing Sector for Q3 2021-22 released. • Conducted: by RBI • It Assesses <ul style="list-style-type: none"> ○ business sentiments relating to demand conditions, ○ financial situation in terms of finance availability, ○ employment conditions, ○ and the prevailing price situation in the economy.

3.13. ERRATA

PT 365 Economy (May 2021-Jan 2022) Magazine

- **Article 4.1 India's Exports:** The information given in the infographics- Top 5 export destinations of India and Share of Top 5 commodities in India's Exports in for the year 2019-20. The same has been updated via the Economic Survey for the year 2020-21. Following is the updated information-
 - Top 5 export destinations (in decreasing order): USA > UAE > China > Bangladesh > Hong Kong.
 - Top 5 export commodities (in decreasing order): Petroleum Products (8.8%) > Drugs, Formulations and Biologicals (6.5%) > Pearl, Precious, Semiprecious Stones (6.2%) > Iron and Steel (4.2%) > Electric Machinery and Equipment (2.8%).
- **Article 7.3 Micro, small and medium enterprises:** In the infographic New Revised MSME Classification, due to a typographical error, the criterion of a medium enterprise is mentioned as- Investment < 20 crore and Turnover < 40 crore. The correct definition is following-

MSMEs definition in India

Classification	Micro	Small	Medium
Manufacturing Enterprises and Enterprises rendering Services	Investment in Plant and Machinery or Equipment: Not more than Rs.1 crore and Annual Turnover; not more than Rs. 5 crore	Investment in Plant and Machinery or Equipment: Not more than Rs.10 crore and Annual Turnover; not more than Rs. 50 crore	Investment in Plant and Machinery or Equipment: Not more than Rs.50 crore and Annual Turnover ; not more than Rs. 250 crore ★

4. ENVIRONMENT

4.1. CLIMATE CHANGE

4.1.1. IPCC'S SIXTH ASSESSMENT REPORT: PART II

Why in news?

The IPCC released the second part of the Sixth Assessment Report, titled 'Climate Change 2022: Impacts, Adaptation and Vulnerability', the Working Group II contribution to the Sixth Assessment Report.

About IPCC's Sixth Assessment Report

- The IPCC is in its sixth assessment cycle, in which it is producing the **Sixth Assessment Report (AR6)** with contributions by its **three Working Groups and a Synthesis Report**.

4.1.1.1. KEY FINDINGS

- According to the latest report, extent and magnitude of climate change impacts are larger than estimated in previous assessments.

Observations	Data and other Information
Observed Impacts: Human-induced climate change, including more frequent and intense extreme events, has caused widespread adverse impacts and related losses and damages to nature and people, beyond natural climate variability.	Impacts on Biodiversity and ecosystems: <ul style="list-style-type: none"> Substantial damages in terrestrial, freshwater, and coastal and marine ecosystems. Increases in disease and mass mortality events of plants and animals. Increased severity and outbreak extent of forest insect pests in several regions. Poleward shift of species: Approximately half of the species assessed globally have shifted poleward or, on land, also to higher elevations. Irreversible losses: Climate-caused local population extinctions have been detected. Impacts approaching irreversibility.
	Impacts on Humans: <ul style="list-style-type: none"> Reduced food and water security Adverse impact on physical health and mental health of people Economic loss: due to negative impact on climate exposed sectors, labour productivity among others. Increase in Humanitarian crises where climate hazards interact with high vulnerability.
	Impacts in Urban areas: <ul style="list-style-type: none"> Intensification of Hot extremes including heatwaves and aggravated air pollution events. Compromised transportation, water, sanitation and energy systems. Impacts concentrated amongst the economically and socially marginalized urban residents, e.g., in informal settlements.
Vulnerability and Exposure of Ecosystems and People	Vulnerability and Exposure of Ecosystems and People <ul style="list-style-type: none"> Factors increasing vulnerability: by affecting the capacities of ecosystems, societies, communities and individuals to adapt to climate change include - <ul style="list-style-type: none"> Unsustainable land-use and land cover change, unsustainable use of natural resources, deforestation, loss of biodiversity, habitat fragmentation, and ecosystem damage by pollutants. Impacts on Human- Competition for land and/or water resources and impact on key infrastructure systems including sanitation, water, health, transport, communications and energy. Vulnerability is exacerbated by- inequity and marginalization linked to gender, ethnicity, low income etc. Impact on ecosystems- <ul style="list-style-type: none"> Degradation of world's forests, coral reefs and low-lying coastal wetlands. Very high extinction risk for endemic species in biodiversity hotspots: ~100% on islands, ~84% on mountains, ~12% on continents and ~54% in the ocean (notably the Mediterranean) are projected to be threatened with extinction due to climate change.

	<ul style="list-style-type: none"> • Regions with higher vulnerability- <ul style="list-style-type: none"> ○ West-, Central- and East Africa, South Asia, Central and South America, Small Island Developing States and the Arctic. ○ Locations with poverty, governance challenges and limited access to basic services and resources, violent conflict and high levels of climate-sensitive livelihoods (e.g., smallholder farmers, pastoralists, fishing communities).
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4.1.1.2. INDIA SPECIFIC FINDINGS

- **Ganges and inter-state Sabarmati River basin could face severe water scarcity challenges.**
- **Impact on Marginalised sections:** For example, salinisation-associated changes in coastal areas may disproportionately burden women responsible for securing drinking water and fuel in the Indian Sundarbans.
- **Impact on health:** Increases in hazards such as intense heatwaves, flooding and drought, air pollutants etc. will lead to increased occurrence of-
 - circulatory, respiratory, diabetic and infectious disease;
 - diarrheal diseases, dengue fever and malaria; and
 - heat-related deaths and infant mortality.
- **Invasive species:** Climate change would promote invasion of a highly invasive species such as Giant African Snail in India.
- **Impact on food production:**
 - **About 69% of the commercially important species of the Indian marine fisheries** were found to be impacted by climate change and other anthropogenic factors.
 - **Rice production can decrease** from 10% to 30% whereas **maize production can decrease** from 25% to 70% assuming a range of temperature increase from 1° to 4°C.
- **Migration:** Increased climate variability and extreme events are already driving migration and will increase involuntary displacement in the future.
- **Exposure to high energy insecurity and industrial systems risk:** due to increase of energy demand for cooling at a rapid rate, together with the population growth.

Concepts discussed in IPCC report:	
Maladaptation	
<ul style="list-style-type: none"> • Actions that focus on sectors and risks in isolation and on short-term gains often lead to maladaptation if long-term impacts of the adaptation option and long-term adaptation commitment are not taken into account. <ul style="list-style-type: none"> ○ For example, seawalls effectively reduce impacts to people and assets in the short-term but can also increase exposure to climate risks in the long-term as reduce space for natural processes. • Maladaptive responses to climate change can- <ul style="list-style-type: none"> ○ Create lock-ins of vulnerability, exposure and risks that are difficult and expensive to change. ○ Decrease Biodiversity and ecosystem resilience to climate change. ○ Affect marginalised and vulnerable groups adversely (e.g., Indigenous Peoples, ethnic minorities, low-income households, informal settlements) by reinforcing and entrenching existing inequities. 	

4.1.2. IPCC'S SIXTH ASSESSMENT REPORT: PART III

Why in news?

The IPCC released the second part of the Sixth Assessment Report (AR6), titled '**Climate Change 2022: Mitigation of Climate Change**', the Working Group III contribution to the Sixth Assessment Report.

Key Findings and Observations of the report

Emission trends	<ul style="list-style-type: none"> • Total net anthropogenic GHG emissions continued to rise during 2010–2019, as have cumulative net CO₂ emissions since 1850. • Average annual GHG emissions during 2010-19 higher than any previous decade. <ul style="list-style-type: none"> ○ But rate of growth between 2010 and 2019 lower than that between 2000 and 2009.
Variation in Regional contributions to global GHG emissions	<ul style="list-style-type: none"> • At least 18 countries have sustained GHG emission reductions for longer than 10 years. • Least Developed Countries (LDCs) emitting only 3.3% of global emissions in 2019. • 10% of households with the highest per capita emissions contribute a disproportionately large share of global household GHG emissions.

<p>Sectoral Emissions</p>	<ul style="list-style-type: none"> Net anthropogenic GHG emissions have increased since 2010 across all major sectors globally. Global share of emissions from urban areas is increasing. Emissions reductions in CO₂ from fossil fuels and industrial processes, due to improvements in energy intensity of GDP and carbon intensity of energy, have been less than emissions increases from rising global activity levels in industry, energy supply, transport, agriculture and buildings. 	<div style="text-align: center;"> <p>Sectoral share of total net anthropogenic GHG emissions in 2019 (in GtCO₂-eq)</p> <table border="1"> <caption>Sectoral share of total net anthropogenic GHG emissions in 2019 (in GtCO₂-eq)</caption> <thead> <tr> <th>Sector</th> <th>Share (%)</th> </tr> </thead> <tbody> <tr> <td>Energy supply sector</td> <td>34%</td> </tr> <tr> <td>Industry</td> <td>24%</td> </tr> <tr> <td>Agriculture, forestry and other land use (AFOLU)</td> <td>22%</td> </tr> <tr> <td>Transport</td> <td>15%</td> </tr> <tr> <td>Other</td> <td>5%</td> </tr> </tbody> </table> </div>	Sector	Share (%)	Energy supply sector	34%	Industry	24%	Agriculture, forestry and other land use (AFOLU)	22%	Transport	15%	Other	5%
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Industry	24%													
Agriculture, forestry and other land use (AFOLU)	22%													
Transport	15%													
Other	5%													
<p>Adoption and cost of low emission technologies</p>	<ul style="list-style-type: none"> Unit costs of several low-emission technologies have fallen and their global adoption risen continuously since 2010, enabled by innovation policy packages. Innovation has lagged in developing countries due to weaker enabling conditions including limited finance, technology development and transfer, and capacity. 													
<p>Mitigation</p>	<ul style="list-style-type: none"> Consistent expansion of policies and laws addressing mitigation since AR5 leading to the avoidance of emissions. Limited Policy coverage for emissions from agriculture and the production of industrial materials and feedstocks. Slow progress on the alignment of financial flows towards the goals of the Paris Agreement. Uneven distribution of climate finance flows across regions and sectors. 													
<p>Current policies inadequate to meet targets of Paris climate agreement</p>	<ul style="list-style-type: none"> Emission gap: Global GHG emissions in 2030 associated with the implementation of nationally determined contributions (NDCs) announced prior to COP26 would likely lead to warming exceeding 1.5°C during the 21st century. Implementation gap: Policies implemented by the end of 2020 are projected to result in higher global GHG emissions than those implied by NDCs. Without a strengthening of these policies, GHG emissions are projected to rise beyond 2025, leading to a median global warming of 3.2°C by 2100. Future CO₂ emissions over the lifetime of existing and currently planned fossil fuel infrastructure (without additional abatement) exceed the CO₂ emissions needed to limit warming to 1.5°C. 													

4.1.3. UNIFORM CARBON TRADING MARKET

Why in news?

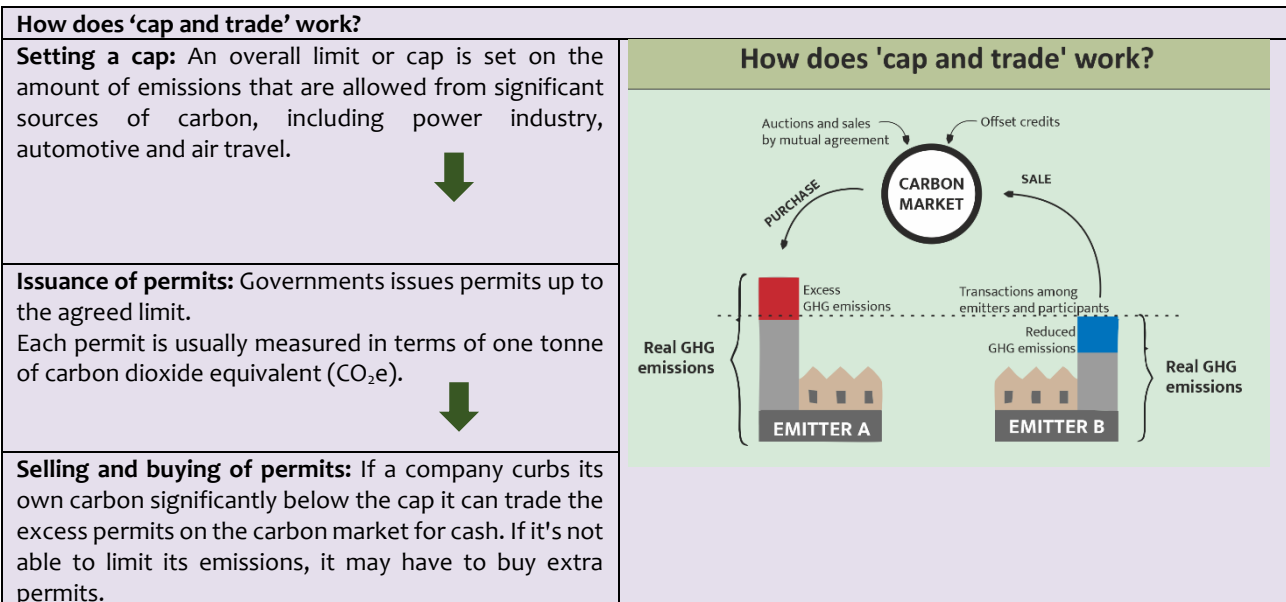
The central government is considering implementation of a carbon trading scheme that will subsume all carbon trading mechanisms in India.

More on the news

The government proposes to begin with a voluntary carbon market and gradually shift to 'cap and trade', where industries are given emission targets like in EU emission trading system markets.

What is carbon trading?

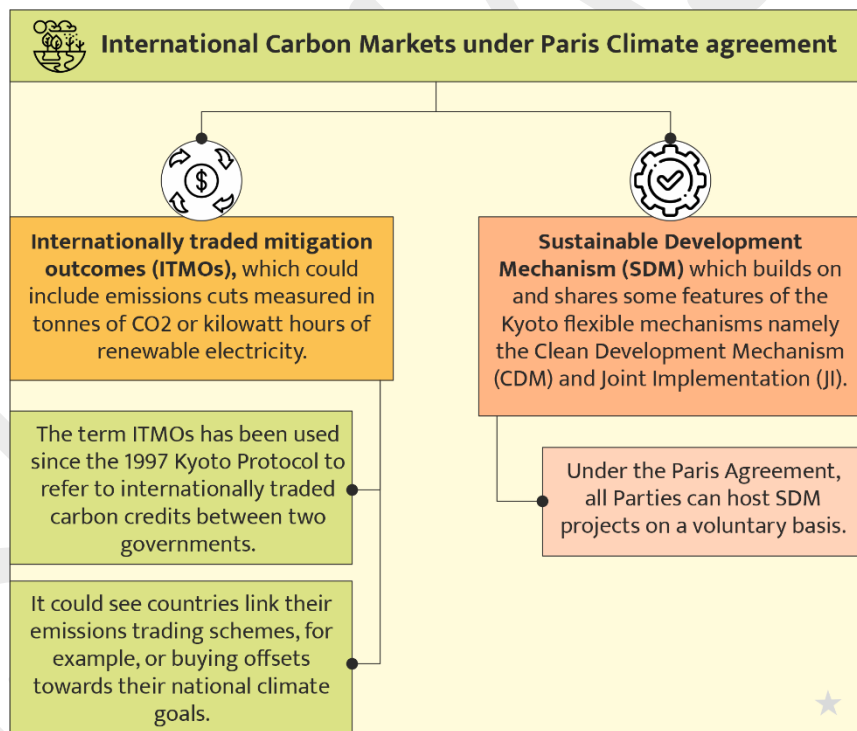
- Carbon trading, also referred to as carbon emissions trading, is a **market-based system of buying and selling permits and credits** that allow the permit holder to emit carbon dioxide.
 - The model used in most carbon trading schemes is called **'cap and trade'**.
- The carbon credits and the carbon trade are authorized by governments with the **goal of gradually reducing overall carbon emissions and mitigating their contribution to climate change.**
- The idea of applying a cap-and-trade solution to carbon emissions **originated with the Kyoto Protocol.**
- Carbon marketplaces associated with carbon trading can exist at international, national, state or local level.
 - For instance, in 2021, China launched the world's largest market for carbon emissions trading.



Existing carbon trading mechanisms in India

- Renewable Energy Certificate (REC)** mechanism is a market-based instrument to promote renewable energy and facilitate compliance of renewable purchase obligations (RPO) by obligated entities.

 - One REC is treated as equivalent to 1 MWh.
 - RECs can also be bought voluntarily by entities.
 - There are two categories of RECs, viz., **solar RECs and non-solar RECs.**
 - They are **traded only on the Central Electricity Regulatory Commission (CERC) approved power exchanges** like- Indian Energy Exchange (IEX) and Power Exchange India (PXIL).



- Energy Saving Certificates (ESCs) under Perform, Trade and Achieve (PAT) scheme:** are market based regulatory instruments to reduce the specific energy consumption (SEC) in energy intensive industries.

 - It covers **13 sectors (Designated Consumers)** including- Aluminium, DISCOMs, Hotels (under commercial buildings), Cement, Fertilizer, Pulp & Paper, Thermal Power Plant, Iron & Steel etc.
 - As per PAT rules, when a designated consumer overachieves the notified SEC targets in compliance year, the **ESCs are to be issued by Central Government** for the difference of quantity between notified target and achieved SEC.
 - ESCs are traded on Indian Energy Exchange (IEX) and Power Exchange India Limited (PXIL).

4.1.4. STATE ENERGY & CLIMATE INDEX

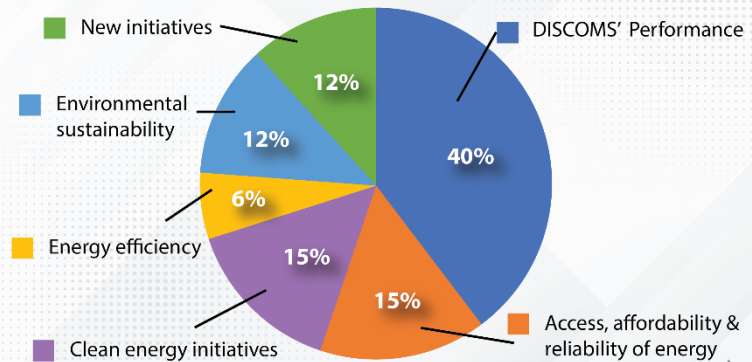
Why in news?

NITI Aayog has recently launched the State Energy & Climate Index (SECI)-Round I.

About the Index

- It is the first index that aims to track the efforts made by states and union territories (UTs) in the climate and energy sector.
- Objectives of the index:**
 - Ranking the States based on their efforts** towards improving energy access, energy consumption, energy efficiency, and safeguarding environment;
 - Helping **drive the agenda of affordable, accessible, efficient and clean energy transition at the State level;**
 - Encouraging healthy competition among the states** on different dimensions of energy and climate.
- Parameters:** SECI rank states and UTs on **six parameters** which include a total of **27 indicators**
 - Discoms' Performance;
 - Access, Affordability and Reliability of Energy;
 - Clean Energy Initiatives;
 - Energy Efficiency;
 - Environmental Sustainability; and
 - New Initiatives.
- Classification of States:** For better comparison, the states have been classified based on size and geographical differences as larger states, smaller states, and UTs.
- Categorization of State and UTs based on the outcome of SECI Round-1 scores:** States and UTs have been categorized into three groups: 'Front Runners', 'Achievers', and 'Aspirants'.

WEIGHTAGE OF PARAMETERS IN THE SECI



Category	SECI score
Front-runners (Top one-third)	Composite SECI score ≥ 46
Achievers (Middle one-third)	Composite SECI score between 36 and 46
Aspirants (Lowest one-third)	Composite SECI score ≤ 36

Other Energy Indexes across the globe and India's performance

Index	World Energy Trilemma Index (WETI)	Energy Transition Index (ETI)	Renewable Energy Country Attractiveness Index (RECAI)	Climate Change Performance Index (CCPI)
Publishing Agency	World Energy Council	World Economic Forum (WEF)	Ernst & Young (EY)	Germanwatch eV.
What it measures	Measures energy system performance in terms of Energy Security, Energy Equity, Environmental Sustainability in Country context	Checks nation's energy system information	Ranks performance of economies based on the investment made in the renewable energy sector -energy supply, renewable technologies, & ease of doing business	Measures country's progress towards the NDC 2030 targets and compares climate protection performance of countries
India's Rank	75/127 (2021)	87/115 (2021)	3/40 (2021)	10/63 (2022)
Best performing countries	Top 3: Sweden, Switzerland, Denmark	Top 3: Sweden, Norway, Denmark	Top 2: USA & Mainland China	Top 6: Denmark (4 th), Sweden (5 th), Norway (6 th)

4.1.5. CARBON CAPTURE & UTILISATION (CCU)

Why in news?

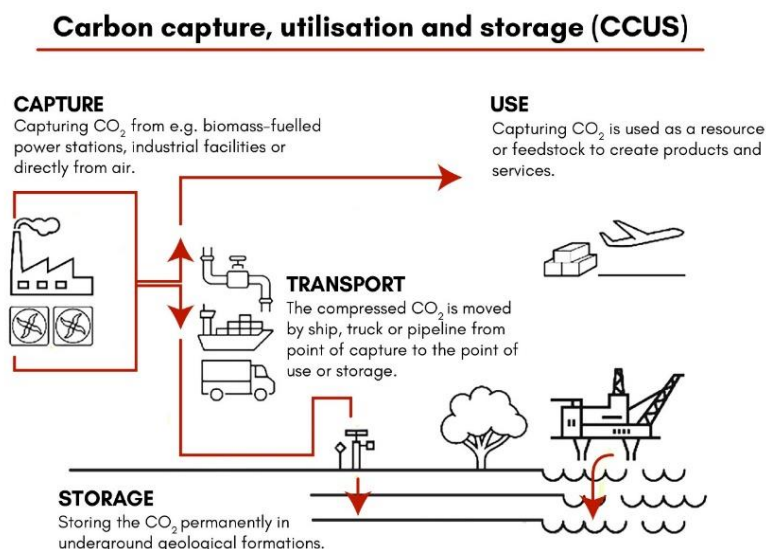
Department of Science & Technology has established two National Centres of Excellence (NCoE) in Carbon Capture & Utilisation (CCU) at Indian Institute of Technology Bombay, and at Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru.

More on the news

- **Centres will focus on:**
 - **Understanding role of carbon dioxide in the global climate** and **reduction strategies of emission of carbon dioxide** from the industrial and energy sectors.
 - **Develop and demonstrate carbon capture and conversion** by developing relevant materials and methodologies.
 - **Promotes CCU research, provide training and consultancy and translate its research excellence into solutions** with global economic and social impact.

About Carbon capture, utilization and sequestration

- It is a process that captures carbon dioxide emissions from sources like coal-fired power plants and either reuses or stores it so that it will not enter the atmosphere.
- It can absorb 85-95 percent of CO₂ emissions in the atmosphere.
- **Benefits:** reducing the overall carbon emissions, improving efficiency of coal and gas fired plants to generate reliable and affordable power etc.
- **Issues:** possible leaks and the related damage from underground storage sites, high capture costs, a lot of energy is needed to convert CO₂ into useful products leading to more emissions etc.
- **India is part of following CCUS initiatives-**
 - **Mission Innovation:** A global initiative to make clean energy affordable, attractive and accessible for all.
 - **Accelerating CCUS Technologies (ACT):** an international initiative to establish CCUS as a tool to combat global warming.



Related news: Novel strategy to synthesize adsorbents for Carbon capture and utilization (CCU)

- Indian Scientists have **discovered special types of nanoparticles or microparticles** for CCU.
- Novel materials that have been synthesized include **porous Covalent organic frameworks (COFs)** like COF-graphene Janus thin films.
 - COFs have attracted attention for their interesting properties, including **high-order porosity, structural versatility, facile surface modification, and high thermal and chemical stabilities.**
 - **Potential applications of COFs:** gas separation and storage, chemical sensing, luminescence, electronic devices, drug delivery, energy storage and conversion etc.

4.1.6. OTHER CLIMATE CHANGE RELATED NEWS

Facility for Low Carbon Technology Deployment (FLCTD)	<ul style="list-style-type: none"> • FLCTD is a project financed by the Global Environment Facility, implemented by United Nations Industrial Development Organisation in collaboration with Bureau of Energy Efficiency. • FLCTD was launched in 2016 with an objective to identify innovative energy efficiency and low carbon technology solutions that address the existing technology gaps in Indian industrial and commercial sectors. • FLCTD has identified six priority technology verticals for 'Innovation Challenge' in the areas like Waste Heat Recovery, Space Conditioning, Industrial Resource Efficiency and Electrical Energy Storage etc.
First Carbon-Neutral Panchayat	<ul style="list-style-type: none"> • Palli in Jammu becomes India's first carbon-neutral panchayat. • Carbon neutrality means having a balance between emitting carbon and absorbing carbon from the atmosphere in carbon sinks. <ul style="list-style-type: none"> ○ Removing carbon oxide from the atmosphere and then storing it is known as carbon sequestration.

4.2. POLLUTION

4.2.1. AIR POLLUTION

4.2.1.1. DUST STORM

Why in news?

System of Air Quality and Weather Forecasting and Research (SAFAR) has attributed the recent **pollution** bout in Mumbai to a second dust storm.

About the dust storm

- The storm originated over **Afghanistan, Pakistan, and the border areas of Rajasthan**.
- Previously, a storm originating in the Middle East had brought dust and haze to north-western Maharashtra, Gujarat, and Rajasthan.
- Sand and dust storms (SDS) are natural events caused by **strong, turbulent winds blowing over dry land surfaces** that have little or no protection from vegetation cover.
- Geography and **plant diversity and abundance**, play a critical role in the birth of dust storms.
 - For instance, **flat areas with sparse vegetation or dunes are most prone to such storms** since these features allow winds to build momentum.
- **Causes of Dust storm in India**
 - **Temperature in Middle East was warm, leading to the lifting of dust** in the air.
 - As **temperature in western parts of India towards the Arabian Sea is warmer**, it was favourable for storms to enter the country.

Impacts of dust storms

- They are a **transboundary meteorological hazard** that affect agriculture, energy, environment, aviation, and human health.
- Deposition of dust on glaciers **induces a warming effect**.
- **Reduces crop yields by burying seedlings**, causing loss of plant tissue etc.
- Larger particles can **cause skin and eye irritations or infections**, while smaller particles may **trigger respiratory disorders like asthma**.
- **Also, increase the nutrient content** in the areas of deposition and benefit vegetation.

4.2.2. WATER POLLUTION AND CONSERVATION

4.2.2.1. GROUNDWATER EXTRACTION GUIDELINES

Why in news

According to National Green tribunal (NGT) the new guidelines issued in 2020 are insufficient to address groundwater crises.

2020 Guidelines for Groundwater Regulation

- **Mandatory requirement of applying for NOC** for new and existing industries, group housing societies, and private water supply tankers.
- NOC holders to pay **groundwater charges based on quantum extraction** unlike old provision where they had to pay a nominal lump-sum.
- **No NOC to industries in over exploited areas**.
- **Installation of Sewage treatment plants; rooftop rainwater harvesting and recharge systems** and wells for groundwater level monitoring in NOC areas.
- **Categories exempted** from NOC requirements include Domestic consumers; rural drinking water supply schemes; Armed Forces Establishments and Central Armed Police Forces; agricultural activities; MSMEs drawing 10 cubic metre/day.

Groundwater Extraction in India

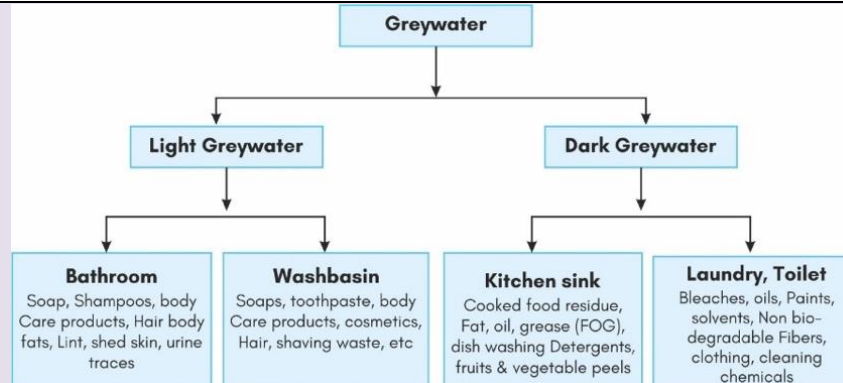
- India uses the most groundwater in the world, accounting for approximately **25% of the global groundwater extraction**.
- **As per the 2020 assessment, out of the total 6965** groundwater units in the country-

About Central Ground Water Board (CGWB)

- It is the National Apex Agency entrusted with the **responsibilities of providing scientific inputs for management, exploration, monitoring, assessment, augmentation and regulation of ground water resources of the country**.
- It was established in 1970 and is a **subordinate office of the Ministry of Jal Shakti**.
- Various activities related to regulation of ground water development in the country are being looked after by the **Central Ground Water Authority (CGWA), constituted under the Environmental (Protection) Act, 1986**.

- 1114 units (16%) were been categorized as **Over-exploited** (more extraction than recharge).
- 270 units (3.9%) as **critical** (extraction is 90-100% of what's recharged)
- 1057 units (15.2%) as **semi-critical** (extraction 70-90% of what's recharged).
- Ground water extraction in India is **primarily for irrigation in agricultural activities**, accounting for 90% of the annual ground water extraction.
- **Industrial use accounts for about 5% of the annual ground water extraction** and the remaining 5% of extraction is for drinking & domestic purposes.

4.2.2.2. OTHER WATER CONSERVATION MEASURES/INITIATIVES

<p>'Sujalam 2.0'</p> <ul style="list-style-type: none"> ● On World Water Day, Union minister for Jal Shakti launched a 'Sujalam 2.0' grey water recycling project. ● Grey water is defined as the wastewater that includes water from baths, showers, hand basins, washing machines, dishwashers and kitchen sinks, but excludes streams from toilets. ● More than 70 percent of freshwater across rural households in India gets converted to greywater. 	
<p>AquaMAP</p> <ul style="list-style-type: none"> ● It is a new water management and policy centre that was inaugurated recently at IIT Madras. <ul style="list-style-type: none"> ○ IIT Madras is collaborating with IIT Dharwad around the broad theme of 'Data Science for Water Security and Agriculture Sustenance'. ● AquaMAP aims at providing solutions for complex and challenging water problems by designing smart and optimal water management practices and implementing them in the field (in villages and towns). ● Other Key activities of AquaMAP include: <ul style="list-style-type: none"> ○ Identify grand challenges in water/wastewater management. ○ Set up of a state-of-the-art Hydro-Informatics Laboratory. 	

4.2.3. MINAMATA CONVENTION

Why in news?

Fourth Conference of Parties (COP4) to the **Minamata Convention (MC) on Mercury** being held in Bali, Indonesia.

Outcomes of COP4

- At the meeting, Indonesia as well as the United Nations have introduced a global declaration that calls on parties to the **MC on Mercury to tackle global illegal trade of mercury.**
- **Non-binding declaration calls upon parties to-**
 - **Develop practical tools and notification and information-sharing systems** for monitoring and managing trade in mercury.
 - **Exchange experiences and practices relating to combating illegal trade** in mercury, including reducing use of mercury in artisanal and small-scale gold mining.

About Minamata Convention

- **MC on Mercury**, adopted in 2013 at Geneva, is the world's **first legally binding treaty to protect human health and environment** from adverse effects of mercury.
 - It is named after the city in Japan that became the epicenter of Minamata disease, a neurological disease caused by severe mercury poisoning, in the 1950s.
 - **India signed the MC in 2014 and ratified in 2018.**
 - **It came into force in 2017.**

Is India a Party? 

Other conventions	
Rotterdam	For certain hazardous chemicals and pesticides in international trade.
Basel	Control of transboundary movements of hazardous wastes and their disposal
Vienna	Protection of Ozone Layer
Stockholm	Persistent Organic Pollutants (POPs)

About Mercury

- Mercury is considered by WHO as one of the top ten chemicals or groups of chemicals of major public health concern.
- It may have **toxic effects on nervous, digestive, and immune systems, lungs, kidneys, skin and eyes.**
- **India is second-largest user of mercury** in world after US.

Other Pollutants in News

<p>Carbofuran</p>	<ul style="list-style-type: none"> • Recent death of more than 95 Himalayan griffon vultures (Near Threatened) and a steppe eagle in Assam has been attributed to pesticide poisoning due to carbofuran. • About Carbofuran: <ul style="list-style-type: none"> ○ It is a pesticide that is widely used to control insects and nematodes on a variety of agricultural crops. ○ Its extensive use for agricultural and non-agricultural purposes has been directly responsible for the environmental contamination and human health issues.
<p>Methyl Isocyanate (MIC)</p>	<ul style="list-style-type: none"> • The 337 tonnes of hazardous waste at Union Carbide India Limited's (UCIL's) in Bhopal will be burnt at an incinerator at Pithampur industrial areas in Indore. • The waste was dumped after leakage of at least 30 tonnes of Methyl Isocyanate (MIC) from the plant in 1984 (Bhopal gas Tragedy). • Methyl Isocyanate (MIC) is a colourless liquid used for making pesticides. It is a highly toxic gas. <ul style="list-style-type: none"> ○ The chemical is highly reactive to heat. When exposed to water, the compounds in MIC react with each other causing a heat reaction. ○ MIC is no longer in production, although it is still used in pesticides. ○ Immediate health effects include ulcers, photophobia, respiratory issues, anorexia, persistent abdominal pain, genetic issue etc. and long-term health effects include chronic conjunctivitis, decreased lung function, increased pregnancy loss, increased infant mortality, etc.

Updated Classroom Study Material

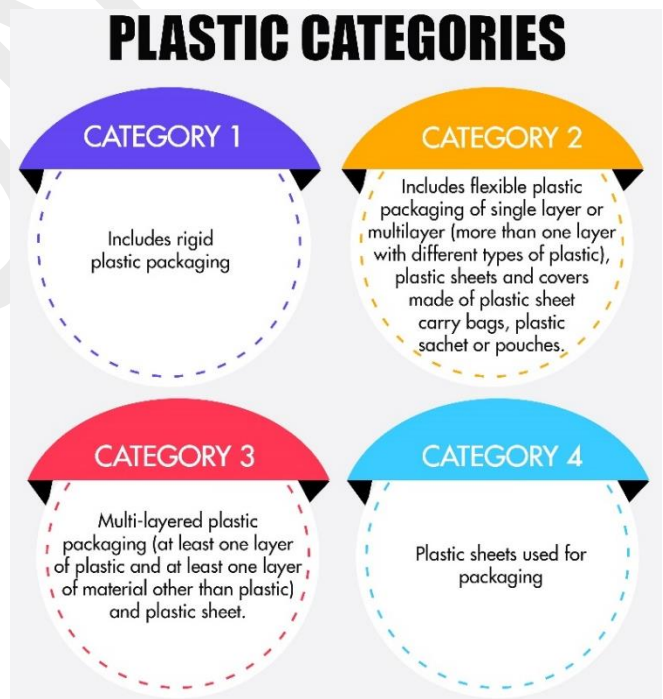
4.2.4. EXTENDED PRODUCERS' RESPONSIBILITY ON PLASTIC PACKAGING

Why in news?

Recently, Ministry of Environment, Forest and Climate Change has notified the Guidelines on Extended Producers Responsibility (EPR) on plastic packaging under Plastic Waste Management Rules, 2016.

New Guidelines of EPR

- **Coverage:** Covers reuse, recycling, use of recycled plastic content and end of life disposal by producers, importers and brand-owners.
- **Classification:** The new rules classify plastics into four categories (See infographic)
- **Compulsory Registration:** The producers, importers and brand-owners (PIBO) shall have to provide the details of recycling certificates only from registered recyclers along with the details of quantity sent for end-of-life disposal, of next financial year while filing annual returns on the online portal.
- **Market mechanism for plastic waste management through EPR Certificates:** For the first time, the guidelines allow for the sale and purchase of surplus extended producer responsibility certificates.
 - **Brand owners and e-commerce** players have been brought under the ambit of EPR.
- **Establishment of Centralised online portal:** by Central Pollution Control Board (CPCB) for the registration as well as filing of annual returns by producers, importers and brand-owners, plastic waste processors of plastic packaging waste by March 31.
- **Compensation:** Environmental compensation shall be levied based upon polluter pays principle, with respect to non-fulfilment of EPR targets by PIBOs.



- **Applicability:** Applicable to both **pre-consumer and post-consumer plastic packaging waste**. Provisions and targets for collection, re-use (by brand owners), recycling (by PIBOs) and use of recycled plastic (by PIBOs) have been laid out.
- The **plastics which cannot be recycled will be sent for end-of-life disposal such as road construction, waste to energy, waste to oil, and cement kilns.**
- **Targets:** The EPR target will be **increased to 70% in 2022-23 and 100% from 2023-24 onwards.**
 - The **recycling obligation for producers will be 50% for rigid plastics in 2024-25, 60% in 2025-26, 70% in 2026-27, and 80% from 2027-28 onwards.**
- **Annual Reports:** SPCBs or PCCs shall submit annual report on EPR portal with respect to its fulfilment by producers, importers and brand-owners (which include manufacturers of plastic packaging material) and plastic waste processors in the state/Union Territory to the CPCB.
 - The report shall also be submitted to the **state-level monitoring committee constituted under the Plastic Waste Management Rules, 2016.**

Other measures to tackle Plastic Pollution

UNEA resolution to end Plastic Pollution	<ul style="list-style-type: none"> • Representatives from 175 nations endorsed the resolution at UN Environment Assembly (UNEA-5) in Nairobi to End Plastic Pollution and forge an international legally binding agreement by 2024.
Prakriti mascot	<ul style="list-style-type: none"> • Union Minister of Environment, Forest & Climate Change (MoEFCC) launched Prakriti mascot to spread awareness among masses about small changes that can be sustainably adopted for a better environment.

4.3. BIODIVERSITY

4.3.1. IUCN GREEN LIST OF PROTECTED AND CONSERVED AREAS

Why in News?

In 2021, 10 protected areas in Switzerland, France and Italy entered IUCN Green List of Protected and Conserved Areas.

About IUCN Green List of Protected and Conserved Areas

- It is the **first global standard of best practice for area-based conservation.**
- It is a **programme of certification for protected and conserved areas** – national parks, natural World Heritage sites, community conserved areas, nature reserves etc. that are effectively managed and fairly governed.
- Its objective is to provide a **global benchmark to assess whether protected and conserved areas are achieving successful conservation outcomes** through effective and equitable governance and management.
- It **aims to increase the number of natural areas** delivering long-lasting conservation results for people and nature.
- The sites admitted to the IUCN Green List have distinguished themselves **through exemplary management, fair governance, and a long-term commitment** to successful conservation.
 - Presently, 59 sites in 16 countries have made it to the list.
 - **No Indian site is currently part of this list.**
- The **IUCN Green List Standard** is organized into 4 components of successful nature conservation in protected and conserved areas. The baseline components concern: **Good Governance; Sound Design & Planning; and Effective Management.**
 - Together, these **support the component on Successful Conservation Outcomes** attesting to the successful achievement of an area’s goals and objectives.

<p>Related news: Other Effective area-based Conservation Measures (OECM) site tag</p> <ul style="list-style-type: none"> • Aravali Biodiversity Park in Gurugram was declared as India’s first OECM site. <ul style="list-style-type: none"> ○ The Biodiversity Park in Aravali range was once a mining site, left wasted and scarred after mindless quarrying. It was later rehabilitated with govt, people, corporates support. • OECM tag is conferred upon areas of rich biodiversity, outside of protected areas like national parks and sanctuaries, for effective in-situ conservation. • It is issued by International Union for Conservation of Nature (IUCN).

4.3.2. NATIONAL WETLAND INVENTORY AND ASSESSMENT-2006-07 AND 2017-18

Why in news?

National Wetland Decadal Change Atlas titled National Wetland Inventory and Assessment-2006-07 and 2017-18 was recently released.

More on News

- National Wetland Decadal Change Atlas titled National Wetland Inventory and Assessment-2006-07 and 2017-18 was **prepared by the Space Applications Centre (SAC) of ISRO**, highlighting the **changes which have happened in Wetlands across the country in the past decade.**
 - The **original Atlas was released by SAC in 2011** and has over the years been used extensively by all the State Governments also in their planning processes.
- **Key highlights**
 - At the national level, the total wetland area has been estimated at 15.98 Mha, which is around **4.86 per cent of country's total geographic area.**
 - Among the wetland types, **more than one-third of the total wetland area is covered by rivers** (35.2 per cent), another around 43 per cent wetland area is covered combining reservoirs (17.1 per cent).
 - A majority of the increase in wetland area in last decade has been found in **inland man-made (81.5 per cent) and coastal artificial (17.0 per cent) categories.**
 - There is a **decrease in coastal natural wetlands**, mostly converted to coastal man-made categories.
 - There is an **increase in the mangroves area, coral reefs area.**

Other Wetland related news



Integrated Management of Wetland, Biodiversity and Ecosystems Services project	<ul style="list-style-type: none"> • Integrated Management of Wetland, Biodiversity and Ecosystems Services project, funded by GEF Trust Fund has been allocated ₹31.13 crore for a period of 5 years. • The project covers 3 wetlands: Sasthamcotta Lake in Kerala, Harike Lake in Punjab, and Kabartal in Bihar. • About Global Environment Facility (GEF) Trust Fund: <ul style="list-style-type: none"> ○ It was established on the eve of the 1992 Rio Earth Summit. ○ GEF funds are available to developing countries and countries with economies in transition to meet the objectives of the international environmental conventions and agreements. ○ World Bank serves as the GEF Trustee, administering the GEF Trust Fund (contributions by donors).
Chilika lake	<ul style="list-style-type: none"> • Number of Irrawaddy dolphins in Chilika lake has fallen. • Chilika Lake, located in east coast of Odisha, is Asia's largest brackish water lake and second largest coastal lagoon in the world. <ul style="list-style-type: none"> ○ It is designated as Ramsar Site, a wetland of International Importance.

4.3.3. PROTECTED AREAS IN NEWS








Periyar Tiger Reserve, Kerala	<ul style="list-style-type: none"> • The much-touted airstrip in Kerala's hill district Idukki is likely to affect the wildlife and ecology of Periyar Tiger Reserve (PTR). • Location: It is situated in the Cardamom Hills and Pandalam Hills of the Southern Western Ghats of peninsular India. • Rivers: Mullayar, Periyar, amba and Azhuta River • Highest peak: Kottamala (2016m) • Forest: Tropical evergreen forests, tropical semi-evergreen forests, moist deciduous forests, rasslands and eucalyptus plantations.
Mouling National Park, Arunachal Pradesh	<ul style="list-style-type: none"> • Mouling National Park is located in the Upper Siang district of Arunachal Pradesh, in Adi hills of the eastern Himalayas adjoining Siang River valley. • It forms the eastern part of the Dihang-Dibang Biosphere Reserve. • It was created in 1986. • The name 'Mouling' has been derived from peak Mouling. • Forests: Tropical wet evergreen and semi-evergreen forests, tending towards wet sub-tropical broad-leaved and temperate forest at the upper reaches. • Fauna: Red Pandas, Deers, Hoolock Gibbons, and Tigers. wild buffalo, panther, elephant, hog deer, barking deer chestnut-breasted Hill Partridge Greater spotted Eagle. • Climate: Extremely humid, with high rainfall and no well-defined dry season.





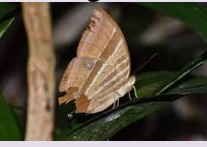


<p>Keoladeo National Park (KNP), Rajasthan</p>	<ul style="list-style-type: none"> Africa's Boma technique adopted for translocating deer from Keoladeo. <ul style="list-style-type: none"> Technique involves luring of animals into an enclosure by chasing them through a funnel-like fencing. Earlier, it is utilised to capture wild elephants for training and service. KNP, popularly known as Bharatpur Bird Sanctuary, is located in Bharatpur, Rajasthan. It was recognised as a World Heritage Site by UNESCO in 1985. It is designated as a Wetland of International Importance under the Ramsar Convention in 1981. It is known as the breeding ground for the rare and elusive to spot Siberian crane.
<p>Changthang and Karakoram sanctuaries, Ladakh</p>	<ul style="list-style-type: none"> Ladakh has identified proper mapping and boundary identification of Changthang and Karakoram sanctuaries along India-China border as a priority concern. <ul style="list-style-type: none"> Wildlife Institute of India (WII) has been asked to map and identify areas of 'high conservation value' to help 'rationalise' boundaries - allowing for addition or deletion of land. Changthang WLS is located in Ladakhi Changthang plateau in Leh district of Jammu and Kashmir. <ul style="list-style-type: none"> Lakes: Home to highest altitude water lakes, namely, Tso Moriri (also the highest lake on earth), Pangong Tso and Tso Kar. Fauna: Kiang or Tibetan wild ass along with the Dark-necked crane. It has Korzok village, which is also considered to be the world's highest village. Karakoram (Nubra Shyok) WLS is located in high altitude of easternmost reaches of Karakoram Range in Leh District. <ul style="list-style-type: none"> Fauna: Abode of Chiru or Tibetan Antelope, Tibetan gazalle, Himalayan ibex, Shapo, bharal, wild yak, Snow leopard etc. Bounded on North and South by China and Pakistan, the Karakoram ranges lines the north.

4.3.4. FAUNA AND FLORA IN NEWS

<p> Terrestrial species</p>	
<p>Snow leopard</p> 	<ul style="list-style-type: none"> Snow leopard conservationist (Charudutt Mishra) wins Whitley Gold Award for efforts to involve local communities. Snow Leopard (Panthera Uncia) <ul style="list-style-type: none"> Often termed as Ghost of Mountain, is closely related to the largest cat species Tiger (Panthera Tigris). Habitat: They are perfectly adapted to cold, arid, barren mountain areas with mountainous rangelands at elevations of 3,000 to over 5,000 m in the Himalaya and Tibetan Plateau as well as Altai Mountains (Russia and Mongolia) at 500 m elevation. <ul style="list-style-type: none"> Are found in 12 snow leopard range countries (Afghanistan, Bhutan, China, India, Kazakhstan, Kyrgyz Republic, Mongolia, Nepal, Pakistan, Russia, Tajikistan, and Uzbekistan) China has world's largest snow leopard population. The main prey animals of Snow Leopard are Siberian ibex goat, Himalayan Tahr, Argali sheep, Blue Sheep (Bharal), Marmots etc. Characteristics: Snow leopards are smaller than common leopards. They are well camouflaged and are essentially solitary animal. <ul style="list-style-type: none"> They can hiss, mew, chuff, growl and wail but can't roar as they lack the throat structure to do so. The spots are called rosettes which is unique to every snow leopard. Conservation Status: <div style="display: flex; justify-content: space-around; align-items: center;"> <div> </div> <div> </div> <div> </div> <div> </div> <div> </div> </div>
<p>Indian Wolf</p> 	<ul style="list-style-type: none"> The first scientific population estimate of Indian peninsular wolves (Canis lupus pallipes) has revealed that only 3,100 members of the species are left in the country. Indian wolf is a subspecies of grey wolf. It is one of the common large carnivores found in scrub, grasslands and agro-pastoral regions of semi-arid India.

	<ul style="list-style-type: none"> • Highest concentration is currently in Madhya Pradesh, followed by Rajasthan, Gujarat, Maharashtra and Chhattisgarh. • Threat- Hunting, encroachment and land conversion, growing man-animal conflict. • Conservation status: <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; text-align: center;"> </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> WPA, 1972 Schedule I </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> </div> </div>
<p>Golden Langur</p> 	<ul style="list-style-type: none"> • A recent study by scientists has suggested a significant decline in the habitat of Golden Langur. • Golden Langur are easily recognised by the colour of their fur, and are distributed in the trans-boundary region of Bhutan and India. • Habitat is restricted to the foothills of Bhutan (north), Manas river (east), Sankosh river (west), and Brahmaputra river (south). • Threat- electrocution, deforestation, habitat loss. • Conservation Status: They are also protected under Bhutan's Forest and Nature Conservation Act, 1995 <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; text-align: center;"> </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> WPA, 1972 Schedule I </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> </div> </div>
<p>White Cheeked Macaque</p> 	<ul style="list-style-type: none"> • Scientists from Zoological Survey of India have recorded presence of White-Cheeked Macaque (Macaca leucogenys) from central Arunachal Pradesh in India. • The species was first discovered in 2015 in China and its existence was not known in India before this. • They have distinct white cheeks, long and thick hair on neck and longer tail than other Macaque species. • It is the last mammal to have been discovered in Southeast Asia. • Both Arunachal Macaque and White Cheeked Macaque exist in the same biodiversity hotspot in the eastern Himalayas. • They have not been yet included in the Wildlife (Protection) Act, 1972 of India. Its conservation status is not yet determined.
<p>Halari Donkey</p> 	<ul style="list-style-type: none"> • Union Minister of Fisheries, Animal Husbandry and Dairying called for a roadmap for conservation of Halari breed of Donkey. • About Halari Donkey <ul style="list-style-type: none"> ○ Native to Saurashtra region of Gujarat. ○ Currently it is in a threatened state and requires immediate steps towards conservation to reverse the declining trend in the population (Numbers declined from 1200 in 2015 to 439 in 2021-22 in its native tract). ○ Challenges in conservation: Unavailability of Halari Donkey male for breeding, disincentives to rearers with no avenues for streamlining the livelihoods (based on donkey milk).
<p>Dholes</p> 	<ul style="list-style-type: none"> • Researchers spot dholes in Kyrgyzstan after 3 decades. • About Dholes - <ul style="list-style-type: none"> ○ A highly social animal, also known as Asiatic wild dogs, they are native to Central and Southeast Asia. ○ India sustains the highest number of dholes, which are widely distributed in three major landscapes- Western Ghats, Central India and Northeast India. ○ Threats- human dominance, excessive habitat loss and declining prey base. ○ Conservation status: listed as Endangered by IUCN. <div style="text-align: right;"> </div>
<p>Koala</p> 	<ul style="list-style-type: none"> • Australian government declared the koala as 'Endangered' in the states of Queensland and New South Wales as well as the Australian Capital Territory. • About Koala (Scientific name: Phascolarctos cinereus): <ul style="list-style-type: none"> ○ Region: Found only in Australia. ○ Habitat: Live high up in eucalyptus trees of native bushlands and forests, usually perched between the forks of the tree's branches. ○ Diet: Up to a kilogram of eucalyptus leaves every day. ○ Major threat: habitat loss; Chlamydia, a bacterial disease and bushfires, drought etc.

<p>Purple frog (or pig-nosed frog)</p> 	<ul style="list-style-type: none"> • Scientific name: <i>Nasikabatrachus sahyadrensis</i> • Distribution: Endemic to the Western Ghats in India. • First discovered in October 2003 in the Idukki district of Kerala. • Habitat: Prefers loose, damp and well-aerated soil close to ponds and ditches or streams. <ul style="list-style-type: none"> ○ It remains underground most of the year except for 2-3 weeks during the monsoon when it comes out to mate. • IUCN Red List status: Endangered • Threats: Deforestation from expanding cultivation, consumption and harvesting by local communities. 	
<p>Aquatic species</p>		
<p>Vaquita porpoise</p> 	<ul style="list-style-type: none"> • Global population of Vaquita porpoise (porpoise family) declined by 98% in 2 decades. <ul style="list-style-type: none"> ○ World's smallest cetacean and most endangered marine mammal. ○ Known as "panda of the sea" for the distinctive black circles around its eyes. ○ Scientific Name: <i>Phocoena sinus</i> ○ Habitat: Found in Gulf of California in Mexico. ○ IUCN status: Critically endangered. • Threat: Gillnet fishing for totoaba, endangered fish threatened by illegal fishing for international markets. 	
<p>Sawfish</p> 	<ul style="list-style-type: none"> • An extremely rare and critically endangered sawfish was caught in fishing nets in Karnataka. • Sawfish have a long-flattened head and body and an elongated snout, much like that of the saw shark, that forms a long flat blade edged with strong teeth. • Habitat: shallow water in subtropical and tropical regions of the world. They are bottom dwellers. • Sawfishes are ovoviviparous fishes (that is, fertilized eggs grow within the body of female sawfishes, and the young are born alive). • Conservation Status (as per IUCN): <ul style="list-style-type: none"> ○ Large tooth sawfish: Critically Endangered ○ Dwarf Saw Fish: Endangered ○ Green Sawfish: Critically Endangered ○ Smalltooth Sawfish: Critically Endangered ○ Narrow Sawfish: Endangered 	
<p>Sea cucumber</p> 	<ul style="list-style-type: none"> • Sea cucumber related seizures increased in 2019 and 2020, making Gulf of Mannar/Palk Bay region a global hotspot for sea cucumber smuggling. • Sea cucumbers are being harvested in India and Sri Lanka owing to high demand from East Asia where they are considered a delicacy, eaten both fresh or dried, and are also used in traditional Chinese medicine. <ul style="list-style-type: none"> ○ Though India banned sea cucumber fishery in 2001, Sri Lanka tried to restrict the trade through a system of permits. This disparity allowed Indian fishers to exploit Sri Lanka's legalised sea cucumber trade. • About Sea Cucumbers <ul style="list-style-type: none"> ○ Sea cucumbers are part of animal group called echinoderms (marine invertebrates) that live on the seafloor. ○ Their body shape is similar to a cucumber, but they have small tentacle-like tube feet that are used for locomotion and feeding. ○ Habitat: Found in virtually all marine environments throughout the world- shallow to deep-sea environments. ○ Threats: climate change and ocean acidification, habitat destruction, illegal fishing, and water pollution. ○ IUCN categorizes a few species of sea cucumber (e.g., brown sea cucumber) as vulnerable or endangered. But most species are considered a species of least concern. 	
<p>Rough-Toothed Dolphin</p> 	<ul style="list-style-type: none"> • A Research team of the Department of Environment and Forest in Lakshadweep has reported the first-ever live sighting of rough-toothed dolphins (Steno bredanensis) in Indian waters. • About Rough-Toothed Dolphin: <ul style="list-style-type: none"> ○ Found in tropical and warmer temperate waters all over the world but little is known about them. ○ Grow up to 8.5ft in length and have grey body with white lips and throat and a speckled belly. 	

	<ul style="list-style-type: none"> • Conservation status: <div style="display: flex; align-items: center; gap: 10px;">   </div>
<p>Pola vatta</p> 	<ul style="list-style-type: none"> • Central Marine Fisheries Research Institute has identified a new species of fish carangid (Vatta) species from the Indian coast. • Locally known as polavatta, fish belongs to ‘queen fish’ group and is available across coasts in the country. • There are over 60 species of carangids in the Indian seas and four of them belong to the ‘queen fish’ category. • The finding would help improve Indian marine biodiversity status.
<p> Insects, rodents etc.</p>	
<p>Butterfly Palmking</p> 	<ul style="list-style-type: none"> • The rare butterfly Palmking has been sighted for the first time in Tamil Nadu. • About the Palmking <ul style="list-style-type: none"> ○ It is characterized by its brown colour and dark bands and is described as reclusive, mostly resting in the shade. ○ Wood color wings make it easy to camouflage. ○ It rarely spreads its wings. ○ It generally feeds on the coconut palm.
<p> Plant Species</p>	
<p>Seaweed</p> 	<ul style="list-style-type: none"> • As per Minister of State for Fishing, Animal Husbandry and Dairying, for the first time in country, a seaweed park will be set up in Tamil Nadu to improve the livelihood of fishermen. <ul style="list-style-type: none"> ○ It will be implemented under the Prime Minister's Matsya Sampada Yojana. • Seaweeds, the primitive, marine non-flowering marine algae without root, stem, and leaves, plays a major role in marine ecosystems. <ul style="list-style-type: none"> ○ Found mostly in intertidal region (Southern Gulf of Mannar), shallow and deep waters of the sea and estuaries and backwaters. • Significance of seaweeds <ul style="list-style-type: none"> ○ Storehouse of nutrients like iron, zinc, magnesium, riboflavin, thiamine, vitamin A, B, C & K etc. ○ Act as a bio-indicator and balance out the ecosystem. ○ Mitigating climate change. ○ Used as fertilizers and to increase fish production. ○ Can be buried in beach dunes to combat beach erosion. ○ Used as an ingredient in preparing toothpaste, cosmetics and paints. • Seaweed is different from seagrass, as seaweed is a non-vascular, plant-like macroalga which lacks true stem, roots and leaves. <ul style="list-style-type: none"> ○ Seagrass is a vascular plant which has true stem, roots and leaves.

4.3.5. THE INDIAN ANTARCTIC BILL, 2022

Why in news?

Recently, the government has tabled **The Indian Antarctic Bill, 2022** in Lok Sabha. The draft bill is the first domestic legislation about the Antarctica in India.

Key Provisions of the Bill

- **Applicability:** Provisions applicable to any, Indian or foreign person, vessel or aircraft that is involved in any Indian expedition to Antarctica.
- **Establishment of a Committee on Antarctic Governance and Environmental Protection** chaired by the Secretary of the Ministry of Earth Sciences along with ten members and two experts by the Union Government. The functions of the Committee include:
 - **Granting permits** for various activities,

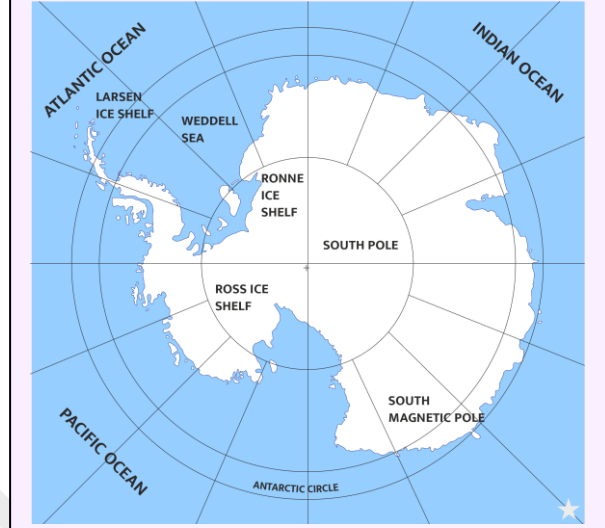
India's other endeavours in Antarctica

- The Protocol on Environmental Protection to the Antarctic Treaty (the Environmental Protocol or **Madrid Protocol**) **entered into force for India in 1998**.
- India is also a **member of Council of Managers of National Antarctic Programme (COMNAP)**, Scientific Committee of Antarctica Research (**SCAR**) and Commission for Conservation of Antarctic Marine Living Resources (**CCAMLR**).
- **India's Research stations: Maitri** at Schirmacher Hills, **Bharati** at Larsemann Hills (Dakshin Gangotri was the first Indian base established in 1984).
- The Antarctic operations of India are currently funded from the **budget allocated to the Ministry of Earth Sciences** under relevant head.

- Implementing and **ensuring compliance** of relevant international laws for protection of Antarctic environment,
- **Obtaining and reviewing relevant information** provided by parties to the Treaty, Convention, and Protocol, and
- **Negotiating fees/charges with other parties** for activities in Antarctica.
- **Permits system:** A permit by the Committee or written authorisation from another party to the Protocol (other than India) will be required for various activities such as:
 - **Entering and staying in Antarctica.**
 - **Mineral resource activities** like drilling, dredging or excavating for mineral resources, or collecting samples of mineral resources.
 - **Introduction of non-native animals** and plants or microscopic organisms into Antarctica.
 - **Removal of biological specimen** or any other sample from Antarctica.
 - **Activities which may harm native species.**
 - **Waste disposal** in Antarctica or discharge into sea.
- **Prohibited activities:**
 - Nuclear explosion, disposal of radioactive wastes.
 - Introduction of non-sterile soil.
 - Introduction of specified substances and products.
 - Discharge of garbage, plastic, or other substance harmful to marine environment in Antarctica.
 - Damage, destroy or remove any historic site or monument.
 - Possession, sale or offering for sale, trading, transporting, transferring, or sending anything that has been obtained by violating provisions of the act.

About Antarctica

- World's 5th largest, southernmost and is the **driest, windiest, coldest, and iciest** continent.
- **Antarctica is not a country.** It has no government and no indigenous population. Instead, the entire continent is set aside as a scientific preserve.
- Mt. Erebus and Deception Island are the two active volcanoes in Antarctica.



● **Stringent penalties for contravention of its provisions:**

Offense	Punishment
Conducting a nuclear explosion in Antarctica	Imprisonment of 20 years which may extend to life imprisonment and a fine of at least Rs 50 crore
Drilling for mineral resources or introducing non-native animals or plants in Antarctica without a permit	Imprisonment up to seven years and a fine between Rs 10 lakh and Rs 50 lakh

- **Sessions court to try punishable offences:** The central government may notify one or more Sessions Courts to be the Designated Court and specify its territorial jurisdiction to try offences punishable under the Bill.

About Antarctic Treaty

- The treaty was signed in 1959 and came into force on 23 June 1961 after ratification by 12 original members.
 - **These 12 countries are:** Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, South Africa, USSR (now Russia) the UK, and the US.
- **Parties:** Currently 54 countries have acceded it.
 - India joined the treaty in 1983 and soon received consultative status.
- **Objectives of the treaty**
 - **To demilitarize Antarctica** and to establish it as a zone free of nuclear tests and the disposal of radioactive waste, and to ensure that it is used for peaceful purposes only.
 - **To promote international scientific cooperation** in Antarctica.
 - **To set aside disputes over territorial sovereignty.**
- The Treaty parties have also negotiated three international agreements which govern activities in Antarctica, collectively known as the **Antarctic Treaty System-**
 - **Convention for the Conservation of Antarctic Seals (1972)**
 - **Convention on the Conservation of Antarctic Marine Living Resources (1980)**
 - **Protocol on Environmental Protection to the Antarctic Treaty (1991)**

Related news: Polar Science and Cryosphere Research (PACER) scheme has been approved for continuation during 2021-2026.

- The scheme comprises the **Antarctic program, Indian Arctic program, Southern Ocean program and Cryosphere and Climate** program.
- Implemented through **National Centre for Polar and Ocean Research (NCPOR)**, an autonomous institute under the **Ministry of Earth Sciences**.

4.3.6. BIODIVERSITY CONSERVATION MEASURES AND INITIATIVES IN NEWS

Montreux Convention	<p>Turkey pledged to implement 1936 Montreux Convention Regarding the Regime of the Straits to limit the movement of Russian warships between Mediterranean Sea and Black Sea.</p> <p>About the convention</p> <ul style="list-style-type: none"> • According to the convention, Turkey has control over both the Bosphorus and Dardanelles straits. • It is an essential element in the context of Black Sea security and stability. • Bosphorus and Dardanelles straits, also known as the Turkish Straits or the Black Sea Straits, connect the Aegean Sea and the Black Sea via the Sea of Marmara. • It is the only passage through which the Black Sea ports can access the Mediterranean and beyond.
Software with Intelligence Marking Based Identification of Asiatic lions (SIMBA)	<ul style="list-style-type: none"> • Gujarat forest department will use SIMBA an Artificial Intelligence (AI)-based photo-identification software-specifically designed to distinguish patterns or marks. • It has been developed by Hyderabad-based “teliolabs”. • How it works - Asiatic lions have unique whisker spots on either side of their muzzle. According to scientific studies, these precise patterns are highly variable and do not change over time. • SIMBA, with machine learning technique automates the individual identification, based on the variability in the individual’s whisker spot pattern, presence of scars on face, notches on ears and other metadata of the photograph.
Hornbill Nest Adoption Program (HNAP)	<ul style="list-style-type: none"> • The Nyishi tribe of Arunachal Pradesh celebrated a decade success of HNAP. <ul style="list-style-type: none"> ○ HNAP, launched in 2011 as community-based hornbill conservation programme, operates in the forests outside Arunachal Pradesh’s Pakke Tiger Reserve. • Hornbills are indicators of the health of a forest, they are seed dispersers and called as ‘farmers of the forest’. • India is home to nine species, of which four are found in Western Ghats—Indian Grey Hornbill, Malabar Grey Hornbill, Malabar Pied Hornbill and the Great Hornbill.
Mother Nature’ A ‘Living Being’ With Legal Entity: Madras High Court (HC)	<ul style="list-style-type: none"> • Invoking ‘parens patriae jurisdiction’, the HC bestowed ‘legal entity’ status upon nature and directed the State and Central governments to protect it. <ul style="list-style-type: none"> ○ Parens Patriae in Latin means “parent of the nation”. It allows the guardianship of the State of the rights of entities that are unable to fight for their own rights. ○ Earlier, in 2017 Uttarakhand HC, granted the Ganga and Yamuna rivers had the same legal status as human beings, however Supreme Court overruled this order. ○ Also, in 2018, Uttarakhand HC declared the “entire animal kingdom including avian and aquatic” as legal entities.
‘Tree City of the World’ (TCW) Tag	<ul style="list-style-type: none"> • Mumbai and Hyderabad have been jointly recognised as ‘2021 TCW’. • TCW programme started by United Nations’ Food and Agriculture Organisation and American non-profit organisation Arbor Day Foundation. • It provides direction, assistance, and worldwide recognition for a community’s dedication to its urban forest. • Also, provides framework for healthy, sustainable urban forestry programme in town or city. • City was evaluated based on five standards i.e. Establish Responsibility, Set the Rules, Know What You Have, Allocate the Resources, and Celebrate the Achievements.
Familial Forestry	<ul style="list-style-type: none"> • Familial forestry means caring for the tree as a family member so that the tree becomes a part of the family’s consciousness. • Land for life Award 2021 was conferred to the Familial Forestry of Rajasthan, India, by United Nations Convention to Combat Desertification (UNCCD) in June 2021. <ul style="list-style-type: none"> ○ Award is conferred to provide global recognition to work which have made a significant contribution to sustainable development through sustainable land management (SLM).

4.4. SUSTAINABLE DEVELOPMENT

4.4.1. SUSTAINABLE SAND MANAGEMENT

Why in news?

A report titled ‘**Sand and Sustainability: 10 strategic recommendations to avert a crisis**’ was recently released by United Nations Environment Programme (UNEP).

About the report

- **Aim of the report:**
 - **Raise awareness** around the world on sand extraction and use, and its related impacts.
 - **Urge policymakers** to explore and adopt policies on sand extraction and use that are appropriate to their contexts and jurisdictions.
 - **Shape common goals** across sectors that will help achieve just and responsible sand governance and management everywhere.
 - **Propose solutions** for finding pathways toward a more sustainable use of sand.
- **Key highlights of the report**
 - **Sand, gravel, crushed stone and aggregates (sand resources) are the second most exploited natural resource** in the world after water.
 - **Current extraction exceeds the replenishment rates** of naturally occurring sand.

About Sand




- It’s a mineral granular material that does not stick together when wet and remoulded (i.e., noncohesive) and where the combined weight of 50% of the particles is smaller than 4.75mm, with less than 15% of material smaller than 75µm.
- **Natural sources of sand-**
 - rock quarries,
 - terrestrial sand deposits,
 - the riverine and lacustrine environment,
 - the beach systems and
 - the marine environment.

Sand management in India

- Sand is a **minor mineral** defined under Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act).
- The act empowers **state governments** to frame rules to prevent illegal mining, transportation, and storage of minerals (both major minerals and minor minerals) and for purposes connected therewith.
- The Ministry of Environment Forest & Climate Change formulated the **Sustainable Sand Management Guidelines 2016** which focuses on the Management of Sand Mining in the Country. But it failed to curb the practice, illegal and unsustainable sand mining has continued to be common.
- In 2020, Ministry of Environment, Forests and Climate Change had released **Enforcement and Monitoring Guidelines for Sand Mining 2020** to check illegal sand mining in the country.

Alternative sand or manufactured sand

It is the sand made from other than natural sources, by processing materials, using thermal or other processes such as separation, washing, crushing and scrubbing. It is mainly classified into-

 <p>Co- and by products of industrial & extractive processes</p>	<ul style="list-style-type: none"> ■ They are a group of secondary materials, derived from the manufacturing or synthesising of another material, and could be used to replace sand and/or grave. ■ E.g., blast furnace slag, waste foundry sand, coal bottom ash, cement kiln dust, wood ash, Ore-sand (O-sand) etc. ■ O-sand is a type of processed sand sourced as a co-product or by-product of mineral ores.
 <p>Crushed Rock Sand</p>	<ul style="list-style-type: none"> ■ It is produced by crushing virgin rocks, is generally more angular and has a rougher surface texture than naturally weathered sand particles. ■ Diorite, metamorphic siltstone, granite, limestone, sandstone, feldspathic quartzite etc. are some of the parent rocks used for its production.
 <p>Recycled Fine Aggregate (RFA)</p>	<p>It is produced from the re-processing of mineral waste materials with the largest source from Construction & Demolition waste.</p>

4.4.2. GREEN PERMITS

Why in news?

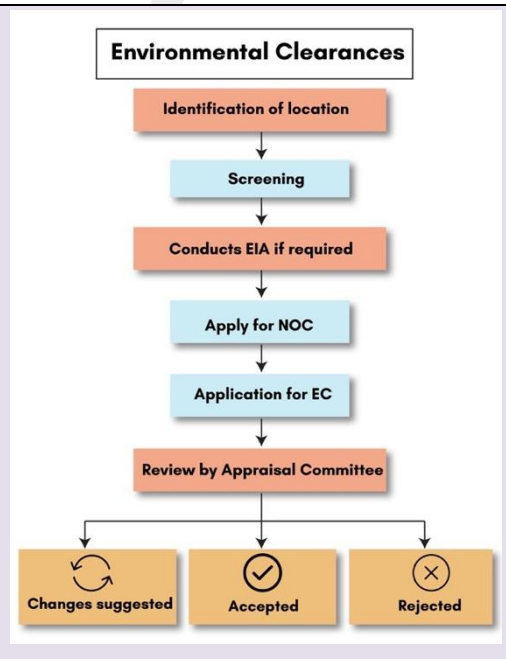
Ministry of Environment has extended tenure of green permits.

More on the news

- The tenure of Environmental Clearances (EC) given has been extended for the following projects -
 - **River valley projects** to have **13-year validity**
 - **Nuclear power projects** or those involving the processing of nuclear fuel to have **15 years** validity
 - For projects and activities **other than mining and river valley projects** will be valid for **10 years**.
- EC for mining leases is also under review as presently, **mining leases are granted for 50 years and EC is valid for 30 years**.
- **About EC**
 - It was first made mandatory under the **Environmental (Protection) Act 1986** for expansion or modernisation of any activity or for setting up new projects listed in Schedule 1 of the notification.
 - The **EIA legislation of 2006** made it mandatory for projects such as **mining, thermal power plants, river valley, infrastructure and industries** including very small electroplating or foundry units to get environment clearance.

Environmental clearance process

- The environmental clearance process is warranted for **39 types of projects listed in the Environmental Impact Assessment notification of 2006**.
 - These include the mining of minerals, the building of airports and townships, and the installation of thermal power plants, to name a few.
- These projects are categorized based on the kind of environmental clearance they would require.
- **Category A projects** require mandatory environmental clearance at the **central level**, and **category B** projects are reviewed at the **state level** by the SEIAAs.
 - The SEIAAs further categorize these projects into **B1 and B2**, with the latter not requiring an environmental impact assessment to be carried out in order for clearance to be granted.
 - Those in the B2 category have to meet a separate set of parameters for clearance.
- The SEIAAs are responsible for providing permissions and environmental clearance for more than **90% infrastructure, developmental and industrial projects** in the country.



Updated Classroom Study Material

4.4.3. ALTERNATE FUEL AND ENERGY

4.4.3.1. GREEN HYDROGEN/GREEN AMMONIA

Why in News?

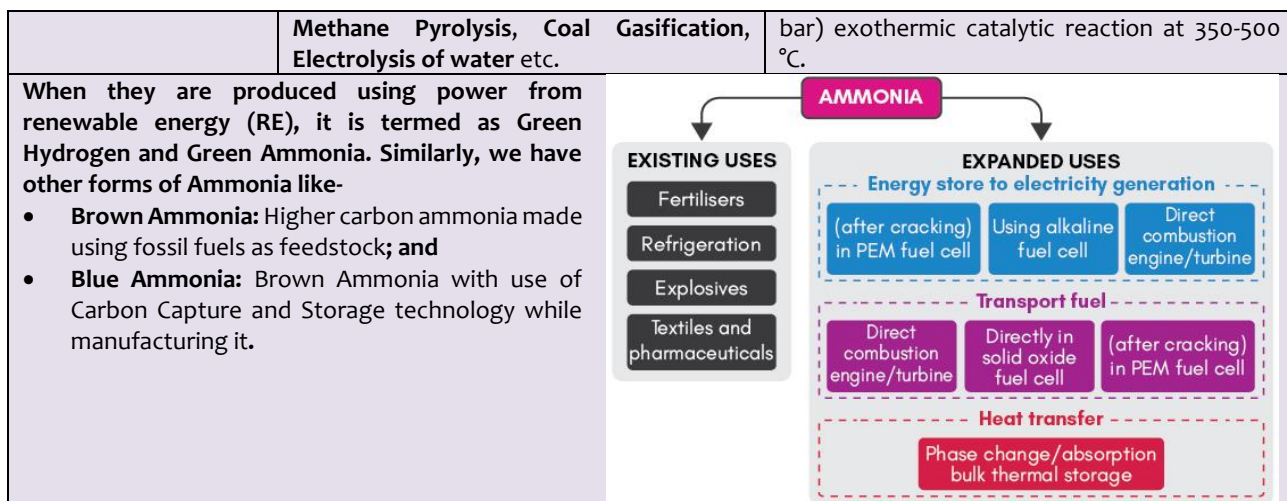
Recently, the Ministry of Power notified the first part of the Green Hydrogen/Green Ammonia Policy to enable production of Green Hydrogen/Green Ammonia using Renewable Sources of Energy.

About Green Hydrogen and Green Ammonia

- Hydrogen and Ammonia have **emerged as future fuels to replace fossil fuels** in a cost-effective manner and achieve sustainable development along with **Wind and Solar Energy**.
- Within it, **Green Ammonia**, closely followed by **Green Hydrogen**, is the **most advantageous zero-carbon fuels** based on **factors** like- fuels' life cycle GHG emissions, environmental factors, scalability, economic viability, and the technical and safety implications.

Properties of Hydrogen and Ammonia as Fuel

Feature	Hydrogen	Ammonia
About	Hydrogen (H ₂) is a clean-burning molecule with water as its by-product.	Ammonia (NH ₃) is the basic building block of all nitrogen fertilizer.
Production	Primarily through Steam Methane Reforming (producing H ₂ from natural gas), along with other methods like	Primarily through the Haber-Bosch Process , i.e. ammonia production from hydrogen (H ₂) and nitrogen (N ₂) through a high pressure (150-300



Advantages and disadvantages of Green Hydrogen and Ammonia as fuel

	Advantages	Disadvantages
Hydrogen	<ul style="list-style-type: none"> • Very high energy density, almost 3 times of hydrocarbons, making it an efficient source of energy. • Easy availability and lower cost (when produced at mass scale) • Colorless and odorless fuel and light in weight. • Multiple production pathways (as given earlier). • Reduced carbon footprints as no release of any toxic by-product or GHG. 	<ul style="list-style-type: none"> • High initial cost due to use of metals like Platinum in production. • Lack of existing storage and transport infrastructure. • Highly flammable fuel.
Ammonia	<ul style="list-style-type: none"> • Flexibility of use as a transport fuel or to store thermal and chemical energy. • Lower cost to produce, store, and deliver hydrogen as NH₃ than as compressed and/or cryogenic hydrogen. • Existing safe storage and transportation infrastructure. • Reduced Carbon footprints. E.g., present ammonia production consumes 1.8% of global energy output, producing around 500 million tonnes of CO₂. 	<ul style="list-style-type: none"> • Energy density is half of typical hydrocarbons. • Toxic to humans. • Risk of Alteration of the Global Nitrogen Cycle by humans which might lead to loss of biodiversity, poor air quality etc.

Features of Green Hydrogen/Green Ammonia (GH/GA) Policy

Operational

- **Manufacturers** of GH/GA may purchase renewable power from the **power exchange** or set up **RE capacity** themselves or through any other developer, anywhere.
- **Open access** will be granted within **15 days of receipt of application**.
- Manufacturers can **bank his unconsumed renewable power**, up to **30 days**, with distribution company and take it back when required.
- **Manufacturers** of GH/GA and the RE plant shall be **given connectivity** to the **grid on priority basis** to avoid any procedural delays.
- **MNRE will set up a single portal for carrying out all the activities** including statutory clearances in a time bound manner.
- **Connectivity**, at the **generation end** and the GH/GA manufacturing end, to the **ISTS for RE capacity** set up for the purpose of manufacturing GH/GA shall be granted on priority.
- Manufacturers of GH/GA shall be allowed to **set up bunkers** near **Ports for storage** of GA for export / use by shipping. The land for the storage for this purpose shall be provided by the **respective Port Authorities** at applicable charges.

Financial

- **Distribution licensees** can procure and supply RE to the **manufacturers of GH/GA** in their States at **concessional prices** which will only include the cost of procurement, wheeling charges and a small margin as determined by the State Commission.
- **Waiver of inter-state transmission charges** for a period of **25 years** will be allowed to the manufacturers of GH/GA for the projects commissioned before **30th June 2025**.
- Benefit of **Renewable Purchase Obligation (RPO)** will be granted incentive to the hydrogen/Ammonia **manufacturer and the Distribution licensee** for consumption of RE.

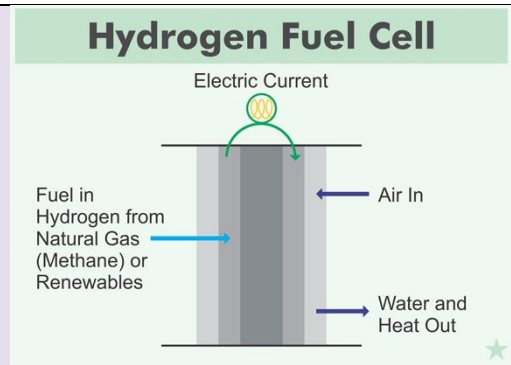
Related News

Green hydrogen-based advanced fuel cell electric vehicle (FCEV)

- This is a **first of its kind project** in India which aims to create a **Green Hydrogen based ecosystem** in the country.
- **About FCEVs**
 - FCEVs use a **propulsion system** similar to that of **electric vehicles**, where **energy stored as hydrogen** is converted to electricity by the fuel cell.
 - Unlike conventional internal combustion engine vehicles, they produce **no harmful tailpipe emissions**.

How Fuel Cells Work?

- Most fuel cell for vehicle applications is the **polymer electrolyte membrane (PEM) fuel cell**.
- In a PEM fuel cell, an **electrolyte membrane** is sandwiched between a **positive electrode (cathode)** and a **negative electrode (anode)**.
- **Hydrogen** is introduced to the **anode**, and **oxygen (from air)** is introduced to the **cathode**.
- Hydrogen molecules break apart into **protons and electrons** due to an **electrochemical reaction** in the fuel cell catalyst.



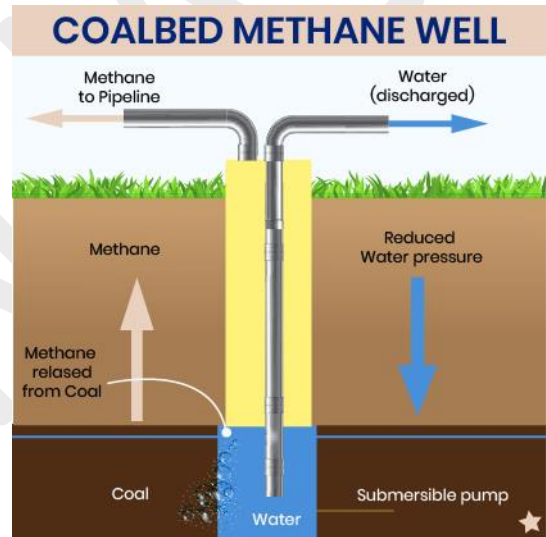
4.4.3.2. COAL-BED METHANE (CBM)

Why in news?

Government to set up renewable energy, Coal-bed methane (CBM) extraction projects on mined-out coal land.

About Coal-bed methane (CBM)

- CBM is an **unconventional form of natural gas** found in **coal deposits or coal seams**.
 - It is formed during the **process of coalification, transformation of plant material into coal**.
 - When coal and methane conversion process occur such that **coal is saturated with water** and **methane is trapped within coal**, the result is CBM.
 - CBM can be used for **power generation, as CNG auto fuel**, feedstock for fertilisers, **industrial uses** such as in cement production, rolling mills, steel plants, and for methanol production.
 - Ministry of Petroleum & Natural Gas formulated **CBM Policy** under Oilfields (Regulation & Development) Act 1948 and Petroleum & Natural Gas Rules 1959 to **harness the potential of CBM**.
- **India has fifth-largest coal reserves** in the world as of 2020, and thus holds significant prospects for exploration of CBM.
 - India's coal and CBM reserves are **found in 12 states**, with Gondwana sediments of eastern India holding the bulk.
 - **Damodar Koel valley and Son valley** are prospective areas for CBM development.



4.4.4. OTHER IMPORTANT NEWS

<p>Rejuvenating Watersheds for Agricultural Resilience through Innovative Development Programme (REWARD) project</p>	<ul style="list-style-type: none"> • REWARD is a \$115 million project signed by Central government, Karnataka, Odisha, and World Bank. • It is proposed as a 6-year Project. • It will help in the adoption of improved watershed management practices that further help increase farmers' resilience to climate change, promote higher productivity and better incomes. <ul style="list-style-type: none"> ○ Watershed management refers to implementing land use practices and water management practices to protect and improve the quality of the water and other natural resources within a watershed.
<p>Clean Energy Ministerial (CEM)</p>	<ul style="list-style-type: none"> • India is hosting the Clean Energy Ministerial (CEM) senior officials meetings. • Discussions on topics such as energy transition, Clean Power, Green Steel, and Hydrogen held as part of meeting.

	<ul style="list-style-type: none"> • CEM is a high-level global forum of 29 member countries to promote policies and programs that advance clean energy technology through sharing of knowledge and best practices. • It brings together the world's leading economies, international organisations and companies to accelerate clean energy transitions.
National Natural Resources Management System (NNRMS)	<ul style="list-style-type: none"> • It is a Central Sector Scheme of Ministry of Environment, Forest and Climate Change. • Objective: Utilization of Remote Sensing Technology for Inventorization, Assessment and Monitoring of country's natural resources. • During last five years, grant of Rs. 1 Crore has been provided for continuing research studies and assessment projects.

4.5. DISASTER MANAGEMENT

4.5.1. COASTAL VULNERABILITY INDEX (CVI)

Why in news?

Recently, the Indian National Centre for Ocean Information Services (INCOIS) prepared Coastal Vulnerability Index (CVI) for Indian coasts.

More on news

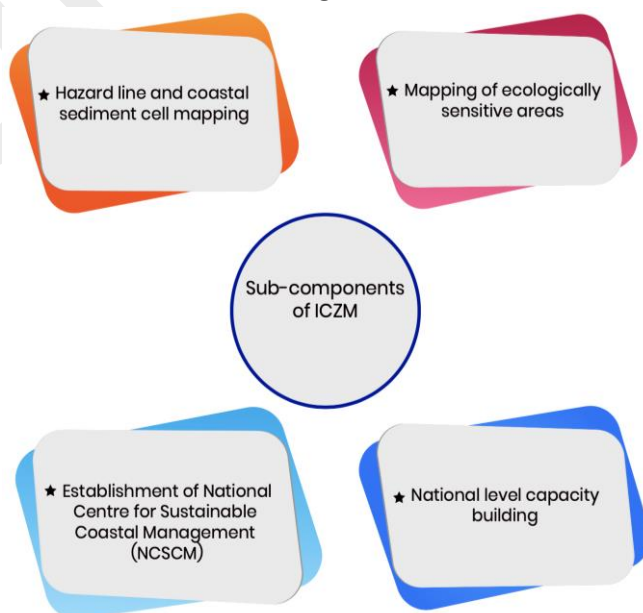
- INCOIS has carried out **coastal vulnerability assessment for entire Indian coast at states level** to bring out an **Atlas**.
- Maps determine the **coastal risks due to future sea-level rise based on the physical and geological parameters** for the Indian coast.
- CVI uses the parameters like **tidal range, wave height, coastal slope, coastal elevation, shoreline change rate, geomorphology, and historical rate of relative sea-level change**.
- Also, a **Coastal Multi-Hazard Vulnerability Mapping (MHVM)** was carried out to **derive composite hazard zones that can be inundated along the coastal areas** due to extreme flooding events.

About INCOIS

- It was established as an **autonomous body** in 1999 under the **Ministry of Earth Sciences (MoES)** and is a unit of the Earth System Science Organization (**ESSO**).
- It is mandated to provide the best possible **ocean information and advisory services** to society, industry, government agencies and the scientific community through **sustained ocean observations** and constant improvements through **systematic and focussed research**.

Initiatives taken to enhance resilience against coastal vulnerability

- **Integrated Coastal Zone Management (ICZM) Project**
 - **Nodal Agency:** Society of Integrated Coastal Management (SICOM)
 - **Assisted by:** The World Bank
 - **Objective:** At the National level, it has the objective to **establish and support an appropriate national institutional structure** for guiding and coordinating coastal zone management.
 - **State level pilot projects:** Towards the development and implementation of State Level approach to ICZM in the three pilot States of Gujarat, Odisha, West Bengal. The objective is to develop and empower state-level authorities to adopt appropriate ICZM approaches consistent with national strategies.
- **Enhancing Coastal and Ocean Resource Efficiency (ENCORE).**
 - In 2020, the **World Bank approved a \$400 million** multi-year financing envelope to help India to-
 - ✓ enhance its **coastal resources, protect coastal populations** from pollution, erosion, and sea level rise, and
 - ✓ **improve livelihood opportunities for coastal communities**.
 - The first phase of this multi-phase approach (MPA) will provide **\$180 million for Enhancing Coastal and Ocean Resource Efficiency (ENCORE)**.



- **Geographical coverage:** In Phase 1, ENCORE will cover eight coastal states (Andhra Pradesh, Gujarat, Goa, Karnataka, Kerala, Odisha, Tamil Nadu, and West Bengal) and three coastal Union Territories (Daman and Diu, Lakshadweep, and Puducherry)

4.5.2. UNEP'S FIRE READY FORMULA FOR WILDFIRES

Why in news

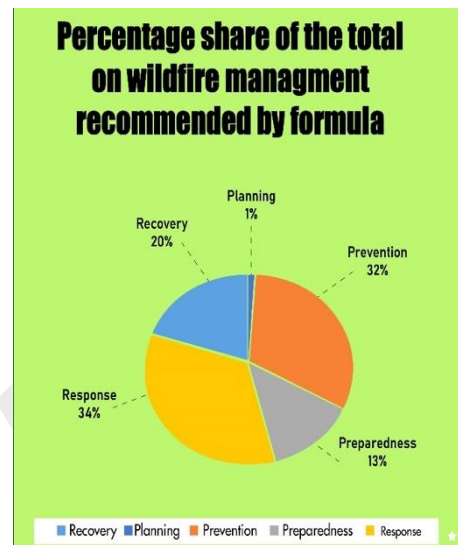
The United Nations Environment Programme (UNEP), called on **global governments to adopt a new 'Fire Ready Formula,'** as it warned that incidences of wildfires would rise in the future.

About UNEP's Fire Ready Formula

- Formula envisages **66% of spending to be devoted to planning, prevention, preparedness, and recovery** and the remaining **34% to be spent on response.**

About Wildfire

- Wildfire is “an **unusual or extraordinary free-burning vegetation fire** which may be started maliciously, accidentally, or through natural means, that negatively influences social, economic, or environmental values”.
- As per UNEP Report, **number of wildfires** is likely to increase by up to **14% by 2030**. It is projected to spike **by 33% by 2050 and by 52% by 2100.**
 - Australia saw **extreme wildfire incident in 2019-20** terming it as “**Black summer**” season.
 - Also, in a first, **wildfires were observed in the Arctic.**



Wildfire vs Forest Fire

- National Institute of Disaster Management (NIDM) defines Forest fire as **an unclosed and freely spreading fire that consumes the natural fuels.**
- When a **fire burns out of control** it is known as **Wildfire.**

Forest fires in India

- India has a **strong legal and institutional arrangement** for forest fire prevention and management.
 - As per, **Indian Forest Act of 1927** it is a criminal offense to burn or to allow a fire to remain burning in reserved and protected forests.
 - **Wildlife (Protection) Act, 1972** further prohibits setting fire in wildlife sanctuaries.
 - **Ministry of Environment, Forest, and Climate Change (MoEFCC)** is the nodal ministry.
- **National Action Plan on Forest Fires (NAPFF), 2018** has been formulated to minimize forest fires. It includes:
 - Performing Fire Risk Zonation and Mapping
 - **Involving communities**
 - **Increasing Resilience through biomass management and weed management.**
 - **Using Satellite based Forest Fire Alerts**
 - **Post Fire Management**
- **Forest Fire Prevention and Management (FPM) Scheme:** It is a centrally sponsored scheme launched in 2017 which is **specifically dedicated to assist the states in dealing with forest fires.**

4.5.3. MARINE HEAT WAVES

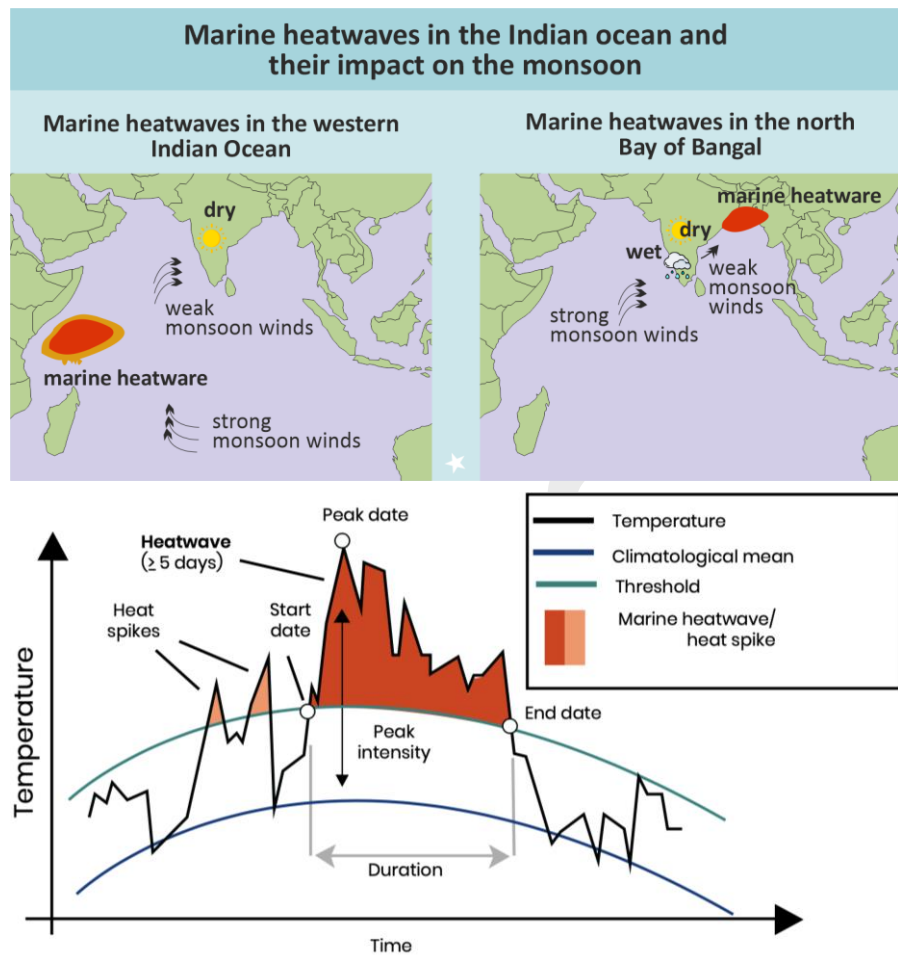
Why in news?

Recently, Experts found that frequent marine heatwaves in Indian Ocean disrupts India's monsoon patterns.

About Marine Heat Waves

- Marine heat waves (MHWs) occur when **seawater temperatures exceed a seasonally varying threshold for at least 5 consecutive days.**
 - Successive heatwaves with gaps of 2 days or less are considered part of the same event.
- During an MHW, the average temperatures of the ocean surface up to a depth of 300 feet goes 5-7 degrees Celsius above normal.
- MHWs have been recorded in **surface and deep waters, across all latitudes, and in all types of marine ecosystems.**

- They can occur in summer or winter. They are defined based on differences with expected temperatures for the location and time of year.
- MHWs have increased by 50% over the past decade and are more severe. They can last for weeks or even years. They can affect small areas of coastline or span multiple oceans.
- In the Indian Ocean, the worst-affected area were its western part and northern Bay of Bengal.
- **Impact on Monsoons:** The marine heat waves in the Indian Ocean are majorly impacting the Southwest Monsoon, the main rain-bearing system over the Indian subcontinent. The MHWs reduce monsoon rainfall over central India. However, the occurrence in north Bay of Bengal increases rainfall over the southern peninsular area.



4.6. GEOGRAPHY

4.6.1. GREATER MALDIVE RIDGE (GMR)

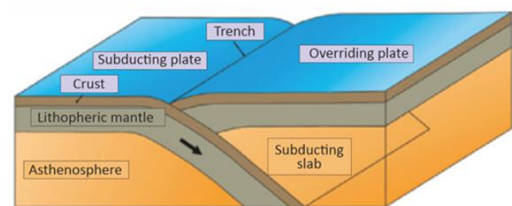
Why in news?

New study on tectonic evolution of Greater Maldivian Ridge (GMR) helps shed light on Gondwanaland break up & dispersal.

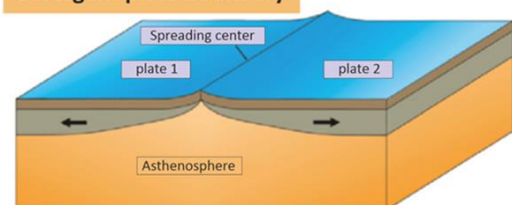
More on the news

- GMR is an **aseismic ridge** not associated with earthquake activities and is located in the western Indian Ocean, southwest of India.
- Study postulated that **GMR may be underlain by an oceanic crust**. It highlighted that the **Maldivian Ridge might have formed in the close vicinity of the Mid-Oceanic Ridge**.
 - Mid-ocean ridge system is a **continuous range of underwater volcanoes that wraps around globe stretching nearly 65,000 kilometers**.
- **Significance of the study**
 - Will provide valuable inputs towards understanding **evolution of ocean basins**;
 - Can help **reconstruct the original Gondwanaland break up** and dispersal that led to **present-day configuration of continents, continental fragments** etc.

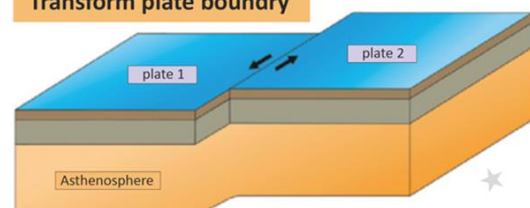
Convergent plate boundary: Subduction zone



Divergent plate boundary



Transform plate boundary



- **About formation of ridges through tectonic plates**
 - In plate tectonics, **Earth's outermost layer, or lithosphere** made up of the crust and upper mantle is **broken into large rocky plates called tectonic plates**.
 - Due to the **convection currents of the asthenosphere** (lying below tectonic plates), the **plates move relative to each other**.
 - Ridge occur along **divergent plate boundaries**, where new ocean floor is created as the **Earth's tectonic plates spread apart**.

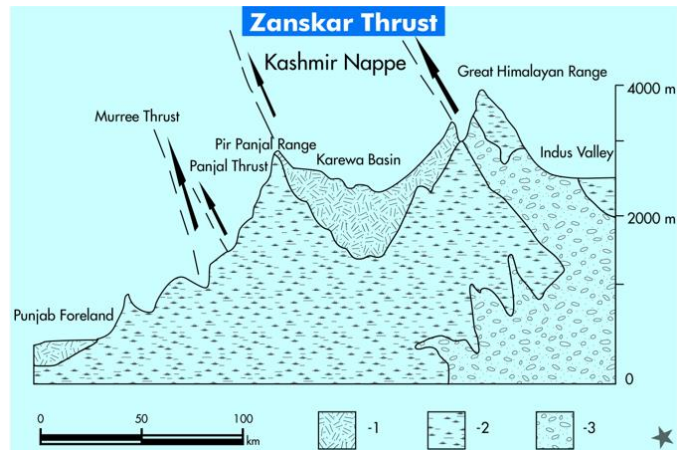
4.6.2. KAREWAS

Why in news?

Development and construction in the Kashmir Valley is **excavating and destroying its highly fertile alluvial soil deposits called 'karewas'**.

About Karewas

- Karewas are **thick lacustrine deposits** (deposits in lake) of glacial clay and other **materials embedded with moraines**.
- These are getting destroyed due to **haphazard constructions, illegal clay mining etc.**
- **Formation of Karewas** (also called Vudr):
 - During the Pleistocene Period (2.6 million years to 11,700 years ago), **due to the rise of Pir Panjal, drainage was impounded and a lake** (about 5000 sq. km) **area was developed, forming a basin in the Kashmir Valley**.
 - Subsequently, the **lake was drained through Bramulla gorge, leaving behind karewa deposits**.
- **Significance:** ideal for cultivation of saffron almonds, apples and several other cash crops, Hold fossils and remnants of many human civilisations and habitations etc.



4.6.3. GEOMAGNETIC STORM

Why in news?

Space Weather Prediction Centre (SPWC) under National Oceanic and Atmospheric Administration (NOAA) has issued **two geomagnetic storm (GMS) watches**.

About geomagnetic storm

- GMS is a **disturbance in the earth's magnetosphere**, which is the area around the planet controlled by its magnetic field.
 - Earth's magnetosphere protects its inhabitants from most of the particles emitted by the sun.
 - It is **caused by massive exchange of energy from the solar wind into the space environment** surrounding the Earth.
 - GMS are **categorized between G1 and G5**, the latter being the strongest.
- **Impact of geomagnetic storms**
 - **Disrupt high-frequency radio broadcasts** and **global positioning system (GPS)** devices.
 - **Damage satellite electronics** and expose astronauts and high-altitude pilots to increased levels of radiation.
 - Voltage surges due to altered magnetic activity can **affect power supply on earth** and cause outages.
- CME is a **large expulsion of plasma and magnetic field from the sun's corona**, or upper atmosphere.
 - Plasma is the highly ionised gas present on the sun, while corona is the outermost part of the sun's atmosphere.

4.6.4. OTHER NEWS

Bernardinelli-Berstein Comet	<ul style="list-style-type: none"> • NASA has confirmed that Bernardinelli-Bernstein comet is indeed the largest icy comet nucleus ever seen by astronomers. <ul style="list-style-type: none"> ○ Comets are large objects made of dust and ice that orbit the Sun. • About Bernardinelli-Berstein comet:
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	<ul style="list-style-type: none"> Officially called C/2014 UN271, it has an estimated diameter of almost 129 kilometres. Mass is estimated to be around 500 trillion tonnes. It is believed to have originated in the Oort cloud (only a theoretical concept), a distant region of the solar system that is predicted to be the source of most comets.
International Monsoons Project Office (IMPO) Launched	<ul style="list-style-type: none"> It will be hosted at the Indian Institute of Tropical Meteorology (IITM), Ministry of Earth Sciences. It would be fostered under the leadership of World Climate Research Programme and World Weather Research Programme. <ul style="list-style-type: none"> Both these international Research programmes are coordinated by World Meteorological Organisation. Setting up the IMPO would expand integrated scientific approach to solve the seasonal variability of monsoons, enhancing the prediction skill of monsoons and cyclones, strengthening monsoon research etc.
Blue blob	<ul style="list-style-type: none"> It is a patch of unusually cold water located south of Iceland and Greenland. <ul style="list-style-type: none"> The cold patch was most prominent during the winter of 2014-2015 when the sea surface temperature was about 1.4 degrees Celsius colder than normal. Scientists believe that it could have helped temporarily reduce the faster melting of the glaciers since 2011. Before the Blue Blob, a long-term cooling trend in the same region, called the Atlantic Warming Hole, reduced sea surface temperatures by about 0.4 to 0.8 degrees Celsius during the last century and may continue to cool the region in the future.


4.6.5. RIVERS IN NEWS

River Devika	<ul style="list-style-type: none"> River Devika rejuvenation project is expected to be completed by 2021. Also known as Devika Nagari, river Devika originates from the hilly Suddha Mahadev temple in Udhampur district (J&K). River presently runs under its sandy surface and flows down towards western Punjab (now in Pakistan), where it merges with Ravi river. Devika river also holds great religious significance as it is revered by Hindus as the sister of river Ganga.
Kabani river	<ul style="list-style-type: none"> Algal bloom poses threat to Kabani River ecosystem. <ul style="list-style-type: none"> Kabani or Kapila (east flowing) originates in Wayanad District of Kerala. It is a major tributary of Cauvery River.
Pranahita river	<ul style="list-style-type: none"> Pranahita Pushkaralu festival organised on banks of Pranahita river concludes. Pranahita is largest tributary of the Godavari River. <ul style="list-style-type: none"> It originates in Madhya Pradesh, merges with Godavari River at Kaleshwaram, Telangana. Kaleshwaram is called Triveni Sangamam as it's the confluence point for Godavari, Saraswathi and Pranahita rivers. Godavari river rises from Trimbakeshwar in the Nashik district of Maharashtra and flows for most of its course generally eastward across broad plateau of Deccan (peninsular India).

4.6.6. PLACES IN NEWS

India	
Seshachalam forests	<ul style="list-style-type: none"> Located in the eastern ghats in Andhra Pradesh. They are bounded by the Rayalaseema uplands in the west and northwest and Nandal valley in the north east (formed by the kunderu river). Their general trend is east-southeast. It comprises 7 peaks representing 7 hoods of Adisesha, thus the name Seshachalam. Area is famous for red sanders tress found here. Seshachalam biosphere reserve is located here.
Atal tunnel	<ul style="list-style-type: none"> Atal Tunnel has been officially recognised by World Book of Records, as 'World's Longest Tunnel above 10,000 Feet. About the Tunnel <ul style="list-style-type: none"> It is a 9.02 km long tunnel run under Rohtang Pass and provided all-weather connectivity from Manali to Lahaul-Spiti valley in Himachal Pradesh. It was built by Border Roads Organisation. It was constructed using drill and blast NATM (New Austria Tunnelling Method) techniques. Safety features: semi transverse ventilation system, telephone connections at every 150 meters for emergency communication, fire hydrant mechanisms.

<p>Deocha Pachami coal block</p>	<ul style="list-style-type: none"> West Bengal government has revised the compensation package for those losing their land for Deocha Pachami coal project. It located in the south-western part of Birbhum Coalfield in West Bengal. It is Asia's largest coal reserve and world's second largest (India's largest) coal mine with an estimated reserve of 2,102 million tonnes. The block has a thick coal seam trapped between equally thick layers of rocks, mostly basalt. The block is spread over 13.7 square kilometres.
<p>Daulat Beg Oldi (DBO)</p>	<ul style="list-style-type: none"> The National Wildlife Board has cleared construction of a road from Ladakh's Saser La to Sasebrangsa. Strategically important, the approach road will pass through Karakoram Wildlife Sanctuary and it will provide an alternate alignment to the Daulat Beg Oldi Road. <ul style="list-style-type: none"> It will provide an alternative approach to DBO areas, Depsang Plains and Karakoram Pass. DBO, named after Sultan Said Khan of Mongol Dynasty, is located at an elevation of 16,614 feet and close to Siachen Glacier, the Karakoram Pass and Xinjiang-Karakoram Highway. It is the highest airfield in the world and an important military outpost since 1962 Sino-Indian War.
<p>Kwar Hydroelectric Project</p>	<ul style="list-style-type: none"> Cabinet has approved the 540 MW Kwar Hydroelectric Project in Kishtwar district of Jammu and Kashmir to harness the vast hydro potential of River Chenab. <ul style="list-style-type: none"> Chenab basin is estimated to have hydro power potential of around 11,283 MW. A number of hydroelectric (HE) projects (running or under-construction) are initiated to harness this potential such as: <ul style="list-style-type: none"> Baglihar HE Power project; Dulhasti Power Station; Salal Power Station; PakalDul HE Project; Kiru HE Project; Kirthai-II HE Project.
<p>Shinku La Pass</p>	<ul style="list-style-type: none"> It is located between Zaskar Valley in Ladakh and Lahaul Valley in Himachal Pradesh. Border Roads Organisation will build the world's highest tunnel at Shinku La Pass to connect Himachal to Ladakh under Project Yojak by 2025. The world's longest tunnel is the Atal tunnel.
<p>The New Road to Ladakh</p>	
<p>International</p>	
<p>Madagascar</p>	<ul style="list-style-type: none"> Madagascar braces for 4th tropical cyclone (EMNATI) in a month. Features & boundaries <ul style="list-style-type: none"> It is an island country located in Indian ocean off the coast of southern Africa. It is also the world's fifth largest island. Shares maritime borders with Comoros, France (Mayotte and Réunion), Mauritius, Mozambique and Seychelles. Separated from the African continent by Mozambique Channel.

	<ul style="list-style-type: none"> • Geographical features <ul style="list-style-type: none"> ○ Climate is tropical along the coast, temperate inland, and arid in the south. ○ With over 250 islands it is home to world’s largest coral reef systems and most extensive mangrove areas in the Western Indian Ocean.
<p>Whakaari/ White Island</p>	<ul style="list-style-type: none"> • New research detects pre-eruption warning signals at Whakaari White Island and other active volcanoes. • Location: It is located in the Bay of Plenty (North Island of New Zealand). <ul style="list-style-type: none"> ○ It marks the northern end of the Taupo Volcanic Zone. • Other features <ul style="list-style-type: none"> ○ Whakaari/White Island has been active for at least 150,000 years. ○ It is a stratovolcano, (composite cone volcano) made of layers of andesite lava flows and pyroclastic deposits (tephra). ○ It formed out of the convergent plate boundary between the Pacific and Australian plates. 
<p>South Col Glacier (SCG) of Mount Everest</p>	<ul style="list-style-type: none"> • Research found that SCG has lost more than 54m of thickness in the last 25 years. <ul style="list-style-type: none"> ○ Since 1990s, ice that took around 2,000 years to form has melted away. • The glacier, which sits around 7,906m (25,938 ft) above sea-level, is thinning 80 times faster than it first took the ice to form on surface. • Mount Everest, at 8,849 meters is highest point on Earth, located between Nepal and Tibet.

4.7. REPORTS IN NEWS

Title	Details
<p>‘Frontiers’ report 2022: Noise, Blazes, and Mismatches</p>	<ul style="list-style-type: none"> • Published by: United Nations Environment Programme (UNEP) • It looks at three concerns: Urban soundscapes, wildfires, and phonological shifts. • Key findings <ul style="list-style-type: none"> ○ Out of 13 noise polluted cities in South Asia, 5 of these are in India, namely Moradabad, Kolkata, Asansol, Jaipur, and Delhi. ○ Highest noise pollution has been recorded in Dhaka, Bangladesh followed by Moradabad.
<p>World Energy transition Outlook 2022</p>	<ul style="list-style-type: none"> • Published by: International Renewable Energy Agency (IRENA) at the Berlin Energy Transition Dialogue. • It sets out priority areas and actions based on available technologies that must be realized by 2030 to achieve net zero emissions by mid-century.
<p>Annual report of the United Nations Environment Programme (UNEP)</p>	<ul style="list-style-type: none"> • The annual report of the United Nations Environment Programme (UNEP) marks 50 years of its inception • Report identifies following 3 actions under Planetary action: <ul style="list-style-type: none"> ○ Climate Actions which include ‘Net-Zero Asset Owner Alliance’, International Methane Emissions Observatory, etc. ○ Nature Action including adoption of System of Environmental-Economic Accounting – Ecosystem Accounting, launching UN Decade on Ecosystem Restoration (2021-30) etc. ○ Chemicals & Pollution Action includes launch of global assessment of air pollution legislation’, International Day of Clean Air for Blue Skies’, ‘Raising awareness of hazardous lead in batteries’ etc.
<p>United Nations World Water Development Report (UN WWDR 2022)</p>	<ul style="list-style-type: none"> • Published by: UNESCO on behalf of UN-Water, which coordinates efforts of UN entities and international organizations working on water and sanitation issues. • Report titled ‘Groundwater: Making the invisible visible’ describes the challenges and opportunities associated with development, management and governance of groundwater.

	<p style="text-align: center;">Groundwater table decline</p> <p> ■ Low - Medium (0 - 2cm/year) ■ Medium - high (2 - 4 cm/year) ■ High - Extremely high (> 4 cm/year) ■ Insignificant trend </p>
<p>Global Wind Report 2022</p>	<ul style="list-style-type: none"> • Published by: Global Wind Energy Council • Report examines the full challenges of scaling up wind energy in an increasingly interconnected world, like supply chain geopolitics, social impacts, disinformation, cybersecurity and cryptocurrencies. • Global Wind Energy Council is the international trade association for the wind power industry.

4.8. ERRATA

PT 365 Environment (May 2021-Jan 2022)

- **Article 3.2 Biological Diversity (Amendment) Act, 2021:** Due to a typographical error the Biological Diversity (Amendment) Bill, 2021 was miswritten as Biological Diversity (Amendment) Act, 2021. Please note that it is still **Biological Diversity (Amendment) Bill, 2021** and the **Bill is still pending.**
- **Article 1.2.3.3 Infrastructure for resilient Island States (IRIS):** Due to a typographical error, the country Mauritius was accidentally replaced with Jamaica resulting in Jamaica getting repeated twice (in the first sentence where names of launching partners are mentioned).



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5. SOCIAL ISSUES

5.1. UNIFIED DISTRICT INFORMATION SYSTEM FOR EDUCATION PLUS (UDISE+) 2020-21

Why in news?

Recently, the Ministry of Education published report on UDISE+ 2020-21.

About UDISE+

- UDISE, integrating DISE for elementary and secondary education, was **one of the largest Management Information Systems on School Education**. It was initiated in 2012-13.
- **UDISE+ is an updated version** (developed in 2018-19) of UDISE to overcome **problems associated with the previous practice of manually filling data** in paper format and feeding it **onto computers**.
 - Under UDISE+ **entire system is online with real-time data collection**.
- **Key Findings**
 - **Gross Enrolment Ratio (GER)** which measure general level of participation **has improved in 2020-21** (25.38 Crore) at all levels of school education compared to 2019-20 (25.10 Crore).
 - **Pupil Teacher Ratio (PTR)** stood at 26 for primary, 19 for upper primary, 18 for secondary and 26 for higher secondary, showing an improvement since 2018-19.
 - **Over 12.2 crore girls are enrolled** in primary to higher secondary showing an increase of 11.8 lakh girls compared to 2019-20.
 - **Impact of COVID-19 pandemic:** 39.7 lakh students of government aided, private school students shifted to Government schools during 2020-21.
 - **School infrastructure:** Percentage of schools with functional girl's toilet facility, drinking water, hand wash facilities, internet facility etc has increased in 2020-21 compared to 2019-20.

5.2. SEXUAL AND REPRODUCTIVE HEALTH

Why in News?

A new study by the World Health Organization (WHO) highlighted inequalities concerning access to sexual and reproductive healthcare.

Different Human Rights obligations linked to Reproductive Rights



Right to health



Right to life and liberty



Non-discrimination and equality



Right to education and information



Right to enjoy benefits of scientific progress



Right to privacy, and to marriage and family life

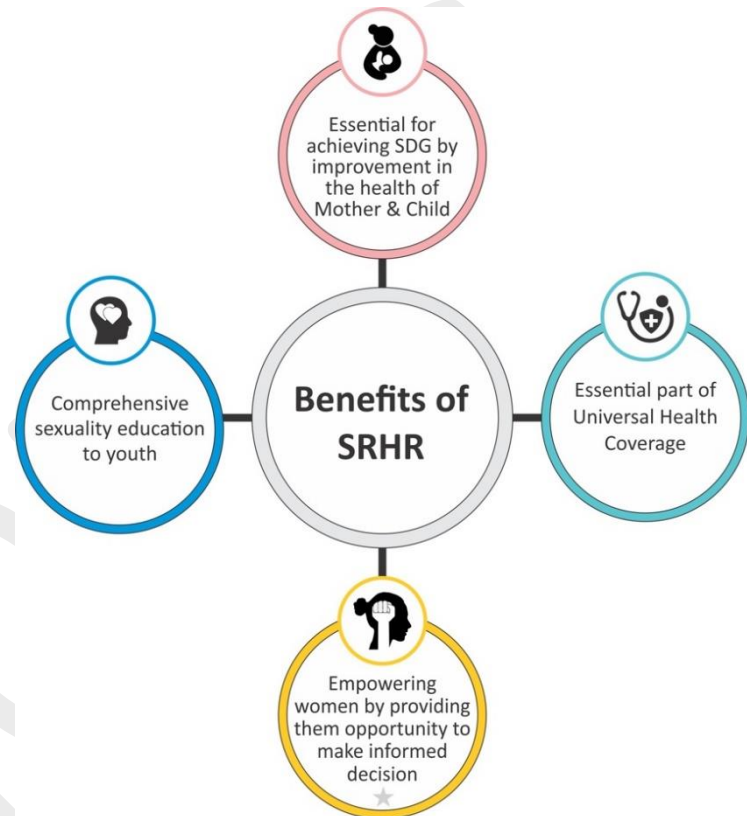


About Sexual and Reproductive Health and Rights (SRHR)

- SRHR includes **access to SRH services, care, and information, as well as autonomy in decision making about their SRHs** including the spacing and timing of children. These are human rights - universal, indivisible, and undeniable.
 - **Sexual rights** may include the right to sexual education, freedom from sexual violence and coercion or the right to decide whether or not to have children.
 - **Reproductive rights** on the other hand, can include **access to contraception, access to menstrual and sanitary products**, access to safe and legal abortions and ensuring safe pregnancies and childbirth.
 - SRHR also deal with violations such as **eliminating female genital mutilation (FGM) and forced sterilization** or preventing sexually transmitted diseases
- At its core is **promotion of reproductive health, voluntary and safe sexual and reproductive choices** for individuals and couples, including decisions on family size and timing of marriage.

Sexual and Reproductive Health Rights in India

- India was **among the first countries in the world** to develop legal and policy frameworks **guaranteeing access to abortion and contraception**.
- Still, women and girls **continue to experience significant barriers to full enjoyment of their reproductive rights**, including poor quality health services and denials of women's and girls' decision-making authority.
 - India has **among the highest number of maternal deaths** worldwide.
 - **Unsafe abortions are one of the leading causes of maternal deaths** in India.
- **Poor awareness of lawful abortion care and contraception is pervasive**. Both the availability and accessibility of abortion services in rural districts is sparse.
- Public policies surrounding reproductive rights are still **largely focused on sterilisation as opposed to other methods of contraception**.
- Misinformation regarding SRH is pervasive in India, owing at least in part to the **absence of comprehensive sex education**.



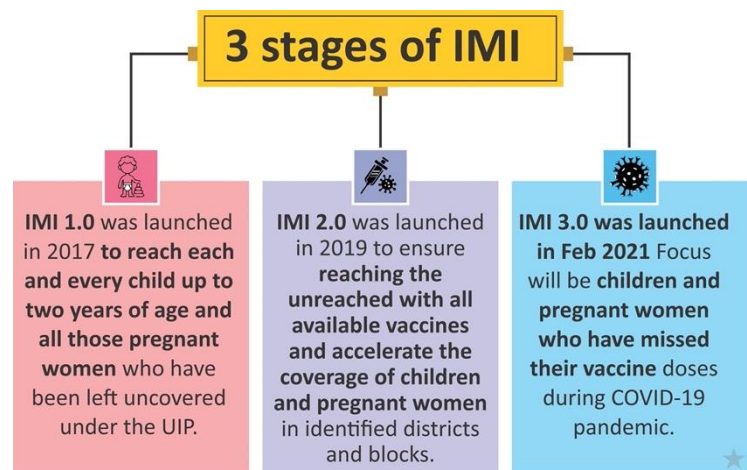
5.3. INTENSIFIED MISSION INDRADHANUSH (IMI) 4.0

Why in News

Recently the Ministry of Health and Family Welfare launched IMI 4.0

About Intensified Mission Indradhanush (IMI) 4.0

- IMI 4.0 **aims to fill gaps in the routine immunisation coverage of infants and pregnant women** hit by the covid-19 pandemic and aims to make lasting gains towards Universal Immunization.
 - It will have **three rounds and will be conducted in 416 districts** across 33 states and UTs.



- Unlike the past 3 rounds under IMI 4.0 will be conducted for seven days, including Routine Immunization (RI) days, Sundays, and public holidays.
- **About Mission Indradhanush (MI)**
 - It was **launched in 2014** with a goal to ensure **full immunization** with all available vaccines under Universal Immunization Programme (UIP) for **children up to two years of age and pregnant women**.
 - It targets **achieving 90% Full Immunization Coverage in all districts** of country.
 - Under MI, **all vaccines under the Universal Immunization Program (UIP) are provided as per National Immunization Schedule**.
 - UIP provides **free vaccines against 12 life threatening diseases** of Tuberculosis, Diphtheria, Pertussis, Tetanus, Polio, Hepatitis B, Pneumonia and Meningitis due to Haemophilus Influenzae type b (Hib), Measles, Rubella, Japanese Encephalitis (JE) and Rotavirus diarrhoea. (Rubella, JE and Rotavirus vaccine in select states and districts).

5.4. SAMPLE REGISTRATION SYSTEM (SRS) STATISTICAL REPORT 2019 RELEASED

Why in news?

Sample Registration System (SRS) bulletin has been released by the Registrar General of India. It is based on data collected for 2018.

Key Highlights

Indicators	Findings
Crude Birth Rate (CBR) - annual number of live births per 1,000 population	<ul style="list-style-type: none"> ● At National level during 2019 stands at 19.7. ● Maximum in Bihar (25.8) and the minimum in Kerala (13.5). ● There has been a decline of 1.3 points in the CBR for the country from 2014 to 2019. The corresponding decline in rural CBR is 1.3 points and in urban CBR 1.0 points.
Crude Death Rate (CDR) - number of deaths per 1,000 midyear population	<ul style="list-style-type: none"> ● At national level: 6.0 in 2019. ● Maximum in Chhattisgarh (7.3) and minimum: Delhi (3.2). ● During the last five years, decline in National CDR has been to the tune of 0.7 points. The corresponding decline in female CDR is 0.6 points whereas in male CDR it is 1.2 points.
Infant Mortality Rate (IMR)	<ul style="list-style-type: none"> ● It registered a 2-point decline to 30 in 2019 from 32 in 2018 at the National level. ● Maximum in Madhya Pradesh (46) and minimum in Kerala (6).
Under 5 Mortality Rate U5MR	<ul style="list-style-type: none"> ● Showed a decline of 1 point over 2019 from 2018 (36 in 2018). ● There has been a decline of 1 point in male U5MR and 2 points in female U5MR during the corresponding period.
Sex Ratio at Birth - number of girls born for every 1,000 boys born	<ul style="list-style-type: none"> ● At the national level it has gone up by 5 points to 904 in 2017-19 from 899 in 2016-2018. ● Kerala has highest (968) while Uttarakhand has the lowest (848).
Total Fertility Rate (TFR) - total number of children that would be born to each woman if she were to live to the end of her child-bearing years.	<ul style="list-style-type: none"> ● It came down to 2.1 in 2019 after being stable at 2.2 for the last two years 2017 and 2018. ● Bihar has reported the highest TFR (3.1) while Andhra Pradesh, Delhi, Jammu & Kashmir, Punjab, Tamil Nadu and West Bengal have reported the lowest TFR (1.5) ● The replacement level TFR, viz. 2.1, has been attained in 15 states.

Civil Registration System (CRS)

The government is planning to revamp the **Civil Registration System (CRS)** to resolve the current issues of **timeliness, efficiency, and uniformity**, leading to **delayed and under-coverage** of birth and death.

- **About CRS**
 - It is a **continuous, permanent, compulsory** recording of the occurrence and characteristics of vital events, like births, deaths, and stillbirths.
 - The **Registration of Births and Deaths Act, 1969** provides for the compulsory registration of births and deaths.
 - **Implementing agencies: Chief Registrar** is mandated to publish a statistical report on the registered births and deaths during the year. The **Registrar General of India (RGI) under Ministry of Home Affairs** coordinates and unifies the activities of registration throughout the country. However, implementation is vested with the **State Governments**.
 - It is **one of the main sources of regular data on vital events** in India others are Sample Registration System (**annual exercise**) and Population Census (**decennial exercise**).

- ✓ SRS is based on a system of dual recording of births and deaths in fairly representative sample units spread all over the country.
- ✓ It is also linked to **National Population Register**.
- CRS provide **legal identity to individual** and access to the rights of a citizen including entitlements such as social benefits etc.

5.5. MINISTRY OF HEALTH AND FAMILY WELFARE (MOH&FW) RELEASES NATIONAL FAMILY HEALTH SURVEY-5 (NFHS) REPORT

- The main objective of successive rounds of the NFHS has been to **provide reliable and comparable data relating to health and family welfare** and other emerging areas in India.

Key findings of the survey

Indicator	NFHS-5 (2019-21)	NFHS-4 (2015-16)
Contraceptive Prevalence Rate (CPR)	67%	54%
Antenatal care (ANC) visits by pregnant women in their first trimester	70%	59%
Unmet needs of family planning	9%	13%
Full immunisation in kids aged 12-23 months	76%	62%

NOTE: Kindly refer Social Issues PT 365, 2022 for data on other indicators

5.6. OTHER NEWS

State of World Population 2022 report	<ul style="list-style-type: none"> • The report released by the United Nations Population Fund's (UNFPA) is titled as "Seeing the Unseen: The case for action in the neglected crisis of unintended pregnancy". <ul style="list-style-type: none"> ○ An unintended pregnancy is a pregnancy that is either unwanted, such as the pregnancy occurred when no children or no more children were desired. • Key findings of report <ul style="list-style-type: none"> ○ Over 60% of unintended pregnancies end in abortion and 45% of abortions are unsafe, causing 5% to 13% of maternal deaths. ○ 13% of women in developing countries begin childbearing before they turn 18. ○ Between 2015 and 2019, 121 million unintended pregnancies across world every year, and one in every seven of these occur in India. ○ Key factors contributing to unintended pregnancies ○ Lack of sexual and reproductive health care and information ○ Harmful norms and stigma surrounding women controlling their own fertility and bodies ○ Judgmental attitudes or shaming in health services ○ Poverty and stalled economic development ○ Gender inequality
Stree Manoraksha project	<ul style="list-style-type: none"> • It was launched by Ministry of Women and Child Development (MoWCD) in collaboration with National Institute of Mental Health and Neurosciences (NIMHANS). <ul style="list-style-type: none"> ○ NIMHANS is an Institute of National Importance, for patient care and academic pursuit in the field of mental health and neurosciences. • It is aimed at extending mental health training to 6000 One-Stop Center (OSC) functionalities across India. <ul style="list-style-type: none"> ○ OSC Scheme (by MoWCD) is being implemented since 2015 to provide integrated support and assistance to women affected by violence and in distress, both in private and public spaces. ○ They provide assistance to women in medical, legal, and crime-related matters.
Operation AAHT	<ul style="list-style-type: none"> • It was launched by Railway Protection Force (RPF), as a nationwide operation to curb human trafficking. <ul style="list-style-type: none"> ○ Special teams will be deployed on all long-distance trains/routes with focus on rescuing victims, particularly women and children, from the clutches of traffickers. ○ RPF rescued more than 2,000 women and children between 2017-21. • RPF is entrusted with protecting railway passengers, passenger area and railway property of the Indian Railways. <ul style="list-style-type: none"> ○ This is only central armed police force which has power to arrest, investigate and prosecute criminals. ○ It is under authority of Ministry of Railways.

6. SCIENCE AND TECHNOLOGY

6.1. BIOTECHNOLOGY

6.1.1. STEM CELLS

Why in News?

Recently, a US patient became the First woman (third person overall) reported to be cured of HIV after a stem cell transplant.

About stem cells

- Stem cells are **special human cells that are able to develop into many different cell types**.
- Stem cells provide **new cells for the body as it grows and replaces specialized cells** that are damaged or lost.
- They **have two unique properties** that enable them to do this:
 - They **can divide over and over again** to produce new cells.
 - As they divide, they **can change into the other types of cells** that make up the body.
- Based on the cell type/tissue of origin, **stem cells are classified as 'Somatic Stem Cells' (SSCs), and 'Embryonic Stem Cells' (ESCs)** (refer infographic).
- Stem Cell Uses:** Research (biology of how living things work etc), Biomedicine applications, Regenerative medicine (to replace lost or damaged cells) etc.
- Challenges related to SCT:** Rejection of donor cells by the host immune system, **Ethical concerns** about use of embryos for creating human embryonic stem cell, potential **danger of tumorigenicity** of stem cells etc.

About Stem Cell Therapy (SCT)

- SCT, also known as regenerative medicine and bone marrow transplant, **promotes the repair response of diseased, dysfunctional or injured tissue** using stem cells or their derivatives.
 - Researchers grow stem cells in a lab. These stem cells are **manipulated to specialize into specific types of cells**, such as heart muscle cells, blood cells or nerve cells.
 - The specialized cells can then be implanted into a person
- Two of the most common types of stem cell transplants are:**
 - Autologous transplantation** uses the patient's **own stem cells**.
 - Allogeneic transplantation** where stem cells come from a donor.

DID YOU KNOW?

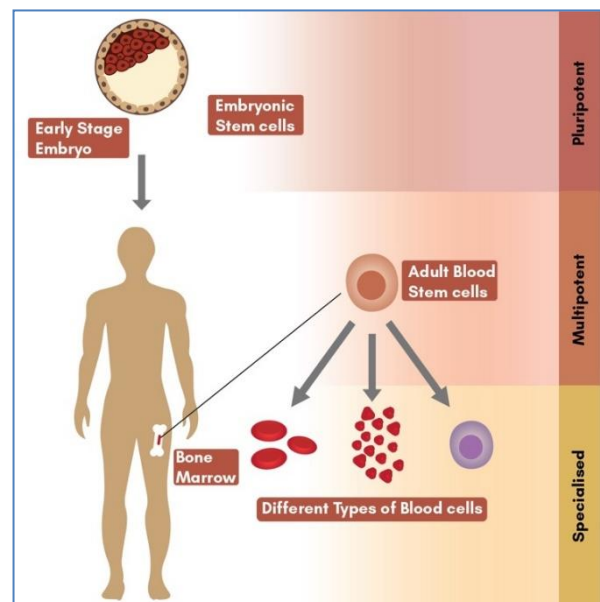
- ✦ Somatic-cell nuclear transfer involves removing the nucleus, which contains the DNA, and implanting it into an unfertilised egg, whose nucleus has been removed.
- ✦ It is used in reproductive cloning of organisms.

Somatic Stem Cells (SSCs) also Known as Adult Stem Cell

- Limited capacity of differentiation and **may be multipotent or unipotent**.
- Are resident, **self-renewable population of cells** that are present virtually in all organs/tissues of the body.
- Could be obtained from **different sources**, for example the fetus, umbilical cord, placenta, infant, child or adult; and from different organs/tissues.
- Generally present in **relatively low numbers** in most tissues.

Embryonic Stem Cells (ESCs)

- ESCs are **pluripotent stem cells**, which mean they can change into any cell in the body.
- ESCs **supply new cells for an embryo as it grows and develops into a baby**.
- Pluripotent stem cells can also be generated in the **laboratory** (by taking normal adult cells, like skin or blood cells, and reprogramming them) and the products thus generated are referred to as '**Induced Pluripotent Stem Cells (iPSCs)**'.
- ESCs and iPSCs **have tumorigenic potential which could be a major safety concern** during clinical application of these cells.



Status in India

- Stem cells and their derivatives **fall under definition of ‘Drug’ as per the Drugs and Cosmetics Act 1940** and are categorized as ‘Investigational New Drug (IND)’ or ‘Investigational New Entity (INE)’ when used for clinical application.
- **Various guidelines released so far**
 - Draft Guidelines for Stem Cell Research/Regulation (2002)
 - Guidelines for Stem Cell Research and Therapy (2007)
 - National Guidelines for Stem Cell Research (NGSCR)-2013
 - **National Guidelines for Stem Cell Research- 2017**
 - ✓ As per these guidelines, **only bone marrow/hematopoietic SCT for blood disorders** (including blood cancers and thalassemia) **is permitted** and use of stem cells all other conditions has to be done only under purview of clinical trials in compliance with National Guidelines for Stem Cell Research 2017.
- Some hospitals providing SCT in India are **AIIMS, New Delhi; Tata Memorial Centre, Mumbai** etc.

6.1.2. TELOMERE-2-TELOMERE (T2T) PROJECT

Why in news?

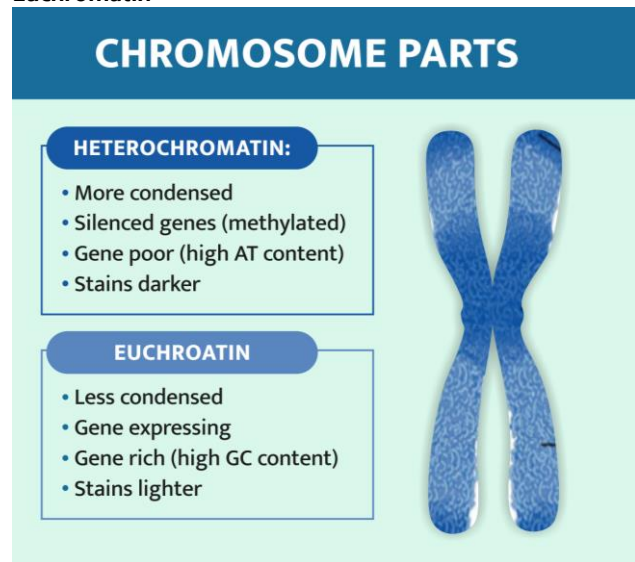
A global collaboration called the Telomere-2-Telomere (T2T) project has managed to **sequence the remaining 8% of the human genome**, 92% of which was already sequenced through the **Human Genome Project (HGP)**.

More about News

- HGP was started in 1988 by a special committee of the **U.S. National Academy of Sciences** and was an international, collaborative research program whose **goal was the complete mapping and understanding of all the genes** of human beings.
- The genetic sequence made available in 2003 from the HGP was known as standard human reference genome, known as **Genome Reference Consortium build 38 (GRCh38)**,
 - It contained **information from** a region of the human genome known as the **euchromatin** (refer to the infographics).
 - Sequencing of **euchromatin** was given priority because here, the chromosome is **rich in genes**, and the DNA encodes for protein.
 - Besides, the **euchromatin** contained **more genes** that were **simpler to sequence** with the tools available at the time.
- The remaining **8% that** was in the area called **heterochromatin**. This is a smaller portion of the genome, and **does not produce protein**.
 - This part of the genome was thought to be **“junk DNA”**, because it had **no clear function**.
- **Significance of the recent discovery**
 - **Large number of genetic variations** has appeared in the newly sequenced stretch of DNA. This **would help in studying genetic diversity**.
 - **It will help understand how the genome as a whole works** i.e. how genes work together to direct the growth, development and maintenance of an entire organism.
 - Understanding Genome variation could help in disease management through understanding the **epidemiology of genetic diseases, Pharmacogenetic (study of how genes affect a person's response to drugs) tests** etc.

About chromosome

- **Chromosome:** DNA is tightly coiled to make a thread like structure called Chromosome.
 - Human beings have 46 chromosomes (23 from each parent).
- Chromosomes have two parts **Heterochromatin** and **Euchromatin**



6.1.3. SITE DIRECTED NUCLEASE

Why in News?

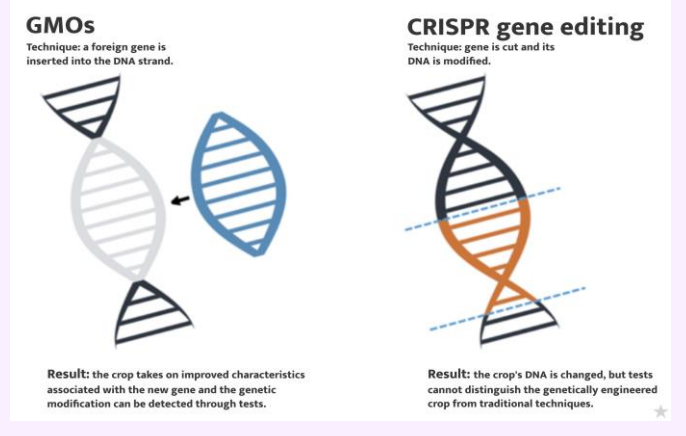
Ministry of Environment, Forest and Climate Change (MoEFCC) has for the first time issued an order exempting certain types of genomes edited crops from the stringent regulations applicable on genetically modified or GM crops.

More on News

- MoEFCC exempted Site directed nuclease (SDN)₁ and SDN₂ genome edited plants from certain rules of the Environment Protection Act (EPA) for manufacture, use or import or export and storage of hazardous microorganisms or genetically engineered organisms or cells rules, 1989.
- It will allow genome-edited plants, or organisms without any “foreign” genes to be subjected to a different regulatory process than the one applied to genetically engineered products.
 - With this notification, SDN₁/SDN₂ category plants will be initially regulated by Institutional Biosafety Committee under EPA Rules 1989 and subsequently under the Seed act under the Ministry of Agriculture and Farmers Welfare.
 - SDN₁/SDN₂ category plants will be allowed without regulation at the Genetic Engineering Appraisal Committee (GEAC).
 - ✓ GEAC is a special committee under MoEFCC entrusted to govern matters related to GM crops.

How is gene editing different from GMO development?

- Genetically modified organisms (GMO)** involves modification of the genetic material of the host by **introduction of a foreign genetic material**.
 - For example, in case of cotton, introduction of genes cry1Ac and cry2Ab mined from the soil bacterium *Bacillus Thuringiensis* (BT).
- The basic difference between genome editing and GMO is that while the **former does not involve the introduction of foreign genetic material**, the latter does.



About Site directed nuclease (SDN)	SDN 1, SDN 2 and SDN 3		
	SDN 1 SDN 2	SDN 3	
<ul style="list-style-type: none"> SDN or sequence specific nuclease (SSN) refers to the practice of cleaving DNA strands to effect the subsequent genome editing. Depending on the nature of the edit that is carried out, the process is divided into three categories — SDN 1, SDN 2 and SDN 3. 	Both processes do not involve alien genetic material and the end result is indistinguishable from conventionally bred crop varieties		
	SDN1 introduces changes in the host genome's DNA through small insertions/deletions without introduction of foreign genetic material.	In SDN 2, the edit involves using a small DNA template to generate specific changes.	Involves larger DNA elements or full length genes of foreign origin which makes it similar to Genetically modified organisms (GMO) development.

6.2. IT & COMPUTER

6.2.1. QUANTUM KEY DISTRIBUTION

Why in News?

Scientists from the Defence Research and Development Organisation (DRDO) and IIT Delhi successfully demonstrated a Quantum Key Distribution (QKD) link for a distance of 100 Km between Prayagraj and Vindhyachal in Uttar Pradesh.

About Quantum Key Distribution (QKD)

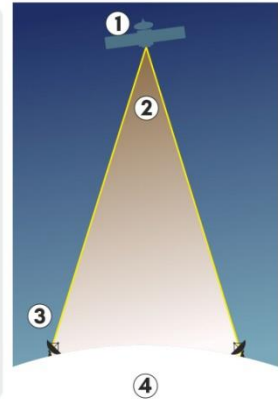
- It is a secure **communication technology that uses quantum physics** to construct a cryptographic protocol.
- It **allows two parties to generate a shared secret key** that is only known to them and can be used to encrypt and decrypt messages, thus achieving a very highly secure communication.

- In **traditional cryptography**, the security is usually based on the fact that an **adversary is unable to solve a certain mathematical problem** while in QKD, **security is achieved through the laws of quantum physics**.

How does Quantum Key Distribution works?

Quantum key distribution allows user to agree on a way of transmitting their data without the worry that someone is listening in

1. Sender instructs satellite to generate 2 entangled photons of particular quantum state
2. Photons are beamed to both ground stations
3. Sender and receiver compare the quantum states of the photons to check if they have been intercepted. If not they use the photons to create a code to encrypt the data
4. Encrypted data can then be sent securely via conventional means



- Two such most important laws in quantum physics are **Superposition and Entanglement**.
 - **Superposition** means that each quantum bit (basic unit of information in a quantum computer) can represent both a 1 and a 0 at the same time.
 - In **quantum entanglement**, subatomic particles become “entangled” (linked) in such a way that any change in one disturbs the other even if both are at opposite ends of the universe.
- **Two main categories of QKD are:**
 - **Prepare-and-measure protocols focus on measuring unknown quantum states.** This type of protocol can be used to detect eavesdropping, as well as how much data was potentially intercepted.
 - **Entanglement-based protocols focus around quantum states** in which two objects are linked together, forming a combined quantum state. In this method, if an eavesdropper accesses a previously trusted node and changes something, the other involved parties will know.

Advantage of QKD

- It will **enable security agencies to plan a suitable quantum communication network** with indigenous technology backbone.
- **Quantum cryptography is considered as ‘future-proof’**, since no future advancements in the computational power can break quantum-cryptosystem.

Challenges in QKD

- **Transmission loss in optical fibres.**
- **Lower communication rate** (100,000 times less) is another parameter where QKD falls short compared to classical communications.
- It is currently **difficult to implement an ideal infrastructure for QKD.**

Related News

Recently, ISRO’s **Space Applications Centre and Physical Research Laboratory** successfully used quantum entanglement to create a hack-proof communication system.

About Quantum Technology

- Quantum technology **seeks to harness laws of quantum physics**, which describe the behaviour of matter and energy at the atomic and subatomic level.
- This is **unlike classical physics, in which an object can exist in one place at one time**. E.g. classical computers operate using binary physical state, meaning its operations are based on one of two positions (1 or 0).
- Some of the future applications of quantum technology will be **autonomous vehicle navigation, weather modelling & prediction, transportation planning, pharmaceutical development**, secure financial communications, resource exploration, sensing and quantum encryption among the many others.

Initiatives taken for advancement of Quantum Technology

- **National Mission on Quantum Technologies and Applications (NM-QTA):** Budget 2020 allocated Rs 8000 Crore to the mission for a period of five years.
- **Quantum Information and Computing (QuIC) lab** at the Raman Research Institute, Bangalore.
- **Quantum-Enabled Science & Technology (QuEST)** a research program by the Department of Science & Technology.
- **Quantum Frontier mission:** It is an initiative of the Prime Minister's Science, Technology, and Innovation Advisory Council (PM-STIAC) which aims to initiate work in the understanding and control of quantum mechanical systems
- **DRDO Young Scientist Laboratory for Quantum Technologies (DYSL-QT)**, Mumbai.

6.2.2. NATIONAL SUPERCOMPUTING MISSION (NSM)

Why in News?

Petascale Supercomputer “PARAM Ganga” established at IIT Roorkee under National Supercomputing Mission (NSM)

More on News

- NSM has now deployed “PARAM Ganga” with a supercomputing capacity of 1.66 Petaflops.
- It is designed and commissioned by Centre for Development of Advanced Computing (C-DAC) under Phase 2 of NSM.

About NSM

- NSM, launched in 2015, is being steered jointly by Ministry of Electronics & Information Technology and Department of Science and Technology and implemented by C-DAC and Indian Institute of Science, Bangalore.
 - Mission envisages empowering our national academic and R&D institutions spread over the country by installing a vast supercomputing grid comprising of more than 70 high-performance computing (HPC) facilities.
 - Till now C-DAC has deployed 11 such facilities under NSM Phase-1 and Phase-2 with a CCP of more than 20 Petaflops.
 - ✓ Eg: PARAM Shivay [IIT (BHU)], PARAM Shakti (IIT Kharagpur), PARAM Brahma (IISER, Pune) etc.
 - These supercomputers will also be networked on the National Supercomputing Grid over National Knowledge Network (NKN).
 - 4 major pillars of NSM are Infrastructure, Applications, R&D, Human resource development.
- NSM is being used for Genomics and Drug Discovery, Urban Modelling, Flood Early Warning and Prediction System for River Basins, seismic Imaging to aid Oil and Gas Exploration etc.

Supercomputers

- Supercomputers are large systems that are specifically designed to solve complex scientific and industrial challenges.
- Unlike traditional computers, supercomputers use more than one central processing unit (CPU).
- Supercomputing is measured in floating-point operations per second (FLOPS).
 - Petaflops are a measure of a computer's processing speed equal to a thousand trillion flops.
 - Floating-point is a method of encoding real numbers within the limits of finite precision available on computers.
- Supercomputers can be one million times more processing power than the fastest laptop.

Related News

- IIT Kharagpur has launched PARAM Shakti, a Petascale Supercomputer developed under the National Supercomputing Mission (NSM).

6.2.3. DARKNET

Why in News?

Germany has shut down Russia-linked ‘Hydra Market’- considered as world's biggest and oldest DarkNet marketplace of illegal items and services.

About DarkNet

- Also known as Dark Web, it is that part of Internet which cannot be accessed through traditional search engines like Google nor is it accessible by normal browsers like Chrome or Safari.
 - It generally uses non-standard communication protocols which make it inaccessible to internet service providers (ISPs) or government authorities.
 - Content on Dark Net is encrypted and requires specific browser such as TOR (The Onion Router) browser to access those pages.



- **Dark Net itself is only a part of Deep Web** that is a broader concept, which includes sites that are protected by passwords.
 - **Part of internet that is readily available to general public** and searchable on standard search engines is called as **Surface Web**.
- **It is used by journalists and citizens working in oppressive regimes, researchers and students** to do research on sensitive topics, law enforcement agencies etc.
- **Concerns over its use:** Anonymity, Haven for illicit activity, Privacy and ethical concerns, drug dealing, communication by terrorists etc.

6.2.4. WEB 3.0

Why in News?

Indian venture capital firms are betting on Web 3.0 startups as they view such companies as developers of products for the next stage of the internet.

About Web 3.0

- **Web 3.0** is the next stage of the web evolution that would **make the internet more intelligent or process information with near-human-like intelligence through the power of AI systems** that could run smart programs to assist users.
- **Web 1.0, also called the Static Web**, which **enabled easy access to information**. However, the information was largely disorganised and difficult to navigate.
- **The Social Web, or Web 2.0**, made the internet a lot more interactive thanks to advancements in web technologies like Javascript, HTML5, CSS3, etc., which enabled startups **to build interactive web platforms such as YouTube, Facebook, Wikipedia and many more**.
- **Significance of Web 3.0:** Data will be more relevant to each user, decentralised data networks, ensure data security and privacy etc.

THREE STAGES OF INTERNET CONSUMPTION



	Web1	Web2	Web3
Time period*	1990-2005	2005-till date	2021
Where data is stored	Server's file system	On-premise/Cloud	Blockchain, distributed across multiple networks
Examples	Static web pages	User generated content like Social media, and web applications like e-commerce etc...	NFTs, cryptocurrency transaction
Who owns data	Companies running the webpages	Companies that host application, cloud service providers	No one owns the data
Transacting	No transaction possible	Payment gateways for currency transactions	Transaction happens using crypto tokens

6.2.5. NEAR FIELD COMMUNICATION (NFC) TECHNOLOGY

Why in news?

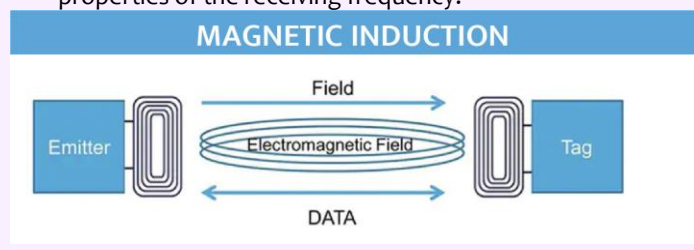
Google Pay has recently launched 'Tap to pay for UPI' that makes use of Near Field Communication (NFC) technology.

About NFC technology

- NFC is the technology that **allows compatible devices to establish radio communication** with each other by touching them together or bringing them into a **distance maximum of 10 cm**.

Principle of Magnetic Induction

- When **electrons flow** through a conductor, they **create a magnetic field**. And when **magnetic fields change**, they can **cause electrons to flow** through a conductor. This relationship -- known as **inductive coupling**.
- In NFC also the **reader or the mobile acts as the active device** whose antenna or the coil releases a sinusoidal carrier wave and **creates a magnetic field**. Then the **passive tags present in that field gets energy from the reader** and change the properties of the receiving frequency.



- NFC works on Radio Frequency Identification (RFID) technology and Magnetic induction principle (refer to the box).
- However, RFID and NFC also have many differences as highlighted in the following infographics.

Basis	RFID	NFC
Communication	<p>Computer --- RFID Reader --- RFID tag</p> <p>Unidirectional- typically an RFID tag sending data to an RFID reader</p>	<p>Smartphone --- NFC tag --- RFID Reader</p> <p>Both unidirectional and bidirectional. This allows NFC to be used for more complex interactions such as peer-to-peer (P2P) data sharing as well as card emulation.</p>
Frequency range	RFID FREQUENCY RANGES:	
	<p>Low Frequency (LF): 125-134 KHz</p> <p>(LF)</p> <p>Range: Up to 10 m</p>	<p>High Frequency (HF): 13.56 MHz NFC</p> <p>(HF)</p> <p>Range: Up to 30 m</p>
		<p>Ultra High Frequency (UHF): 856 MHz TO 960 MHz</p> <p>(UHF)</p> <p>Range: Up to 100 m</p>
Application	<ul style="list-style-type: none"> Asset tracking Race timing Attendee tracking Inventory management 	<ul style="list-style-type: none"> Contactless payment Information/data sharing In-store check-ins wearables like smartwatch Post-sale product experiences (such as scanning QR codes on posters for additional product information)
<p>Other similar technology</p> <ul style="list-style-type: none"> • Infrared Data Association (IrDA): It is a short range (a few metres) connection based on exchange of data over infrared light where the two communication devices must be positioned within a line of sight. It is mainly used for remote control devices. <p>IrDA vs NFC</p> <ul style="list-style-type: none"> • For IrDA technologies' receiver devices need their own power supply. Therefore, the receiving device cannot be powered by the radiofrequency (RF) field like in NFC. • In IrDA, user is required to configure their device and to pair them together for communication. Connection cannot be initiated by a simple touch gesture like in NFC. 		

6.2.6. ADDITIVE MANUFACTURING

Why in News?

National Strategy on Additive Manufacturing was released by the Ministry of Electronics & Information Technology (MeitY).

About Additive Manufacturing (AM)/ 3D printing

- It is a process in which a **three-dimensional object is built from a computer-aided design (CAD) model, usually by successively adding** materials in a layer-by-layer fashion.
 - The addition of material can happen in multiple ways, namely power deposition, resin curing, filament fusing.
 - **Thermoplastics, Metals, Ceramics as well as Biomaterials** can be used in AM.
- **Application:** in sectors including automotive, consumer products, medical, business machines, aerospace, government/military, academic and others.

Basic Additive Manufacturing Process



- **Traditional vs. AM:** Unlike AM, traditional manufacturing methods, by contrast, are subtractive in nature.
 - Subtractive manufacturing **involves removing parts of a block of material** in order to create the desired shape.
 - Cutting wood into useful shapes, for instance, is a very simple example of a subtractive process.
- **Globally US dominate the AM market share** followed by EU. **In Asia-Pacific China is the leader** followed by Japan. **India accounts for 3-5% share in Asia- Pacific.**
- **Challenges in AM manufacturing in India:** High cost of equipments, lack of AM ecosystem, lack of skilled manpower, legal issues related to IPR etc.

Initiatives taken in India

- **Establishment of 3D printing Manufacturing Lab** at National Institute of Electronics & Information Technology, Aurangabad.
- Under Atal Innovation Mission (Niti Aayog), **Atal Tinkering Labs have been set up**, where do-it-yourself (DIY) kits on latest technologies like 3D Printers, Robotics etc. are installed through government financial support.

National Strategy for Additive Manufacturing

- It aims to **inspire an effective strategy on AM, maximizing economic benefits** from future growth opportunities, while minimizing risks and mitigating associated challenges.
- **Key goals envisaged are:**
 - Position India as a global hub for AM.
 - Protect India's AM intellectual properties.
- **Key Objectives are:**
 - **Encourage domestic manufacturing** across the value-chain.
 - **Reduce import dependency.**
 - Encourage global market leaders to **establish global bases for manufacturing AM components and sub-assemblies** in India.
 - **Strengthen India's collaborations with global AM organizations** and Innovation and Research Centres.
 - Establish a **"National Centre on AM"** for harnessing AM transformation.
 - **Promote Innovation and Research infrastructure.**
- **Focus sectors are** Electronics, Aerospace, Defence, Automotive, Medical Devices, Capital Goods, Consumer goods, Construction and Architecture etc.



6.2.7. NET NEUTRALITY

Why in News?

The **net neutrality debate has resurfaced in the country** as telecom operators are backing a proposal to regulate content delivery networks (CDN), which are used by global big tech companies to host data locally.

More on News

Telecom operators say that CDN, which were kept out of the Telecom Regulatory Authority of India's (TRAI) 2017 recommendations on net neutrality, need regulatory re-examination.

About Net Neutrality

- Net Neutrality is the idea that **Internet service providers (ISPs) should treat all data that travels over their networks fairly**, without improper discrimination in favour of particular apps, sites, or services.
- It means ensuring that all **end users are able to access the Internet content, applications and services at the same level of service quality, speed and price.**
- **Each country adopts different responses to the issue.**

About content delivery network (CDN)

- CDN refers to a **geographically distributed group of servers** that work together to provide fast delivery of Internet content.
- Thus, **internet companies like** search engines (such as Google) OTT content providers (Netflix etc.) will employ CDN services to **deliver services faster.**
- CDN management software **dynamically calculates which server is located nearest** to the user making the request and delivers content based on those calculations.
- **Benefits of CDN:** Can handle more traffic and avoid network failure, improve webpage loading time, enhance security, reduce bandwidth consumption and cost etc.

- Countries which have taken no specific measures e.g. Australia, Republic of Korea, New Zealand.
- Countries that have adopted light-touch regulatory measures e.g. European Commission, Japan, UK.
- Countries that have taken or propose to take specific legislative measures e.g. Brazil, Chile, France, Netherlands, Singapore, USA (FCC rules).
- Mechanisms for establishing guidelines ensuring Net Neutrality in India are at present mainly enforced by TRAI.
- Net Neutrality is needed for open and non-discriminatory access to internet, preventing ISPs to slow down the websites or services, reduce social exclusion etc.
- Arguments against Net Neutrality: Data packets of different applications need different type of treatment on the network, bandwidth of internet is limited, makes it easier for ISPs to filter dangerous content.
- A.K. Bhargava committee (2015) suggested some approach that should be followed on Net Neutrality.

6.2.8. OTHER IMPORTANT NEWS

Atal New India Challenge 2.0	<ul style="list-style-type: none"> ● Atal Innovation Mission launched the phase 1 of the 2nd edition of the Atal New India Challenge (ANIC 2.0) <ul style="list-style-type: none"> ○ ANIC is a flagship program of Atal Innovation Mission, NITI Aayog. ● ANIC is aim to address the Commercialization Valley of Death- supporting innovators scale over the risks associated with access to resources for testing, piloting and market creation. <ul style="list-style-type: none"> ○ ANIC 2.0 will see 18 challenges in 7 sectors, such as; E-mobility, Road Transportation Space Technology and Applications, etc.
Side-channel attacks (SCAs)	<ul style="list-style-type: none"> ● Indian researchers have built a low-energy security chip to prevent SCA on IoT (Internet of Things) devices. ● SCA aims to extract sensitive information like cryptographic keys, proprietary machine learning models and parameters by measuring things like timing information, power consumption and electromagnetic leaks of a system. <ul style="list-style-type: none"> ○ They are also referred to as sidebar attack or an implementation attack. ○ They are difficult to detect and defend against. ● Types of SCAs: Timing attack, Electromagnetic (EM) attack, Acoustic, Power, Optical, memory Cache, hardware weaknesses.
TRACE – Metaverse Token	<ul style="list-style-type: none"> ● Crypto trading platform Bitbns has listed the metaverse token 'TRACE' on its platform. <ul style="list-style-type: none"> ○ It has become India's first crypto exchange to list this token. ● Metaverse tokens are the currency used by people within the metaverse. Users can create, buy and sell goods as well as tokenized funds.

6.3. SPACE TECHNOLOGY

6.3.1. CHANDRAYAAN-3

Why in News?

Minister of State for Atomic Energy and Space, in a written reply to Lok Sabha, stated that Chandrayaan-3 is scheduled for launch in August 2022.

More on News

- ISRO conceived Chandrayaan-3 after it failed to soft-land Vikram (lander of Chandrayaan-2) on the lunar surface while it still has a **fully operational orbiter of Chandrayaan-2** going around Moon.
- While the mission was initially planned for late 2020 or 2021, **owing to Covid-19, the launch is being targeted for 2022.**

Why lunar missions?

- In the coming years, **several countries are planning to launch their lunar missions.**
 - **Other lunar missions:** Artemis (NASA), Volatiles Investigating Polar Exploration Rover (NASA), Korea Pathfinder Lunar Orbiter (South Korea)
- **Reasons for renewed interest**
 - Helium-3 (an isotope of the element helium) is abundant on the Moon, but rare on Earth. It is a potential fuel for nuclear fusion.
 - **Base for future space exploration.**
 - Moon and Earth share a common past, **studying it will reveal how earth's early past.**

Related News

China's Chang'e 5 lunar probe finds first on-site evidence of water on moon's surface

- Presence of water had been confirmed by remote observation but the lander has **now detected signs of water in rocks and soil.**
 - It also revealed that the moon had **turned drier**, owing probably to the degassing of its mantle reservoir.

About Chandrayaan-3

- Chandrayaan-3 is a **follow-on mission to Chandrayaan-2** and is meant to **demonstrate lunar landing and roving capability**.
- Chandrayaan-3 will carry only a modified lander and rover and **will use the orbiter of the Chandrayaan 2 mission** to communicate with the earth.
- **Scientific payloads that are being carried on-board are:**
 - **Lander:** Langmuir probe, Chandra's Surface Thermo Physical Experiment (ChaSTE) and Instrument for Lunar seismic activity (ILSA).
 - **Rover payloads are** Alpha Particle X-Ray Spectrometer (APXS) and Laser Induced Breakdown spectroscopy (LIBS).
- Chandrayaan-3 lander is planned to perform an **in-situ experiment of surface and sub-surface measurements of temperature**.
 - It is meant to help understand the thermal exchange and physical properties of the uppermost Lunar soil.

India's Lunar missions

- India's Lunar exploration journey began with **Chandrayaan-1 in 2008 and Chandrayaan-2 in 2019**.
- Around 2024-25, India and Japan are expected to **launch a joint Lunar Polar Exploration Mission**, meant to land at the Lunar South pole with a rover.

About Chandrayaan-1 and 2

	Chandrayaan-1	Chandrayaan-2
About	<ul style="list-style-type: none"> • India's first mission to Moon. • It carried 11 scientific instruments built in India, USA, UK, Germany, Sweden and Bulgaria. 	<ul style="list-style-type: none"> • Second lunar exploration mission with following basic components: <ul style="list-style-type: none"> ○ Orbiter: to observe the lunar surface and relay communication between Earth and Chandrayaan 2's Lander. ○ Lander (called Vikram): Designed to execute India's first soft landing on the lunar surface. ○ Rover (called Pragyan): AI powered vehicle to move on the lunar surface and perform on-site chemical analysis. • Though mission spacecraft failed its soft landing on the Moon's surface, its Orbiter continued to successfully collect and relay crucial insights about the Moon
Launch Date	<ul style="list-style-type: none"> • October 22, 2008. • Mission concluded when the communication with the spacecraft was lost on August 29, 2009. 	<ul style="list-style-type: none"> • July 22, 2019. • It will be operational for 7 years.
Objective	<ul style="list-style-type: none"> • To conduct chemical and mineralogical mapping of the entire lunar surface for distribution of mineral and chemical elements. • To prepare a three-dimensional atlas of both near and far side of the moon. 	<ul style="list-style-type: none"> • Primary objective: To demonstrate the ability to soft-land on the lunar surface and operate a robotic rover on the surface. • Scientific Objectives <ul style="list-style-type: none"> ○ Moon provides the best linkage to Earth's early history. ○ Evidence for water molecules discovered by Chandrayaan-1 requires further studies. ○ It will also study new rock types with unique chemical composition.
Payloads	<ul style="list-style-type: none"> • Scientific Payloads from India <ul style="list-style-type: none"> ○ Terrain Mapping Camera, ○ Hyper Spectral Imager, ○ Lunar Laser Ranging Instrument, ○ High Energy X - ray Spectrometer, ○ Moon Impact Probe. • Payloads from abroad <ul style="list-style-type: none"> ○ Chandrayaan-1 X-ray Spectrometer, 	<ul style="list-style-type: none"> • Orbiter payloads <ul style="list-style-type: none"> ○ Terrain Mapping Camera-2 (TMC-2), ○ Chandrayaan-2 Large Area Soft X-ray Spectrometer (CLASS), ○ Solar X-ray monitor (XSM), ○ Orbiter High Resolution camera (OHRC) ○ Dual Frequency L and S band Synthetic Aperture Radar (DFSAR), ○ Imaging IR Spectrometer (IIRS), ○ Chandrayaan-2 Atmospheric Compositional Explorer 2 (ChACE-2), ○ Dual Frequency Radio Science (DFRS) experiment.

	<ul style="list-style-type: none"> ○ Near Infrared Spectrometer, ○ Sub keV Atom Reflecting Analyzer, ○ Miniature Synthetic Aperture Radar, ○ Moon Mineralogy Mapper, ○ Radiation Dose Monitor. 	<ul style="list-style-type: none"> ● Vikram payloads <ul style="list-style-type: none"> ○ Radio Anatomy of Moon Bound Hypersensitive Ionosphere and Atmosphere (RAMBHA), ○ Chandra's Surface Thermo-Physical Experiment (ChaSTE), ○ Instrument for Lunar Seismic Activity (ILSA) ● Pragyan payloads <ul style="list-style-type: none"> ○ Alpha Particle Induced X-ray Spectroscopy (APXS), ○ Laser induced Breakdown Spectroscopy (LIBS) ○ Passive Experiment- Laser Retroreflector array (LRA)
Major Findings	<ul style="list-style-type: none"> ● Detected water in vapour form in trace amounts, ● Confirmed the Ocean Magma Hypothesis i.e., the moon was once completely in molten state, ● Detected x-ray signals during weak solar flares thus indicating presence of magnesium, aluminum, silicon and calcium on lunar surface, ● Detection of new spinel-rich rock type on lunar far-side. 	<ul style="list-style-type: none"> ● Detected unambiguous presence of hydroxyl and water molecules on the Moon with the precision of differentiating between the two. ● Detected solar proton events due to high intensity solar flares. ● Imaged Sarabhai crater on the Moon. ● Detection of Argon-40 in the lunar exosphere. <ul style="list-style-type: none"> ○ Earlier, NASA's Apollo-17 had detected presence of Ar-40 in the lunar exosphere confined only to near-equatorial region of Moon. ○ Argon is an inert, colorless and odorless element, and a noble gas. ○ Argon-40 is isotope of Argon that originates from the radioactive disintegration of Potassium-40 (K-40) present below the lunar surface.
Launch Vehicle	PSLV - C11	GSLV MkIII-M1

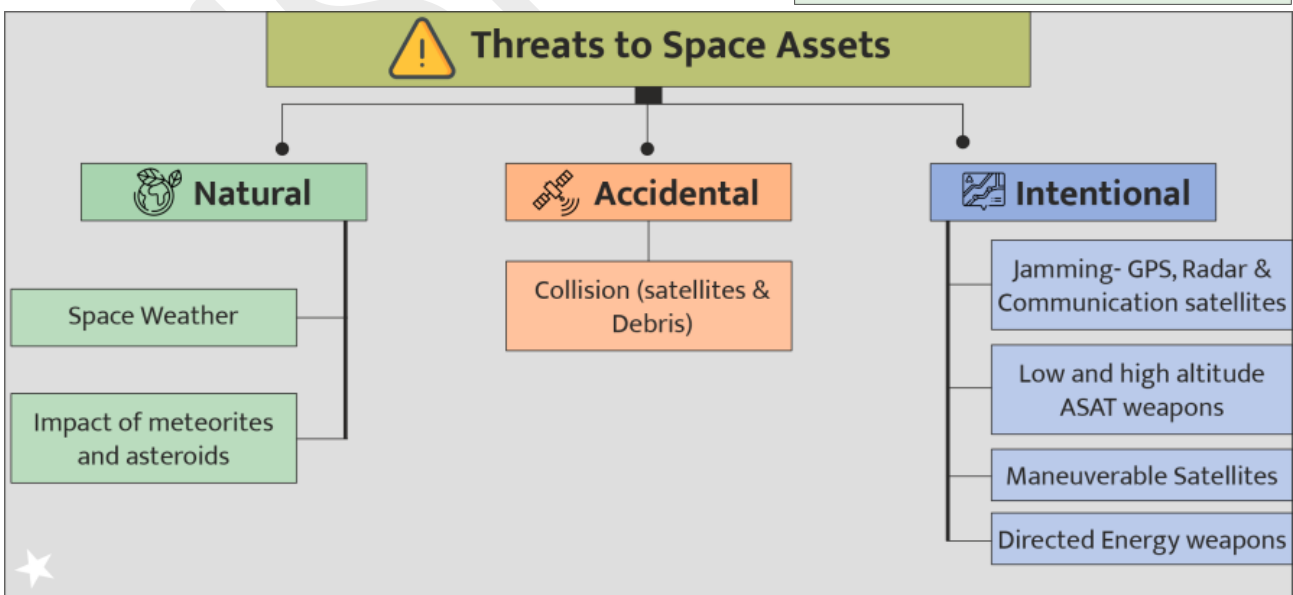
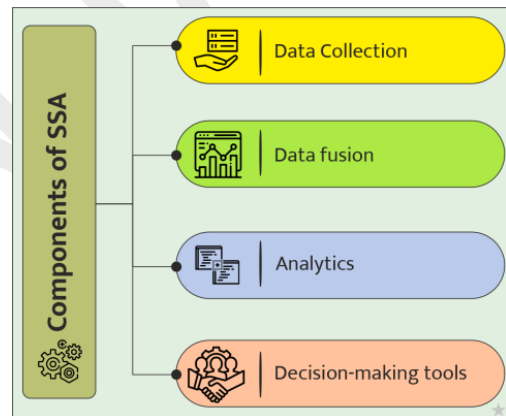
6.3.2. SPACE SITUATIONAL AWARENESS (SSA)

Why in News?

India and the US finalized the signing of a new Space Situational Awareness (SSA) arrangement.

What is SSA?

SSA is the practice of **tracking objects** in space, **identifying** them, **establishing their orbits**, **understanding the environment** they're operating in, and **predicting their future positions and threats** to their operations.



Importance of SSA for India

- SSA can help in **debris tracking, collision avoidance**, Prediction and monitoring of **threats** (refer infographic) and **Satellite anomaly detection**.

- SSA also helps in providing **information regarding adversary's activities** in space, which will enable decision makers to **gain and maintain space superiority**.
- **Dramatic rise in number of space objects**, with advent of **private players**, heightening the risk of collisions between space objects.

Steps taken in the light of importance of SSA

- **ISRO's Directorate of Space Situational Awareness and Management (SSAM)** aims at protecting high valued space assets from space debris close approaches and collisions.
- **A control centre, related to SSAM, is being established at Bengaluru** to carryout activities including **protection of Indian Space assets, tracking data of inactive satellites etc.**
- India is an active member of Inter-Agency Debris Coordination Committee (IADC) and also engages in several initiatives with North American Aerospace Defense Command (NORAD).
- **Multi Object Tracking Radar (MOTR)**, when used in conjunction with NETRA, can improve the observation accuracy of space assets.

6.3.3. OTHER IMPORTANT NEWS

Venera-D Mission	<ul style="list-style-type: none"> • It is a planned joint space exploration mission project between Russia's Roscosmos and US's NASA to explore Venus. <ul style="list-style-type: none"> ◦ It is being reported that following American sanctions, Russia will carry out the mission alone or with China's participation. • Other future missions to Venus: India's Shukrayaan ,NASA's proposed Deep Atmosphere Venus Investigation of Noble gases, Chemistry and Imaging (DAVINCI+), Venus Emissivity, Radio Science, InSAR, Topography, and Spectroscopy (VERITAS).
ExoMars	<ul style="list-style-type: none"> • European Space Agency's ExoMars 2022 mission won't be launched in September as planned after the agency suspended all cooperation with Russia's space program Roscosmos. • ExoMars mission aims to address the question whether life has ever existed on Mars. • It has two parts: <ul style="list-style-type: none"> ◦ The first part launched an orbiter and a lander in 2016, but the lander crashed. ◦ September 2022 launch would have delivered a Mars rover to the planet.
Pluto's atmospheric pressure	<ul style="list-style-type: none"> • A team of scientists have derived accurate value of Pluto's atmospheric pressure which is 80,000 times less than the atmospheric pressure at mean sea level on Earth. • It was calculated from data obtained by observation of stellar occultation by Pluto. <ul style="list-style-type: none"> ◦ An occultation happens when a celestial object gets hidden from the view of the observer due to another celestial object passing in between them. • Data was calculated using 3.6-m Devasthal optical telescope (DOT) (India's largest optical telescope) and 1.3-m Devasthal Fast Optical Telescope (DFOT) telescopes located at Devasthal, Nainital.
Multi-slit Solar Explorer (MUSE) and HelioSwarm	<ul style="list-style-type: none"> • NASA has selected these two missions to help improve understanding of the Sun, the Sun-Earth connection, and the constantly changing space environment. • MUSE: It will help in assessing the forces driving the heating of the Sun's corona and the eruptions in that outermost region that are at the foundation of space weather. • HelioSwarm: It will be a constellation or "swarm" of nine spacecraft that will capture the first multiscale in-space measurements of fluctuations in the magnetic field and motions of the solar wind known as solar wind turbulence.
Vigil mission	<ul style="list-style-type: none"> • Formerly known as "Lagrange mission", It is a European Space Agency's (ESA) mission to monitor Sun. • It will give advance warning of oncoming solar storms and therefore more time to protect spacecraft in orbit, infrastructure on the ground and explorers. • It will be launched in the mid-2020s and will be placed in the 5th Lagrange point orbit.
Asteroid Terrestrial-impact Last Alert System (ATLAS)	<ul style="list-style-type: none"> • ATLAS, NASA-funded asteroid detection system, has become the first survey capable of searching the entire dark sky every 24 hours for near-Earth objects (NEOs). <ul style="list-style-type: none"> ◦ ATLAS is developed by University of Hawaii Institute for Astronomy (IfA). • Now comprised of four telescopes, ATLAS has expanded its reach to the southern hemisphere from the two existing northern-hemisphere telescopes on Haleakala and Mauna-Loa in Hawaii to include two additional observatories in South Africa and Chile.
Europa Clipper Spacecraft (ECS)	<ul style="list-style-type: none"> • Recently, NASA began the assembly of ECS, which is scheduled to launch in 2024. • ECS will scan Europa in search of signs of habitability as scientists believe that the moon harbours an ocean with twice the amount of water in Earth's oceans combined beneath its icy surface, and those oceans might have conditions suitable for life.

	<ul style="list-style-type: none"> Europa is one of Jupiter's four largest moons, called the Galilean satellites (others are Io, Ganymede and Callisto).
GSAT 7B	<ul style="list-style-type: none"> Defence Acquisition Council (DAC) has accorded Acceptance of Necessity (first step of procurement) for the indigenously designed, developed and built GSAT 7B. <ul style="list-style-type: none"> Proposed to be launched in next 2-3 years, GSAT 7B will be a state-of-the-art, multiband, military-grade satellite for the Army. It will act as a force multiplier and fail-safe communication support to the force as it moves deeper into network-centric warfare scenario. GSAT 7 series satellites are advanced geosynchronous transfer orbit (GTO) satellites developed by Indian Space Research Organisation (ISRO) to meet the communication needs of the defence services. <ul style="list-style-type: none"> GSAT 7 satellite (launched 2013) is used by Indian Navy while GSAT 7A (2018) is designed for Indian Air Force. Currently, the Army is using 30% of the communication capabilities of the GSAT 7A.
InspireSat-1 and INS-2DT satellite launched by ISRO	<ul style="list-style-type: none"> ISRO sent 2 small satellites aboard Polar satellite launch vehicle (PSLV - C52). <ul style="list-style-type: none"> InspireSat-1 satellite to study ionosphere dynamics and the Sun's coronal heating process. <ul style="list-style-type: none"> ✓ Satellite is built by Indian Institute of Space Science and Technology & other institutes. INS-2DT has a thermal imaging camera and can help in assessment of land and water surface temperatures and in mapping vegetation and thermal inertia (day and night). <ul style="list-style-type: none"> ✓ It is a technology demonstrator satellite from ISRO, a precursor to India-Bhutan Joint Satellite (INS-2B).
Localizer Performance with Vertical Guidance (LPV)	<ul style="list-style-type: none"> Airports Authority of India (AAI) successfully conducted flight trials using GAGAN based LPV (Localizer Performance with Vertical Guidance) approach procedure. It is one among the only four Space-Based augmentation systems available in the world which also includes US (WAAS) Europe (EGNOS) and Japan (MSAS). LPV permits aircraft guided approaches that are operationally nearly equivalent to Category 1- Instrument Landing System (Cat-1 ILS), without the need for ground-based navigational infrastructure. <ul style="list-style-type: none"> LPV permits aircraft guided approaches that are operationally nearly equivalent to Category 1- Instrument Landing System (Cat-1 ILS), without the need for ground-based navigational infrastructure. It will provide substantial operational benefit in poor weather and low visibility conditions. India is the first country in the Asia Pacific Region to achieve such a landmark in field of Air Navigation Services (ANS).
Gravitational lensing	<ul style="list-style-type: none"> Recently, gravitational lensing allowed scientists to observe a star that is extremely far away. A gravitational lens can occur when a huge amount of matter, like a cluster of galaxies, creates a gravitational field that distorts and magnifies the light from distant galaxies that are behind it but in the same line of sight. <ul style="list-style-type: none"> The effect is like looking through a giant magnifying glass. It allows researchers to study the details of early galaxies too far away. This effect was first predicted by Einstein's general theory of relativity.
Giant Metrewave Radio Telescope (GMRT)	<ul style="list-style-type: none"> Astronomers at National Centre of Radio Astrophysics, Pune used GMRT to map distribution of atomic hydrogen gas from the galaxy hosting a fast radio burst (FRB) for the first time. <ul style="list-style-type: none"> FRBs are extremely bright radio pulses from distant galaxies that last for only a few milliseconds. GMRT is an instrument for studying astrophysical phenomena, ranging from nearby Solar system to the edge of observable Universe, at low radio frequencies (40 to 1450 MHz). <ul style="list-style-type: none"> It is operated by NCRA, which is part of Tata Institute of Fundamental Research. It is located near Pune.
SARAS 3 radio telescope	<ul style="list-style-type: none"> Using indigenously invented and built SARAS 3 radio telescope, Indian researchers conclusively refuted a recent claim (2018) of the discovery of a radio wave signal from cosmic dawn. <ul style="list-style-type: none"> Cosmic dawn is the time in the infancy of Universe when the first stars and galaxies came into existence. About SARAS (Shaped Antenna measurement of the background Radio Spectrum) 3 radio telescope <ul style="list-style-type: none"> It is a precision radio telescope to detect extremely faint radio wave signals from Cosmic Dawn. It is the first telescope worldwide to reach the required sensitivity. Developed by: Raman Research Institute, an autonomous institute of Department of Science & Technology.

<p>Space bricks</p>	<ul style="list-style-type: none"> • Researchers from ISRO and Indian Institute of Science (IISc) have developed a way to make bricks of complex shapes from Martian soil with the help of bacteria and urea. • First slurry was made by mixing Martian soil with guar gum (also used in extraction of shale gas), a bacterium called <i>Sporosarcina pasteurii</i>, urea and nickel chloride (NiCl₂). <ul style="list-style-type: none"> ○ Bacteria convert the urea into crystals of calcium carbonate. ○ These crystals, along with biopolymers secreted by microbes, act as cement holding soil particles together. • In the past, the team had made bricks out of lunar soil using a similar method.
<p>Telangana spacetech framework</p>	<ul style="list-style-type: none"> • It is a first-of-its-kind attempt in the government sector to launch spacetech framework. • It aims to: <ul style="list-style-type: none"> ○ Help the state emerge as a commercial hub for all space-related products and services. ○ Promote domestic production of launch vehicles, satellite systems and subsystems, ground equipment manufacturing and other facilities. ○ Establish Telangana as a one-stop global destination for space technology.

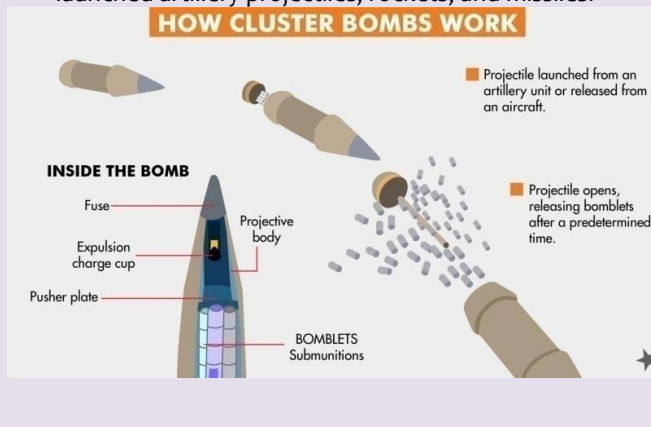
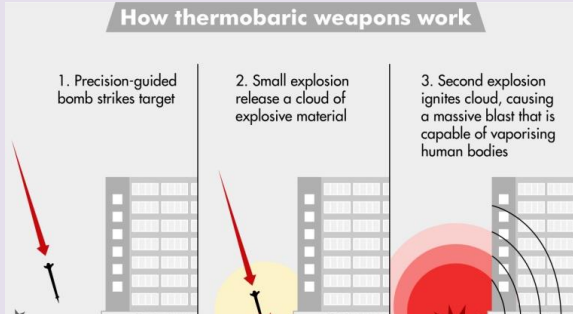
6.4. DEFENCE

6.4.1. CLUSTER BOMBS AND THERMOBARIC WEAPONS

Why in News?

Human rights groups accused Russia of using **cluster bombs and Thermobaric weapons in the ongoing war**.

About Cluster bombs and Thermobaric weapons

Cluster munitions	Thermobaric weapon (also called aerosol bombs, fuel air explosives, or vacuum bombs)
<ul style="list-style-type: none"> • These are non-precision weapons that are designed to injure or kill human beings indiscriminately over a large area, and to destroy vehicles and infrastructure. • They can be dropped from an aircraft or launched in a projectile, scattering many bomblets as it travels. • Many of these bomblets end up not exploding, but continue to lie on the ground. • Countries that have ratified Convention on Cluster Munitions are prohibited from using cluster bombs. As of date, there are 110 state parties to the convention. <ul style="list-style-type: none"> ○ Russia, Ukraine, India are not signatories. • India has cluster munitions delivered by ground-launched artillery projectiles, rockets, and missiles. 	<ul style="list-style-type: none"> • They use oxygen from the air for a large, high-temperature blast. • Causes significantly greater devastation than a conventional bomb of comparable size. • The weapon goes off in 2 separate stages: <ul style="list-style-type: none"> ○ As they hit their target, a first explosion splits open the bomb's fuel container, releasing a cloud of fuel and metal particles that spreads over a large area. ○ A second explosion then occurs, igniting the aerosol cloud into a giant ball of fire and sending out intense blast waves that can destroy even reinforced buildings or equipment and vaporise human beings. • These are not prohibited by any international law or agreement. 

Related News

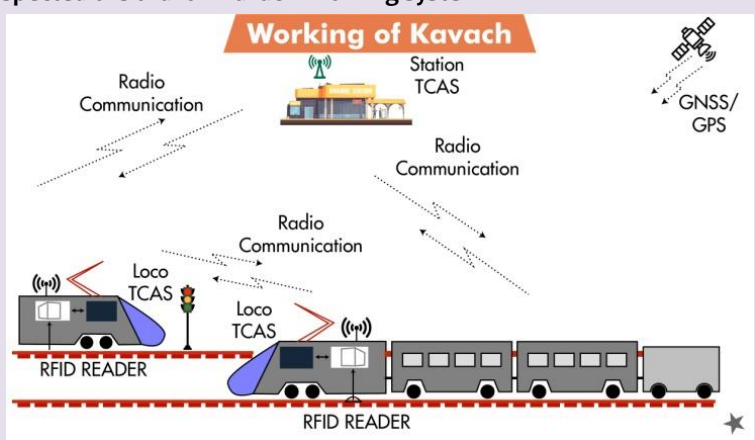
Phosphorus bomb

- Russian forces are accused of **launching phosphorus bomb attacks** in Lugansk and Donetsk regions of eastern Ukraine.
- International law **prohibits the use of white phosphorus shells in heavily populated civilian areas**, but allows them in open spaces to be used as cover for troops.

- White phosphorus munition is UN-banned weapon. It is used in smoke, lights and during war to make the bomb more lethal.
- It is pyrophoric (it is ignited by contact with air), burns fiercely and can cause horrendous injuries.

6.4.2. OTHER IMPORTANT NEWS

<p>Kavach</p>	<ul style="list-style-type: none"> • Minister of Railways inspected the trial of ‘Kavach’ working system. • Kavach is the indigenously-developed train collision avoidance system (TCAS), developed by Research Design and Standards Organisation (RDSO) in collaboration with Indian industry. <ul style="list-style-type: none"> ○ It is a set of electronic devices and Radio Frequency Identification devices installed in locomotives, in the signalling system and tracks. ○ These communicate with each other using ultra-high radio frequencies to control the brakes of trains and also alert drivers. • Key features include: <ul style="list-style-type: none"> ○ It automatically takes over and applies sudden brakes — in case of a human error in jumping a red signal and prevents rear-end collisions too when they are on the same line. ○ The hooter sounds by itself when a level crossing is approached helping the loco-pilots during fog conditions. ○ Speeds automatically shift to permissible limits during curves or on bridges.
<p>Schemes for defence start-ups</p>	<ul style="list-style-type: none"> • Minister of Defence rolls out schemes during DefConnect 2.0, an event that aims to attract innovators and investors from India’s leading industries in the defence sector. • Major schemes launched are: <ul style="list-style-type: none"> ○ Innovations for Defence Excellence (iDEX) Prime <ul style="list-style-type: none"> ✓ iDEX-Prime aims to support projects, requiring support beyond Rs 1.5 crore up to Rs 10 crore, to help ever-growing start-ups in the defence sector. ✓ Core objective of iDEX is to create an ecosystem, essentially to foster innovation, entrepreneurship and technology development, specifically in the Defence and Aerospace sector. ✓ iDEX is the operational framework of the Defence Innovation Organization (DIO), a special purpose vehicle under Ministry of Defence (MoD). ○ Sixth Defence India Start-up Challenge (DISC 6) <ul style="list-style-type: none"> ✓ DISC is aimed at supporting Startups/MSMEs/Innovators to create prototypes and/or commercialize products/solutions in the area of National Defence and Security. ✓ DISC has been launched by MoD in partnership with Atal Innovation Mission. ○ Third edition of Innovate4Defence internship (i4D), a two-months-long acceleration program for students of Higher Educational Institutions (HEIs) of India.
<p>HANSA-New Generation (HANSA-NG)</p>	<ul style="list-style-type: none"> • It is India’s first indigenous aircraft trainer, designed and developed by CSIR-National Aerospace Laboratories (NAL). • It has completed sea level trials a necessary prelude to it being evaluated by Directorate General of Civil Aviation (DGCA). • Key features - composite light weight airframe, a glass cockpit, a bubble canopy with a wide panoramic view, and electrically operated flap. • Significance - ideal aircraft for Commercial Pilot Licensing due to its low cost and low fuel consumption. • NAL - Formed in 1959, it is a government-owned aerospace research and development laboratory under the Council of Scientific and Industrial Research (CSIR).
<p>Kamikaze drones</p>	<ul style="list-style-type: none"> • They are small unmanned aircraft that are packed with explosives that can be flown directly at a tank or a group of troops that are destroyed when it hits the target and explodes. <ul style="list-style-type: none"> ○ Also called Switchblade drones as their bladelike wings spring out on launch.



Updated Classroom Study Material

	<ul style="list-style-type: none"> • Features - difficult to detect on radar, can hit targets without human intervention, based on facial recognition, can adjust the blast radius and are cost effective. • They are presently being supplied to Ukraine by US in war against Russia. <ul style="list-style-type: none"> ○ Other countries including Russia, China, Israel, Iran and Turkey all have some version of it.
Medium Range Surface to Air Missile	<ul style="list-style-type: none"> • DRDO successfully flight-tested Indian Army version of Medium Range Surface to Air Missile at Chandipur, Odisha • This MRSAM version is a Surface-to-Air Missile developed jointly by India and Israel for use by the Indian Army. • About MRSAM <ul style="list-style-type: none"> ○ It is a high response, quick reaction, vertically launched supersonic missile, designed to neutralize enemy aerial threats – missiles, aircraft, guided bombs, helicopters. ○ It is used by the Army, Navy (Tested successfully in 2019) and Air Force (inducted in 2021) as different variants.
Pinaka missile systems	<ul style="list-style-type: none"> • Pinaka Mk-I (Enhanced) Rocket System (EPRS) and Pinaka Area Denial Munition (ADM) rocket systems have been successfully flight-tested by Defence Research and Development Organisation and Indian Army at Pokhran. <ul style="list-style-type: none"> ○ The new Pinaka ER gives it a range of around 70 km, over the 45 km existing range of the missile which has been with the Indian forces for nearly a decade. • The Pinaka is a Multi-Barrel Rocket-Launcher (MBRL) system which can fire a salvo of 12 rockets over a period of 44 seconds.
Dornier (Do-228) Aircraft flight	<ul style="list-style-type: none"> • Ministry of Civil Aviation has announced the launch of first commercial flight of the made-in-India Dornier-228. <ul style="list-style-type: none"> ○ Do-228 has been made by Hindustan Aeronautics Limited (HAL) delivered to Alliance Air. ○ Alliance Air will be India's first commercial airline to fly an India- made aircraft for civil operations. ○ Aircraft will link five remote towns of Arunachal Pradesh to Assam's Dibrugarh, boosting air connectivity in the north-eastern region of the country. • It is part of government's UdeDeshkaAamNaagrik (UDAN) regional connectivity scheme.
Kinzhal	<ul style="list-style-type: none"> • Russia has claimed to have used Kinzhal missiles for the first time in Ukraine. • Kinzhal, which means dagger, is an air-launched hypersonic missile with a reported range of 1,500-2,000km. It can carry nuclear payload of 480 kg. <ul style="list-style-type: none"> ○ Hypersonic describes any speed faster than five times that of sound. • Hypersonic weapons are normally defined as fast, low-flying, and highly maneuverable weapons designed to be too quick and agile for traditional missile defence systems to detect in time.
Hermes Starliner unmanned system	<ul style="list-style-type: none"> • Israel becomes first country to allow drones (Hermes Starliner) in civilian airspace. <ul style="list-style-type: none"> ○ The approval will allow Hermes Starliner drone to fly in civilian airspace like any other civilian airliner, rather than being restricted to unsegregated airspace. • It will be able to participate in border security and anti-terror operations, take part in securing mass public events, perform maritime search and rescue, commercial aviation and environmental inspection missions, as well as precision agriculture work.
Indian Naval Ship (INS) Vagsheer	<ul style="list-style-type: none"> • Vagsheer, sixth and last submarine of Project 75, has been launched. <ul style="list-style-type: none"> ○ Vagsheer is a diesel attack submarine, designed to perform sea denial as well as access denial warfare. ○ It is also capable of performing anti-surface warfare, anti-submarine warfare, intelligence gathering, mine laying and area surveillance related operations.

6.5. HEALTH

6.5.1. VIRUSES

Why in news?

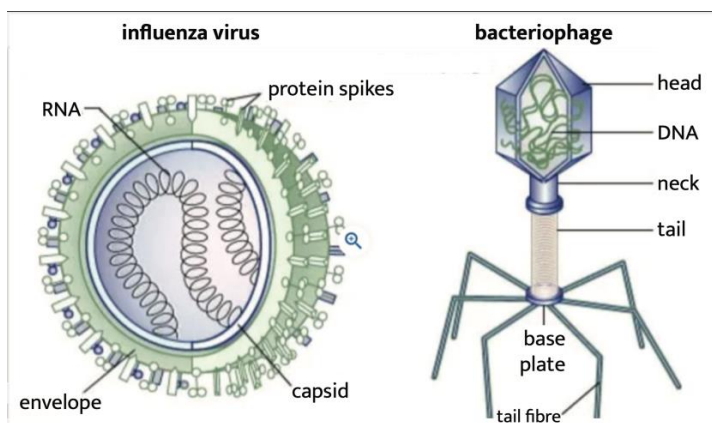
Recently, an analysis of the genetic material in the ocean has identified thousands of previously unknown RNA viruses.

More on news

- The discovery has **doubled the number of biological groups** of viruses thought to exist.

About Viruses

- Viruses are **obligatory intracellular pathogens** which completely depend on their hosts for survival and reproduction i.e. they **cannot replicate outside of a host cell**.
- They could be **crystallised** and crystals consist largely of proteins.
- The **protein coat called capsid** made of small subunits called capsomeres, **protects the nucleic acid**.
- In addition to proteins, viruses also contain **genetic material** that could be **either RNA or DNA**. **No virus contains both RNA and DNA**. Thus, a virus is a nucleoprotein and the **genetic material is infectious**.
- While scientists have catalogued hundreds of thousands of DNA viruses in their natural ecosystems, **RNA viruses have been relatively unstudied**.
- In general,
 - viruses that **infect plants** have **single stranded RNA**
 - viruses that **infect animals** have **either single or double stranded RNA or double stranded DNA**.
 - Bacterial viruses or **bacteriophages** (viruses that infect the bacteria) are usually double stranded DNA viruses.
- Replication of virus:** A virus injects its genetic information into a host cell and then **takes control of the cell's machinery**. This process enables the virus to make copies of its DNA or RNA and **make the viral proteins inside the host cell**.



DNA virus vs RNA Virus

Attributes	DNA Viruses	RNA viruses
Mutation	Mutation rate is lower	Mutation rate is very high
Place of replication inside the host cell	Nucleus of the host cell	Cytoplasm of the host cell
Mechanism of replication inside the host cell	<p>The DNA of DNA viruses is transcribed into mRNA by the host cell. The viral mRNA is then translated into viral proteins by the host cell. These viral proteins then assemble to form new viral particles.</p>	<p>When these viruses enter a host cell, they must first convert their RNA into DNA. This process, called reverse transcription, enables the virus to inject its genetic material into the host cell and use the host's biochemical machinery, similar to a DNA virus .</p>
Diseases caused	Tobacco Mosaic Virus in tobacco plants, Papillomaviruses, Herpesviruses, Poxviruses	Hepatitis C Virus (HCV), Ebola disease, SARS, influenza, polio measles, Human T-cell lymphotropic virus type 1 (HTLV-1) and HIV.

Glossary

- **Transcription:** It is the process by which the information in a strand of DNA is copied into a new molecule of messenger RNA (mRNA).
- **Reverse transcription:** The process in cells by which an enzyme makes a copy of DNA from RNA.
- **Translation:** It is the process through which information encoded in mRNA directs the addition of amino acids during protein synthesis.
- **Mutation:** It is an alteration in the genetic material (the genome) of a cell of a living organism or of a virus.

Related News**Self-amplifying messenger RNA (mRNA) vaccine has shown promising results against Covid-19.**

- **About Self-amplifying messenger RNA (mRNA) vaccine**
 - Unlike conventional vaccines that inject a weakened form of a virus or bacteria into the body, **RNA vaccines use part of virus' own genes to stimulate an immune response.**
 - A conventional mRNA vaccine, such as those from Pfizer and Moderna, **uses mRNA that encodes the spike protein of the coronavirus.**
 - ✓ mRNA vaccines teach cells how to make copies of the spike protein that triggers an immune response inside human bodies, when actual infection takes place.
 - A self-amplifying mRNA vaccine is an **improvement over the traditional mRNA** as it **encodes four extra proteins in addition to the vaccine antigen**, and these enable amplification of original strand of RNA once inside the cell.
 - **Advantage of self-amplifying mRNA vaccine** over conventional mRNA vaccine: making storage easy, minimizing dose of RNA and lowering the cost of vaccines.
 - **Advantages of RNA vaccines: Safe and non-infectious** as they are not made with pathogen particles or inactivated pathogen, **Can generate a stronger type of immunity, Can be produced more rapidly etc.**

6.5.2. ZONOTIC DISEASES**Why in News?**

Indian Council of Medical Research (ICMR) will conduct bat surveillance to check the threat of zoonotic diseases.

More on News

- ICMR is proactively taking steps to **monitor bat habitats to locate potential hotspots and prevent the spread of zoonotic diseases.**
- Bats are **reservoirs of a host of viruses** including Nipah, and have the potential to cause **annual outbreaks and pandemics.**
 - Nipah virus was first **discovered in 1999** following an outbreak of disease in pigs and people in **Malaysia and Singapore.**
 - India has witnessed **four outbreaks of Nipah virus** during 2001–2019.

About Zoonotic Diseases

- “Zoonosis” is a disease that has **passed into the human population from an animal source.**
 - For e.g. Ebola virus disease, Kyasanur forest disease (KFD) and Middle East respiratory syndrome (MERS)
- Transmission is through **direct contact or through food, water and the environment.**
- About **60% of human infections are estimated to have an animal origin.** Further 75% of emerging infectious diseases are zoonotic.
- **7 anthropogenic factors identified for ZD-** increased demand for animal protein; rise in intense and unsustainable farming; increased use and exploitation of wildlife; unsustainable utilisation of natural resources; travel and transportation; changes in food supply chains; climate change crisis.
- **One Health approach** can be taken to prevent Zoonotic Diseases.

Related News

- Lassa fever is **zoonotic disease caused by Lassa virus.**
- It was **first discovered in 1969 in Nigeria.**
- It is **endemic in parts of West Africa** including Sierra Leone, Liberia, Guinea and Nigeria.
- **Symptom includes** bleeding, Difficulty breathing; vomiting; facial swelling; pain in the chest, etc.
- **It spreads through** Infected rats, rarely spread via direct contact with a sick person's body fluids.
- **Ribavirin an antiviral drug** that is used for its treatment and maintaining hydration, oxygen levels etc.

6.5.3. NON COMMUNICABLE DISEASE (NCD)

Why in news?

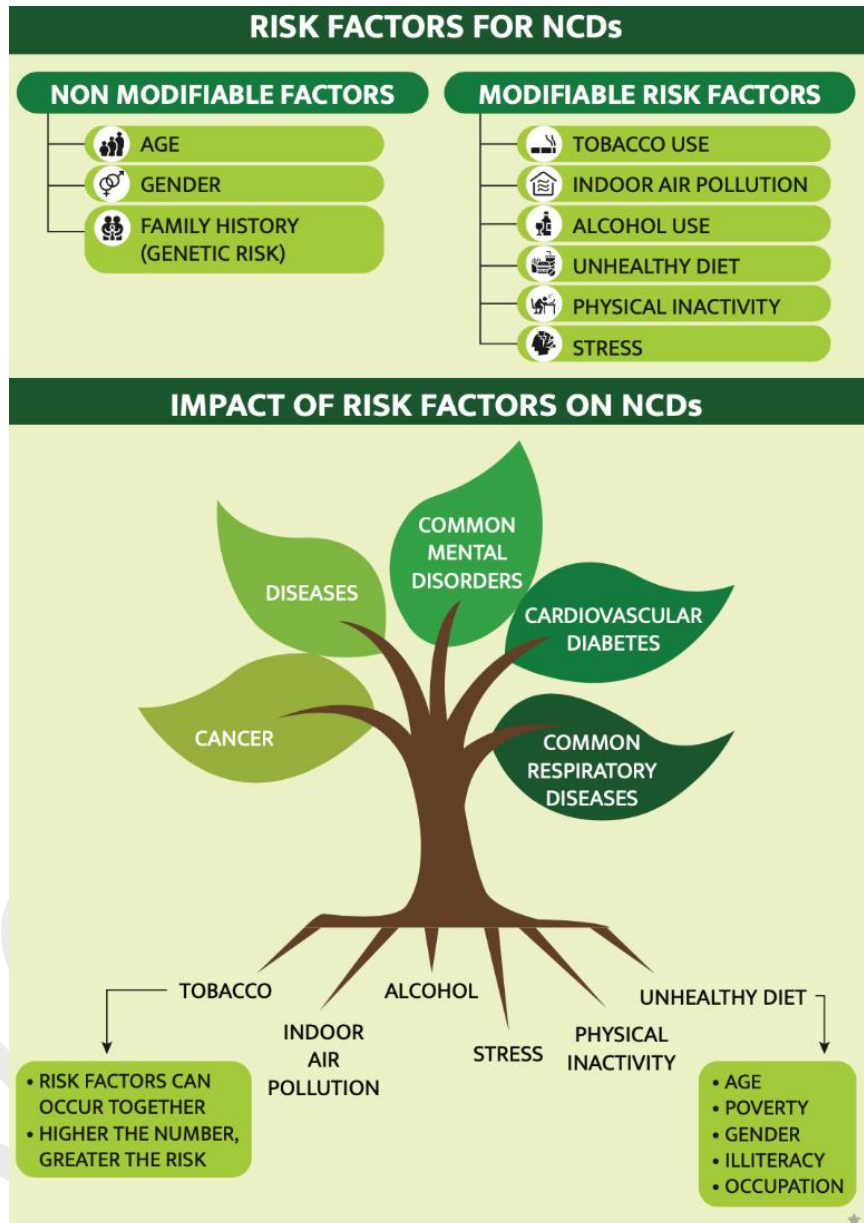
According to the Sample Registration System (SRS), largest major group of diseases that caused deaths in 2015-17 were non-communicable diseases.

More on news

- The SRS data on causes of deaths for 2014-16 and 2015-17 was released by the Office of the Registrar General and Census Commissioner of India.
 - SRS is the only official source of various demographic indicators in India except the census.
- Key findings of the survey
 - 52.8% of deaths in 2015-17 were caused by NCDs (52.4% in 2014-16).
 - ✓ 54.1% of deaths among men in 2015-17 were caused by NCDs (0.5% up from 2014-16).
 - ✓ 50.9% of deaths among women in 2015-17 were caused by NCDs (0.3% up from 2014-16).

About Non communicable disease (NCD)

- NCDs, also known as chronic diseases, tend to be of long duration and are the result of a combination of genetic, physiological, environmental and behaviours factors.
 - Main types of NCDs are cardiovascular diseases, cancers, chronic respiratory diseases and diabetes.
 - 71% of global deaths (approximately 41 million) is caused by NCDs worldwide each year.



Initiatives taken by India against NCDs

- **National Multisectoral Action Plan for prevention and control of common NCDs:** In response to the “WHO Global Action Plan for the Prevention and Control of NCDs 2013-2020”, India is the first country to adopt the National Action Plan.
- **National Monitoring Framework for Prevention and Control of NCDs:** It has committed for a 50% relative reduction in household use of solid fuel and a 30% relative reduction in prevalence of current tobacco use by 2025.
- **Non Communicable Disease Control Programmes:** Following programmes have been launched as part of the National Health Mission:
 - National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular disease and Stroke (NPCDCS).
 - National Mental Health Programme (NMHP).
 - National Tobacco Control Programme (NTCP) etc.
- **Initiatives by the Food Safety and Standards Authority of India (FSSAI)**
 - State Food Safety Index.

- FSSAI has mandated to reduce the limit of industrially produced trans-fats, to not more than 2% to make the country free from the industrially produced trans- fats by 2022, a year ahead of the WHO guidelines.
- **The Eat Right Movement.**
- **SNF@Workplace initiative (safe and nutritious food at workplace).**

6.5.4. TRADITIONAL MEDICINE

Why in news?

Recently, WHO Director-General laid the foundation stone for world's first and only Global Centre for Traditional Medicine (GTCM) at Jamnagar in Gujarat.

About GTCM

- The GTCM will emerge as an **international hub of global wellness**. It will **spread across the world, the rich heritage of ancient medicine, and social-cultural diversity** of different regions.
- The centre will also provide **guidance on technical aspects of the medicines**.
- **4 main strategic areas of GTCM:** Evidence and Learning, Data and Analytics, Sustainability and Equity, Innovation and Technology.

Initiatives by India to Promote its Traditional Medicine system

- **National AYUSH Mission (NAM):** To promote AYUSH medical systems through cost effective AYUSH services, strengthening of educational systems, facilitate the enforcement of quality control of Ayurveda, Siddha and Unani & Homoeopathy (ASU &H) drugs and sustainable availability of ASU & H raw-materials.
- **Champion Services Sector Scheme for Medical value Travel** to amplify medical tourism in the field of Ayush.
- **Ayush Export Promotion Council (AEPC).**
- **The AYURSWASTHYA YOJANA:** to roll out authentic and classical Ayush Interventions for promoting community health care and to provide support for establishment of Ayush medical health units in reputed Ayush and Allopathy institutions.

About Traditional Medicine

- It refers to health practices, approaches, knowledge, and beliefs incorporating plant, spiritual therapies, etc to treat, diagnose and prevent illnesses or maintain well-being.
- It composes of Ayurveda, Yoga, Naturopathy, Unani, Siddha, and Homoeopathy (AYUSH) and Sowa Rigpa.
- According to WHO, **170 WHO member countries** have acknowledged their **use of T&CM** since 2018.
- **Advantages of mainstreaming T&CM:** Relatively low levels of technological inputs are required for T&CM, Enhancing the accessibility to public health facilities, reduces burden on secondary and tertiary public health care facilities, Effective in managing chronic diseases.

6.5.5. NATIONAL AIDS AND STD CONTROL PROGRAMME (NACP)

Why in News?

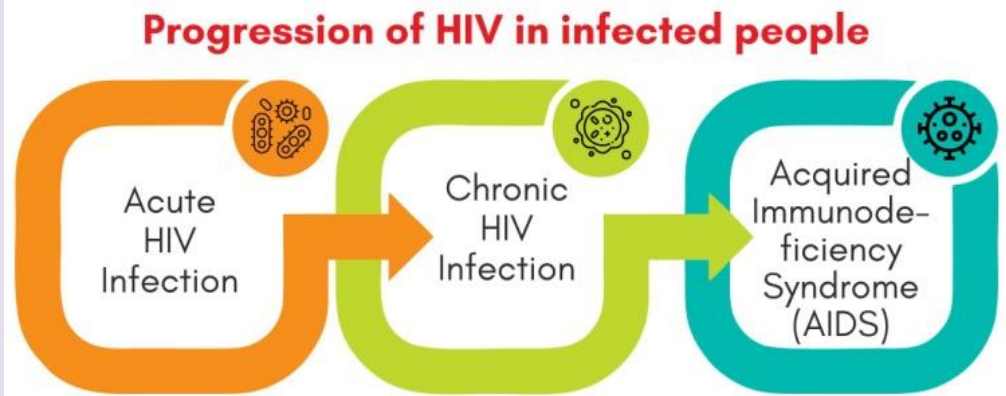
Union Cabinet has **approved continuation of National AIDS and STD control programme (NACP)** for a period of five years (April 1, 2021- March 31, 2026) by approving phase-V of the programme.

About National AIDS and STD control programme (NACP)

- **NACP, a Central sector scheme, was launched in 1992** and four phases have been successfully completed since.
 - **NACP Phase-V will enable India's AIDS response towards attainment of UN's SDG 3.3** of ending the HIV/AIDS epidemic as a public health threat by 2030.
- NACP is being implemented as a **comprehensive programme for prevention and control of HIV/AIDS in India**.
 - Over time, **focus has shifted from raising awareness to behavior change**, from a national response to a more decentralized response and to increasing involvement of NGOs and networks of PLHIV (People Living with HIV).
- **NACP is considered as an extremely successful programme highlighted by facts such as**
 - **Annual new HIV infections** in India have **declined by 48%** (baseline year of 2010).
 - Annual **AIDS-related deaths** have **declined by 82%** (baseline year of 2010).
 - HIV prevalence in India **continues to be low** with an adult HIV **prevalence of 0.22%**.

Related News
Virologist who shared a Nobel Prize for discovering the Human Immunodeficiency Virus (HIV) died recently

- Luc Montagnier won Nobel Prize for Medicine in 2008 for discovery of the HIV that causes acquired immunodeficiency syndrome (AIDS).



About HIV

- HIV is a virus that attacks the **body's immune system**. If not treated, it can lead to **AIDS**.
 ✓ It **targets the immune system and weakens people's defence** against many infections.
- HIV infections may be caused by **one of two retroviruses, HIV-1 or HIV-2** and HIV-1 is more prevalent worldwide.
- HIV in **infected people progress in three stages** (see infographic) in the absence of effective medicine.
- **Body fluids** like, blood, pre-seminal fluid, rectal fluids, vaginal fluids, and breast milk from a person with HIV can transmit HIV.
- **Treatment:** it can be **managed (not cured)** by treatment regimens composed of a **combination of three or more antiretroviral drugs** that allows an individual's immune system recovery to strengthen and regain the capacity.
- In India, **there were estimated 23.48 lakh People Living with HIV (PLHIV)** in 2019.
 - **Mizoram was estimated to have the highest adult HIV prevalence** followed by Nagaland and Manipur.
- **Initiatives taken by government**
 - National AIDS Control Organization (NACO) to oversee policies related to HIV and AIDS
 - National AIDS Control Program
 - HIV & AIDS (Prevention and Control) Act, 2017 to address discrimination against PLHIV
 - National Strategic Plan 2017-24 and Mission SAMPARK for tracing.

6.5.6. FOOD FORTIFICATION

Why in News?

CCEA has approved the supply of fortified rice in government-run food schemes **by 2024 in a phased manner** with an **aim to combat nutrition deficiency in all states and UTs**.

More about the decision

- Supply of fortified rice through Targeted Public Distribution System (TPDS) will be done **under National Food Security Act (NFSA), Integrated Child Development Services (ICDS), PM POSHAN, and other welfare schemes (OWS)**.
 - **Entire cost** of rice fortification would be **borne by Centre**.
- **Three phases are envisaged for full implementation**
 - **Phase-I:** Covering ICDS and PM POSHAN in India all over by March, 2022 which is under implementation.
 - **Phase-II:** Phase I above plus TPDS and OWS in all Aspirational and High Burden Districts on stunting (total 291 districts) by March 2023.
 - **Phase-III:** Phase II above plus covering the remaining districts of the country by March 2024.

Extrusion technology

- In India, **rice is fortified using extrusion technology**.
- In this technology, **milled rice is pulverized and mixed with a premix** containing vitamins and minerals.
- **Fortified rice kernels (FRK)** are produced from this mixture using an extruder machine.
- **FRK is added to traditional rice in ratio ranging from 1:50 to 1: 200** resulting in fortified rice nearly identical to traditional rice in aroma, taste, and texture.

About Food Fortification

- Rice fortification is a process of **adding micronutrients, commonly iron, Vitamin B12 and folic acid, to regular rice** to improve the dietary requirement.
- **Benefits of rice fortification:** Provide nutritional boost to undernourished and vulnerable populations, combat anaemia, cost-effective, helpful in pregnancy for growth of the baby.

6.5.7. OTHER IMPORTANT NEWS

Acute Encephalitis Syndrome (AES)	<ul style="list-style-type: none"> • Authorities in Bihar are working on strategies to prevent AES as rising temperature and humidity reignite fears of an outbreak. • AES is characterized as acute-onset of fever and a change in mental status and/or new-onset of seizures in a person of any age at any time of the year. • It most commonly affects children and young adults and can lead to considerable morbidity and mortality. • Viruses are the main causative agents in AES cases, although other sources such as bacteria, fungus, parasites, spirochetes, chemicals, toxins and non-infectious agents have also been reported.
Leprosy	<ul style="list-style-type: none"> • A report by Leprosy Mission Trust India (largest leprosy-focused NGO in India) identified that: <ul style="list-style-type: none"> ○ COVID-19 pandemic caused a fall of 62.5% in detection of active leprosy cases between April and September 2020 in four States — Andhra Pradesh, Odisha, Bihar and Madhya Pradesh. • About Leprosy(Hansen’s disease), <ul style="list-style-type: none"> ○ It is a chronic infectious disease caused by slow-growing bacteria called Mycobacterium leprae. ○ Mainly affects skin, peripheral nerves, mucosa of upper respiratory tract, and eyes. ○ Curable with multidrug therapy and treatment in the early stages can prevent disability. ○ Transmission: Via droplets, from nose and mouth, during close and frequent contact with untreated cases. ○ India accounts for highest burden of the global caseload.
White spot syndrome virus	<ul style="list-style-type: none"> • Scientists from Agharkar Research Institute (ARI), an autonomous institute of the Department of Science and Technology have developed and patented a diagnostic tool that detects the White Spot Syndrome Virus (WSSV). • WSSV <ul style="list-style-type: none"> ○ It is a DNA based highly contagious viral infection of crustaceans that can cause high levels of mortality in cultured shrimp. ○ The virus infects only crustaceans (prawns, lobsters and crabs etc) and appears not to be related to any other known viruses. ○ At present there is no treatment available to interfere with the unrestrained occurrence and spread of the disease.
Canine Distemper	<ul style="list-style-type: none"> • The Gujarat Biotechnology Research Centre has developed and completed the first trials of the Canine Distemper Virus (CDV) vaccine for the Asiatic lion. • Canine distemper is caused by the paramyxovirus virus and it spreads through body fluids like infected urine, blood and saliva. <ul style="list-style-type: none"> ○ The virus attacks the respiratory, gastrointestinal and nervous systems of puppies and dogs and can be transmitted to lions, tigers, leopards and other wild cats as well as seals. ○ There is no known cure for CDV.
India TB report	<ul style="list-style-type: none"> • Ministry of Health and Family Welfare launched the report on the theme ‘Coming Together to End TB Altogether. • Key highlights of India TB report <ul style="list-style-type: none"> ○ 2021 witnessed 19% increase from previous year in TB patients’ notification. ○ Vision of the National Strategic Plan for Elimination of Tuberculosis (NSP 2017- 25) permeated to state and district levels with 18 states having committed to Ending TB by 2025. ○ In India, childhood Tuberculosis remains a staggering problem, contributing to approximately 31% of the global burden. ○ There has been an increase in the mortality rate due to all forms of TB between 2019 and 2020 by 11% in India. • Government also launched "Dare to Erade TB" program for formation of a Genome Sequencing Consortium for Whole Genome Sequencing TB surveillance based on the Indian Data.
Common Antibiotic Manufacturing Framework (CAMF)	<ul style="list-style-type: none"> • Recently, third progress report of Antimicrobial Resistance (AMR) Industry Alliance was released. • AMR Industry Alliance is a private-sector coalition working to tackle AMR. <ul style="list-style-type: none"> ○ In order to mitigate the environmental risks associated with antibiotic production, Alliance manufacturing members had developed CAMF in 2018. • About CAMF <ul style="list-style-type: none"> ○ CAMF provides a methodology and set of minimum requirements needed to conduct a site risk evaluation of both macro and micro controls in our supply chains. ○ It provides certain:

	<ul style="list-style-type: none"> ✓ Minimum expectations such as compliance with local laws and regulations, environment permits, no untreated discharge of manufacturing waste containing antibiotic etc. ✓ Minimum requirements for environmental programs (such as water management program, solid waste management program, audits of antibiotic manufacturers) to focus on environmental compliance and appropriate antibiotic discharge management.
Sustainable Access to Markets and Resources for Innovative Delivery of Healthcare (SAMRIDH) initiative	<ul style="list-style-type: none"> • Atal Innovation Mission, NITI Aayog, and U.S. Agency for International Development announced a new partnership under SAMRIDH initiative. • It improves access to affordable and quality healthcare for vulnerable populations in tier-2 and tier-3 cities, and rural and tribal regions. • It focuses on innovations across the healthcare landscape to mount an effective response to the ongoing third wave of COVID-19 and build health system preparedness for future infectious disease outbreaks and health emergencies.
Probiotics	<ul style="list-style-type: none"> • Indian scientists have developed a next-generation probiotic that provides hope for longevity and healthy aging. • Probiotics, usually called as beneficial bacteria, are live microorganisms that have health benefits when consumed. • Types of probiotics: <ul style="list-style-type: none"> ○ Lactobacillus- Most common probiotic found in yogurt and other fermented foods. ○ Bifidobacterium- Found in some dairy products and ease symptoms of irritable bowel syndrome. • Benefits: Improve digestive health, Reduce depression, Promote heart health etc.
Xenotransplantation	<ul style="list-style-type: none"> • A person on whom Xenotransplantation was done, scummed to death in 2 months. • About Xenotransplantation - <ul style="list-style-type: none"> ○ It involves the transplantation, implantation, or infusion into a human recipient of live cells, tissues, or organs from a nonhuman animal source. ○ Pigs are increasingly being used for this, as their organs are anatomically similar to those of humans and are more tuned for genetic engineering. • Concerns involved: Medical implications as sometimes even human donor organ transplantation is unacceptable to body, issue of animal rights, and of faith and religion.
Endosymbiosis	<ul style="list-style-type: none"> • The endosymbiotic hypothesis for the origin of mitochondria (and chloroplasts) suggests that mitochondria are descended from specialized bacteria (probably purple nonsulfur bacteria). • Endosymbiosis is an intense form of symbiosis when one of the organisms is captured and internalized by the other. • Mitochondria are dubbed the power houses of the cell, because they help in generating energy in the form of Adenosine Triphosphate (ATP) within the cell, powering it.
Micro-swimmers	<ul style="list-style-type: none"> • Recent research is aiming at moving microbots/micro-swimmers into the bloodstream to deliver drugs. • These micro-swimmers are microbots are made from two-dimensional compound poly (heptazine imide) carbon nitride. <ul style="list-style-type: none"> ○ They range from 1-10 micrometre (a micrometre is one-millionth of a metre) in size, and can self-propel when energised by shining light. ○ These ions move around the particle and make the fluid around it, causing the microbots (micro-swimmers) swim.
Unified Health Interface (UHI)	<ul style="list-style-type: none"> • National Health Authority invites stakeholders to join hands in building UHI. • UHI is foundational layer of the National Digital Health Mission (NDHM) aiming to provide access to healthcare services digitally <ul style="list-style-type: none"> ○ It is an open and interoperable IT network through which people use healthcare facilities through online mode. ○ It enables patients to connect with doctors of their choice through any app compatible with it, share health information and receive health reports. ○ It enables public and private solutions and apps to be a part of NDHM.

6.6. ALTERNATIVE ENERGY

6.6.1. NUCLEAR FUSION

Why in News?

Scientists in the UK have managed to produce the largest amount of energy so far from a nuclear fusion reaction.

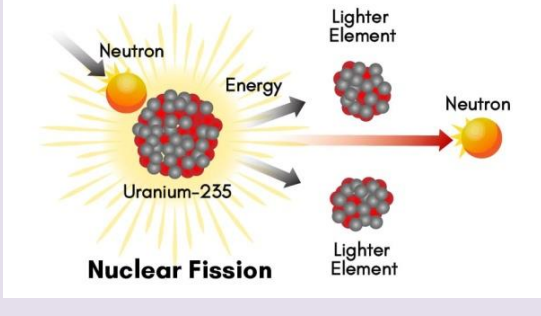
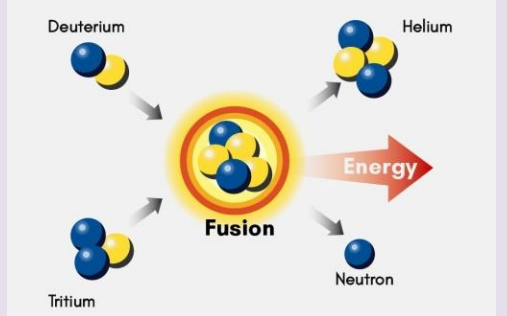
More on News

- A team at the Joint European Torus (JET) facility near Oxford in central England generated **59 megajoules of sustained fusion energy over five seconds** (11 megawatts of power), more than doubling a 1997 record.
- The energy was produced in a machine called a **tokamak**, a doughnut-shaped apparatus.
- All current nuclear reactors are based on the fission process.

Tokamak

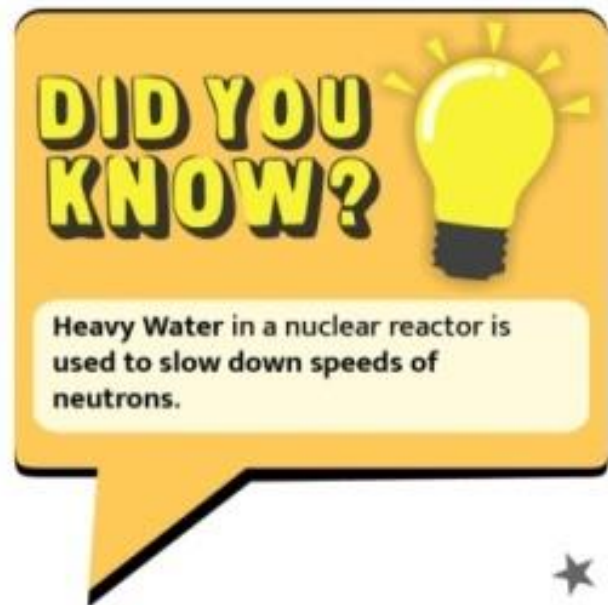
- The **tokamak** is an experimental **magnetic fusion device** designed to harness the energy of fusion.
- Inside a tokamak, the energy produced through the fusion is **absorbed as heat in the walls of the vessel**, which will be used by a fusion power plant to produce steam and then electricity by way of turbines and generators.
- The device uses **magnetic fields** to contain and control the hot plasma, which enables the fusion between **deuterium and tritium nuclei** to produce great amounts of energy.
 - **Plasma** is an ionized state of matter similar to a gas. A gas becomes plasma at extreme temperatures.
- The **machine has been designed** specifically to:
 - **Produce 500 MW of fusion power**
 - **Demonstrate the integrated operation of technologies for a fusion power plant** such as heating, control, diagnostics, cryogenics and remote maintenance.
 - **Achieve a deuterium-tritium plasma** in which the reaction is sustained for a long duration through internal heating
 - **Test tritium breeding**: Since the world supply of tritium is not sufficient to cover the needs of future power plants.

Difference between Nuclear fission or fusion

Criteria	Nuclear Fission	Nuclear Fusion
Energy release through	Splitting of a heavy, unstable nucleus into two lighter nuclei	Combining of two light nuclei
Process	 <p>Nuclear Fission</p>	 <p>Fusion</p>
Fuel	Uranium and plutonium	Atoms of Tritium and Deuterium (isotopes of hydrogen)
Amount of energy produced	Lesser than that in nuclear fusion	Several times greater than fission
Waste generated	Highly radioactive fission products	Produces no high activity/long-lived radioactive waste . The burnt fuel in a fusion reactor is helium, an inert gas.
Operational life	Additional neutrons released can initiate a Chain reaction sustaining fission reactions for longer durations	Difficult to sustain for long periods of time due to the tremendous amount of pressure and temperature needed

Advantage of Nuclear Fusion

- **Much more energy** (as much as four times) is released in the fusion process than in fission.
- Fusion **doesn't emit harmful toxins** like carbon dioxide or other greenhouse gases into the atmosphere. Its **major by-product is helium**: an inert, non-toxic gas.
- **No risk of meltdown** as it is difficult to reach and maintain the precise conditions necessary for fusion.
- **Limited risk of proliferation** as fusion doesn't employ fissile materials like uranium and plutonium (Radioactive tritium is neither a fissile nor a fissionable material).
- **Fusion fuels are widely available** and nearly inexhaustible.
- Produces much **less radioactive waste compared to fission.**



Over the years, scientists have been able to draw up the plan for a fusion nuclear reactor. It is called ITER (International Thermonuclear Experimental Reactor).

Challenges faced in fusion process

- Fusion is **possible only at very high temperatures**, of the order of a few hundred million degrees Celsius.
- At such high temperatures, **matter exists only in the plasma state, which has a tendency to expand very fast**, and is extremely difficult to handle and work with.
- **Fusion reactions are not easily controlled**, and it is expensive to create the needed conditions for a fusion reaction.

About ITER (International Thermonuclear Experimental Reactor)

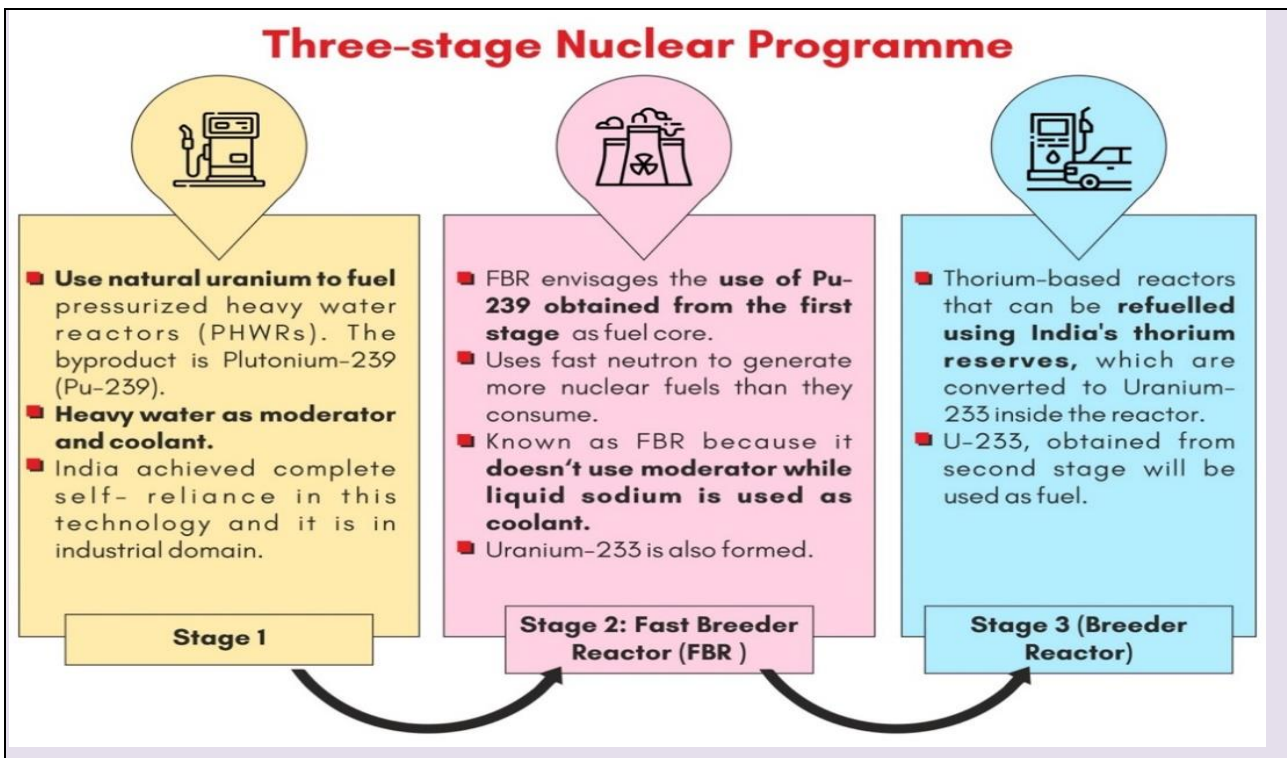
- Launched in 1985, ITER is an **experimental fusion reactor facility** currently under construction in Cadarache, south of France.
- It aims to prove the feasibility of **nuclear fusion as a future source of energy** and build the world's largest tokamak through an international collaboration.
- **ITER Members:** Signatories to the ITER Agreement include **China, the European Union, India, Japan, Korea, Russia and US.**
 - These countries share the **cost of project** and will also share in the **experimental results and any intellectual property** generated by the project.
 - ✓ **Europe is responsible for the largest portion of construction costs** (45.6 percent); the remainder is shared equally by China, India, Japan, Korea, Russia and the US (9.1 percent each).
 - **Each Member has created a Domestic Agency** to fulfill its procurement responsibilities to ITER.
- ITER has also **concluded non-Member technical cooperation agreements** with countries like Australia, Kazakhstan, Canada etc.
- **India's contribution:** India is responsible for delivery of cryostat, in-wall shielding, cooling water system, cryogenic system, heating systems, Diagnostic Neutral Beam System, power supplies and some diagnostics.
 - India is **contributing resources worth about \$2.2 billion** to this effort.
 - **ITER-India is the Indian domestic agency**, a specially empowered project of the Institute for Plasma Research, an aided organization under Dept. of Atomic Energy.

Related News

Recently, government announced that India will have 9 nuclear reactors by 2024.

More on News

- In addition, **12 more nuclear power reactors have been accorded administrative approval** and financial sanction.
 - There are **presently 22 reactors with a total capacity of 6780 MW** in operation.
 - As on December 2021, share of Nuclear energy in **total Installed generation capacity stands at 1.7%.**
- Indian Nuclear Power Generation **envisages a Three Stage Programme.**
- India is currently on the **second stage (FBR) of its ambitious nuclear program.**
- India's **first prototype fast breeder reactor (PFBR)** is a nuclear power reactor currently under construction at the Madras Atomic Power Station in **Kalpakkam, Tamil Nadu.**
 - **FBRs in general produce more fissile material** than they consume.



Related Info

- Nuclear reactors in India are placed under IAEA safeguards only if they are fuelled by uranium procured from abroad.
- There are at present 22 operational reactors, of which 14 are under the International Atomic Energy Agency (IAEA) safeguards as these use imported fuel.
- India has ratified the **Additional Protocol**, a commitment given under India-U.S. nuclear deal by the previous dispensation to grant greater ease to International Atomic Energy Agency to monitor India's civilian atomic programme.
- Inter-Governmental Agreement (IGA) for co-operation in peaceful uses of nuclear energy have been signed with countries including: Argentina, Australia, Bangladesh, Canada, Czech Republic, European Union, France, Japan, Kazakhstan, Mongolia, Namibia, Republic of Korea, Russia, Sri Lanka, United Kingdom, United States of America, Vietnam and Ghana.

6.7. MISCELLANEOUS

6.7.1. EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH (CERN)

Why in news?

Large Hadron Collider (LHC) was restarted after a 3-year shutdown.

About European Organization for Nuclear Research (CERN)

- Founded in 1954, the CERN laboratory (near Geneva) was one of Europe's first joint ventures.
- CERN's main area of research is particle physics. Because of this, the laboratory operated by CERN is often referred to as the European Laboratory for Particle Physics.
- Members of CERN
 - Today CERN has 23 Member States: Austria, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany,

About the Large Hadron Collider (LHC)

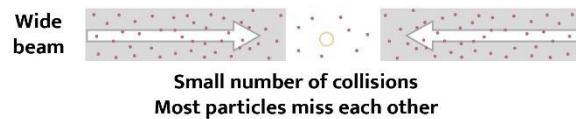
- It is the world's largest and most powerful particle accelerator.
- LHC is part of the European Organisation for Nuclear Research, known as CERN.
- It first started up in 2008, and remains the latest addition to CERN's accelerator complex.
- It consists of a 27-kilometre ring of superconducting magnets with a number of accelerating structures to boost the energy of the particles along the way.
- Inside the accelerator, two high-energy particle beams travel at close to the speed of light before they are made to collide.
- There are four particle detectors to record the tracks left by debris from the collisions. The detectors (also called experiments) are: ATLAS (A Toroidal LHC ApparatuS); CMS (the Compact Muon Solenoid); ALICE (A Large Ion Collider Experiment); LHCb (study of physics in B-meson decays at LHC)

Greece, Hungary, Israel, Italy, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovak Republic, Spain, Sweden, Switzerland and UK. They **contribute to the budget of the Organization in proportion to their Net National Income (NNI)**.

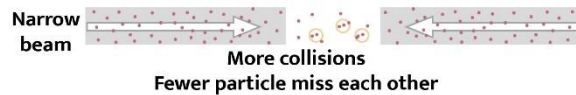
- **Observer status:** Japan, the Russian Federation and USA.
 - This status is **usually awarded to States that have made significant contributions to the CERN infrastructure**, and to international organisations which maintain close links with CERN.
- **Associate membership:** Associate Members have to compulsorily pay a reduced contribution to the CERN budget and enjoy benefits which are reduced accordingly.
 - **Associate Member States:** Croatia, **India**, Latvia, Lithuania, Pakistan, Turkey and Ukraine.
- **Significance of CERN: Fundamental research** (LHC brought proof of the existence of Higgs boson particle), **Advancing the frontiers of technology** including **World Wide Web (WWW)** and **The Grid** (harnesses the power of computers around the world) etc.

How the large hadron collider works

Unit Now



From now on



India and CERN collaboration

India and CERN collaboration Background

- 1960s:

The collaboration between CERN and India started with scientist-to-scientist and institutional collaborations.
- 1980s:

Scientists from TIFR won recognition for their contribution to the L3 detector.
- 1991:

An agreement of cooperation for a ten year period was signed. The Raja Ramanna Centre for Advanced Technology (RRCAT), Indore successfully delivered a few sub-systems for upgradation of LEP-200
- 1996:

A protocol was signed and India joined the LHC project
- 2003:

India was awarded the Observer status of CERN
- 2016:

India became an Associate Member.

Benefits to India: Accessibility to scientific data, Access to research facilities, allowing for industrial cooperation in scientific research etc.

6.8. OTHER IMPORTANT NEWS

Indian Neutrino Observatory (INO)	<ul style="list-style-type: none"> Tamil Nadu government has filed an affidavit in the Supreme Court stating that it would not permit the proposed INO at Bodi West Hills in Theni district. About INO <ul style="list-style-type: none"> It is a multi-institutional effort aimed at building a world-class underground laboratory and an Iron Calorimeter (ICAL) detector for studying neutrinos. It aims to assess the properties of neutrino particles and to make precision measurements of the parameters related to neutrino oscillations. It is jointly funded by the Dept. of Atomic Energy and the Dept. of Science and Technology. About Neutrinos <ul style="list-style-type: none"> Neutrinos are tiny, neutral, elementary particles which interact with matter via the weak force. The weakness of this force gives neutrinos the property that matter is almost transparent to them. The Sun, and all other stars, produce neutrinos copiously due to nuclear fusion and decay processes within their core. Neutrinos provide a tool to study the structure of nucleons (protons and neutrons), to learn how matter evolved from simple particles into more complex composites of particles.
Accelerate Vigyan	<ul style="list-style-type: none"> Launched in 2020, by Science and Engineering Research Board (SERB) to strengthen scientific research mechanisms in the country. <ul style="list-style-type: none"> SERB was setup by an Act of Parliament, for promoting basic research in Science and Engineering and to provide financial assistance to persons engaged in such research, etc. It has three broad goals: <ul style="list-style-type: none"> consolidation of all scientific programs, initiating high-end orientation workshops, and creating opportunities for research internships. Its component include: <ul style="list-style-type: none"> ABHYAAS Programme for boosting R&D by enabling potential PG/PhD students through High-End Workshops i.e. KARYASHALA and Research Internships i.e. VRITIKA. SAMOOHAN programme for capacity building activities in S&T.
Promotion of University Research and Scientific Excellence (PURSE)	<ul style="list-style-type: none"> Through infrastructure support granted under PURSE scheme, Indian Scientists have developed a first-of-its-kind tool for understanding the process of long-term memory consolidation in the brain. About PURSE <ul style="list-style-type: none"> It is flagship Infrastructure program of Department of Science and Technology, commenced in 2009 exclusively for the University sector. Objective is to strengthen research capacity of Indian Universities. Duration of support for Project is for a period of 4 years. Pattern of funding is in the ratio 75% by DST and 25% by host institution.
Standard Model	<ul style="list-style-type: none"> Recently scientists have found out that a fundamental particle 'W boson' has a significantly greater mass than theorised by the Standard Model. About the Standard Model <ul style="list-style-type: none"> It is a set of mathematical formulae and measurements describing elementary or fundamental particles and their interactions. It contains 12 fundamental matter particles categorised as quarks and leptons and three forces that govern the behavior of matter: electromagnetism, the strong and weak nuclear forces. <ul style="list-style-type: none"> ✓ The force of gravity is currently not included in the standard model. This model was developed in the early 1970s, and is still considered to be the most accurate theory covering the foundations of particle physics. It predicted the existence of yet-to-be discovered particles, such as the Higgs boson. However, this model is yet incomplete and falls short in explaining: General relativity's description of gravity, why is the Universe expanding ever faster, why is there more matter than antimatter etc.
Gallium Nitride (GaN)	<ul style="list-style-type: none"> Union Minister visited Gallium Nitride Ecosystem Enabling Centre and Incubator facility Indian Institute of Sciences (IISc), Bengaluru. GaN is a very hard, mechanically stable semiconductor. With higher breakdown strength, faster switching speed, higher thermal conductivity and lower on-resistance, power devices based on GaN significantly outperform silicon-based devices. It is used in production of semiconductor power devices and light-emitting diodes (LEDs). It is expected to play a key role in enabling e-vehicles and wireless communication

Metamateria I	<ul style="list-style-type: none"> • Metamaterials are artificially structured materials used to control and manipulate light, sound, and many other physical phenomenon. • They are designed such so that their properties are derived from their physical structure, rather than intrinsic properties of the material from which the metamaterial is fabricated. • Recently Researchers from IIT Madras have developed a special class of origami metamaterials that can be used to absorb shock. <ul style="list-style-type: none"> ○ Researchers combined the Japanese art of paper folding (origami) and the existing material of choice and fold it to obtain desired properties.
Boltzmann medal	<ul style="list-style-type: none"> • Deepak Dhar, physicist, from the Indian Institute of Science Education and Research, became first Indian to receive this medal. • Named after, physicist Ludwig Boltzmann, the medal is awarded for outstanding achievements in the field of statistical physics. • Awarded by: Commission on Statistical Physics of International Union of Pure and Applied Physics (IUPAP). • IUPAP is the only international physics organization that is organized and run by the physics community itself.
Abel prize	<ul style="list-style-type: none"> • Abel prize for 2022 was awarded to American mathematician Dennis P. Sullivan. • Abel Prize is a scientific prize, awarded within the discipline of mathematics. Prize is awarded annually by the Norwegian Academy of Science and Letters on behalf of the Norwegian government. <ul style="list-style-type: none"> ○ It is named after 19th century Norwegian mathematician Niels Henrik Abel. ○ It was instituted in 2002, to commemorate his 200-th birth anniversary. ○ Prize consists of a citation and a prize money of 7.5 million Norwegian Kroner. ○ First Abel Prize was awarded in 2003. ○ It helps to raise the status of mathematics in society and to stimulate the interest of young people in mathematics.

Errata: In “Article 3.10. Other Important News (Under IndiGau)” of the earlier PT 365 Science and Technology document the boundaries of Maharashtra were wrongly represented because of some designing issue. The error is regretted.

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16 JUNE

1 PM

7. CULTURE

7.1. ARCHITECTURE

7.1.1. HOYSALA TEMPLES

Why in news?

Ministry of Culture announced that the **Hoysala temples of Belur, Halebid and Somnathapura in Karnataka** have been selected as **India's nomination for UNESCO's list of World Heritage sites for 2022-2023.**




More about News

- Temples representing the **Hoysala Architecture style** are collectively called '**The Sacred Ensembles of Hoysala**'.
- They have been on the **tentative list of UNESCO since 2014.**
- Set in the foothills of Western Ghats, sacred ensembles included **Hindu temples, Jaina temples, secondary structures**, intricate sculpture and iconography, temple dances and music etc.
 - Ensembles were important agents in the **development of spiritual beliefs of Vaishnavism, Shaivism, and Jainism.**

Hoysala Architecture style

- It **evolved between the 11th to 14th centuries** in the **southern Deccan region and Kaveri River Valley.**
- Hoysala temples are often referred to as **hybrid or Vesara temple style** and have **star-like ground-plans** and a profusion of decorative carvings.
- Hoysala rulers were **influenced by the western Chalukyan architecture.**
- **Some of the distinctive styles of Hoysala Architecture:**
 - Hoysala temples have **several shrines arranged around a central pillared hall** in the form of an **intricately designed star (stellate-plan).**
 - The **garbha griha (sanctum sanctorum)** houses a **centrally placed murti (enshrined icon)** on a **pitha (pedestal).**
 - Sculptures were **made of soapstone, a relatively soft stone.**
 - **Both open and closed mandapas** can be found in Hoysala architecture.
 - ✓ Hoysala temples have **circular pillars in their mandapas.** Each pillar has **four sculpted figures** on the top brackets.
 - ✓ The mandapa's ceilings are ornate, with **mythological figures and floral designs.**
 - The **vimana (where most sacred shrine is present)** is simple on the inside though lavishly decorated on the outside.
 - On the uppermost part of the temple tower, the Hoysala temples have a **vase-shaped water pot.**

Characteristics of Belur, Halebid, and Somnathapura temples

Chennakeshava Temple, Belur (Belur was first capital city of Hoysalas)	Hoysaleshwara Temple, Halebidu	Keshava Temple, Somanathapura
		
<ul style="list-style-type: none"> • Also referred as Keshava, or Vijayanarayana Temple of Belur. • Commissioned by King Vishnuvardhana in 1117 CE. • Built on the banks of the Yagachi River in Belur. • It is an ekakuta (temple with one shrine) and the garbha griha (sanctum sanctorum) houses portrait of Krishna. • Temple is dedicated to Lord Vishnu. • Exterior sculpture depicts scenes from daily life, music, and dance, and 	<ul style="list-style-type: none"> • Also called 'Halebidu' temple, a 12th-century double building temple dedicated to Lord Shiva as Nataraja. • Sponsored by King Vishnuvardhana. • It is said to be the largest monument in Halebidu. • Halebid has a walled complex containing of three Jaina basadi (temples) of the Hoysala period as well as a stepped well. 	<ul style="list-style-type: none"> • Consecrated in 1258 CE by Somanatha Dandanayaka, a general of the Hoysala King Narasimha III. • It is on the banks of River Kaveri. • It is believed that this was the last major temple built by the Hoysala dynasty. • It is a Trikuta Temple dedicated to Lord Krishna in three forms – Janardhana, Keshava and Venugopala.

<p>narrates scenes from life of Vishnu and his reincarnations and the epics, Ramayana, and Mahabharata.</p> <ul style="list-style-type: none"> Some of the representations of Shiva are also included. It includes images from Jainism and Buddhism. 	<ul style="list-style-type: none"> The basadi are located in close proximity to the Dorasamudhra lake. Sculptures inside the temple depict scenes from Ramayana, Mahabharata and Bhagavata Purana. Includes themes from Vaishnavism and Shaktism, too, along with images from Jainism. 	<ul style="list-style-type: none"> Sculptures found at the Keshava Temple are that of Lord Vishnu, Lord Ganesha, Goddess Lakshmi and Saraswati. It is no longer used as a place of worship as the temple was desecrated by the invading armies of the Muslim Sultanate.
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7.1.2. LINGARAJ TEMPLE

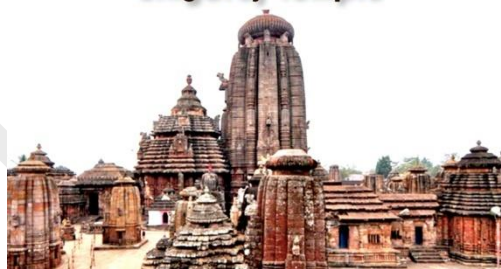
Why in news?

The Central government has opposed the **Odisha government’s ordinance to bring Lingaraj temple** and its associated temples under a special law on the grounds that it is outside the legislative competence of the state legislature.

— Lingaraj Temple —

About Lingraj Temple

- The temple is **dedicated to Lord Shiva.** It is the **biggest temple in Bhubaneswar.**
- It was **built by Somavanshi Dynasty King Jajati Keshari** in the 10th Century and completed by King Lalatendu Keshari in the 11th Century.
- There is a pillared hall, a dancing hall (NatyaMandap) and a hall for serving offerings (BhogaMandap).
- The walled campus has about 50 smaller shrines, including one dedicated to Goddess Parvati.
- Built in red stone, this great temple **represents the quintessence of the Kalinga type of architecture.**
- It is divided into four sections:** GarbhaGriha (sanctum sanctorum), Yajna Shala (hall for prayers), Bhoga Mandap (hall of offering) and Natya Shala (hall of dance).
- Lingaraj is referred to as **“Swayambhu”** – (self-originated Shivling). Another important aspect of the temple is that it signifies the syncretisation of Shaivism and Vaishnavism sects in Odisha. The Shivling is known as Hari Hara.



Related News

- Objections are being raised against Odisha government’s massive **beautification project around the Jagannath temple due to its execution mismanagement.**
- About Jagannath Temple**
 - It is a Hindu temple **dedicated to Lord Jagannath**, a form of Krishna, in Puri, Odisha.
 - The temple is believed to have been constructed on the site of an earlier temple in the 12th century by **King Ananta Varman Chodaganga Deva**, the first king of the Eastern Ganga dynasty.
 - Jagannath Puri temple is called **‘Yamanika Tirtha’** where, according to the Hindu beliefs, the power of ‘Yama’, the god of death has been nullified in Puri due to the presence of Lord Jagannath.
 - It was called the **“White Pagoda”** and is a part of Char Dham pilgrimages (Badrinath, Dwaraka, Puri, Rameswaram).
 - In front of the entrance stands the **Aruna stambha or sun pillar**, which was originally at the Sun Temple in Konark.
 - Jagannath Rath Yatra** also called as **Chariot Festival**, is celebrated here on the 2nd day of Shukla Paksha of Ashadh, the third month, according to the traditional Oriya calendar.
- Architectural features**
 - Main temple is constructed in such a way that **no shadow of the temple falls on the ground at any time of the day.**
 - Idols of the holy trinity** (Lord Jagannath, Devi Subhadra and elder brother Balabhadra) **are carved out of wood.**
 - Unlike other temples of the region, the **carvings on the temples are predominantly of gods and goddesses.**

— Jagannath Temple, Puri —



Related News





Asurgarh as Odisha's oldest fortified settlement

- Asurgarh fortified settlement (**ninth century BC**) has been ascertained to be the **oldest among the major fortified settlements in the State**.
 - **Accelerator Mass Spectrometry (AMS) radiocarbon technique**, a technology that allows to **distinguish** different types of atoms on the basis of **differences in atomic weights (mass)**, was used.

Major Findings:

- Cultural sequence of the site could be **divided into three phases**:
 - **Iron Age** (ninth century BC to fourth century BC),
 - **Early Historic or Rampart phase** (second century BC to first century AD), and
 - **Late Period/Decline** of the settlement (second century AD to third-fourth century AD).
- **Antiquities found** include **Beads of coral, lapis lazuli, carnelian, glass, jasper, garnet, shell, agate, milky quartz, terracotta, kaolin, and soft stone, and circular discs** made out of potsherds and stone.
- Most important findings were **imperial variety punch-marked coins and tokens** made of a mixed material of silver and copper, a **tiny figurine of lion** made of copper, a **gold chain, terracotta sealings**.
- Only site in Odisha which shows **highly skilled engineering of water management** in comparison to contemporary sites.
- Other **early historic sites** in Odisha include Sisupalgarh (near Bhubaneswar); Jaugarh, a fortified settlement on the Rushikulya valley (Ganjam); Khalkattapatna (Puri); the port site of Manikpatna (Puri) etc.

7.1.3. OTHER IMPORTANT NEWS

<p>Bamiyan Buddhas</p> 	<ul style="list-style-type: none"> • Taliban are preserving Bamiyan buddhas in Mes Aynak, with eye to China investment. • About Bamiyan Buddhas: <ul style="list-style-type: none"> ○ It is situated in the Hindu Kush in the central highlands of Afghanistan. ○ Bamiyan Buddhas date back to the 5th century AD and were once the tallest standing Buddhas in the world. ○ They were locally known as Salsal and Shamama. ○ They were great examples of a confluence of Gupta, Sassanian and Hellenistic artistic styles. ○ In 2001, Taliban began blowing up the two statues. ○ Following this, UNESCO included the remains in its list of World Heritage Sites in 2003.
<p>Avalokiteshvara</p> 	<ul style="list-style-type: none"> • Indian Officials have received a 1200-year-old Buddha statue that went missing more than two decades ago from the DevasthanKundalpur Temple in Bihar. • The statue, also known as an Avalokiteshwara Padmapani idol, depicts Budhha holding the stem of a blossoming lotus in his left hand with two female attendants below his feet. • Avalokiteshwara is the Bodhisattva of Infinite Compassion. <ul style="list-style-type: none"> ○ Bodhisattvas are enlightened beings who have put off entering paradise in order to help others attain enlightenment.
<p>Reclining Lord Vishnu</p> 	<ul style="list-style-type: none"> • A 1,000 years old sandstone sculpture of the reclining Lord Vishnu has been restored by Indian National Trust for Art and Culture Heritage. • Statue is situated in Bandhavgarh National Park (Madhya Pradesh). • Popularly known as SheshShaiyya, the sculpture belongs to Kalchuri period (8th century, feudatories of the Rashtrakutas at central part of India).
<p>Santhali Sohrai mural</p> 	<ul style="list-style-type: none"> • Santhali communities of Odisha and Jharkhand are changing their ways of painting Sohrai murals. • About Sohraimural art <ul style="list-style-type: none"> ○ It is painted on the mud wall and is a matriarchal tradition handed down from mother to daughter. ○ Usually either monochromatic or colorful, with the use of natural pigments mixed in mud. ○ The red line is drawn first as it represents the 'blood of the ancestors', procreation, and fertility. ○ It is performed during marriage and harvest seasons. ○ It is continued since 10,000-4,000 BC which was prevalent into caves' structure. ○ In 2020, Jharkhand received a Geographical Indication tag for its Sohrai art.

<p>Megalithic jars in Assam</p> 	<ul style="list-style-type: none"> Discovery of megalithic stone jars in Assam's Dima Hasao district has brought to focus possible links between India's Northeast and Southeast Asia, dating back to the second millennium BC. <ul style="list-style-type: none"> There are typological and morphological similarities between the jars found at Assam with the stone jars found in Laos and Indonesia. About Megaliths <ul style="list-style-type: none"> Constructed either as burial sites or commemorative (non-sepulchral) memorials. Non-sepulchral megaliths include memorial sites such as menhirs. In India, megaliths are seen in Peninsular South, Deccan plateau, Vindhya and North West region. Megalithic sites in India are dated to period ranging from 1300 BCE to 12 century CE. In related news, a rock-cut cave from Megalithic period (800 BC to 500 BC) has been found at Kadaba taluk in Dakshina Kannada, Karnataka. <ul style="list-style-type: none"> An altar like pit, Small pieces of red, black, and red pottery were also found.
<p>Deoghar temple, Jharkhand</p> 	<ul style="list-style-type: none"> Also known as Baidyanath Jyotirlinga temple, Deoghar temple is one of the twelve Jyotirlinga in India. <ul style="list-style-type: none"> A Jyotirlinga is a shrine where Lord Shiva is worshipped in the form of a fiery column of light. The other 11 Jyotirlingas are <ul style="list-style-type: none"> Somnath in Gujarat, Mallikarjuna at Srisailem in Andhra Pradesh, Mahakaleswar at Ujjain in Madhya Pradesh, Omkareshwar in Madhya Pradesh, Kedarnath in Uttarakhand, Bhimashankar at Pune in Maharashtra, Viswanath at Varanasi in Uttar Pradesh, Tryambakeshwar at Nashik in Maharashtra, AundhaNagnath at Aundha in Hingoli District in Maharashtra, Rameshwar at Rameshwaram in Tamil Nadu and Grushneshwar at Ellora near Aurangabad, in Maharashtra.

7.2. PERSONALITIES

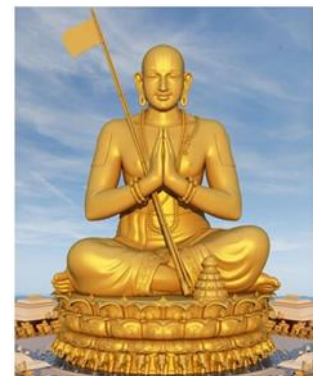
7.2.1. SAINT RAMANUJACHARYA

Why in news?

216-feet tall 'Statue of Equality' commemorating Sri Ramanujacharya was recently dedicated to the nation.

More about news

- The statue has been **inaugurated at Hyderabad** in the backdrop of celebrations of 'Festival of equality', marking the **1000th birth anniversary of the Saint**.
- The statue has been **conceptualized by Sri Chinna Jeeyar Swami** of Sri Ramanujacharya Ashram.
- It is **made of 'panchaloha', a combination of five metals: gold, silver, copper, brass, and zinc**.
- It is **mounted on a 54-ft high base building, named 'Bhadra Vedi'**.



About Sri Ramanujacharya


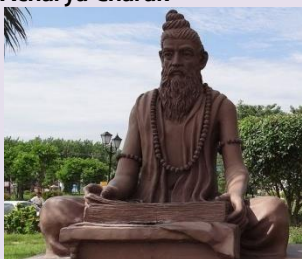

- Born in Tamil Nadu in the **11th century**, Ramanujacharya is revered as a **Vedic philosopher and social reformer**.
- Contributions of Sri Ramanujacharya as a Philosopher**
 - He was **deeply influenced by the Alvars (Vishnu worshippers)** and according to him the best means of attaining salvation was through **intense devotion to Vishnu**.
 - He **propounded the doctrine of Vishishtadvaita or qualified oneness**.
 - Ramanuja **revived the Bhakti movement**. He is considered to be the **inspiration for poets like Annamacharya, Bhakt Ramdas, Thyagaraja, Kabir, and Meerabai**.


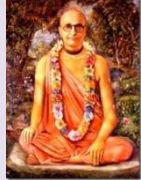
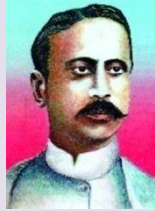
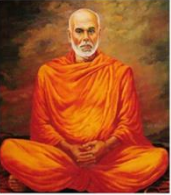
- He wrote nine scriptures known as the Navaratnas, including Sri Bhashya, Gita-Bhasya and Vedartha-Sangraha and composed commentaries on Vedic scriptures.
- He is also credited with establishing the correct procedures for rituals performed in temples throughout India, the most famous being Tirumala and Srirangam.
- Contributions of Sri Ramanujacharya as an advocate of social equality
 - He encouraged temples to open their doors to everyone irrespective of caste or position in society, asked royal courts to treat them as equals, took education to those who were deprived of it.
 - Propounded the concept of “vasudhaiva kutumbakam” (originally in Maha Upanishad), which translates as “all the universe is one family”.
 - His Guru named honoured him with the coveted title “Em-perum- anar” meaning ‘you are ahead of us’. Sri Ramanuja named subjugated classes “Thirukkulathar” meaning ‘Born Divine’.
- He spoke of universal salvation through devotion to God, compassion, humility, equality, and mutual respect, which is known as Sri Vaishnavam Sampradaya.
- He was also believed to be an environmentalist.

About Sri Ramanujacharya’s Philosophy - Vishishtadvaita

- According to him the soul even when united with the Supreme God remained distinct.
- Philosophy believes that the supreme reality is *Saguna Brahman*, a personal being with countless auspicious attributes, and it is a qualified whole of which Brahman is the soul, and the *Jiva* and the *Jagat* (the soul and material nature) constitute the body, which has an inseparable relationship with the whole.
 - Though it is a non-dual whole, yet it is characterised by internal differences in it.
 - This is why this one reality is called ‘Visistadvaita’ meaning ‘qualified non- dualism’.
 - Here the non-dual reality is made known by its qualities—the souls and the world which are of two different natures. These two kinds of entities are distinct yet real parts of the whole.
- The ‘Visistadvaita’ was not coined by Ramanuja but came to be used by others afterwards.

7.2.2. OTHER PERSONALITIES IN NEWS

<p>Sri Madhwacharya</p> 	<ul style="list-style-type: none"> ● He is regarded as an incarnation of wind-god Vayu and was born in year 1238 A.D. in Pajaka in South Kanara district of Karnataka. ● He was great exponent of the Dvaita School of philosophy. ● According to his philosophy, the Supreme Being is Vishnu or Narayana. ● He, argued that a body of canonical texts called the “Vedanta” or “end of the Veda” taught the fundamental difference between the individual self or atman and the ultimate reality, brahman. ● He wrote 37 works in Sanskrit, mostly commentaries on Hindu sacred writings and treatises on his own theological system and philosophy. ● He insisted that knowledge is relative, not absolute.
<p>Acharya Charak</p> 	<ul style="list-style-type: none"> ● National Medical Commission has recommended a modified Maharishi Charak Shapath for candidates on introduction to medical education. ● Acharya Charak, also known as Pranacharya Charak, was born in Kashmir (around 300 BC) and remembered as Father of Indian Medicine. ● He was an Ayurvedic practitioner and considered to be a court physician of King Kanishka. ● He wrote Charaka Samhita, a Sanskrit text on Ayurveda dealing with subjects such as basic physiological and anatomical details of humans, Tridosha (vata, pitta and kapha), etc. <ul style="list-style-type: none"> ○ Charaka Samhita is dedicated to Maharshi Bharadwaja, as it traces its root to Atharva Veda with verses from Maharshi Bharadwaja to treat various ailments ○ Agnivesha Samhita (by Rishi Agnivesha) on Ayurveda is also mentioned in Charaka Samhita
<p>Lachit Borphukan</p> 	<ul style="list-style-type: none"> ● President launched 400th birth anniversary celebrations of Ahom general Lachit Borphukan. ● He was a general during 17th Century period of Ahom dynasty (Assam). ● He is best known for the Battle of Saraighat on the Brahmaputra, where he defeated the Mughals, in 1671. Lachit was appointed as ‘Borphukan’ by King Chakradhwaj Singha. <ul style="list-style-type: none"> ○ Borphukan is a position embedded with both executive and judicial powers.

<p>Alluri Sitarama Raju</p> 	<ul style="list-style-type: none"> • Alluri Sitarama Raju (1897-1924), also known as ManyamVeerudu (Hero of the Jungles), was an Indian Revolutionary who fought for Indian Independence. • He was born in Pandurangi Village in Bheemunipatnam, near the Coastal city of Visakhapatnam and led the Rampa Rebellion (1922-24) in Godavari Agency of Madras Presidency, British India. <ul style="list-style-type: none"> ○ It was based on guerilla warfare and he mobilised tribals and forest dwellers against the British due to their oppressive Madras Forest Act, 1882.
<p>Siddhanta Saraswati Goswami Prabhupad</p> 	<ul style="list-style-type: none"> • Recently, President inaugurated the three-year long celebrations of the 150th birth anniversary of Siddhanta Prabhupada. <ul style="list-style-type: none"> ○ He was the founder of Gaudiya Math and Mission in Puri. • Gaudiya Math is a monastic organisation to spread Gaudiya Vaishnavism, the philosophy of the medieval Vaishnava saint Chaitanya Mahaprabhu. <ul style="list-style-type: none"> ○ Chaitanya was a 15th Century Bhakti Saint who promoted worship of Lord Krishna as the Supreme Soul.
<p>Nabinchandra sen</p> 	<ul style="list-style-type: none"> • His 175th birth anniversary was celebrated recently. • Revolutionary Bengali poet and writer. • He described the battle of Plassey and the arrival of British rule in India as “A Night of Eternal Gloom”. • Other significant literary contributions include - <ul style="list-style-type: none"> ○ Novel-in-verse Bhanumati and memoir of his travels 'Prabaser Patra'. ○ Also, he wrote a five-volume autobiography, Aamar Jiban-My Life, chronicling politics and social aspirations of the Bengali literati in the late nineteenth century.
<p>Sri Narayan Guru</p> 	<ul style="list-style-type: none"> • He was a Hindu saint & social reformer from Kerala (1856-1928). • He propagated the ideas of ‘One Caste, One Religion, One God’ and gave a spiritual dimension to patriotism. • Key achievements <ul style="list-style-type: none"> ○ He, along with Padmanabhan Palpu, founded the 'Sree Narayana Dharma ParipalanaYogam' (SNDP) that worked towards the spiritual upliftment and education of underprivileged Ezhava community. ○ He lent support to Vaikom Satyagraha for temple entry (1924-25) in Travancore for the lower castes’ community. ○ His works include DaivaDasakam, Anukampadasakam etc.

7.3. 100 YEARS OF CHAURI CHAURA INCIDENT

Why in news?

Year 2022 marks the completion of 100 years of Chauri Chaura Incident.

About Chauri Chaura Incident

- The incident occurred in the **last phase of the Khilafat-Non Cooperation Movement (NCM)**.
- Chauri Chaura is a **village in Gorakhpur district in United Province**, which awoke to violence on **February 5, 1922** owing to a **clash between the police and the protesters**.
- The **police had opened fire on the protesters** who were protesting against liquor sale and high food prices.
- In retaliation, **the agitated crowd torched the police station with policemen inside** resulting in the death of 22 policemen.
- In response to the violence at Chauri Chaura in 1922, **Gandhiji called off the NCM unilaterally** on 12 February 1922.

Outcome of Chauri Chaura incident

- **Congress Working Committee met at Bardoli in February 1922** and resolved to roll back NCM.

About Khilafat and Non-Cooperation Movement

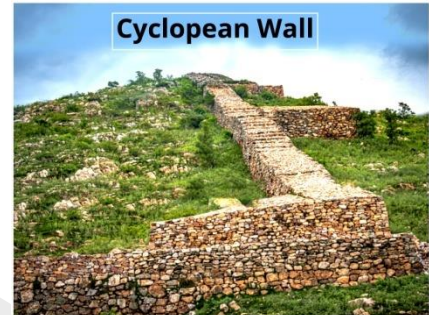
- It was a mass movement that the British Raj in India faced between **1919 to 1922**.
- **Movement was based on following demands**
 - **Favourable treatment of Turkey** by the British after the First World War.
 - **Jallianwala Bagh massacre, imposition of the Rowlatt Act, and the economic situation of the country** post the first world war.
 - **Establishment of Swaraj**.
- **Techniques used:** Boycott of government-run schools, colleges, law courts, municipality and government service, foreign cloth, liquor; setting up of national schools, colleges, panchayats and using khadi; second stage to include civil disobedience by non-payment of taxes.

- British Government arrested Gandhiji in March 1922 and sentenced him to six years in jail.
- Two factions were created in Congress. **One faction, the ‘Swarajists’ led by C.R. Das and Motilal Nehru** wanted an end to boycott of legislative councils.
- However, other faction, the **‘No-changers’ led by C. Rajagopalachari and Vallabhbhai Patel** opposed it which led to a **split within the Congress and formation of Congress-Khilafat-Swarajya Party (CKSP).**

7.4. CYCLOPEAN WALL

Why in news?




Bihar government has again sent a proposal to the Archaeological Survey of India (ASI) to get Cyclopean wall listed in the UNESCO World Heritage Site.



About Cyclopean Wall

- The Cyclopean Wall is a **40 km long wall of stone** (more than 2,500 years old structure) which encircled the ancient city of Rajgir in Bihar.
 - Rajgir was the capital city of King Bimbisara and his son Ajatshatru who were contemporaries of the Buddha.
- It was **built in the pre-Mauryan era** (before 3rd century BC) and was erected by King Jarasandha, the 2nd ruler of **Brihadratha (Rawani) dynasty** to protect their capital.
- The wall is **among the oldest examples of cyclopean masonry**, a **type of megalithic architecture** entailing the working of unusually large blocks of stone without mortar, often for the construction of fortifications.
 - The **term was coined by Greeks** in the Classical Age.
- It is believed that it is **similar to “Frontiers of the Roman Empire”** that runs through Germany, UK and Northern Ireland, which was included on UNESCO’s world heritage list in 1987.
- **Some UNESCO World Heritage Sites in Bihar:** Nalanda University, Mahabodhi temple of Bodhi Gaya.



7.5. GEOGRAPHICAL INDICATION (GI) TAG PRODUCTS IN NEWS

<p>Panruti Cashews</p> 	<ul style="list-style-type: none"> • Cashew Processors and Exporters based in Tamil Nadu have sought GI tag for Panruti Cashews. <ul style="list-style-type: none"> ◦ Known as the ‘goldmine’ of Cuddalore, demand for Panruti Cashew is huge because of its unique taste and quality. • A GI is a sign used on products that have a specific geographical origin and possess qualities or a reputation that are due to that origin.
<p>Kashmir carpets</p> 	<ul style="list-style-type: none"> • First ever Geographical Indication (GI) tagged Kashmir carpets flagged off to Germany. • Department of Industry Promotion and Internal Trade granted GI tag to Kashmiri hand knotted carpets in 2016 but the registered carpets were certified from this year. • History of Kashmiri carpet dates back to the period of the famous Sufi Saint and scholar, Hazrat Mir Syed Ali Hamdani (1341- 1385 AD) of Persia. • Kashmiri carpets are very similar to Iranian carpets, but in Kashmiri carpets weavers use a written set of codes and symbols for design patterns and colors, called Taleem. <ul style="list-style-type: none"> ◦ Taleem, a coded color chart indicates the number of knots to be woven in their respective colors.
<p>Bardhaman Mihidana</p> 	<ul style="list-style-type: none"> • Bardhaman Mihidana (Mihi meaning fine and Dana meaning grains) is described as a micro cousin of traditional Boondi. • It is made from powdered Gobindabhog rice or kaminibhog rice flour mixed with a small amount of Bengal gram flour and saffron is added for a golden colour. • It is a famous sweet of Bardhaman district, West Bengal and got GI Tag in 2017.
<p>Banarasi Pashmina</p>	<ul style="list-style-type: none"> • Khadi and Village Industries Commission (KVIC) launched Banarasi Pashminain Varanasi. • This is for the first time that Pashmina products are being produced outside the region of Leh-Ladakh and Jammu & Kashmir. • Changthangi or Pashmina goats are raised for ultra-fine cashmere wool, known as Pashmina once woven.




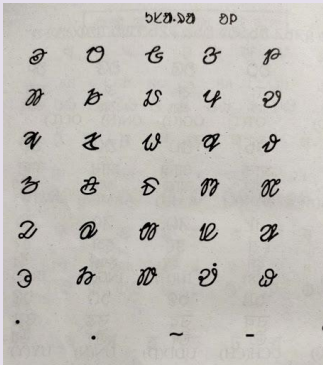
- Changthangi or Pashmina goat is a special breed of goat **indigenous to the high altitude regions of Ladakh** (domesticated and reared by Changpa nomadic communities).
- Kashmir Pashmina has been **assigned GI tag**.


7.6. OTHER IMPORTANT NEWS

Festivals/dance	
<p>Medaram Jathara</p> 	<ul style="list-style-type: none"> ● Recently, Ministry of Tribal Affairs has sanctioned ₹2.26 Crores for Medaram Jathara. ● It is the second-largest fair of India, after the Kumbh Mela. ● It is celebrated by the tribal community of Telangana for four days. ● It is biennially celebrated and organized by the Koyas tribes in collaboration Telangana government. ● It is a festival with no Vedic or Brahmanic influence. ● Jampannavagu river (a tributary to river Godavari) is worshiped as one of the parts of rituals. ● It assists the tribals to preserve their unique Tribal Traditions, Culture and Heritage.
<p>Karakattam dance</p> 	<ul style="list-style-type: none"> ● Kerala NattukalaKshema Sabha has demanded that Karakattam (known as Kumbakkali in certain parts) be recognised as agricultural art form of Kerala. ● Karakattam is an ancient folk dance of Tamil Nadu performed in praise of the rain goddess Mariamman. It's performed in different parts of Kerala as well. ● It is performed at festivals, road shows and primarily at Mariamman festivals. ● It involves balancing a large number of pots of decreasing size on the head of the dancers while dancing and expressing theme of the dance. ● Mariamman pooja is held in the month of Medam after Makarakkoythu (harvest season) in Kerala.



Schemes/ Programs/ Missions	
Scheme of Assistance to National Sports Federations (NSFs)	<ul style="list-style-type: none"> • Union Government has approved continuation of Scheme of Assistance to NSFs with an outlay of Rs. 1575 crore for XV Finance Commission Cycle (2021-22 to 2025-26). • About scheme: <ul style="list-style-type: none"> ○ It is the flagship Central Sector Scheme. ○ It is the main source of funding for preparation of national teams for all major national and international competitions like Olympic Games, Para-Olympics, Asian Games, Commonwealth Games (CWG) etc. ○ The outlay will be extended to NSFs to train and field national teams for national and international competitions between 2022 and 2026.
Utsav Portal	<ul style="list-style-type: none"> • Ministry of Tourism launched the Utsav Portal at the inaugural day of AmritSamagam Conference. <ul style="list-style-type: none"> ○ Utsav Portal website, digital initiative, aims to showcase all the events, festivals and live darshans across India to promote different regions of the country as popular tourist destinations worldwide. • Objective is to increase tourism awareness, attractions, and opportunities by providing tourists with contextual digital experiences in the form of visually appealing photographs and stills from the events.
National Digital Tourism Mission (NDTM)	<ul style="list-style-type: none"> • Ministry of Tourism (MoT) invited final comments on draft report for setting up NDTM. <ul style="list-style-type: none"> ○ In 2021, MoT had constituted an inter-ministerial task force for NDTM to define the overall scope of NDTM. • NDTM envisages to achieve the objective of harnessing the full potential of digitization in tourism sector by facilitating exchange of information and services in tourism sector. <ul style="list-style-type: none"> ○ Its vision is to bridge the existing information gap amongst different stakeholders of tourism ecosystem through a digital highway.
Hornbill Nest Adoption Program (HNAP)	<ul style="list-style-type: none"> • Nyishi tribe of Arunachal Pradesh celebrated a decade success of HNAP. <ul style="list-style-type: none"> ○ HNAP, launched in 2011 as community-based hornbill conservation programme, operates in the forests outside Arunachal Pradesh's Pakke Tiger Reserve. • Hornbills are indicators of the health of a forest, they are seed dispersers and called as 'farmers of the forest'. • India is home to nine species, of which four are found in Western Ghats—Indian Grey Hornbill, Malabar Grey Hornbill, Malabar Pied Hornbill and the Great Hornbill. • Also, to encourage inter-tribal interaction and to promote cultural heritage of Nagaland, the Government of Nagaland organizes the Hornbill Festival every year in the first week of December
	
Awards	
Saraswati Samman Award	<ul style="list-style-type: none"> • The 2021 Saraswati Samman is given to Professor Ramdarsh Mishra for his Hindi Poetry collection 'Mein to Yahan Hun'. • Instituted in 1991 by KK Birla Foundation, Saraswati Samman is one of the most prestigious literary awards in the country. • The eligible languages of work for the award are 22 Scheduled Languages of India. • It carries a citation, a plaque, and a cash prize of ₹15 lakh.
Sangeet Natak Akademi, Lalit Kala Akademi Awards	<ul style="list-style-type: none"> • Vice president conferred the Sangeet NatakAkademi Fellowship and Sangeet Natak Awards for 2018 while the Lalit Kala Akademi's Fellowship and National Awards for 2021. • Sangeet Natak Akademi <ul style="list-style-type: none"> ○ Sangeet NatakAkademi, the apex body in the field of performing arts in the country, was set up in 1953 for the preservation and promotion of the vast intangible heritage of India's diverse culture expressed in forms of music, dance and drama. ○ Sangeet NatakAkademi Awards are national honours given by the government to performing artists, teachers and scholars in the field of performing arts. • Lalit Kala Akademi <ul style="list-style-type: none"> ○ It was inaugurated in New Delhi in 1954.

	<ul style="list-style-type: none"> Lalit Kala Akademi manifests a commitment to the service of the visual arts by establishing, preserving and documenting visual art of the highest order that in turn reflects the vitality, complexity and unfolding patterns of ancient, modern and contemporary art in India.
Miscellaneous	
UNESCO's City of Literature	<ul style="list-style-type: none"> Recently, Kozhikode was proposed by the Kerala Institute of Local Administration (KILA) to be branded as a UNESCO's City of Literature, which is part of a wider UNESCO's Creative Cities Network (UCCN). UCCN was created in 2004 to promote cooperation with and among cities that have identified creativity as a strategic factor for sustainable urban development. <ul style="list-style-type: none"> It covers seven creative fields: Crafts & Folk Art, Design, Film, Gastronomy, Literature, Music, and Media Arts. It was established in 1946 and is based in Paris. 6 Indian cities are included on the list- Hyderabad (gastronomy), Mumbai (film), Varanasi (music), Chennai (music), Jaipur (crafts and folk art) and the latest addition, Srinagar (crafts and folk art).
Dhara: An Ode to Indian Knowledge Systems	<ul style="list-style-type: none"> As the Azadi Ka Amrit Mahotsav is being celebrated throughout the country, India's contribution in the field of knowledge was commemorated and initiatives like Dhara are being taken for a concentrated and focused effort in this direction. Dhara is, a flagship initiative of the Ministry of Culture, conceptualised as a series of lecture demonstrations dedicated to specific areas of enquiry, highlighting India's contribution and achievements across domains.
India wins right to host 2023 International Olympic Committee's (IOC) session	<ul style="list-style-type: none"> This will be the second time India hosts an IOC session, having done so in 1983 in New Delhi. IOC is a not-for-profit independent international organization, established in 1894. <ul style="list-style-type: none"> Based in Lausanne, Switzerland, It is entirely privately funded and distributes 90% of its revenues to wider sporting movement, for development of sport and athletes at all levels. President represents IOC and presides over all its activities. He is elected by the session. IOC session discusses and decides on key activities of the global Olympics movement including adoption or amendment of the Olympic Charter, and its decisions are final. <ul style="list-style-type: none"> An ordinary Session is held once a year, while Extraordinary Sessions may be convened by President or upon written request of at least one-third of the Members.
OI Chiki 	<ul style="list-style-type: none"> For the first time, Indian Constitution is translated into Santali script 'OI Chiki'. <ul style="list-style-type: none"> 92nd Constitutional Amendment Act 2003 added Santali to Schedule VIII along with the Bodo, Dogri and Maithili languages About OI Chiki <ul style="list-style-type: none"> OI Chiki script—the word <i>ol</i> means “write,” and <i>chiki</i> means “script”—was invented by Pandit Raghunath Murmu in 1925 to write Santali. OI Chiki is alphabetic, and does not share any of the syllabic properties of the other Indic scripts. It contains 30 letters and five basic diacritics (marks placed above or below (or sometimes next to) a letter in a word to indicate a particular pronunciation). Santals community is concentrated in several states including Assam, Tripura, Bihar, Chhattisgarh, West Bengal, Odisha and Jharkhand. <ul style="list-style-type: none"> They speak Santali language which belongs to the Munda group of Austro-Asiatic sub-family of languages. Santals are well known for their housing architecture with colourfully painted walls, floors and artistically carved doors.
Tarapur Massacre	<ul style="list-style-type: none"> Bihar will commemorate February 15 as “Shahid Diwas” in memory of the 34 freedom fighters who were killed by the British in Tarapur (1932). <ul style="list-style-type: none"> It was the biggest massacre carried out by the British after the Jallianwala Bagh Massacre (Amritsar, 1919). It happened when a group of young freedom fighters planned to hoist an Indian national flag at Thana Bhavan during a protest.

	<ul style="list-style-type: none"> • Causes of protest: <ul style="list-style-type: none"> ○ Hanging of Bhagat Singh, Sukhdev, and Rajguru in Lahore (1931) ○ Arrest of Mahatma Gandhi following collapse of the Gandhi-Irwin Pact (1932) ○ Congress was declared an illegal organisation, and Nehru, Patel, and Rajendra Prasad were also arrested.
Pal-Dadhvav Massacre	<ul style="list-style-type: none"> • On 7th March, Gujarat government marked 100 years of the Pal-Dadhvavkillings. • Pal-Dadhvav massacre took place in the Pal-Chitariya and Dadhvaav villages of Sabarkantha district part of Idar state (was princely state in Gujarat). <ul style="list-style-type: none"> ○ The movement was to protest against the land revenue tax (lagaan) imposed on the peasants by the British and feudal lords. ○ British officer Major H.G. Sutton from Mewad Bhil Corps ordered to open fire at the innocent tribals.
Punaura Dham 	<ul style="list-style-type: none"> • Punaura Dham in Sitamarhi district (Bihar) was included in Ramayana Circuit of Swadesh Darshan scheme. <ul style="list-style-type: none"> ○ Also, it was included in PRASHAD (Pilgrimage Rejuvenation And Spiritual Augmentation Drive) scheme. • Punaura Dham is considered to be birthplace of Goddess Sita. <ul style="list-style-type: none"> ○ Shrine compound has a Ram Janki temple, a pond called Sita Kund and a hall. • Ramayana Circuit is one of the thematic circuits identified for development under the Swadesh Darshan scheme of Ministry of Tourism. <ul style="list-style-type: none"> ○ Ministry has initially identified following destinations under the Ramayana Circuit theme namely Ayodhya, Nandigram, Shringverpur & Chitrakoot (Uttar Pradesh), Sitamarhi, Buxar & Darbhanga (Bihar), Chitrakoot (Madhya Pradesh), Mahendragiri (Odisha), Jagdalpur (Chattisgarh), Nashik & Nagpur (Maharashtra), Bhadrachalam (Telangana), Hampi (Karnataka) and Rameshwaram (Tamil Nadu)
Stolen Artefacts	<ul style="list-style-type: none"> • Stolen artefacts to be returned to India from Scotland museums. • Legal framework for Indian Antiquities <ul style="list-style-type: none"> ○ Ancient Monuments and Archaeological Sites and Remains Act of 1958 deals with the preservation of ancient and historical monuments including antiquity. ○ Antiquities And Art Treasures Act 1972 - under this, ASI works to retrieve stolen or illegally exported art objects by regulating the export trade in antiquities and art treasures. ○ National Mission on Monuments And Antiquities creates a National Register On Artifacts that are unprotected. ○ National Manuscript Mission for Documenting Heritage. • Also, India is a signatory to the UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property (1970 UNESCO Convention). <ul style="list-style-type: none"> ○ However, India has not signed the 1995 UNIDROIT (International Institute for the Unification of Private Law) Convention on Stolen or Illegally Exported Cultural Objects.
National calendar	<ul style="list-style-type: none"> • 65th anniversary of the adoption of the National Calendar of India is being celebrated. • About National Calendar <ul style="list-style-type: none"> ○ It is based on the Saka era, adopted on 22 March 1957 by the government along with the Gregorian calendar <ul style="list-style-type: none"> ✓ It is based on the ascension of King Shalivaahan to the throne in 78 AD. ○ One year is consists of 365 days, with Chaitra being the first month of the year. ○ New year starts on 22 March in a normal year, and on 21 March in a leap year. ○ It was adopted on the recommendation of Calendar Reform Committee (Chaired by Meghnad Saha) ○ It is used in the Gazette of India, News broadcast by All India Radio, Government communications addressed to the public and Calendars issued by the Government.
Hatti community	<ul style="list-style-type: none"> • Hatti community of Sirmaur district in Himachal Pradesh have been demanding for inclusion under the Scheduled Tribe (ST) list since 1967 when Hatti from JaunsarBawar of Uttarakhand were included in ST list.

	<ul style="list-style-type: none"> ○ The community in both the states is divided by Giri and Tons rivers but have similar traditions, and inter-marriages are commonplace. ● The Hattis are a close-knit community who got their name from their tradition of selling homegrown vegetables, crops, meat and wool etc. at small markets called 'haat' in towns.
Angadias	<ul style="list-style-type: none"> ● It is a century-old parallel banking system in the country where traders send cash generally from one state to another through a person called Angadia that stands for courier. ● It is used largely in jewellery business. ● The cash involved is huge and it is the responsibility of the Angadia to transfer cash from one state to another for which they charge a nominal fee. ● Generally, it is the Gujarati, Marwari and Malbari community that are involved in the business. ● They have recently been under attack by robbers owing to the large quantities of cash they carry.
Indigenous/traditional games	<ul style="list-style-type: none"> ● Rural and indigenous/tribal games are being promoted under Khelo India Scheme (KIS), flagship Central Sector Scheme of Ministry of Youth Affairs & Sports. ● Following major Indigenous/traditional games have been identified: Mallakhamb (MP), Kalaripayattu (Kerala), Gatka (Punjab), Thang ta (Manipur), Yogasana, Silambam (Tamil Nadu).
UN World Tourism Organization (UNWTO)	<ul style="list-style-type: none"> ● Russia has withdrawn from UNWTO amid Ukraine conflict, losing with immediate effect its rights and privileges as part of UN specialized agency. ● UNWTO is United Nations agency responsible for promotion of responsible, sustainable and universally accessible tourism. <ul style="list-style-type: none"> ○ Headquarters are based in Madrid, Spain since 1976. ○ India is the founder member of UNWTO.

Errata: In “Article 6.5. Festivals in News (under Jallikatu)” of the earlier PT 365 Culture document –Kambala was mentioned as a sport of Andhra State. The correct state for Kambala would be Karnataka.

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8. SCHEMES IN NEWS

8.1. NITI AAYOG

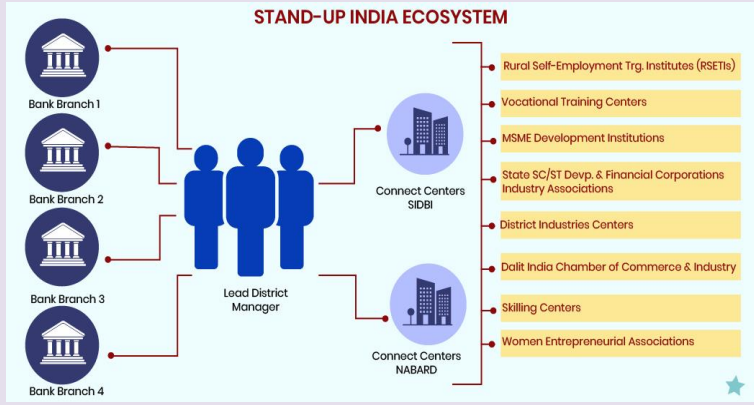
8.1.1. ATAL INNOVATION MISSION (AIM)

Objective	Salient features
<ul style="list-style-type: none"> To create and promote an ecosystem of innovation and entrepreneurship across the country at school, university, research institutions, MSME and industry levels It is envisaged as an umbrella innovation organization that would play an instrumental role in alignment of innovation policies between central, state and sectoral innovation schemes 	<ul style="list-style-type: none"> AIM was launched in 2016 by NITI Aayog to create and promote a culture of innovation and entrepreneurship across the length and breadth of our country. <ul style="list-style-type: none"> The Union Cabinet, recently, approved continuation of Atal Innovation Mission (AIM), till March 2023. The AIM has focused on both infrastructure creation and institution building. AIM has adopted a holistic approach encompassing schools, universities, research institutions, industry, MSME, NGOs, Ministries, at district, state and national levels. It has two core functions: <ul style="list-style-type: none"> Entrepreneurship promotion through Self-Employment and Talent Utilization (SETU), wherein innovators would be supported and mentored to become successful entrepreneurs. Innovation promotion: to provide a platform where innovative ideas are generated <p>AIM Framework</p> <ul style="list-style-type: none"> Atal Tinkering Labs (at school level) where students from Class 6th to Class 12th learn innovation skills and develop ideas. <ul style="list-style-type: none"> Atal Tinkering Marathon: The marathon puts nation-wide challenge in 6 thematic areas namely Clean Energy, Water resources, Waste management, Healthcare, Smart mobility, and Agri-tech to find out the best student innovators of India. <div style="text-align: center;"> </div> <ul style="list-style-type: none"> Atal Incubation Centres (AICs) & Atal Community Innovation Centers (ACIC): They will be set up at the university, NGO, SME and Corporate industry levels for promoting entrepreneurship in universities and industry. Atal New India Challenges: To promote technology driven innovations and product creation for social and commercial impact Mentor India Campaign: It's a strategic nation building initiative to engage leaders who can guide and mentor students. Industry, Academia, Government, Global Collaborations as a key to success. ARISE-Atal New India Challenges: To spur applied research and innovation in Indian MSMEs and startups. The programme will be driven by Indian Space Research Organization (ISRO), four ministries—Ministry of Defence; Ministry of Food Processing

Industries; Ministry of Health and Family Welfare; and Ministry of Housing and Urban Affairs—and associated industries to facilitate innovative solutions to sectoral problems.

8.2. STAND UP INDIA SCHEME

Objectives	Eligibility	Salient features
<ul style="list-style-type: none"> Promote entrepreneurship amongst women, SC & ST category Provide loans for greenfield enterprises in manufacturing, services or the trading sector and activities allied to agriculture Facilitate bank loans between Rs.10 lakh and Rs.1 crore to at least one Scheduled Caste/ Scheduled Tribe borrower and at least one woman borrower per bank branch of Scheduled Commercial Banks 	<ul style="list-style-type: none"> SC/ST and/or women entrepreneurs, above 18 years of age; Loans under the scheme are available for only green field projects. (Green field signifies the first time venture of the beneficiary in manufacturing, services etc); In case of non-individual enterprises, 51% of the shareholding and controlling stake should be held by either SC/ST and/or Women Entrepreneur; Borrowers should not be in default to any bank/financial institution; The Scheme envisages ‘up to 15%’ margin money which can be provided in convergence with eligible Central/State schemes (while such schemes can be drawn upon for availing admissible subsidies or for meeting margin money requirements, in all cases, the borrower shall be required to bring in minimum of 10 % of the project cost as own contribution). 	<ul style="list-style-type: none"> Recently, the 6th anniversary of this scheme was celebrated (launched in 2016). The scheme has been extended upto the year 2025 and activities allied to agriculture have been included in the Scheme. Government does not allocate funds for loans under the Stand Up India Scheme. The loan is repayable in 7 years with a maximum moratorium period of 18 months. The rate of interest would be lowest applicable rate of the bank for that category (rating category) not to exceed Bank’s base rate (MCLR) +3%+ tenor premium. Besides primary security, the loan may be secured by collateral security or guarantee of Credit Guarantee Fund Scheme for Stand-Up India Loans (CGFSIL) as decided by the banks. The offices of SIDBI and NABARD are designated as Stand-up Connect Centres, who will arrange for the support required. SIDBI is a refinancing agency. It also provides for Creation of a credit guarantee mechanism through the National Credit Guarantee Trustee Company (NCGTC). Loans under the Scheme are extended by all the branches of the Scheduled Commercial Banks as per commercial parameters, Board approved policies of respective banks and extant RBI guidelines. Handholding support: Apart from linking prospective borrowers to banks for loans, the online portal developed by SIDBI is also providing guidance to prospective entrepreneurs in their endeavour to set up business enterprises, starting from training to filling up loan applications. Steps taken for effective implementation of the Scheme <ul style="list-style-type: none"> Provision for submission for online applications by potential borrowers through www.standupmitra.in portal Handholding support Intensive publicity campaigns Simplified loan application form Credit Guarantee Scheme Convergence with State and Central Government Schemes



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8.3. OTHER SCHEMES IN NEWS OR MISCELLANEOUS INITIATIVES



Ministry of Defence	
Innovations for Defence Excellence (iDEX) Prime	<ul style="list-style-type: none"> iDEX-Prime aims to support projects, requiring support beyond Rs 1.5 crore up to Rs 10 crore, to help ever-growing start-ups in the defence sector. Core objective of iDEX is to create an ecosystem, essentially to foster innovation, entrepreneurship and technology development, specifically in the Defence and Aerospace sector. iDEX is the operational framework of the Defence Innovation Organization (DIO), a special purpose vehicle under Ministry of Defence (MoD).
Sixth Defence India Start-up Challenge (DISC 6)	<ul style="list-style-type: none"> DISC is aimed at supporting Startups/MSMEs/Innovators to create prototypes and/or commercialize products/solutions in the area of National Defence and Security. DISC has been launched by MoD in partnership with Atal Innovation Mission.
Third edition of Innovate4Defence internship (i4D)	<ul style="list-style-type: none"> i4D is a two-months-long acceleration program for students of Higher Educational Institutions (HEIs) of India.
Ministry of Home Affairs	
Tour of Duty (ToD) scheme	<ul style="list-style-type: none"> Department of Military Affairs has finalised ToD scheme. Under the scheme, youngsters will be recruited as soldiers only for three to five years. <ul style="list-style-type: none"> Purpose is to curb the salary and pension bills, that are adversely impacting military modernisation. Idea was mooted by late Chief of Defence Staff, General Bipin Rawat. ToD scheme, which is likely to be called the “Agnipath” recruitment is likely to be launched on an experimental basis first.
Revised Scheme of Village Defence Groups (VDGs) in J&K	<ul style="list-style-type: none"> Ministry of Home Affairs has given a nod to formation of VDGs in Jammu and Kashmir (J&K). Members of VDGs will be designated as Village Defence Guards. They will function under the direction of SP/SSP of the concerned district. VDGs were earlier known as village defence committees (VDCs). <ul style="list-style-type: none"> During peak of militancy in the 1990s, 4,125 VDCs existed in J&K. VDCs play a significant part in assisting the forces in counter-terrorism operations, maintaining vigil over inimical elements and assisting in maintaining peace.
Inter-Operable Criminal Justice System (ICJS) project	<ul style="list-style-type: none"> Ministry of Home Affairs has approved implementation of ICJS project Phase II during 2022-23 to 2025-26, as a Central Sector Scheme. <ul style="list-style-type: none"> ICJS is an initiative of e-Committee of Supreme Court to enable seamless transfer of data and information among different pillars of criminal justice system. ICJS is a national platform for enabling integration of the main IT system used for delivery of Criminal Justice in the country by five pillars namely: <ul style="list-style-type: none"> Police (Crime and Criminal Tracking and Network Systems) e-Forensics e-Courts e-Prosecution for Public Prosecutors e-Prisons Phase-II is built on the principle of ‘one data one entry’ whereby data is entered only once in one pillar and the same is then available in all other pillars. <ul style="list-style-type: none"> Under Phase-I, individual IT systems have been implemented and stabilized; search of records has been enabled. National Crime Records Bureau will be responsible for the implementation of ICJS in association with National Informatics Center, in collaboration with States and UTs.
Ministry of Labour and Employment	
Donate a pension scheme	<ul style="list-style-type: none"> The Ministry of Labour and Employment launched the “donate a pension” scheme. <ul style="list-style-type: none"> The scheme allows any citizen to pay the premium amount on behalf of an unorganised worker (domestic workers, drivers, helpers, care givers) under the PradhanMantriShram Yogi Maan-Dhan Scheme. The donor can pay the contribution for a minimum of one year, with the amount ranging from ₹660 to ₹2,400 a year depending on the age of the beneficiary.
Ministry of Education	
Scheme for Residential Education for	<ul style="list-style-type: none"> Ministry of Education has joined hands with Ministry of Social Justice and Empowerment for SHRESTHA.

Students in High Schools in Targeted Areas (SHRESTHA)	<ul style="list-style-type: none"> • Objective of SHRESTHA: Enhance reach of development Intervention of the Government and fill the gap in service deficient SCs dominant areas. • Earlier known as ‘Grant in-aid to voluntary and other organisations for Scheduled Castes’, SHRESTHA has two Modes with: <ul style="list-style-type: none"> ○ Mode 1: To provide high quality residential education to bright scheduled caste (SC) students. ○ Mode 2: It provides Grant-in-aid to Schools/Hostels run by voluntary and other organisations meeting the required criteria. • District administration is its prime implementing agency for Mode 1.
Rashtriya Uchcharat Shiksha Abhiyan (RUSA)	<ul style="list-style-type: none"> • Ministry of Education has approved the continuation of the RUSA scheme till March 31, 2026. • About RUSA <ul style="list-style-type: none"> ○ Centrally sponsored scheme, launched in 2013. ○ Seeks to provide strategic funding to eligible state higher educational institutions. ○ Under the new phase, RUSA aims to reach out to unserved, underserved areas; remote and rural areas; LWE (left-wing extremism) areas; aspirational districts, tier-2 cities, etc. <ul style="list-style-type: none"> ✓ New Phase is designed to implement some of the recommendations of National Education Policy 2020. ✓ It will support state governments for gender inclusion, equity initiatives, ICT, enhancing employability through vocationalisation and skill upgradation. • Grants will be provided to strengthen both accredited and non-accredited universities and colleges for undertaking various activities including teaching-learning in Indian languages.
National Means-cum-Merit Scholarship	<ul style="list-style-type: none"> • Government has approved continuation of the scheme from 2021-22 to 2025-26 with financial outlay of Rs. 1827 crore. • Also, modifications have been made in eligibility criteria such as increasing income ceiling from Rs.1.5 lakh per annum to Rs.3.5 lakh per annum and revising renewal criteria. • About scheme <ul style="list-style-type: none"> ○ Launched in 2008-09, it is a Central Sector scheme. ○ Objective is to award scholarships to meritorious students of economically weaker sections to arrest drop-out at class VIII. • One lakh fresh scholarship of Rs.12,000/- per annum per student are awarded to selected students of class IX and renewed in classes X to XII.
Ministry of Statistics and Programme Implementation	
Capacity Development (CD) Scheme	<ul style="list-style-type: none"> • Cabinet has approved continuation of the Scheme till 2026, with outlay of ₹3179 crore. • About CD scheme <ul style="list-style-type: none"> ○ It is a Central Sector Scheme of of Ministry of Statistics and Programme Implementation. ○ Objective is to augment infrastructural, technical as well as manpower resources for enabling availability of credible and timely official statistics. ○ It comprises of two sub schemes. <ul style="list-style-type: none"> ✓ Support for Statistical Strengthening: aims to improve statistical capacity and operations of State Statistical Systems for collecting, compiling and disseminating reliable official statistics. ✓ Economic Census: gives complete count of all non-farm economic establishments located within the geographical boundary of India.

9. APPENDIX

India's Major Contributions in the field of knowledge

Idea	Details
Digit Zero	<ul style="list-style-type: none"> Mathematician Aryabhata was the first person to create a symbol for zero and it was through his efforts that mathematical operations like addition and subtraction started using the digit, zero.
Arabic numeral system 	<ul style="list-style-type: none"> The Arabic numeral system owes its origins to the Bakhshali Manuscript, the first surviving reference of the Indian numeral system. This system was transmitted to the Arab world by around 800 CE and was popularised by the Persian mathematician Al-Khwarizmi and the philosopher Al-Kindi. From the Arab world, it was transmitted to Europe by around 1100 CE.
Decimal System	<ul style="list-style-type: none"> In the Early Vedic period (1200–600 BC), a decimal system of numbers was already established in India, together with rules for arithmetical operations (ganita) and geometry (rekha-ganita). These were encoded in a complex system of chants, prayers, hymns, curses, charms and other religious rituals.
Fibonacci Numbers	<ul style="list-style-type: none"> The Fibonacci numbers and their sequence first appear in Indian mathematics as mātrāmeru, mentioned by Pingala in connection with the Sanskrit tradition of prosody (the study of poetic metres and verse). Later on, the methods for the formation of these numbers were given by mathematicians Virahanka, Gopala and Hemacandra.
Binary Numbers	<ul style="list-style-type: none"> The binary number system was first described by the Vedic scholar Pingala, in his book Chandahśāstra, which is the earliest known Sanskrit treatise on prosody.
Geometry and Pythagoras theorem	<ul style="list-style-type: none"> Sulbasutras, the oldest extant texts (~800 BCE) explicitly state and make use of the Pythagorean theorem besides giving interesting approximations to surds.
Value of Pi and Trigonometry	<ul style="list-style-type: none"> The Kerala school of astronomy and mathematics pioneered by Madhava (c. 1340-1420) discovered the infinite series for pi (π) (the so-called Gregory-Leibniz series) and other trigonometric functions.
Chakravala method of Algorithms	<ul style="list-style-type: none"> The chakravala method is a cyclic algorithm to solve indeterminate quadratic equations, including the Pell's equation. This method for obtaining integer solutions was developed by mathematician Brahmagupta (7th century CE). Another mathematician, Jayadeva later generalized this method for a wider range of equations, which was further refined by Bhāskara II in his Bijaganita treatise.
Ruler Measurements	<ul style="list-style-type: none"> Excavations at Harappan sites have yielded rulers or linear measures made from ivory and shell. Ancient bricks found at the excavation sites have dimensions that correspond to the units on these rulers.
Atomic Theory	<ul style="list-style-type: none"> Acharya Kanada, also known as Kashyapa, an ancient Indian natural scientist and philosopher, formulated the theory of atoms 2500 years before John Dalton's discovery. He founded the Vaisheshika school of Indian philosophy that epitomized the earliest Indian physics.

Heliocentric Theory	<ul style="list-style-type: none"> • Aryabhata in his magnum opus <i>Aryabhatiya</i>, propounded a heliocentric model in which the Earth was taken to be spinning on its axis and the periods of the planets were given with respect to a stationary Sun. • He was also the first to discover that the light from the Moon and the planets was reflected from the Sun, and that the planets follow an elliptical orbit around the Sun).
Zinc Smelting Technology	<ul style="list-style-type: none"> • India was the first to smelt zinc by the distillation process (12th Century AD), an advanced technique derived from a long experience of ancient alchemy. Zawar in the Tiri valley of Rajasthan is the world's first known ancient zinc smelting site.
Plastic Surgery	<ul style="list-style-type: none"> • Written by Sushruta in 6th Century BC, <i>Sushruta Samhita</i> is considered to be one of the most comprehensive textbooks on ancient surgery. The text mentions various illnesses, plants, preparations and cures along with complex techniques of plastic surgery. • The <i>Sushruta Samhita</i>'s most well-known contribution to plastic surgery is the reconstruction of the nose, known also as rhinoplasty.
Cataract Surgery	<ul style="list-style-type: none"> • The first cataract surgery is said to have been performed by the ancient Indian physician Sushruta, way back in 6th century BCE. • To remove the cataract from the eyes, he used a curved needle, Jabamukhi Salaka, to loosen the lens and push the cataract out of the field of vision.
Ayurveda	<ul style="list-style-type: none"> • Long before the birth of Hippocrates, Charaka authored a foundational text, <i>Charaka Samhita</i>, on the ancient science of Ayurveda. • Referred to as the Father of Indian Medicine, Charaka was the first physician to present the concept of digestion, metabolism and immunity in his book.
Iron-Cased Rockets 	<ul style="list-style-type: none"> • The first iron-cased rockets were developed in the 1780s by Tipu Sultan of Mysore who successfully used these rockets against the larger forces of the British East India Company during the Anglo-Mysore Wars. • He crafted long iron tubes, filled them with gunpowder and fastened them to bamboo poles to create the predecessor of the modern rocket.
Wootz Steel 	<ul style="list-style-type: none"> • The Damascus swords, with a high carbon content of 1.5-2.0 per cent were made from Wootz steel in India. • Till the 19th century, Wootz steel swords and daggers were made at centres such as Lahore, Amritsar, Agra, Jaipur, Gwalior, Tanjore, Mysore and Golconda.

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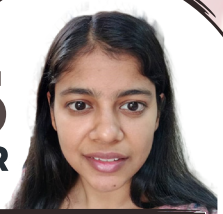
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