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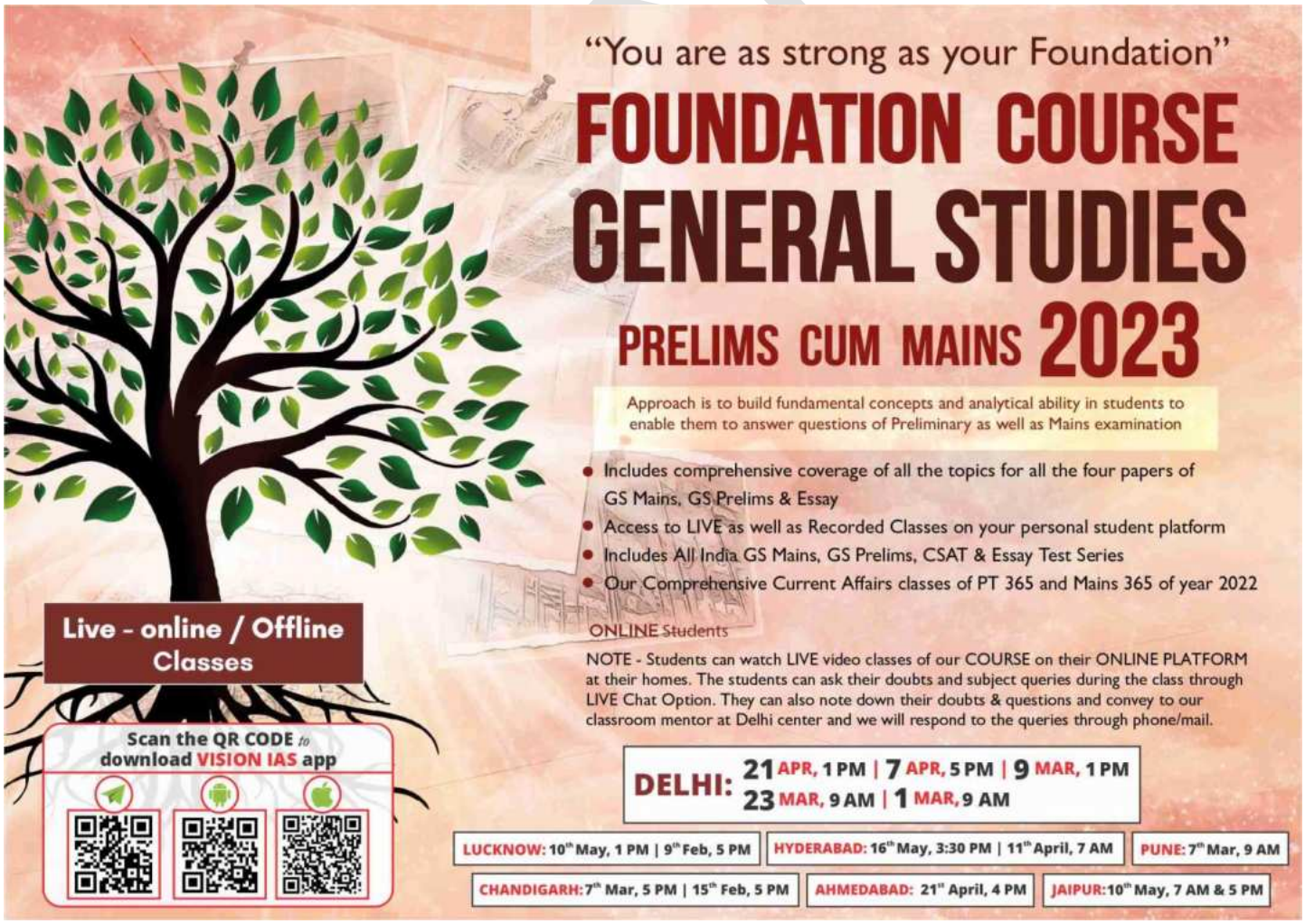
NOTE:

Dear Students,

Memorisation and recollection of information in Current Affairs is as important as understanding the articles. In order to enhance the learning outcomes from the Monthly Current Affairs Magazine, we are introducing following additions:

- A thematic based colors has been used in the document in the boxes, tables etc to enable easy identification and recollection of various concepts and topics.
- Questions are an important tool to assess and retain information. To enable this we are adding a Smart Quiz at the end of each section in the document for practicing the questions.
- A wide variety of infographics have been added to ensure smoother learning experience and enhanced retention of the information. This will also help in effective presentation of information in the answer writing as well.
- Places and persons in news are being presented in an objective manner through Maps, Tables & Pictures. This will help in easier recollection of factual information.



1. POLITY AND GOVERNANCE

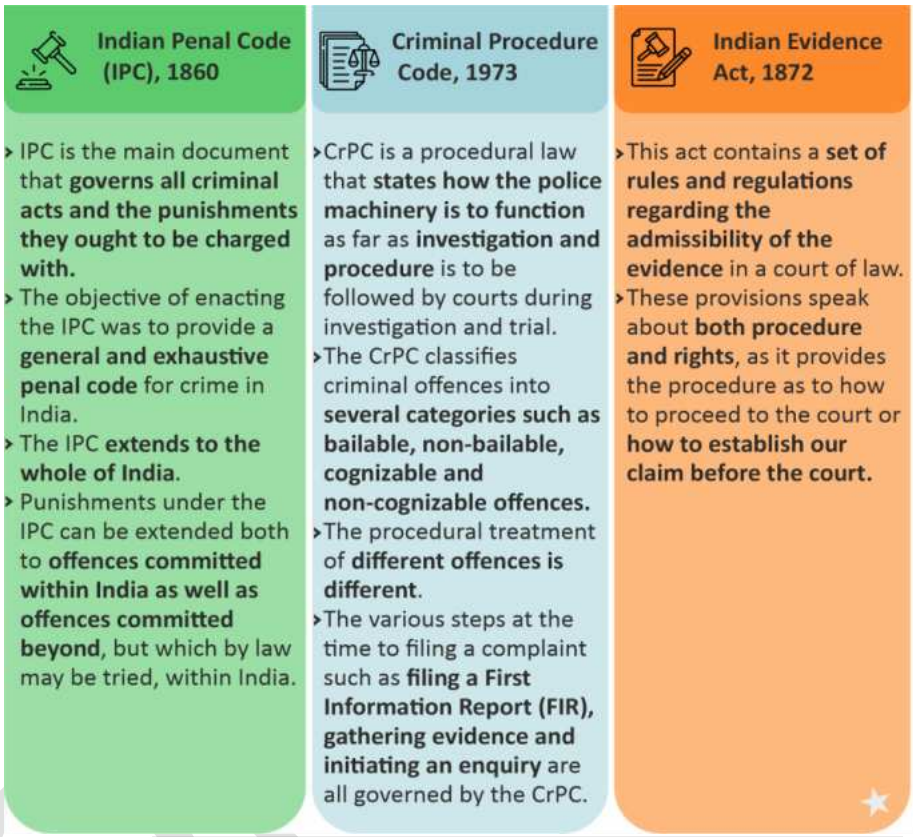
1.1. CRIMINAL LAWS AMENDMENT

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 the Indian Penal Code 1860; the Indian Evidence Act, 1872; and the Criminal Procedure Code, 1973 (CrPC).



Need of amendments in criminal laws

- **Accommodate the evolving society**: With the changes in the society, perspectives of people, and the nature of crimes, the laws need to evolve in accordance with the contemporary needs and aspirations of people.
  - For example, although the IPC enacted in 1860 was ahead of its time and has been in India for one and a half-century, it has not kept pace with the progressive times.
- **Recognise new crimes**: The restructuring of criminal laws is needed as many of the provisions have become obsolete with changing economic developments and technological advances.
  - For example, crimes like **mob lynching, financial crimes, white-collar crimes, economic crimes, etc.,** have not found proper recognition in the IPC.

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.

- **Simplification of the legal process**: The agenda for the government to amend this law is to fulfil the democratic aspirations of the people and ensure speedy justice and simplify legal procedures.
- **Remove ambiguity and vagueness:** For instance, the distinction between 'culpable homicide' and 'murder' is criticized for their obscure definitions.
  - 'Culpable homicide' is defined, but 'homicide' is not defined at all.
- **To give a fair share to individuals**: In a criminal justice system, since an accused as an individual is pitted against the might of the state, criminal law must ensure that the state does not take undue advantage of its position as a prosecutor.

Major changes required in criminal laws

- **Criminalization of Marital rape**: Till now, marital rape has not been considered as rape in India. Criminalization of marital rape has been a long-standing recommendation of the law commission, various committees and the criminalization of marital rape has been demanded by many sections of society.

- **Gender Neutrality in the definition of sexual offences under IPC:** The language of the sections relating to sexual offences needs to be amended to a neutral gender rather than continuing with language relating to the female gender.
- **Amendment in the language of Section 124A of the IPC** which deals with **sedition law**: The language of the law is ambiguous and that is why even a simple dissent from the policies and decision making of the government may attract a sedition charge that is why the amendment is required in the language of this section.
- **Laws on custodial torture and death**: A tough law is required over this topic as there is seen a rise in cases related to custodial torture.

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.

Way forward

- **Checking Law's relevance and enforceability**: The laws which are outdated and not relevant in the present times should be identified and empirical research should be done for the same. The problems with the enforceability of the provisions should also be checked.
- **Accommodating new forms of crimes**: To avoid duplicity and confusion, separate chapters on new forms of crimes like cyber laws, economic offences, etc. should be added to IPC.
- **Updated act:** According to the Report of **Malimath Committee on Reforms of Criminal Justice System**, the Indian Police Act, 1861 has become outdated and a new Police Act must be enacted on the pattern of the draft prepared by the National Police Commission.
- **Recommendations of Law Commission**:
  - Taking DNA as the material of evidence is totally upon the discretion of the court.
  - Insertion of Section 53A for the **protection of women at the workplace**.
  - It suggested the insertion of Section 436A in Criminal Procedure Code for the release of undertrial prisoners in the jail.

To know more about Criminal Justice System, please refer to our following Weekly Focus Document.

India's Criminal Justice System: Reforming Institutions For Delivering Justice

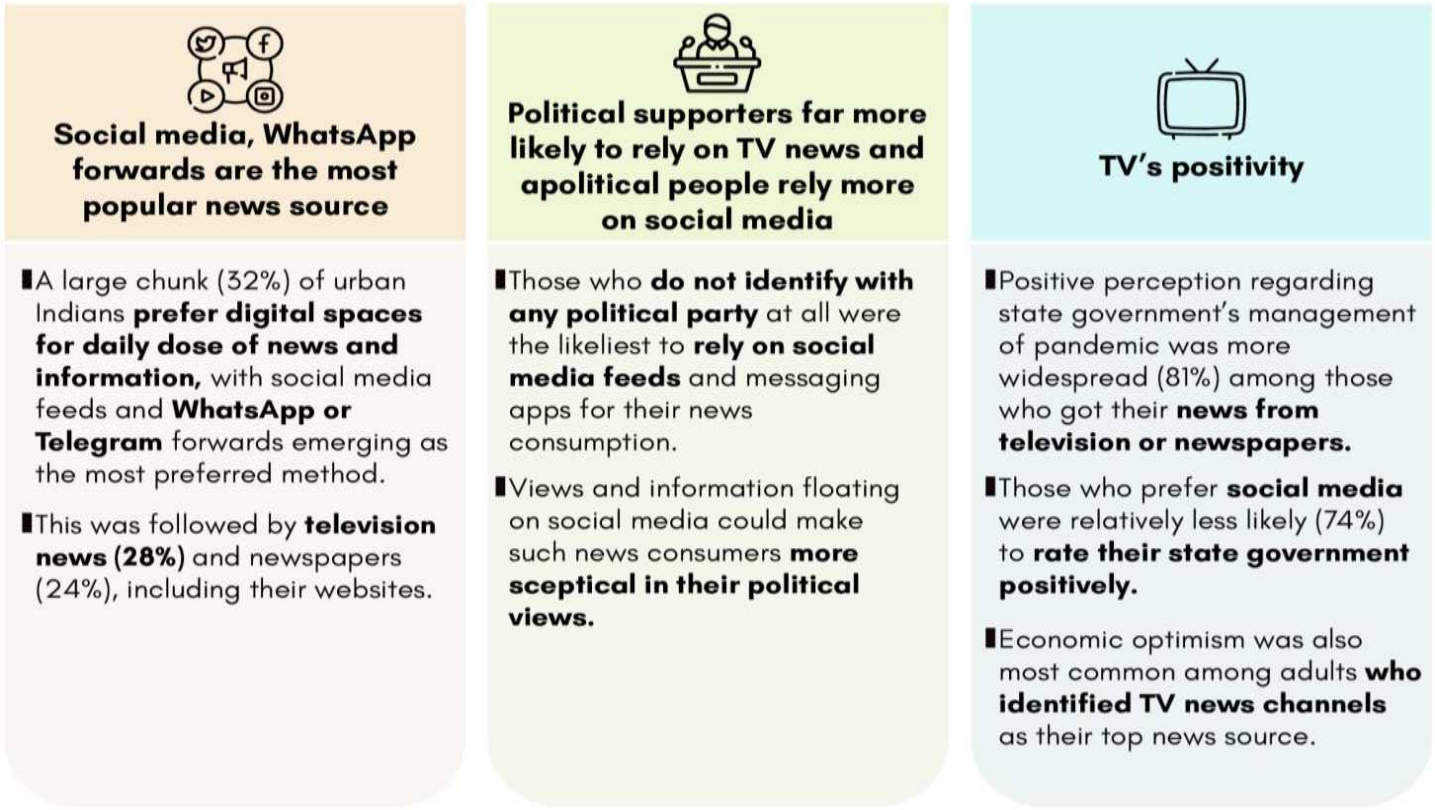
The entire existence of the orderly society depends upon sound and efficient functioning of the Criminal Justice System. Understanding the evolution and various components of criminal justice system in India, the document examines various maladies and faults with which the existing criminal justice system is affected. It further pinpoints various alternatives and suggestions for strengthening the system in order to achieve equity and prompt delivery of justice in the country.

1.2. SOCIAL MEDIA AND POLITICS

Why in news?

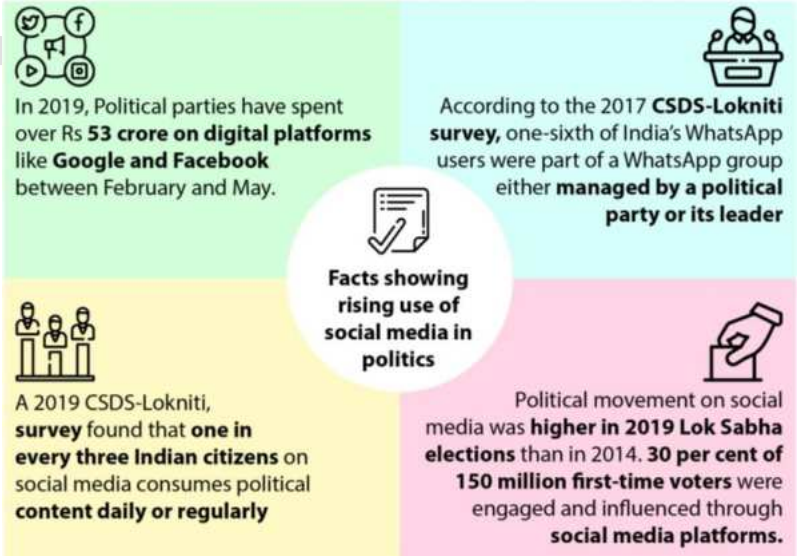
Recently a survey of was conducted to find out how preferred news source is likely to **influence political leaning**, and even **perception of the post-pandemic economic recovery**.

Key Highlights of survey



About Social media and its importance in politics

Social media refers to the wide range of **internet-based and mobile related services** that allow users to participate in **online exchanges of views**, contribute towards **user-created content**, or **join online communities**. Examples include **blogs, social networking sites, status-update services etc.**



Importance of social media in politics:

- **Re-energise the political landscape: Political campaigning and routine communication** through social media provide unmediated and **direct communication** to **connect leaders and citizenry**. It helps the parties to **communicate their goals and ideologies** more effectively.
- **Promoting a two-way communication**: Many political parties use social media to **invite suggestions** for their election manifesto, **take feedback** from the people about their current performance etc., thus creating a **sense of belongingness.**
- **Cost effective**: Social media **incurs low cost** when compared to other modes likes **print or electronic** media for the communication of information. This opens the **field for a large number of players to contest** in the race who were earlier **not able to compete due to a shortage of funds.**

- **Public engagement:** Encourages **diversity of viewpoints** and **public engagement** on an unprecedented scale by **amplifying engagement** through **comments, online interactions, trolls**, posts, pictures showing support etc.
- **Others:**
  - **Political campaigns go viral** through modes like "share" function on Facebook and "retweet" feature of twitter.
  - Acts as a key battleground to mould **public opinion** and set an agenda or **political discourse.**
  - Allows citizens who were **traditionally excluded from politics** due to geography and demography, to gain **direct entry into the political process.**
  - Information and opinions travel across networks, **like ripples in a pond**, allowing **each person to participate as an opinion leader** through media production and distribution, **not just by passive consumption.**
  - Also encourages political candidates to **speak more truth** rather than **selling rhetoric** to the voters during **their election speeches.**

Concerns associated with rising use of social media in politics

- **Emergence of post-truth politics:** Post-truth refers to circumstances in which **objective facts are less influential in shaping public opinion** than appeals to **emotion and personal belief.**
- **Proliferation of fake news:** Through social media, **unverified information can circulate freely** on the Internet, increasing instances of **fake news.** It is a **threat multiplier** and can increase **overall suspicion, outrage, hatred, and violence** because of **misinformation and disinformation.**
- **Ethical fallouts:** Ethics in political communication, which has always been a **complex issue** is further complicated by the **rise of digital technologies** that are **weakening traditional ethical constraints** among all political actors—politicians, journalists and the mass media, and audiences.
- **Online abuse** in the form of **trolling, verbal threats etc**. of people with dissenting opinions can threaten freedom of speech.
- **Misuse of data**: For example, **2018 Cambridge Analytica case** where **personal data** of millions of Facebook profiles was **harvested without their consent** and reportedly used for **targeted messaging.**
- **Security implications:** Rapid proliferation of **misinformation**, inflamed passions, sensational reporting have **security implications for the region** as a whole.
- **Propensity to fuel social instability:** Allowing **hate speech and extreme speech** to thrive in online spaces that are **unregulated**, particularly in regional languages have widened **societal fault lines**.
  - These troubling trends raise new questions about the role of governments, corporations, press, and citizens in **curbing unethical political discourse.**

Steps taken to address related concerns

- **Instructions issued by Election Commission (EC):** EC has issued **Instructions with respect to the use of social media** in Election campaigning:
  - The **model code of conduct and its pre-certified political advertisement** rules will apply to the social media as well.
  - Candidates are required to **furnish details of their social media account (if any)** at the time of filing nominations. The **expenditure incurred on social media campaigning** by them will be included within their **limit of election expenditure.**
  - All major social media platforms are required to **adhere to the "silence period"** that comes into effect 48 hours before the polls.
  - A special **social media expert** has been added in district and state-level **media certification and monitoring committees** to monitor social media and report violations.
- **Code of ethics**: The Social Media Platforms and Internet and Mobile Association of India (IAMAI) presented a "**Voluntary Code of Ethics for the General Election 2019**" to ensure free, fair & ethical usage of Social Media Platforms to maintain the integrity of the electoral process.
  - The Platforms agreed to create a **high priority dedicated reporting mechanism** and appointment of dedicated teams for **taking expeditious action** on any reported violation. It also promises to **facilitate transparency** in paid political advertisements.
- **IT rules 2021: Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules 2021** has been framed under section 87 (2) of the Information Technology Act, 2000 to **empower the ordinary users** of digital platforms to **seek redressal** for their grievances and **command accountability** in case of infringement of their rights.

Further measures to make use of social media in politics more constructive

- **Responsibility-based approach:** The social media platforms themselves must more effectively **halt the spread of disinformation**, and work to guarantee the platforms do not become a **vehicle for social and communal polarization.**
  - **Using advance technology** like Artificial Intelligence (AI) to detect signals generated by **inauthentic content and toxic behaviour** and employing **independent fact checking agencies/organisations** can help in this regard.
- **Conducting studies**: Current politics cannot be effectively understood without understanding the **contours of the transformative changes brought by the social media** platforms. Studies should be conducted to understand the dynamism of such platforms and their **disruptive potential.**
  - **Guidelines** towards **acceptable and forbidden content, data handling, citizen engagement** etc. are a few **best practices** that requires more attention.
- **Coordination among stakeholders**: Regulatory authorities should work with coalitions comprising of **fact-checkers, civil society organizations, academia, think tanks, etc.**, to put **ethical communication principles into practice** in a social-media age.

Conclusion

The **advent of social media** has changed how politics is **being organized and conducted**, as well as the **nature of political communication** in India. While **democratization of politics** has increased, it also created **several ethical dilemmas** due to **non-ethical uses of social media**. The issue needs to be tackled on a war footing through **a multi-stakeholder approach.**

1.3. IDENTIFICATION OF MINORITIES

Why in news?

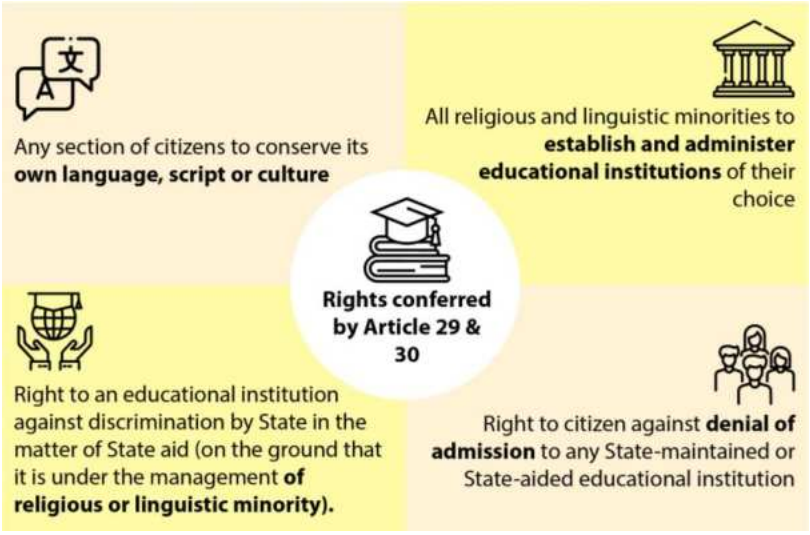
Supreme Court expressed displeasure that the **Centre has not yet filed its counter affidavit** on a plea seeking **minority status for Hindus** in states where their numbers are low.

More about news

- The plea has **sought** a direction that **followers of Judaism, Bahaism and Hinduism** can establish minority educational institutions in states **where they are in a minority**.
- It 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 have to 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

- A special Sub-Committee of **United Nations Human Rights Commission in 1946** defined the 'minority' as those "**non-dominant groups in a population** which possess a wish to preserve **stable ethnic, religious and linguistic traditions or characteristics** markedly different from those of the rest of population."
- 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**);
  - Language to be used in representations for redress of grievances (**article 350**);

Identification of minorities:

- **Linguistic minorities**: Since there is **no majority at the national level** and the minority status is to be essentially **decided at the State/Union Territory level**.
- **Religious minorities:** As **regards religious minorities** at the national level in India, all those who **profess a religion other than Hinduism** are considered minorities.
  - **National Commission for Minorities Act (1992)** also does not offer a definition of the term 'religious minority'. Instead, it is the **central government** that is **empowered to notify a few communities** as "minority" for the purpose of this Act.
  - Following this mandate, the Central government notified **five religious communities**: Muslims, Christians, Sikhs, Buddhists and Zoroastrians (Parsis) as **national religious minorities** in October 1993. This list was amended in 2014 when **Jains were also notified as a national minority**.
  - A national level minority shall have **the status of a minority in the entire country** irrespective of its local population. This will be so even in a **state, region or district** where such a minority **is factually not a minority in numerical terms**.

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.
- **TMA Pai case (2002)**: Court came to a conclusion that since the **reorganization of States in India had been on linguistic lines**, religious and linguistic minorities have to be **considered state wise.**
- **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.
  - Court observed that it is pertinent to **declare religious minorities nation-wise** to preserve the unity and integrity of the nation.
  - For instance, the **Christians are majority** in **Mizoram, Meghalaya and Nagaland** and there is a significant population of them in Arunachal, Goa, Kerala, Manipur, Tamil Nadu, and West Bengal but they are **treated as Minority** as they are a minority at the National level.

Conclusion

The identification of religious minorities still remains **highly ambiguous,** and a **clear procedure** should be introduced to determine the status of minorities **both at state as well as national level** to **streamline the process**. A **robust and fair identification process** would allow such communities to avail their **legitimate share** in the state resources.

1.4. DATA COLONISATION

Why in news?

Recently writer and historian Yuval Noah Harari has warned the world about too much **dependence on data-driven technologies which could result in data colonialism**, hence leading to the creation of monopolistic corporations and tyrant governments.

More about news

- He contended that **big data and artificial intelligence are the two big problems at national and global levels as over concentration of data** into a corporation.
- A government agency or amongst a few countries has increased the risk of '**data colonialization** and '**digital dictatorship'.**
- The **use of the internet has exponentially increased in the last decade**, exposing individuals to thousands of benefits of a connected world, starting from making communication faster to accessing services easier.
- **About Digital Colonialism and Digital Dictatorship**
  - **Digital Colonialism** is the process by which multi-national corporations claim ownership of and privatize the data that is produced by their users and citizens which gives them disproportionate power and ability to exploit other countries.
  - **Digital Dictatorship** is when few groups, corporations and even government can monopolise the immense power of data and AI to create an extremely unequal society, or the worst totalitarian regime in human history.

What can be the possible impact of data colonialization and 'digital dictatorship'?

- **Economic Monopoly**: Economically, the danger is that across the world, most industries are dependent on harvested data.
  - For instance, in the textile industry, companies would gather data on customers' likes, preferences and trends. So, if a company can harvest this data around the world, it can monopolize the textile industry.
- **Technological Monopoly**: All of the sophisticated technologies like AI & Machine Learning are produced in a few developed countries and can be used to exploit the rest of the world. It is a fact that 5 of the top 10 companies of the world, in terms of market share, are US tech giants.
- **Privacy issues**: India has more than 600 million internet users who spend significant time online. Extremely personal aspects can be shared with different stakeholders without someone's consent.
  - For example, Aadhaar is one of the largest databases of information about individuals and it is not restricted to data of connected people but extends beyond to those who are not connected, are poor, and are illiterate. There is a huge potential for this information being used to catch people in a virtual captivity.
- **Surveillance:** Infiltration of technology in daily lives along with ongoing developments in Big Data analytics has provided surveillance opportunities for governments and private players. For example, Pegasus snooping case**.**
- **Cyber-crimes:** India is witnessing a significant change in the nature of

India's framework to maintain data balance

- **Personal Data Protection Bill, 2019**: It seeks to provide for protection of personal data of individuals and establishes a Data Protection Authority for the same. It also has provision regarding transfer of data outside India in order to address the issue of Data colonialisation:
  - **Sensitive personal data** may be transferred outside India for processing if explicitly consented to by the individual and subject to certain additional conditions. However, such sensitive personal data should continue to be stored in India.
  - **Critical personal data** can only be processed in India.
  - **Personal data** other than sensitive and critical personal data don't have such localisation mandates.
- Supreme Court in **K.S. Puttaswamy case** has declared **Right to Privacy is a Fundamental right**. Hence protecting individual privacy is constitutional duty of the state thereby tackling digital dictatorship to an extent.

Global Framework

- **Osaka Declaration on Digital Economy**: G20 countries announces the launch of the '**Osaka Track'**, a process that aims to intensify efforts on international rulemaking on digital economy, especially on data flows and e-commerce, while promoting enhanced protections for intellectual property, personal information, and cybersecurity.
  - **India has not signed Osaka Track**.

cybercrimes; it is now extremely organized and collaborative. Moreover, as the volume of data on internet is expanding exponentially and the spread of new technologies like artificial intelligence, the internet of things, big data poses a threat of abuse and misuse of data.

Way forward

- **For effective implementation of the data protection regime**, it is required that all the stakeholders:
  - Align their policies with the requirements of Data Protection.
  - Encourage adoption of Privacy by design principles.
  - Explore the possible consent requirements at time of data collection.
- **Global data governance**: Policymakers should provide multiple mechanisms to transfer personal data, encourage firms to improve consumer trust through greater transparency about how they manage data, support the development of global data-related standards, and provide more assistance to developing countries to help with digital economy policy.
- **Work with like-minded countries:** To create interoperable data-sharing frameworks. This would support the responsible and ethical cross-border sharing of data.
- **Robust and comprehensive Personal data protection law:** It is the need of the hour in order to tackle Digital dictatorship back at home. Due importance must be given to public awareness, better implementation and regulation and efficient grievance redressal.

1.5. NEWS IN SHORTS

1.5.1. ELECTION COMMISSION OF INDIA (ECI) RESTORES MAXIMUM LIMIT ON STAR CAMPAIGNERS

- **Citing decline in COVID-19 cases, ECI has restored the number of star campaigners** a party can field for campaigning in the ongoing polls in five states.
- Star campaigners are **nominated by political parties to campaign in a given set of constituencies for a specified duration.**
  - **List of star campaigners** must be **communicated to Chief Electoral Officer and ECI** within a week from the election notification date **under section 77(1) of Representation of People Act (RPA), 1951.**
  - A recognised political party can have **40 Star campaigners** and an unrecognised (but registered) political party can have 20.
  - There is **no law that defines** who can be a star campaigner.
- **Expenditure incurred on campaigning** by such notified star campaigners is **exempt from being added to the election expenditure of a candidate.**
  - However, this **only applies when a star campaigner limits oneself to a general campaign** for the political party one represents.
  - If a **candidate or his/her election agent shares stage** with a star campaigner at a rally, then the **entire expenditure on that rally**, other than the travel expenses of star campaigner, is **added to candidate's expenses**.

1.5.2. GOVERNMENT APPROVES IMPLEMENTATION OF INTER-OPERABLE CRIMINAL JUSTICE SYSTEM (ICJS) PROJECT

- **Ministry of Home Affairs** has approved implementation of **ICJS project Phase II** during 2022-23 to 2025-26, as a **Central Sector Scheme.**
  - 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:
  - **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.
  - 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.

- **Significance**
  - Make justice delivery system **speedy and transparent**.
  - **Strengthen smart policing** which include empowering citizen, investigating agencies and policymakers.

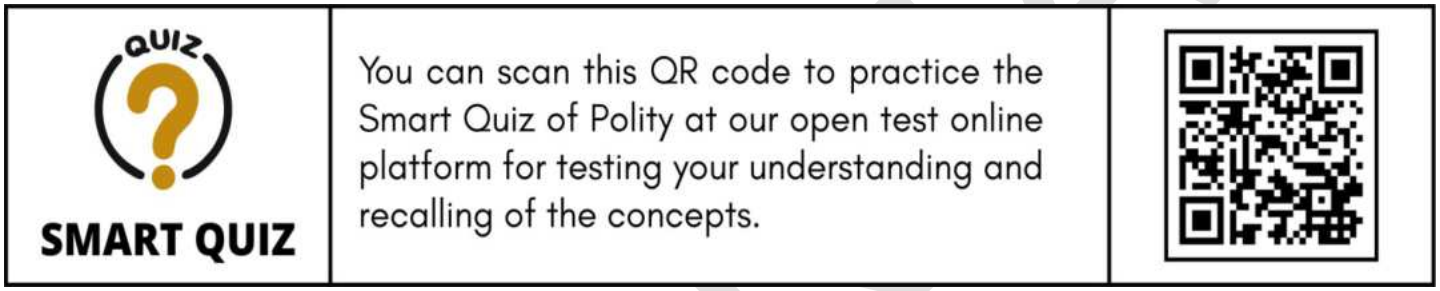
About e-Committee of Supreme Court

- 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.**

Errata

Article 1.2, January 2022 Monthly Current Affairs Magazine- Due to a typographical error it was mentioned that the Constitution restricts the grounds for declaration of National emergency to war and breakdown of law and order.

Corrected Information: The Constitution restricts the grounds for declaration of National emergency to war or external aggression and armed rebellion.

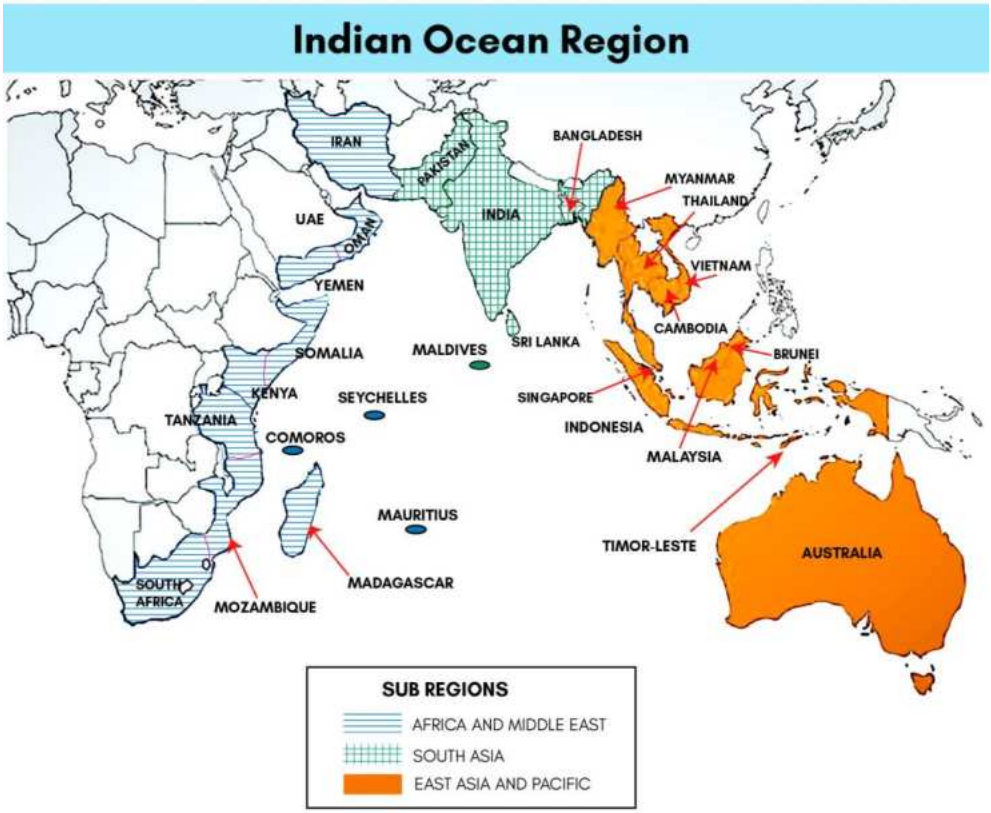


2. INTERNATIONAL RELATIONS

2.1. INDIAN OCEAN REGION: INDIA AS NET SECURITY PROVIDER

Why in news?

Recently, India's President praised India's constant vigil in protecting the Indian Ocean region (IOR) and advocated that India had become a preferred security partner in the region.



What is Net security provider?

- Net security provider is usually meant as **enhancing the mutual security of more than one country** by addressing common security concerns, including dealing with transnational piracy, or responding to disasters, etc.
- It encompasses **4 different activities**:
  - **Capacity building:** It refers to the **training of foreign forces**—both civilian and military, either at home or by deploying trainers abroad.
  - **Military diplomacy:** It enhances military diplomacy mainly through **military visits and exercises**. Such activities can **bolster foreign militaries** and signal strong bilateral relations and partnerships.
  - **Military assistance:** Primarily by supplying equipment (arms and ammunition).
  - **Direct deployment of military forces:** To stabilise a situation arising either out of an environmental disaster, transnational threats, and evacuation of citizens from conflict areas or to protect self-defined national interests. Such deployment of troops has the potential to be the most controversial, both domestically and diplomatically.
- Indian Ocean Region has threats mostly like **piracy, drug trafficking, IUU (Illegal, Unreported and Unregulated) fishing, human trafficking, climate change,** etc.
- The **growing realisation of importance of Indian Ocean Region (IOR) by the littoral states** has brought the seas in the epicentre of a strategic churn.

How does India act as a Net security provider in Indian Ocean Region (IOR)?

- **India's policies**: India's policy towards countries in the IOR is guided by the **'Neighbourhood First' policy** and Prime Minister's vision of **SAGAR (Security & Growth for All in the Region).**
  - **India's Neighbourhood First policy:** It focuses on creating mutually beneficial, people-oriented, regional frameworks for stability and prosperity. India's engagement with IOR countries is based on a consultative, non-reciprocal and outcome-oriented approach, which focuses on delivering benefits like **greater connectivity, improved infrastructure, stronger development cooperation in various sectors area**, security and broader people-to-people contacts.
  - **SAGAR Policy:** The vision of SAGAR is building greater trust and promoting respect for maritime rules, norms and peaceful resolution of disputes**.**
- **Geostrategic positioning:** India's central position in the IOR gives it an immense advantage. Indian Ocean encompasses about 1/5th of the world's sea area and the Indian Peninsula extends 2000 kms into the sea, bringing approximately 50% of the Indian Ocean within a 1000-mile arc ascribed from Indian Territory.

- This provides for a **dominant position for India in the middle of the Indian Ocean**. Its national and economic interests are inseparably linked up with the Indian Ocean.
- The presence of **major maritime chokepoints and Sea Lanes of Communications (SLOCs)** in the IOR lends it strategic importance of gigantic magnitude.

- **Assistance in wake of natural disasters and calamities:** India has been regularly conducting exercises to deepen the Humanitarian Aid and Disaster Relief (HADR) cooperation and coordination among our neighbours with the focus on sharing expertise and assisting building capabilities.
- **Indian Ocean Naval Symposium (IONS)**: It was conceived by the Indian Navy in 2008. It is a forum that seeks to enhance maritime cooperation among Navies of the littoral states of the IOR and helps to preserve peaceful relations between nations.

Significance of IOR for India

The IOR broadly defines **areas consisting of littoral states of the Indian Ocean.** Marked by a glaring cultural, social, political and economic diversity, IOR comprises a number of sub-regions, such as **Australia, South East Asia, South Asia, Horn of Africa and the Southern and Eastern Africa**.

- **Trade**: India **imports about 70% of its oil** through the IOR to its various ports. **90% of India's international trade by volume** is dependent on sea.
- **Resources**: India depends heavily on Indian Ocean resources with her **fishing and aquaculture industries** being a major source of export as well as providing **employment** to more than 14 million people.
- **Countering China's influence**: China's aggressive soft power diplomacy has widely been seen as arguably the most important element in shaping the IOR environment, transforming the entire region's dynamics.

Impediments to India for being a Net Security Provider

- **Resource Availability vs Requirement:** Achieving the status of net security provider can put enormous strain on country's finite resources and calls for manifold increase in existing military hardware.
- **Existing Civil-Military Relationship**: The ambiguous civil-military relationship existing in India not only manifests itself in serious differences and lack of clarity over strategy formulation but also over undistorted execution of formulated policies.
- **Non-alignment Policy:** India has ideologically followed the principle of military non-alignment with any super power so as to retain its strategic autonomy which limits opportunities for deeper security partnerships with other countries.
- **Past Experience of Overseas Deployment**: The recipe of net security provider does encompass 'Overseas Deployment' as a vital ingredient. However, the **experiences in Sri Lanka** continues to have a dragging effect on any thought process involving overseas deployment.
- **Shifting US Policy:** Uncertainty in Indo-pacific policy of US would leave a vacuum in the IOR, which China would be more than obliged to fill. Consequently, for India, this would greatly increase the scope of maritime conflict with China, singly or collusively with Pakistan.
- **Non-traditional threats:** The challenges from non-state forces to include, **piracy, maritime terrorism, drug trafficking, illicit weapons trafficking, illegal migrants,** etc. as well as, vagaries of climate change falls within the ambit of non-traditional threat spectrum of conflict. The frequency of resurgence and occurrence of such threats are very high and hence require immediate attention.

Approach needed for Net Security Provider

- **Focus on capacity building and military diplomacy:** India can easily enhance. capacity building (mainly training) & military diplomacy as activities as they are largely uncontroversial and cost effective.
- **Higher Defence Organisation**: This would enable coherent application of strategic thoughts vis-à-vis a myopic threat assessment by individual Services, which is the case at present.
  - In addition, it would also **facilitate establishing clearly defined priorities of defence acquisitions** and an assured budget for the same, which are pre-requisites for strategic planning.
- **Formulation of a National Defence Policy**: An assertive defence policy would inspire confidence, not only within India but also amongst the small littoral nations of IOR who would then acknowledge her intent, desire and capability to become a net security provider in the region.
- **Coherent IOR Strategy**: India needs to formulate and adhere to a coherent IOR strategy involving complementary intents and actions in dealing with IOR nations rather than piecemeal strategy on stand-alone basis with each IOR nation.

- This would help in exerting a positive influence over these nations and help the smaller nations overcome any potential inhibition towards gauging India through the prism of 'Big Brother' syndrome.

- **Development of Andaman, Nicobar and Lakshadweep Islands**: Infrastructure up-gradation in these islands and their development as a potent military base would be amongst the first steps needed for an assertive Indian Ocean policy.
- **Capability Enhancement of IOR Nations**: A thrust on capability enhancement of IOR nations, particularly their respective navies, would accrue immense benefit for the entire IOR. India is already involved in training of naval personnel from various IOR nations as part of exchange programmes.

2.2. INDIA-MALDIVES RELATIONS

Why in news?

The **"India Out" protests** have **increased in pitch** since the release from house arrest of former Maldives president **Abdulla Yameen**.

More about news

- **The "India Out" campaign** targets the presence of **large numbers of Indian military personnel** in the Maldives and asserts that the government is planning to **hand over the Uthuru Thilafalhu atoll** to the Indian Navy.
- It has highlighted the **difficulties** that both countries face in **building a stable strategic partnership** while also addressing **popular sensitivities.**
- The Maldives government **responded sharply** by describing India as the country's "**closest ally and trusted neighbour**". It is also considering **legislation to criminalise protests** "that affect the **country's relations with other nations**". The draft bill is seen as effectively targeting the **"India Out" campaign.**

India-Maldives relations: Brief background

- India was **among the first** to recognize Maldives **after its independence in 1965** and to establish **diplomatic relations** with the country.
- Both countries **share ethnic, linguistic, cultural, religious and commercial links** steeped in antiquity. Except for a brief period between February 2012 to November 2018, relations have been **close, cordial and multi-dimensional**.
- The relation is free of any **politically contentious** issues. The one-time **claim of Maldives to Minicoy Island** was resolved by the **Maritime Boundary Treaty of 1976** between the two countries, whereby Maldives has recognized **Minicoy as an integral part** of India.

Significance of Maldives

- **Geostrategic:** Maldives' **proximity to the west coast** of India and its **potential to allow a third nation's naval presence** in the area imbues it with **significant strategic importance** to India.
  - It is an important member of **India's 'Neighbourhood First' policy** and **SAGAR (Security and Growth for All in the Region) vision.**
- **Geopolitical:** As **maritime economic activity** in the Indian Ocean has risen dramatically, the **geopolitical competition** has intensified in which Maldives plays a **key role** due to her **strategic maritime geography.**
  - China's '**Belt and Road' Initiative (BRI)**, involving the Maldives has widened the Chinese sphere of influence that has potential to **adversely impact India's interests**.
- **Geoeconomics: Sea lanes of communication (SLOCs)** in the vicinity of the Maldives have immense significance for global maritime trade and for India since nearly **50 per cent of India's external trade and 80 per cent of her energy imports** transit these westward SLOCs in the **Arabian Sea.**

- **India's credentials of being the first responder:** Apart from prompt assistance during the **1988 coup attempt**, India was the **first to assist during the 2004 Tsunami** and during **water crisis in Malé** in December **2014 (Operation NEER** to dispatch **water aid** after a fire destroyed its biggest water treatment plant).
    - India's swift dispatch of **30,000 doses of measles vaccine** in January 2020 to **prevent an outbreak** in the Maldives, and **rapid and comprehensive assistance** since the COVID-19 pandemic has further **reinforced India's credentials of being the first responder.**
- **Net security Provider:** Maldives is positioned like **a 'toll gate'** between the **western Indian Ocean** chokepoints (Gulf of Aden and the Strait of Hormuz), and the **eastern Indian Ocean chokepoint** of the Strait of Malacca. It is an important partner in **India's role as the net security provider** in the Indian Ocean Region.

Areas of engagement

- **Bilateral Economic and Trade Relations:** India-Maldives **bilateral trade stood at US$ 246 million in 2020**, heavily in **favour of India**. India emerged as **Maldives' 2nd largest trade partner** in 2020.
    - **Indian imports** from the Maldives primarily comprise **scrap metals** while **exports include a variety of engineering and industrial products** like drugs and pharmaceuticals, agriculture produce, poultry produce etc.
    - India is also **offering USD 100 million grant support** to the **Greater Male Connectivity Project** which will be a major catalyst for the Maldivian economy.
- **Security and Defence Cooperation**: India provides the largest number of training opportunities for Maldivian Defence Force, meeting around **70% of their defence training** requirements. A **comprehensive Action Plan** for Defence was also signed in **April 2016** to consolidate defence partnership.
    - Key projects in the defence sector include **Composite Training Centre**, Coastal Radar System (CRS) and construction of new **Ministry of Defence Headquarters.**
- **Development Cooperation**: The major completed, and ongoing **development assistance projects** executed by India are **Indira Gandhi Memorial Hospital, Maldives Institute of Technical Education** (now called the Maldives Polytechnic), **Technology Adoption Programme** in Education Sector in Maldives etc.
    - A **US$ 800 million Credit Line Agreement** between Ministry of Finance, Maldives government and EXIM Bank of India was signed in March 2019 for financing connectivity and infrastructure projects.
    - Further, India has funded several projects in Maldives under its **High-Impact Community Development projects scheme.**
- **Others:**
    - **Tourism**: In 2019, India was the 2nd largest source of tourist arrivals in Maldives. In 2021, India was the **largest market** with a **23% market share.**
    - **Culture**: **Exchange of cultural troupes** takes place regularly between the two counties. The Indian Cultural Centre (in Male) was inaugurated in 2011 to give **a further boost to the cultural activities**.
    - **People-to-People contacts**: Indians are the **second largest expatriate community** in Maldives. About **25% of Doctors and Teachers** in Maldives are **Indian nationals.**
        - ✓ India is a **preferred destination** for Maldivian for **education, medical treatment, recreation and business**.

Challenges in India-Maldives relations

- **Domestic factors**: India's relationship with the Maldives was slightly **ruffled during the regimes of Mohammed Hassan and Abdulla Yameen (2013-18).** This was due to Yameen's open **preference for Saudi Arabia and China** and **hostility towards India**.
    - Situation changed after election of President Solih in 2018 who reaffirmed **"India-First Policy".**
    - **Recent acquittal** of former president Yameen has wider **implications for Maldives-India relations** which was also visible in **"India out" protests.**
    - In 2018, India had **voted against Maldives** and in favour of Indonesia for a **non-permanent seat at the UN Security Council.**
- **Growing Chinese influence**: China is **actively establishing its presence** in this strategically positioned island-state by involving itself in **large number of infrastructure projects** in the archipelago which is a **major concern** for India.
    - In 2018, when the Maldives **faced a turbulent political crisis**, Chinese **warships were deployed** just off the eastern fringes of the Indian Ocean. Such events have served to **intensify the regional strategic competition**.

- **Concerns of workers:** Expatriate workers, particularly the unskilled labourers sometimes face problems relating to **holding of Passports** by employers, **non-payment of salaries** and other dues, exploitation and other job-related harassment.
- **Popular sensitivity:** While the recent 'India-First Policy' of the Maldives and **India's 'Neighbourhood First Policy'** are intuitively complementary, the challenge lies in implementing these policies with **cultural, geoeconomic, and geostrategic sensitivity.**
    - Relationship between one of the **largest countries** in the world and one of the **smallest** inevitably brings **sensitivities.** Opposition leaders have raised concerns **that presence of Indian military personnel** undermines Maldives **sovereignty.**

Way Forward

- **Deepening security cooperation:** Security cooperation should be furthered through various mechanisms like 'Colombo Security Conclave' under which **India, Sri Lanka and the Maldives** have agreed to work **on "four pillars"**, covering areas of **marine security, human trafficking, counter-terrorism, and cyber security.**
    - The potential for both countries to work together on adaptive and mitigating measures against the adverse **maritime-impacts of climate change** is enormous.
- **Gujral doctrine**: To guide India-Maldives relations, five **basic principles** of Gujral doctrine are relevant:
    - With **Nepal, Bangladesh, the Maldives and Sri Lanka**, India would **not ask for reciprocity**, but do all it could in **good faith and trust**;
    - Not allowing one's territory to be used **against another country**;
    - **Non-interference** in the internal affairs of another;
    - Respecting one another's **territorial integrity and sovereignty**;
    - **Settling disputes peacefully** through bilateral negotiations.

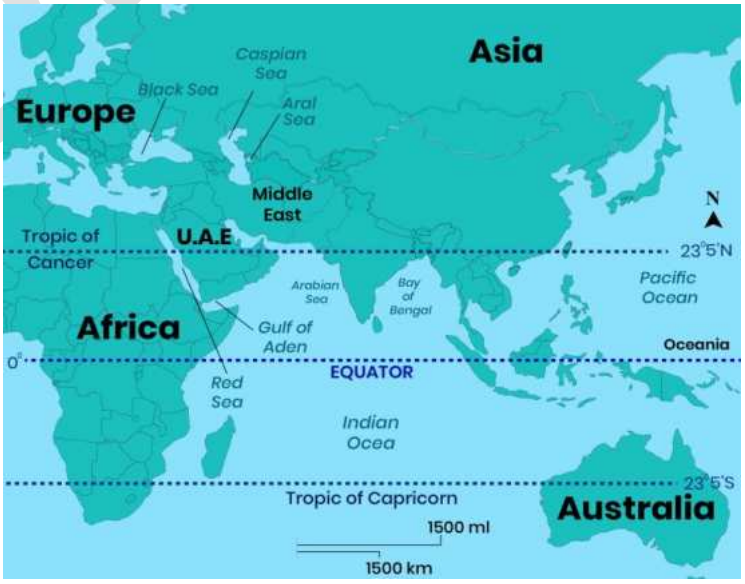
Conclusion

Given India's **huge presence in multiple spheres** and attempt of Maldives to diversify its foreign investments to avoid consequences as in Sri Lanka from Chinese "debt-trap diplomacy," India will **remain important** for Maldives. The relationship should be boosted through **imaginative foreign-policy initiatives.**

2.3. INDIA-UAE RELATIONS

Why in news?

India and the United Arab Emirates (UAE) signed a **Comprehensive Economic Partnership Agreement (CEPA).**



More about news

- 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.

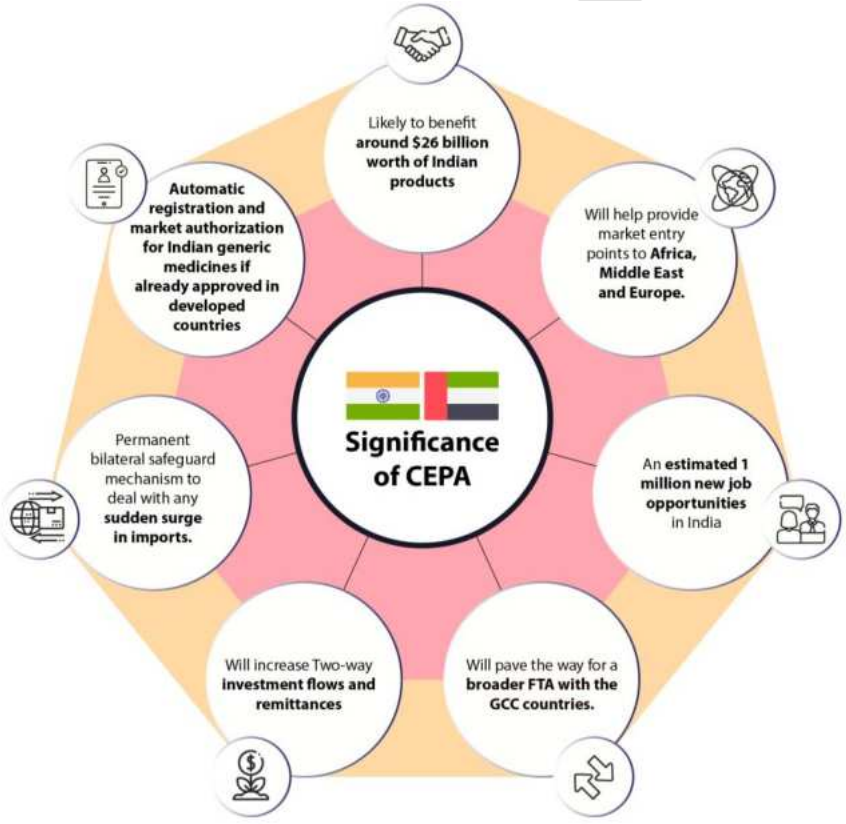
India- UAE relations

- India and United Arab Emirates (UAE) enjoy **strong bonds of friendship** based on age-old **cultural, religious, and economic ties** between the two nations.
- **1972:** Establishment of **diplomatic relations.**

- **2015:** Received impetus with the visit of Indian PM to UAE in 2015;
  - Beginning of a **new strategic partnership.**
- **2017:** Relations upgraded to Comprehensive Strategic Partnership.

Areas of engagement

- **Energy:** UAE is an important **supplier of crude, LNG and LPG** to Indian market. In 2020, UAE was the **3rd largest source** of India's **oil imports (22 million tonnes).** UAE is also a major source **of LPG**.
- **Trade and investments:** UAE is already **India's third-largest trading partner** with bilateral trade in 2019-20 valued **at $59 billion**. India ranks as the UAE's **number one trading partner for non-oil exports**, accounting for **nearly 14 percent** of the UAE's total non-oil exports globally.
  - UAE is the **second largest export destination** of India (after US) with an amount of over **US$ 30 billion** for the year 2018-19.
  - The UAE is also regarded as a valuable source of foreign direct investment (FDI) in India. UAE investments are currently billed **about $18 billion**.
  - The special **UAE PLUS desk** and the **Fast Track Mechanism** have played crucial roles in facilitating investment.
  - More engagement is expected through the **West Asia Quad** that was launched last year by **US-Israel-India-UAE** as a platform for **economic cooperation.**



- **Diaspora**: Indians are the **largest ethnic** community- about **30% of the population**- in all walks of services- Administrative, Health and Tourism and labour- and send remittances of about **$14 billion a year.**
- **Defence and security:** Recent progress in relations stems also from **broadly compatible geopolitical outlooks** and **shared security concerns**. Both sides recognize that the **security of the Gulf and the Indian Ocean** are indivisible.
  - India is keen on **enhancing security cooperation** with the UAE to **counter terrorist threats and combat online radicalization**. India and UAE hold **annual defence dialogue.**
  - **Defense exercises**: **Desert Eagle** bilateral exercise between air forces of both countries, **joint naval exercise (Gulf Star-1)** conducted in 2018.
  - Indian and Emirati militaries have regularly participated **in defence exhibitions** in India and UAE.
  - UAE is also a key part of **Indian Ocean Region dialogue.**
- **Jammu and Kashmir**: After India's move on Article 370 and **bifurcating Jammu Kashmir**, the UAE was one of the first countries to **offer its support** and has subsequently signed a number of MoUs promising **investment and infrastructure in J&K** and starting flights.
  - This is significant, as the UAE had **traditionally supported Pakistan** on the issue.
- **Terrorism- extradition and support:** From being seen as a safe haven for some of India's most wanted terrorists and underworld figures, post 2001, the UAE decided to change policies, and now **cooperates with India** both on extraditing **fugitives and terror suspects** as well as **intelligence sharing**.
- **Technology partnerships:** Both countries have signed several **digital innovations, technology partnerships**, and plans to cooperate on missions like the **Red Moon mission**. The Emirates has offered **"golden visa" residency permits** for doctors, engineers, PhD scholars and specialists in **high-end technology fields** such as artificial intelligence (AI).

Challenges in India-UAE relations

- **Energy pricing**: As an OPEC country, UAE is on the **supply side** of the debate, whereas India, as a major oil consumer, is arguing for **a cap on prices**.
- **Balancing geopolitics** i.e., India **with Iran and UAE** (also played out over Yemen) and UAE **with India and China.**
- **Treatment of Indian labour**: Indians aren't **granted citizenship** in the UAE, and conditions at Indian labour camps is also a matter of concern. During the pandemic **much of the labour to the gulf has had to return**, and remittances are **likely to be slashed** in the next few years.
- **Air services agreement**: India and UAE are **yet to renegotiate** their air services agreement, which has become a thorn in ties, because the UAE **wants to increase the number of flights** to India and the number of destinations, but India continues to **cap these to protect Indian airlines**.
- **Treatment of minorities in India**: The Organisation of Islamic Cooperation (UAE is a member) has raised concerns and issued strong statements against perceived injustices against Muslim minorities in India.

Road Ahead

- **Improving the investment climate in India**: India has a huge market and there is a significant scope for growth in automobile industry, services sector, agriculture and allied industries. If **business regulations are eased** and the time spent on **getting clearances can be reduced**, it can lead to major investments from UAE.
- **Enhancing defence engagement:** There is a need to further enhance cooperation through **joint training programs** for Indian and UAE officers. Increasing the number of Emirati **officers who can avail training** in its defence schools will lead to **greater familiarization** within the defence establishment.
- **Untapped potentials in various areas:**
  - **Promoting medical tourism:** India's **private hospitals** have the necessary **infrastructure, facilities and expertise** to provide **world class medical care** within a **fraction of the cost spent in developed countries**. Hence, it can be an **important area** where India can attract Emiratis.
  - **Renewable energy**: The **cost for production and transmission** of solar energy in the UAE are a fraction to that of India and this is a **priority area** for the UAE government. Indian companies **with expertise** in this area can **invest in the renewable energy** sector in UAE.
  - **Education sector**: India has some of the finest higher education institutions in **engineering and management fields** and given their **cost-effective and world-class education**, they can be a major attraction for UAE students looking for **acquiring higher education and better skills**.
- **Enhancing people to people contacts**: There is a need for enhancing the people-to-people contacts for **familiarization** and increasing **interactions between think tanks, researchers and through academic exchanges.**

Conclusion

India-UAE relations have become a pivot of **India's Extended Neighborhood and Look West Policy** in the region. The fast trajectory of developing **Indian-Emirati relations over the past decade** shows that both nations are turning **a new page**.

2.4. NEWS IN SHORTS

2.4.1. MUNICH SECURITY CONFERENCE (MSC)

- India's External Affairs Minister spoke on an array of issues pertaining to India's strategic policies and diplomatic stances during MSC 2022.
- MSC is, **world's leading forum,** an annual conference on **international security policy** that takes place in Munich, Germany since 1963.
  - "**Turning the Tide. Unlearning Helplessness**" is the conference motto and the title of Munich Security report.
  - The conference takes place **every year in February** in Munich, Germany.

2.4.2. UKRAINE RUSSIA CONFLICT

Recent developments

News	About
United States and European nations on Saturday agreed to block select	• Founded in 1973, SWIFT (Society for Worldwide Interbank Financial Telecommunication), **a non-listed, Belgium-based firm is actually a cooperative of banks.** • It **doesn't handle any transfers of funds itself,** but its messaging system provides banks the

Russian banks from SWIFT	means to communicate rapidly, securely and inexpensively. • Banks **use the SWIFT system to send standardised messages about transfers of sums** between themselves, transfers of sums for clients, and buy and sell orders for assets. • This measure will ensure that **Russian financial institutions are disconnected from the international financial system** and harm their ability to operate globally.

Ukraine moves International Court of Justice (ICJ), files case against Russia	• The lawsuit demands that **Russia be held accountable for distorting the concept of genocide** to justify aggression.
	• ICJ is **principal judicial organ of United Nations** established in June 1945 by Charter of UN.
	  ○ **Seat of the Court is at the Peace Palace in The Hague (Netherlands).**
	• **It is composed of 15 judges,** who are elected for terms of office of nine years by United Nations General Assembly and Security Council.
	  ○ **Judge Dalveer Bhandari from India** is among present members.
	• Its official languages are **English and French**.

India abstains from UNSC resolution "deploring" the Russian invasion of Ukraine	• India, along with China and the United Arab Emirates, abstained from a vote. ○ Resolution **was not passed since Russia vetoed it.** • Resolution called for Russia to **cease the use of force against Ukraine,** withdraw all its forces etc. • While abstaining, India expressed its **commitment to "UN Charter, international law, and respect for the sovereignty and territorial integrity of states**" and asked all states to "honour these principles in finding a constructive way forward".
Operation Ganga	• It is an **evacuation mission by Indian government** to bring back all the Indian nationals who are currently stranded in Ukraine.

2.4.3. DONETSK AND LUHANSK REGIONS

- Russian President recognized two separatist **eastern Ukrainian regions- Donetsk and Luhansk.**
  - Donetsk and Luhansk regions are **collectively known as the Donbas.**
- The region **comprises both Ukraine-controlled parts** as well as **separatist-controlled areas**.
  - Its main industries are **coal mining and steel production**.
  - Most of the people living in these regions **speak Russian**, result of migration of Russian workers after World War II, during the Soviet era.

2.4.4. NORD STREAM 2

- 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**.
- It runs **parallel to an earlier Nord Stream pipeline** which has been working since 2011 and would double its capacity, to 110 billion cubic meters of gas a year.
- Russian **state-owned gas company Gazprom** owns half of Nord Stream 2

QUIZ
SMART QUIZ
You can scan this QR code to practice the Smart Quiz of International Relations at our open test online platform for testing your understanding and recalling of the concepts.

3. ECONOMY

3.1. 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: • **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%**. • **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	• 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

Different from taxation of gains from other classes of capital assets, it offers benefits like:

- **Dynamic Definition:** The dynamic nature of definition allows the government to include or exclude any new virtual digital assets as and when needed.
- **Stringent Taxation:** 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:** It will pave the way for classifying virtual digital assets as a separate asset class. E.g., gifting of virtual assets.
- **Resource Mobilization:** Taxes will help in generation of additional revenues, reducing the fiscal deficit and providing funds for holistic economic growth of a nation.

Central Bank Digital Currency (CBDC)

Definition of bank note under the RBI Act 1934 is also amended to broaden "bank note" means a bank note issued by the Bank, whether in **physical or digital form**. It will allow introduction of **CBDC** from RBI in 2022-23 with benefits like:

- Giving **boost to digital economy**.
- Help in **efficient and cheaper currency management system**.

Concerns over Taxation Framework

- **Concerns over Definition** such as-
  - **Broad definition** carries risk of potentially including vouchers, reward points issued by shopping sites or credit card companies, airline miles etc.
  - **No clarity** on taxation over underlying assets of virtual digital assets like NFT.
- **Issues in Taxation Provisions**
  - **Cost of acquisition and Sales Consideration** is not defined, leading to confusion whether brokerage paid will be part of cost or will be deducted from sales consideration or not.

- Income of miners, persons minting NFT, crypto exchanges fee etc. are also not specifically specified for taxation.
- Risk of peer-to-peer (P2P) or wallet-to-wallet transactions escaping this tax.

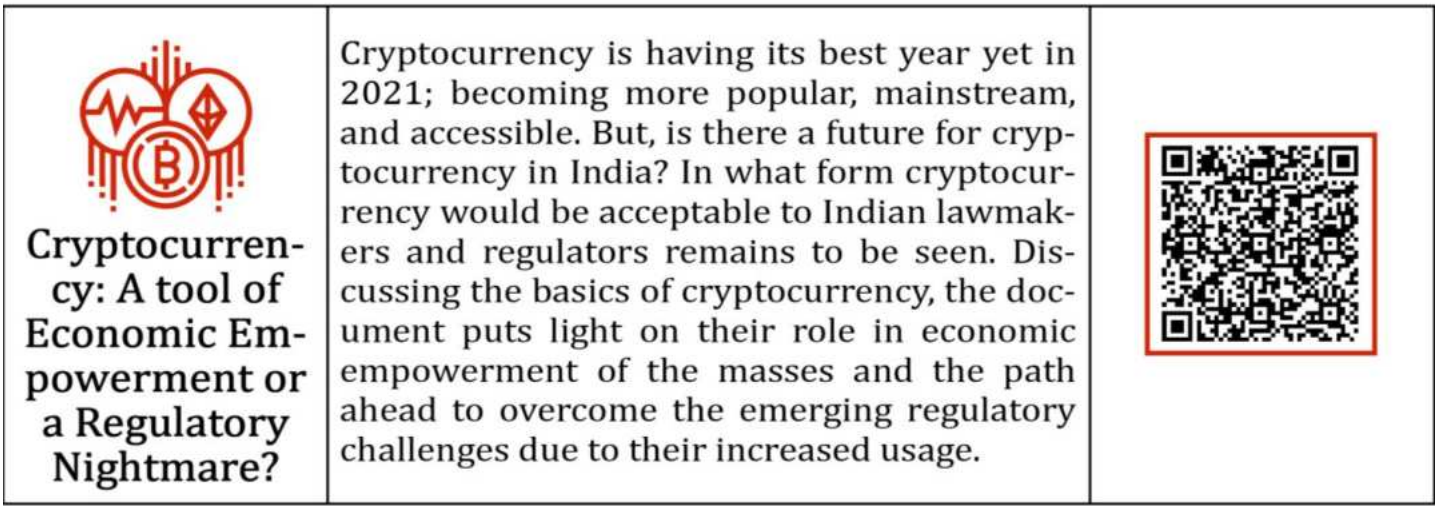
- **Taxability of income from digital assets** for FY 2021-22 is still open for interpretation as the proposed framework will be applicable from 01.04.2022.
- **Cumbersome TDS process** if transaction involves non-resident buyer from a resident, requiring TAN number (Tax Deduction and Collection Account No) in India to deduct the TDS.
- **No clarity on Goods and Services tax** on virtual digital assets.
- **Money Laundering and Terror Financing** concerns remain with provisions for tax on gifted crypto assets likely to be misused due to anonymity of assets and data gaps for regulators.
- **Defrauding and misselling of products remain** due to limited or inadequate disclosure/oversight and chances of using taxability to show transactions in them as legal.
  - E.g. Out of over 16,000 listed digital tokens only 9,000 exist today.
- **Falls Short in addressing** RBI and IMF concerns over **greater financial instability** from crypto assets.

Way Forward

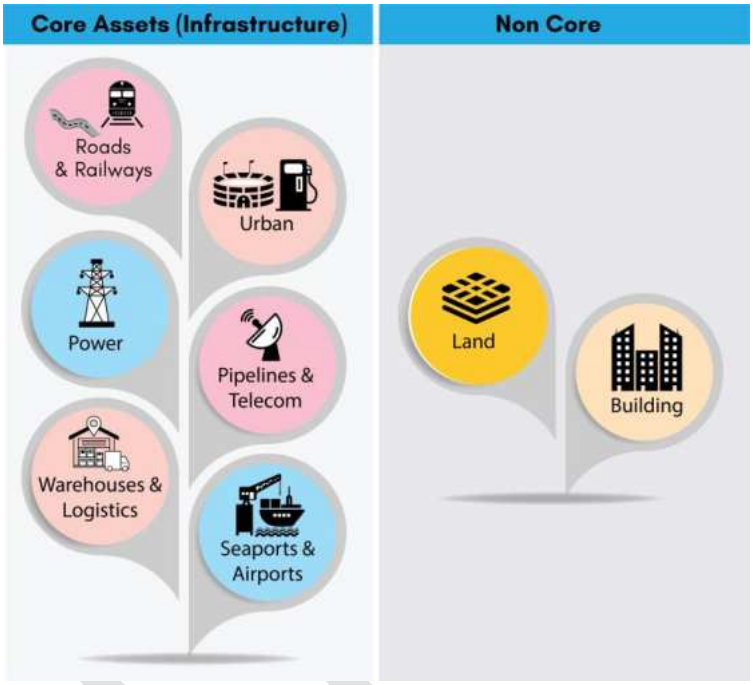
The new taxation framework serves as the first step towards regularization of virtual digital assets. It shows the government intention to dissuade investment in the volatile assets instead of outright banning them. But the growing magnitude and frequency of transactions calls for:

- **Finalization of legal status of crypto assets**, i.e. providing clarity on ban or bring **supervision contingent** on the financial stability risks posed by them.
  - This includes the disclosure norms, fit and proper rules for network administrators and issuers to regulate the business activities of its gatekeepers and ensure their productive use for economy and society.
- **Strong vigil and better coordination** among all government agencies to address data gaps and avoid its misuse for activities like money laundering.
- **Launch of CBDC** to promote financial inclusion and ensure effectiveness of RBI in implementing monetary policy.
- **Awareness among people** over volatility of virtual digital assets and mere taxing as no acceptance of transaction as legal to reduce misselling frauds.
- **Clarity in Taxation Framework** over issues related to- definition of virtual digital assets; taxation provisions including GST regulations, TDS process, etc.

To know more about **Cryptocurrency,** please refer to our following Weekly Focus Document.



3.2. ASSET MONETISATION



Why in News?

Recently, the government has set up a **National Land Monetisation Corporation (NLMC)** to fast-track monetisation of land and non-core assets of public sector entities.

More on News

- 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**.
- As per latest Economic Survey, Central Public Sector Enterprises (CPSEs) have referred around 3,400 acres of land and other **non-core assets** for monetisation to **Department of Investment and Public Asset Management (DIPAM)**.
    - This includes CPSEs like MTNL, BSNL, BPCL, B&R, BEML, HMT Ltd, Instrumentation Ltd.
- Monetisation of **core assets** is steered by **NITI Aayog**.

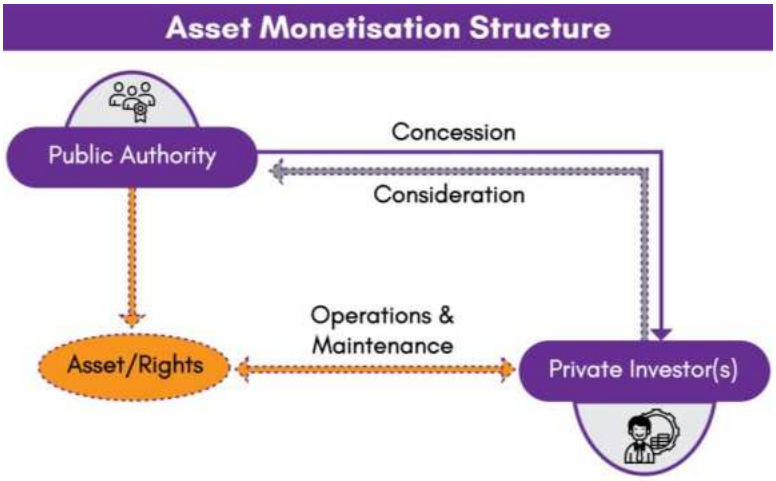
About DIPAM

- DIPAM is one of the Departments under the **Ministry of Finance**.
- It deals with **all matters** relating to-
    - **Management of Central Government investments** in equity including **disinvestment of equity** in CPSEs.
    - **Sale of Central Government equity** through offer for sale or private placement or any other mode in the erstwhile CPSEs.
- Its work is divided under **four major areas** as:
    - Strategic Disinvestment & Privatization,
    - Minority Stake Sales,
    - Asset Monetisation, and
    - Capital Management.

About Asset Monetisation

Also referred to as **asset or capital recycling,** asset monetisation involves creation of new sources of revenue by unlocking the value of hitherto unutilized or underutilized public assets.

- With projected infrastructure investment of **₹111 lakh crores** during FY 2020 to FY 2025 under **National Infrastructure Pipeline (NIP)**, **15-17%** of it is expected to be met through **innovative** and **alternative** initiatives such as asset monetisation.
- As per Economic Survey, there is an **aggregate monetisation** potential of **₹6 lakh crore through core assets of the central government** over a four-year period from 2021-22 to 2024-25.
    - Around **83%** of the aggregate value is to come from the **top five sectors** (roads, railways, power, oil and gas pipelines and telecom).
- Asset Monetization is different from 'privatization' and 'slump sale' of assets; it represents a **structured partnership** with the private sector having defined **contractual frameworks**.



Benefits of Asset Monetisation

Indian infrastructure development is largely driven by the public sector or public funding. The private sector and debt financiers' **appetite for greenfield (new) infrastructure development has remained subdued** due to financing issues, project clearance delays etc.

Structured around **mature brownfield assets, asset monetisation helps** in it through-

- **Resource mobilization** through diversified alternatives providing **long-term capital for enhanced infrastructure investment**.
    - It can play a **critical role** in revival of growth post Covid-19.

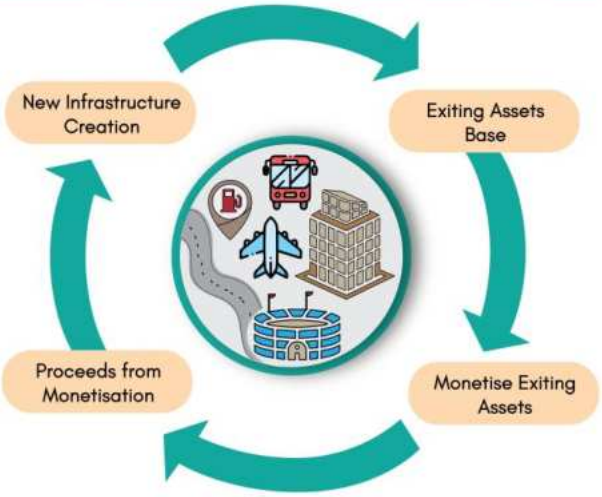
Significance of NMP

Understanding the Difference

	Asset Monetisation	Disinvestment	Strategic Disinvestment	Privatisation
Meaning	Government cedes control over its assets for a certain period of time, after which the assets must be returned to the government unless the lease is extended.	Govt shareholding in an asset is reduced but remains >51%.	Sale of a substantial portion of the Government shareholding of up to 50%, or higher to either private or public entity.	Govt shareholding in an asset is <51%.
Ownership	Remains with the Govt.	Remains with the Govt.	Transferred to Public/Private Entity.	Transferred to Private Entity.
Management Rights	Temporarily Transferred to Private Entity	Remains with the Govt.	Transferred to Private Entity.	Transferred to Private Entity.

- **Create greater financial leverage and value** for companies as well as for government with significant stake in them through better use of resources.
    - E.g., **Railways has 0.51 lakh hectare of land assets lying vacant.**
- **Efficient operation and management** of existing sub-optimally utilized infrastructure. This is due to greater operational efficiencies of the private sector.
    - E.g., Non-core assets like residential buildings and office spaces with BSNL and MTNL.
- **Other benefits:**
    - **Sustained Economic Growth** through well managed infrastructure, providing better access to market and materials at reduced costs for other businesses.
    - **Support livelihood** with increased employment opportunities due to the inherent ability of infrastructure to generate employment.
    - **Improved Quality of Life** through increased investment in good quality Infrastructure from mobilized resources. E.g., spending money on core assets or social infrastructure like schools, hospitals.

Infrastructure Asset Monetisation Cycle



Challenges to Asset Monetisation

Financial Challenges	• Availability of a sustained **and robust asset pipeline to attract and keep investors interest in bidding.** • **Lack of identifiable revenue streams and revenue transfer mechanism in various infrastructure assets.** • Can lead to higher prices for consumers **due to leasing of public utilities to private investors.**
Regulatory Challenges	• **Lack of independent sectoral regulators** who could provide dedicated domain expertise and simultaneously aid development of the sector. • **Structural problems such as legal uncertainty and the absence of a deep bond market** that hold back private investment in infrastructure. • **Inefficient Dispute resolution mechanism.**
Other Challenges	• **Lack of State participation** despite holding large assets; • **Uncertainties** due to Covid-19, climate-related disasters and economic transformation under Industrial Revolution 4.0, • Concerns over **political influence** and **issues of corruption**.

Way Forward

National Monetization Pipeline (NMP) with sector specific plans is first step to help private sector plan their fundraising on brown-field asset inventory with potential financing opportunities. Other steps which can help address challenges and help meeting asset monetisation targets includes:

- **Ensure proper implementation** of asset monetization plan by:
  - **Building capacity and expertise** among public authorities with desired skill set to ensure monetisation of land and other non-core assets efficiently.
  - **Systematic and Transparent allocation** of assets, in line with international best practices with **oversight committee** to ensure international investors interest.
- **Work Closely with States** to encourage them for leveraging assets for resource mobilization to ensure high capital investment for higher growth and jobs.
- **Developing proper brownfield models and frameworks** to set quality benchmarks with:
  - **Flexibility in contracts** to address unforeseen developments.
  - **Robust Dispute Resolution Mechanism** to avoid needless and long litigation (also recommended by Kelkar Committee on PPPs).
- **Strong regulatory framework** with innovative models like InvITs and REITs (under SEBI) for non-core sector as well to ensure participation from different investor class such as global pension funds, sovereign wealth funds and retail investors.
  - E.g. the success of POWERGRID Infrastructure Investment Trust (PGInvIT).

3.3. 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.
- Global credit rating is dominated by **three credit rating agencies** (S&P, Moody's, and Fitch).
- 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**.

CREDIT RATING SCALE COMPARISON BETWEEN SOME MAJOR CRAs

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

Source: IMF (2010)

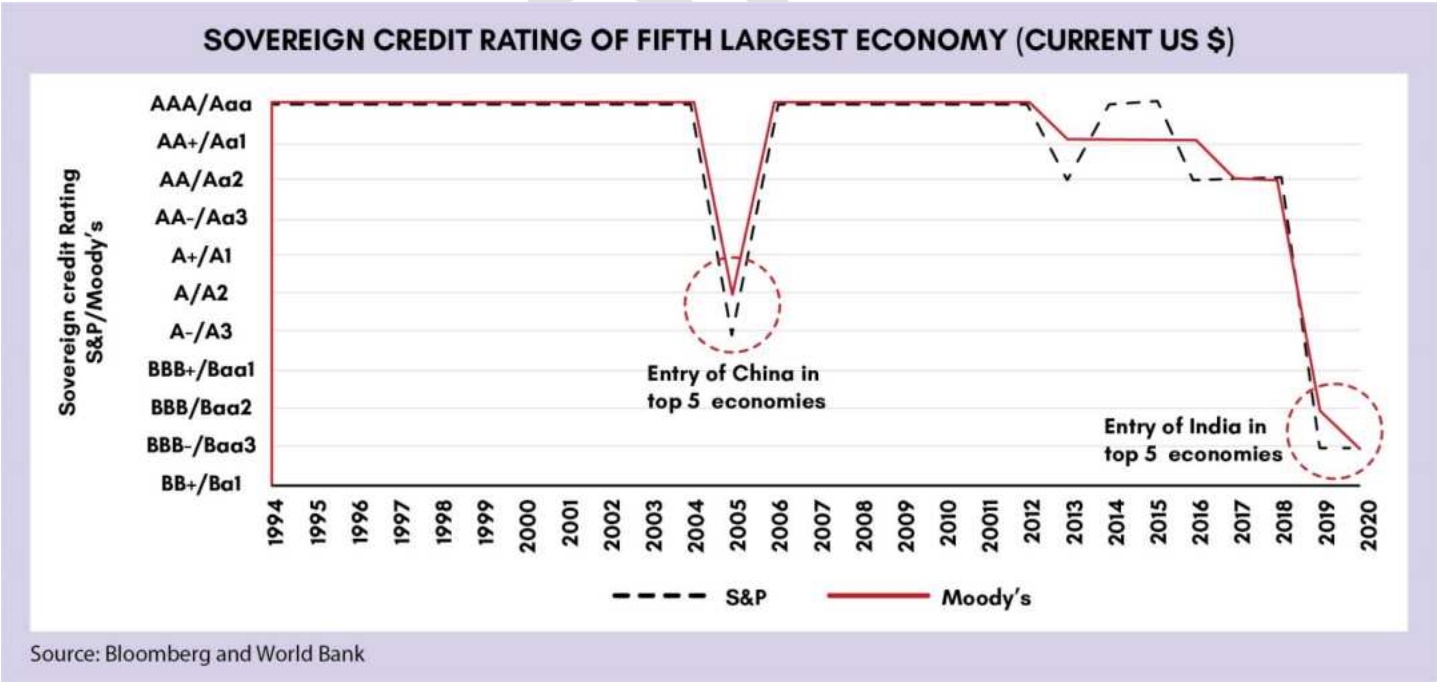
Importance of SCR

Importance of SCR	
For Governments	Governments obtain SCR to facilitate- • **Borrowing Money from global capital markets** by indicating its ability to pay back the money borrowed. • **Attract Foreign Investment** by indicating the country's worth as an investment destination. • **Assessment** on the country's economic and political environment to benchmark itself with other nations.
For Investors	Though not a **guarantee or absolute measure**, it is used by investors, as part of multiple analytical resources, to make **informed investment decisions** by- • **Highlighting Level of Risk**, i.e., providing information on the level of risk involved with investing in a particular country, including any political risk. • **Strategic Planning** through relative comparison against similar peers. These investors include **sovereign wealth funds, pension funds etc.**

India's Sovereign Credit Ratings (SCR)

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

- India's SCR and outlook from three global rating agencies is as given in **image**, where-
  - **Moody's Baa3** or higher rating is considered investment grade. While Ba1 or below rating is considered speculative.
  - S&P and Fitch's **BBB-** or higher rating are considered investment grade. While BB+ or lower ratings are considered speculative/junk grades.
- 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.



Source: Bloomberg and World Bank

Reasons for differing view between Rating Agencies and Government	
Reasons given by Rating Agencies for Low Rank	• **India** is the **most indebted emerging market**. • Deteriorating fiscal position or **high deficit**. • Budgetary support for near-term growth with **lack of clarity on long-term fiscal consolidation**. • Challenges in implementation of policies to mitigate risks of a sustained period of low growth such as **little financial headroom to respond to potential growth shocks**.

Reasons given by Government for its higher SCR	• **Zero sovereign default** history. • **High GDP growth rate**, **low inflation,** and **V shaped recovery**. • **Improved financial stability** with large recovery of bank bad loans. Recently, NARCL and IDRCL were also set up to address the bad loans. • **Higher Foreign Exchange Reserves** when compared to the country's debt. • **High political stability** with improved Ease of Doing Business, Rule of Law, corruption control etc.

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

Way Forward on Global Rating

To effectively address the issues raised by emerging economies like India, the **Rating Agencies** need to take a number of steps such as:

- **Improve transparency** in ratings to address concerns like **higher probability** and **higher size** of **downgrade** of emerging countries compared to developed economies.
- **Avoiding Reactive SCR** for emerging countries to keep them free from any bias and subjectivity.
- **Engage emerging countries and their rating agencies** to ensure their methodology reflects the true ability of economies and willingness to pay their external obligations.
- **Proper scrutiny of entities** from developed countries.
  - E.g., Positive credit ratings for mortgage-backed securities by them in US lead to **bad investments,** contributing to great recession of 2007-09.
  - Similarly, downgrading of Greece, Portugal, and Ireland by S&P in 2010 worsened the European sovereign debt crisis.

Domestic Rating Agencies

- In India, Credit rating agencies are **regulated by SEBI** under SEBI (Credit Rating Agencies) Regulations, 1999 of the Securities and Exchange Board of India Act, 1992.
- Presently, we have **seven domestic rating agencies** (see image).

Recent steps by SEBI for Accountability from Rating Agencies

- **Tightened disclosure standards** for credit rating agencies while assigning ratings to companies and their debt instruments.
- **Disclose liquidity position** of a company being rated.
- **Disclose rating history** and how the ratings have transitioned across categories.
- **Disclose the source of funding** if rating is assigned on the **assumption of cash inflow**.
- **Analyze the deterioration of liquidity** and also check for **asset liability mismatch**.

3.4. GREEN BONDS

Why in news?

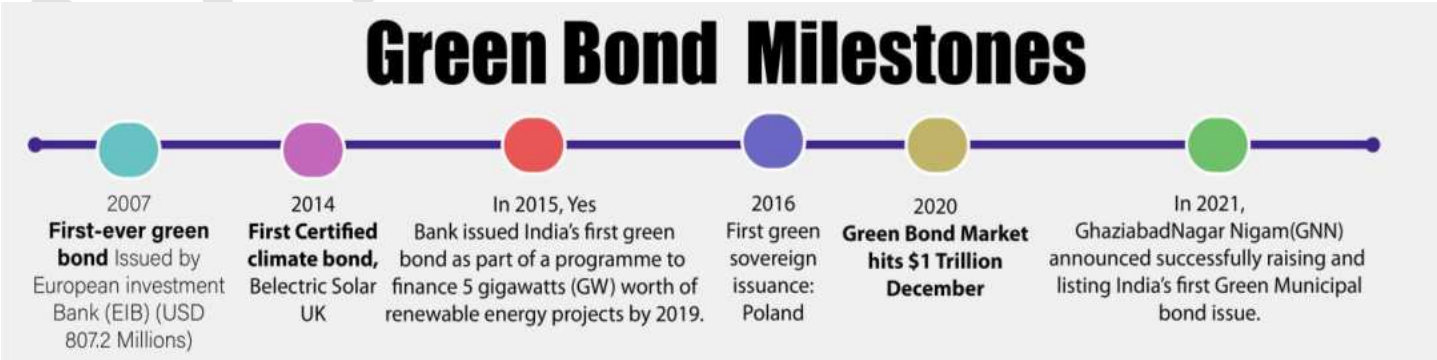
Recently, The Government planned to issue **sovereign 'green bonds'**, a move planned towards achieving carbon neutrality.

About Green bonds

- Green bonds are **fixed-income financial instruments** which are used to fund projects that have positive environmental and or climate benefits.
- They are just like any regular bond with a key difference that the money raised from investors is **used exclusively to finance projects that have a positive environmental impact such as renewable energy and green buildings**.
- The popularity of green bonds has been rising considerably, **driven primarily by investors embracing socially responsible investing, and not a better risk and return potential over conventional bonds.**
- Any organization – such as governments, corporations, and financial institutions – can issue a green bond.

Advantage of green bonds

- **Promotes Clean Energy:** Green bonds aims to put energy transition and clean energy at the heart of India's economic growth. More specifically, green bonds finance projects aimed at **energy efficiency, pollution prevention, sustainable agriculture, fishery and forestry, the protection of aquatic and terrestrial ecosystems, clean transportation, clean water, and sustainable water management**.
- **Sustainability:** Green bonds are **designated bonds** intended to **encourage sustainability and to support climate-related or other types of special environmental projects**. They also finance the cultivation of environmentally friendly technologies and the mitigation of climate change.
- **Long term funds:** The green bond market is globally expanding at a fast pace and will help India access long-term funds at competitive rates.
- **Benefits for issuers:**
  - Highlights their green assets/business
  - Positive marketing story
  - Diversify their investor base
- **Tax incentives:** Green bonds may come with tax incentives such as tax exemption and tax credits, making them a more attractive investment compared to a taxable bond.
- **Untapped potential:** India has the second largest bond market among emerging markets after China. However, India's green bond market is roughly less than a tenth the size of China's, which points to the country's untapped potential.



Challenges with green bonds

- **Sovereign Credit Rating:** India's current sovereign credit rating indicates that many green bonds would require credit enhancement in order to attract international investors. Demand and performance of green bonds would depend on the robustness of the bond market of the country.
- **Regulatory uncertainty:** Regulatory uncertainty is also created by situations where tariff is unilaterally revised or allotted tenders are cancelled.
- **Greenwashing:** Greenwashing, as a concept, refers to the deceptive promotion of the perception that an organization's products, aims or policies are environmentally friendly.
    - With no single global standard or recognised legal definition and the market criteria based on voluntary compliance, it is difficult to conclusively say if some bonds are green or not, hence there is growing skepticism around the greenness of green bonds.
- **Borrowing costs and information asymmetry:** The cost of issuing green bonds has generally remained higher than the other bonds in India. While India does monitor greenhouse gas emissions through various reporting mechanisms including PAT (perform-achieve trade) and RPO (renewable purchase obligations), however like many other countries it does not have a national measurement, reporting and verification platform for tracking climate finance.
- **Market infrastructure development:** Given the large size of domestic market and much smaller penetration of green instruments so far, there is requirement of development of market infrastructure.

How Are Green Bonds Different from Blue Bonds?

- Blue bonds are sustainability bonds to finance projects that protect the ocean and related ecosystems. This can include projects to:
    - **support sustainable fisheries**
    - **protection of coral reefs and other fragile ecosystems**
    - **reducing pollution and acidification**
- All blue bonds are green bonds, but not all green bonds are blue bonds.

How Are Green Bonds Different from Climate Bonds?

- Green bonds and climate bonds are sometimes used interchangeably.
    - Some authorities use the latter term specifically for projects focusing on reducing carbon emissions or alleviating the effects of climate change.
- The **Climate Bonds Initiative** is an organization that seeks to establish a standard for certifying climate bonds.

Way Forward

- **Decrease in costs:** Any form of **decrease in the cost of raising green bonds** in view of the generally high costs of issuing the same in India is key to making it attractive for project developers.
- **Encourage Green bonds:** The government may explore formulating principles and standards for certification of climate change projects. From an issuer's perspective, if the policy framework of the country provides a direct financial or compliance related incentive for tagging projects as 'green', the same would also encourage green bonds as a mode of finance.
- **Attract Global investors:** Introduction of projects with prospective green bond issuance and strategic green bond issuances by government and semi-government institutions would help in improving global investor sentiment in the Indian green bond market.

3.5. 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.

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

- 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.**

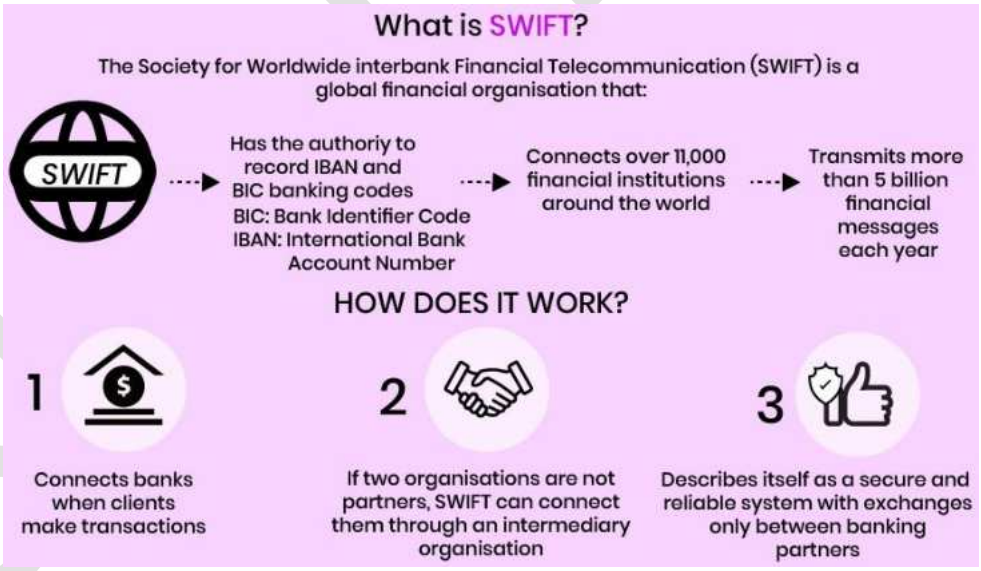
Significance of SWIFT system

- **Global coverage:** The wide coverage of SWIFT – **covering over 11,000 institutions in more than 200 countries around the world** – makes it an almost-universally accepted system. It counts central banks of countries like the US, UK, Germany, France, Japan, India, China, Singapore and others among its list of overseers.
- **Standardized and reliable communication:** It provides standardized and reliable communication to facilitate the transaction.
    - This payment network **allows individuals and businesses to take electronic or card payments** even if the customer or vendor uses a different bank than the payee.

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.

- **Neutral:** SWIFT claims to be neutral. Its shareholders, consisting of 3,500 firms across the globe, elect the 25-member board, which is responsible for oversight and management of the company.
    - SWIFT is overseen by the G-10 central banks (**Belgium, Canada, France, Germany, Italy, Japan, The Netherlands, United Kingdom, United States, Switzerland, and Sweden**), as well as the European Central Bank, with its lead overseer being the National Bank of Belgium.
    - It is a cooperative company under Belgian law, headquartered in Belgium.



- **Range of service:** The SWIFT system offers many services that assist businesses and individuals to complete seamless and accurate business transactions. Some of them are
    - Applications for processing clearing and settlement instructions for payments, securities, forex, and derivatives transactions.
    - Business Intelligence and compliance services.
    - Messaging, Connectivity, and Software Solutions.

3.6. 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.**

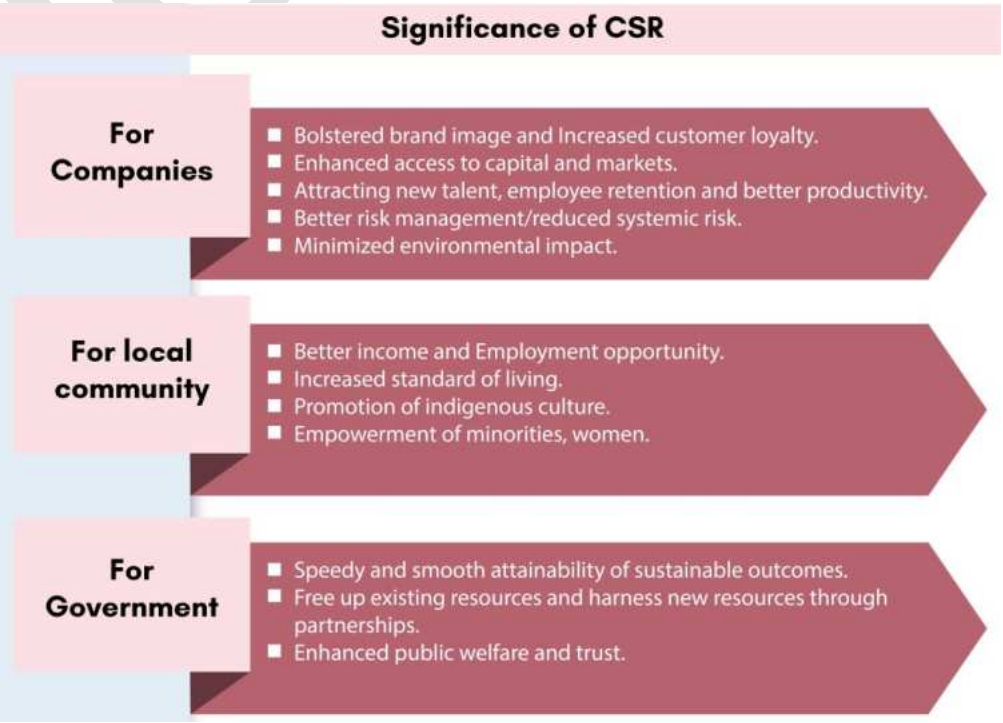
Key Facts related to CSR spending in FY 21

- Companies spent a **total of ₹8,828 crores** in FY21 on CSR, roughly **a third of** what they had spent in the **pre-pandemic year** of FY20 at ₹24,689 crores.
- Number of companies engaged in CSR activities **dropped by about 93%** on an annualised basis in 2020-21, compared to a year ago.
- The combined expenditure of state-run firms in 2020-21 was a **mere 6% of the total amount spent** on CSR activities, while private firms contributed 94%.

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 i**mmediately 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.

Challenges in CSR

- **Failure to Consider Holistic View**: Companies still have a **narrow perception** of CSR. They fail to understand that CSR has **impact on mostly all of the stakeholders** of the company and it impacts both **society and the environment** as a whole.
  - The business should embrace CSR in their business operations and should **clearly identify the areas of priority and investment.**
  - Due to a lack of **strategic planning, proper experimentation, innovation,** and engagement, companies aren't able to make a **meaningful impact** on their CSR efforts.
- **Lack of Community Participation**: There is a **lack of interest** of the local community in participating and contributing to CSR activities which is largely attributable to **little or no knowledge about CSR** within the local communities.
  - The situation is further aggravated by a **lack of communication between the company and the community** at the grassroots.
- **Inadequate Local Capacities**: There is a need for capacity building of the **local non-governmental organizations** as there is serious **dearth of trained and efficient organizations** that can effectively contribute to the ongoing CSR activities initiated by companies.
  - This seriously compromises **scaling up of CSR initiatives** and subsequently **limits the scope** of such activities.
- **Large states corner most CSR funds**: Small and far-flung states get a **measly amount** of CSR funds spent by companies, while **large state economies benefit** mostly from it. In FY21, over **80% of the funds** for which state-wise break up of spending is available, has gone **to ten states** (include **eight of the largest state economies** by their FY20 gross state domestic product (GSDP)).
- **Skewed spending:** In FY21, **education and health care** together accounted **for two-thirds of all the CSR spending**. Companies have traditionally preferred to **build physical structures** like hospitals and schools because apart from being, quite literally concrete, they can also **carry branding**.
  - Though these structures are necessary, by doing this, they **distance themselves from the field** and hence, the activities **tend to be a form of charity** rather than following major principles of grounded social work.

Road Ahead

- **Cooperation between government and corporates:** For speedy and impactful implementation, a mechanism of **mutual cooperation** between government administration & corporates is much needed. This will help in **better understanding of the expected outcomes** of each initiative.
  - CSR activities should be **better aligned and integrated** with Government/local administration systems. They should **complement and upscale** government initiatives rather than create a **parallel system and duplicate efforts**.
- **Using technology driven solutions**: There is a need to shift from **traditional methods** of implementation to technology driven solutions for redressal of socio-economic issues. This will **amplify the scale, reduce time and enhance impact** of CSR activities**.**
- **Active Participation of media and individuals:** The role of media in **highlighting good cases of successful CSR initiatives** is welcomed as it spreads good stories and **sensitizes the local population** about various ongoing CSR initiatives of companies.
  - Also, gradually inculcating the idea of **Individual Social Responsibility (ISR).**

Individual social responsibility (ISR)

- ISR refers to **our awareness** of how our actions **affect the community** as a whole.
- It deals with individuals becoming **more responsible in their actions** affecting **communities,** in their **immediate circle** of family and friends and also **beyond.**
- It can include **volunteering time, giving money, and standing up for issues** that affect the rights of others.

- **High Level Committee** under the Chairmanship of **Injeti Srinivas** had made following recommendations:
  - **Extending the scope** of CSR applicability to **Limited Liability Partnerships (LLPs)** which are within the purview of the MCA and to **Banks** registered under the Banking Regulation Act, 1949.
  - Companies be encouraged to **forge partnerships** when creating assets for public purpose. The ownership **shall rest with the public** and the company may act as a **custodian to operate** it and make it **self-sustaining.**

- Board of a Company to ascertain the **credibility of an Implementing Agency (IA)** and carry out necessary due diligence. IAs to be **registered with MCA** to carry out CSR activities.
- **International organizations may be engaged** as partners for designing CSR **projects, monitoring and evaluation** as well as **capacity building** of CSR-eligible companies and implementing agencies.
- Board of a company may engage a **CSR professional**, if it so desires, and the Government may prescribe **eligibility criteria** for such professionals.
- 5% of CSR mandated companies be identified on a random basis for **third-party assessments** on a pilot basis.

3.7. URBAN EMPLOYMENT

Why in News?

Recently, the Rajasthan Government announced an urban job guarantee scheme to address unemployment in urban areas

More on News

- Designed on lines of MGNREGA, the scheme is named as **Indira Gandhi Shehri Rozgar Guarantee Yojana**.
- Under this scheme, **100 days** of employment will be provided in a year.
- With this, Rajasthan has become the **5th state** in the last two years after Himachal Pradesh, Odisha, Jharkhand, and Tamil Nadu to introduce employment schemes for urban areas.
  - Earlier, in 2010, Kerala launched an urban employment guarantee scheme.

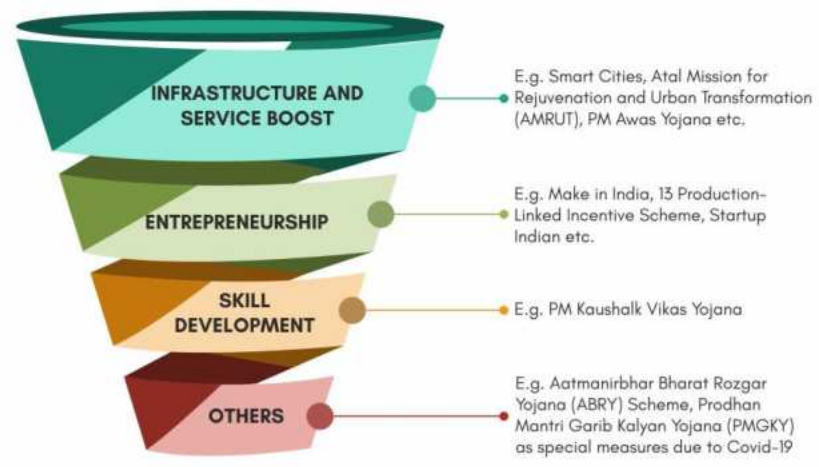
Need for Urban Job Guarantee

Despite larger contribution in GDP, over **60% of GDP with expected contribution of 75% of GDP by 2030**, the urban India suffers from:

- **Unemployment: Higher Urban unemployment** as compared to rural India.
  - As per **Periodic Labour Force Survey (PLFS) 2019-20**, **Unemployment Rate (UR)** in urban areas was **7%** as compared to **4%** in rural areas (overall **UR was 4.8%**).
  - UR for persons of **age 15-29 years** was even higher in urban areas with **18.2% UR among males** and **24.9% among females**.
- **Inflation: Higher inflation in urban areas** as compared to rural areas.
- **Covid-19 Impact:** The impact of Covid-19 in urban areas was higher in terms of stalled economic activities. It reduced **consumption** with a negative impact on **employment generation** and **security** of existing jobs.
  - E.g., **Services Sector** contribution to GDP reduced from 55% in 2019-20 to 53% in 2021-22.
- **Rising Urban Population:** In comparison to nearly **31% population (census, 2011),** the percentage of urban population is expected to grow **above 40% by 2030**.

Recent Employment Generation Initiatives

- **Deendayal Antyodaya Yojana-National Urban Livelihoods Mission** to reduce poverty and vulnerability of the urban poor households**.**
- **PM Street Vendor's AtmaNirbhar Nidhi (PM SVANidhi)** as a special micro-credit facility for street vendors.
- **Pradhan Mantri Mudra Yojana (PMMY)** for collateral free loans upto ₹10 lakh for micro/small business enterprises and individuals to set up or expand their business activities.
- **Prime Minister's Employment Generation Programme (PMEGP)** as a credit linked subsidy programme for establishment of micro enterprises in urban and rural India.



- A number of other initiatives are also taken with large employment generation potential and to overcome hardships of Covid-19 (**see image**).

Challenges and Concerns with regard to Urban Employment

- **No National level Legal Work Guarantee Scheme** for urban areas like MGNREGA for rural areas with at least 100 days of guaranteed wage employment of unskilled nature in every FY.
  - E.g., For 2021-22, MGNREGA has created 331.87 crore person days benefitting nearly 7 crore rural households.
- **Migration** from rural areas outpacing the job creation in urban areas due to presence of **push factors** as well along with pull factors.
- **Poor Quality of Job, Low Wages, and lack of social security** due to dominance of Informal employment and low value-added activities, making them more vulnerable due to low savings.
- **Growing Environmental Concerns**, putting a limit on scope for industrial development due to the degradation of urban ecological commons.
- **Limited role of ULBs** due to lack of financial and human capacity. Even carrying out basic functions is a challenge for many without state support due to low revenues.
- **Low employment generation** from infrastructure and services boost initiatives due to increasing automation and lack of skills to take benefits of it.
- **Lack of synchronization** between efforts from ministries such as the Ministry of Labour, Ministry of Commerce and Industry and Ministry of Housing and Urban Poverty Alleviation.
- **Other Challenges:** Proper Beneficiary Identification and providing work close to people; Low productivity of labour; Ensure childcare facilities at work to encourage female **Labour Force Participation Rate (LFPR)** (18.5% in urban areas as compared to 24.7% in rural India) etc.

Way Forward

According to the Standing Committee on Labour "there is an imperative need for putting in place an Employment Guarantee Programme for the urban workforce in line with MGNREGA. It starts with passing of a National Urban Employment Guarantee Act to recognize the severity of India's urban employment crisis with following steps to address it-

- **Investment in urban infrastructure** in a **labor-intensive approach** or **high capital-labour ratio** to create more employment. E.g., Construction of low-cost housing through a labor-intensive approach.
- **Horizontal integration of efforts** from various ministries to maximize benefits. **Capacity Building of Urban Local Bodies** can help in it as they can serve as a common link for them including the implementation of any urban employment guarantee scheme.
- **Decentralized urban employment and training** to move towards a demand-driven urban employment guarantee.
  - E.g., Skilling and Apprenticeship Programme for educated youth to assist in administrative functions at municipal offices, healthcare centres etc.
- **Vulnerability reduction** through formalization of the workplace and extension of social security initiatives to vulnerable sections.
  - **eSHRAM Portal** can play a key role in it by serving as a national database of unorganised workers including migrant workers, construction workers, gig and platform workers, etc.
- **Encouraging small enterprises** to create jobs and overcome the slowdown in major employment generating sectors due to Global Supply chain disruptions and reduced mobility.
- **Reduce Migration** from rural areas through rural development, creating employment in rural areas with improved access to basic facilities like drinking water, healthcare etc.
- **Creating gender-responsive workplaces** in cities with facilities like childcare, work near to home etc.

3.8. 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 Cargo Terminals** for multimodal logistics facilities will be developed during the **next three years.**

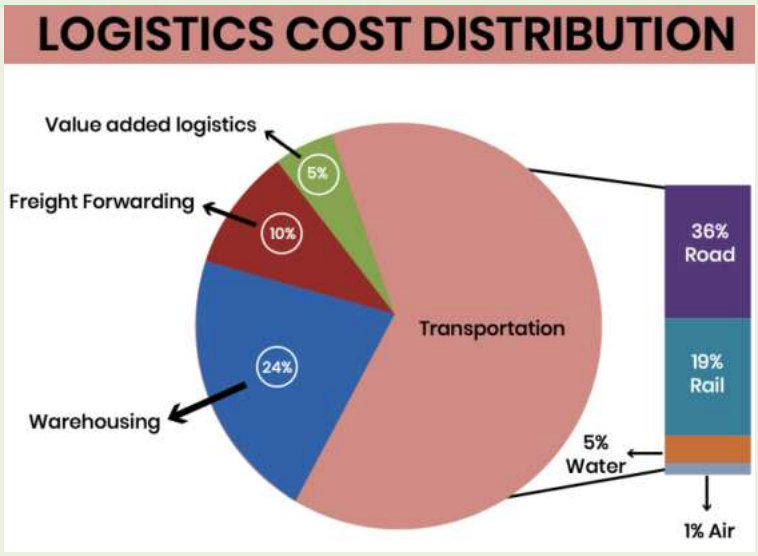
- **The data exchange among all mode operators** will be brought on a **Unified Logistics Interface Platform,** designed for Application Programming Interface.
- This will provide for efficient movement of goods through different modes, reducing logistics cost and time, assisting just-in-time inventory management, and in eliminating tedious documentation.

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.

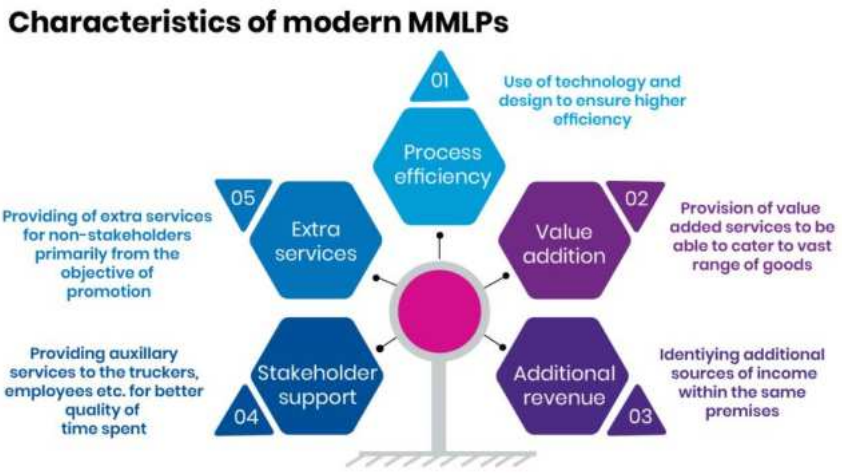
About MMLP

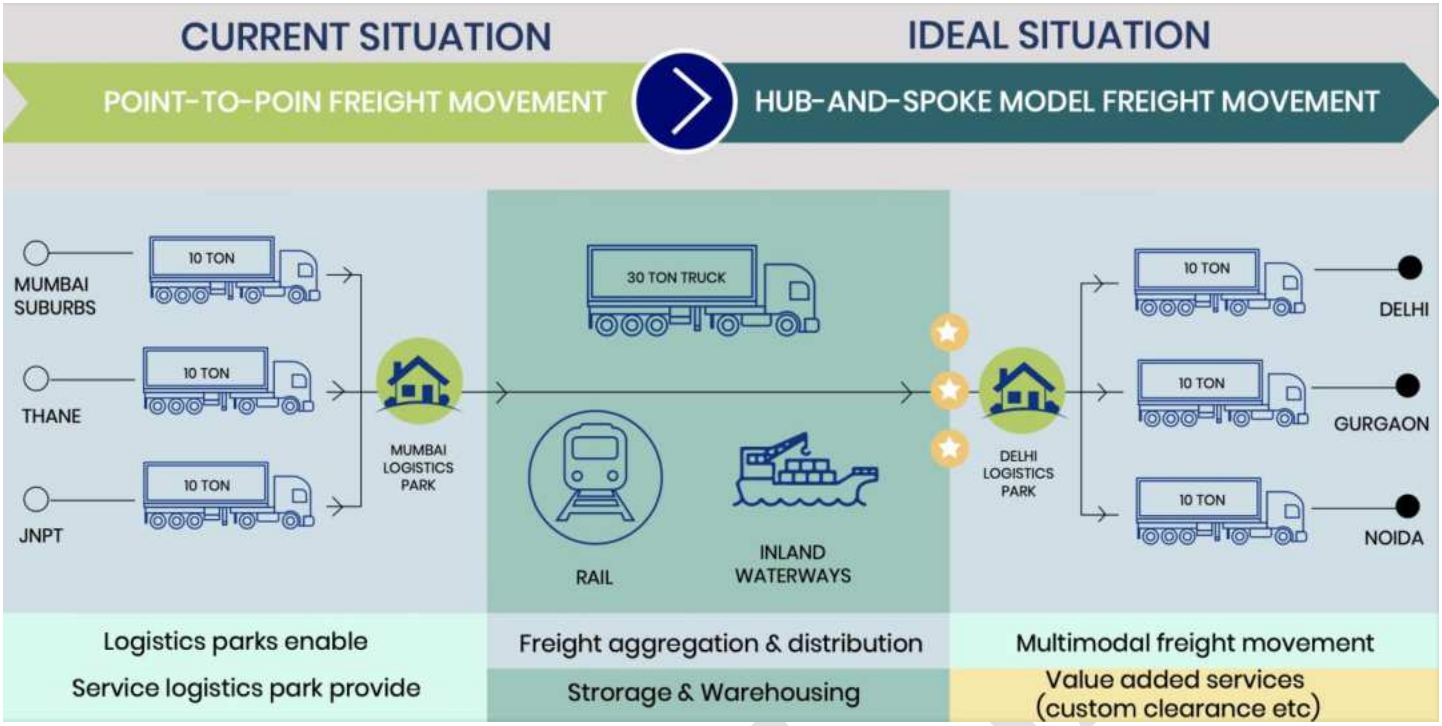
- A Multi-Modal Logistics Park (MMLP) as an **inter-modal freight-handling establishment** comprising warehouses, dedicated cold chain facilities, freight or container terminals and bulk cargo terminals eases and optimizes merchandise movement via road, rail, waterway and air, consequently, rationalizes 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.



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.





Challenges in establishing MMLP

- **No definition of MMLP:** In the absence of a specific definition, different ministries including railways, shipping and the department of industrial policy and promotion are facing clearance issues for these parks**.** Specification, and standardization of these parks are also one of the major issues.
- **Infrastructure development:** For MMLPs to succeed, roads, railways, and other available modes of transportation must be improved for smooth and uninterrupted linkages among adjacent parks, industrial clusters, and consumption centers.
- **Use of technology:** Cutting-edge information technology for delivery management must also play an important role for MMLPs to work effectively.
- **COVID-19 led slowdown:** With only four of the proposed projects being allocated land since the scheme was first announced in 2017, COVID-19 has brought forward some issues that question the viability of some of MMLP projects, especially in areas where transport infrastructure needs to be developed, in particular aerial coverage and shipping coverage.
    - The country's aviation sector, road transport sector, and shipping sector are currently facing issues of their own due to the outbreak of COVID-19.
- **Administrative hassles:** In the absence of a nodal agency to supervise the construction, execution and working of the proposed MMLPs, around 50 different approvals are required from various central and state ministries in order to develop and operate. This is also expected to fend off investors.

VISION IAS

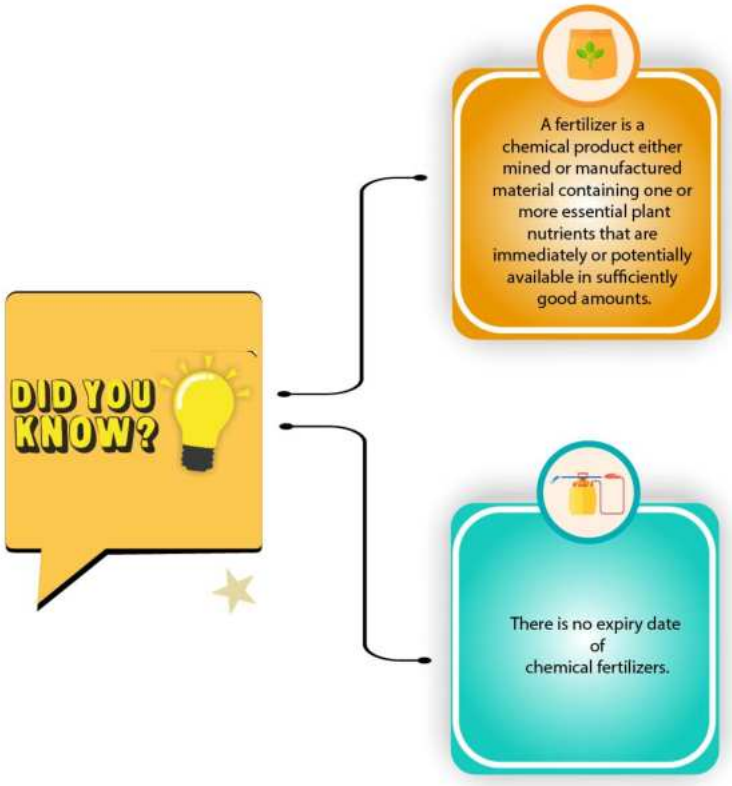
Way ahead

Levers	Description
1 Regional connectivity	• Strong regional connectivty through multi-modal infrastructure linkage. • Coherent and well-coordinated transport and industry policies • Presence of large industrial corridors • Advanced human resources capability in logistics • Leading IT and digital infrastructure.
2 Adopting leading practices in transportation	• Continuous upgrading of road,maritime and air infrastructure • Improvement of efficiency of transportation • Increased inter-modal connections and cargo transfer through such nodes • Intelligent transport system
3 Adopting digital solution	• Demand forecasting • Using warehouse management system • Digital enablers for modal shift at cargo
4 Efficiently operating logistics parks	• Optimising the location of the park and easy land availability • Flexibility in land allotment for logistics park development • Keeping provisions for end-to-end logistical services, including value added servies • Using leading storage technologies and practices • Adopting digital architecture for efficient operations
5 Nodal agency	• Create MMLP Authority of India' (MMLPAI), in line with Land Ports Authority of India (LPAI), National Highways Authority of India (NHAI), etc., which will have the requisite expertise for overseeing the day-to-day operations of MMLPs and act as a facilitator between the concerned stakeholders.

3.9. DRAFT INTEGRATED PLANT NUTRITION MANAGEMENT BILL, 2022

Why in news?

The Department of Fertilizers had sought comments from all stakeholders on the draft Integrated Plant Nutrition Management Bill, 2022.



More on news

- The draft, which has been put up for public consultation, seeks to **regulate the pricing, movement, distribution, import, and storage of fertilisers** in the country to ensure their **balanced use** in the country.
- The draft seeks to incorporate several existing provisions of the **Fertiliser Control Order (FCO,** administered by the Department of Agriculture) **and the Fertiliser Movement Order** or FMO (Department of fertilisers) into one piece of legislation

Background

- The FCO had laid down fertilizer-wise detailed specifications and **no fertilizer, not meeting the said specification, can be sold in the country** for agricultural purposes.
- It also lays down **detailed procedure for sampling and analysis of each fertilizer.**
- The **Central Fertilizer Quality Control & Training Institute CFQC&TI), Faridabad** and its four Regional Fertilizer Control Laboratories (RFCL) under the **Department of Agriculture & Co-operation (DAC)** take samples of imported fertilizers at the discharge port for analysis thereof.
- The **States also have their own State notified quality control laboratories** that analyse samples taken from field (warehouses/dealers/retailers) as well as from the manufacturing plants.

Key highlights of the draft bill

- **Registration:** No person can manufacture, sell, import for sale, or market without obtaining the appropriate registration.
- **Integrated Plant Nutrition Management Authority of India:** It would regulate the manner of registration for manufacturers of fertilisers, set out technical standards with respect to the quality of fertilisers and fertiliser products, and promote the sustainable use and development of innovative fertilisers.
- **Ease of doing business:** It seeks to **simplify the process** for the manufacture, production, distribution and price management of fertilisers in India, which will, in turn, improve the **ease of doing business.**
- **Maximum price of fertiliser:** The **Central Government** may, with a view to regulating the equitable distribution of fertilisers and making fertilisers available at fair prices, by notification in the Official Gazette, fix the maximum prices or rates at which any fertiliser may be sold by a dealer, manufacturer, importer or a fertiliser marketing entity.
- **Different rates for fertilisers:** It also aims to empower the Centre to fix different prices or rates for fertilisers having different periods of storage or for different areas or for different classes of consumers.
- **Suo motu cognizance: The** Central government may take the "suo motu cognizance" of any irregularities in the actions of manufacturers, dealers or retailers and to initiate action for inquiry or to direct the State Controller to inquire into the matter.
- **Movement of fertiliser across the country:** The Central government can also prescribe the manner in which fertilisers are to be moved from one state to another.

Concerns raised about the draft bill

- **Corruption:** Industry experts believe that both inspector raj and corruption will return if we go back to control.
- **Discourage innovation:** Keeping parts of the FCO and FMO under the new Act even while proposing to repeal the FCO and FMO would lead to greater confusion and stifle innovation.
    - Both the FCO and FMO were administrative orders, incorporating some of their provisions into a separate Act and introducing penal provisions into them could create undue regulation in the industry.
- **Regulation of traditionally used nutrients:** Draft bill seeks to regulate all fertilisers, including traditionally used fertilisers such as "amritpani" and farming practices like **"pachgavya krishi**". This could create a backlash in traditional farming communities.
- **Not a solution to imbalanced use of fertilisers:** The current policy of imbalanced subsidies on nutrients (refer to the box) and products is the main reason for the imbalance in the NPK ratio, thereby affecting soil health. Instead of a new law to promote balanced use of nutrition, the policy of routing fertiliser subsidies through the industry needs a rethink.

Subsidy on fertilisers in India

Nutrient Based Subsidy Scheme

- It is a **Central Sector Scheme.**
- The scheme was launched in 2010 when the prices of **Phosphatic & Potassic (P&K) fertilizers were decontrolled** (price of urea fertilizer is still controlled).
- **Subsidy:** Maximum Retail Price (MRP) of P&K fertilizers is decontrolled and fertilizer manufacturers / marketers are allowed to fix the MRP at reasonable price. The **Centre provides a fixed rate of subsidy** (in Rs. Per Kg basis) **on each nutrient.**
    - These nutrients include **Primary nutrients**: **Nitrogen (N), Phosphate (P), Potash (K)** and Secondary Nutrient-**Sulphur (S)**.
    - **Additional subsidy** for micronutrients namely **Boron and Zinc** is also provided.
    - **22 grades of P&K fertilizers** namely DAP, MAP, TSP, MOP, Ammonium Sulphate, SSP and 16 grades of NPKS (Nitrogen (N), Phosphate (P), Potash (K) and Sulphur (S) **Ammonium Phosphate** fertilizers are covered under the scheme.

Urea subsidy Scheme

- It is a **Central Sector Scheme.**
- Urea is provided to the farmers at a statutorily notified **Maximum Retail Price (MRP) below** their normal supply-and-demand-based **market rates** or what it costs to produce/import them.
- **The difference** between the delivered cost of Fertilizers at farm gate and net market realization by the urea units is given as **subsidy to the Urea manufacturer/Importe**r by the Govt. of India. So, it also includes **freight subsidy for movement of urea** across the country.
- The subsidy is given to the fertilizer manufacturing companies and the **rate of subsidy** is **decided on annual basis.**
- From March 2018, a new so-called **direct benefit transfer (DBT) system** was introduced, wherein **only upon the sale getting registered** on the e-Urvarak platform **can a company claim subsidy**.

Way ahead

The Alliance for Sustainable and Holistic Agriculture (ASHA), a network of volunteers that seek to promote sustainable farm livelihoods and farmers' rights in India, has opposed some provisions in the Draft Integrated

Plant Nutrition Management Bill, 2022 and has given the following recommendations-

- **Compensation:** It wanted the government to spell out compensation mechanisms for aggrieved farmers (who purchased sub-standard, misbranded or spurious fertilisers) at the taluka-level in the statute itself. There should be a fund to take care of payment of compensations to farmers.
- **Do not criminialise farmers:** The restriction about the use of fertilisers should exclude the farmers and should not criminalise them in any way.
- **Need for legal recourse to farmers:** ASHA wants a provision that allows farmers or other aggrieved parties to seek legal recourse if they are not satisfied with the appellate authority's resolutions.
- **Incentivise localised production and distribution:** A separate process should be there for bio-stimulant, organic fertilisers, bio-fertilisers and non-edible de-oiled cakes, which incentivise localised production for localised distribution.
- **Rights of States:** ASHA, a network of volunteers that seek to promote sustainable farm livelihoods and farmers' rights in India, wanted a mechanism to allow the State governments to regulate the price, distribution and movement of fertilisers notified by them from time to time.
-

Related news

The Fertilizer (Inorganic, Organic or Mixed) (Control) Amendment Order, 2022

- The amendment order was issued in exercise of the powers conferred by **section 3 of the Essential Commodities Act (ECA), 1955.**
  - Section 3 of the ECA gives power to the Central Government **to control production, supply, distribution, etc., of essential commodities.**
- The amendment was brought **to bring clarity on liability of dealer and manufacturer** if samples drawn from non-tampered bags fail to meet standards.
- **Power to states:** The amendment allows States to proceed against both manufacturers and dealers whenever samples drawn from non-tampered bags fail to meet standards.
- While the order had provisions to file complaints against both manufacturers and dealers for selling substandard fertilisers, dealers and manufacturers were passing the buck to each other.
- **Digital stock-keeping:** The order also asks the dealers to 'maintain digital stock register in the form which clearly exhibits the date wise stock position, opening balance, receipts during the day, sales during the day and closing stock'.

Role of plant nutrients	Nutrients
Anion-cation balance in cell	Na, K, Cl
Water splitting in photosynthesis	Cl, Mn
Components of coenzymes	S (in thiamine, biotin, Coenzyme A)
Components of enzymes	Mo (in nitrogenase and nitrate reductase)
Activates enzymes	Zn (in carboxylases), Fe (in catalase enzyme), Mg (in enzymes of respiration & Photosynthesis), Ca, K
Nucleic acids	N, P
Chlorophyll	Fe (formation), Mg (Constituent)
Cell wall synthesis	Ca
Plasma Membrane	P

Other significant role:

- N: required by all parts of a plant, major constituents of proteins vitamins and hormones
- P: phosphorylation reactions (ATP synthesis)
- K: protein synthesis, opening and closing of stomata, maintenance of the turgidity of cells

NOTE: Calcium: Ca, Chlorine: Cl, Iron: Fe, Magnesium: Mg, Manganese: Mn, Molybdenum: Mo, Nitrogen: N, Phosphorus: P, Potassium: K, Sodium: Na, Sulphur: S, Zinc: Zn

3.10. NEWS IN SHORTS

3.10.1. SCHEME ON ENHANCEMENT OF COMPETITIVENESS IN THE INDIAN CAPITAL GOODS SECTOR- PHASE II

- The scheme has been notified by **Ministry of Heavy Industries for providing assistance to Common Technology Development and Services Infrastructure.**
- **Objective of Phase II**: To expand and enlarge the impact created by the Phase I pilot scheme, thereby

providing greater impetus through **creation of a strong and globally competitive capital goods sector.**
    - Phase I of the scheme was **notified in 2014 to encourage technology development** and infrastructure creation.
- **Six components under Phase II**
    - Identification of Technologies through **Technology Innovation Portals**
    - Setting up of **New Advanced Centres of Excellence** and augmentation of Existing Centres of Excellence
    - Promotion of **skilling in Capital Goods Sector**.
    - **Setting up of Common Engineering Facility Centres** (CEFCs) and augmentation of existing CEFCs
    - Augmentation of Existing **Testing and Certification Centres**.
    - Setting up of **Industry Accelerators** for Technology Development
- **Capital Goods industry is the "mother" of all manufacturing industries** and is of strategic importance to national security and economic independence.
    - India's capital goods sector **contributes at least 25% to the manufacturing sector**.
    - Provides **approximately 1.4 million direct and 7 million indirect jobs**.

Capital Goods

- Capital Goods refer to **products that are used in the production of other products but are not incorporated into the new product.**
- These include **machine tools, industrial machinery, process plant equipment** etc.

3.10.2. ECONOMIC SURVEY BATS FOR GREEN FINANCING FRAMEWORK

- Green finance refers to the **financial arrangements that are specific to the use for projects that are environmentally sustainable** or projects that adopt the aspects of climate change.
    - These include **clean energy projects**, **clean transportation**, **energy-efficient projects** like green building and waste management, sustainable water management projects etc.
- **In order to meet the financial needs** for these types of projects, **new financial instruments** such as green bonds; **carbon market instruments** (e.g. carbon tax); and **new financial institutions** (e.g. green banks and green funds) **are being established.**
- **Significance of Green Finance:** Helps to address challenges to the sustainable economic growth, to protect and substantially improve the environment etc.
- **Challenges of green financing:** Higher borrowing cost, false claims of environmental compliance, plurality of green loan definitions etc.
- **Initiatives taken in India**
    - **RBI's Sustainable Finance Group** for regulatory initiatives in sustainable finance and climate risk
    - **Task Force on Sustainable Finance** has been set up by Ministry of Finance
    - RBI has included **small renewable energy sector under its Priority Sector Lending** (PSL) scheme.

3.10.3. UNIFIED PAYMENTS INTERFACE (UPI)

- National Payments Corporation of India (NPCI) announced that **Nepal will be the first foreign country** to adopt **India's UPI** system.
    - It is expected to serve the **larger digital public good** in Nepal and bolster **interoperable real-time person-to-person (P2P) and person-to-merchant (P2M) transactions**.
- Unified Payments Interface (UPI) is a system that **powers multiple bank accounts into a single mobile application** (of any participating bank), merging several banking features.
- **Key Features of UPI: Instant transfer** of funds, bill sharing facility, can be used **24 hours** and on all public holidays etc**.**

3.10.4. CORE BANKING SYSTEM (CBS) AT POST OFFICE

- 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.**
- **Significance**: Enable financial inclusion and access to accounts through net banking, mobile banking, ATMs and also provides online transfer of funds between post office accounts and bank accounts, especially in rural areas.
- **Currently, post offices provide** savings account services and payments bank services through the **India Post Payments Bank.**

3.10.5. OMBUDSPERSON APP

- To ensure **transparency and accountability**, Union Minister for Rural Development and Panchayati Raj has launched **Ombudsperson App** for Mahatma Gandhi NREGA.
- **About app**
    - Developed for **smooth reporting and categorization** of grievances based on complaints received from **various sources** related to the **implementation of the MGNREGA**.

- At present, the **reporting** of complaints, **passing awards** and **disposal** of complaints are in **physical form.**
- This will strengthen Ombudsperson in the **discharge of her/his duty** in a hassle-free manner by enabling **easy tracking and timely passing of awards** on each case.

3.10.6. 'PRADHAN MANTRI KISAN SAMPADA YOJANA (PMKSY)' EXTENDED AND PM GRAMEEN SADAK YOJANA (PMGSY) TWEAKED

PMKSY	PMGSY
• Tenure has been **extended for a period of 2021-22 to 2025-26** with allocation of Rs 4,600 crore. • Approved in 2017, Under **Ministry** of **Food Processing** Industries, it **aims to boost growth of food processing sector** and also help in **providing better prices to farmers and creating huge employment opportunities** • It is an **umbrella scheme** incorporating ongoing schemes like Integrated Cold Chain and Value Addition Infrastructure, Food Safety and Quality Assurance Infrastructure, Infrastructure for Agro-processing Clusters, and Operation Greens.	• **Centre has proposed to fully fund certain road projects under the PMGSY** rather than meeting the usual 60% of cost, in a move **aimed at pushing rural jobs.** • Allocation under PMGSY has been **increased by 35%** for FY23 from revised estimates for FY22. • It is part of the **additional ₹1 trillion capital allocation** announced for states in the Union Budget 2022. • It was **launched by Minister of Rural Development in December, 2000** to provide **connectivity to unconnected Habitation**s as part of a poverty reduction strategy. • Its phase 3 **was launched in 2019 for consolidation of existing Rural Road Network** by upgradation of existing Through Routes and Major Rural Links that connect habitations to Gramin Agricultural Markets (GrAMs) Hospitals.

3.10.7. GOVT. APPROVES 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.
  - 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**.
- Following sub-schemes have been approved under IFLDP during **2021-26.**

Sub-schemes	About
Sustainable Technology and Environmental Promotion	Special Purpose Vehicle constituted for each **Common Effluent Treatment Plants would be provided assistance** @ 80% of the total project cost for Northeastern Areas, 70% in other areas.
Integrated Development of Leather Sector	Assistance would be provided to sectoral units for their **modernization/capacity expansion/technology up-gradation**.
Establishment of Institutional Facilities	Facilities like **International Testing Centre, Sports Complex**, replacement of conventional light fixtures with LED lights etc.
Mega Leather Footwear and Accessories Cluster Development	Aims at **world-class infrastructure and to integrate the production chain** in a manner that caters to the business needs domestic market and exports.
Brand Promotion of Indian Brands in Leather and Footwear Sector	GoI assistance of 50% of total project cost.
Assistance for Development of Design Studios (a new sub-scheme)	Design Studios will be kind of '**one-stop-shop'** providing a wide range of services: **design, technical support, quality control etc.**

3.10.8. PARVATMALA- AN EFFICIENT AND SAFE ALTERNATE TRANSPORT NETWORK

- 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**.
  - 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.
- In February 2021, **Government of India (Allocation of Business) Rules 1961** was amended, which enables Ministry of Road Transport and Highways to also look after the **development of Ropeways and Alternate Mobility Solutions.**

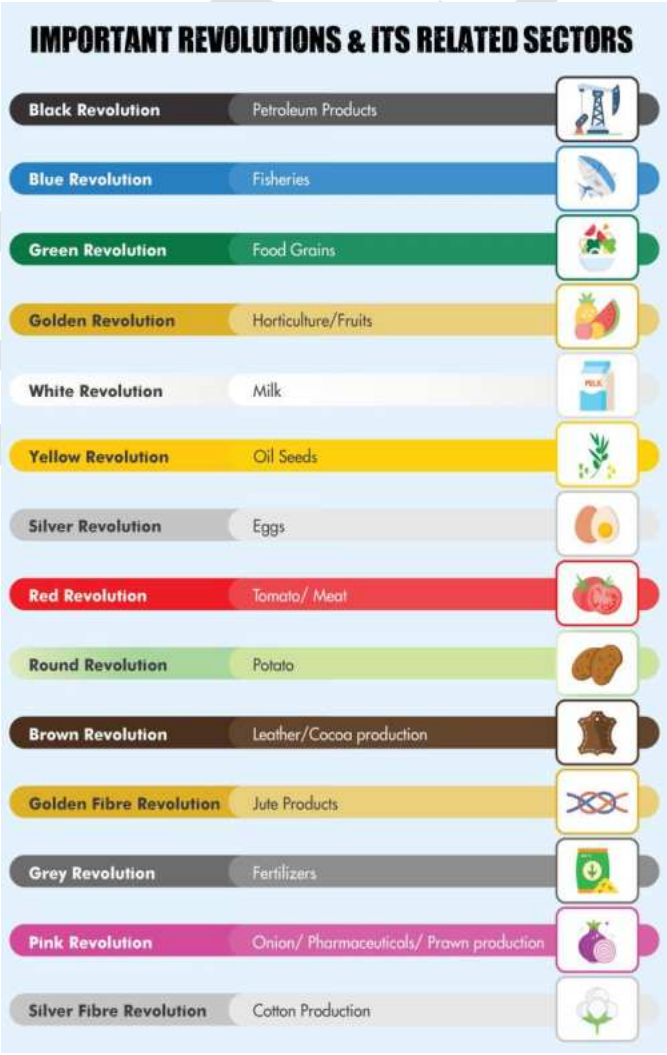
- **Major Factors Driving Ropeway Infrastructure:**
  - Ropeway projects results in **lower land acquisition costs**.
  - **Faster** mode of transportation.
  - **Environmentally friendly** as it emits low dust.
  - **Last mile connectivity**.
- **Benefits of Ropeways:**
  - Ideal for **difficult / challenging / sensitive terrain**.
  - Ropeway having multiple cars propelled by a single power-plant and drive mechanism. This **reduces both construction and maintenance costs**.
  - A ropeway allows for the **simultaneous transport of different types of material**.
  - Ropeways and cableways (cable cranes) can **handle large slopes and large differences in elevation.**

3.10.9. PRIME MINISTER'S DEVELOPMENT INITIATIVE FOR NORTH-EAST (PM-DEVINE)

- This new scheme was announced in Union Budget 2022-23, with initial allocation of Rs. 1,500 crore.
- It will **fund infrastructure** (in the spirit of PM GatiShakti) and **social development projects** based on felt needs of the North-East.
- This will **enable livelihood activities for youth and women**, filling the gaps in various sectors.
- It is to be **implemented through the North-Eastern Council**, and will **not be a substitute for existing central or state Schemes**.
- While the central ministries may also propose their candidate projects, **priority will be given to those posed by the states**.

3.10.10. LAVENDER CULTIVATION UNDER CSIR-IIIM'S AROMA MISSION IN RAMBAN 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.
  - During **Phase-I** of the Mission, **CSIR helped cultivate 6000 hectares of land** and covered 46 Aspirational districts.
  - **Phase-II** proposed to **engage over 45,000 skilled human resources** and benefit more than 75,000 farming families.
- **Significance**: **Improve farmers' livelihood** and income; **generated rural employment** of farmers, **spurred entrepreneurship** in aromatic oils and **aromatic products manufacturing**, and **lowered the import of essential and aromatic oils.**



3.10.11. SAFFORN 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, Mawsmai, Shillong, and Lalingtop.**

3.10.12. INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS (ICRISAT)

- PM started **50th Anniversary Celebrations** of ICRISAT**.**
  - 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.
  - 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.

3.10.13. WATER TAXI SERVICE

- **India's first water taxi** service **connecting the twin cities**, **Mumbai and Navi Mumbai**, was flagged off by Union Shipping Minister.
  - The water taxi will ply between **Domestic Cruise Terminal in South Mumbai** and the newly inaugurated **Belapur Jetty** in Navi Mumbai.
- **Benefits**
  - Promise a **comfortable** and stress-free journey;
  - **Time-saving** and eco-friendly;
  - Major boost to the **tourism** sector;
  - Opens avenues for **employment generation.**

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4. SECURITY

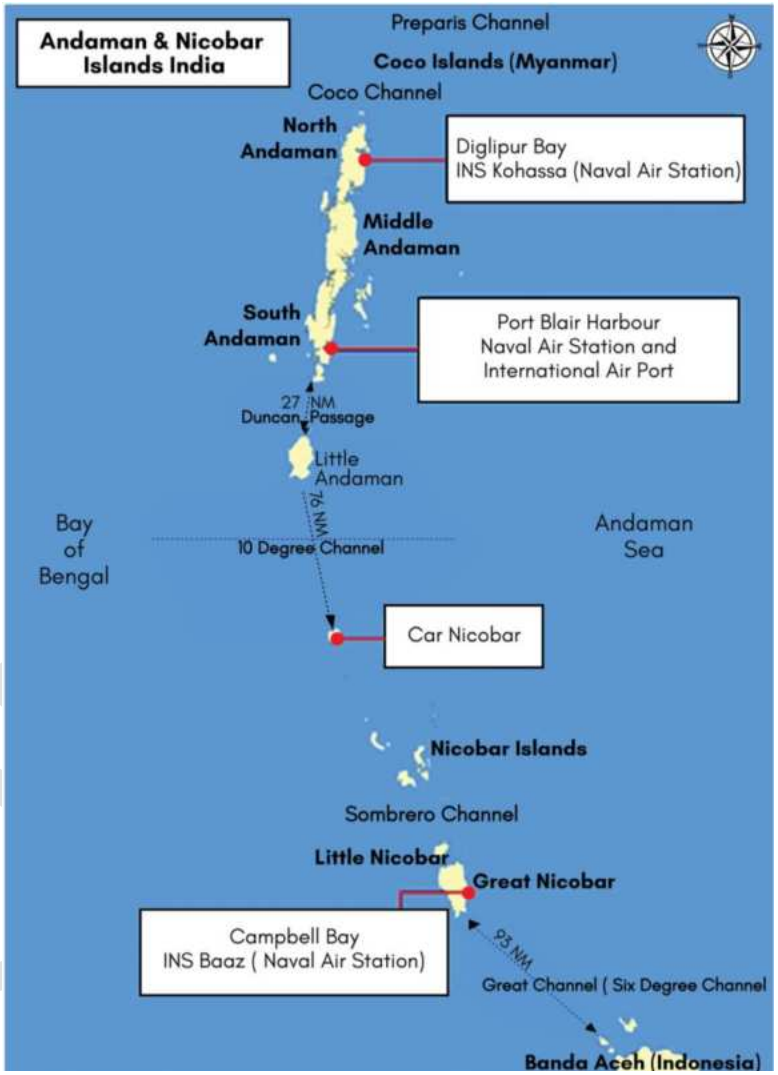
4.1. STRATEGIC IMPORTANCE OF ANDAMAN AND NICOBAR ISLANDS (ANI)

Why in news?

In the last few years, the **Andaman and Nicobar Islands (ANI)** have gained an important position in **India's foreign policy.**

About Andaman and Nicobar Islands (ANI)

- The ANI are **two groups** of islands: Andaman Islands and the Nicobar Islands, covering an area of 8,249 sq km.
- The entire island chain consists of **836 islands** including islets and rocky outcrops, of which **some 38 are permanently inhabited**.
- The islands are governed as a **single Union Territory** by the Central Government of India, through the **Andaman Nicobar Administration.**
- The ANI are also home to **India's only integrated tri-service command** of the armed forces—the Andaman and Nicobar Command (ANC) for **maritime surveillance** and enhancing **India's strategic presence** in the eastern Indian Ocean.



Strategic importance of ANI

- **Securing SLOC:** These islands act as a **physical barrier** that secures busy **Sea Lines of Communications (SLOC)** by creating a series of **chokepoints**: The **Preparis Channel** in the north, the **Ten Degree Channel** between the Andaman and Nicobar Island groups and the **Six Degree Channel** to the south.
    - While the first two sea lanes are **used infrequently** by commercial shipping, all vessels that pass through the Malacca Strait **must traverse the Six Degree Channel.** For instance, the channel acts as primary conduit for India-ASEAN trade ($ 78 billion in 2021).

- **Countering increasing Chinese presence:** China's efforts to expand its footprint in the IOR to overcome its **'Malacca Dilemma'** (China's fear of a maritime blockade at the Straits of Malacca') and fulfil its 'Maritime Silk Road' ambitions have fueled apprehensions about **freedom of navigation** in these waters.

- By gaining ground at critical chokepoints, China could use them to **its benefit** during any **future conflict or a standoff with India**.
- ANI's strategic location allows India to pursue **sea denial warfare** strategy (**denying the adversary** the use of the near sea) to **dictate terms in littoral space.**

- **Net security provider:** India can also leverage the potential of these islands to **protect its own interests** and burnish its image as the **'net security provider'** in the region.
- **Connection with Southeast Asia:** Containing about **30 percent of India's Exclusive Economic Zone (EEZ)**, ANI **connects South Asia with Southeast Asia**. The northernmost point of this archipelago is merely 22 nautical miles **from Myanmar** and the southernmost point, Indira Point, is only 90 nautical miles **from Indonesia**.
- **Important fulcrum of Indo-pacific:** The ANI are at the **intersection of the Indian Ocean and the South China Sea**, and further to the Pacific Ocean, an important **fulcrum of the strategic concept of the Indo-Pacific**.

Challenges in ANI's strategic development

- **Inadequate attention to strategic importance of ANI**: A section of India's foreign policy community has argued against turning the islands into a **strategic-military hub**, on the grounds that it wouldn't **sit well with Southeast Asian countries**, who perceive India to be **benevolent and benign power**.
- **Slow pace of development: Internet connectivity**, even at the naval base in the capital Port Blair, is **reported to be erratic.** Road building, airstrip construction, and even the building of jetties has been **slow or non-existent.**
- **Institutional reluctance**: Notwithstanding episodic visits by other navies, there exists some traditional institutional reluctance towards **allowing port visits** to the ANI by **foreign navies** in general and the US Navy in particular.
  - If **naval vessels and military aircraft** of other major navies become **regular visitors**, it could accentuate **China's 'Malacca Dilemma'**.
- **Ecological Fragility:** Establishing a credible **Aerial and Naval presence** in this ecologically **fragile** and ethnographically extremely **sensitive region** presents complex challenges. The governance parameters were regulated under a **protectionist regime** to ensure the **preservation of natural resources**.
  - The state machinery was also designed in a way that **imposes structural limitations** on development projects.
  - These were further sustained by **environmentalists, anthropologists and social scientists and backed by the Supreme Court**, which favoured **environmental conservation** in its judgements regarding the islands.
- **Other challenges:**
  - The **absence of a human presence** on hundreds of these islands has made them v**ulnerable to narcotics smuggling, intrusion by foreign vessels, and other incursions.**
  - **Heavy rainfall** restricts building activity to **six months a year** and the distance from mainland adds to **the cost of construction** as all material must be shipped to the islands.
  - **Few companies are willing** to work on the islands because of the **distance and cost**. For some materials, **importing from Indonesia would be far cheaper** and more cost effective than sending shipments from the Indian mainland.

Initiatives taken in ANI

- **Maritime hub:** In 2015, the government announced a INR 100,000-million plan to develop the islands into the **country's first maritime hub**. It aims to develop facilities, such as **telecommunications, electricity, and water** which will help in building and expanding **strategic capabilities**.
- **Declining protectionism:** In 2019, a new Island **Coastal Regulation Zone Notification** was promulgated, allowing **land reclamation** for **ports, harbours and jetties**. This is expected to **usher in luxury tourism** in Smith, Aves and Long Islands, and **water aerodromes** in Neil and Havelock islands. Allowing such projects will help in **creating strategic infrastructure.**
- **Maritime exercises**: ANC conducts **joint maritime exercises** such as the Singapore India Maritime Bilateral Exercise and Coordinated Patrols with Myanmar, Thailand and Indonesia. It also conducts **MILAN**, a **biennial multilateral** naval exercise, to build friendship across the seas.
  - Twenty countries participated in the **2018 MILAN edition**, making it the **largest naval exercise** in the Andaman Sea.

- **Expanding naval presence**: Following the Ladakh stand-off with China in May 2020, India is expediting plans for **stationing additional forces, warships, aircraft, and missile batteries** in the ANI. There have also been reports of naval air stations INS BAAZ and INS KOHASSA expanding their support operations.
- **Others:**
  - The **Chennai-Andaman and Nicobar** undersea internet cable was inaugurated to provide **high-speed internet connection** to seven remote islands of the ANI chain —i.e., Swaraj Dweep (Havelock), Little Andaman, Car Nicobar, Kamorta, Great Nicobar, Long Island, and Rangat.
  - The **commander-in-chief** of the ANC has been empowered to **requisition military assets** from the three services, handle **land acquisition cases**, and been granted **additional financial powers**.
  - In 2018, India and Indonesia, set up a special task force to **enhance connectivity between the ANI and the port of Sabang** in Aceh to promote **trade, tourism and people-to-people contacts.**
  - An **India-Japan cross-servicing agreement**, which has provisions for the ANC to host Japanese warships, is under consideration.

Road Ahead

- **Encouraging migration:** There is a need to consider **encouraging migration from the mainland** and open up some of the strategically located uninhabited islands to tourism. That would give India a **stronger physical footprint** and would help the country track the **movement of vessels and people**.
- **Strategic infrastructure:** In a bid to emphasise its **regional pre-eminence**, the Indian Navy in recent times has raised the tempo of naval operations in the Bay of Bengal. **Reinforcing strategic infrastructure** on the islands is a way of highlighting **India's combat prowess.**
- **Cooperation with strategic partners: Port visits** by US, Japan, Australia, France or the UK can lead to **further graded cooperation** in all the dimensions in the ANI **between India and its key strategic partners.**
- **Engagement with ASEAN:** There lies an opportunity to make ANI an important element of **"Act East Policy"** of engaging with countries in the **region east of India**.

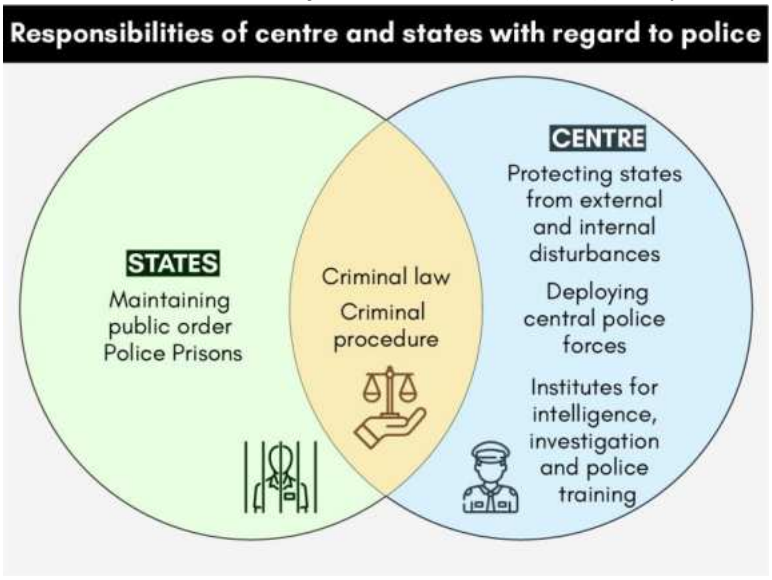
4.2. MODERNISATION OF POLICE FORCES

Why in news?

Centre has approved the **continuation of Modernisation of Police Forces (MPF) scheme for five years** up to 2025-26.

More about news

- The MPF, a **centrally sponsored scheme**, was initiated in 1969-70 and **Ministry of Home Affairs (MHA)** is responsible for its implementation.
- Its objective is to **reduce dependence of State Governments on Army and Central Armed Police Forces** to control internal security and law and order situations by adequately equipping State Police Forces and strengthening their training infrastructure.

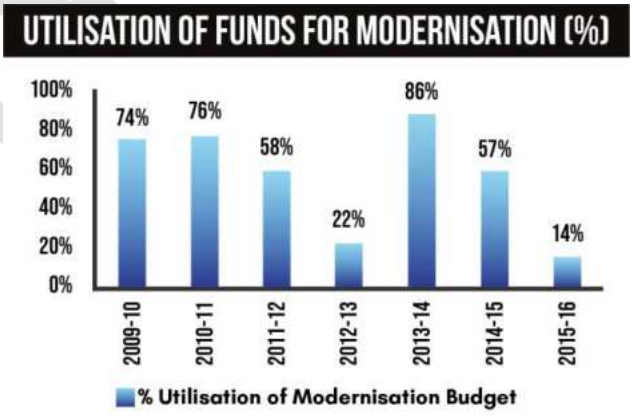


- **Key features of the scheme include**
  - **Provision for internal security, law and order, adoption of modern technology by Police,** assisting States for narcotics control and strengthening the criminal justice system by developing a robust forensic set-up in the country.
  - **Develop operationally independent high-quality forensic sciences facilities in States/Union Territories** for aiding scientific and timely investigation through modernization of resources. For this, **central Scheme for Modernisation of Forensic Capacities** has also been approved.

Background of police reforms

- Police come under **state list of Schedule 7** of the Indian constitution.
- The reforms aim to **transform the values, culture, policies and practices of police organizations** so that police can perform their duties with respect for democratic values, human rights and the rule of law.
    - It also aims to **improve how the police interact with other parts of the security sector**, such as the courts and departments of corrections, or executive, parliamentary or independent authorities with management or oversight responsibilities.
- The **police reforms were introduced in pre-independence** by the British government in 1902-1903.
    - Post-independence, Indian government set up **first** "**National Police Commission (NPC)" in 1977**.

Issues associated with police force in India



- **Colonial legacy:** Even at present, the police are based on colonial laws like **Indian Police Act, 1861**. British used police as their instrument to suppress the voice of people and for their personal functions.
- **Politization of police**: Police officers are not able to do their work due to the interference of political leader. There is no minimum tenure security for officers at the higher post.
    - The **Second Administrative Reforms Commission (2007)** has noted that police control has been abused in the past by the political executive to unduly influence police personnel and have them serve personal or political interests.
- **Slow progress**: As per Parliamentary standing committee (PSC) **report on 'Police- training, modernisation and reforms',** even after 15 years of Model Police Act, 2006, only 17 states have either enacted the law or amended their existing law.
- **Overburdened police force**: As per a report by the Bureau of Police Research and Development (BPRD), **nearly 20% of the sanctioned strength are vacant at various levels** in police departments across the country.
    - The workload of the existing staff increases forcing them to do work **overtime in stressful and tiring circumstances,** that compromises the overall performance of police in the discharge of their duties.
    - United Nations recommended standard is **222 police per lakh persons**, while actual police strength in **India is at around 137 police per lakh persons**.
- **Infrastructural issues:**
    - **Lack of resources**: According to the BPRD data, police forces across India **lack weapons, fundamental communications and transport infrastructure.**
        - ✓ **Weaponry**: CAG has found that weaponry of several state police forces is outdated, and the acquisition process of weapons slow, causing a **shortage in arms and ammunition.** For instance, **Rajasthan and West Bengal had shortages of 75% and 71% respectively.**

- ✓ **Police vehicles**: CAG noted the shortage of police vehicles and drivers. This affects the response time of the police, and consequently their effectiveness.
- ✓ **Connectivity:** Police stations are **without telephones or proper wireless connectivity** especially in many sensitive states like Arunachal Pradesh, Odisha and Punjab.

  - **Use of technology**: Despite rising cyber-crimes, several states like Punjab, Rajasthan, Goa, Assam do not have a single cyber-crime cell.

- **Public perception**: The common public perception of police is being unprofessional, insensitive, brutal and corrupt.

Government initiatives

- **SMART policing**: To encourage innovations and the use of modern technologies, SMART Policing has been introduced. It implies-
  - **S-Sensitive and Strict**;
  - **M-Modern and Mobility;**
  - **A-Alert and Accountable**;
  - **R-Reliable and Responsive**
  - **T- Trained and Techno-savvy**.
- **Crime and Criminal Tracking Network System (CCTNS):** It is conceptualized by the Ministry of Home affairs, to create a **comprehensive and integrated system for enhancing the efficiencies and effective policing** at all levels and especially at the Police Station level.
- **Model Police Act, 2006**: It replaced the Police Act, 1861. It emphasized the **need to have a professional police 'service' in a democratic society,** which is efficient, effective, responsive to the needs of the people and accountable to the Rule of Law.
  - The Act **provided for social responsibilities of the police and emphasized that the police** would be governed by the principles of impartiality and human rights norms, with special attention to the protection of weaker sections including minorities.

Way forward

- **Proper training**: There is a need for **adequate training and firing practices to the police personnel on the latest weaponry** which is being used by them.
- **Technology**: It is important for the police forces to **assess the need of technology to improve policing in the country**. Technologies like biometric identification, facial recognition, Automatic License Plate Recognition (ALPR), CCTV cameras, GPS, forensic science, etc. are also proving instrumental in collecting and storing data, identifying and apprehending criminals.
  - There is also need to **upgrade the existing cyber cells by setting up dark web monitoring cells and social media monitoring cells** to tackle different types of cyber-crimes.
- **Vacancies**: MHA advised States/UTs to conduct Police recruitment drives in a mission mode and remove the administrative bottlenecks for the recruitment of police personnel at different ranks in a time-bound manner.
  - Appointment of women in police should be done by c**reating additional posts rather than converting the vacant posts of men**.

- Higher women representation will also help in **improving the police-population ratio.**

- **Implement Seven directives of Supreme Court in Prakash Singh vs Union of India, 2006:** The set of seven directives, aimed at kick-starting reforms, was introduced based on a public interest litigation (PIL) filed in 1996.

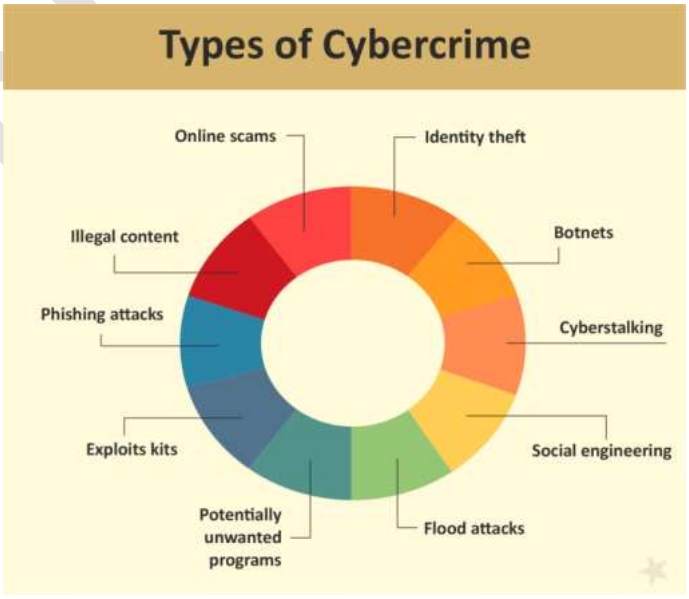
To know more about **Criminal Justice System,** please refer to our following Weekly Focus Document.

India's Criminal Justice System: Reforming Institutions For Delivering Justice	The entire existence of the orderly society depends upon sound and efficient functioning of the Criminal Justice System. Understanding the evolution and various components of criminal justice system in India, the document examines various maladies and faults with which the existing criminal justice system is affected. It further pinpoints various alternatives and suggestions for strengthening the system in order to achieve equity and prompt delivery of justice in the country.	

4.3. 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 is among the **top five targets for cyberattacks in the Asia Pacific (APAC) region**, particularly security breaches that involve cyber espionage, as per 'Cyberthreats to Financial Organizations in 2022' report.
  - As per **State of Ransomware 2021**, 68% of organizations in India deals with ransomware.

What is the present cyber security architecture in India?

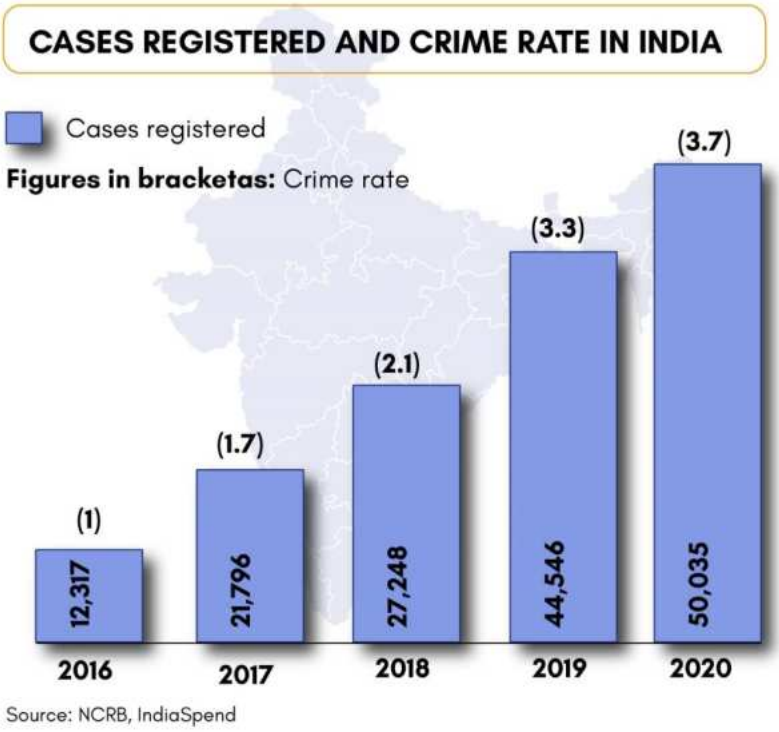
National Cyber Security Policy, 2013: It was the first comprehensive document brought out by government to **create a secure and resilient cyberspace ecosystem and strengthen the regulatory framework.**

- It aims to **protect information infrastructure in cyberspace**, reduce vulnerabilities, build capabilities to prevent and **minimize damage from cyber incidents** through a combination of institutional structures, people, processes, technology and cooperation.

- **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**.

- **Pillars of strategy** are Secure (the National Cyberspace), Strengthen (Structures, People, Processes, Capabilities), and Synergise (Resources including Cooperation and Collaboration).

- **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**. It **issues alerts and advisories regarding latest cyber threats/vulnerabilities** and counter measures to protect computers and networks on regular basis.
  - **National Cyber Coordination Centre (NCCC):** It is multi-stakeholder cyber-security and e-surveillance agency, under CERT-In. It generates **situational awareness of existing and potential cyber security threats and enable timely information sharing** for proactive, preventive and protective actions by individual entities.
  - **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.



Causes of cybercrime

- **Embedding Malware:** Cyber criminals have embedded malware into legitimate applications to target poorly secured Wi-Fi spots and passwords, so that they can steal useful information.
- **System vulnerabilities:** When cybercriminals spot a weakness, they pounce on it.
  - For instance, **Software developer SolarWinds** was subject to a cyber-attack in 2020. Cyber criminals exploited a vulnerability in the company's software after employees shared details of the system flaw online.
- **Anonymity:** Law enforcement is handicapped by the fact that cybercriminals can operate from anywhere with internet access.
- **Accessibility**: Amid pandemic, **sensitive information has become susceptible to security vulnerabilities** as Firms permitted employees to work from home.
- **Regulatory mechanism:** IT Act, 2000, is not equipped to consider new-age changes in the mode of functioning of businesses and modus operandi of crimes in cyber space.

Why there is a need to enhance India's cyber security architecture?

- **Financial loss**: India has lost a huge amount of money each year in cyberattacks. For instance, cybercrimes in India caused losses of Rs. 1.25 lakh crore in 2019.
- **Lack of awareness**: Almost 80% of cybercrime frauds occur due to lack of cyber knowledge. During Covid-19 pandemic, overuse or addiction to social media and increased use of online mode to earn money led to rise in cybercrimes.
- **Weak digital security**: Outdated infrastructure, with **poor or inadequate cyber security protection** have exposed India's **digital vulnerability**. For example, Aadhaar data leakage.
  - In 2020, cyber-attacks increased by almost 300% linking it to an enormous increase in digital activities.

- **Multiple organizations**: India has 36 different central bodies that deal with cyber issues, leading to overlapping of responsibilities. Lack of coordination further exacerbates the issue.
- **Lack of resources**: Lack of manpower, training and indigenization in hardware and software cyber security tools is pushing it to a more vulnerable position.
    - For instance, like Israel's National Cyber Directorate or US's Cyber security and Infrastructure Security Agency Act (CISA), India doesn't have any active mechanism for cyber defence.

Way forward

- **Establish National Cyber Security Commission (NCSC):** To coordinate with all ministries for National Critical Information Infrastructure (NCII) in their areas and play a catalytic role for the requirements of military in cyber warfare.
- **Awareness among mass**: Proper education and awareness about cyber security can prevent cybercrimes.
- **Map hotspots area**: States should map the cybercrime hotspots which will **help in quick detection** and take proactive measures to prevent cybercrimes.
- **Upgrade Cyber cells:** The existing cyber cells needs upgradation by **setting up dark web monitoring cells and social media monitoring cells**, induct technical experts, along with traditional police recruitments.
    - States like Punjab, Rajasthan, Goa, Assam do not have a single cybercrime cell, while in Andhra Pradesh, Karnataka and Uttar Pradesh, only one or two cybercrime cells have been set up.
- **Proper investigations**: Development and continual **upgradation of cyber forensics capabilities and investigating skills** of enforcement agencies, to handle cyber-crimes in the ever-expanding proliferation of devices, platforms, big data, Internet of Things, mobility and social media.

4.4. SPACE WEAPONIZATION

Why in news?

Recently IAF chief cautioned about the newer threats in the race to weaponize the space domain, a domain which was hitherto considered relatively safe.

Concept of Weaponization of Space

- It includes **placing weapons in outer space or on heavenly bodies** as well as creating weapons that will transit outer space or simply travel from Earth to attack or destroy targets in space.
    - Examples include the placing of orbital or suborbital satellites with the intention of attacking enemy satellites, using ground-based direct ascent missiles to attack space assets, jamming signals sent from enemy satellites, satellite attacks on Earth targets etc.
- The **weaponization of space is different from the militarization of space**, which includes using space-based assets for C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance).
    - The militarization of space assists armies on the conventional battlefield, whereas via the weaponization of space, outer space itself emerges as the battleground, sometimes referred to as the **"fourth frontier of war."**
- Development projects for militarisation and weaponisation of outer space have been on the increase with the **aim of one country achieving military dominance over the other in outer space.**

Why Space Weaponization takes place?

The desire to establish military supremacy in outer space emerges out of some basic apprehensions like:

- Firstly, **lack of faith in the present missile defence system** to stall an incoming ICBM (Intercontinental ballistic missile) armed with a nuclear warhead.
- Secondly, **to preserve own satellites in space** against other Anti-Satellite (ASAT) weapons.
- Thirdly, the deployment of weapons in space would give **supremacy to a country in the conduct of war over the land, sea and air.**

Implications of space weaponization

- **Fear of War**: The ensuing arms race for weaponisation of outer space would create an environment of uncertainty, suspicion, miscalculations, competition and aggressive deployment between nations, which may lead to war.

- **Against commercial and scientific interests**: It would put at risk the entire range of commercial satellites as well as those involved in scientific explorations.
    - A major problem is that a country that deploys a military satellite is **reluctant to disclose its orbital slot and radio frequency** (as the peaceful scientific and commercial operations in space rely on radio frequencies and orbital path, particularly in the geosynchronous orbit.), fearing that such information could be used by an adversary.
- **Space Debris**: The problem of space debris, radio frequencies and orbital slots are some of the other alarming issues that would get further muddled should space weaponization be resorted to in the real sense.
    - Due to the **very high speed in low orbit**, about 10 km/sec, particles less than one-tenth of a millimetre in diameter can **damage satellites and spacecraft**.
    - When debris in LEO returns to the Earth, it poses a lethal danger to people and to property.
- **Monopoly of Orbit**: Countries, particularly developed ones like the United States, may reserve an orbital slot and may not use it for several years, thus, monopolizing the diminishing number of orbital slots. These actions have rightly become a source of international tension.

India in the race of space power

- **Institutional progress**:
    - As a first step, the Department of Atomic Energy formed **the Indian National Committee for Space Research (INCOSPAR)** under the leadership of Dr Sarabhai and Dr Ramanathan in 1962. Later, the **Indian Space Research Organisation** (ISRO) was formed on August 15, 1969.
    - India established a **Defence Space Agency (DSA**) in 2019, which is expected to be the forerunner for a full-fledged aerospace command.
    - It is also establishing a **Defence Space Research Organisation (DSRO**), which is meant to undertake research and development on the capability mix that is required as per the strategy and policy developed by the DSA.
- **Anti-satellite (ASAT) missile test (Mission Shakti)**: **India is now the fourth country** in the world to conduct an ASAT missile test**, after the United States, Russia, and China**.
    - The test entailed launching a ballistic missile into outer space to destroy an Indian satellite located about 300 kilometres above the earth's surface in low earth orbit (LEO).

United States' programme for developing space weapons

Some of its declared projects for space Weaponisation include:

- **Space-Based Lasers (SBLs**): These would operate in LEO and destroy hostile ballistic missiles during their boost phase.
- **Space-Based Missile Interceptors**.
- **Anti-Satellite (ASAT) Weapons**: It includes high powered lasers, micro-satellites, Kinetic-Energy Anti-Satellites (KE-ASAT) weapon, Near Field IR Experiment (NFIRE), etc.

Global Framework to prevent Weaponization of Space

- **Outer Space Treaty**: It was conceptualized by the United Nations in 1967.
    - It emphasizes the fact that the **exploration of outer space** should be beneficial to all mankind and nations and it should be for peaceful purposes.
    - It claims that **one nation cannot claim national sovereignty in outer space.**
- **Prevention of an Outer Space Arms Race**: It re-emphasized the importance of using space for peaceful purposes, the importance of **avoiding an arms race** and the readiness of all states to contribute to that common objective, in conformity with the provisions of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.

Way Forward

- **Need of Legal framework**: Re-conceptualizing and revising existing space laws to develop a new legal framework to address momentum towards the weaponization of outer space is important in this context.
- **Awareness about Space situation**: In order to increase situational awareness of space objects already in space, as well as their purposes, states should submit valid information to international institutions which can then organize the data and **provide open-source information** to all about the situation in space.
- **Universal access of technology**: Legitimate access for all States to outer space and the provision of training, the **transfer of technology and cooperation among nations**, without discrimination should be promoted.
- **Promoting Transparency**: Transparency and **confidence-building measures** can help maintain space security by complementing a negotiated international legal instrument on outer space arms control.

4.5. NEWS IN SHORTS

4.5.1. INDIA APPOINTS FIRST NATIONAL MARITIME SECURITY COORDINATOR

- Proposed after the 26/11 terror attacks (2008), the National Maritime Security Coordinator (NMSC) will be **part of the National Security Council Secretariat** and will **report to National Security Advisor** (NSA).
  - NMSC has been a **long pending requirement since the Kargil Group of Ministers (GoM)** recommended it.
- **Role**
  - **Principal advisor to the government** on maritime security domain.
  - **To coordinate among the Indian Navy, the Coast Guard, security agencies** involved in coastal and maritime security and 13 coastal states and UTs.
    - ✓ At present, all these agencies **tend to work in silos with overlapping jurisdictions and are constantly at odds with each other.**
- **Need to secure India's maritime domain**:
  - **India has suffered from sea blindness over centuries** with over 7000 km of coastline and over 2 million kilometres of Exclusive Economic Zone.
  - Over **70% of Indian trade including vital crude oil** is transported through sea.
  - **China moving towards a sea-based security doctrine** and is penetrating into the Indian Ocean through Pakistan and Myanmar.

Other measures for maritime security

- **SAGAR- Security and Growth for All in the Region** is the theme of Indian Ocean Policy as outlined by PM.
- Signing of **White Shipping Agreements**, and agreements on **Humanitarian Assistance and Disaster Relief (HADR).**
- Setting up of **Coastal Surveillance Radar Systems** and **medical supplies** through Operation-Sagar-I and Sagar II during covid times.
- **Net Security provider** - deployment of ships by Indian Navy and Coast guard for maritime security and anti-piracy operations.

4.5.2. GOVERNMENT TO CONTINUE CENTRAL SECTOR UMBRELLA SCHEME OF BORDER INFRASTRUCTURE & MANAGEMENT (BIM) FROM 2021-22 TO 2025-26

- BIM scheme will help in the **creation of infrastructuresuch 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.
- **Significance of BIM:** Strengthen infrastructure for improving border management, policing and guarding.
- **Importance of border infrastructure for India**
  - Quick **mobilisation of troops** including armoured vehicles.
  - **Curbing of illegal activities** like smuggling, illegal immigrations, counterfeit currency.
  - Improve all weather **connectivity**.
  - Improve **trade relations** with neighbouring countries.
  - **Helps to maintain peace and stability** in the region.
- **Other initiatives for border management**:
  - **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.

4.5.3. MILITARY EXERCISES IN NEWS

MILAN 2022

- Latest edition of **Indian Navy's (IN) biennial multilateral exercise** commencing in **Visakhapatnam** will witness its largest ever participation**, with more than 40 countries**.
- It was **first conceived by IN in 1995 at Andaman and Nicobar Command** with participation of four countries (Indonesia, Singapore, Sri Lanka and Thailand)

COBRA WARRIOR 22

- Ex-Cobra are the **largest annual exercises conducted by the UK's Royal Air Force.**

EASTERN BRIDGE-VI

- The **6th edition** of bilateral exercise, **'Eastern Bridge-VI' Air Force Exercise is taking place between India and Oman** at Air Force Station Jodhpur.

5. ENVIRONMENT

5.1. 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.

More about news

- The guidelines on EPR coupled with prohibition of identified single use plastic items are important steps **for reducing pollution caused due to littered plastic waste in the country.**
- As per the new notification, **the Government has announced setting up of a committee which shall be constituted by the Central Pollution Control Board (CPCB) under chairpersonship of CPCB chairman**, to recommend measures to the Environment ministry for effective implementation of EPR, including amendments to EPR guidelines.
    - It will **strengthen circular economy of plastic packaging waste, promote development of new alternatives to plastics and provide steps for moving towards sustainable plastic packaging** by businesses.

What is EPR?

- Extended producer responsibility (EPR) is a critical policy mechanism that helps advance the circular economy, decreases the environmental impact from a product and its packaging, and promotes the principle of "polluter pays" by holding the producer accountable for the entire lifecycle of the product.
    - EPR programs **ensure that the producers, manufacturers, brand owners, and first importers of products and packaging are given the legal responsibility for collection, recycling, and end-of-life management of materials.**

Constitutional perspective of EPR in India

- **Article 21:** It is widely accepted that the right to life under Article 21 also embraces the right to live in a wholesome, pollution-free environment.
- **Article 48-A:** It imposes a duty on the State to preserve and improve the environment.
- **Article 51-A (g):** It makes the State as well as the citizens responsible for the preservation of the natural environment.

- EPR policies and programs are well established in **Europe, Canada, Japan, and South Korea** for a wide range of products.
- The **Plastic Waste Management Rules, 2016** introduced the concept of EPR to manage plastics in India.
    - The **Plastic Waste Management Rules, 2016,** mandate the generators of plastic waste to take steps to minimize generation of plastic waste, not to litter the plastic waste, ensure segregated storage of waste at source and hand over segregated waste in accordance with rules.

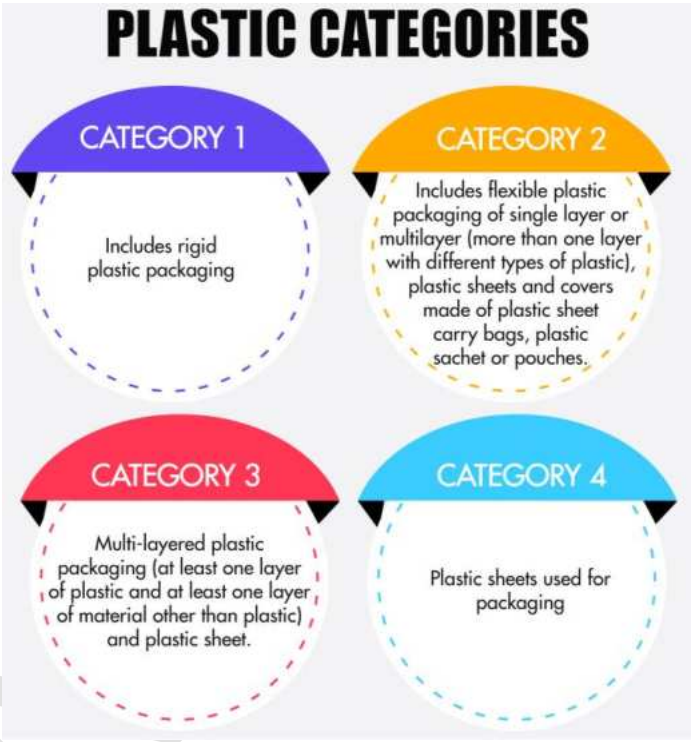
New Guidelines of EPR

- With respect to plastic packaging, the **EPR 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)
- **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. As per the notification, registration would be compulsory.

- **EPR Certificates:** For the first time, the guidelines allow for **the sale and purchase of surplus extended producer responsibility certificates**. Thus, **setting up a market mechanism** for plastic waste management. **Brand owners and e-commerce** players have been brought under the ambit of EPR.
- **Establishment of Centralised online portal:** The government has also called for **establishing of a 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.

- The **online system developed** for the registration as well as for filing of returns by PIBOs shall reflect the plastic packaging material introduced in the market by them in a financial year.
- The **centralized portal would act as the single point data repository** with respect to orders and guidelines related to implementation of EPR for plastic packaging under Plastic Waste Management Rule, 2016.

- **Compensation:** Environmental compensation shall be levied based upon polluter pays principle, with respect to non-fulfilment of EPR targets by PIBOs.
  - The funds collected shall be utilized for collection, recycling and end of life disposal of uncollected plastic waste in an environmentally sound manner.
- **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**.
- **Applicability:** EPR is now 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.**



- **Annual Reports:** Under the new guidelines, 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**.

Limitations

- **Accurate Data:** There is little data on the type of e-waste generated and being imported into the country. There is lack of waste inventory with the State Pollution Control Boards (SPCBs) and Urban Local Bodies (ULBs). Also, the biggest challenge would be monitoring the data provided by PIBOs, PROs and other stakeholders.
- **Lack of proper enforcement:** Despite creating a strong stringent implementation and monitoring system, there is a possibility of non-compliance from stakeholders. Ultimately, a collective participation by stakeholders will ensure the EPR is effectively implemented.
- **Inclusion of Informal sector:** Informal sector manages more than 90% of the waste. EPR implementation will be inefficient if the informal sector is not duly recognised and formalised.
- **Waste Segregation:** Waste segregation is essential for EPR implementation. There is lack of awareness among consumers on the nature of waste. For instance, e-waste is toxic to the environment if not disposed of consciously. Lack of segregation at source poses severe challenges to local authorities and burdens the waste collectors for segregation.
- **Inadequate Infrastructure:** The waste disposal, collection, processing, and recycling facilities in every ULBs is **understaffed and lack proper infrastructure**. There is a possibility of waste leakages in the system due to inadequate infrastructure.
- **Stringent law:** The drawback of this rule is that it sets a very high penal condition which will ensure a large number of cases that will be filed for even minor violations.

Way Forward

- **Waste minimization:** Through the new EPR policy in India, the brand owners should be encouraged to gradually decrease the number of plastics they introduce in the market by adopting alternatives such as paper, glass, metals, among other things.

- **Research and development:** It should be supported for lower-cost recycling technologies as this will enable safer recycling and the growth of the formal sector. Further, lessons from successful public partnerships can be applied to set up collection and distribution logistics and incentives.
- **Awareness creation:** Lack of knowledge regarding the repercussions of improper disposal leads most consumers to prefer the most convenient disposal route of selling plastic waste to kabadiwalas or illegal contractors. Therefore, there is a growing need for educating the consumers, because any amount of infrastructure or best technology will be a failure if no waste flows in that.

5.2. GROUNDWATER EXTRACTION GUIDELINES

Why in news

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

More about news

- Central Ground Water Board had notified new guidelines on groundwater extraction **to be effective from September 24, 2020 after the 2018 guidelines were scrapped by National Green Tribunal (NGT)** for being unsustainable.
- However, recently objections have also been raised by NGT to the 2020 guidelines as -
  - Guidelines issued by the Ministry of Jal Shakti **do not satisfy directions given by it repeatedly and persistently.**
  - Guidelines do not address the **root cause and central issue, i.e., protection and preservation of ground water**, prevention of depletion, and effective attempt for recharge and restoration.

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.**

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.
- **Penalty** between Rs 50,000 and Rs 10 lakh for noncompliance.

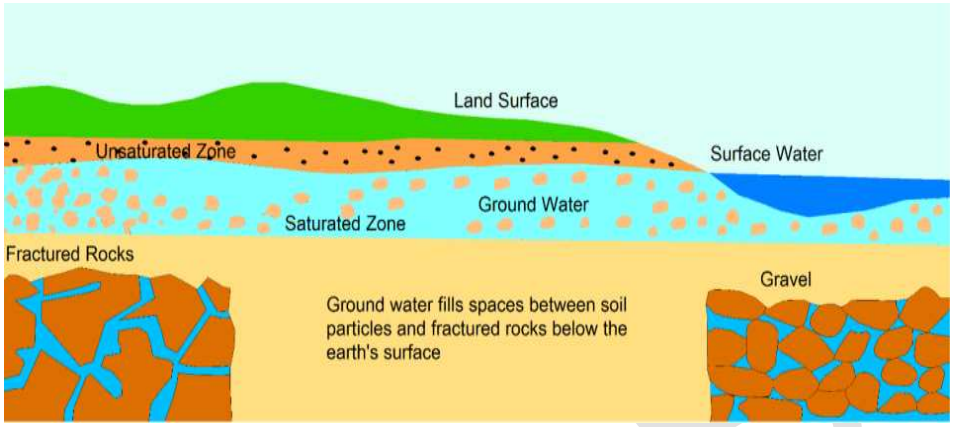
2018 guidelines on groundwater extraction

- **Concept of Water Conservation Fee (WCF)** for industrial extraction
- Encouraging use of recycled and treated sewage water by industries,
- Provision of action against polluting industries
- **Mandatory requirement of digital flow meters, piezometers,** and digital water level recorders
- Mandatory water audit.
- Mandatory roof top rainwater harvesting
- Prevention of ground water contamination in premises of polluting industries/ projects.

Groundwater Extraction in India

- India uses the most groundwater in the world, accounting for approximately **25% of the global groundwater extraction.**
- According to CGWB survey of 6,584 groundwater units across India
  - **1034 units were found to be over-exploited** (more extraction than recharge)
  - **253 critical** (extraction is 90-100% of what's recharged)
  - **681 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.



Causes of High Ground Water Extraction in India

- **Inadequate rainfall**: Lower amount of precipitation and precipitation occurring in short bursts does not allow for recharge of aquifers. For instance, in Central India.
- **Green Revolution**: Owing to green revolution, water intensive crops could be grown in water deficit region. For instance, the case of paddy in North and North West India.
- **Increase in demand**: This is attributed to multiple factors including
  - **Rise in population** which resulted in increased demand for agriculture
  - **Urbanisation which decreased green spaces and also promoted deforestation** and
  - **Rise in industries which resulted in decreased water quality**.
  - However, the supply could not match the demand.
- **Geomorphological issues**: In the central and southern states there are limited storage facilities owing to the hard rock terrain.
- **Inadequate administration**: As water is a state subject, thus forming a comprehensive law is under the primary domain of states. Also, Inadequate regulation encourages over exploitation of groundwater without any penalty.
- **Water User's Behavior**: Misuse has been tacitly accepted owing to policies supporting free Subsidies on electricity and high MSP for water intensive crops.

Impact of Ground Water Extraction

- **Lowering of the Water Table:** Excessive pumping can lower the groundwater table, and cause wells to no longer be able to reach groundwater.
- **Increased Costs**: As the water table lowers, the water must be pumped farther to reach the surface, using more energy. In extreme cases, using such a well can be cost prohibitive.
- **Reduced Surface Water Supplies**: Groundwater and surface water are connected. When groundwater is overused, the lakes, streams, and rivers connected to groundwater can also have their supply diminished.
- **Land Subsidence**: Land subsidence occurs when there is a loss of support below ground. This is most often caused by human activities, mainly from the overuse of groundwater, when the soil collapses, compacts, and drops.
- **Water Quality Concerns**: Excessive pumping in coastal areas can cause saltwater to move inland and upward, resulting in saltwater contamination of the water supply.

Steps taken by government for Groundwater management -

- **National Water Policy 2012** which proposes a framework for creation of a system of laws and institutions and for a plan of action with a unified national perspective
- **Jal Shakti Abhiyaan, 2019** is a time-bound, mission-mode water conservation campaign
- "Master Plan for Artificial Recharge to Ground Water in India" by CGWB in 2013
- Watershed Development Component (WDC) of the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)
- Atal Bhujal Yojana
- The Environment (Protection) Act, 1986" for groundwater management.

Way Forward

- **Data Collection and Analysis**: Preparing a Database on natural and artificial recharge of water and also on over-exploited areas.
- **Preventing misuse of groundwater in agriculture**: Measured suggested include
  - on-farm water management techniques and adoption of improved irrigation methods
  - implementation of 'Master Plan for Artificial Recharge to Ground Water'
  - revamping agricultural power pricing structure, as flat rate of electricity adversely affects the use of groundwater.
- **Concurrent list**: Bringing the subject of water under the concurrent list to help evolve a comprehensive plan of action.
- **Water Quality Management**: Steps to minimize and control the dumping of industrial waste into surface water and underground aquifers should also be taken.

5.3. 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.

About International Union for Conservation of Nature (IUCN)

- IUCN is the world's **leading provider of conservation data, assessments and analysis**.
- It was **created in 1948.**
- It is a **membership Union** composed of both **government and civil society organizations**.
- It is headquartered in **Switzerland**.
- **India is its member.**
- **Private for-profit organisation cannot be an IUCN Member** even if their objectives are in line with IUCN's.

Related Fact

About Green Status of Species

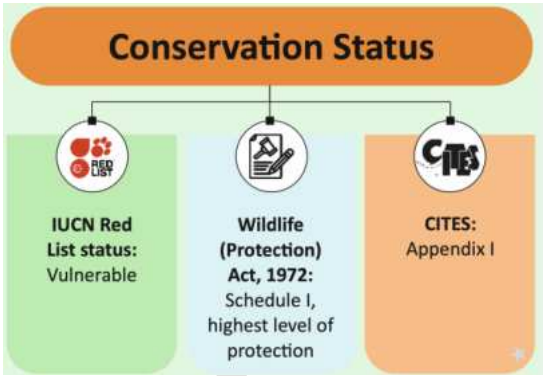
- **Prepared by:** IUCN**.**
- It is a global standard for **measuring species recovery and assessing conservation impact.**
- The Green Status **assesses species against three essential facets of recovery -**
    - A species is fully recovered if it **is present in all parts of its range**, even those that are no longer occupied but were occupied prior to major human impacts/disruption; AND
    - **It is viable** (i.e., not threatened with extinction) in all parts of the range; AND
    - **It is performing its ecological functions in all parts of the range.**
- These factors contribute towards a **"Green Score" ranging from 0–100%, which shows how far a species is from its "fully recovered" state.**
    - A value of **0% means the species is Extinct or Extinct in the Wild, and 100% means it is Fully Recovered**.
- **The significance of the Green Status** is its **potential to tell the story of a species** by calculating Green Scores at different time intervals.
- Green Status assessments are **not an alternative to extinction risk assessments through the IUCN Red List,** but provide complementary information.
    - Red List is the **global standard for assessing the risk of extinction that individual species of animal, fungus, and plant faces.**
    - It consists of **Nine categories - Not evaluated, Data deficient, least concern, near threatened, vulnerable, endangered, critically endangered, extinct in wild, extinct.**

5.4. DUGONG

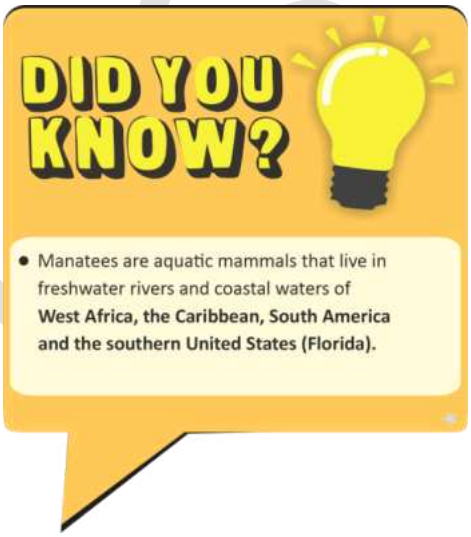
Why in news?

Recently, Tamil Nadu has declared India's first dugong conservation reserve in the Gulf of Mannar and the adjacent Palk Bay on the southeast coast of India.

About Dugong



- The dugong is a species of sea cow **found throughout the warm latitudes of the Indian and western Pacific Oceans**.
  - The name sea cow refers to the fact that **they graze on seagrass, which forms meadows in sheltered coastal waters**.
  - Most of the world's dugong population now occurs in northern Australian waters. The Great Barrier Reef region supports globally significant populations of dugong.
- It is the only member of the **Dugongidae family,** and its closest living relatives are the manatees.
  - Unlike manatees, which use freshwater areas, the dugong is strictly a marine mammal. These are more closely related to elephants than to other marine mammals such as whales and dolphins.
- They can tolerate the brackish waters found in coastal wetlands, and **large numbers are also found in wide and shallow mangrove channels and around leeward sides of large inshore islands**, where seagrass beds are common.
- Dugongs can be quite large, reaching lengths of more than 13 feet (4 m) and weights more than one metric tonne. Dugongs are **long-lived**, and the oldest recorded specimen reached age 73.
  - Although **they are social animals,** they are **usually solitary or found in pairs** due to the inability of seagrass beds to support large populations. They are **shy and donot approach humans**.
- As with all other marine mammals, **Dugongs must surface to breathe**.
- These are **semi-nomadic, often traveling long distances in search of food, but staying within a certain range of their entire life**.
  - It is thought that these movements are caused by changes in seagrass availability.



Significance of conservation reserve

- **Conservation of marine species:** The rich marine diversity of the Gulf of Mannar would completely come under the protection in the conservation reserve. The Gulf of Mannar and Palk Bay are habitats for a **wide range of marine fauna, including rare fishes, sea turtles, seahorses, and sea cucumbers**.
  - The region is presently facing threats of climate change apart from destructive fishing practices and industrial pollution.
- **Indicator species:** Dugong play an important ecological role in coastal marine ecosystems, and dugong populations in an area can be used as an indicator of general ecosystem health.
- **Protection of Seagrass:** Other than supporting dugongs, it will **restore seagrass beds along the continental shelf** which play a vital role in protecting the fragile marine biodiversity of the Gulf of Mannar and Palk Bay, and support the health of coastal ecosystems in the Bay of Bengal off the eastern coast of India.
  - The region has thirteen different species of seagrasses, with **Thalassia hemprichii, Syringodium isoetifolium, and Cymodocea serrulate** identified as the dominant species.
- **Livelihood:** Seagrass beds are also essential for the **livelihood of traditional fisher community** in the area.

About seagrass

- Seagrasses are **underwater plants that evolved from land plants**.
- They are like **terrestrial plants in that they have leaves, flowers, seeds, roots, and connective tissues**, and they make their food through photosynthesis.
- Unlike terrestrial plants, however, they **do not have strong stems to hold themselves up**. Instead they're **supported by the buoyancy of the water that surrounds them**.
- Seagrasses are a **very important food source and habitat** for wildlife, supporting a diverse community of organisms including fish, octopuses, sea turtles, shrimp, blue crabs, oysters, sponges, sea urchins, anemones, clams, and squid.
- Seagrasses have been called '**the lungs of the sea**' because they release oxygen into the water through the process of photosynthesis.
- Seagrasses can reproduce sexually or asexually. They are flowering plants that produce seeds. Seagrasses are not true grasses. They are more closely related to terrestrial lilies and gingers than grasses.

Conservation efforts

- **A National Level Task Force for Dugong Conservation** has been established and a National Conservation Action Plan for Dugongs and their habitats in India has been drafted.
- **Species Recovery Programme:** Dugong is chosen as one of the species under the program.
  - The MoEFCC, in consultation with Wildlife Institute of India and other scientific institutions/ organizations, identified 16 terrestrial and 7 aquatic species with the objective of saving critically endangered species/ecosystems that to ensure their protection outside Protected Areas, across the wider landscape/seascape.
- **Seagrass ecosystems** in India are **classified as Ecologically Sensitive Areas under the Coastal Regulation Zone Act 1986 (amendment).**
- **Dugong and Seagrass Conservation Project** focuses on the dugong range states of Indonesia, Madagascar, Malaysia, Mozambique, Solomon Islands, Sri Lanka, Timor-Leste and Vanuatu.
  - It seeks to work with local communities to help them understand the benefits of conserving dugongs and their habitat.

5.5. 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.

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.**

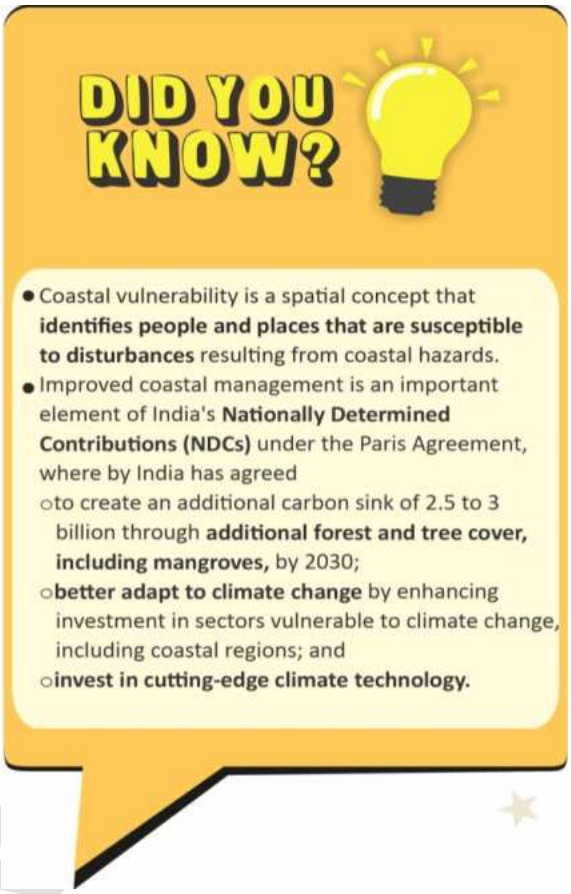
More on news

- 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.

What is the relevance of the CVI?

Coastal vulnerability assessments are **useful for coastal disaster management and building resilient coastal communities** by helping in addressing the following factors-

- **Sustainable development:** Coastal regions have multiple uses, like high productivity of the ecosystem, highly concentrated population, industrial friendly, waste disposal, tourism, transportation, strategic planning in military and many more. Despite all of these, Indian coasts are under threat due to multiple stresses like global climate change and human intervention.
- **Climatic vulnerability:** Sea levels along the Indian coast have risen by 8.5 centimeters during the past 50 years. India lost 235 square kilometers of land to coastal erosion between 1990 and 2016, placing people's livelihoods and homes in jeopardy, with flight to safer places.
- **Long-Term displacements:** More than 26% of Indian population live within 100 km from shoreline. Scientific prediction suggests that 36 million Indians are likely to be living in areas experiencing chronic flooding by 2100. However, certain coastal regions are more vulnerable than others, evidenced by multiple, repeated displacements in the same places. Beyond displacement and migration along the eastern coast, sea-level rise and flooding might also lead to increased relocation in major coastal cities.
- **Informed policy making:** While most of the existing policies in India address displacement from rapid-onset disasters such as monsoons and cyclones under disaster reduction and rehabilitation policies, **displacement due to slow-onset disasters such as coastal erosion has yet to find a place at the policy level.**
    - Local-level policies in India have responded to displacement in coastal communities, however, the response has not addressed many current and future impacts resulting from sea-level rise and coastal flooding.



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).**

VISION

- **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)

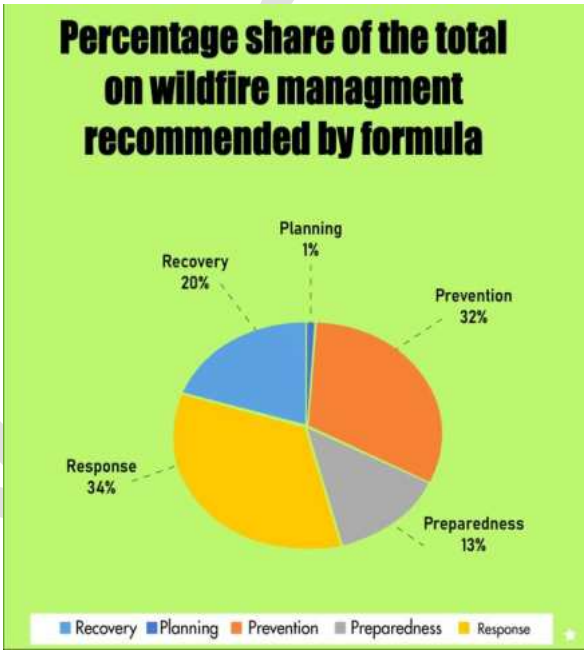
Conclusion

India's coastal regions are on the front lines of a shifting climate, experiencing sea-level rise, erosion, and natural disasters such as tropical storms and cyclones. The recent CVI would prove the most fundamental factors in improving the design and implementation of policies for making coastal regions resilient to any anthropogenic or natural vulnerabilities.

5.6. 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.**
- **Significance of the formula**
  - **Investing effectively** as current government responses to wildfires put money in the wrong place.
  - **Focus on prevention** as **true cost of wildfires i.e. financial, social, and environmental** is extremely high.
  - **Development of international standard** for wildfire management which will help countries build capacity for domestic application and international assistance.
  - **Help in SDG achievement** as changing scale and intensity of wildfires may **especially impact achieving SDG goals to end hunger, poverty and the goal on climate action in developing countries.**

About Wildfire

- Wildfire is "an **unusual or extraordinary free-burning vegetation fire** which may be started maliciously, accidently, 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.**

Wildfire vs Forest Fire

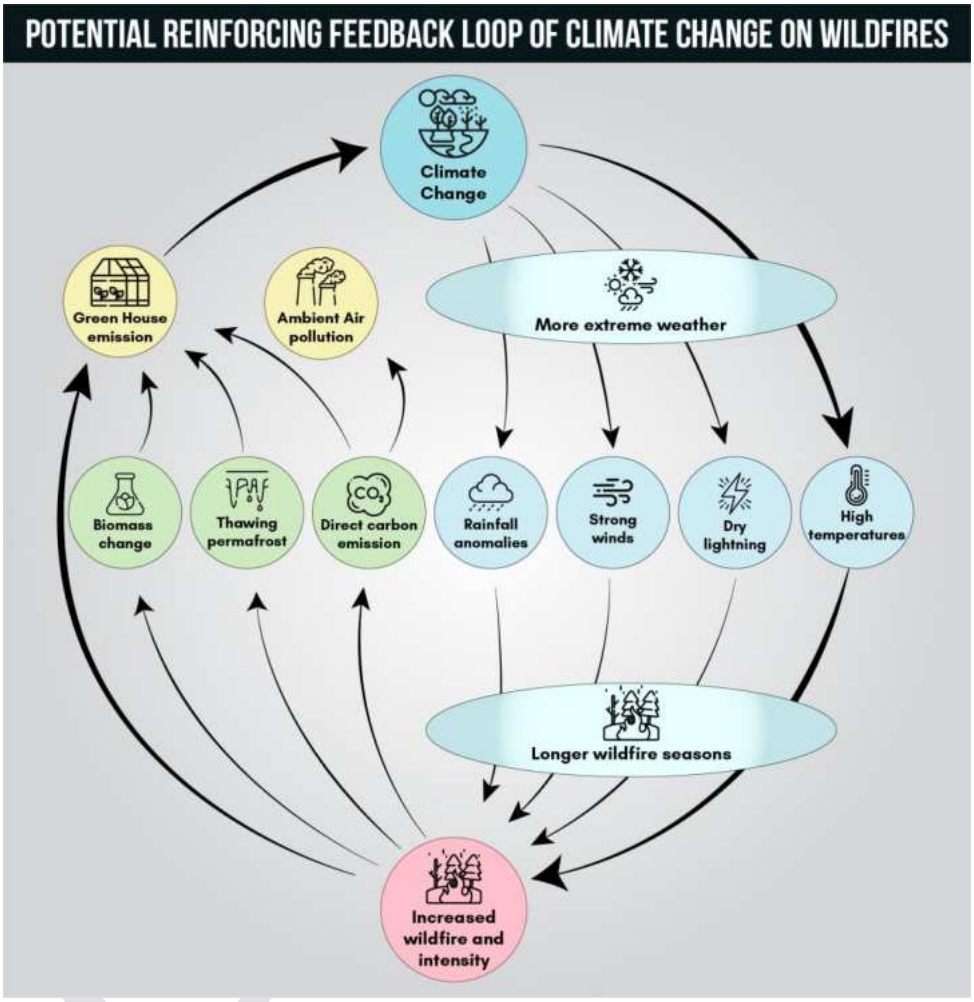
- National Institute of Disaster Management (NIDM) defines Forest fire as **an unclosed and freely spreading fire that consumes the natural fuels**.
- When a **fire burns out of control it is known as Wildfire.**

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**.

- Australia saw **extreme wildfire incident in 2019-20 terming it as "Black summer**" season.
- Also, in a first, **wildfires were observed in the Arctic.**

Impact of Wildfires/forest fire



- **Affect the global carbon cycle**: Wildfires in ecosystems like peatlands and rainforests, which store large amounts of irrecoverable terrestrial carbon, release vast quantities of CO2 into the atmosphere, exacerbating global warming.
- **Economic impacts**: Wildfires result in long term impacts on individuals, communities, and nations. Though cost of disasters is difficult to ascertain, however world's poorer communities are disproportionately affected.
- **Harm to human health**: Wildfire smoke contains particulates and toxic combustion products which cause respiratory harm, cardiovascular impacts, and increased risk of neurological disorders.
- **Impact on wildlife**: due to mortality during the fire and, for some animals and post-fire habitat changes such as impact on vegetation, landscape, and individual plants.
- **Impact water catchments**: Contaminants, increased soil erosion, changed soil composition, and slope stability affect both yield and quality for extensive periods.
- **Climate change**: Forest Fires are obviously one of the major responses to climate change, but fires are not only a response -- they feed back to warming, which feeds more fires.

5.7. MARINE HEAT WAVES

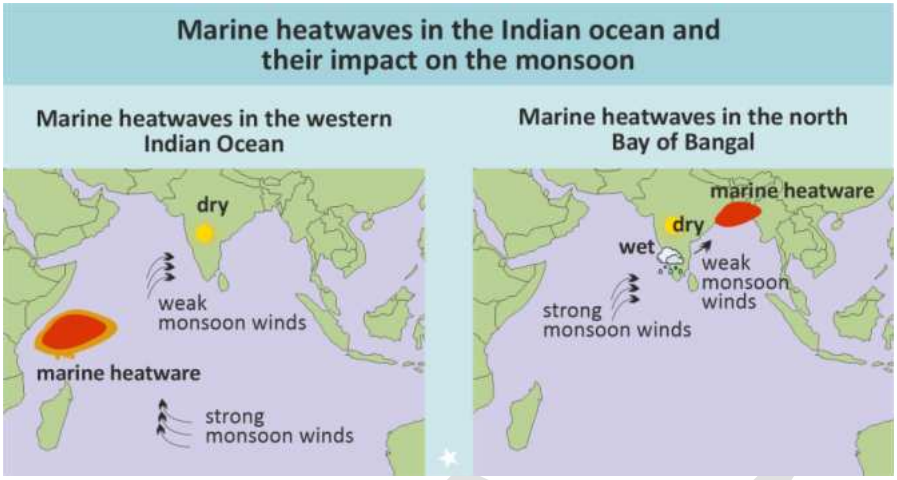
Why in news?

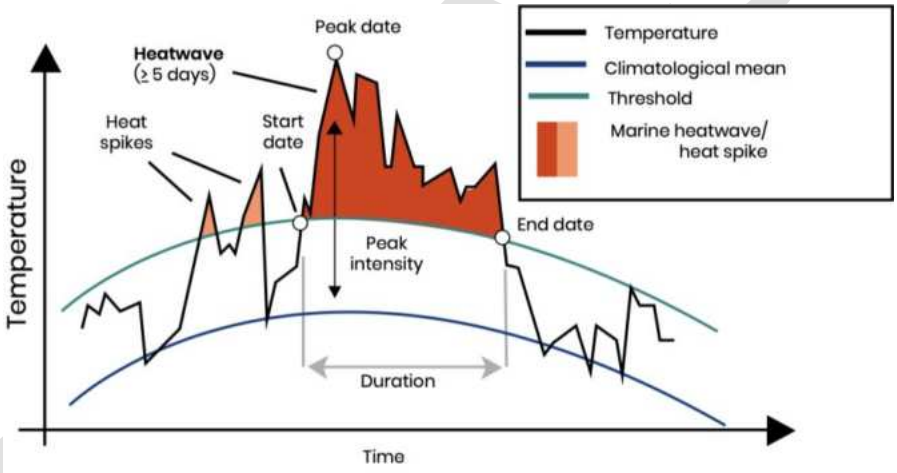
Recently, Experts found that frequent marine heatwaves in Indian Ocean disrupts India's monsoon patterns.

More about news

- According to a new report, **Marine heat waves (MHW),** which are periods of increased temperatures overseas and oceans**, in the Indian Ocean region have increased significantly in the past few decades**.
- As per the study published in the **journal JGR Oceans**, the phenomenon is **impacting the Indian monsoon.**
  - Also, an underwater survey showed **85 per cent of corals in the Gulf of Mannar near the Tamil Nadu coast got bleached after the marine heatwave in May 2020**.
- In the **Indian Ocean**, the worst-affected area were its **western part and northern Bay of Bengal**.
  - The number of MHWs in the West Indian Ocean **increased by around 1.5 events per decade between 1982 and 2018**.The occurrences went up by around **0.5 events per decade in North Bay of Bengal** in the same period.
    - ✓ There were a total of 66 events in West Indian Ocean and 94 in North Bay of Bengal in the 36 years.

- Projections suggest that by 2100, MHWs will occur as many as 50 times as often as in pre-industrial times, and increase 20-50 times in frequency and 10 times in intensity. While these changes impact the entire ocean, the Arctic and tropical regions are expected to be most affected.





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**.

Causes of MHW

- **El Nino:** The increase in marine heat waves is due to **rapid warming in the Indian Ocean and strong El Nino events**.
  - El Nino is one phase of the **El Nino Southern Oscillation (ENSO) phenomenon** which has a generally **warming effect on the world's ocean and land surfaces**.
- **Increased Sea surface temperatures (SST):** SST have increased at a rate of nearly 0.6°C per century. This warming has increased the likelihood of marine heatwaves from occurring.
- **Anthropogenic factors:** Around 90 per cent of the warming caused by greenhouse gas emissions is absorbed by the oceans. Climate change is causing ocean warming globally, and regionally MHWs are driven by unusual weather patterns and disruptions in ocean currents and mixing.
- **Ocean Currents:** The most common drivers of marine heatwaves include Ocean currents which can build up areas of warm water and air-sea heat flux or warming through the ocean surface from the atmosphere. Winds can enhance or suppress the warming in a marine heatwave.

Impact of Marine Heat waves

- **Habitat destruction:** These events cause **habitat destruction due to coral bleaching, seagrass destruction and loss of kelp forests, affecting the fisheries sector adversely**.
  - Marine heatwaves can change the habitat ranges of certain species, such as the spiny sea urchin off southeastern Australia which has been expanding southward into Tasmania at the expense of kelp forests which it feeds upon.
- **Impact on Monsoons:** The marine heat waves in the Indian Ocean are also 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.

- **Natural calamities:** Higher water temperatures associated with MHWs can cause extreme weather events such as **tropical storms and hurricanes, and disrupt the water cycle; making floods, droughts and wildfires on land** more likely.
- **Degrades Marine ecosystem and loss of biodiversity:** MHWs have been associated with the **mass mortality of marine invertebrates** and may force species to change behaviour in a way that puts wildlife at increased risk of harm. MHWs have been linked to whale entanglements in fishing gear.
    - Changing conditions can help invasive alien species to spread, which can be devastating for marine food webs.
- **Socio-economic impacts:** MHWs have other profound socio-economic impacts for coastal communities.
    - Aquaculture, for instance, requires water temperatures to remain suitable for farmed species, while fisheries rely on species that often relocate in response to changing environmental conditions.
    - MHWs can also **harm regional tourism**.

Way Forward

- **Reducing Fossil fuels:** Governments must invest in nature-based solutions alongside ambitiously reducing fossil fuel-based emissions to achieve the goals agreed to under the Paris Agreement.
- **Research capacity:** Funding agencies and governments must build research capacity to monitor MHWs, understand their impacts, and predict future heatwave events. Research should aim to establish a temperature baseline which considers species' thermal limits and combine physical and biological data to better predict future conditions and highlight biodiversity most at risk.
- **Raise Awareness:** Local management agencies should raise awareness across all stakeholders and implement forecast systems to help achieve a coordinated response.
- **Legal provisions:** National and sub-national governments should design and implement measures to protect communities and build regional ocean resilience. Examples of such measures include creating and protecting marine protected areas to act as refuges for species of coral, kelp and seagrass; and enforcing catch management or fishing restrictions to help limit economic losses linked to MHWs.

5.8. GREEN HYDROGEN/GREEN AMMONIA

Why in News?

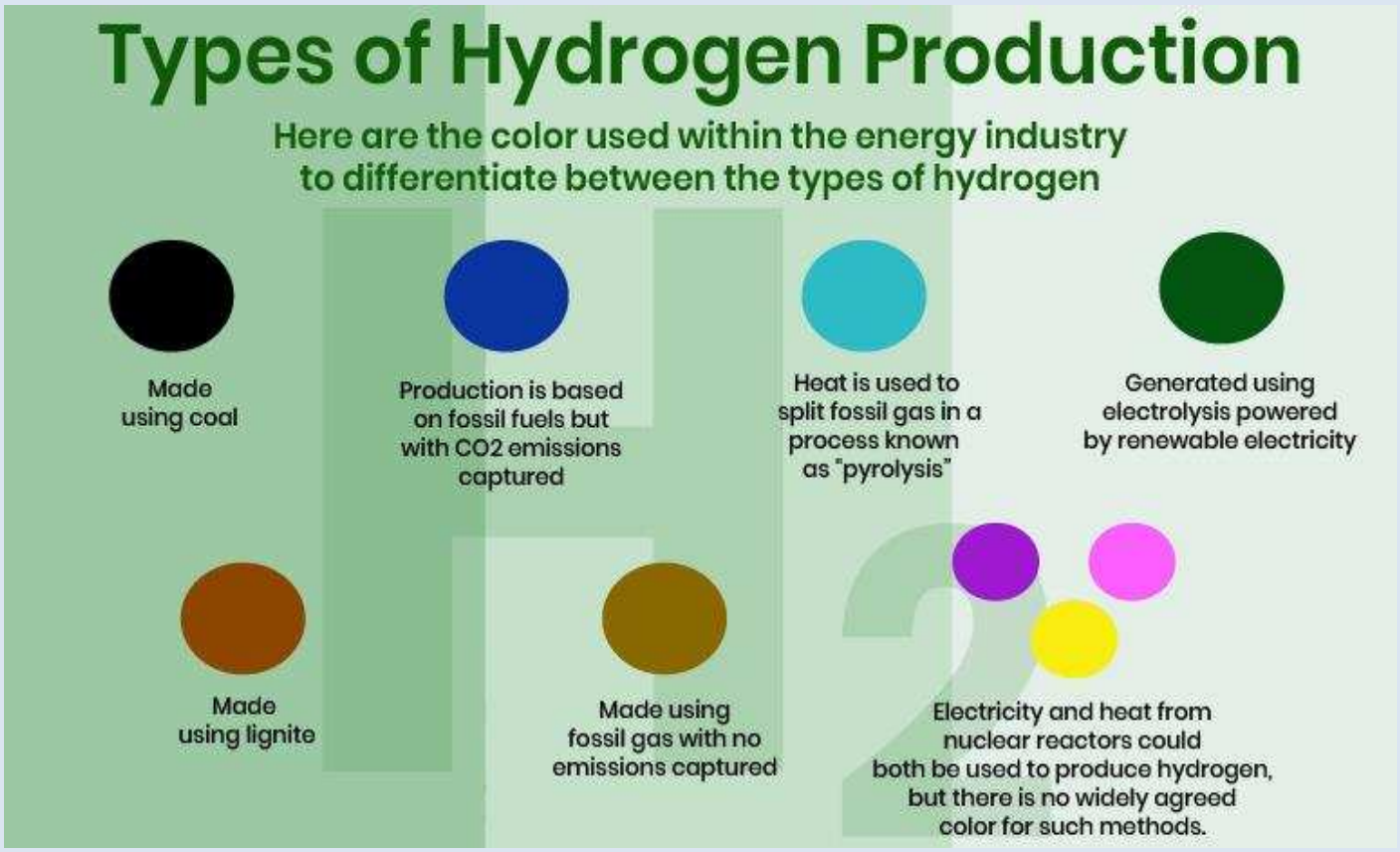
Recently, the Ministry of Power notified the first part of the Green Hydrogen/Green Ammonia Policy to enable production of Green Hydrogen/Green Ammonia using Renewable Sources of Energy.

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.
- The Government of India has also recognized their role to **tackle global carbon challenge** and ensure **environmentally sustainable energy** security of the nation.

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 **Methane Pyrolysis**, **Coal Gasification**, **Electrolysis of water** etc.	Primarily through the **Haber-Bosch Process**, i.e. ammonia production from hydrogen (H_2) and nitrogen (N_2) through a high pressure (150-300 bar) exothermic catalytic reaction at 350-500 °C.
When they are produced using **power from renewable energy (RE)**, it is termed as **Green Hydrogen** and **Green Ammonia.**		



Similarly, we have other forms of Ammonia like-

- **Brown Ammonia:** Higher carbon ammonia made using fossil fuels as feedstock; and
- **Blue Ammonia:** Brown Ammonia with use of Carbon Capture and Storage technology while manufacturing it.

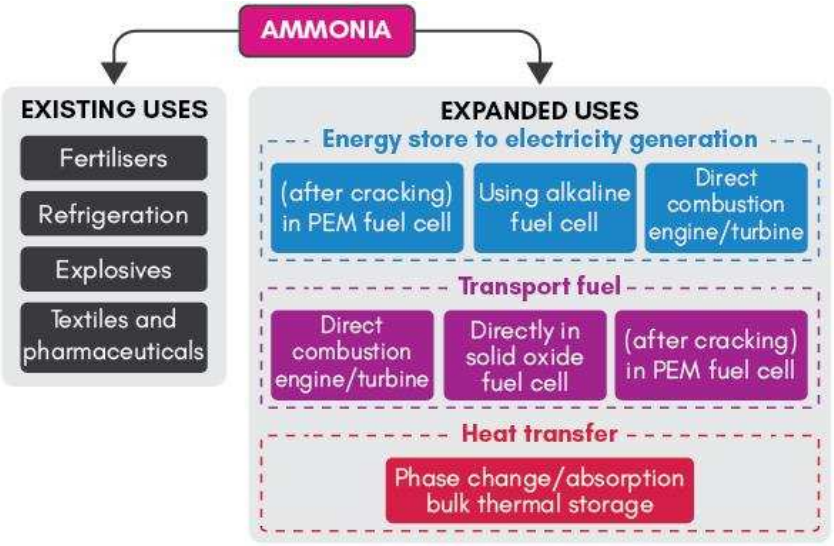
Advantages and disadvantages of Green Hydrogen and Ammonia as fuel

	Advantages	Disadvantages
Hydrogen	• Very **high energy density (120 MJ/Kg),** almost 3 times of hydrocarbons, making it an **efficient source of energy.** • **Easy availability and lower cost** (when produced at mass scale) as it can be produced from gas, coal, wind, water, biomass etc. • **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. ○ As per IEA, green hydrogen would save the world from **830 million tonnes of CO_2** emitted annually when produced using fossil fuels.	• **High initial cost** due to use of metals like **Platinum** in production. • **Lack of existing storage and transport infrastructure.** • **Highly flammable fuel**.
Ammonia	• **Flexibility of use as a transport fuel** or to **store thermal and chemical energy**. • **Lower cost to produce, store, and deliver hydrogen** as NH_3 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.	• **Energy density** (22.5 MJ/Kg) 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.

Benefits of Green Hydrogen/Green Ammonia (GH/GA) for India

- **Reduction of energy imports** as India purchases nearly **85%** of its **oil** and **53% of gas** demand from other countries.
- **Increased green fuels penetration**, promoting developments in RE as well as De-carbonization of the energy sector; achieving **Net-Zero Emission** target by 2070.
- **Reduced Green hydrogen production** cost to **$1-1.5/kg** with potential to become a **net exporter of hydrogen**.

- Address **Duck Curve challenge** of solar power by using the solar power for hydrogen production during the generating hours.
    - **Duck Curve**, resembling shape of a duck, shows the difference in electricity demand and the amount of available solar energy throughout the day.



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.
- **To ensure ease of doing business** 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.

Further steps which can be taken to promote Green Energy

- **Demand Creation mandate** through compulsory purchase obligation or fixed blending norms for green hydrogen starting with key sectors like refining and fertilizers.
    - In a stepwise approach, promoting its use in vehicles by blending with natural gas for existing CNG vehicles, use in power production and other applications like gas-based turbines or fuel cell vehicles.

- **Right policies** to provide clarity to investors, creating a market for Green Hydrogen domestically as well as to create a vibrant export market.
- **Progressive and stable regulatory framework** such as long-term tax/duty incentives, creation of green energy aggregators etc.
- **Promote local R&D** and **manufacturing** of electrolysers (e.g., the PLI Scheme for investors in electrolyser manufacturing) and other technologies required to **generate, store, and transport** them.
    - R&D can also help to decouple ammonia use from environmental impact, especially avoiding or eliminating emissions of nitrogen oxides and ammonia release.

5.9. NEWS IN SHORTS

5.9.1. ONE OCEAN SUMMIT: UNESCO PLEDGES TO HAVE AT LEAST 80% OF THE SEABED MAPPED BY 2030

- At **One Ocean Summit** (OOS), UNESCO has announced that **at least 80% of the seabed will be mapped by 2030**, **compared to 20% currently**.
- **Seafloor mapping**, also called **seabed imaging**, is the measurement of water depth of a given body of water.
    - **Bathymetric survey** measures the **depth and map the underwater features of water body**.
- In 2017, UNESCO joined with Nippon Foundation, Japan's private foundation to launch **Seabed 2030 Project**.
    - The Project aims to bring together all available bathymetric data to **produce the definitive map of the world ocean floor by 2030** and make it available to all.
    - It is carried out in collaboration with **General Bathymetric Chart of the Oceans,** the **only intergovernmental organisation** with a **mandate to map the entire ocean floor.**
- **Significance of seabed mapping**
    - Understanding location of **ocean faults**, workings of **ocean currents and tides**, and the **transport of sediments**.
    - Protect populations by anticipating **seismic and tsunami risks**.
    - Identify **natural sites** that need to be **safeguarded** and fisheries resources for **sustainable exploitation.**
    - Plan construction of **offshore infrastructure** and to respond effectively to disasters such as **oil spills, air crashes and shipwrecks.**

One Ocean Summit

- OOS was organised by **France** (as part of French presidency of **Council of the European Union**) in cooperation with **United Nations and World Bank.**
- Its **objective** is to mobilise international community to take **tangible action towards** preserving and supporting healthy and **sustainable ocean ecosystems.**

5.9.2. UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP) HAS RELEASED ITS ANNUAL FRONTIERS REPORT

- The report titled '**Noise, Blazes and Mismatches'** identifies and draw attention to following emerging issues of **environmental concern.**

Issue identified	Impacts	Recommendations
Noise pollution	• **On human health**: Annoyance; cognitive **impairment**; effects on sleep; hearing impairment; **adverse quality of life**, mental health and well-being. • **On animals**: Can interfere with acoustic communication and **alter behaviours** in a range of species.	• **Vegetation** in urban environments, • **Soundscape planning** (considers **contextual characteristics** of the place, including perceived acoustic parameters, physical features, natural factors, purpose, usage and user community). • **Noise barriers** along highways or railways
Wildfires	• Emit vast amounts of **atmospheric pollutants** and greenhouse gases. • Increase the susceptibility of soil to **erosion.** • Long-term change in **plant species composition.** • Fire-induced **thunderstorms.**	• **Preventive approach** by engaging vulnerable groups. • Appreciating and adopting **indigenous fire management techniques.** • Focus on long-range **weather forecasting and remote-sensing capabilities** such as satellites.
Phenology (study of seasonal changes in	• Phenological responses in crops will **challenge food production**.	• Increasing **ecological connectivity** through habitat corridors.

plants and animals)	• Complicates **climate-smart agricultural adaptation**; • **Asynchronous changes** in the phenology of interacting species can **disrupt the functioning of whole ecosystems**.	• Promoting **genetic diversity** and increasing the chances of **successful adaptation.** • Reducing **greenhouse gas emissions.**

5.9.3. WETLANDS: THE UNSUNG HEROES OF THE PLANET

- This year, **for the first time** since it was established by the Ramsar Convention on Wetlands in 1972, **World Wetlands Day (February 2)** is **being observed as a United Nations international day**.
  - A wetland is defined as **any land area that is saturated or flooded with water, either seasonally or permanently** such as lakes, aquifers and marshes, mangroves, peatlands, estuaries, coral reefs etc.
- **Importance of Wetlands**
  - Wetlands store **more carbon than any other ecosystem**, with peatlands alone storing twice as much as all the world's forests.
  - Wetlands are **home to over 100,000 freshwater species** of amphibians, reptiles and migratory birds.
  - **Wetlands act as nature's shock absorbers,** acting as a natural buffer during extreme weather, reducing flooding and delaying onset of droughts.
  - Provision of fresh water; filtration of harmful wastewater; sustains the **livelihood of over 61.8 million people** (food, fishing and aquaculture) etc.
- However**, 85% of wetlands present in 1700 were lost by 2000** due to development, farming or other "productive" uses.
  - They are facing extinction due to **invasive species, pollution, habitat loss and over-harvesting.**

Global initiatives for Wetlands

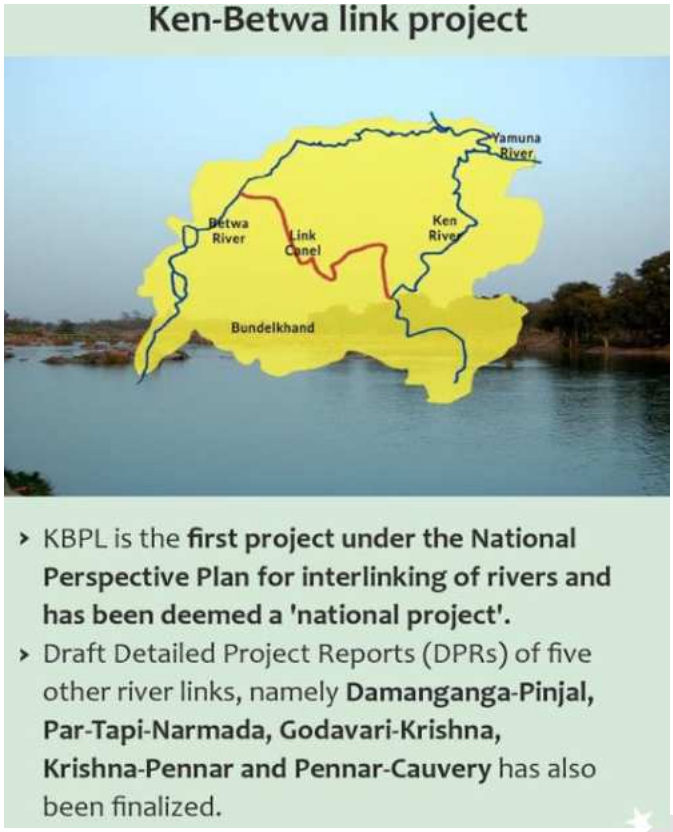
- **Ramsar Convention** adopted in 1971, is an **intergovernmental treaty** that provides the framework for the conservation and wise use of wetlands and their resources.
- **Sustainable Development Goal 6, Target 6** Mandates all countries are committed to protecting and restoring wetlands by 2030.
- **Protection of wetlands** is a priority for UNEP and a **special focus of the UN Decade on Ecosystem Restoration (2021-2030)**.

Related News: Two new Ramsar sites in India

- With the latest addition, **India now has 49 Ramsar Sites** (Wetlands of International importance).
- **Khijadia Wildlife Sanctuary**, a freshwater wetland near the coast of the Gulf of Kutch (Gujarat).
  - It provides habitat for endangered **Pallas's fish-eagle,** vulnerable **common pochard, Dalmatian pelican**, greylag goose, and common crane.
- **Bakhira Wildlife Sanctuary, a freshwater marsh** in the Sant Kabir Nagar district (UP).
  - It is an "eco-sensitive zone", **protected under the Wildlife Protection Act (1972).**
  - It provides habitat for endangered **Egyptian vulture**, vulnerable greater **spotted eagle, common pochard,** wamp francolin, woolly-necked stork.

5.9.4. CENTRE CONSTITUTES KEN-BETWA LINK PROJECT AUTHORITY (KBLPA)

- Centre has constituted a **KBLPA and a national steering committee** for interlinking the **two rivers.**
  - KBLPA has been constituted as a vertical of **National Water Development Agency**.
  - It will comprise of secretaries **from ministries of environment, power and tribal affairs.**
  - All central funds for the project will be **routed through KBLPA**.
- **About Steering committee**:
  - It will be chaired by **Jal Shakti Ministry secretary.**
  - **Functions**:
    - ✓ Approve fundamental **administrative policies**, **byelaws and norms** for KBLPA;
    - ✓ Approving/examining **annual budget** and **financial statements.**
    - ✓ **Resolve any operational issue** at the implementation stage.
  - It has to meet **at least twice a year**, with a **quorum of 2/3** of total members.
- **About KBLP:**
  - This project **involves transfer of water from the Ken river to the Betwa River**.
  - It **aims to address the perennial water scarcity in the parched regions of Bundelkhand region**, spread across the states of MP and UP.
  - **Concerns**: **Daudhandam**, to be built on the Ken River will involve a submergence of about **7.6% of the** total **Panna Tiger Reserve area.**



5.9.5. KAZIRANGA NATIONAL PARK- A NET CARBON EMITTER

- According to research conducted by Indian Institute of Tropical Meteorology and Tezpur University, **KNP is releasing more carbon than it is absorbing.**
- **Reasons**:
  - The **unique soil** of the KNP's deciduous forest is **home to a large population of bacteria that release CO2 as they breathe**.
  - Further, **ability of forest to absorb CO2 decreases** as the photosynthetic activity of trees during the monsoon decreases due to increased cloud cover.
- Situated in Assam, KNP was declared as a **World Heritage Site by UNESCO** (1985) and has the **largest-population of the one-horned rhinoceros in the world.**
- Also, it is a **Tiger Reserve** and an **Important Bird Area** (by BirdLife International)

5.9.6. STAR RATING SYSTEM FOR SEIAA

- Recently, Environmental Impact Assessment (EIA) Division of the Ministry of Environment, Forest and Climate Change (MoEFCC), **introduced a star-rating system to assess the performance of each State Environment Impact Assessment Authority (SEIAA)** based on the time taken to process the environmental clearance applications.
- The move has aimed at **encouraging the efficiency, transparency and accountability** in the functioning of SEIAAs without diluting any regulatory safeguards.
- The SEIAAs will be **rated on seven different criteria, which would exhibit their efficiency**.
  - It will be done to enable 'Ease of Doing Business', in context of 'ranking of states based on the time taken in according to clearances.
- The ranking system is **based on the provisions of EIA (Environment Impact Assessment) Notification 2006 and various guidelines issued by ministry without diluting any regulatory safeguards.**
- There **is no negative marking proposed for not meeting the criteria for ranking.**
  - In case of deficiency in proposals, the SEIAA may **raise Essential Details Sought (EDS)** and the period for which the reply is pending shall not be counted for calculating the number of days taken by the SEIAA.
- **Issues with rating system**
  - It could lead to **oversight by the SEIAAs in granting environmental clearance**.
    - ✓ This pressure of speed, efficiency and incentivisation is going to skew environmental governance and make it pro-business.
  - **Penalising SEIAAs for seeking additional information more than once could lead to them granting clearances with inadequate data,** since seasonal changes also impact the biodiversity profile of a certain area.
  - It also **creates artificial competition between states**, which may result in industries locating in states that offer environmental clearance quicker.

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 categorised **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 categorise 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.

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5.9.7. OTHER EFFECTIVE AREA-BASED CONSERVATION MEASURES (OECM) SITE TAG

- **Aravali Biodiversity Park in Gurugram** was declared as India's first OECM site.
    - 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).**

5.9.8. WHITE CHEEKED MACAQUE

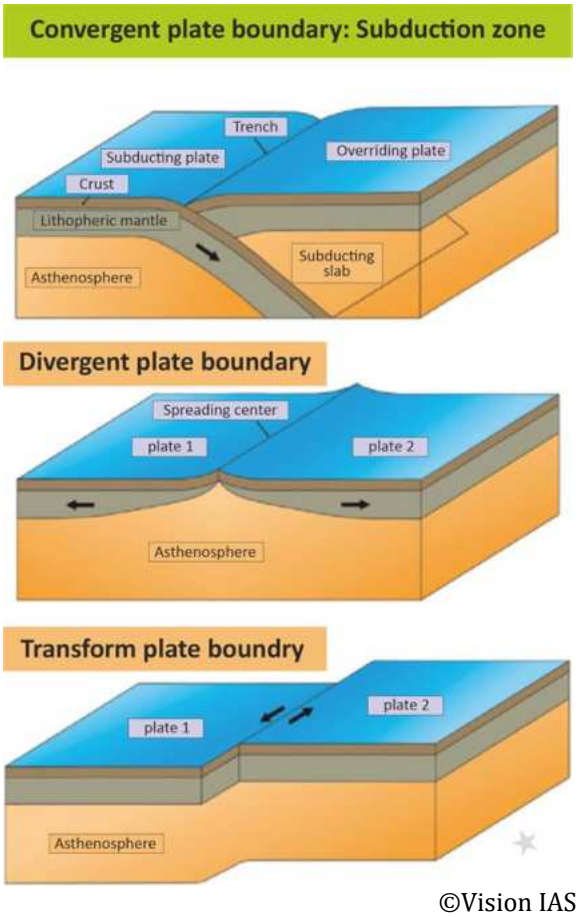
- Scientists from Zoological Survey of India have recorded presence of **White-Cheeked Macaque (Macaca leucogenys)** from central Arunachal Pradesh in India.
- The species was **first discovered in 2015 in China** and its existence was not known in India before this.
- They have **distinct white cheeks, long and thick hairon 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.

5.9.9. POLA VATTA

- **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.**

5.9.10. NEW STUDY ON TECTONIC EVOLUTION OF GREATER MALDIVE RIDGE (GMR) HELPS SHED LIGHT ON GONDWANALAND BREAK UP & DISPERSAL

- A recent study has traced the **tectonic evolution** and the nature of the **Greater Maldive Ridge (GMR**).
    - 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 **Maldive 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.
- **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**.



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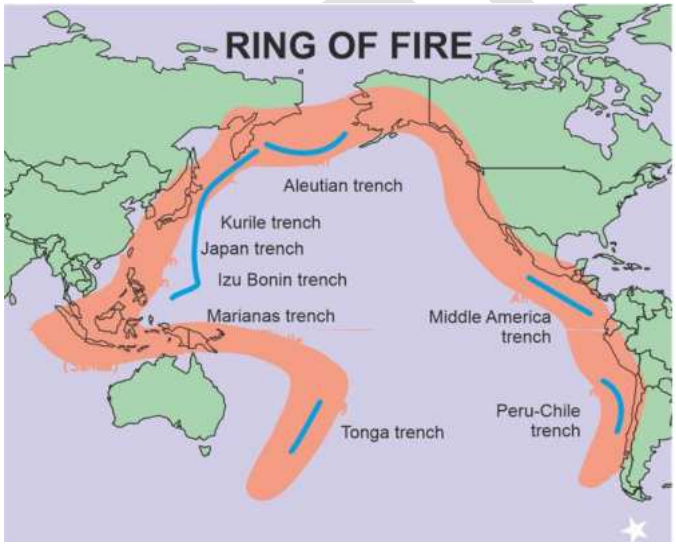
5.9.11. TONGA VOLCANO PLUME REACHED THE MESOSPHERE

- The plums from the recently volcanic eruption in Tonga has reached to **mesosphere** (layer of Earth's atmosphere extending from about 50 to 85 km).
  - An explosive combination of **extreme heat from the volcano and moisture from the ocean helped propel** volcanic plume to such a startling height.
  - As per experts, it was the **biggest volcanic event** recorded anywhere in the world in **over three decades**.
- **Impact of Volcano eruption**
  - Volcanic ash/dust/aerosols released into the atmosphere during an eruption **shade sunlight and cause temporary cooling.**
  - Release large amounts of **greenhouse gases such as water vapor and carbon dioxide** increasing the warming effect.
  - May cause **significant alternation in local weather** condition like intense thunderstorm etc.
  - Eruption also **triggered a devastating tsunami** that swept over Tonga.
- **About Tonga Volcano**
  - It lies along Pacific '**Ring of fire',** and is just over 60 kilometres from island nation of Tonga.
  - Along the Ring of Fire, **tectonic plates move towards each other creating subduction zones.** Along this subduction, rocks melt, become magma and move to Earth's surface and cause volcanic activity.
  - In case of Tonga, **Pacific Plate was pushed down below the Indo-Australian Plate and Tonga plate**.



5.9.12. INDIA LACKS SOLAR WASTE HANDLING POLICY

- Ministry of New and Renewable Energy has highlighted that **India currently considers solar waste a part of electronic waste and does not account for it separately.**
  - Solar waste is the electronic waste generated by discarded solar panels.
- According to report by International Renewable Energy Agency, **global photovoltaic waste will touch 78 million tonnes by 2050, with India expected to be one of the top five photovoltaic-waste creators.**
  - If fully injected back into the economy, the **value of the recovered material could exceed USD 15 billion by 2050.**
- **Solar waste in India**
  - Solar panels have **estimated life of 25 years**, and given that India's solar manufacturing industry took off in 2010 most of installed systems are in **their calendar life cycle** and therefore unlikely to generate a large quantity of solar waste.
  - However, **modules also get damaged during transportation and installation** and during plant operations.
- **Suggestions**
  - Devising **sustainable end-of-life management policies** for PV panels,
  - Expand waste management infrastructure,
  - Environmental disposal and recycling of solar waste to be part of power purchase agreement,
  - Ban on Landfills as solar waste is harmful to the environment.

Practices in other countries

- European Union (EU) has adopted **PV-specific waste regulations**.
- **Extended producer responsibility (EPR)** regulations in Washington and California.
- Japan and South Korea indicated to come up with **dedicated legislation to address the PV waste problem.**

5.9.13. GAIL STARTS INDIA'S MAIDEN PROJECT OF BLENDING HYDROGEN INTO CGD NETWORK AT INDORE

- In line with **National Hydrogen Mission**, GAIL has commenced India's **first-of-its-kind project of mixing hydrogen into the natural gas system** to establish the techno-commercial feasibility of **blending hydrogen in City Gas Distribution (CGD) network**.
  - Government is planning to **blend 15% green hydrogen with piped natural gas (PNG)** for domestic, commercial and industrial consumption.

- **Importance of blending Hydrogen with natural gas:**
  - Blending **integrates concentrations of hydrogen into existing natural gas pipelines** and reduces carbon intensity of methane.
  - Hydrogen-enriched compressed natural gas (HCNG) will ensure **70% more reduction in carbon monoxide emissions** compared to CNG.
  - It is **easier and safer to use than hydrogen** as it contains very low energy content from hydrogen i.e., up to 30% by volume.
  - **Power output of HCNG is also better** than CNG ones.
- **Challenges**: Hydrogen embrittlement can **weaken metal or polyethylene pipes and increase leakage risks.**
- Hydrogen is a **clean fuel** and **produces only water as by-product.**
  - Depending on the source, hydrogen is classified as **brown** (derived from coal gasification), **blue** (produced from natural gas with a process of steam methane reforming), **green** (produced from electrolysis) and **grey** (produced from natural gas).

CGD

- CGD **refers to transportation of natural gas** toenable supply of cleaner cooking fuel (like **PNG**) to households, industrial and commercial units as well as transportation fuel (like **Compressed Natural Gas**) to vehicles through a network of pipelines.
- Under Petroleum and Natural Gas Regulatory Board Act (PNGRB Act) **2006**, PNGRB grants **authorization to entities for developing a CGD network** in a specified **geographic area** of the country.

5.9.14. GREEN HIGHWAY POLICY, 2015

- Under the policy, **244.68 lakh plants** have been planted upto December, 2021 across 869 NH projects having length of 51,178 Km.
- Green Highways (Plantation, Transplantation, Beautification & Maintenance) Policy 2015 aims to **promote greening of corridors across all the National Highways of the country.**
- It also aims:
  - Making India **pollution free**
  - Help in **curtailing the number of road accidents,**
  - Help **local communities,** and **generate employment**.

5.9.15. REJUVENATING WATERSHEDS FOR AGRICULTURAL RESILIENCE THROUGH INNOVATIVE DEVELOPMENT PROGRAMME (REWARD) PROJECT

- REWARD is a $115 million project signed by **Central government, Karnataka, Odisha, and World Bank**.
- It is proposed as a 6 years 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.
- **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.

5.9.16. LAKSHYA ZERO DUMPSITES (LZD)

- **Ministry of Housing and Urban Affairs approved ₹ 235 crore Legacy Waste Remediation Proposal** of Andhra Pradesh with goal of LZD.
- LZD under SBM-U 2.0 **seeks to remediate 16 crore metric tonnes (MT) of legacy waste dumpsites that occupy nearly 15,000 acres of city land.**
- Legacy dumpsites pose a **major threat to the environment** and contribute to air pollution and water pollution.

5.9.17. NANOPLASTIC

- A study conducted at Alps to determine the amount of plastic falling to Earth from the atmosphere concluded that **plastic nanoparticles travel over 1,200 miles through air** before settling.
  - Nanoplastics are **particles resulting from the degradation of plastics.** They present colloidal behavior **within the size range from 1 to 1000 nm.**
- **Sources of nanoplastics**: Densely populated and urban areas; oceans (plastics entering the air via spray of waves) etc.
- **Impact**: Unlike micro-particles, they are likely **capable of crossing the cell-blood barrier after respiration into the lungs** and **eventually entering the bloodstream**.

5.9.18. MUMBAI POLLUTION INCREASES AS DUST STORMS HIT

- According to **System of Air Quality and Weather Forecasting and Research (SAFAR)**, the current **high pollution in Mumbai is due to a second dust storm** that has hit the city.
  - This storm originated over **Afghanistan, Pakistan, and the border areas of Rajasthan**.
  - Last month, 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.

QUIZ

SMART QUIZ

You can scan this QR code to practice the Smart Quiz of Environment at our open test online platform for testing your understanding and recalling of the concepts.

6. SOCIAL ISSUES

6.1. BRAIN DRAIN

Why in news?

A recent report estimates that about **8 lakh students travel abroad for higher education** every year, this has again highlighted the issue of Brain Drain.

More about news

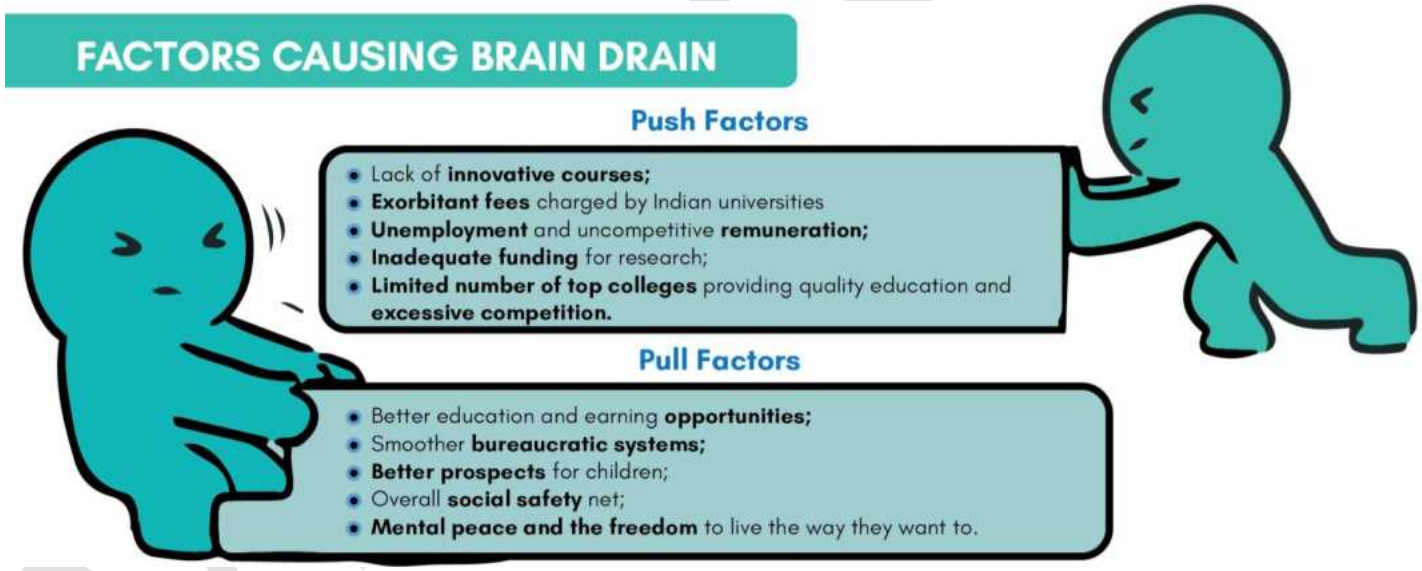
- These students spend $28 billion or **1 per cent of India's GDP.**
- Of this, about **$6 billion are fees (i.e., about** Rs 45,000 crore) that go to foreign universities. This is adequate capital to **start and run** 10 new **IITs, IISERs or JNUs or any such elite institution** every year.

About Brain Drain

The term "brain drain" refers to the **international transfer of human capital resources**, and it applies mainly to the migration of **highly educated individuals from developing to developed countries**.

Key Facts to highlight brain drain:

- Reports suggest that **more than half of the first rankers** in Class 10 and Class 12 examinations during 1996-2015 had migrated and **were studying or employed overseas**, mostly in the US.
- Some of the **world's largest corporations** like Alphabet, Mastercard, Microsoft etc. are being led by **Indian CEOs**.
- It has been reported that **over 100,000 Indians surrendered their citizenship** in the first nine months of 2021, and **more than 600,000 Indians renounced** their citizenship over the last five years.
- Many of those renouncing their Indian citizenship are **high-net-worth individuals**. Morgan Stanley's report found that around **35,000 Indian entrepreneurs of high net worth left between 2014-2020.**



Effects of brain drain

- **Fiscal costs:** High-skilled emigrants **do not pay taxes** in their home country once they have left. As education is **partly or totally subsidized** by the government, emigrants leave before they can **contribute their share back to the society.**
- **Shortage of qualified manpower:** It induces shortages of manpower in **key activities**, when **engineers or health professionals** emigrate in **disproportionately large numbers**. For several decades, India has been a **major exporter of healthcare workers** to developed nations which is one of the prime reasons for the **shortage in nurses and doctors (**1.7 nurses per 1,000 population and a doctor to patient ratio of 1:1,404).
- **Undermines country's capabilities**: It also undermines a country's **ability to adopt new technologies,** potential to undertake economic expansion or deal with an emerging **health crisis.**

- **Increases gap between developing and developed nations**: Brain drain **increases the technological and economic gap** between developing and developed nations because the **concentration of human capital in the most advanced economies** contributes to their **progress.**
- **Students get trapped in a debt cycle:** External changes related to **currency devaluation and tighter immigration policies** make it difficult for Indian students to **recover their investment** in overseas education.
    - According to Indian Banks' Association, the **percentage of defaults** on education loans rose to **about 9% as of March 2018** from 7.3% in March 2016.

Initiatives taken to prevent Brain drain

- **Visiting Advanced Joint Research (VAJRA) Faculty Scheme:** It aims to bring **overseas scientists and academicians** including Non-resident Indians (NRI) and Overseas Citizen of India (OCI) to India to work in **public funded Institutions and Universities** for a specific period of time.
- **Ramanujan Fellowship**: This fellowship provides **attractive avenues and opportunities** to Indian researchers of high calibre, who are **residing abroad**, to work in Indian Institutes/Universities in all areas of Science, Engineering and Medicine.
- **Ramalingaswami Re-entry Fellowship**: The programme is to **encourage scientists (Indian Nationals)** working outside the country, who would like to return to the home country to pursue their **research interests in Life Sciences, Modern Biology, Biotechnology, and other related areas.**
- **Biomedical Research Career Programme (BRCP):** It provides opportunity to **early, intermediate and senior level researchers** to establish their research & academic career in **Basic biomedical or Clinical & Public Health** in India.
- **Scientists/ Technologists of Indian Origin (STIO) in Indian research Laboratory**: There is a provision to appoint Scientists/ Technologists of Indian Origin (STIO) on a **contractual basis at Council of Scientific and Industrial Research (CSIR) laboratories** to nurture a research field in their area of expertise.
- **Senior Research Associateship (SRA) (Scientist's Pool Scheme):** This scheme is primarily meant to provide **temporary placement** to highly qualified Indian scientists, engineers, technologists, and medical personnel returning from abroad, who are not holding any employment in India.

Road Ahead

- **Circular migration or brain share:** The government should focus on **framing policies** that promote circular migration and return migration i.e., policies that **incentivise workers to return home** after the completion of their training or studies.
    - It could also work towards **framing bilateral agreements** to shape a **policy of "brain-share"** between the sending and receiving countries i.e., the destination countries of the migrants would be obliged to supply **healthcare workers** to their country of origin in **times of need** like recent pandemic.
- **Redefining role of elite institutions to create opportunities in emerging areas:** Elite central institutions like IITs should look at the **problems of the day, formalise them, and convert them into business models and job definitions** which offer solutions that deliver value.
    - An example can be air pollution. An ICMR study estimates that air pollution **caused about 1.7 million deaths and Rs 2.6 lakh crore worth of lost output**.
    - With suitable **professional know-how and business models**, it could become a Rs **26,000 crore industry** of measuring, mitigating, and managing air pollution and **employing 26,000 people** in posh jobs.
- **Making India attractive education destination for migrants:** Government has launched '**Study in India'** programme to endorse India as a **prime education hub** for international students by **inviting them to pursue their higher education** in the country. Following steps can be taken to attract foreign students:
    - Identifying the **target geographical areas (like low-income countries**) for attracting students and lowering **tuition fees**. Low tuition will attract **middle- and low-income students** from these countries.
    - Devising **suitable short-term courses** of study for those foreign students keener on spending a **semester, or even less**, to study abroad. India can **better attract foreign students** from higher-income countries if its universities design **short-term programmes.**
- **Creating cross border institutional mobility**: Institutional mobility takes place through different forms like-
    - **Branch campuses** which primarily provide face to-face instruction leading to award of a degree **from the parent institution or jointly with a partner institution**.

- **Franchising** that denotes the **delivery in-country** by an authorised domestic institution.
- **Twinning** which means **joint ownership and delivery** by institutions in the home and host countries.

Majority of Indians, especially those who want to do business internationally, renounce their citizenship or leave their country because of the **privileges they get under citizenships of other countries** like **strong global mobility options** that prioritise safety, security, and a healthy environment. In the light of this, it becomes important that a peaceful, safe and conducive atmosphere is created which enables retention of quality individuals.

Related News

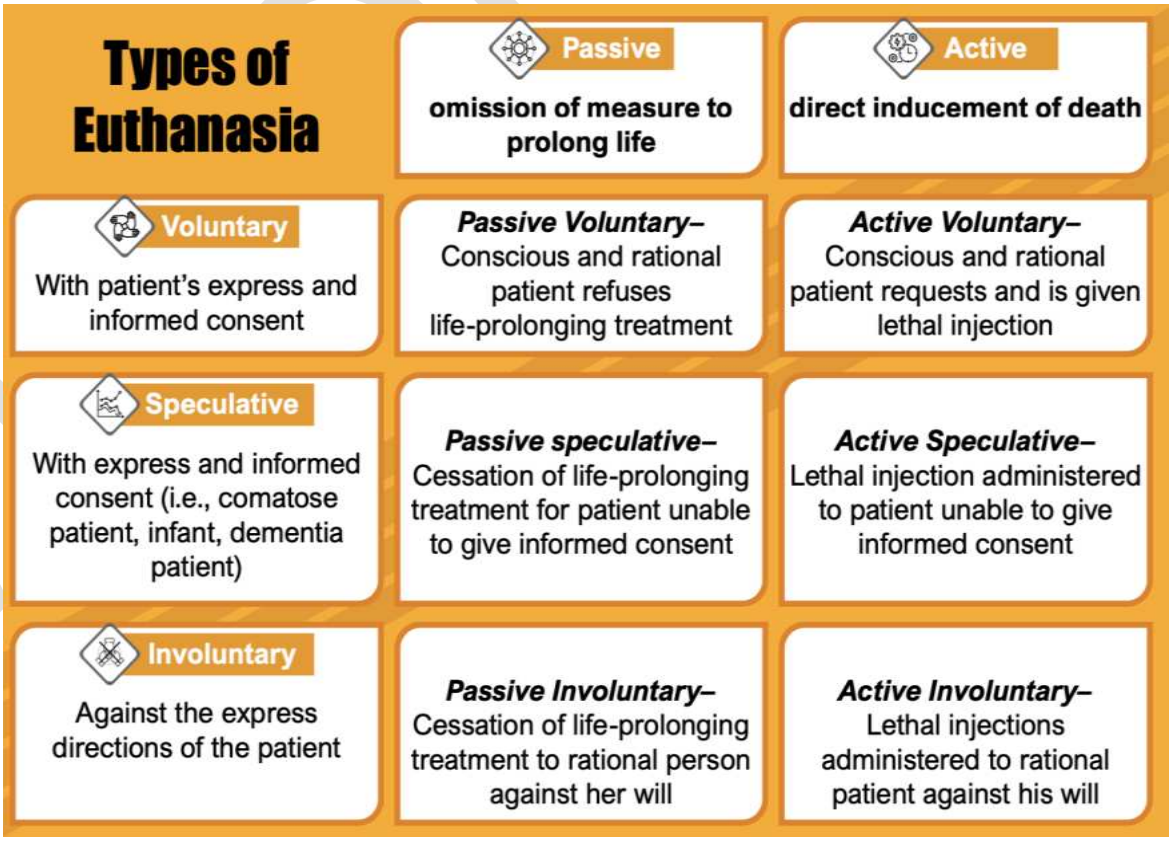
Central panel to prepare roadmap for Indian universities to set up foreign campuses

- The committee, under Dr. K Radhakrishnan, has been asked to "submit a **framework for opening of campuses abroad by Higher Education Institutes** (HEI)".
  - The development comes on the back of **IIT Delhi's proposal to open centres in Saudi Arabia and Egypt.**
- Earlier, **Centre had issued guidelines allowing institutions of eminence** (IoE) **to open overseas campuses** with the prior approval of the Ministry of Education and no-objection certificates from Ministry of External Affairs and Ministry of Home Affairs.
  - **National Education Policy (NEP) 2020**, proposed **internationalization of education** that allows foreign universities to operate in India, and similarly, encourages high performing Indian universities to set up campuses in other countries.
- **Benefits of** Indian HEIs establishing campuses in other countries-
  - **Global footprint** of Indian HEI would increase.
  - Helps **improve international ranking**.
- **Benefits of** Foreign HEIs establishing campuses in India
  - Indian students study **contemporary and globally recognised courses** from the comforts of a home environment.
  - **Widening the reach of such courses** and **world-class pedagogy** at affordable costs.
  - **Enhancement in pedagogical skills** for Indian teaching community.
  - Helpful to **improve Gross Enrolment Ratio to 50%.**

6.2. EUTHANASIA: RIGHT TO DIE WITH DIGNITY

Why in News?

Recently, a man in Colombia became first person with non-terminal illness to die by legal euthanasia.



About Euthanasia

- The term was derived from the **Greek words 'eu' and 'thanatos' which means 'good or easy death'**.
- **Euthanasia** can be defined as the **intentional killing by act or omission of a dependent human being for his or her alleged benefit.**

- It is also known as '**Mercy Killing'** which is an act where the individual who, is in an irremediable condition or has no chances of survival as he is suffering from painful life, ends his life in a painless manner.
- **The Right to die** is a concept which is based on the opinion that a human being is **entitled to make any decisions about ending his or her life (this also includes undergoing voluntary euthanasia).**

- There are primarily two types of Euthanasia.
  - **Active euthanasia** refers to the physician deliberate act, usually the administration of lethal drugs, to end an incurably or terminally ill patient's life.
  - **Passive euthanasia** refers to withholding or withdrawing treatment which is necessary for maintaining life.
- **Both euthanasia and assisted suicide are considered illegal in many countries** since they can amount to murder in disguise.

Suicide vs Assisted Suicide

- **Suicide:** It is one way to exercise the right to die. Generally, when people are not content with their lives, they choose to commit suicide due to various factors such as mental disease, unbearable physical ailments, affliction by socially dreaded diseases, depression, physical disability etc.
- **Assisted suicide:** Assisted suicide happens **when another person assists the person who is willing to commit suicide**, with all the guidance and tools to take his own life.

Arguments in Favour of legalising euthanasia	Arguments against euthanasia
• Article 21 of the Indian **Constitution clearly provides for living with dignity.** A person has a right to live a life with at least minimum dignity and **if that standard is falling below that minimum level then a person should be given a right to end his life**.	• The **human life is gift of God and taking life is wrong** and immoral human beings cannot be given the right to play the part of God.
• In many developing and underdeveloped countries like India, there is lack of funds. **There is shortage of hospital space. So, the energy of doctors and hospital beds can be used for those people whose life can be saved instead of continuing the life of those who want to die.**	• It is **totally against the medical ethics, morals, and public policy.** Medical ethics call for nursing, caregiving and healing and not ending the life of the patient. o In the present time, **medical science is advancing at a great pace. Thus, even the most incurable diseases are becoming curable today.**
• The essence of human life is to live a dignified life and to force the person to live in an undignified way is against the person's choice. Thus, it **expresses the choice of a person which is a fundamental principle.**	• It is **feared that if euthanasia is legalised then other groups of more vulnerable people will become at risk of feeling into taking that option themselves**. o Groups that represent disabled people are against the legalisation of euthanasia on the ground that such groups of **vulnerable people would feel obliged to opt for euthanasia as they may see themselves as a burden to society.**
• Its aim is altruistic and beneficial as it is an act of painlessly putting to death to those persons who are suffering from painful and incurable diseases. So, the **motive behind this is to help rather than harm.**	• **Patient would not be able to trust either doctors or their relatives** as many of them were taking about patient's painless dignified death and **it became a euphemism for assisted murder.**

Euthanasia in India

- Active euthanasia is a crime under section 302 or 304 of IPC.
- Passive euthanasia is legal in India under exceptional circumstances. The theory of passive euthanasia got its legal status in the year 2011.
  - The Supreme Court in **2011 in Aruna Ramchandra Shanbaug v. Union of India** had **held that passive euthanasia can be allowed under exceptional circumstances.**
  - Prior to Aruna Shanbaug's case, the Supreme Court had formulated an opinion on legality of suicide in **Gian Kaur v. State of Punjab, in which it had held that the right to life under Article 21 does not include the right to die.**
- In Common Cause (A Regd. Society) v. Union of India & Anr. case delivered on 9th March 2018**, the Supreme Court of India held that a person in persistent vegetative state can opt for passive euthanasia**, and that a **person can execute a living will to refuse medical treatment in case of a terminal illness.**
  - In 2016, **The Medical Treatment of Terminally ill Patients (Protection of Patients and Medical Practitioners) Bill, 2016, was introduced which** makes provisions for patients of sound mind to make an informed decision regarding

the withholding of medical treatment for themselves, paving the way for the implementation of passive euthanasia in the country.

- 2018 judgement has made it harder to give passive euthanasia an effect as now it involves execution of the directive in presence of two witnesses, authentication by a:
  - ✓ Judicial Magistrate
  - ✓ permission from two Medical Boards
  - ✓ Jurisdictional collector

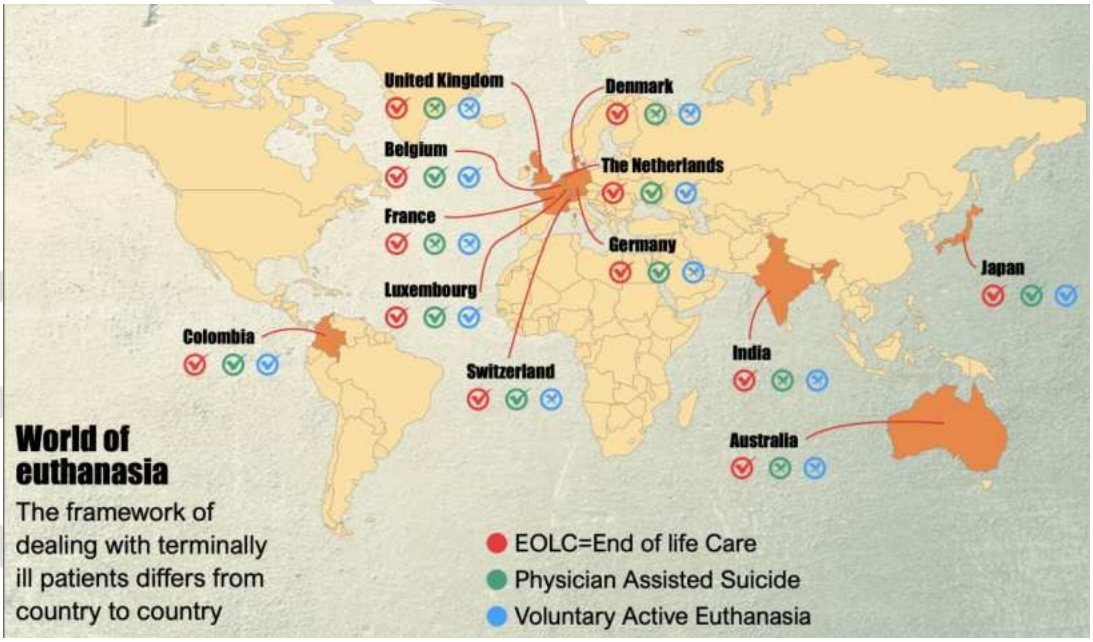
Living will

- A 'living will' is a concept where a **patient can give consent that allows withdrawal of life support systems** if the individual is reduced to a permanent vegetative state with no real chance of survival.
  - It is a type of advance directive that may be used by a person before incapacitation to outline a full range of treatment preferences or, most often, to reject treatment.
- One of the situations in which the Living Will gets **activated is when a patient is no longer in a position to communicate his wish due to being in a vegetative state or a coma and a panel of doctors at the hospital, where the patient is, diagnose the condition as being irreversible.**
- **Guideline for living will**
  - Living Will shall be **voluntarily executed and without any coercion or inducement or compulsion**.
  - It is mandatory for a living will to be in **written format** clearly mentioning as to when can medical treatment be withdrawn or a specific kind of medical treatment shall be given which will merely have the effect of procrastinating the death of the sufferer that may otherwise only prolong the pain, anguish and suffering of that person.

- In **response to the apprehensions of misuse of advance directives (or living wills)**, the **court also issued comprehensive guidelines on the procedure for execution of an advance directive as well as for giving effect to passive euthanasia**.
  - The guidelines will remain in force until Parliament enacts a legislation on the subject.

Conclusion

Euthanasia is indeed a contentious issue, with the heart of the **debate lying at active voluntary euthanasia and physician assisted suicide**. There is an urgent **need to invest in our health care system**, so that people suffering from serious ill health can access free health care. Investment in health care is under 'Right to Health' which is bestowed under 'Right to Life' of our Constitution. Thus, the **complete expenses need to be borne by the State so that 'Right to life' becomes a reality and succeeds before 'Right to death with dignity'.**



6.3. MANUAL SCAVENGING

Why in news?

Activists have claimed that deaths due to manual scavenging continue despite government's Parliament stance that there were no deaths due to manual scavenging.

About Manual scavenging

- Manual Scavenging is **lifting of human excreta from unsanitary latrines** as defined in Section 2 (1) (g) of the "Prohibition of Employment as Manual Scavengers and Rehabilitation Act 2013" or the MS Act 2013 (refer to the table).
- Manual scavengers die of the **potent mix of methane, hydrogen sulphide and carbon monoxide fumes** from sceptic tanks.
- According to the **Safai Karamchari Andolan** at least 45 people have died due to manual scavenging in 2021 alone, with Karnataka accounting for at least five deaths.
- The Union government acknowledged the **prevalence of caste in manual scavengers** that has far deeper implications on the social fabric.
    - Recently, the Union Minister for Social Justice and Empowerment said that of the 43,797 persons among the total 58,098 identified in manual scavenging, caste data shows that over 42,500 or a staggering **97.25% are from communities classified as Scheduled Caste.** Another 421 are from Scheduled Tribes, a similar number from communities classified as other backward classes.

Steps taken to address manual scavenging

- **Swachhata Abhiyan app:** To create a database on location of unsanitary latrines and identifying manual scavengers who can be rehabilitated.
- **Safai-mitra Suraksha Challenge across 243 cities:** It aims to ensure that no life is ever lost while cleaning sewer or septic tanks.
    - Under the campaign, sewers and septic tanks in **243 cities will be mechanized and a helpline created** to register complaints if manual scavenging is reported. Cities which reach the end result will receive prize money.
- **Changed terminologies:** Prohibiting use of the word 'manhole' anymore and instead using only 'machine-hole' to support the government's decision to eradicate manual scavenging.
- **Safai Karamchari vs Union of India, 2014:** The Supreme Court has ruled that the continuance of **manual scavenging in the country is in blatant violation of Article 17 of the Constitution of India** by which, "untouchability is abolished and its practice in any form is forbidden". The court was **emphatic about the duty cast on all states and union territories "to fully implement the law** and to take action against the violators".

Key provisions of the 'Prohibition of Employment as Manual Scavengers and Rehabilitation Act 2013'

Who is a 'manual scavenger'?	• Any person who has been employed to **handle undecomposed human waste from an insanitary latrine, open drain or pit or railway track** is a manual scavenger under this law. • The person could have been employed by anyone - say, someone from their village or by an agency or contractor. • It does not matter if she was given regular employment or engaged on contract basis, she is covered under this law. • **Exception** - Any person who has been employed to clean human waste and does so with the help of the appropriate protective gear and equipment will not be considered a manual scavenger under this law. • Another group of people called 'safai karamcharis' are also sometimes considered as manual scavengers - however, they usually refer to people working as sweepers or cleaning workers in the municipalities, government or private organisations.
How does this law prevent manual scavenging?	• Under this law, the first step to preventing manual scavenging is **demolishing 'insanitary latrines'.** It imposed certain time bound commitments by the local authorities (municipal bodies, cantonment boards and railway authorities). • The **local authorities are responsible for the building and maintenance of the community sanitary latrines** and must make sure that they are functional and hygienic.
Law makes it an offence to:	• Employ people as manual scavengers to clean insanitary latrines. • Employ people to clean sewers and septic tanks without protective gear. • Construct insanitary latrines. • Not demolish or convert insanitary latrines within a certain period of this Act coming into force
Rehabilitation of manual scavengers	it **lays down the rules and procedure for the rehabilitation of manual scavengers** through training in alternate employment, financial help and help with purchasing property.
Responsibility for identifying manual scavengers	Every **local authority** (municipality or panchayat), cantonment board or railway authority is responsible for surveying its area to identify manual scavengers.

Factors underscoring prevalence of manual scavenging

- **Vague legal provisions:** The 2013 Act seems to have no problems with manual scavenging if it is done with adequate and appropriate protective gear. However, the Act fails to define what is meant by protective gear. For example, some cases were reported where contractors claimed a handkerchief was adequate gear to protect workers from toxic gases.
- **Low conviction:** In the eight years since the 2013 law was passed, there has not been a single case where a manual scavenger's death has led to a conviction. Only 37 FIRs, or less than 1%, invoked the Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, the law actually meant for such cases.
- **Lack of accountability:** There is no clear assignment of responsibility to any department of the Centre, State or local self-government body resulting in no accountability every time questions are raised.
- **Issues in mechanization:** Septic tanks are located and designed in a way that a person has to enter them manually to clear any clogging or choke-up. The redesign of these tanks has not been treated as a priority. Swachh Bharat mission has also not addressed the issue.
- **Keeping the issue invisible**: There is lack of adequate media attention on the issue which creates another hurdle towards building a favourable public opinion against manual scavenging.
- **Acute poverty:** Most of the manual scavengers are from Dalit community who suffer from abject poverty. They quit school and take up whatever odd job that came their way to ensure their family's sustenance. .

Way ahead

- **Consultation with stakeholders:** To make the law crystal clear about the modus operandi of ending manual scavenging and to address the loopholes in existing law.
- **Tackle corruption in local bodies:** Open drains are badly designed, allowing people to dump solid waste into open drains, which adds to the problem. To address this, corruption in local bodies needs to be tackled.
- **Making contractual workers permanent:** The widespread shift to contractual labour ensures that when sewage workers die doing work undertaken for the government, it pins the blame on contractors who are then shown "as absconding". Therefore, manual workers could be recognised as permanent to ensure their social and financial security.
- **Facilitate mechanization:** The government can place orders for machines that are small enough to navigate the smaller lanes. Companies should manufacture them according to the customers' requirements. For the upcoming sewer networks, all septic tanks and drainage chambers need to be built to dimensions that allow mechanical cleaning.
- **Proper waste disposal**: Improper disposal of contraceptives, sanitary napkins and diapers contributes to clogged drains which machines cannot clear. This also creates circumstances requiring people to enter sewers. Widespread campaign against such waste disposal should be carried out. Also, Civic bodies need to provide dustbins for proper disposal.
- **Behavioural change**: Nobody should be made to clean another person's faeces, in any form. This requires behavioral and attitudinal change at the individual and societal level.

Conclusion

Ending manual scavenging is one of the core initiatives to ensure dignified life to all as guaranteed under Article 21 of the Constitution. A multipronged and multi stakeholder approach is needed to curb this menace. In this direction, officials, contractors and the public all must pay due diligence to their duties and behavior.

6.4. NEWS IN SHORTS

6.4.1. UGC RELEASED HIGHER EDUCATION FRAMEWORK RULES

- University Grants Commission (UGC) released a **draft National Higher Educational Qualification Framework (NHEQF).**
  - Draft framework was released as **part of National Education Policy (NEP) 2020.**
- NHEQF has **set up certain parameters of assessments for students** in higher education institutions and divided it in various levels.
- UGC has listed a **range of learning outcomes,** from job readiness to entrepreneurship mindset, understanding of ethical and constitutional values etc., **to assess students at different levels.**

- It also **fixes the number of credits required to clear the different levels** of the four-year undergraduate programme, postgraduate degrees and doctoral degrees.

6.4.2. UNIVERSITY GRANTS COMMISSION (UGC) REFORMS: EDTECH FIRMS CAN TIE UP WITH UNIVERSITIES TO DEVELOP ONLINE COURSES

- Through proposed amendments in **UGC (Open and Distance Learning Programmes and Online Programmes) Regulations, 2020**, EdTech companies will be allowed to **collaborate with higher education institutes offering online undergraduate and postgraduate degrees** to help develop course content and carry out evaluation of students.
  - EdTech is short for "**education technology**". It **uses computers**, **computer programs**, and **educational systems** to provide learning and training.
- **Significance of the move**
  - **Huge market value** i.e., Indian EdTech industry was valued at US$ 750 million in 2020 and is expected to reach US$ 4 billion by 2025 at a CAGR of 39.77%.
  - Encouraging **greater flexibility** for colleges and universities.
  - Harnessing the **technological tools available** with the fast growing ed-tech sector.
  - Increase **transparency and formalisation in** EdTech sector & in digital schooling.
- Also, to strengthen digital education ecosystem, **Ministry of Education** organised webinar on '**Digital University: Making World Class Higher Education Accessible for All'.**
  - Digital University ecosystem will have **three important components**:
    - ✓ Technology Platform provider,
    - ✓ Digital content creator, and
    - ✓ Higher Education Institutions with the Digital University at core of ecosystem.

6.4.3. RASHTRIYA UCHCHATAR SHIKSHA ABHIYAN (RUSA)

- **Ministry of Education** has approved the continuation of the RUSA scheme till March 31, 2026.
- **About RUSA**
  - 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.
    - ✓ 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**.

6.4.4. NATIONAL MEANS-CUM-MERIT SCHOLARSHIP

- 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**
  - 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.

6.4.5. SCHEME FOR RESIDENTIAL EDUCATION FOR STUDENTS IN HIGH SCHOOLS IN TARGETED AREAS (SHRESTHA)

- Ministry of Education has joined hands with Ministry of Social Justice and Empowerment for **SHRESTHA**.
- **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:
  - **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.

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6.4.6. NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL (NAAC)

- As per revised guidelines by NAAC, **colleges and universities that have completed even one academic year will be eligible to apply for provisional accreditation.**
  - Until now, only those higher education institutions that are at least six years old, or from where at least two batches of students have graduated, could apply for NAAC accreditation.
- **NAAC was established in 1994 as an autonomous institution** of University Grants Commission (UGC).
- It **evaluates institutions of higher education on a range of parameters,** including their governance structure, teaching and learning, research etc.
- **NAAC gives institutions grades ranging from A++ to C.** If an institution is given a D, it means it is not accredited.

6.4.7. MINISTRY OF EDUCATION LAUNCHES NEW INDIA LITERACY PROGRAMME, A NEW SCHEME OF ADULT EDUCATION

- Objective of the scheme is to **cover all aspects of Adult Education which include foundational literacy and numeracy (FLN)** as other components **necessary for a citizen of 21st century** such as:
  - critical life skills
  - vocational skills development
  - basic education and
  - continuing education.
- It aligns with **National Education Policy 2020** and from now on term "**Education For All**" will be used in place of "Adult Education".
- **Launched for FYs 2022-27**, target for FLN is **5 crore learners @ 1.00 crore per year** by using "Online Teaching, Learning and Assessment System (OTLAS)".
- **Key features**
  - FLN will be imparted to **all non-literates in the age group of 15 years and above.**
  - Priority will be given to **Girls and women, SC/ST/OBC/ Minorities, Persons with Special Needs (Divyangjans), Marginalized/Nomadic/construction workers/laborers/etc**.
  - **Focus areas**: **Aspirational districts, districts with literacy rates less than National/State average, districts with female literacy rates less than 60%.**
  - Outlay: **Rs.1037.90 crore** (Central share of Rs.700 crore and State share of Rs.337.90 crore).
- **Need:** Even after **Saakshar Bharat programme** was implemented during 2009-10 to 2017-18, it is estimated that **18.12 crore adults are still non-literate.**

6.4.8. RASHTRIYA YUVA SASHAKTIKARAN KARYAKRAM (RYSK)

- Ministry of Youth Affairs & Sports has **decided to continue RYSK Scheme for another five years** from 2021 -22 to 2025-26.
  - RYSK is a Central Sector Scheme that **aims to develop personality and leadership qualities** of youth and to **engage them in nation building activities.**
- It is an **umbrella scheme with several sub-schemes under it** including Nehru Yuva Kendra Sangathan, National Youth Corps, National Young Leaders Programme etc.
  - Scheme **beneficiaries are in age-group of 15-29 years.**
  - For **adolescents' specific components,** beneficiaries are in **age-group of 10-19 years.**

6.4.9. SWACHHTA SAARTHI FELLOWSHIP 2022 ANNOUNCED

- Fellowship was **launched in 2021 to recognize students, community workers/self-help groups (SHGs), and municipal workers** who are engaged in tackling waste management, scientifically and sustainably.
- It is aimed at amplifying the role of young students and citizens **in sensitizing the society towards waste management and offer innovative solutions** for conversion of waste to value.
- It is announced **by Office of Principal Scientific Adviser under its Waste to Wealth Mission,** one of the nine national missions of Prime Minister's Science, Technology, and Innovation Advisory Council (PM-STIAC).

6.4.10. MINISTRY OF SOCIAL JUSTICE & EMPOWERMENT LAUNCHED "SMILE: SUPPORT FOR MARGINALISED INDIVIDUALS FOR LIVELIHOOD AND ENTERPRISE" SCHEME

- SMILE, a Central Sector scheme, is designed to **provide welfare and rehabilitation to Transgender community and people engaged in the act of begging.**
  - The scheme **will be implemented from 2021-22 to 2025-26.**
- **Two sub-schemes of SMILE scheme are**
  - **'Central Sector Scheme for Comprehensive Rehabilitation for Welfare of Transgender Persons'** with following components:
    - ✓ **Scholarships for Transgender Students** for studying in IX and till post-graduation.

- ✓ **Skill Development and Livelihood** under PM-DAKSH (scheme for skilling of marginalized persons).
- ✓ **Housing facility in the form of 'GarimaGreh** to provide food, clothing, recreational facilities, skill development etc.
- ✓ **Setting up of Transgender Protection cell** in each state to monitor cases of offences.
- ✓ **Composite Medical Health package** in convergence with PM-JAY supporting Gender-Reaffirmation surgeries through selected hospital.
- ✓ **E-Services** (National Portal & Helpline and Advertisement)

- **Comprehensive Rehabilitation of persons engaged in the act of Begging** with focus on Survey and identification, Mobilisation, Rescue/ Shelter Home and Comprehensive resettlement.

- **Other provisions**
  - **Skill development/vocational training** will be provided to help them sustain and live a life of dignity by engaging in self-employment.
  - **Pilot projects initiated on Comprehensive Rehabilitation** in Delhi, Bangalore, Chennai, Hyderabad etc.

6.4.11. UNION MINISTER FOR SOCIAL JUSTICE AND EMPOWERMENT LAUNCHES THE SCHEME FOR ECONOMIC EMPOWERMENT OF DNTS (SEED)

- It is to be an umbrella scheme for **empowering De-notified, Nomadic and Semi Nomadic Communities (DNTs, NTs, SNTs).**
- There are **four components of the scheme**
  - **Educational empowerment**- Free coaching to students from these communities for Civil Services, entry to professional courses like medicine, engineering, MBA, etc.
  - **Health Insurance** through PMJAY of National Health Authority.
  - **Livelihoods to support income generation**, and
  - **Housing** (through PMAY/IAY)
- A **budget of Rs.200 crore has been earmarked** and **timeline of scheme is five years beginning 2021-22.**
- **Development and Welfare Board for DNTs, SNTs &NTs** has been tasked with implementation of scheme.
- De-notified Tribes' stands for those communities which were notified as '**born criminals'** under colonial-era **Criminal Tribes Act (CTA) 1871**.
  - Post-independence, CTA, 1871 was repealed, and these communities were "De-Notified".
  - It was replaced with **Habitual Offenders Act, 1952.**
- **Other steps for DNTs:**
  - Setting up of **Renke Commission in 2008** and **National Commission in 2015 under chairmanship of Shri Bhiku Ramji Idate.**
- **Nomads and semi-nomads** are applied to 'social groups who undertook a fairly frequent, usually seasonal physical movement as part of their livelihood strategy in the recent past.

6.4.12. CABINET APPROVES IMPLEMENTATION OF AYUSHMAN BHARAT DIGITAL MISSION (ABDM) FOR FIVE YEARS

- ABDM, of Ministry of Health and Family Welfare, **is a Central Sector Scheme** that aims to develop the **backbone necessary to support the integrated digital health infrastructure** of the country.
  - **National Health Authority (NHA)** is the implementing agency.
- **Objective of ABDM is to:**
  - **Establish state-of-the-art digital health systems,** to manage the core digital health data, and the infrastructure required for its seamless exchange.
  - **Establish registries** of clinical establishments, healthcare professionals, health workers, drugs and pharmacies at appropriate level.
  - **Create a system of personal health records,** easily accessible to individuals and healthcare professionals and services providers.
  - **Ensure national portability** in provision of health services.
- **Main components of ABDM are:**
  - **ABHA (Ayushman Bharat Health Account) number** for accessing and sharing health records digitally
  - **Health Facility Registry,** a comprehensive repository of all health facilities across different systems of medicine.
  - **Unified Health interface (UHI),** an open protocol to enable a wide variety of digital health services between patients and health service providers.
  - **Healthcare Professionals Registry**
- **Benefits:** Evidence-based decision making, better continuum of care, catalyse innovation and generate employment, Improve efficiency, effectiveness, and transparency of health service etc.

VISION IAS

6.4.13. CENTRAL MOTOR VEHICLES (SECOND AMENDMENT) RULES, 2022

- As per rules, **from 2023 onwards** driver **of a motorcycle** shall ensure following safety measures while **carrying a child between age of nine months and four years, on the vehicle as a pillion:**
    - **Safety harness shall be used for attaching the child to the driver of the motorcycle.** It is a vest that ensures the upper torso of the child is securely attached to the driver.
    - Driver shall ensure that the **child pillion passenger must wear his own crash helmet** which fits his head or wear bicycle helmet.
    - **Speed of motorcycle** with child upto age four years being carried as a pillion, **shall not be more than 40 kmph**.

QUIZ
SMART QUIZ
You can scan this QR code to practice the Smart Quiz of Environment at our open test online platform for testing your understanding and recalling of the concepts.

7. SCIENCE AND TECHNOLOGY

7.1. ADDITIVE MANUFACTURING

Why in News?

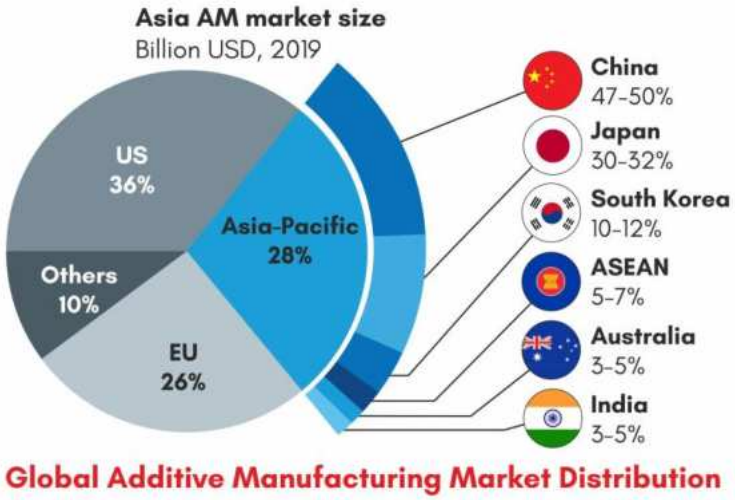
National Strategy on Additive Manufacturing was released by the Ministry of Electronics & Information Technology (MeitY).

About Additive Manufacturing (AM)/ 3D printing

- **Definition:** AM 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.**
  - The deposition and solidification are controlled by computer to create a three-dimensional object.
  - **Thermoplastics, Metals, Ceramics as well as Biomaterials** can be used in AM.
- **Application:** AM market globally focused on the sectors including **automotive, consumer products, medical, business machines, aerospace, government/military, academic** and others.
- **Drivers of the AM Market:** Major drivers to propel global AM market are new and improved technologies, financial support from governments, large application area, rapid product development at a low cost, and ease of development of custom products.
- **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.

Additive Manufacturing process

- It **begins with a software programme used to design a digital model** for prototyping a physical object, a process referred to as CAD. A digital model may also be created through reverse engineering using a 3D scanner.
- **Digital model is then converted to a Stereolithography file (.STL).** STL breaks it down into a series of polygons, which represent surfaces of an object, and the model is then fed to Computer Aided Manufacturing software (CAM).
- **Printing processes are classified into various categories,** each supported by specific materials and laser-based technologies.

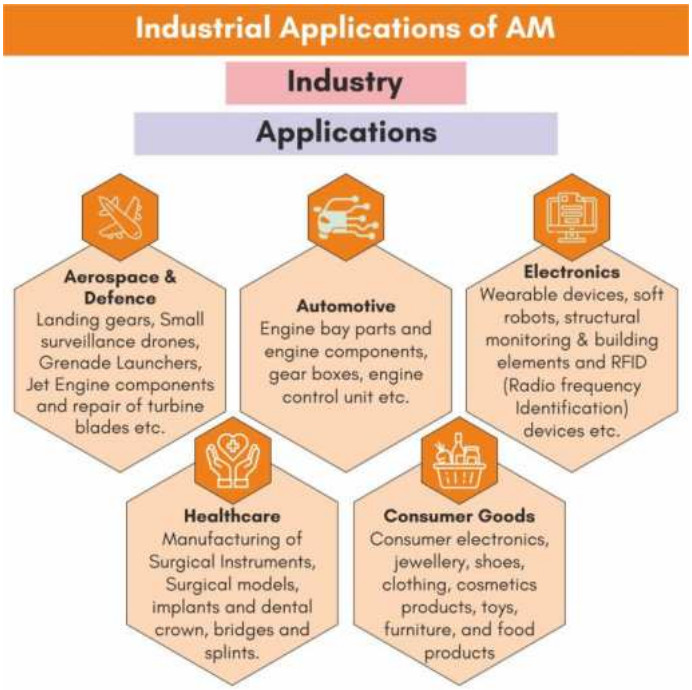


Global Additive Manufacturing Market Distribution

Potential Impact of Additive Manufacturing

- **Economic Competitiveness**
  - **Supply Chains** will be flattened and simplified as semi-fabricated products replace raw materials, rationalization due to on-demand manufacturing of multifunctional products and spare parts.
  - **Increase in Gross Value Addition (GVA):** AM will ensure democratization of innovation by empowering individuals to create and actively participate in the global value chain thereby developing new technology-driven industries and jobs.
  - **Workforce:** AM may facilitate a net increase in employment through new products and other means.

- **Environmental impact:** AM facilitates development of new materials and technologies which are more energy and resource efficient to alleviate its carbon footprint and increases its energy security.
- **Innovation Diffusion:** It allows for removing design constraints without the risk of high expenditure thereby boosting innovation in the product development process.
- **Patient specific medical care:** AM has the potential to fabricate biomedical implants, prosthetics, skin/tissues and intricate organs, specialized surgical instruments and medicals devices quickly and cost effectively.
- **Military Superiority:** AM technology also promises to transform the Indian military supply chain system.
    - In place of storing important stocks, our military entities will only require adequate AM facility and important raw materials to help the manufacturing process even in the operationally difficult places.



Recommendations by National Strategy on AM

- **Creation of National Additive Manufacturing Centre:** A dedicated agency to spearhead the National Initiative for positioning India at the forefront of development of AM technologies and address legal & ethical issues arising out of it.
- **Identifying gaps**: Detailed study to analyze existing disabilities and import dependency across the supply chain, sectoral potential for integrating AM technologies, demand and supply parity in the workforce etc.
- **Research and IP creation:** Dedicated R&D platforms should be established by private companies, and Government at academic institutes and laboratories. Indian R&D laboratories should also be encouraged to work with industries to create Indian IP for the AM technologies.
- **Strategy for AM related manpower development**
    - **Engineering curriculum** should focus on the fundamentals, applications and implications of AM.

    - **National network of Industrial MakerSpaces and FabLabs** (similar to Kerala's Maker village) may be developed through a PPP framework for encouraging community participation to promote the horizontal exchange of knowledge.
    - **To incentivize organizations to invest in re skilling their workforce,** a certain percentage of CSR fund may be permitted to be utilized for this purpose.

Initiatives taken in India

- **Establishment of 3D printing Manufacturing Lab** at National Institute of Electronics & Information Technology, Aurangabad.
- Under Atal Innovation Mission, **Atal Tinkering Labs have been set up,** where do-it-yourself (DIY) kits on latest technologies like 3D Printers, Robotics, Miniaturized electronics are installed through government financial support.
- **Several states** (Gujarat, Andhra Pradesh etc) have **collaborated with foreign universities** to set up 3D printing Labs.

- INTECH Additive Solutions, Bangalore pioneering in metal 3D Printing in India and the largest commercial set up available.
- Bengaluru based start-up, Accreate Labs & innovation, announced that it will produce user interface panels for ISRO operated GSLV.
- **Department of Heavy Industries collaborated with Wipro** to build India's first industrial grade 3D printer.
- HP Inc has signed an MoU with the Government of Andhra Pradesh to build a Centre of Excellence for 3D printing.
- International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI) and Central Glass and Ceramic Research Institute (CGCRI), Kolkata (SLM) have established a joint demonstration centre at ARCI Hyderabad to develop AM based technologies.

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 development and deployment.
  - Create and protect the integrity of India's AM intellectual properties.
- **Key Objectives are:**
  - **Encourage domestic manufacturing** across the value-chain to promote Make in India and 'Atmanirbhar Bharat'.
  - **Reduce import dependency** of domestic market by developing local skill, technology, scale of production etc.
  - 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 and driving capabilities by continuously engaging all key stakeholders.
  - **Promote Innovation and Research infrastructure** for commercialization of end-user application based industrial AM products suited for domestic and global markets.
  - **Promote ease of adoption of AM in India** by introducing policy interventions that provide
    - ✓ Enhancing manufacturing capabilities and encouraging manufacturing with foreign technology in India.
    - ✓ Encouraging and further incentivizing manufactures with indigenous technology that promote a sustainable AM ecosystem, both nationally and globally.
    - ✓ Encouraging export and re-export of machines, materials, AM produced goods and services.
    - ✓ Discouraging import for domestic AM market.
- **Focus sectors are** Electronics, Aerospace, Defence, Automotive, Medical Devices, Capital Goods, Consumer goods, Construction and Architecture etc.

7.2. QUANTUM KEY DISTRIBUTION

Why in News?

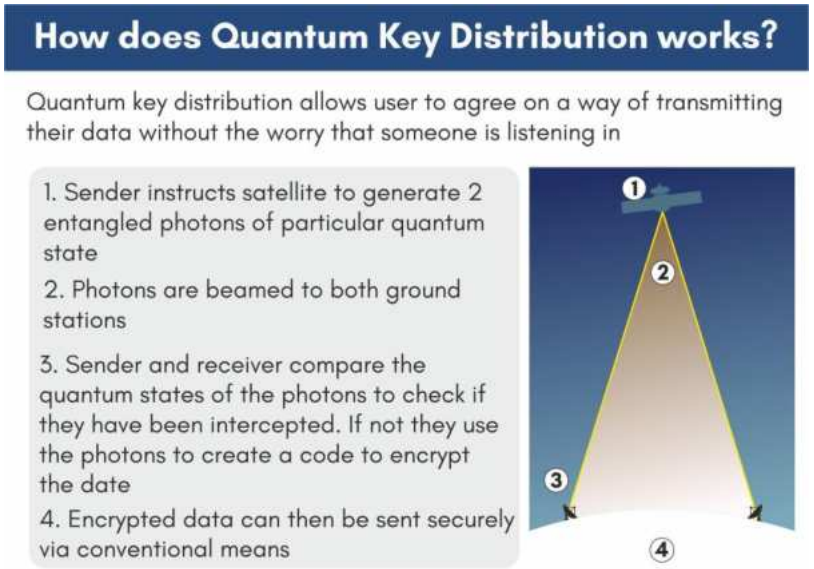
Scientists from the Defence Research and Development Organisation (DRDO) and IIT Delhi successfully demonstrated a Quantum Key Distribution (QKD) link for a distance of 100 Km between Prayagraj and Vindhyachal in Uttar Pradesh.

More on News

- This technological breakthrough was achieved using a commercial-grade optical fibre.
- With this breakthrough, the country has demonstrated its own secure key transfer method, which can be used to bootstrap a military-grade communication security key hierarchy.

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.**
- 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 and Entanglement-based protocols.
  - **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.
- Secure communications are vital not just for the defence and strategic agencies across the globe but **also for various civilian applications.**

Challenges in QKD

- A central challenge in implementing QKD over long distances and at high communications rates is the **'transmission loss' in optical fibres.**
- **Communication rate is another parameter where QKD falls short** compared to classical communications.
  - Current classical optical communications deliver speeds on the order of 100Gbit/s, whereas QKD communications achieve rates in the range of Mbit/s (100,000 times less).
- It is currently **difficult to implement an ideal infrastructure for QKD.** QKD secured communications require specialised hardware and will undoubtedly cost more to develop.

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).
- It concerns the control and manipulation of quantum systems, with the **goal of achieving information processing beyond the limits of the classical world.**
- 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.

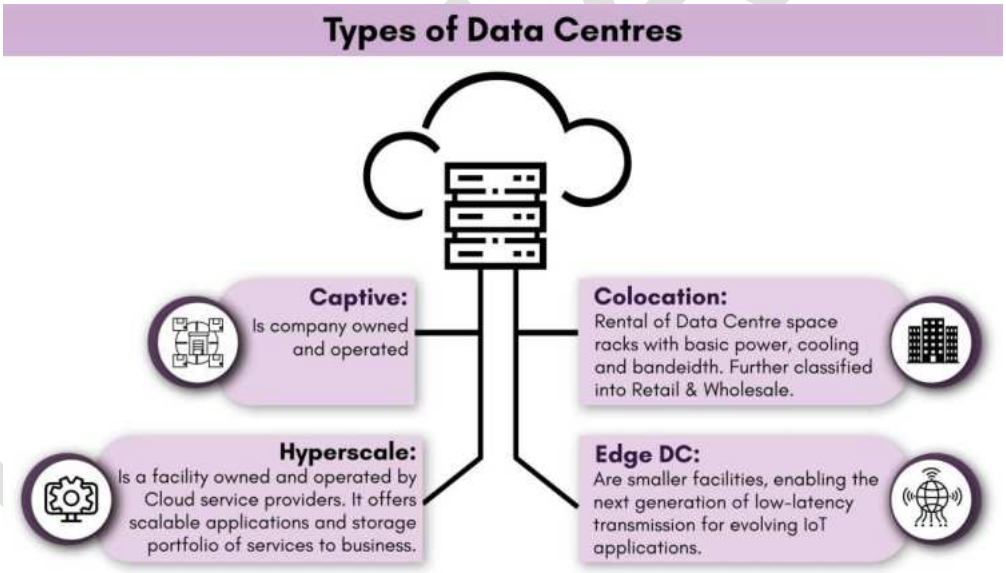
Other initiatives taken for advancement of Quantum Technology

- **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 to manufacture and establish the usage of heralded and entangled photon sources towards various applications in quantum technologies.
- **Quantum-Enabled Science & Technology (QuEST**): It is a research program to build quantum capabilities set up 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
- **In December 2020, QKD technology was tested** for communication between two DRDO facilities in Hyderabad over a distance of 12 km.
- **DRDO Young Scientist Laboratory for Quantum Technologies (DYSL-QT),** Mumbai, developed a Quantum Random Number Generation (QRNG), which has the ability to detect random quantum events and convert those into a stream of binary digits.
- Indian Army, with support from the National Security Council Secretariat (NSCS) established the **Quantum Lab at Military College of Telecommunication Engineering, Mhow.**

7.3. DATA CENTRES

Why in News?

Interest from companies such as Microsoft, Flipkart, Amazon Web Services etc. suggests that India is slowly becoming a favourable destination for corporations setting up data centres.



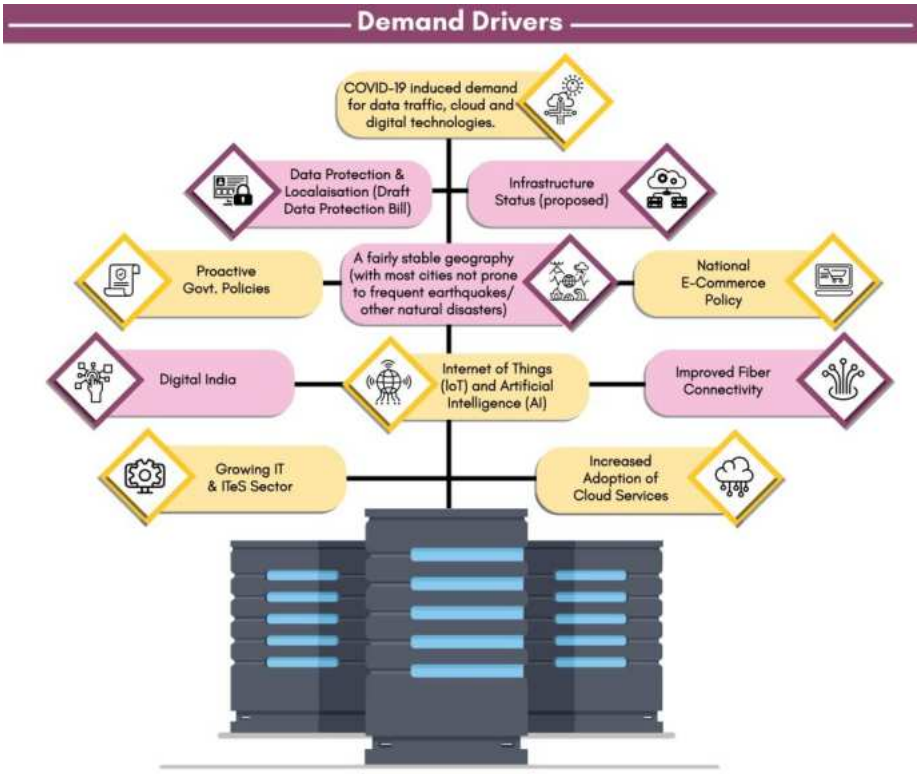
About Data Centre

- Data centre is **a dedicated secure space within a building / centralized location where computing and networking equipment is concentrated** for the purpose of collecting, storing, processing, distributing or allowing access to large amounts of data.
- Such physical facilities are **available all across the world and are not restricted by geographical borders.**
  - It means anyone from anywhere in the world can use data centre services by paying a stipulated amount, without physically visiting the facility.
- **Key components of a data center** design include routers, switches, firewalls, storage systems, servers, and application-delivery controllers. **Together these components provide:**
  - **Network infrastructure:** This connects servers (physical and virtualized), data center services, storage, and external connectivity to end-user locations.
  - **Storage infrastructure:** Data is the fuel of the modern data center. Storage systems are used to hold this valuable commodity.
  - **Computing resources:** Applications are the engines of a data center. These servers provide the processing, memory, local storage, and network connectivity that drive applications.
- **Geographic location, favorable climatic conditions, availability of power, proximity to customers,** fiber connectivity and real estate costs remain the key selection criteria for site selection before setting up a Data Centre.

Data Centres in India

- The India market is witnessing investments in at-least 10 data centre projects on an annual basis from data centre service providers.

- **India's data centre industry has around 499 megawatts (MW) of critical information technology capacity,** of which seven cities account for 490 MW — Mumbai (225 MW), Chennai (62 MW), Bengaluru (61 MW), Pune (61 MW), Delhi NCR (42 MW), Hyderabad (33 MW) and Kolkata (6 MW)
- Based on the latest data available with industry body Nasscom, the **country has around 80 third-party data centres** and is expected to see investments of around $4.5 billion by 2025.

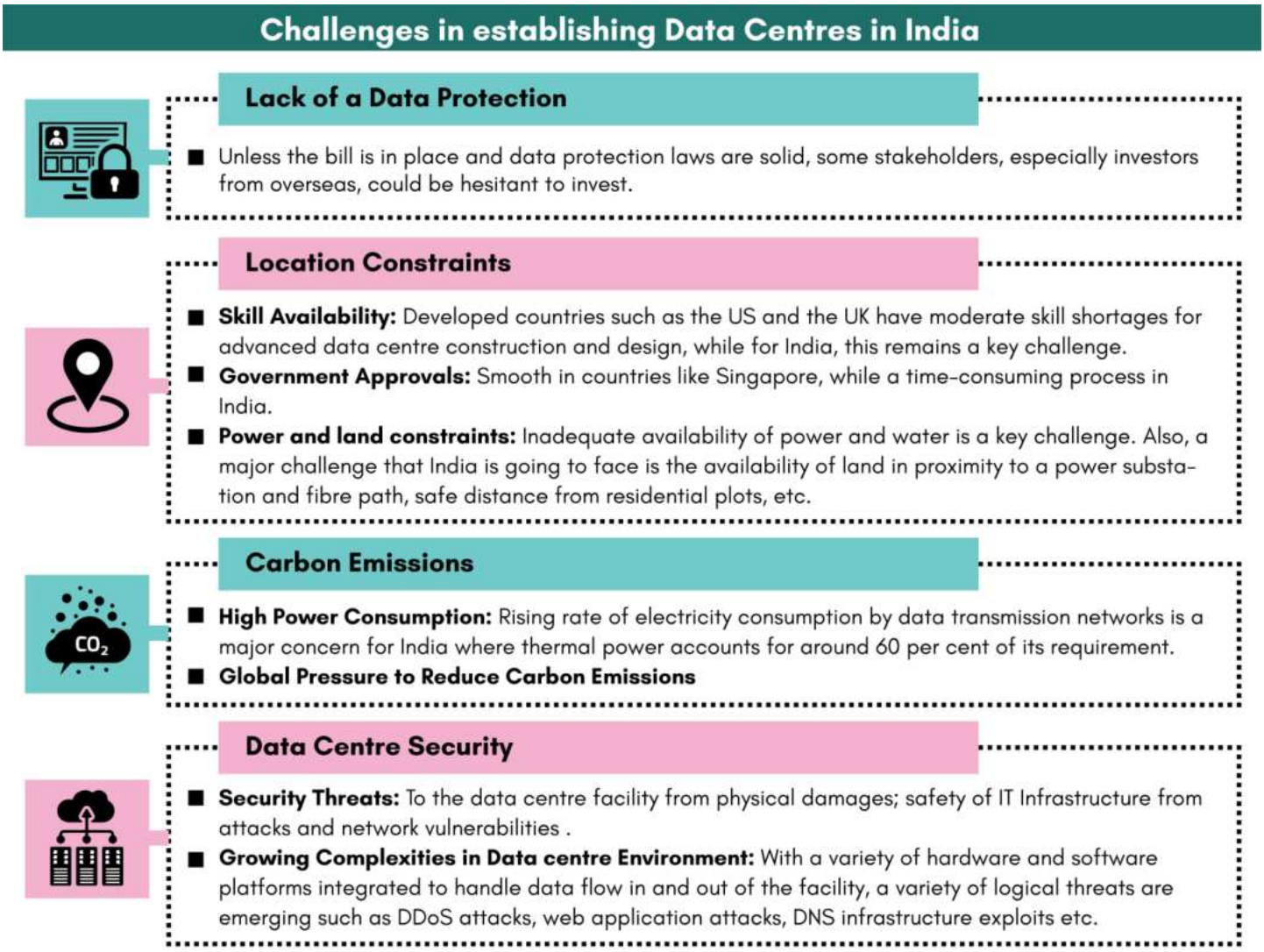


Importance of Data Centres for India

- **Rising digital economy:** The size of the digital economy in India is estimated to grow from $ 200 billion in 2017-18 to a staggering $ 1 trillion by 2025.
- **Data localization provisons:** Presence of domestic data centres will allow companies to store critical personal data and sensitive personal information of Indian citizens within India.
- **High growth potential:** India's data centre market is expected to reach values of approximately $4 billion by 2024 and is set to play a key role in job creation, bring in foreign investment and contribute to the growth of the country's economy.
- **Meeting demands of digital population:** Indian Data Centre market has seen tremendous growth in the past decade, riding on the explosion of data through smartphones, social networking sites, ecommerce, digital entertainment, digital education, digital payments and many other digital businesses / services.
- **Suitability for emerging technologies:** Data centres has the potential to fulfil the growth in data stimulated by adoption of emerging technologies such as quantum computing, artificial intelligence, internet of things etc.

Initiatives taken in India

- **Draft Data Centre policy by Meity** to accelerate the growth in the projected Data Centre capacity in the country.
- National Informatics Centre (NIC) has set up **state-of-the-art National Data Centres at NIC Headquarters Delhi, Pune, Hyderabad and Bhubaneswar** and 37 small Data Centres at various State Capitals to provide services to the Government at all levels.
- In February 2020, **Finance Minister in her budget speech announced** the intention of the Government of India to develop a Data Centre policy.
- **Uttar Pradesh's data center policy provides several incentives** such as land subsidy, capital subsidy, stamp duty exemption etc.
- **Tamil Nadu released its data center policy** to facilitate higher investments.



Way forward

Draft Data Centre Policy, 2020 proposes following strategies that can help India become a Global Data centre hub

Ease of Doing Business Ecosystem	• **Providing Infrastructure Status to the Data Centre Sector:** Also proposed in Budget 2022, will help in bringing in the benefits of availing long-term credit from domestic and international lenders at easier terms. • **Simplify clearances** for setting up Data Centres in India. • **Setting up of Pre-provisioned Data Centre Parks** with necessary infrastructure like road connectivity, availability of water and other essential infrastructure items. • **Formulation of Data Centre Incentivization Scheme** for promotion of Data Centre Parks / Data Centre
Enabling a Favourable Ecosystem	• Availability of **uninterrupted, clean and cost-effective electricity.** • MeitY to work with Department of Telecommunications (DoT) to **facilitate robust and cost-effective connectivity** • Data centres to be **declared as an Essential Service** under "The Essential Services Maintenance Act, 1968 • **Recognize Data centre as a separate category** under National Building Code as they require different norms as compared to other office/ commercial buildings.
Setting up Data centre SEZs	• Government to set up **at least four Data Centre Economic Zones (DCEZ) in the country** as a Central Sector Scheme. • To create an **eco-system of Hyper-scale Data Centres, Cloud Service Providers,** IT companies, R&D units and other allied industries.
Promote Indigenous	• **Encourage use of indigenous hardware and software products** to reduce import burden. • **Encourage joint ventures** between the foreign investors and domestic companies to promote participation from Indian companies.

Technology Development	• **Promote R&D in Data Centre ecosystem** • Collaborate with Ministry of Skills Development and Entrepreneurship (MSDE) and leading academic institutes to impart **large scale trainings to workforce on Data Centre, Digital and Cloud technologies,** and facilitate sector linkages for such trained workforce.

7.4. STEM CELLS

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 and allogeneic transplants.
  - **Autologous transplantation** uses the patient's **own stem cells**. These cells are **removed, treated and returned** to his or her own body after a conditioning regimen.
  - **Allogeneic transplantation where** stem cells come from another person, called a donor.

Why in News?

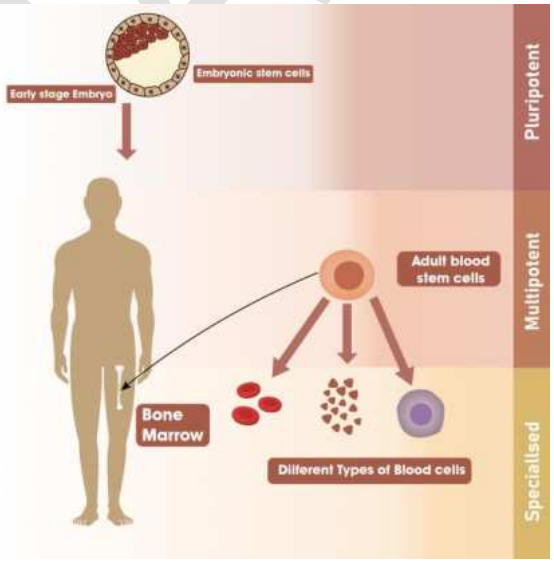
Recently, A US patient became the First woman reported to be cured of HIV after stem cell transplant (SCT).

More on News

She became the third person to date **to be cured of HIV** (human immunodeficiency virus) **after receiving a SCT from a donor who was naturally resistant to virus that causes AIDS** (acquired immunodeficiency syndrome).

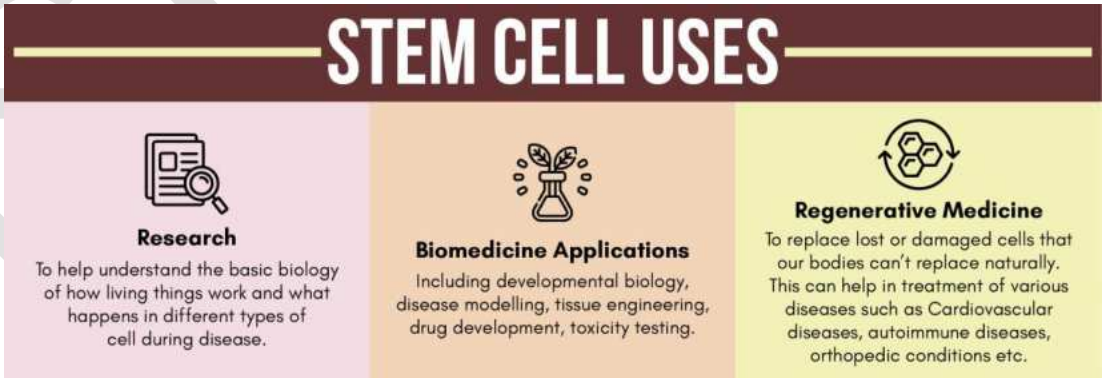
About stem cells

- Stem cells are s**pecial 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.
- **Stem Cell Classification:** Based on the cell type/tissue of origin, stem cells are classified as **'Somatic Stem Cells' (SSCs), and 'Embryonic Stem Cells' (ESCs)** (refer infographic)**.**



Challenges related to stem cell technology

- **Safety of the patient:** immune rejection of donor cells by the host immune system post-transplantation is a primary concern. This limits the efficacy and therapeutic potential of stem cell–based therapies.

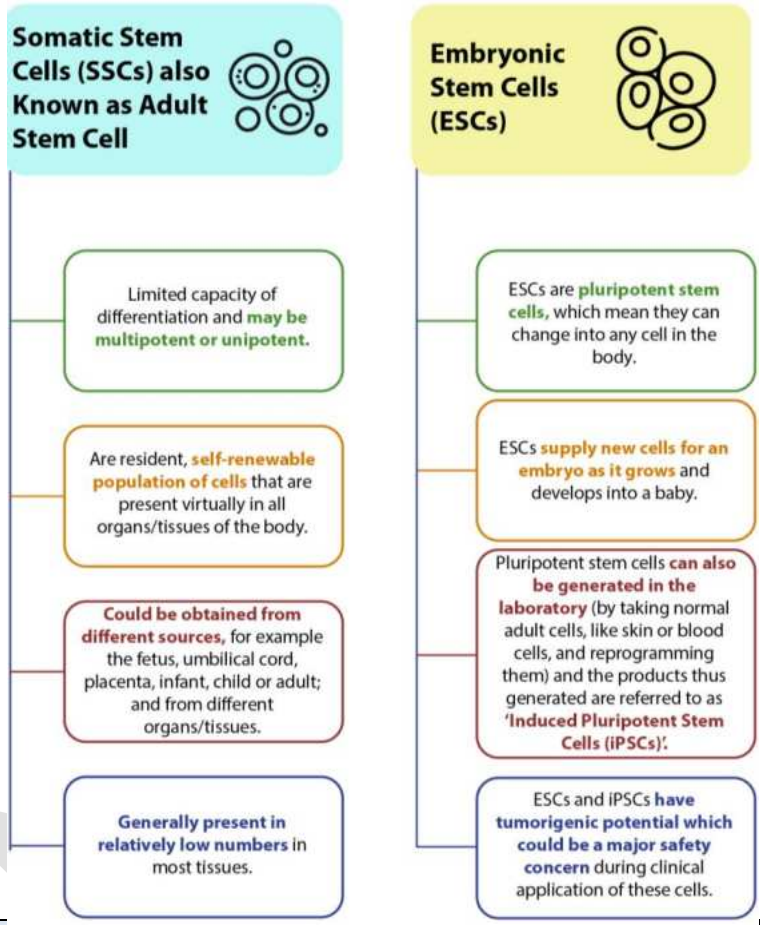


- **Ethical concerns:** There are important concerns related to the use of embryos for creating human embryonic stem cell lines as these may lead to commoditization of human cells and tissues.
- **Limited technology:** to generate large quantities of stem cells. Also, therapies using these avenues are largely new and much more research and testing is needed.
- **Other Concerns:** Challenges related to gene editing/ modification, potential danger of tumorigenicity of stem cells, possible risk of contamination and genomic changes etc.

VISION

Way Forward

- **Better regulation:** Monitoring mechanism and regulatory pathway for basic, clinical research and product development based on categories of research and level of manipulation.
- **Informed consent for trials:** Researchers should describe the risks and prospective benefits in a realistic manner and should discuss a broader range of information with potential participants.
- **Scientific considerations:** Appropriate measures should be taken and proper investigations performed to ensure that the stem cell derived product is safe for human application.
- **Addressing ethical dilemma** by developing guidelines (like India's National Guidelines for Stem Cell Research) for various stakeholders that comprehensively address permissible and impermissible categories of stem cell research.



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.

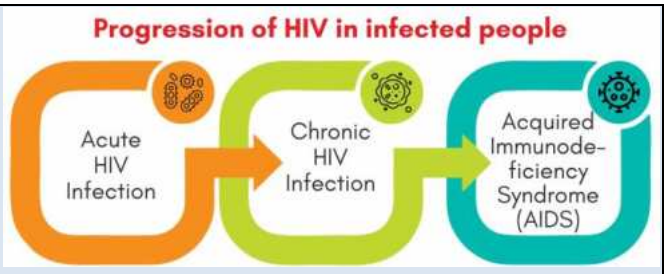
Related News

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 and some types of cancer that people with healthy immune systems can fight off.
  - 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 under ART services
  - Training and sensitization programmes for various stakeholders



7.5. NUCLEAR FUSION

Why in News?

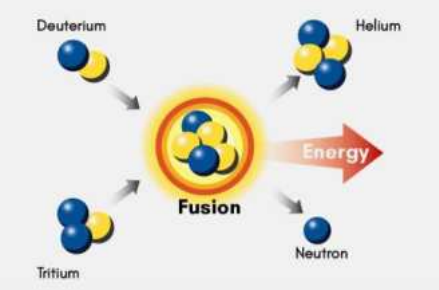
Scientists in the United Kingdom have managed to produce the largest amount of energy so far from a nuclear fusion reaction.

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, and the JET site is the largest operational one of its kind in the world.
- 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
  - **Demonstrate the safety characteristics of a fusion device**.

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		
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

- **Abundant Energy:** Much more energy (as much as four times) is released in the fusion process than in fission. Also, a kg of fusion fuel contains about several million times as much energy as a kg of coal, oil or gas.
- **No CO_2**: 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**: It is difficult to reach and maintain the precise conditions necessary for fusion. Thus if any disturbance occurs, the plasma cools within seconds and the reaction stops.
- **Limited risk of proliferation**: Fusion doesn't employ fissile materials like uranium and plutonium (Radioactive tritium is neither a fissile nor a fissionable material). There are no enriched materials in a fusion reactor that could be exploited to make nuclear weapons.
- **Sustainability**: Fusion fuels are widely available and nearly inexhaustible.
- **Other benefits:** raw materials are in sufficient supply and produces much less radioactive waste compared to fission.

Challenges faced in fusion process

- Fusion is **possible only at very high temperatures,** of the order of a few hundred million degrees Celsius, the kind of temperature that exists at the core of the Sun and the stars.
- 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.

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).

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 construction, operation and decommissioning**, 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.

Conclusion

Demand for energy is going to increase under the combined pressure of population growth, increased urbanization and expanding access to electricity in developing countries.

Relying on fossil fuels alone to increase the energy production is both impractical and impossible, because of lack of access to required resources and irreparable damage to the environment through global warming.

So, if humans are able to master nuclear fusion, there will be no need to use fossil fuel-based energy sources and even nuclear power. Nuclear fusion energy would become an ideal source of low-carbon, low-radiation energy.

7.6. 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**
  - **Economic**: 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**: It is the best place to test how life reacts to harsh conditions of space.
  - **To study Earth**: Moon and Earth share a common past, studying it will reveal how earth's early past.

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.
  - Modifications being proposed on Chandrayaan-3 **also include changes in software and algorithms, strengthening of the legs and better power and communication systems.**
- **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 spectroscope (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 a maiden mission **Chandrayaan-1 in 2008 and a second mission in 2019.**
  - While the 2008 mission was a success, the 2019 mission Chandrayaan-2 failed to land successfully on the Lunar surface.
- Around 2024-25, India and Japan are expected to **launch a joint Lunar Polar Exploration Mission.**
  - This probe is meant to land at the Lunar South pole with a rover.

About Chandrayaan-1 and 2

	Chandrayaan-1	Chandrayaan-2
About	• **India's first mission** to Moon. • It carried 11 scientific instruments built in India, USA, UK, Germany, Sweden and Bulgaria.	• **Second lunar exploration mission** with following basic components: ○ **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. ✓ **It failed while attempting soft landing.** ○ **Rover (called Pragyan)**: A 6-wheeled, 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	• October 22, 2008.	• July 22, 2019. • It will be operational for 7 years.

	• **Mission concluded** when the communication with the spacecraft was lost on August 29, 2009.	
Objective	• 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.	• **Primary objective:** To demonstrate the ability to soft-land on the lunar surface and operate a robotic rover on the surface. • **Scientific Objectives** ○ 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	• **Scientific Payloads from India** ○ Terrain Mapping Camera, ○ Hyper Spectral Imager, ○ Lunar Laser Ranging Instrument, ○ High Energy X - ray Spectrometer, ○ Moon Impact Probe. • **Payloads from abroad** ○ Chandrayaan-I X-ray Spectrometer, ○ Near Infrared Spectrometer, ○ Sub keV Atom Reflecting Analyzer, ○ Miniature Synthetic Aperature Radar, ○ Moon Mineralogy Mapper, ○ Radiation Dose Monitor.	• **Orbiter payloads** ○ 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. • **Vikram payloads** ○ 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** ○ Alpha Particle Induced X-ray Spectroscope (APXS), ○ Laser induced Breakdown Spectroscope (LIBS) ○ Passive Experiment- Laser Retroreflector array (LRA)
Major Findings	• **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.	• 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.
Launch Vehicle	PSLV - C11	GSLV MkIII-M1

7.7. NEWS IN SHORTS

7.7.1. TAMIL NADU SAYS NO TO INDIAN NEUTRINO OBSERVATORY (INO) PROJECT IN THENI

- 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.**
- **Affidavit raised following concerns over INO Project**
  - **Tunnelling work** would create the problems like construction waste material, rock bust, and roof collapse movement in the eco-fragile area.
  - **Biodiversity impact as** the region harbours **many endemic species**.
  - The area is a significant **watershed and catchment zone** for the rivers Sambhal and Kottakudi and **supports livelihoods** in five districts of Tamil Nadu.
  - The project area links **Periyar Tiger Reserve** in Kerala with **Srivilliputhur Meghamalai** Tiger Reserve. Quarrying and construction activities will **upset wild animals** which use the **corridor for seasonal migrations**.

- **About INO**
  - 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

- 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 neutrinos), to **learn how matter evolved** from simple particles into more complex composites of particles.

7.7.2. CENTRE MOOTS POLICY ON SYNTHETIC BIOLOGY

- **A draft foresight paper on synthetic biology** by Department of Biotechnology has **stressed the need for a national policy** that can consolidate India's stand on the issue.
  - **Synthetic biology refers to** design, re-design and fabrication of biological components and systems that do not already exist in the natural world.
- **Potential applications** are biofuels, bioremediation, biosensors, health (biosensor-based diagnostics, engineered bacteria to target specific pathogens etc.), Food fortifications etc.
- **Concerns regarding using synthetic biology:**
  - **Biosafety**: Can cause problems like allergies, antibiotic resistance, carcinogens, and toxicity among humans.
  - **Biosecurity**: Related to inappropriate, or malicious **use of potentially dangerous biological agents or biotechnology to develop biological weapons.**
  - **Ethical concerns relating to human eugenics** (selection of desired heritable characteristics in order to improve future generations) etc.
- **Status of regulation in India:**
  - **Parliament is yet to clear Biotechnology Regulatory Authority of India Bill, 2013,** that had provisions for regulating research around genetic engineering that could have also encompassed synthetic biology.
  - Regulations on **GM food crops**.
  - Earlier, as part of 12th Five-Year Plan, a **task force on systems biology and synthetic biology research in 2011** was set up.

7.7.3. ACCELERATE VIGYAN

- **Launched in 2020, by Science and Engineering Research Board (SERB)** to strengthen scientific research mechanisms in the country.
- It has **three broad goals**
  - **consolidation** of all scientific programs,
  - initiating high-end orientation **workshops**, and
  - creating opportunities for research **internships**.
- **Its component include:**
  - **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.
- 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.

7.7.4. VIGYAN SARVATRA PUJYATE

- It is a week-long, countrywide festival by **Ministry of Culture as part of the Azadi Ka Amrit Mahotsav programme.**
- **Literally meaning science is worshipped everywhere**, it aims to showcase and pay homage to India's achievements in 75 years of Independence.
- Exhibitions are being held in 75 locations and are **based on 4 themes –**
  - 'Annals of Science' tracing individual contributions
  - 'Milestones of Modern S&T'
  - Swadeshi Paramparik Inventions & Innovations'
  - Transforming India'.

7.7.5. PARAM PRAVEGA SUPER-COMPUTER

- It is **one of the most powerful supercomputers** in India, and **the largest in an Indian academic institution.**
- It was installed and commissioned by Indian Institute of Science (IISc.) under **National Supercomputing Mission (NSM).**
- NSM was **launched to enhance the research capacities and capabilities in the country by connecting them to form a Supercomputing grid**, with **National Knowledge Network as backbone**.
- Mission is being **jointly steered by Department of Science and Technology and Ministry of Electronics and Information Technology** and **implemented by Centre for Development of Advanced Computing, and IISc.**

VISION IAS

7.7.6. POWERTHON-2022

Minister for Power launched Powerthon-2022, a **hackathon competition under Revamped Distribution Sector Scheme (RDSS) to find technology driven solutions** to solve the complex problems in power distribution and to ensure quality and reliable power supply.

7.7.7. INDIA INNOVATION GRAPHENE CENTRE (IIGC)

- India's first graphene innovation center to be established in **Thrissur**, **Kerala.**
- **Graphene** is the **thinnest and strongest material** in the world and has **good chemical stability**, **high electrical conductivity** and a large surface area while being transparent and lightweight.
  - It is **two-dimensional form** of crystalline carbon.
- **Applications**: Anti-corrosion coatings and paints, efficient and precise sensors, faster and efficient electronics, flexible displays, efficient solar panels, faster DNA sequencing, drug delivery, and more.

7.7.8. RAMANUJAN PRIZE FOR YOUNG MATHEMATICIAN

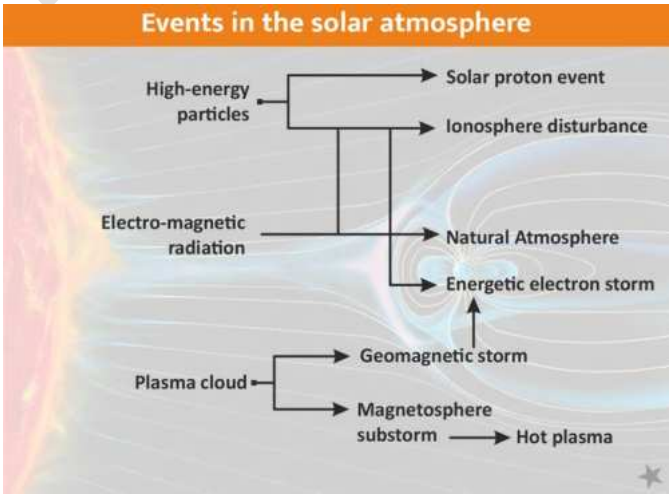
- For the year 2021, the award has been facilitated upon **Professor Neena Gupta,** for her outstanding work in **affine algebraic geometry and commutative algebra**.
- **About the award (**named after **Srinivasan Ramanujan)**
  - **Awarded annually since 2005**, it was originally instituted by International Centre for Theoretical Physics (ICTP), Niels Henrik Abel Memorial Fund, and International Mathematical Union.
    - ✓ Participation of Abel Fund ended in 2012 and **Department of Science and Technology, India of agreed to fund the Prize starting 2014**
  - Awarded to a **researcher from a developing country who is less than 45 years of age** and is working on any branch of the mathematical sciences.
  - Prize carries a **$15,000 cash award** to support the research of the recipient.
  - In 2021, **name of the Prize was changed to the "DST-ICTP-IMU Ramanujan Prize".**
- **About S Ramanujan**
  - Born in Madras, he made substantial contributions to **analytical theory of numbers and worked on elliptic functions, continued fractions, and infinite series.**
  - He became **second Indian Fellow of the Royal Society** in 1918, and first Indian Fellow **of Trinity College, Cambridge** in the same year**.**
  - His birth anniversary **on 22 December** is celebrated as **National Mathematics Day**.

7.7.9. PLUTO'S ATMOSPHERIC PRESSURE

- 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.
  - 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.

7.7.10. EOS (EARTH OBSERVATION SATELLITE) -04

- Launched aboard a Polar Satellite Launch Vehicle, **EOS-04 is a radar imaging satellite capable of providing high-quality images** under all weather conditions.
- EOS-04 is the **fourth in a series of earth observation satellites** and can be used **to capture images for agriculture, forestry, flood mapping, soil moisture and hydrology.**
- **Earlier series of EOS** including Cartosat, Oceansat, Resourcesat, Scatsat etc. have **all become part of new EOS series.**



7.7.11. 2 SMALL SATELLITES LAUNCHED BY ISRO

- ISRO sent **2 small satellites** aboard **Polar satellite launch vehicle (PSLV - C52).**
  - **InspireSat-1 satellite** to study ionosphere dynamics and the Sun's coronal heating process.
    - ✓ Satellite is built by **Indian Institute of Space Science and Technology**& other institutes.
    - ✓ Life of the mission is one year.

- **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).
  - ✓ This is a technology demonstrator satellite from ISRO, **a precursor to the India-Bhutan Joint Satellite (INS-2B).**

7.7.12. PARKER SOLAR PROBE (PSP)

- Launched by **NASA in 2018**.
- Using data from PSP, **scientists were able to peer beneath Venus' thick atmosphere to take the first visible light images of the surface**.
  - **Venus's sky is filled with thick, toxic clouds that rain sulfuric acid** making it difficult to investigate up close.
  - Such images of Venus can **help scientists learn about Venus' surface geology, what minerals might be present there, and the planet's evolution.**
- **Launched from Cape Canaveral** (Florida), PSP Mission is first spacecraft which has flown through the **Sun's upper atmosphere** (**Corona**) to study the Sun.
  - PSP **uses Venus' gravity during seven flybys** to gradually bring its orbit closer to the Sun.

7.7.13. GEOMAGNETIC STORM THAT KILLED STARLINK SATELLITES

- Starlink (launched by SpaceX) has lost dozens of satellites that were caught in a geomagnetic storm a day after they were launched recently.
  - Starlink are **Low earth orbit (altitude of less than 1000 km) satellites** for broadband connectivity.
- Geomagnetic storm is a **major disturbance in Earth's magnetosphere** that occurs when there is a **very efficient exchange of energy from the solar wind into the space environment surrounding the planet.**
  - A magnetosphere is that area of space, around a planet, that is **controlled by the planet's magnetic field.**
- These storms are **triggered by powerful blasts of radiation called solar flare**, which are a sudden explosion of energy caused by **reorganizing of magnetic field lines near sunspots**.
  - Sunspots occur **when the solar magnetic cycle that works in Sun's interior creates regions that rise to the surface** and appear like dark spots.
  - They **appear dark because they are cooler** than other parts of Sun's surface.
- **Impact on Earth**
  - Can hit **operations of space-dependent services** like GPS, radio, and satellite communications.
  - **Aircraft flights, power grids, and space exploration** programs are vulnerable.
  - Astronauts on spacewalks face **health risks** from possible exposure to solar radiation.

7.7.14. COMMON ANTIBIOTIC MANUFACTURING FRAMEWORK (CAMF)

- Recently, the **third progress report of the Antimicrobial Resistance (AMR) Industry Alliance** released.
- AMR Industry Alliance is **a private-sector coalition working to tackle AMR,** bringing together research and development pharmaceutical, generic, biotechnology and diagnostics companies together.
  - In order to mitigate the environmental risks associated with antibiotic production, **Alliance manufacturing members had developed CAMF in 2018.**
- **About CAMF**
  - 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:**
    - ✓ **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.

7.7.15. BONE OSSIFICATION TEST

- It is an **age determination test of a person on the basis of assessment of his or her bony framework** done through X-Rays/ CT-scans.
  - The test is **required to determine the age** in order to fix the criminal liabilities based on which the law treats the persons differently based on their age.
- Recently, **Supreme Court** has said the **test can't be said to be an infallible** and **cannot be the sole basis to decide the age of an accused** who claims to be a juvenile.

7.7.16. CONVERSION THERAPY

- National medical commission held that **conversion therapy is banned** in India.
- Conversion therapy - sometimes called **"reparative therapy"** or **"gay cure therapy"** - tries to **change someone's sexual orientation or gender identity**.

- Several countries (Brazil, Ecuador, Malta, Switzerland, Germany, Chile etc.) have introduced criminal bans for those found to be practicing conversion therapy.

7.7.17. NEO COV

- A new kind of coronavirus, NeoCov, is found among bats in **South Africa**.
- NeoCov virus shares **85% similarity to Middle East respiratory syndrome coronavirus (MERS-CoV)** in genome sequence which enter cells via DPP4 receptors.
  - MERS-CoV is a viral disease that was first identified in Saudi Arabia in 2012.
- NeoCov is **not SARS-CoV-2**.
  - NeoCoV is a **bat coronavirus** that was first identified in 2011.
  - It was identified in a species of bats known as **Neoromicia**.
  - NeoCov can use **ACE2 receptors of bats,** but **they can't use human ACE2 receptor unless a new mutation occurs.**

7.7.18. POLIOMYELITIS (POLIO)

- Malawi has recorded **Africa's first wild poliovirus (WPV)** case in five years.
- **About Polio:**
  - Poliomyelitis (polio) is a highly **infectious viral disease** that largely affects children **under 5 years of age.**
  - It may **affect the spinal cord causing muscle weakness and paralysis**.
  - Transmitted by **person-to-person** spread mainly through the **faecal-oral route** or, less frequently, by a contaminated water or food).
  - **Wild poliovirus (WPV)** is the most commonly known form of the poliovirus.
  - There are **3 strains** of WPV- type 1, type 2 and type 3.
    - ✓ type 2 was **eradicated** in 1999
    - ✓ no case of type 3 has been found since 2012.
    - ✓ As of 2020, type 1 affects two countries: **Pakistan and Afghanistan.**

7.7.19. LASSA FEVER

- 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.

7.7.20. CASES OF FAIRBANK'S DISEASE AND ACROMEGALY IN INDIA

- Both these are **rare disorders**, affecting fewer than 1 in 2500 individuals.
- **Acromegaly is** caused by **excessive secretion of growth hormone**, from a tumour in the pituitary gland.
  - It **causes increased height** when it manifests in childhood and adolescent age group.
- **Fairbank's disease is** also known as **Multiple epiphyseal dysplasia.**
  - In this patient usually requires **management of pain and orthopedic procedures.**

7.7.21. HAVANA SYNDROME

- A new report on **Havana syndrome (**a **mysterious illness** that afflicted hundreds of **United States diplomats and intelligence officials** worldwide) has brought renewed attention to **microwave weapons.**
- **About Havana syndrome:**
  - It refers to a set of **mental health symptoms** that typically involves **hearing certain sounds** without any outside noise being present, nausea, vertigo and **headaches, memory loss and issues with balance.**
  - It was **first reported** by officials based in the **U.S. embassy in Cuba in 2016.**

7.7.22. SERVICES E-HEALTH ASSISTANCE AND TELECONSULTATION (SEHAT)

- **Ministry** of **Defence** has rolled out the **home delivery of medicines for veterans and serving military personnel** in Delhi, seeking healthcare services under an online medical consultation platform.
- SeHAT stay-home OPD is **a patient-to-doctor system** where the patient can **consult a doctor remotely through the internet** using his Smartphone, laptop, Desktop or Tablet.
  - The online outpatient platform was launched in May 2021 to ensure widespread **access to quality**

health services in remote areas, besides reducing the load on the hospitals.

7.7.23. FSSAI HEALTH STAR RATING

- Food Safety and Standards Authority of India (FSSAI) is starting a **star rating system** for packaged foods.
    - Rating system will be **similar to star energy rating by Bureau of Energy Efficiency** for an electronic appliance.
- Packaged foods will display the **number of stars on the front of the pack**, indicating how healthy or unhealthy it is **depending upon the amount of salt, sugar and fat it has.**

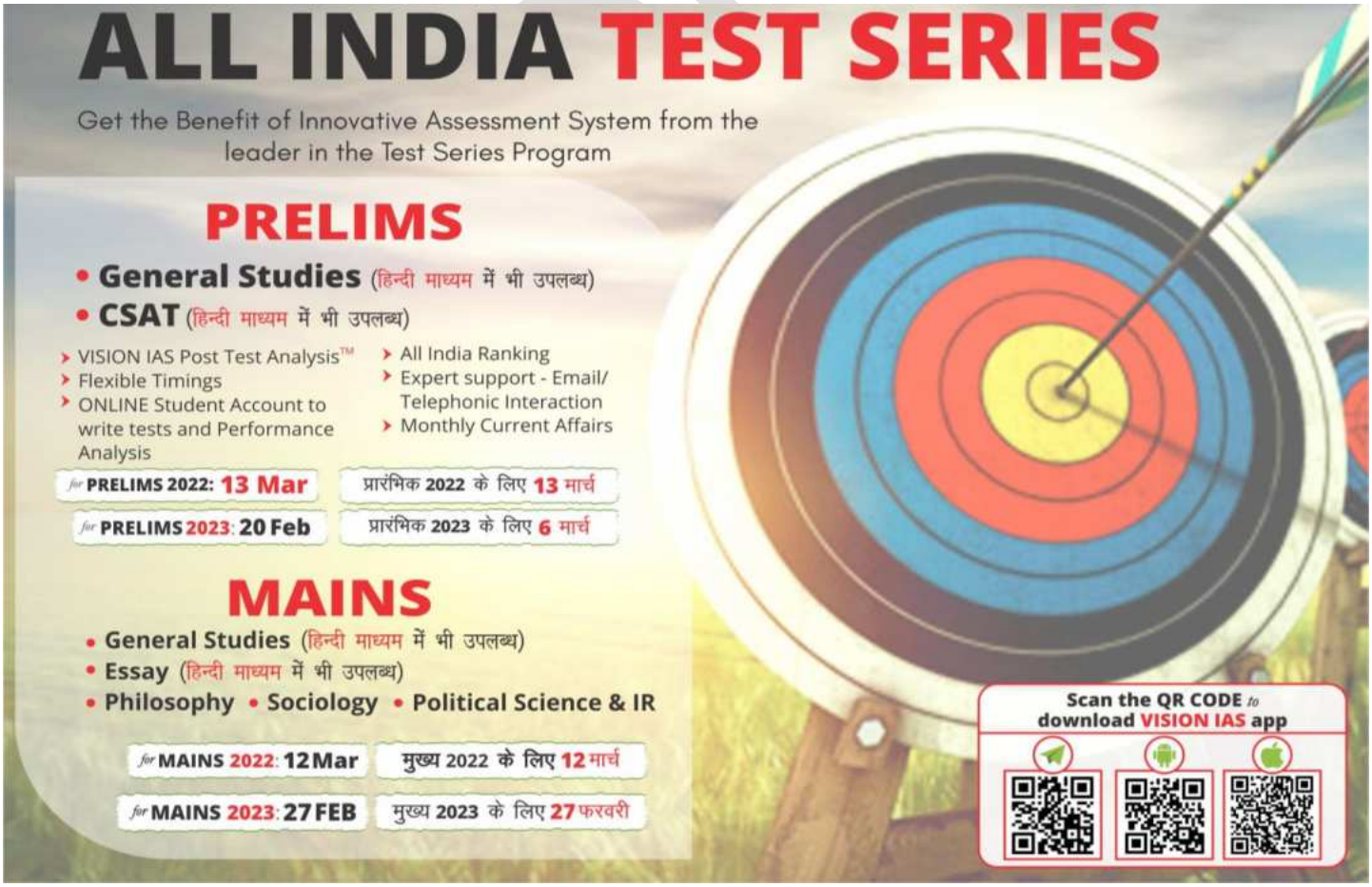
7.7.24. ARTIFICIAL SNOW

- For the first time in the history of the Winter Olympics, **athletes will compete on 100% artificial snow** in Beijing.
- Artificial snow is **small particles of ice that are used to increase the amount of snow available** for winter sports such as skiing or snowboarding.
    - It is **produced by a machine that uses a high-pressure pump to spray a mist of water into the cold air.** The water **droplets subsequently crystallize** to form fake snow.

QUIZ

SMART QUIZ

You can scan this QR code to practice the Smart Quiz of Science & Technology at our open test online platform for testing your understanding and recalling of the concepts.



8. CULTURE

8.1. HOYSALA TEMPLES

Why in news?

The Union Ministry of Culture has 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 the year 2022-2023.

More about News

- The 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** and represent one of the highest points of human creative genius and stand testimony to the rich historical and cultural heritage of the country.
- They are **protected monuments of the Archaeological Survey of India (ASI),** which takes care of their conservation and maintenance.

About World Heritage Sites

- A World Heritage Site is a **landmark or area with legal protection** by an international convention administered by the **United Nations Educational, Scientific and Cultural Organisation (UNESCO).**
  - They are designated by **UNESCO for having cultural, historical, scientific** or other forms of significance.
  - This is embodied in an **international treaty called the Convention concerning the Protection of the World Cultural and Natural Heritage,** adopted by UNESCO in 1972.
- **How are they selected?**
  - According to the Operational Guidelines for the Implementation of the World Heritage Convention, a **country must first list its significant cultural and natural sites** into a document known as the **Tentative List.**
  - The sites selected from that list **move onto the Nomination File**, which is then evaluated by the International Council on Monuments and Sites and the World Conservation Union.
  - Any site that wasn't first included in the Tentative List cannot be nominated.
  - The two bodies then make their recommendations to the **World Heritage Committee (WHC)**, which consists of diplomatic representatives from 21 countries.
  - The **committee meets each year** to decide whether a nominated property can be inscribed on the World Heritage List.
  - The committee makes the final decision if a site meets **at least one of the ten selection criteria**.
  - A **site may lose its designation when the WHC determines** if it is not properly maintained or protected.

Hoysala Architecture style

- Hoysala architecture is a building style that **evolved between the 11th to 14th centuries** under the Hoysala Empire's rule in the **southern Deccan region** and **Kaveri River Valley**.
- Hoysala temples are often referred to as **hybrid or Vesara temple style** because their distinctive design tends to have a **basic Dravidian style**, but also show a **strong influence of 'Bhumija'** which is seen in central India, along with '**Nagara' traditions of northern and western India**. (refer image).
  - They **are easily distinguishable from other medieval temples by their highly original 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).
  - The temple craftsmen carved their sculptures intricately because they were **made of soapstone, a relatively soft stone**. These sculptures can be seen in the gods' jewellery that adorns the temple walls.
  - **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**.
    - ✓ Mandapa is basically a hall where groups of **people used to gather for prayers**.
  - The **vimana in Hoysala temples** is simple on the inside though lavishly decorated on the outside.
    - ✓ Vimana is the point where the **most sacred shrine is present**.
  - 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**
• Also referred as **Keshava, or Vijayanarayana Temple** of Belur. • Commissioned by **King Vishnuvardhana** in **1117 CE.** • Built with **soapstone,** on the banks of the **Yagachi River** in Belur, also known as **Velapura**. • Combines elements of **North Indian Nagara** and **South Indian Karnata style** architecture. • It is an **ekakuta (temple with one shrine)** and the garbha griha (sanctum sanctorum) houses portrait of Krishna. • Temple is dedicated to **Lord Vishnu** known as Chennakesava, which means beautiful (chenna) Vishnu (Keshava). • Exterior sculptured exterior depicts scenes from daily life, music, and dance, and **narrate scenes from life of Vishnu** and his reincarnations and the epics, **Ramayana, and Mahabharata**. • Some of the **representations of Shiva** are also included. • It includes images from **Jainism and Buddhism**.	• Also called '**Halebidu' temple**, a **12th-century temple** dedicated to **Lord Shiva as Nataraja**, the God of Destruction. • It is a **double building with a large hall for the mandapa** to facilitate music and dance. • Sponsored by **King Vishnuvardhana.** • It is said to be the **largest monument in Halebidu**, a town in Karnataka and erstwhile capital of the Hoysala Empire. • There are **more than 240 images** in the temple and no other temple has these many intricate sculptures. • Halebid has a walled complex containing of **three Jaina basadi (temples)** of the Hoysala period as well as a stepped well. • 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**.	• **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. • It has a **stellar plan with three shrines and Vimanas**. • 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** because the idols here have been broken and the temple was desecrated by the invading armies of the Muslim Sultanate.

8.2. 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 and is among one of the tallest metallic statues in sitting position, in the world.
- It is **mounted on a 54-ft high base building, named 'Bhadra Vedi'** and has floors devoted for a library, ancient Indian texts, theatre and a gallery detailing works of Sri Ramanujacharya.

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,** and his preachings inspired other Bhakti schools of thought. 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.
  - He also **asked royal courts to treat them as equals**.
  - He **took education** to those who were deprived of it.
  - He worked tirelessly towards liberating millions from social, cultural, gender, educational, and economic discrimination with the foundational conviction that every human is equal regardless of nationality, gender, race, caste, or creed.
  - 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** as he appealed for the protection of nature and its resources like air, water, and soil.

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 inseparabe 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.**

8.3. 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 protestors** 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, Gandhi called off the NCM unilaterally and thus, on 12 February 1922, **the Non-Cooperation Movement came to an end.**

Outcome of Chauri Chaura incident

- **Roll back of NCM:** The **Congress Working Committee met at Bardoli in February 1922** and resolved to roll back NCM.
  - It was decided to **take the movement to the passive phase and focus on constructive work** like popularisation of khadi, national schools, and campaigning for temperance, for Hindu-Muslim unity and against untouchability.
- **Arrest of Gandhiji**: As a response to the violence, British Government arrested Gandhiji in March 2022 and sentenced him to six years in jail. Government also ordered death sentence for 19 convicts and sentenced 110 to life imprisonments.
- **Fall out in Congress -** Most of the nationalist leaders including C.R.Das, Motilal Nehru, Subhash Bose, Jawaharlal Nehru expressed bewilderment at Gandhi's decision to withdraw the movement.
  - Also, sudden roll back of NCM led to **disintegration, disorganization and demoralization among nationalist ranks.**
  - Two factions were created. **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).**
- **Fearlessness in masses**: According to Subhas Chandra Bose, the movement led to a peak of boiling public enthusiasm. Also, as per **Marxist interpretation, it seemed that the masses had started taking initiative.**
  - There was dissatisfaction amongst the masses which **germinated the seeds of extremism as the goals of NCM were not reached.**

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 three demands**
  - **Favourable treatment of Turkey** - Khilafat movement was born out of resentment of Indian Muslims owing to mistreatment of Turkey (which was ruled by spiritual leader, Khalifa) by the British after the First World War.
  - Also, the **Jallianwala Bagh massacre, imposition of the Rowlatt Act, and the economic situation of the country** post the first world war, all added fuel to the fire.
  - **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.

8.4. NEWS IN SHORTS

8.4.1. PUNAURA DHAM, BIHAR

- Punaura Dham in Sitamarhi district was included in **Ramayana Circuit of Swadesh Darshan scheme**.
  - Also, it was included in **PRASHAD (**Pilgrimage Rejuvenation And Spiritual Augmentation Drive) **scheme**.
- Punaura Dham is **considered to be birthplace of Goddess Sita**.
  - Shrine compound has a **Ram Janki temple, a pond called Sita Kund and a hall**.
- **PRASHAD scheme,** launched by Ministry of Tourism**,** focuses on **developing and identifying pilgrimage sites across India** for enriching the religious tourism experience.
- **Swadesh Darshan Scheme** aims to **promote, develop and harness potential of tourism** in India through Central Financial Assistance for infrastructure development of circuits.

8.4.2. KARAKATTAM DANCE

- Kerala Nattukala Kshema 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,** roadshows 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.**

8.4.3. BYANJANA DWADASHI

- Celebrated by **Vaishnavas, festival celebrates a variety of food (Byanjana in Odia) on 12th day (Dwadashi)** of bright lunar phase of moon in the month of Margashira of Hindu calendar.
- Dedicated to Krishna, tale goes that **Yashoda on noticing that Kahn's body had collapsed** prepared a variety of nutritious and delicious dishes to feed Krishna.
- This episode was **re-enacted in Vaishnava mutts of Puri by medieval seer Chaitanya Mahaprabhu,** after he reached Puri around 500 years ago.
- All the ingredients used for the preparation of food are **contributed by devotees.**

8.4.4. PANRUTI CASHEWS

- Cashew Processors and Exporters based in Tamil Nadu have **sought GI tag** for Panruti Cashews.
    - 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.**
- **Geographical Indications of Goods (Registration and Protection) Act**, 1999 seeks to **provide for the registration and better protection of GI r**elating to goods in India.

8.4.5. MEDARAM JATARA

- 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.

8.4.6. ANGADIAS

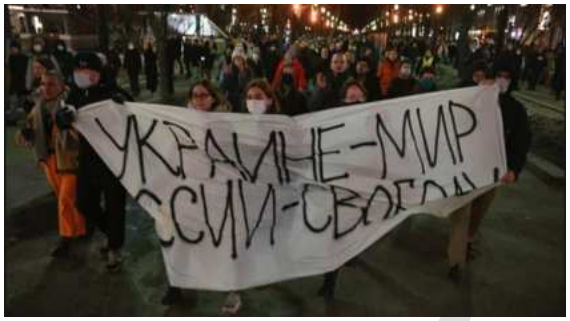
- It is a **century-old parallel banking system** in the country where traders send cash generally from one state to another through a person called Angadia that stands for courier.
- It is used **largely in jewellery business.**
- The cash involved is huge and it is the **responsibility of the Angadia** 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.**

QUIZ
SMART QUIZ
You can scan this QR code to practice the Smart Quiz of Culture at our open test online platform for testing your understanding and recalling of the concepts.

9. ETHICS

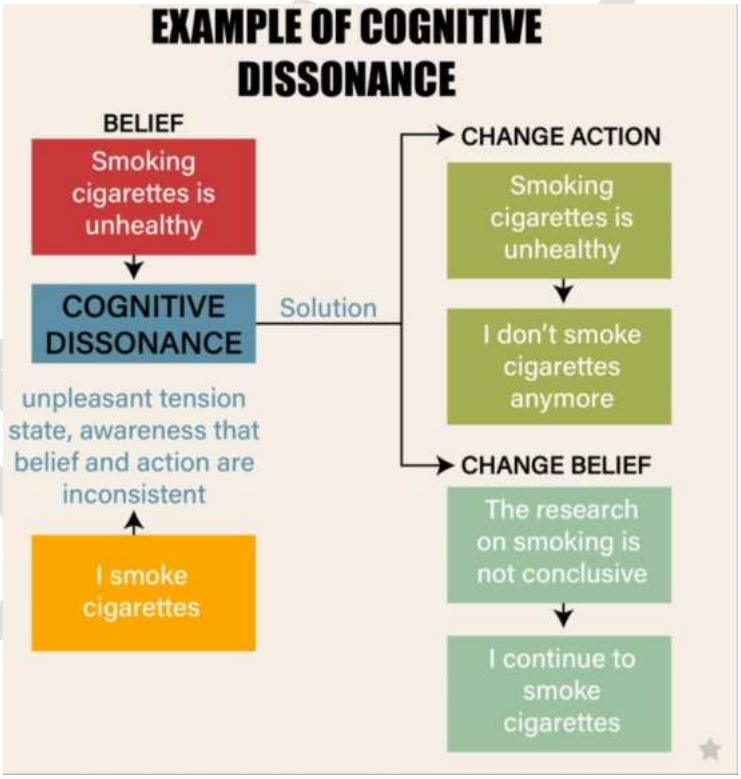
9.1. COGNITIVE DISSONANCE

Introduction



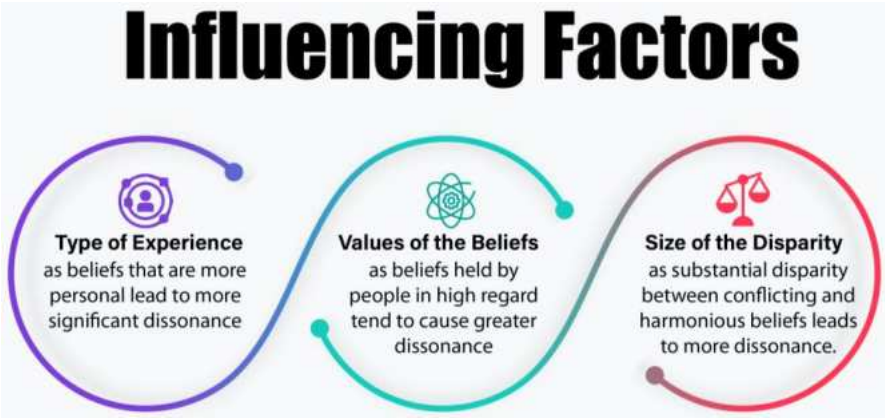
48-year-old Dmitry Maltsev, who joined the rally in St. Petersburg was in two minds, whether to support his country in these testing times or lean towards humanism for understanding the plight of the Ukrainian people.

Such cognitive dissonance is not rare. People from all walks of life from public servants to businesspersons, all face such dilemmas. The matters embodying this dissonance range from personal choices to balancing economic growth and ecology.



What is Cognitive Dissonance?

- Cognitive Dissonance is generally defined as a 'the mental conflict or discomfort which occurs when a person **holds conflicting beliefs** or when **actions contradict their beliefs'**.
- It can occur at personal as well as in professional life. Based on the time of Cognitive dissonance and actions, it can be of two types as-
  - **Anticipated Dissonance**, i.e., expected wrongdoing before actual moral violation.
  - **Experienced Dissonance**, i.e., realization of wrongdoing or guilt after action.
- Though it is common, it may not be easy to recognize it. Following signs act as a **marker to identify cognitive dissonance-**
  - **Feeling uncomfortable** before doing something or making a decision.
  - **Trying to justify or rationalize a decision** that you've made or an action you have taken.
  - **Feeling embarrassed or ashamed** about something you've done and trying to hide your actions from other people.
  - **Experiencing guilt or regret** about something you've done in the past.



What are the potential causes of Cognitive Dissonance?

- **Forced Compliance:** Sometimes one might find yourself engaging in behaviors that are opposed to your own beliefs due to external expectations. This might involve going along with something due to peer pressure, prior commitments or as one's duty.
- **New Information:** Sometimes learning new information can lead to feelings of cognitive dissonance. For example, if you engage in a behavior that you later learn is harmful, it can lead to feelings of discomfort.
- **Decisions:** When faced with choices which involve conflicting beliefs, people often are left with feelings of dissonance.

- For instance, at a store, a boy sees his friend steal a toy. The boy knows that stealing is against his code of ethics, but he doesn't want to lose his friend by telling on him. This creates cognitive dissonance between being true to his friend and being true to what he knows is right.

Cognitive Dissonance among Medical Experts due to COVID-19: A case study

Recently, number of medical experts wrote to health authorities for intervention and stopping the use of medications and diagnostics that are inappropriate for the clinical management of COVID-19. This was the result of persistent cognitive dissonance faced by doctors due to issues like:

- **Use of limited efficacy drugs** with greater risks over its benefits, violating the medical ethics of **Beneficence** (maximum good) and **do not harm**.
  - Doctors' cognitive dissonance over **use of unreliable drugs** or **wait for proper drugs availability.**
- **Use of High-cost drugs** with no National Task Force endorsement and informed patient consent, i.e., **violation of autonomy**.
  - Doctors' cognitive dissonance due to price and inconsistency between CDSCO approved COVID-19 drugs and drugs endorsed by National Task Force on Covid-19.
    - ✓ E.g., Itolizumab, a monoclonal antibody, with price of ₹32,000 for four vials was approved by CDSCO after trial over 30 patients.
- **Increased hospitalization cost and black marketing** during Covid-19, violating the medical ethics of **equality/equity** as well as moral ideals like **justice** and **proportionality**.

All this cognitive dissonance led to irrational drug use, higher costs for patients and confusion within the medical community, leading to moral distress.

What can be done to overcome the Cognitive Dissonance of the situation?

- **Coordination:** Address the lack of coordination between the National Task Force on COVID-19 and Central Drug Standard Control Organization (CDSCO).
- **Transparency:** The drug's approval should be more transparent, i.e., open and accessible for all to avoid misuse of power and make citizens more aware.
- **Objectivity:** CDSCO should have more objectivity in drug's approval to avoid hasty approval and ensure that the efficacy of the drug periodically monitored.
- **Awareness:** The medical professionals and citizens should be made aware of pros and cons of drugs to remove moral distress and ensure informed consent.

Way Forward

At individual level, Cognitive Dissonance leads to discomfort or unease due to feeling of anxiousness, guilt or being ashamed. Similarly, at social level it can lead to larger issues of distrust and lack of harmony. Therefore, efforts can be made to resolve it in public sphere as-

- At personal level people tend to resolve such dissonance themselves, known as the "**principle of cognitive consistency**", through change of behavior or reduced importance of cognition, by re-evaluating the cost-reward ratio attached with various things, beliefs, and ideas.
- But at professional and higher levels, it can **elicit greater cognitive dissonance** with **limited individual ability** to address it, requiring **external interference** in the form of recognition to the issue and taking institutional steps to resolve it.

In the public context, resolution of such situations requires leaders, civil servants and experts having **credibility** and **expertise** to provide an effective way forward. Also, they should have the **ability to connect with people emotionally** in order to find a **common ground** in order to **resolve the cognitive dissonance**.

10. SCHEMES IN NEWS

10.1. PM-KUSUM SCHEME

Why in news?

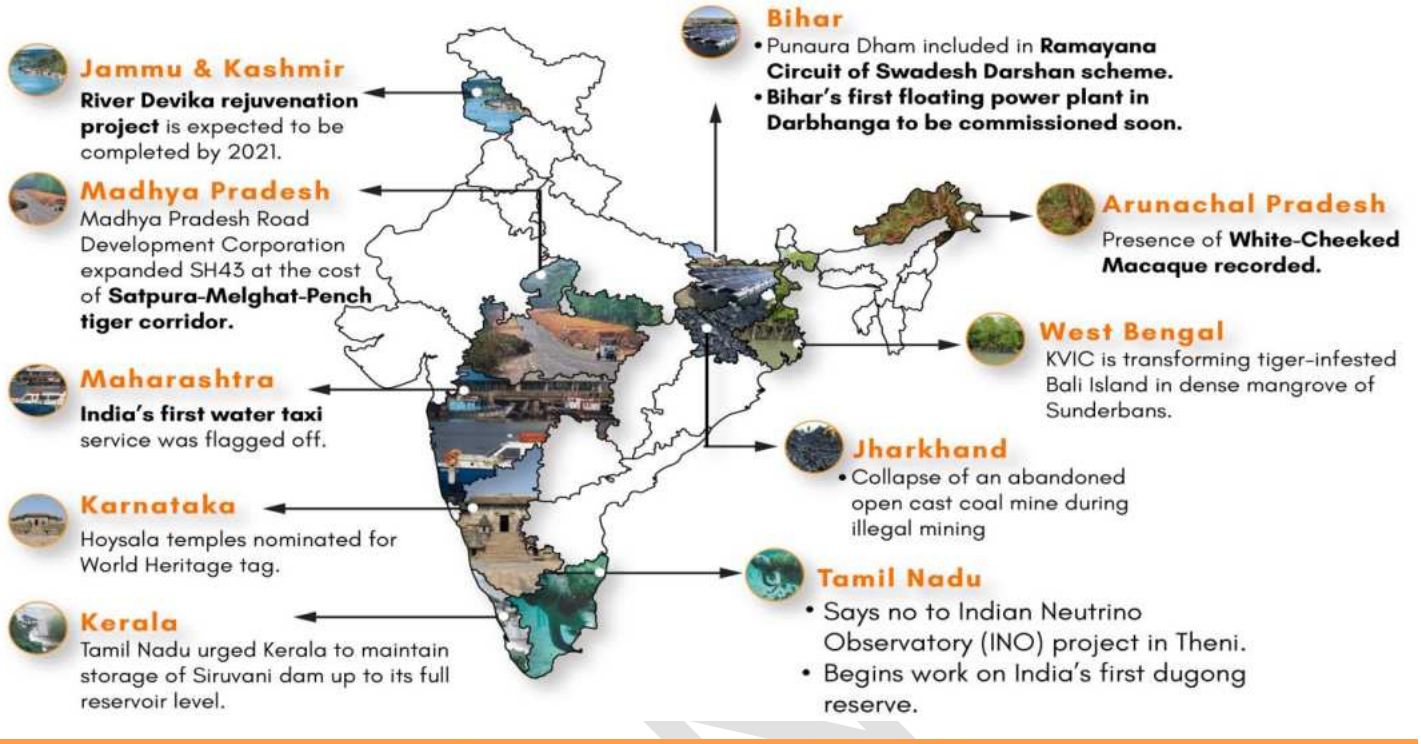
Ministry of New and Renewable Energy (MNRE) has cautioned against fraudulent websites cheating the public through fake registration portals of PM-KUSUM scheme.

About PM-KUSUM scheme

Objectives	Key Features

• To **provide financial and water security** to farmers.
  ○ The goal was to **de-dieselise the farm sector** by replacing diesel pumps with solarised ones.
  ○ It would also **reduce the burden on state-owned discoms** that have to supply subsidised electricity to the agriculture sector.
• The Budget 2020-21 has also sought to expand the coverage:
  ○ Scheme to enable farmers to set up **solar power generation capacity** on their **fallow/barren lands** and to **sell it** to the grid.
  ○ **20 lakh farmers** to be provided for setting up **stand-alone solar pumps**.
  ○ Another **15 lakh farmers** to be helped to **solarise their grid connected pump sets**.
	• It aims to add a solar capacity of **25,750 MW by 2022**. The scheme originally consisted of three components:
	  ○ **Component-A**: 10,000 MW of Decentralized Ground Mounted Grid Connected Renewable Power Plants.
	  ✓ Renewable power plants of **capacity 500 KW to 2 MW** will be setup by individual farmers/ cooperatives/panchayats /farmer producer organisations (FPO) on their barren or cultivable lands (now on pastureland and marshy land of farmers also) referred as Renewable Power Generator (RPG).
	  ✓ To support small farmers, the **solar power projects smaller than 500 kW** may be **allowed by States** based on techno-commercial feasibility.
	  ✓ There shall be **no penalty to RPG for shortfall** in solar power generation from minimum prescribed Capacity Utilization Factor (CUF).
	  ✓ The power generated will be purchased by the DISCOMs at Feed in tariffs determined by respective SERC.
	  ○ **Component-B**: Installation of standalone Solar Powered Agriculture Pumps.
	  ✓ Individual farmers will be supported to install standalone solar pumps of capacity up to 7.5 Horsepower (HP).
	  ✓ For solar pumps to be set up and used by Water User Associations (WUA)/Farmer Producer Organisations (FPO)/Primary Agriculture Credit Societies (PACS) or for cluster-based irrigation system, the **Central Financial Assistance (CFA)** will be allowed for solar pump capacity of **higher than 7.5 HP** considering **upto 5 HP capacity** for **each individual** in the group.
	  ✓ It will be mandatory to **use indigenously manufactured solar panels** with **indigenous solar cells** and **modules**.
	  ✓ To remove delay in installation services, ministry has allowed **joint venture of manufacturer of solar pump/solar panel/solar pump controller with integrators**.
	  ✓ Centre and state to **share 30% of pump cost each**; farmer to provide the remaining 40% (can access bank loan for up to 30% of the cost).
	  ○ **Component-C -as amended recently**: **the Component C has been restructured** to shift focus to solarise agricultural feeders instead of pumps.
	  ✓ Until now farmers were provided with **60% financial assistance (equally shared between Centre and State)** for solarising their agricultural pumps which meant **40% had to be borne by the farmers themselves**.
	  ✓ Centre will now bear **30% of the cost of building a small solar plant** to supply electricity to the feeder and the **balance 70% would be borne by State-owned DISCOMs**.
	• This would **obviate need for farmers to replace every existing pump** in a village with a solar pump. **Discom or power department** will be the **implementing agency** for **feeder-level solarisation** in their respective areas.
	• This feeder-level solarisation would ensure **economies of scale** and **better efficiency**.

Places in News: India



Bihar
- Punaura Dham included in **Ramayana Circuit of Swadesh Darshan scheme.**
- **Bihar's first floating power plant in Darbhanga to be commissioned soon.**

Jammu & Kashmir
River Devika rejuvenation project is expected to be completed by 2021.

Madhya Pradesh
Madhya Pradesh Road Development Corporation expanded SH43 at the cost of **Satpura-Melghat-Pench tiger corridor.**

Maharashtra
India's first water taxi service was flagged off.

Karnataka
Hoysala temples nominated for World Heritage tag.

Kerala
Tamil Nadu urged Kerala to maintain storage of Siruvani dam up to its full reservoir level.

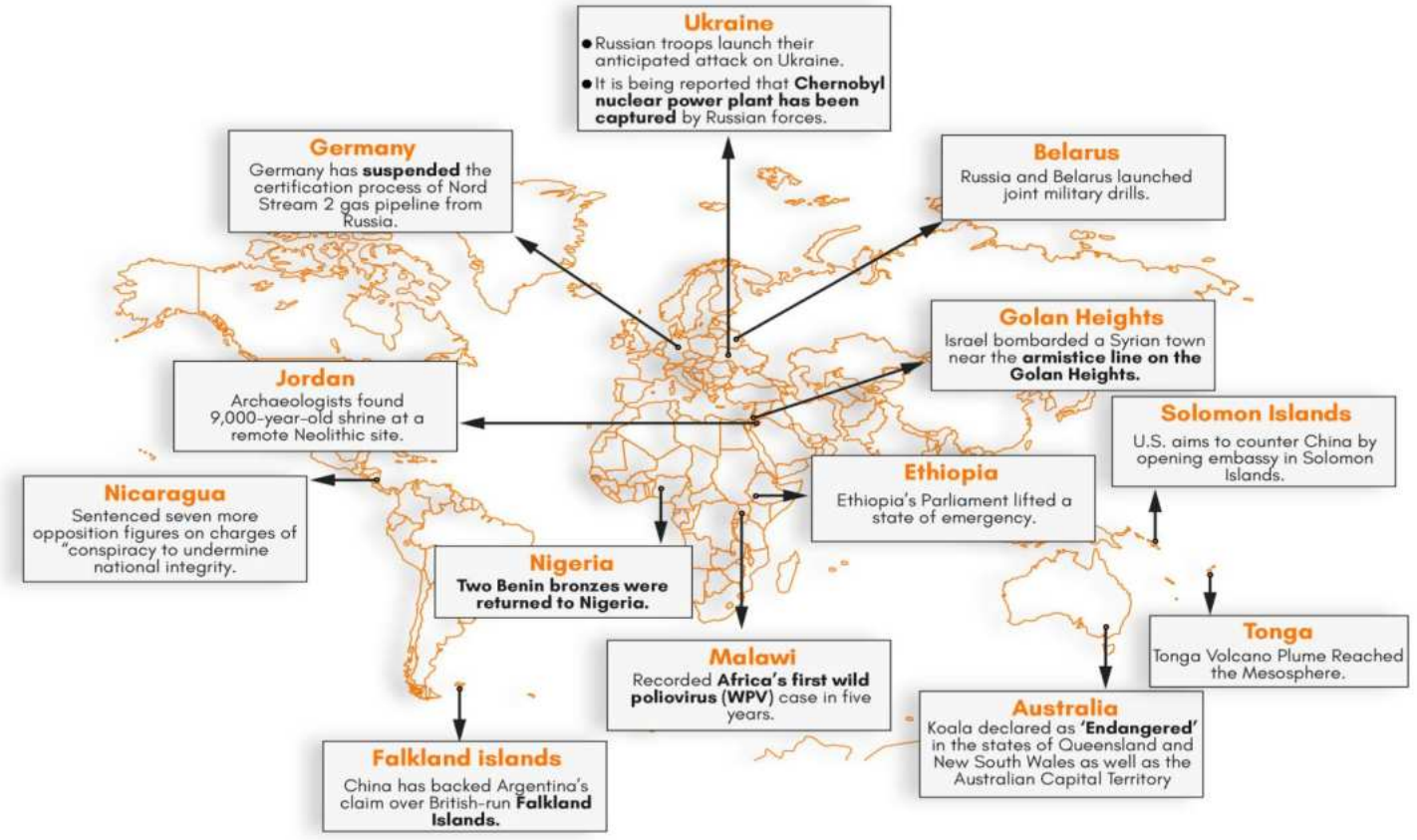
Arunachal Pradesh
Presence of **White-Cheeked Macaque recorded.**

West Bengal
KVIC is transforming tiger-infested Bali Island in dense mangrove of Sunderbans.

Jharkhand
- Collapse of an abandoned open cast coal mine during illegal mining

Tamil Nadu
- Says no to Indian Neutrino Observatory (INO) project in Theni.
- Begins work on India's first dugong reserve.

Places in News: World



Ukraine
- Russian troops launch their anticipated attack on Ukraine.
- It is being reported that **Chernobyl nuclear power plant has been captured** by Russian forces.

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

Belarus
Russia and Belarus launched joint military drills.

Golan Heights
Israel bombarded a Syrian town near the **armistice line on the Golan Heights.**

Jordan
Archaeologists found 9,000-year-old shrine at a remote Neolithic site.

Solomon Islands
U.S. aims to counter China by opening embassy in Solomon Islands.

Nicaragua
Sentenced seven more opposition figures on charges of "conspiracy to undermine national integrity.

Ethiopia
Ethiopia's Parliament lifted a state of emergency.

Nigeria
Two Benin bronzes were returned to Nigeria.

Tonga
Tonga Volcano Plume Reached the Mesosphere.

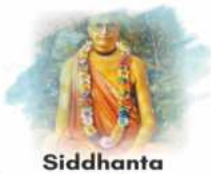
Malawi
Recorded **Africa's first wild poliovirus (WPV)** case in five years.

Australia
Koala declared as **'Endangered'** in the states of Queensland and New South Wales as well as the Australian Capital Territory

Falkland islands
China has backed Argentina's claim over British-run **Falkland Islands.**

Personalities in News

Personality	About	Ethical Values Exhibited by the personality
Narsinh Mehta	• A new species of spider is named Narsinhmehta in honour of Narsinh Mehta. • He was the **15th century poet** who was a **devotee of Lord Krishna.** • He was a **contemporary of Mira Bai**. • He was a **Vaishnavite poet-saint**, who is revered in Gujarati literature as its **Adi Kavi**. • He was the **pioneer poet of Gujarati literature**. He wrote **Padas called Akhyan and Prabhatiya** and numerous Bhajans and Kirtans which were preserved orally for centuries before being scripted in writing.	• **Devotion** ▸ Being devotee of Lord Krishna, he in his entire life, he spread the message of universal love and dis-attachment. He penned down his thoughts through literature.
Rani Abbakka Chowta	• Government had released a **pictorial book on India's Women Unsung Heroes** of Freedom Struggle as part of Azadi ka Mahotsav which narrates the tales of valor of **Rani Abbakka**. • Rani Abakka, the Queen of Ullal, belonged to the **Chowta dynasty** who ruled over parts of **coastal Karnataka.** • **Contribution:** ▫ Rebelled against **foreign invaders and colonialism.** ▫ She confronted, fought and **repeatedly defeated the Portuguese.**	• **Valour** ▸ In the 16th century, Portuguese were the frequent invaders of coastal regions of the western ghats. Rani Abbakka queen of one such region gave a fiercest resistance to foreign attacks.
Lachit Borphukan	• 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. ▫ Borphukan is a position **embedded with both executive and judicial powers.**	• **Fortitude and leadership** ▸ As a military administrator, he successfully led the army of Ahoms against extremely powerful Mughals.
Maharaja Surajmal	• PM paid tributes to Maharaja Surajmal on his Jayanti. • He was the **ruler of the Bharatpur dynasty.** • He **united various factions of Hindus and Muslims** and kept them together. • He **considered farmers as the most important section of the society** and introduced reforms to rectify various problems identified by them.	• **Visionary** ▸ He was known for his progressive ideas and will to bring reforms in the society and economy. He undertook various reform programmes for agriculture, education, social inequality and discrimination.
Velu Nachiyar	• Known by Tamils as **Veeramanga**i, she was the princess of **Ramanathapuram**. • **Contributions** ▫ She was the **first Indian queen** to wage war against the British **East India Company**. ▫ She was **trained in several martial art** forms like **Valari and Silambam** and was an ace **horse-rider and archer**. ▫ Also, earned proficiency in **English, French and Urdu.**	• **Fortitude** ▸ When Britishers attacked the parts of her kingdom, undeterred by their superior force she decided to confront and defeat them. She put a brave fight against them and struck a major blow to company's plan to easily control the part of South India.
U Tirot Sing	• He was a **Khasi chief in the early 19th century** who **declared war and fought against British** for attempts to take over control of the Khasi Hills. • He is known for **mastery of guerrilla warfare tactics** along with the ability to organize warriors. • He took part it **Anglo-Khasi war, 1829-33**, where he was injured, took refuge in the nearby caves. He was eventually captured by British in and **deported to Dhaka**. • His death anniversary, 17th July, is commemorated every year as a state holiday in **Meghalaya**.	• **Patriotism** ▸ He fought against Britishers using the tactics of guerrilla warfare with great courage and commitment. Through his unique strategy, he was successful in inflicting great injury to enemies.
Jhalkari Bai	• Born in 1830 in Bhojla village near Jhansi, she was a woman soldier who became **one of the key advisors to the Rani of Jhansi**. **Contributions** ▫ During the **battle of fort of Jhansi**, she disguised herself as Rani Laxmibai, thus giving the real queen a **chance to escape**. ▫ Prominent fighter during the **Rebellion of 1857**, she was able to **strike fear** in the hearts of the British army. • **Honour**: Statue in **Gwalio**r and in 2001, Indian government **released a stamp** to pay tribute.	• **Bravery and Sacrifice** ▸ Being a soldier and close associate of Rani Laxmibai, she exhibited tremendous courage and dedication through her brave acts. She even risked her life for the sake of the leader and become successful in averting the enemies plan to trap Laxmibai.
Nabin Chandra sen	• 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** - ▫ 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.	**Creativity** ▸ He used his creative impulse to serve the cause of freedom and truth. His literary work played a very important role in awakening people minds for the social and political causes.

 Matangini Hazra	• Affectionately known as **Gandhi Buri** (Bengali for old lady Gandhi), she participated in the Indian independence movement after getting inspired by Mahatma Gandhi. • **Contributions**: ▫ **Participated in the Non-Cooperation Movement** and was arrested for breaking the Salt Act (1932). ▫ During the **Quit India Movement** (QIM, 1942), **at 73 years, she led a procession of 6000 supporters**, mostly women volunteers, to take over the Tamluk police station. ✓As she stepped forward, she was shot and killed by the British.	• **Commitment to the cause** ▸ She lost her life to the cause of national struggle as she led the procession of women during the Quit India Movement. Her sacrifice to the cause shows her degree of commitment for the goals of freedom struggle.
 **Siddhanta Saraswati Goswami Prabhupad**	• Recently, President inaugurated the three-year long celebrations of the **150th birth anniversary** of Siddhanta Prabhupada. ▫ 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**. ▫ Chaitanya was a **15th Century Bhakti Saint** who promoted worship of Lord Krishna as the Supreme Soul.	• **Devotion** ▸ His devotion to the cause of spiritual awakening was very strong. It influenced the lives of millions of people as his lessons and teachings helped them to understand the trappings of materialism in modern life.
 Sant Gadge Baba Gadge	• He was social reformer from Maharashtra and contemporary of Dr Ambedkar. ▫ He belonged to the **tradition of Sant Kabir and Raidas**. • **Significant Contributions** ▫ **Opposed Brahmanism**, religious hypocrisy and the caste system. ▫ Fought on prohibition of liquor, **untouchability and animal sacrifice.** ▫ He donated the building of his hostel to the **People's Education Society founded by Dr Ambedkar.** ▫ Dr Ambedkar had described him as **greatest servant of the people after Jotiba Phule.**	• **Selflessness and hard work** ▸ His life was the living example of the values he taught. He led the life of voluntary poverty i.e. simplicity with focus on hard work, respect and service to others. He questioned the superstitious beliefs and customs on the grounds that they do not serve any social good.
 Sachindra Nath Sanyal	• **Contributions**: ▫ He along with Rashbehari Bose **attacked Viceroy Hardinge** while he was entering the new capital of Delhi (1912) ▫ **Involved in the Ghadar Conspiracy** for which he was at Cellular Jail (Andaman & Nicobar Island). ✓ There he wrote his famous book titled **Bandi Jeevan** (A Life of Captivity, 1922). ▫ **Sanyal, Ram Prasad Bismil and other revolutionaries founded the Hindustan Republican Association** (HRA) in 1924. ✓ He was the **author of the HRA manifesto**, titled **'The Revolutionary'** ▫ Was **involved in the Kakori Conspiracy** (1925) ▫ Was a **mentor for revolutionaries like Chandrasekhar Azad and Bhagat Singh**.	• **Zeal** ▸ His energy and enthusiasm to fight against Britishers was contagious. Whoever came into contact with Sanyal got influenced by his zeal for taking action against the tormentors and do something for the cause of freedom. • **Courage** ▸ Even after he was imprisoned and given severe punishment, he continued his activities for supporting revolutionary activities from the jail.
 Chakali Ilamma	• She was born at Krishnapuram village of Warangal district (Telangana). • **Contribution:** fighter of the Telangana Peasants' Armed Struggle of 1946-51. ▫ Rebelled against the feudal lords. ▫ Was fascinated by the ideas of Socialism.	• **Dignity and self-respect** ▸ Inspired by the ideals of justice and equality, she joined the movement of peasants against feudalism. She fought for the dignity and self-respect of the downtrodden.
 Padmaja Naidu	• She was an **Indian freedom fighter** and a former governor of West Bengal. • She was **daughter of** Indian freedom fighter, **Sarojini Naidu.** • She was **associated with the Red Cross** and was the chair of the Indian Red Cross from 1971 to 1972. • **Padmaja Naidu Himalayan Zoological Park** in Darjeeling is named after her.	• **Dedication** ▸ Being a daughter of illustrious woman i.e. Sarojni naidu, Padmaja learned the higher values of freedom and dedication in quite a young age. She spent a great deal of time of her life in leading the programmes of freedom struggle.
 Usha Mehta	• **She was born in Gujrat and** famously known as **Radioben**. • **Significant contributions:** ▫ In 1928, at the age of eight, she took part in her **first protest against the Simon Commission.** ▫ Launched the **first announcement of Congress Radio** 1942, (secret radio station) during the quit India movement. ✓It **helped deliver news to the remotest corners** during Quit India Movement. • **Awards**: Padma Vibhushan.	• **Creative zeal** ▸ Dr. Usha Mehta known for her efforts in organising the Congress Radio, a clandestine radio station to spread nationalistic fervor at a time when the country was vehemently fighting the British.
 Shakuntala Choudhary	• A **Gandhian social worker and Padma Shri recipient** belonging from Kamrup district of Assam. She joined **Kasturba Gandhi National Memorial Trust (KGNMT), Assam (also known as Sarania Ashram) in 1947** where she worked for the upliftment of the downtrodden. ▫ KGNMT was **founded in 1945 by Gandhiji himself**. It's headquarter is in Indore and has branches in 22 states of India. • She also **led the Bhoodan Movement in Assam** and **founded a monthly magazine 'Asomiya Vishwa Nagari' in Devanagari script** to promote Devanagari.	**Care and Kindness** ▸ She through her organizational efforts worked for the betterment of the villagers, especially women and children in her region.

Parbati Giri	• **About Parbati Giri:** ▫ Also called as the **Mother Teresa of Western Odisha**, she was a **fierce freedom fighter** and a **social reformer**. ▫ **Contributions:** ✓ She was in the forefront of agitation following Mahatma **Gandhi's "Quit India" call.** ✓ Participated in the **Bhudaan movement**; ▫ **Accolades:** Odisha government dedicated an **irrigation scheme in her honour**, the 'Parbati Giri Mega Lift Irrigation Scheme'.	• **Commitment to the cause** ▹ Driven by her love for humankind, she started an ashram for women and orphans where people who are helpless and in need can be given humanly care and guidance. She even worked for improvement of the conditions of prisoners and eradication of leprosy.
Lata Mangeshkar	• Born in **Madhya Pradesh with her father a classical musician, Lata Mangeshkar was trained by Ustad Aman Ali Khan** (son of Chhajju Khan, founder **of Bhendi Bazaar Gharana**). • Called as '**Swar Kokila' by people, she started singing at a young age of 13 and recorded over 30,000** songs in several Indian languages in her career of over seven decades. • In her life, she received various awards including **Bharat Ratna**(2001), **Padma Vibhushan**(1999), **DadasahebPhalke Award** (1989) etc.	• **Determination** ▹ She took up singing under duress as she was forced to become breadwinner for her family at the young age of 13. However she through her hard work and passion carved a niche for her singing. • **Commitment** ▹ Music remained her calling throughout her life and she later became the artist with the most number of recordings in the world.

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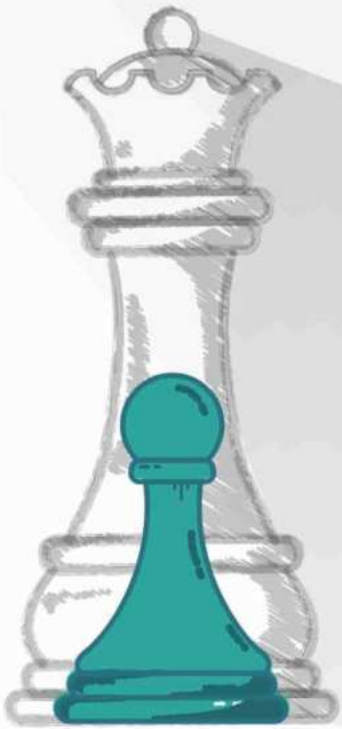

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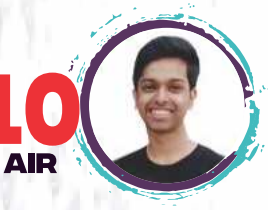

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