VISION IAS
INSPIRING INNOVATION

MAINS 365

Updated Classroom Study Material

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MAINS 365 - UPDATION

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1. POLITY AND CONSTITUTION

1.1. SIMULTANEOUS ELECTIONS

Why in News?

Prime Minister raised the pitch for Simultaneous Elections to the Lok Sabha and State Assemblies.

About Simultaneous Elections (SE)

- It means **structuring the Indian election cycle in a manner that elections to Lok Sabha and State Assemblies are synchronized together** under which voters in a particular constituency vote for both on the same day.
- SE were the **norm until 1967**. But following dissolution of some Legislative Assemblies in 1968 and 1969 and that of Lok Sabha in 1970, elections to State Assemblies and Parliament have been held separately.
- Later, SE idea was **proposed by Election Commission in 1983**. It was also referred by Law Commission and NITI Aayog.
- SE **does not mean that voting across the country for Lok Sabha and State Assemblies happen on a single day**. It can be conducted in a phase-wise manner and voters in a particular constituency vote for both State Assembly and Lok Sabha the same day.

> **Constitutional provisions related to simultaneous Elections**
> - **Article 83** stipulates that Lok Sabha shall have a normal term of 5 years from the date appointed for its first meeting and no longer.
> - **Article 85** states that President of India has the power to dissolve the Lok Sabha on the advice of the Union Cabinet.
> - **Article 172** lays down the term for the Legislative Assemblies as five years.
> - **Article 174 is** states that Governor has the power to dissolve the state assembly on the advice of the state Cabinet.

Arguments in favor of Simultaneous Elections

- **Policy paralysis:** Frequent elections lead to imposition of Model Code of Conduct (MCC) over prolonged periods of time which often leads to policy paralysis and governance deficit in the form of suspended development programs, welfare schemes, capital projects etc.
- **Huge expenditures:** By various stakeholders like political parties, individual candidates, etc. The urge to spend more (than the set limit) to win elections is blamed as one of the key drivers for corruption and black-money in the country.
- **Engagement of security forces:** Deployment of security forces is normally throughout the elections and frequent elections takes away a portion of such armed police force which could otherwise be better deployed for other internal security purposes.
- **Disrupting public life:** Frequent elections lead to disruption of normal public life and impact the functioning of essential services. If SE are held, this period of disruption would be limited to a certain pre-determined period of time.
- **Impact on social fabric:** Frequent elections perpetuate caste, religion and communal issues across the country as elections are polarizing events which have accentuated casteism, communalism and corruption.
- **Focus on populist measures:** Frequent elections will impact the focus of governance and policy making as it forces the political class to typically think in terms of immediate electoral gains rather than focus on long-term programmes and policies.
- **Impact on voter turnout:** According to law commission report simultaneous polls will boost voter turnout.

Arguments against Simultaneous Elections

- **Operational feasibility** such as how to synchronize cycle for the first time, what will be the procedure in case ruling party/coalition loses majority before 5 years, feasibility for the Election Commission to conduct elections at such a massive scale etc.
- **Constitutional issues:** Holding SE will require certain requirements such as Curtailment and extension of terms of the House of the People/ State Legislative Assemblies, Amendment to the relevant provisions of the Constitution, Amendment to the Representation of People Act, 1951, ratification by the States to these Constitutional amendments.

- **National and state issues are different**, and holding simultaneous elections may affect the judgment of voters and and he/she may vote for the same political party, which in most cases may be larger national parties.
- **Reduce government's accountability to the people** as frequent elections bring the politicians back to the voters and enhance accountability of politicians to the public.
- **It can go against federalism** as when an election in a State is postponed until the synchronized phase, President's rule will have to be imposed in the interim period in that state.
- **Homogenization of the country**, instead of bringing equity, sustaining plurality, and promoting local and regional leadership, as SE may promote national parties.

Conclusion

Analysis of financial implications, effect of MCC and law commission's recommendations suggest that there is a feasibility to restore SE as it existed during the first two decades of India's independence.

However, SE cannot be the panacea. The issues related to frequent elections can be addressed by, re-looking at the duration of restrictions under MCC, curbing poll expenditures by electoral funding reforms, bringing political parties under RTI, etc.

1.2. ELECTIONS DURING COVID TIMES

Why in News?

Several countries, including India, have successfully conducted polls during COVID-19 with safety measures in place.

COVID-19 and elections

- One of the cascading effects of the COVID-19 pandemic has been its impact on conducting elections. Some countries have pushed ahead with elections.
- Elections during COVID-19 presents certain challenges. However, postponing elections may not be the appropriate option as it has following risks:
  - **Political risks:** disturbing the level playing field and undermining the incumbent or opposition;
  - **Reputational risks**, for an organization that makes decisions, for trust in democratic processes and institutions
  - **Financial risks:** budgetary implications, e.g. money invested that cannot be recovered;
  - **Operational risks**: alternative dates are not feasible because of other risks, e.g. extension of term, other events;
  - **Legal risks**: the decision can be legally challenged.
- **Challenges faced in elections during COVID-19:**
  - **Campaigning:** large rallies can spread the virus. Virtual campaigning through social and print media and radio will have to suffice. This will raise the cost of campaigning, exclude the poor and indigent, further favoring those with access to finance and technology.
  - **Polling stations:** These will be impacted as it becomes increasingly more difficult to find workers to man them and also need to provide protective gear and sanitizer at such a large scale.
  - **Preparedness of electoral management bodies (EMBs):** preparing for elections will be infinitely more difficult where movement and contact is constrained. Most EMBs will face increased administrative and logistical work necessary to hold elections during COVID-19.

> **Key measures announced by Election Commission for Bihar elections**
> - **COVID-19 patients were also allowed** to take part in the democratic exercise by extending voting time by one hour.
> - **Number of voters per booth was restricted** (to 1000 persons) so that social distancing norms are followed.
> - **Postal ballot facility was provided** wherever required and requested.
> - **Nomination forms were made available online,** apart from offline.
> - There were **restrictions on door-to-door campaigning.** The ECI said only five, including the candidate, will be allowed for door-to-door campaign.

> **Best Practices on elections during COVID-19**
> - **New Zealand:** Alternative voting arrangements being considered are extending the online service for voting; extending the telephone dictation voting service; offering proxy voting and postal voting and expanding the use of mobile ballot boxes.
> - **South Korea:** special polling stations for COVID patients, postal voting and early voting, political agreements on electoral calendar and procedures etc.

- o **Effect on turnout:** Elections are characterised by high turnout and equal levels of participation across different groups in a society. Holding an election during a pandemic could undermine this aspect by reducing turnout.
- o **Impediments on Transparency:** Conventionally, elections are monitored by domestic and international observer groups to ensure the processes are lawful and meet the requirements for an election conducted with integrity. For COVID-19 elections, the situation could be different.

Measures for conducting elections during COVID-19

- **Political consensus in sustaining decisions** made on the electoral calendar and procedures to avoid political friction and not undermining the legitimacy of the electoral result.
- **Special Voting Arrangements** and enabling various modalities to cast the vote. Voters should be offered voting methods that minimise direct contact with other people and reduce crowd size at polling stations.
- **Adopt measures that reduce the risks of contagion**, which range from the availability of masks and other protective materials, to the opening of more voting centers and the extension of the voting period.
- **Voter education** should reach all genders**.** It is important to understand how women access information during the pandemic and target voter education to ensure they have equal access to that information.

1.3. RIGHT TO RECALL

Why in News?

Haryana Assembly passed Haryana Panchayati Raj (Second Amendment) Bill, 2020, which provides the right to recall members of Panchayati Raj institutions.

More on News

- Right to Recall is a process whereby the **electorate has the power to remove the elected officials** before the expiry of their term**.** It is an example of **instrument of direct democracy**.
- Bill allows the **recall of village sarpanches and members of the block-level and district-level panchayats** if they fail to perform.
- To recall, **50% members of a ward or gram sabha have to give in writing** that they want to initiate proceedings.
- This will be followed by a secret ballot, in which their recall **will require two-third members voting against them.**

Benefits of Right to Recall

- **Ensure greater accountability** in the political system as the electorate retains control over those legislators who are underperforming or are misusing their office for their selfish gains.
- **Lack of competence and ethics in representatives** call for a mechanism which vests in people the control over such unworthy representatives who have failed to secure the best interests of their electorates.
- **Check corruption as well as the criminalization of politics** by deterring candidates from spending crores of money in campaigning for the elections because they will always have a fear of being recalled.
- **Logic and justice** as it will provide an option to correct wrong decisions without having to wait for the next five years.

Limitations of Recall

- **De-stabilise the government:** It might lead to destabilization as wherever there is discontent, people will start recalling.
- **Election fatigue**- by recalling/rejecting the candidates and having another election may cause election fatigue & lower voter turnout.

> **Direct Democracy**
> - Direct democracy describes those rules, institutions and processes that **enable the public to vote directly on a proposed constitutional amendment, law, treaty or policy decision.**
> - **Various instruments of direct democracy include:**
>   - o Referendums
>   - o Citizens' initiatives
>   - o Plebicite
>   - o Agenda initiatives

- **Political tool:** It could be misused by special interest groups with money power and genuine politicians may become victims of this power.
- **Independence of representatives:** It would inevitably discourage the representatives from using their own judgment and coming up with tough but unpopular stands rather than the populist ones.

- **Viability of the process:** It would require a minimum percentage of the electorate to sign the petition for effectuating a recall, the verification of authenticity of those signatures, verification to see whether those signatures were given with free consent or under coercion etc.
- **Increased expenditure:** The conduct of a by-election would further require a lot of resources including financial resources, man-power, time etc.

Way forward

- **Enhancing political awareness:** main focus should be on enhancing the political awareness of masses by various means possible and on ensuring a better turn-out of voters in the elections respectively.
- **Proper scrutiny:** A recall should be carried only after conducting proper judicial scrutiny on certain specific grounds and not on vague or ambiguous grounds.
- **Strong deterrence:** Recalled representative must be debarred from contesting the by-election held thereafter. Otherwise, all the money, man-power, time etc. in conducting the recall would go in vain.
- **Strengthening existing mechanisms:** There are already in existence various neglected 'pre-election' measures which aim to ensure accountability such as provisions relating to disqualification and expulsion of members and the existing vigilance bodies to check corruption etc.

1.4. REGULATING OVER-THE-TOP (OTT) PLATFORMS

Why in news?

The Union government has brought Over the Top (OTT) platforms, such as Netflix, Amazon Prime and others, under the ambit of the Ministry of Information and Broadcasting (I&B ministry).

More on the news

- The **Films and Audio-Visual programmes made available by online content providers** have been brought under the jurisdiction of I&B ministry by amending the **Government of India (Allocation of Business) Rules, 1961**.
- The amendment also **brought news and current affairs content on online platforms** under the purview.
- Earlier the digital media platforms were under the jurisdiction of the Ministry of Electronics and Information Technology (MeitY) while other media such as print, television and radio were under the I&B ministry.
    - The user-generated content, such as what is streamed on YouTube or Facebook, will continue to remain under MeitY.

Background

- Earlier, in 2019, The Centre has asked the major online-streaming players several times to firm up a self-regulatory model as well.
- In January 2019, the **Internet and Mobile Association of India (IAMAI)** had put out a code called the 'Code of Best Practices for Online Curated Content Providers'.
- In February, 2020, IAMAI released a 'Code for Self-Regulation of Online Curated Content Providers' which was signed by around 15 several digital platforms by September.

> **About OTT Platforms**
> - These are online platforms that **curate a range of content and present it on a singular platform**. Examples of these platforms include Netflix, Amazon Prime, Hotstar, AltBalaji amongst others. They are also known as **Online Content Curated Platforms (OCCPs)**.
> - The OCC industry is distinguished from others (such as, intermediaries and user generated content (UGC) providers like Youtube, Facebook, Instagram etc.) inter-alia by the following features:
>   - **A fully curated content catalogue** which is licensed or owned by the individual provider
>   - **A 'pull' model of consumption** where consumers choose the content they wish to watch and access it on device(s), time or place of their choice; and
>   - **Technology-enabled solutions** for content filtering and access controls.
>
> **Present regulatory framework:**
> - **Information Technology Act, 2000** has provisions relating to content on websites, and information / websites / URLs can be blocked under Section 69A of that Act, on matters relating to sovereignty and integrity of India, defence of India, security of the state, friendly relations with foreign states or public order etc.
> - **Indian Penal Code, 1860-** prohibits content against national integration.
> - **Protection of Children from Sexual Offences Act 2012** - prevents child pornography.

- However, the code was **rejected by the I&B Ministry** stating that it lacks independent third-party monitoring, does not have a well-defined Code of Ethics etc.
- In October, 2020 a **Supreme Court bench issued notices to the central government, I&B Ministry and IAMAI** on a petition to regulate OTT platforms such as Netflix, Amazon Prime etc through an autonomous body.

Need of regulating OTT platforms

- **Rapid growth in OTT industry:** India is currently the world's fastest growing OTT market, and is all set to emerge as the world's sixth-largest by 2024. The Indian OTT market is set to reach Rs 237.86 billion by FY25, from Rs 42.50 billion in FY19.
- **Lack of oversight:** While the Press Council of India (PCI) looks after the print media, the television news channels come under News Broadcasters Association (NBA) and Central Board of Film Certification (CBFC) monitors films, there is at present no law or autonomous body governing digital content or OTT platforms.
  - Also, there is no specific law for content regulation on online services.
- **Receipt of several complaints from the public:** Several PILs have been filed in courts across the country underlining the concern and need to regulate online content.
- **Concerns regarding objectionable content:** Without appropriate regulation, online platforms can be potentially used for spreading fake news and hate speech and can publish obscene or violent content.
- **Parity in treatment of content:** The film industry in India has voiced concern that while their industry requires a Central Board of Film Certification (CBFC), digital content on OTT platforms is made available to the public at large without any filter or screening.

> **Self-Regulation of media platforms in India**
> In Indian television broadcasting, there is the inter-ministerial committee and the content is guided by self-regulating bodies such as the Broadcasting Content Complaints Council and the News Broadcasting Standards Authority.
> **Benefits of Self Regulation**
> - **Promotes standards that advance media's credibility with the public,** particularly in a country like ours which still needs to evolve to get an independent press;
> - **Develops confidence in the public** that free media is not irresponsible while protecting the rights of journalists/producers to be independent;
> - **Inculcates a professional culture** to be judged for mistakes not by those in power but by colleagues.
> - **Lessens pressure on the judiciary** if violations of personal rights by the press are corrected with satisfaction by self-regulatory bodies.
> **Issues in self regulation:**
> - **Difficult to arrive at a regulatory consensus** that is acceptable to all stakeholders.
> - **Toothless in nature:** due to absence of an independent enforcement mechanism.
> - **Open to interpretations:** Self regulatory codes can be interpreted differently by different platforms.
> - **Self censorship:** A self-regulatory code might not factor in the diversity of content on the internet and can lead to self censorship internally among platforms to avoid scrutiny.

Way Forward

- **Model combining state censorship and self regulation:** A multi-stakeholder approach to self-regulation can be adopted, that safeguards the creative freedom of content creators and artists, and protects the interests of consumers in choosing and accessing the content.
- **Establishing global ratings system:** A standard rating system for content and quotas for indigenous content on OTT platforms can be created.

> **Arguments against Regulation of OTT platforms**
> - **Fears of a censorship regime**.
> - **No need of additional regulations:** existence of statutory provisions, such as IT Act etc. already present.
> - **Freedom to consume content:** OCCP is pull content and hence users exercise substantial choice in the content they want to view. Moreover, major platforms classify and mark programmes according to age and provide a brief description of the content before it is played.
> - **Growth in Indian film industry:** The rapid growth of OTT industry is benefiting small-scale content producers and these platforms are making regional films available around the country as well as globally. Excessive regulation might put Indian content creators at a disadvantage when they are competing on world stage.
> - **Vast amount of content:** The content on OTT platforms is originating from all across the world thus it is technologically not feasible to censor/block the content.

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- **Independent mechanism for complaints redressal:** An autonomous organization can be created to look into citizen complaints in relation to content made available by respective OCCPs.
- **Formulating broad guidelines:** The Government can frame guidelines that cover principles laid out in statutes like The Information Technology Act, 2000, Indian Penal Code, 1860, Indecent Representation of Women (Prohibition) Act, 1986, Protection of Children from Sexual Offences Act, 2012, Copyright Act, 1957 etc., to aid OTT platforms in self-regulating its content.

1.5. DATA GOVERNANCE QUALITY INDEX

Why in news?

Results of **Data Governance Quality Index (DGQI) survey** were released.

About DGQI

- DGQI survey **assesses different Ministries /Departments' performance** on the implementation of Central Sector Schemes (CS) and Centrally Sponsored Schemes (CSS).
- It is conducted by **Development Monitoring and Evaluation Office (DMEO) under NITI Aayog**.
- Its objective is to **assess data preparedness of Ministries / Departments** on a standardized framework to drive healthy competition among them and promote cooperative peer learning from best practices.
- **Major themes of DGQI include** Data Generation; Data Quality; Use of Technology; Data Analysis, Use and Dissemination; Data Security and HR Capacity & Case Studies.

What is the role of data in governance?

- **For digital economy growth:** Affordable access to the internet and an encouraging regulatory system has made India the country with the second-largest internet users in the world and has powered its digital economy.
- **Better decision making:** The rapid technological advances have led to large volumes of data being generated by various activities, thus, increasing the dependence of business on data-decision making.
  - **Political accountability:** Open government data can create political accountability, generate economic value, and improve the quality of federal initiatives. The possible benefits of Big Data analytics in government could range from transforming government programmes and empowering citizens to improving transparency and enabling the participation of all stakeholders.
  - **Citizen empowerment:** Since the launch of the Digital India Program, the country has witnessed tremendous growth in digital infrastructure and initiatives in innovating e-governance policies that can lead to digital empowerment of citizens.
  - **Prevents leakage:** Real time monitoring of Direct Benefit Transfer could reduce any potencial leakage. It would also lead to need based improvisation in the governance without any lag.
  - **Efficient administration:** Actively engaging policy makers and researchers with the processed data is crucial for making targeted and tailored programmes could improve the efficiency of programmes.

Challenges

- **Collection of data**: Collection of data is a paramount task for government as data is received from multiple online and offline channels. Sharing data between departments and across ministries is a challenge, given the jurisdictional boundaries that exist.
  - Moreover, there has been a lack of consistent dialogue and coordination between key stakeholders.
- **Political will for utilizing data in governance**: Data driven policies would be more realist and may target long term benefits. This may go against popular will. Hence, strong political will is required to implement such policies.
- **Privacy concerns:** While privacy of data is important for businesses and government, public trust in government is particularly important. Hence, any breach of confidentiality regarding data that is collected and processed by the government could have serious ramifications.
  - According to The Internet Crime Report for 2019, India stands third in the world among top 20 countries that are victims of internet crimes.
- **Funding & Innovations:** While access to personal data has skyrocketed, funding targeted towards cross-disciplinary research on data governance has remained limited. This has led to a dearth of original

research that policymakers can draw upon when trying to make sound policy decisions on data governance in India.

Way ahead

- **Open Data Policy:** Holistic decisions could be made if various government organizations share the pieces of data in their possession. Sharing and monitoring the collected data can help to make a democratic and cost effective governance process

- **Capacity building:** Technological companies and start-ups, which can offer solutions in data analytics by managing massive, complex data, need to be encouraged.

- **Funding the innovations and research:** A structured mechanism should be established for financial contribution of industries in the research field. Also government should put funding of research in priority list.

- **Legislative reforms:** Data collected by various entities is processed and disseminated in various forms. During this process, it should be ensured that the information is not distorted; not disclosed; not appropriated; not stolen; and not intruded upon within specified rules and guidelines.
  - **The proposed "Data Protection bill" and the report by Kris Gopalakrishnan committee** may prove a milestone in this direction.
  - Also, data protection and privacy regulations and guidelines, as exemplified by the EU's General Data Protection Regulation, is prerequisite.

> **Utility of Data in governance in India**
> - There are a few large data projects that **seek to improve delivery of government services, boost private sector opportunities**, all the while enhancing the state's law enforcement and surveillance powers.
> - **Various projects include:**
>   - **Unique Identification Authority of India (UIDAI):** UIDAI stores all biometric and demographic details of Aadhaar card holders.
>   - **National Intelligence Grid (NATGRID):** This came about in the wake of the 26/11 attacks as a unified intelligence database which would collect data and patterns, such as immigration entry and exit, etc.
>   - **Interoperable Criminal Justice System (ICJS):** It was launched with an aim to integrate all courts, police stations, prosecution, forensic science laboratories and jails in the country.
>   - **DNA Databanks:** The DNA Technology (Use and Application) Regulation Bill of 2018 seeks to establish regional and national level databanks for both criminal and civil matters.
>   - **Big data:** Big Data and associated analytics are beneficial in various areas, such as solving traffic problems in cities; targeting healthcare delivery; efficient supply chain management; preventive steps for environmental protection; etc.

KEY DRIVERS OF DATA GOVERNANCE

Privacy and regulatory compliance | Data-driven decision making | Shared data eco-system

Enhance customer experience and user trust in data | Improve operational efficiency

Conclusion

Quality data, if analysed at the right time, can be critical for programmatic decision-making, efficient delivery of schemes, and proactive policy revision. Big Data can have a big impact only if used on a massive scale (with safeguards) by governments for the delivery of public goods and services.

1.6. FOREST RIGHTS ACT

Why in news?

The Jammu and Kashmir administration recently said that it was in the process of implementing the Forest Rights Act, 2006 to grant the rights to forest dwellers in the region.

About Forest Rights Act, 2006 (FRA)

The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, or Forest Rights Act, 2006 was enacted to protect the marginal and tribal communities and other forest

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dwellers and balance environmental conservation with their right to life and livelihood. Key features of the FRA are:

- Following rights have been granted to Scheduled Tribes and Other Traditional Forest Dwellers:
  - **Title rights** - i.e. ownership - to land that is being cultivated by tribals or forest dwellers as on 13December 2005, subject to a maximum of 4 hectares.
  - **Community rights** - to grazing areas, fishing, accessing water bodies in forests, to pastoralist routes, etc. and to **intellectual property and traditional knowledge** related to biodiversity and cultural diversity
  - **Relief and development rights** - to rehabilitation in case of illegal eviction or forced displacement; and to basic amenities, subject to restrictions for forest protection.
  - **Forest management rights** - to protect, regenerate or conserve or manage any community forest resource which the communities have been traditionally protecting and conserving for sustainable use.
  - **Right to collect and sell minor forest produce (MFP):** These include forest products like tendu leaves, honey and other products that have commercial value.
- **Eligibility to get rights under the Act:** is confined to those who "primarily reside in forests" and who depend on forests and forest land for a livelihood. Further, either the claimant must be a member of the Scheduled Tribes scheduled in that area or must have been residing in the forest for 75 years.
- **Authority:** The Act provides that the Gram Sabha, will initially pass a resolution recommending whose rights to which resources should be recognised. This resolution is then screened and approved at the level of the sub-division and subsequently at the district level.

Importance of Forest rights in India

- **Reversing the historical Injustice**: The Act helps in recognising the rights that were denied to forest-dwelling Scheduled Tribes and other traditional forest dwellers since colonial times.
- **Poverty alleviation and inclusive growth:** FRA helps in securing traditional livelihood of forest-dwelling communities by granting them access to the forest products and forest land and facilitating commercial trading in MFPs.
  - For Example, around 50-gram sabhas in the Gondia district of Maharashtra organised a federation that guaranteed competitive prices and bonus for the communities for their product collection and earned Rs 2.5 crore by selling Tendupatta.
- **Conservation of forests:** FRA recognizes the symbiotic relationship of the forest dwelling communities with the forests and allows them to manage and conserve the forest using their traditional wisdom.
  - For example, the forest cover in community forest reserves in Maharashtra increased from 6.81% in 2000 to 9.32% in 2014.
- **Decentralization:** It provides for democratic decentralisation through Gram Sabhas which facilitates communities to discuss, debate, decide, plan, and effectively implement forest management plans leading to their empowerment.
- **Curbing extremism:** Implementation of FRA in Left Wing Extremism affected districts not only leads to the development of forest dwellers but also build a relationship of trust and bond between them and the government, thereby reducing land conflict and other grievances.

Concerns regarding implementation of FRA

- **Little progress in recognition of rights:** FRA has the potential to secure the forest rights of at least 200 million tribals and other traditional forest dwellers over 40 million ha (50 per cent of India's forest land) covering 177,000 villages. However, only 13 per cent of the 40 million ha has been demarcated under the FRA by the environment ministry.
- **Inadequate efforts to promote co-existence and preservation:** Despite Community Forest Resource (CFR) having being recognized, there have been few efforts from the state forest departments to move towards co-existence and supporting and recognizing CFRs by gram sabhas.
- **Diversion of tribal Lands:** There have been instances where plantations by forest agencies are being done on land used by tribal communities and other traditional forest dwellers that are entitled to these lands under FRA.
  - As per a study, there has already been a diversion of around 0.39 million hectares (ha) of forest land between 2008 and 2019.

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- **Relocation in violation of FRA**: Several people have been denied rights or relocated from Protected areas or critical wildlife habitats without prior assessment whether co-existence is possible and exercising forests rights would lead to irreversible damage to the habitat or species.
- **Discrepancies and delays in the process of recognising claims:** A large number of claims have been pending, rejected or the area recognized has been drastically reduced without any proper reasons along with imposition of extra-statutory and extraneous conditions in the title for recognised rights.
  - The situation has been worsened due to misinterpretation of the law by officials, illiteracy among forest dwellers, lack of awareness about their rights and little knowledge about procedure for filing claims.
- **Other issues:** Inadequate financial and administrative support to implement the law; lack of coordination between the tribal, revenue and forest department; poor or non-functioning of district and sub-division level committees; dissatisfactory Rehabilitation and compensation, etc.

Way Forward

- **Organizing large scale awareness campaigns:** Efforts should be made to reach out through radio, television and other media to ensure that people receive the basic communication regarding salient provisions of the Act, interpretation of community right etc.
- **Intensive capacity building approach:** Sub-division and district administration officers, especially revenue, forest and tribal functionaries entrusted with the task of processing forest rights have to be systematically trained not only the procedural requirements under FRA but also the challenges and contexts of forest resource use and access pattern.
- **Participation of civil society:** There is a need to identify NGOs working in the area to provide assistance to tribal communities in filing applications, resolving issues of caste certificates, identification and measurement of land and negotiating with the officials to resolve conflicts.
- **Using technology to strengthen outreach:** Technology needs to be utilised to support implementation and make the process more efficient and effective. For instance, GPS survey maps can be used to resolve competing claims at the local level.
- **Expedite the process of claims:** There is a need for reviewing all rejected and pending claims to individual and community forest rights expeditiously.
- **Ensuring transparency and accountability**: on decision making related to claims procedure. The reasons for rejection or delay in recognition of claims should be conveyed to the claimants.

1.7. NATIONAL GREEN TRIBUNAL (NGT)

Why in news?

The National Green Tribunal (NGT) recently completed 10 years.

About National Green Tribunal

- The NGT is a **statutory and quasi judicial body** established under the National Green Tribunal Act, 2010.
- It aims for effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources.
- The Tribunal is not bound by the Code of Civil Procedure, 1908 or the the Indian Evidence Act, 1872 but is **guided by principles of natural justice**.
- **Structure**: It consists of a Chairperson, Judicial members and Expert Members
  - Chairperson or Judicial Member of the Tribunal should be a Judge of the Supreme Court of India or Chief Justice of a High Court.
  - These members are not eligible for reappointment
- **Powers of NGT**
  - It has the power to **regulate its own procedure**.
  - An order/decision/award of Tribunal is **executable as a decree of a civil court** and an appeal against the order/decision/ award of the NGT can be filed in the **Supreme Court** (usually within 90 days).
  - The Tribunal is **mandated to dispose applications or appeals within 6 months of filing**.
  - NGT by an order, can provide-
    - ✓ relief and compensation to the victims of air pollution and different environmental damage,

✓ restitution of property damaged
✓ for restitution of the surroundings for such vicinity or areas
- o **Penalty for not complying with the Tribunal's orders**: Upto 3 years imprisonment and/ or fine of Rs 10 crores for individuals (Rs 25 crores for companies)
- **Jurisdiction of NGT:** The NGT deals with civil cases under the seven laws related to the environment:
  - o The Water (Prevention and Control of Pollution) Act, 1974
  - o The Water (Prevention and Control of Pollution) Cess Act, 1977
  - o The Forest (Conservation) Act, 1980
  - o The Air (Prevention and Control of Pollution) Act, 1981
  - o The Environment (Protection) Act, 1986
  - o The Public Liability Insurance Act, 1991
  - o The Biological Diversity Act, 2002

Significance of NGT
- Is less formal, less expensive
- Since its members are not eligible for reappointment it **can deliver judgements independently**, without succumbing to any pressures
- **Reduces the burden of higher courts** by providing an alternative dispute decision mechanism.

Achievements of NGT

- **Speedy environmental justice in environmental matters**: Since it began operations in July 2011 and till May, 2020, the NGT has heard 32,626 cases, of which 29,760 have been disposed off.
- **Strengthened the concept of Environmental Justice in India:** Over the years NGT has emerged as a vital player in environmental regulation, passing strict orders on issues ranging from pollution to deforestation, waste management to protection the rights of tribal communities.
- **Technical judgments**: NGT has employed legal and scientific methods and assessed environment impact assessment reports before deciding,
- **Created a new breed of legal practitioners** with expertise in environmental laws.

Challenges/Issues associated with its functioning

- **Lack of institutional mechanism to ensure compliance of its orders**: or to re-work its orders if found infeasible to implement.
  - o Most of the landmark orders of the NGT related to Ganga water pollution, Delhi air pollution, illegal mining, and solid waste management remain unenforced.
- **Generic orders:** Since July 2018, the Tribunal has disposed of over 700 cases, all at different stages of hearing, with directing the concerned authorities "to look into the matter and take appropriate action in accordance with law".
- **Large number of dismissals:** Since 2018, the NGT dismissed many appeals filed before it, most of them on procedural grounds.

Significant judgments of the NGT over the years
- **In 2012,** NGT **suspended the clearance given to the South Korean steel maker, POSCO**, to set up a 12 million-tonne steel plant in Odisha in favour of the nearby communities and forests.
- **In 2012 Almitra H. Patel vs. Union of India case**, NGT gave judgment of entire prohibition on open burning of waste on lands, which include landfills and directed states to implement Solid Waste Management Rules.
- In 2013 in Uttarakhand floods case, NGT relied on the precept of **'polluter pays'** to order the Alaknanda Hydro Power Co. Ltd. to compensate to the petitioner .
- In 2015, the NGT **banned all diesel motors over 10 years** in Delhi-NCR.
- In 2017, the Art of Living Festival on Yamuna Food Plain was declared violating the environmental norms and the NGT panel imposed a penalty of Rs. 5 Crore.
- The NGT, in 2017, imposed an **intervening time ban on plastic bags of less than 50-micron thickness in Delhi** due to the fact "they had been inflicting animal deaths, clogging sewers and harming the environment".

- **Restricted jurisdiction in case of forest rights**: Two important acts - Wildlife (Protection) Act, 1972 and Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 have been kept out of NGT's jurisdiction.
- **Obstacle to development**: Decisions of NGT have additionally been criticised and challenged due to their repercussions on monetary growth and development.
- **Vacancies**: NGT only has three judicial and three expert members against the sanctioned strength of 10 each. This forces the tribunal to **outsource most of its technical work and constitute external committees** to look into various aspects of cases.

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- o This gives the impression that the NGT is abrogating its own jurisdiction on cases pertaining to environmental protection
- **Other issues**- Absence of a formula-based mechanism in determining the compensation, Restricted number of regional benches, **Prolonged litigation** due to the option of challenging orders of the NGT before the Supreme Court etc.

Way forward

- Amendment to the NGT Act to give the tribunal powers to follow-up its directions and to establish a mechanism for enforcing its directions.
- NGT can provide specific reasons for dismissal of cases or appeals.
- Filling up vacancies in NGT, especially among expert members, to enable the tribunal to become self reliant while inspecting technical aspects of cases.

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2. INTERNATIONAL RELATIONS

2.1. INDIA'S DEVELOPMENT EFFORTS IN AFGHANISTAN

Why in News?

India announced 100 projects worth $80 mn in Afghanistan.

India's developmental projects in Afghanistan

- India has **pledged more than US$2 billion in Afghanistan and invested in diverse areas** including healthcare, education, infrastructure, social welfare, and in the training of politicians, diplomats, and police (see infographic).
    - India is **fifth largest donor to Afghanistan and the largest regional donor.**
- India is implementing **high-visibility large-scale projects** in relatively stable areas and **low-visibility small development projects** (SDP) in relatively remote and insecure areas in order to increase its sectoral spread and geographic reach.
- Over the years, India has shifted focus from a **narrow security-centric approach**, **to regional confidence building,** development, governance, and trade and investment, aiming to use Afghanistan's resource potential to build its economic viability, sustainability, and independence.

Importance of these projects

- **Soft power approach:** Avoiding a security-centered role, India adopted a soft power approach, re-establishing cultural and historical links between the two countries.
- **Demand driven strategy:** Most Indian projects have been provided based on the needs and requests of the Afghan government. This strategy has generated a **significant amount of goodwill for India**.

5 PILLARS
THAT DRIVE INDIA'S DEVELOPMENT PARTNERSHIP WITH **AFGHANISTAN**

HUMANITARIAN ASSISTANCE
- Supply of 1.1 million MT of wheat to Afghanistan
- The Indira Gandhi Institute of Child Health (IGICH) - a 400-bed hospital that caters to the well-being of children from all across the country

INFRASTRUCTURE
- 218 km road from Zaranj to Delaram to help move goods & services to Iran border
- 220 kV DC transmission line from Pul-e-Khumri to Kabul and a 220/110/20kV sub-station at Chimtala
- India-Afghanistan Friendship Dam (Salma Dam)
- New Afghan Parliament

ECONOMIC DEVELOPMENT
- Private investments into Afghanistan, such as through the India Afghanistan Trade and Investment Show in 2017
- 116 new 'High Impact Community Development Projects' in 31 provinces of Afghanistan

CONNECTIVITY
- Chabahar Port development
- Direct Air Freight Corridor between India & Afghanistan established in 2017

CAPACITY BUILDING
- More than 3,500 Afghans undergoing various training programmes in India
- 1,000 scholarships per annum to Afghan nationals under Indian Council for cultural Relations (ICCR)
- 500 Indian Technical and Economic Cooperation (ITEC) slots to Afghanistan annually to strengthen its administration and governance

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- **Connectivity to Central Asia:** India has worked towards reviving the role of Afghanistan as a 'link' connecting South Asia and Central Asia. Some of the large-scale infrastructure projects in Afghanistan are geared towards achieving those objectives.
    - It will help India to fulfil its own energy needs and trade interests in Central Asia in the long-term.
- **Improving Afghanistan's connectivity:** Most of India's high-visibility and infrastructure development initiatives have veered around regional connectivity, trade, and transit. For landlocked Afghanistan, regional connectivity and access to the sea remains crucial.
- **Improving service delivery:** India's SDPs are designed to help provide basic service delivery and at the same time maximize Afghan participation and ownership, at both the government and community levels.
- **India has invested in training and capacity building,** working with legislators, parliamentary staff, and diplomats to develop the political sector.

Challenges in India's efforts

- **Security concerns:** Withdrawal of NATO-led Security Assistance Force personnel from Afghanistan has raised concerns about an unstable Afghanistan yet again turning into a springboard for destabilization and terrorism.
- **Pakistan's behind-the-scenes support for the Taliban** in destabilizing India's development efforts is aimed at neutralizing India's regional power expansion.
- **Lack of follow up support:** Increasing gap between short-term projects, which heighten people's expectations but with limited follow-up action or integrated plan in terms of job creation or building an industrial base is fueling despair and discontent among the local population.
- **Delay in project completion:** Issues of financing and capacity lead to delays in large-scale infrastructure projects like in the case of the Salma Dam and the new Parliament building. Also, issues of quality control remain.
- **Lack of Monitoring:** Monitoring of these projects remains a challenge and in insecure and inaccessible districts, matters can be much worse.
- **Sustainability challenge:** In the face of a deteriorating security situation and insurgent influence or control of territory, the sustainability of these projects is doubtful. E.g. In insurgent controlled areas, the construction of a clinic or school without health workers or teachers could easily turn into a ghost project (Projects reflected only on plans but are not implemented in reality).
- **Mismatch with needs of people:** Sometimes aid delivered is not always in harmony with the needs of the community. For example, the primary need of the residents of a village might be source of drinking water, they were instead provided with a school.

Way forward

India **needs to shift its focus from asset creation to programme delivery.** Some recommendations for immediate, medium-term (one to five years), and long-term (five to 10 years) policy interventions:

- In the immediate and medium-term, **there is a need to establish small and medium-sized enterprises** to help revive the Afghan indigenous economic base.
- Projects that address the **needs of poor people in rural and remote areas should be targeted towards income generation schemes,** rather than focused only on health and education.
- Greater **intervention in the agriculture sector is needed** to help vulnerable communities. There is a need for assistance in agricultural modernisation, satellite imagery, vocational training centers, and technical assistance.
- **Accountability mechanisms,** as well as monitoring of the aid disbursed needs to be built into the aid delivery programme.
- **Broad based approach involving players with overlapping interests in Afghanistan in development of projects.** E.g., India and China launched a program to train Afghan diplomats and China's ambassador.

Some development projects by India in neighbouring countries
- **Bhutan:** India is Bhutan's **largest development partner** and the Bhutan is highest recipient of India's overseas aid. Bhutan received from India a total of $ 4.7 billion in grants between 2000 and 2017. Some projects include, Mangdechhu Hydroelectric Project, Trade route from West Bengal to Ahlay, Pasakha in Bhutan.
- **Bangladesh:** Key projects include rail links between Akhaura-Agartala, and Khulna-Mongla, Maitree Thermal Power Project a 50:50 joint venture inked by Bangladesh Power Development Board and NTPC India, India-Bangladesh Friendship Pipeline connecting Siliguri in West Bengal and Parbatipur in Bangladesh.
- **Maldives:** India is assisting in USD 500 million **Greater Male Connectivity project,** the largest civilian infrastructure project in Maldives, reclamation project for the Addu island. Also, India assists through **High Impact Community Development Projects** in the areas of livelihood and income generation, health, education, gender and child empowerment, etc.
- **Myanmar: Kaladan** Multi-Modal Transit Transport Project, India- Myanmar-Thailand Trilateral Highway Project, **Integrated Check Posts (ICPs) on India-Myanmar border etc.**
- **Nepal:** India has been supporting construction of various Highways, Roads, Bridges, Airports, etc. as part of its multi-sectoral and multi-dimensional **India-Nepal Economic Cooperation Programme** e.g., Terai Roads project (10 roads), housing reconstruction project (50,000 houses) etc., Motihari-Amalekhgunj petroleum pipeline, Pancheshwar multipurpose project, motorable bridges over Mahakali River etc.
- **Sri Lanka:** Development projects in Jaffna like funding for Jaffna international airport, cultural centre at Jaffna; **The Indian Housing Project**, with an initial commitment to build 50,000 houses for the war affected; development of a container terminal at **Colombo Port in collaboration with Japan.**

2.2. ASEAN-INDIA SUMMIT

Why in news?

17th ASEAN-India Summit was held virtually.

Key Highlights of the Summit

- India announced a contribution of **US$ 1 million to the COVID-19 ASEAN Response Fund**.
- Both India and ASEAN welcomed the adoption of the new **ASEAN-India Plan of Action for 2021-2025**.
  - The new Plan of Action (POA) builds upon the achievements made under the previous POAs for 2010-2015 and 2016-2020, and guides the implementation of ASEAN-India Strategic Partnership.
  - The POA elucidates future strategies and possible engagements across varied fields including-Political Cooperation, Maritime Cooperation, Transnational Crime and Counter-Terrorism, Trade and Investment, Transport, Agriculture and Forestry, Information and Communication Technology (ICT), Tourism, Science, Technology and Innovation, Climate Change etc.
- India reiterated its offer of **US$ 1 billion Line of Credit to support ASEAN connectivity** for greater physical and digital connectivity between ASEAN and India.
- Both sides also started discussions for determining the scope of review of India-ASEAN free trade agreement (FTA) at the earliest with a view to make the pact more user-friendly, simple, and trade facilitative for businesses.

Importance of ASEAN for India

- **ASEAN's centrality in India's foreign policy**: A cohesive, responsive and prosperous **ASEAN is central** to India's Indo-Pacific Vision and India's Act East Policy and contributes to Security and Growth for All in the Region (SAGAR).
- **Maritime security**: The Indian Ocean carries 90% of India's trade and its energy sources. Presence of choke points such as the Malacca strait makes the South East Asian region significant for countering traditional and non-traditional maritime threats like piracy and terrorism.

> **Association of Southeast Asian Nations (ASEAN)**
> - It is an intergovernmental organization of ten Southeast Asian countries: **Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam**.
> - It promotes intergovernmental cooperation and facilitates economic, political, security, military, educational, and sociocultural integration among its members and other countries.
>
>
> ASEAN Member Countries

- **Investment opportunities for Indian businesses**: Cost of production is lower in Laos, Cambodia, and Myanmar, it means that Indian firms can gain significantly by investing in these countries.
- **Lucrative market for Indian firms**: Around 67 million households in ASEAN states are part of the consuming class with incomes exceeding the level at which they can begin to make significant discretionary purchases, making ASEAN a pivotal consumer market of the future.
- **Countering China**: Cooperation between India and ASEAN is crucial to counter China's power projection in the region. Both have territorial and border issues with China, disputes over the South China Islands and waters for ASEAN and over land boundaries for India.
- **Integration with regional and global supply chains:** Increasing engagement with ASEAN is pivotal to facilitate India's integration with regional and global supply chain movements.
  - Strengthening relations with ASEAN members such as Vietnam which has recently signed a free trade agreement with European Union can prove beneficial for India.
- **Addressing regional and international issues**: India and ASEAN have of common interest and concerns such as promoting a rules-based order in the region, maintaining peace and stability in the South China Sea, ensuring freedom of navigation and overflight etc.

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- **Failure of South Asian Association for Regional Cooperation (SAARC):** It has made India look outside South Asia towards countries of Southeast Asia for economic and political cooperation.

Way Forward

- Cooperation between India and ASEAN in the Indo Pacific region can be enhanced through **convergence between India's Indo-Pacific Oceans Initiative and the ASEAN Outlook on Indo-Pacific.**
- To explore the opportunity in the post COVID world, ASEAN and India must upgrade the skilling, improve logistics services and strengthen the transportation infrastructure. Also **bringing ASEAN in Supply Chain Resilience Initiative (SCRI)** will strengthen our value chain linkages.

- India should proactively **utilize northeast states** in its efforts towards regional connectivity with ASEAN countries, given their strategic location. Myanmar, for one, shares a land border with India's northeast, thereby providing a bridge between Indian and Southeast Asian markets.
- India-ASEAN relations should be **enhanced through cooperation on common areas of interest** like combating piracy, maritime disaster management and keeping the Sea Lanes of Communication open for trade.
- There is a strong **cultural connect that India has enjoyed with ASEAN Region** through language, culture, dance, mythology, spirituality and religion. This provides an opportunity for India to build an organic relation based on shared cultural heritage.

> **Concerns in India ASEAN Relations**
> - **Trade Deficit:** India's trade deficit with ASEAN rose from less than US$ 8 billion in 2009-10 to about US$ 22 billion in 2018-19.
> - **RCEP:** India walking out of RCEP can become a sticking point between India and ASEAN, since India's domestic market was considered a key element in the RCEP negotiations.
> - **India's limited Capacity:** India's capacity to provide development assistance, market access, and security guarantees remains limited.
> - **Inadequate infrastructure**: Due to **lack of adequate physical** and **institutional infrastructure** between India and Southeast Asia, trading remains underutilized.
>   - Moreover, the presence of non-tariff barriers and restrictive institutional arrangements hinder the movement of goods and services.
> - **Chinese Influence**: China is a prominent trade and investment partner of ASEAN. Recently ASEAN became China's largest trading partner. Growing economic ties between China-ASEAN is concerning for India.

- India should actively engage with ASEAN to **fast pace review of the FTA** to strengthen rules of origin provisions, work towards removal of non-tariff barriers and provide better market access to Indian businesses.

> **Overview of India-ASEAN Relations**
> **Background**
> - India became **a Strategic Partner of ASEAN in 2012**, after progressing from its earlier roles of Sectoral Partner (1992), Dialogue Partner (1996) and Summit Level Partner (2002).
> - The India-ASEAN Strategic Partnership acquired a new momentum with the announcement of **"Act-East Policy"** in the 12th Summit in 2014.
> - **India's Act East Policy** provides the guiding framework to take forward the ASEAN-India Strategic Partnership to the next level and recognizes connectivity in its broadest sense to **include physical, economic, political and people-to-people connectivity**.
> - Currently, there are 30 Dialogue Mechanisms between India and ASEAN, cutting across various sectors.
> - Since ASEAN-India Commemorative Summit in 2002, the **ASEAN-India Summits have been held every year**.
> **Economic and commercial relations**
> - **India has a Free Trade Agreement with ASEAN** spanning goods, services and investment.
> - ASEAN is India's **fourth largest trading partner.**
> - Meanwhile, foreign direct investments (FDI) flow from India to ASEAN increased by 98 per cent from $1.02 billion in 2018 to $2.02 billion in 2019.
> **Political and Security Cooperation**
> - Dialogue and cooperation frameworks initiated by ASEAN such as the **ASEAN Regional Forum (ARF), the East Asia Summit (EAS)**, **ASEAN Defence Ministers' Meeting plus** etc. contribute to enhancing regional dialogue and accelerating regional integration.
>   - The ADMM+ brings together Defence Ministers from the 10 ASEAN nations plus Australia, China, India, Japan, New Zealand, Republic of Korea, Russia, and the United States on a biannual basis.
> - At the 25th Anniversary of ASEAN-India Dialogue Relations in 2018, they adopted **Delhi Declaration** which charts out the future direction of ASEAN-India Strategic Partnership.

- India has an **annual Track 1.5 event Delhi Dialogue**, for discussing politico-security and economic issues between ASEAN and India.

Socio-Cultural Cooperation

- Programmes and projects launched by India for capacity development and enhancing people-to-people connectivity, include **exchange programmes** for students, Parliamentarians, media personnel and farmers and **Training Programmes** for ASEAN diplomats.
- In September 2019, External Affairs Minister and Minister of Human Resource Development **launched 1000 integrated PhD Fellowships for ASEAN students at the IITs.**
- ASEAN countries are **emerging as the major tourist destinations for Indians**. Out of 129 million foreign tourist arrivals to ASEAN in 2018, 3.45 million were from India.
- **Indian Diaspora** in the ASEAN region, which constitutes about **20% of India's total diaspora**, plays a seminal role in strengthening India-ASEAN ties.

Connectivity

- In 2013**, India became the third dialogue partner of ASEAN** to initiate an ASEAN Connectivity Coordinating Committee-India Meeting.
- India has made considerable progress in implementing the **India-Myanmar-Thailand Trilateral Highway** and the **Kaladan Multimodal Project**.
    - A possible extension to India-Myanmar-Thailand Trilateral Highway to Cambodia, Lao PDR and Viet Nam is also under consideration.

Science and Technology

- At the 6th ASEAN-India Summit in 2007, India announced the setting up of an **ASEAN-India Science & Technology Development Fund** with a $ 1 million contribution from India to promote joint collaborative R&D research projects in Science & Technology.
- This Fund become operational in 2009-10 and has been enhanced to $5 million from 2016-17.

Environment

- At the **6th ASEAN-India summit** in 2007, India also announced the setting up of an **ASEAN-India Green Fund** with an initial contribution of US$ 5 million from India, to support collaboration activities relating to environment and climate change.
- Some of the areas identified for collaboration under the Fund are climate change, energy efficiency, clean technologies, renewable energy, biodiversity conservation and environmental education.

2.3. REGIONAL COMPREHENSIVE ECONOMIC PARTNERSHIP (RCEP) AND INDIA

Why in News?

15 Asia-Pacific nations have signed the Regional Comprehensive Economic Partnership (RCEP), while India chose to opt out of the trade agreement.

About RCEP

- Regional Comprehensive Economic Partnership (RCEP) is a Free Trade Agreement (FTA) that has been signed between 15 countries including the 10 ASEAN members, China, Japan, South Korea, Australia and New Zealand.
- It now forms the **world's largest trade bloc,** covering over 2.2 billion people and accounting for 30 per cent of the world's economy.
- The RCEP was first proposed at the 19th ASEAN meet in 2011 with an aim to create a consolidated market for the ASEAN countries and their trade partners.
- While India was a part of the RCEP's

negotiations, it dropped out in November 2019, citing significant outstanding issues that remain unresolved. Although **India has been given the option of joining it later.**

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Why did India pull out of RCEP?

- **Trade imbalance with RCEP members:** India's trade deficit with RCEP countries has almost doubled in the last five-six years – from $54 billion in 2013-14 to $105 billion in 2018-19, of which China alone accounts for $53 billion.

- **Geopolitical considerations**: India wanted RCEP to exclude most-favoured nation (MFN) obligations from the investment chapter, as it did not want to hand out, especially to countries with which it has border disputes (China), the benefits it was giving to strategic allies or for geopolitical reasons.

- **Security considerations**: Closer economic ties under RCEP have the potential to make the countries of the region even more vulnerable to China's economic and political coercion. This could impact India's security interests in Southeast Asia.

INDIA'S TRADE BALANCE WITH RCEP MEMBERS

RCEP Member	2018-19	2019-20
ASEAN	-21.85	-23.82
China	-53.58	-48.65
South Korea	-12.05	-10.81
Japan	-7.91	-7.91
New Zealand	-0.25	-0.14
Australia	-9.61	-6.93

All figures in $billion
Source: Ministry of Commerce and Industry

- **Lack of adequate protection for domestic industries**: India's proposals for **strict rules of origin (ROO)** (criteria to determine the source country of a product based on which they get tariff concessions or duties) and **an auto-trigger mechanism to impose tariffs** when imports crossed a certain threshold were not accepted.

- **Lack of Service component**: Most developed RCEP countries where India can export services, have been unwilling to negotiate wide-ranging disciplines in services that can create new market access for trade in services in this region.

- **Impact on local industries**: A large number of sectors including dairy, agriculture, steel, plastics, copper, aluminium, machine tools, paper, automobiles, chemicals and others had expressed serious apprehensions on RCEP citing dominance of cheap foreign goods would dampen its businesses.

- **The impact of earlier FTAs on India's trade balance has been ambiguous**: Several trends in the existing FTAs that does not favour signing another FTA, include-
  o Usually, signing FTAs has required India to significantly cut import duties, since most partner countries already have low import duties. This has only led to **trade diversion** (diversion of trade from non FTA countries to FTA countries) and has rarely increased India's exports.
  o A NITI Aayog report had stated that India's exports to its FTAs partners have not outperformed exports to the rest of the world and have generally led to greater imports than exports, giving rise to **high trade deficits** with FTA partners like South Korea, Japan and ASEAN.

- **Other reasons** include:
  o Lack of credible assurances on market access and non-tariff barriers.
  o Differences over tariff structure with China on goods.
  o India already has bilateral FTAs with ASEAN, Korea and Japan and negotiations are underway with Australia and New Zealand.
  o The e-commerce chapter has some clauses that affect data localization norms in India.

Possible Implications of not joining RCEP

- **Protectionist image**: Withdrawal from RCEP along with other recent measures such call for self-reliance under Atmanirbhar Abhiyan, revised public procurement order giving preference to local content etc. can be perceived as India taking a protectionist stance in terms of trade policy.

- **Impact on India's export sector**: RCEP was envisaged to strengthen Asian supply chains, bring in investments and boost the member countries' competitiveness in global markets. Isolation, loss of potential investments and lack of competition might affect India's performance in terms of exports and growth.

- **Lost opportunity in securing a position in the post COVID world**: RCEP is expected to help member countries emerge from the economic devastation caused by the pandemic through access to regional supply chains.

- **Effect on bilateral ties with RCEP countries**: There are concerns that the decision will hamper India's bilateral trade with RCEP member countries as they would be inclined to bolster trade within the bloc. Also, it could affect India's relation with Japan and Australia with regards to their coordinated efforts in the Indo-Pacific.

- **Loss for consumers:** Some products might become more expensive for Indian consumers, especially when global trade, investment and supply chains face unprecedented challenges due to the Covid-19 pandemic.

Way Forward

- **Discussing benefits and costs of signing RCEP:** Further discussions regarding whether or not to sign RCEP in the future must take into account facts about India's trade balance and how its industries, exports and imports are placed vis-a-vis the trading partners.
- **Making India's export sector globally competitive:** Reducing the cost of doing business through infrastructure investment and improving the business environment holds the key for improving India's export prospects.
- **Focusing on negotiating bilateral FTAs with countries where trade complementarities and margin of preference is high** for example- European Union, USA.

2.4. INDIA US DEFENCE AGREEMENT

Why in News?

India and the United States signed **Basic Exchange and Cooperation Agreement (BECA)** during the third round of 2 + 2 India-US ministerial dialogue.

More in News

- BECA is the final of the four foundational agreements that the US signs with close partners.
  - o Foundational agreements are meant to build basic ground work and promote interoperability between militaries by creating common standards and systems. They also guide sale and transfer of high-end technologies.

Four foundational agreements

Basic Exchange and Cooperation Agreement (BECA) for Geospatial Intelligence	- BECA will allow India and US militaries **to share geospatial and satellite data with each other.** It shares - Maps, charts, commercial and other unclassified imagery. - Geodetic, geophysical, geomagnetic and gravity data. - Related products, publications and materials, in printed or digital formats. - Mutual technical assistance and technology information exchanges. - It will allow India to use the US's advanced geospatial intelligence and **enhance the accuracy of automated systems and weapons like missiles and armed drones.** - It is signed in 2020
Logistics Exchange Memorandum of Agreement (LEMOA)	- LEMOA gives access, to both countries, **to designated military facilities on either side for the purpose of refuelling and replenishment.** - The agreement will primarily cover four areas — port calls, joint exercises, training and Humanitarian Assistance and Disaster Relief. Any other requirement has to be agreed upon by both sides on a case-by-case basis. - There **will be no basing of the U.S. troops or assets on Indian soil**. This is purely a logistical agreement. - India can access the string of U.S. facilities across the globe for logistical support and the U.S., which operates in a big way in Asia-Pacific, will benefit from Indian facilities. **It was signed in 2016.**
Communications Compatibility and Security Agreement (COMCASA)	- It is an India-specific version of Communications and Information Security Memorandum of Agreement (CISMOA). - It allows **both sides to operate on the same communication systems, enabling an "interoperable" environment for militaries.** - It **provides the legal framework for the US to part with its sensitive communication equipment and codes** to enable transfer of realtime operational information. - It **allows India to procure transfer specialised equipment for encrypted communications** for US origin military platforms like the C-17, C-130 and P-8Is. **It was signed in 2018 and valid for 10 years.**

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General Security of Military Information Agreement (GSOMIA)	• It facilitates opportunities **for greater intelligence sharing between India and US**. Recently, Industrial Security Annex (ISA) to GSOMIA was concluded between both countries. • ISA provides a framework for **exchange and protection of classified military information between U.S. and Indian defence industries.** • Under GSOMIA, such information is exchanged between Government authorities. • **It was signed in 2002.**

Significance of foundational Agreement

- **Affirmation of the mutual trust:** Signing of Foundational agreement is an affirmation of the mutual trust between the two militaries, and its application will enhance the trust.
- **Facilitate Better Defence Ties:** Signing of these agreements is mandatory, under American law, for the US to enter military alliances related to the export of sensitive equipment.
- **Strengthen India's conventional offensive and defensive capacity:** It gives India access to detailed, sensitive intelligence that can enable to be more accurate in targeting terrorists or rival militaries, and to better monitor the location of the enemy either just across the border or in faraway seas.
- **To counter China:** These agreements may empower India to check Chinese expansionism which threatens a large number of countries in its neighbourhood and beyond, and which has been challenging several established norms and aspects of international relations.
  - Close defence and military cooperation between India and US as well as with other like-minded nations in the future helps to counter Chinese aggression in the region
- **Strategic Convergence in the Indo-Pacific:** A close partnership between the United States and India is central to a free, open, inclusive, peaceful, and prosperous Indo-Pacific region.
- **Enhance humanitarian assistance:** Assist in building worldwide capacity to conduct successful peacekeeping operations, with a focus on enabling other countries to field trained, capable forces for these operations;

Issues with these Agreement

- **Russia Factor:** US wants India to move away from Russian equipment and platforms, as it feels this may expose its technology and information to Moscow.
- **Boost U.S. arms sales to India:** Critics express that agreements are intended to boost U.S. arms sales to India to the benefit of the U.S. economy and American workers.
- **India's policy of Strategic Autonomy:** critics express that the agreements imperil India's long-held foreign policy of strategic autonomy by paving the way for U.S. bases or ports in Indian territories, or unduly binding India to U.S. systems and procedures.
- **Sharing of critical data:** Implementation of the COMCASA would involve data-sharing that could reveal the location of Indian military assets to Pakistan or other third parties.
- **More favourable to US:** The agreements, particularly the LEMOA, primarily benefit the United States since Indian ships are less likely to refuel and resupply at U.S. ports.

Conclusion

Since the Civil Nuclear Agreement of 2005, the India-U.S. defence cooperation has been advancing at a rapid pace. The U.S. has relaxed restrictions on technology trade in India's favour considerably, and India is designated a 'Major Defence Partner'. Conclusion of foundational agreements would further deepen defence cooperation and definitely placed India in a strategically advantageous position. However, India's policy maker must ensure that these agreements would not affect India's strategic autonomy.

2.5. BRICS

Why in news?

The 2020 BRICS Summit was held virtually under the chairmanship of Russia, which adopted the motto for the year as '**BRICS Partnership for Global Stability, Shared Security and Innovative Growth**'.

Key Takeaways of the summit

Moscow Declaration was adopted which reflects the five countries' consolidated approach to the further development of the association. Two pillars of this year's summit are the economy and counterterrorism:

- **Strategy for BRICS Economic Partnership 2020-2025 was signed:** It focussed on three priority areas — trade, investment and finance; digital economy; and sustainable development.
- **The BRICS counter-terrorism strategy:** with the objective of contributing to the global efforts to combat terrorism while also strengthening intra-BRICS ties in the area. This includes improving intelligence sharing, cracking down on their sources of finance and preventing the spread of terrorism.
- **Other highlights:**
  - Proposals to set up a **BRICS Integrated Early Warning System** for future outbreaks of infectious diseases and to minimise the risks of such outbreaks turning into pandemics.
  - BRICS countries also **highlighted the urgency of agreeing on an extension of the 2010 Russia-U.S. Treaty** on Measures for the Further Reduction and Limitation of Strategic Offensive Arms without delay, which speaks highly of the five countries' shared vision for global strategic stability.
  - Countries **reiterated the need for a comprehensive global governance mode**l based on reviewing the UN and its Security Council, IMF and WTO mechanisms and bringing in more representativeness and efficiency into these organizations. Also, **for the first time the group called for reforms of the World Health Organisation.**

> **About BRICS**
> - BRICS **started in 2001** as BRIC, an acronym coined by Goldman Sachs for Brazil, Russia, India, and China. South Africa was added in 2010. The notion behind the coinage was that the nations' economies would come to collectively dominate global growth by 2050.
> - The BRICS grouping **aims to promote peace, security, development and cooperation** in the world. It also **aims at making a positive impact on the development of humanity** and establishing a **more equitable and fairer world.**
> - **BRICS Nations account for**
>
> 50% of world economic growth
> 42.58% of world population
> 26.6% of world land area
> 23.2% of world GDP in 2018
> 14.91% of IMF quota shares
> 13.24% of World Bank voting power
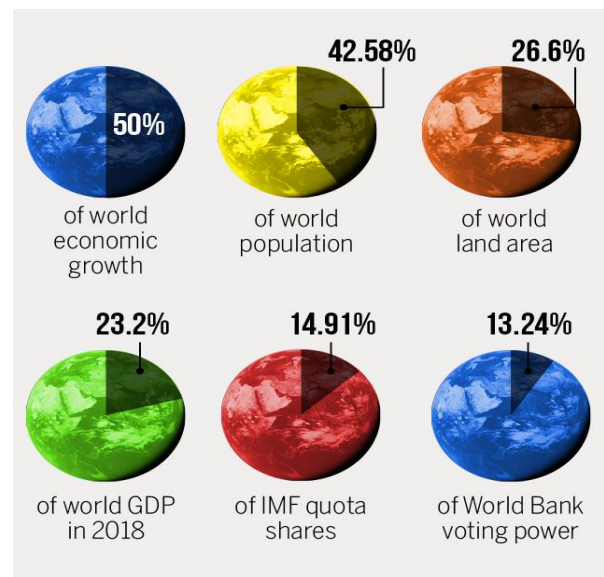
Significance of BRICS for India

- **Safe space to modulate rivalry:** The grouping provides India and China the opportunity to decouple their strategic contest from the other dimensions of the relationship.
  - During the Doklam standoff of 2017 and the recent Ladakh standoff, both China and India remained engaged through BRICS throughout the entirety of the crisis.
- **Providing a transcontinental reach**: With the presence of Brazil and South Africa in the group, it provides is a low-cost way for India to signal its aspirations as a global power.
- **Boosting India's demand for institutional reforms:** BRICS' repeated calls for reform of multilateral institutions, boosts India's own assertions in this direction, acting as a multiplier to the country's own demands for reform.
- **Contribution in creating an inclusive international financial architecture:** India was the main BRICS country behind the establishment of the NDB and has remained the **largest beneficiary of NDB loans** so far.
  - NDB intends to provide non-conditional financing, unlike the WB and IMF and attempts to rectify the North-South divide to make it more inclusive.
- **Trade dependency:** Thirty-four per cent of India's total imports are from the other four BRICS nations.

Challenges faced by the grouping

- **Disparities among the members:** The grouping bring together a mix of democratic and authoritarian regimes, with very different societal structures, resource bases, developmental trajectories, and historical traditions. The current pandemic has exacerbated pre-existing differences amongst the BRICS.
  - From South Africa, along with other African countries, China has attracted criticism for the ill-treatment that has been meted out to African residents there.
- **Suspicions among members about Chinese regional and global ambition** may impact group's functioning in future.

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- o This results from China's Belt and Road Initiative; adventurism in the neighbouring seas and the passage of a new security law in Hong Kong.
- **Approach towards institutional reforms:** BRICS may have raised the issue of UNSC reform but this is more declaratory in nature than a serious attempt to overhaul the UNSC. BRICS is interested in selective reform of the system, as its members have developed vested interests in the existing system. That is why the grouping seeks to reform global financial governance but is divided over UNSC reform.
- **Dependency on other global institutions:** BRICS does not have the 'strategic vision' to deal with 'global matters' on its own. For this, it relies on other international organisations, like throwing its support behind the G20 when the latter came together to deal with the 2008 financial crisis.
- **Changing world order:** The ongoing churn in the world order, further complicated by the pandemic sweeping through the world, has raised concerns about future policy directions of BRICS member states and its eventual impact on the organisation as a whole. If the US-China rivalry intensifies, the already complex dynamics between India and China, India's balancing act with the US, the growing Russia-China linkages, Russia-US tensions — raise the prospects of an 'internal split.'
- **Lack of capital:** BRICS do not have the funds to outcompete the Bretton Wood Institutions, the World Bank and IMF. More investment, more capital is needed in the NDB.
- **Low Intra-country trade:** Despite the opportunities and the potential, intra-BRICS trade and investment flows are very low. Imports and exports among BRICS nations are low. FDI flows to and from the BRICS are mainly to other countries and not to each other. China dominates whatever little flows happen within the BRICS nations.

> **Achievements of BRICS**
> - **New Development Bank (NDB):** It was created in the 6th BRICS summit in Brazil, on the lines of Asian Development Bank and the World Bank.
>   - o The Bank has **reserved $10 billion to combat the pandemic,** while its overall portfolio of investment projects now exceeds $20 billion.
>   - o **62 large projects are being implemented** in the BRICS countries with **increasing number of bank's regional offices.**
>   - o The bank is currently preparing to accept new members – most likely Uruguay, the United Arab Emirates and the Philippines – thus **expanding its global footprint.**
> - **Setting up the Contingent Reserve Arrangement (CRA):** to provide mutual financial support, and as a contribution to the global financial safety net.
> - **Medical cooperation: Ufa Declaration** was adopted in the 7th summit in 2015 and included an agreement to work together to prevent the spread of infectious diseases. Also, the proposal of setting up a **BRICS Vaccine Research and Development Centre** was mooted and endorsed in the 10th summit in 2018.
> - **BRICS Science, Technology and Innovation (STI) Framework Programme** pioneered in 2015 helped scientists and researchers to stay connected and effectively exchange their findings to better facilitate a common response to COVID-19.
> - **Expanding trade:** Over the past five years, intra-BRICS exports grew by 45% and the share of intra-BRICS exports in total BRICS international trade increased from 7.7% to 10%.
> - **Other areas:**
>   - o **BRICS Payments Task Force** as a step towards cooperation between central banks and other financial institutions on national payments systems.
>   - o **BRICS Rapid Information Security Channel** to promote the exchange of information on cyber threats among their central banks.

Way ahead

BRICS has managed to begin a process of institutionalisation as well as increased intra-BRICS cooperation in areas like health, science and technology, finance, trade etc. This has also meant that despite the differing foreign policy positions in several areas, BRICS had remained an important arena for 'discussing the prospects of geopolitical evolution.'

- The future of BRICS will depend on how much the **leaders have agreed to stand collectively** against trade protectionism, increase investments and share a global political agenda.
- The BRICS nations **need to move towards a bottom-up approach** to increasing private sector and citizen involvement. This could involve a single BRICS visa, removing visa requirements for member nations, inducing increased collaboration among researchers and orchestrating private sector collaboration.

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- As the COVID-19 pandemic underscored the need for stepping up international cooperation in the healthcare sector, it provides **an opportunity for the group to accelerate the establishment of the BRICS vaccine research and development centre** as agreed in 2018.

Conclusion

The ongoing churn in the global order is especially relevant for BRICS and its future as a multilateral organisation. Building a collective strategy and identifying priority processes to implement it can ensure that BRICS cooperation deepens and becomes self-reinforcing.

2.6. SHANGHAI COOPERATION ORGANIZATION (SCO)

Why in News?

Russian President chaired the 20th Summit of SCO Council of Heads of State.

More about news

- This was **the first SCO Summit held in Virtual Format**.
- India extended full support to observing the 20th anniversary of SCO in 2021 as the **"SCO Year of Culture."**
  - o India announced that in 2021, the National Museum of India will hold an **exhibition on the Buddhist heritage of the SCO countries**.
- India **proposed to set up a Special Working Group on Innovation and Startups** and a Sub Group on Traditional Medicine within SCO.

Related News

- India's Vice President chaired **19th meeting of SCO Council of Heads of Government.**
- This is the **first time that summit-level meeting was held under India's chairmanship** since it gained full membership of SCO in 2017.
- **Key highlights**
  - o India called upon SCO member states to enforce internationally-recognised legal statutes to comprehensively **eradicate safe havens, infrastructure and financial networks supporting terrorism.**
  - o **SCO members stressed the need to reform WTO,** including by improving its key functions such as negotiations, monitoring and dispute resolution.
  - o **India refused to support China's Belt and Road project** which was backed by all other members.
  - o Approved action plan for implementation of the **program of multilateral trade and economic cooperation for 2021-2025.**

About the SCO

- It is a **permanent intergovernmental political, economic and military organization** founded in Shanghai in 2001.
  - o **Regional development and security issues** (terrorism, ethnic separatism and religious extremism) are its main focus.
- **Russian and Mandarin** are presently used as official and *working languages in the SCO.*
- Working of the SCO is underpinned by the "*Shanghai Spirit*" which is about mutual trust, mutual benefit, equality, consultation, respect for cultural diversity and pursuit of common development.
- **Working structure**
  - o **The Heads of State Council (HSC):** It is the highest decision-making body in the SCO.

Map legend:
1. Russia
2. Kazakhstan
3. Uzbekistan
4. Kyrgyzstan
5. Tajikistan
6. Pakistan
7. India
8. China

  - o **The Heads of Government Council (HGC)**: It is SCO's second-highest body that deals with the grouping's trade and economic agenda besides approving its annual budget.

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- o **It has two permanent bodies**
    - ✓ **The Secretariat** coordinates the activity of the *SCO* and provides informational, analytical, legal, organisational and technical support.
    - ✓ **The Regional Anti-Terrorist Structure (RATS)** works for combating regional terrorism, separatism and extremism.
  - o **The SCO Business Council** and **SCO Interbank Consortium** also work for increasing the cooperation among members for expanding economic cooperation and bank services respectively.
- **Global influence**
  - o SCO represents around **42% of the world's population and 20% of the global GDP.**
  - o 4 of its members (India, Russia, China and Pakistan) are **nuclear powers** and 2 (Russia and China) **are permanent members of the UN Security Council** (UNSC).
  - o The SCO is considered a **counterweight to the North Atlantic Treaty Organization (NATO).**
    - ✓ Both the organizations have geopolitical interests in Central Asia and the Gulf.
    - ✓ The SCO holds a degree of influence that is greater (in terms of land-mass) than NATO.

Relevance of the SCO for India

- **Controlling regional terrorism:** SCO's defence-centric structures and activities of RATS have achieved considerable successes in curbing regional terrorism.
- **Participant in the political dynamics of Afghanistan:** It is likely that after the withdrawal of US and NATO forces from Afghanistan SCO will start playing a more prominent role.
  - o The SCO-Afghanistan Contact Group which was suspended in 2009 has also resumed working since 2017. Thus, SCO would provide a platform to India for engaging in the Afghanistan's political dynamics.
- **Political:** At annual summit of the SCO India gets opportunity to renew bilateral ties with regional countries.
  - o The forum also provides India greater visibility in the **affairs of the Eurasian region.**
  - o India can also **scuttle influence of Pakistan in Central Asia**.
  - o SCO also makes India an active key stakeholder in **shaping the dynamics of politically fragile, Central Asian Region (CAR)** which is also seen as a fertile ground for terrorism and drug trafficking.
- **Economic:** CAR is rich in iron-ore, coal, oil, gas, gold, lead, zinc, molybdenum, uranium, gold, gas and energy gas etc. India's economic diplomacy in SCO is focused less on Russia, China and Pakistan and more on CARs.
- **Connectivity:** India's pending energy projects like the TAPI (Turkmenistan-Afghanistan-Pakistan-India) pipeline, IPI (Iran-Pakistan-India) pipeline, and CASA (Central Asia-South Asia)-1000 electricity transmission projects all of which are blocked due to Pakistan may get a much needed push through the SCO.

Challenges for India in the SCO

- **Dominance of China:** SCO is a China dominated organisation. Barring India, the Belt and Road Initiative (BRI) has been endorsed by all the members.
- **Controlling Pakistan Sponsored terrorism:** China has always condoned Pakistan's link with terrorist activities in India. SCO may not prove very effective in controlling Pakistan sponsored terrorism.
- **Trust deficit:** Growing closeness of Russia and China adds to the difficulties that India faces due to China-Pakistan axis in the SCO. Other member countries are also well disposed towards Pakistan. This puts India at the risk of being isolated in the organization.
- **Lack of connectivity with Central Asia and beyond:** A major impediment in connectivity with Central Asia and Eurasia remains the strategic denial of direct land connectivity between India and Afghanistan and beyond by Pakistan.
  - o India's bilateral trade with Central Asia stands at about $2 billion against over $50 billion of China's.

Way ahead for India

- **Maintain an independent voice against China's dominance: On BRI India has** articulated its view that connectivity projects must respect the sovereignty, and territorial integrity.
  - o India-Russia diplomatic relations and India's cultural and historical connect with the CAR could be leveraged for promoting India's interests in the SCO.
- **Revitalise connectivity projects:** The opening of Chabahar port and entry into Ashgabat agreement should be utilized for a stronger presence in Eurasia.

- o Also, a clear focus on operationalising International North-South Transport Corridor (INSTC) is needed.
  - o This will pave the way for enlarging economic clout in the central Asia which in turn makes India indispensible in the region.
- **Constructively engage Pakistan:** Recently Russia, at the request of the Indian, has decided not to enter into an arms relationship with Pakistan. India should mobilize opinion in the SCO to ensure its connectivity projects to extended neighbors are unblocked by Pakistan.
- **Play a constructive role:** India could play a role in de-radicalisation of youths in Central Asia. It should also leverage its soft power to enhance its spheres of engagements in the field of culture, cuisine, education etc. This will ensure India does not get isolated in the organization.

2.7. 75 YEARS OF UN

Why in news?

United Nations (UN) has completed 75 years in 2020.

Background of UN

- United Nations is an international organization founded in 1945 after the Second World War. It is currently made up of 193 Member States.
- The mission and work of the United Nations are guided by the **purposes and principles contained in its founding Charter.**
- The UN has 4 main objectives:
  - o To keep peace throughout the world;
  - o To develop friendly relations among nations;
  - o To help nations work together to improve the lives of poor people, to conquer hunger, disease and illiteracy, and to encourage respect for each other's rights and freedoms;
  - o To be a centre for harmonizing the actions of nations to achieve these goals
- The main organs of the UN are the General Assembly, the Security Council, the Economic and Social Council, the Trusteeship Council, the International Court of Justice, and the UN Secretariat.

Achievements of UN

- **Peace and Security**
  - o **Maintaining Peace and Security:** By **sending peacekeeping and observer missions to the world's trouble spots**, UN has been able to restore calm, allowing many countries to recover from conflict.
  - o **Promoting Arms Control:** Apart from signing of treaty on Non-Proliferation of Nuclear Weapons (NPT), UN treaties are the legal backbone of disarmament efforts including, Chemical Weapons Convention, biological weapons convention, etc.
- **Promoting economic and social development**:
  - o **United Nations Development Program** provides economic assistance through expert advice, training, and limited equipment to developing countries.
  - o UN **played a significant role in improving agricultural techniques** and increasing crop yields in Asia, Africa and South America. UN has helped developing nations through the World Bank, International Monetary Fund (IMF) in funding projects, promoting international cooperation on monetary issues etc.
  - o U.N. has made progress with its Millennium Development Goals, which was followed by **17 Sustainable Development Goals** to enhance social, environmental and economic progress by 2030.
- **Raising consciousness of Human Rights:** The Human Rights Declaration of 1948 for the first time set out fundamental human rights to be universally protected. Since then, various conventions, treaties were signed, including on the rights of children, women, migrant workers, against torture, racism etc. It has created a **new framework for thinking about the relationship between the individual,** the state and the international system.
- **Humanitarian Assistance and Health:**
  - o World Food Programme (WFP) is **fighting hunger worldwide, delivering food assistance in emergencies** and working with communities to improve nutrition and build resilience.
  - o World Health Organization (WHO) and other UN affiliated groups have **eliminated smallpox and are actively pursuing a battle against AIDS, tuberculosis, and malaria around the world.**

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- **Environmental cooperation**: **UN Framework Convention on Climate Change (UNFCCC)** provides foundation for UN members to negotiate agreements to reduce emissions that contribute to climate change and help countries adapt to its effects. Montreal Protocol-1987 to protect ozone layer, finalising of Paris Climate Agreement are concrete achievements of UN.
- **Establishing International Law:** UN Convention on the Law of the Sea, which has gained nearly universal acceptance, e International Court of Justice (ICJ) has helped to settle international disputes involving territorial questions, maritime boundaries, diplomatic relations, etc.

Limitations and failures of UN

- **Threats to Peace and Security:** UN could not prevent cold war, invasion of Iraq, genocide of Rwanda. Also, UN has to failed to achieve peace in war torn countries of Syria, Iraq, Afghanistan etc. Failure to finalize **Comprehensive Convention on International Terrorism** shows inability of UN to come out of power struggles of Nations.
- **Failure of peacekeeping forces:** During the Bosnian War, Peacekeeping forces stationed in declared 'safe area' by the UN, failed to stop the massacre of more than 8000 people by Bosnian Serb forces. Also, there have been allegations of sexual exploitation and abuse and other misconduct by peacekeepers.
- **Neglect of International law:** Despite NPT, UN could not prevent nuclear proliferation programmes of countries like Israel, Iran, North Korea. Also, UNSC permanent members like USA, China, Russia continue to disregard international law.
- **Failure to reform with changing Global order:** UNSC, bodies such as IMF and World Bank are dominated by West reflecting the division of power internationally at the end of World War II. This undermines their credibility.
- **Refugee crises:** Despite treaties like 1951 Refugee Convention, and work of the UN High Commission for Refugees, there is somewhere between 30 and 40 million refugees, living for decades outside their homelands. This is in addition to more than 40 million people displaced within their own countries.
- **Emerging challenges**: In the wake of challenges like **Climate change, pandemics like COVID-19, threats by non-state actors like ISIS**, environmental refugees, UN of 1945 is not able to adequately respond. E.g., there is no international framework in place for responding to people who will be displaced by rising seas and other effects of climate change.

Way forward

Despite having many short-comings, UN has played a crucial role making this human society more civil, more peaceful & secure in comparison to time of its origin. To remain relevant in changing priorities and emerging threats, UN needs to be reformed. Some reform suggestions are:

- **Accountability and Transparency**: UN General secretary has proposed a new management paradigm for the Secretariat and a United Nations that **empowers managers and staff, simplifies processes, increases transparency** and improves on the delivery of UN's mandates.
- **United Nations peace operations** must be more people-centred; the speed, capability and performance of uniformed personnel shall be improved, and allegations of abuse shall be addressed by appropriate accountability mechanisms.
- **Urgent action on UNSC Reforms**: Areas identified under UNSC reforms include, Categories of membership, the question of the veto, regional representation, size of an enlarged Council and its working methods and the Security Council-General Assembly relationship.
- **General Assembly Reforms:** It is the UN's most democratic body, since it includes all member states. Suggestions include**,** ending reliance on consensus, which often results in weak resolutions; more attention to implementation of its resolutions, so that they do not remain dead-letters of non-compliance etc.
- **Reforms in other UN organs like, Economic and Social Council**: Reforms to create a more effective Council for coordination, policy review, policy dialogue and recommendations on issues of economic and social development.

2.8. G20

Why in News?

Prime Minister participated in the 15th G20 Summit convened by Saudi Arabia in virtual format.
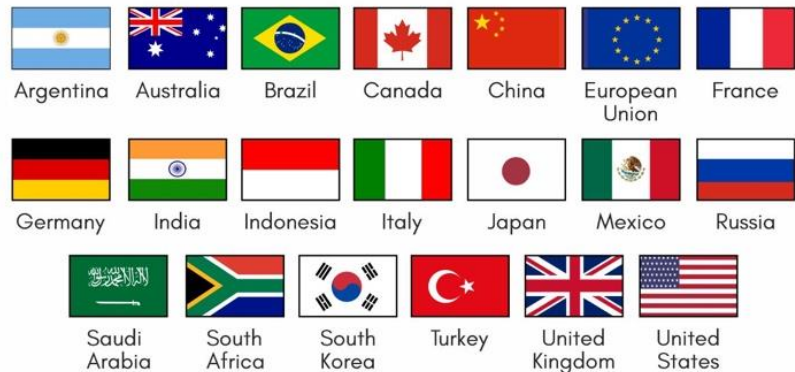
About G20 (Group of Twenty)

G20 COUNTRIES

Argentina, Australia, Brazil, Canada, China, European Union, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, United Kingdom, United States

- The G20 is the international forum that brings together the world's major economies. Its members **account for more than 80% of world GDP, 75% of global trade and 60% of the population.**
- The forum has **met every year since 1999** and includes, since 2008, a yearly Summit, with the participation of the respective Heads of State and Government.
- In addition to the Summit, ministerial meetings, Sherpa meetings (in charge of carrying out negotiations and building consensus among Leaders), working groups and special events are organized throughout the year.
- **The objectives of the G20 are:**
  o **Policy coordination** between its members in order to achieve global economic stability, sustainable growth;
  o To **promote financial regulations** that reduce risks and prevent future financial crises;
  o To **create a new international financial architecture**.
- **G20 has two working tracks:**
  o **Finance Track:** The primary focus is on global economic and financial issues such as monetary, fiscal and exchange rate policies, infrastructure investment, financial regulation, financial inclusion and international taxation.
  o **Sherpa Track**: The focus is on broader issues such as political engagement, anti-corruption, development, trade, gender equality, energy and climate change.
- The G20 **does not have a permanent secretariat:** its agenda and activities are established by the rotating Presidencies, in cooperation with the membership.
  o A "Troika", represented by the country that holds the Presidency, its predecessor and its successor, works to ensure continuity within the G20.
  o The Troika countries are currently Saudi Arabia, Italy and Indonesia.
- **G20 is supported by international organizations,** including the Financial Stability Board, International Labour Organisation, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, World Bank and World Trade Organization.

India and G20

- **India has been a founding member of G20** process and has played an active role in proposing new ideas and finding solutions.
- **Some of the proposals that India made in the previous G20 summits:**
  o **Terrorism:** International action on terrorism is needed as the roots of terrorism may be in some other country; the conspiracy could be hatched in some third country, and the actual target maybe another country like India.
  o **Economic offenders:** Dealing with the economic offenders has been emphasized by India as a serious policy challenge for India and other countries in G20. Economic offenders often commit the crime in one country and flee to another to escape the legal process at home.
  o **Global Taxation:** G20 has already taken cognizance of this fact and has come up with the Base Erosion and Profit Sharing (BEPS) framework.
  o **New Digital Technologies**: Although the benefits of digital technologies for economic growth and social development are well-known, there are certain issues such as privacy, data security and digital governance which are to be properly understood.

Importance of G20

- **G20 works with developing countries,** particularly low-income countries to support them in implementing their nationally driven policies and priorities which are needed to fulfil internationally

agreed development goals. **G20 provides policy coherence, analysis and practical tools to support growth and development.**

- **G20 plays a critical role in creating an enabling environment for inclusive global growth and development.** Its work on ensuring financial stability, promoting growth and avoiding and managing crises is critical in supporting the opportunities.
- **Other issues it addresses include** the advancement of women in the job market, the 2030 Agenda for Sustainable Development, climate change, global health, anti-terrorism and inclusive entrepreneurship, among others.
- **Its membership features both developed and emerging markets** from all continents, making it big enough to be globally representative and the world's most impactful global forum.

Achievements of G20

- **The prime achievements of the G20 include:**
  - Quick deployment of emergency funding during the 2008 global financial crisis.
  - Reforms for international financial institutions such as reforms to the international tax system, through the G20/OECD Base Erosion and Profit Shifting (BEPS) project and implementation of tax transparency standards.
  - Improving oversight of national financial institutions.
  - Bolstering the quality of financial regulatory bodies in markets whose fiscal and monetary policies have led to crisis.
- Amid ongoing COVID-19 pandemic, **G20 has taken many measures to support economies and supply chains in the region.** G-20 has also lent its support to international organizations like the WHO and IMF.
  - G20 nations committed to **pump more than $5 trillion into the global economy** and contribute to the **WHO-led COVID-19 solidarity response fund.**
- G20 played a **critical role in the ratification of the Trade Facilitation Agreement,** with the WTO estimating it could contribute up to somewhere between 5.4 and 8.7 per cent to global GDP by 2030.
- **Increasing the lending capacity of the International Monetary Fund (IMF)** and collecting richer information on the shadow banking system.
- With only 20 official members, the G20 is **agile enough to make prompt decisions and to adapt to new challenges.** The keys to its success have been the ability of the Group to engage in meaningful debate, frankly and informally, and a commitment to seek consensus.

Challenges faced by G-20

- **G20 lacks an objective framework through which to set goals and measure progress** toward them. Its agenda has been fluid, with each host country adding something new to the mix at every annual gathering.
- **Every country, which assumes presidency, wants to put their stamp on it.** And therefore, every country would like to add some issues from their own perspective, like Japan did, by **including ageing and society 5.0** (technology-based and human-centered society, concept given by Japanese) in the Osaka Summit.
- **The exclusivity of its membership has attracted criticism.** The group represents a massive share of global economy and its decisions can impact non-member countries. Critics also point at disproportionate non-representation of African countries.
- **Not all resolutions passed at the G20 Summit are fully implemented** as only 10% of world countries are included in G20 decision-making, thereby denting the organization's authority.
- **G20 authority is also weakened** since some major members sometimes fail to fulfil their commitments (e.g., the delay of the IMF reform due to resistance from the U.S. Congress).

Way forward

- **There should be continuity of issues taken up** in the previous presidencies along with appreciation of new issues in the subsequent presidencies.
- **G20 must provide the vision to bind all the countries especially the emerging markets** like Indonesia, India, Brazil and Mexico which are new actors in global governance to support coordinated actions on major global issues and promote global public goods.
- **G20 should strengthen its ties with the UN** to give the Organisation and all of its relevant institutions full agency in promoting development.

- Redoubled **efforts are also needed in fields like infrastructure and food security** so as to address the North-South imbalance.
- Amid **COVID-19 pandemic, G20 role will be critical to build robust global supply chains** and strengthen international investment for economic recovery.

2.9. WORLD FOOD PROGRAMME

Why in News?

The **Nobel Peace Prize** 2020 was awarded to **World Food Programme** (**WFP**) for "its efforts to combat hunger, bettering conditions for peace in conflict-affected areas and preventing the use of hunger as a weapon of war and conflict".

WFP and its achievements

- WFP, established in 1961, is an **intergovernmental organisation and UN's primary agency** that works towards achieving the SDG Goal of eradicating hunger (Goal 2) by 2030.
- Currently, it is the **world's largest humanitarian agency combating hunger. It delivers food assistance in emergencies** and **works with communities to improve nutrition** and build resilience.
- Its **headquartered in Rome, Italy.**
- **Every year, WFP distributes more than 15 billion rations** at an estimated average cost per ration of $0.61 and **two-thirds** of its work is **in conflict-affected countries** where people are three times more likely to be undernourished than other countries.
- **In 2019, it assisted close to 100 million people in 88 countries** who are victims of acute food insecurity and hunger.
- It **plays a key role in multilateral cooperation** to combat the use of hunger as a weapon of war and conflict and on making **food security an instrument of peace**.
- WFP publishes **Hunger Map** that depicts the prevalence of undernourishment in the population of each country **to monitor the status of global hunger** and help enhance the efficiency of operations.

> **Links between hunger and conflict**
> - The Nobel award recognises a key connection between hunger and global conflict. As the UN Security Council emphasized in a 2018 resolution, **humankind can never eliminate hunger without first establishing peace. Conflict causes rampant food insecurity:**
>   - It **disrupts infrastructure and social stability**, making it hard for supplies to get to people who need them.
>   - Too often, **warring parties may deliberately use starvation as a strategy.**
>   - Food insecurity also **perpetuates conflict**, as it drives people from their homes, lands and jobs, deepening existing fault lines and fueling grievances.
> - Conflict-driven hunger has been **widespread in** the past several years in Afghanistan, the Central African Republic, the Democratic Republic of the Congo, South Sudan and Yemen.

WFP and India

- The WFP has been **working in India since 1963.**
- Apart from **focusing on reforms in the Targeted Public Distribution System**, it provides policy inputs, advocacy and technical assistance for improving access to food.
- The WFP has **proposed some unique initiatives** like Automatic Grain Dispensing Machine (Annapurti) and Mobile Storage Units for the effective implementation of TPDS and has completed a **pilot on rice fortification** used in the government's Mid-day Meals scheme in Varanasi.
- During the current COVID pandemic, it has signed an **MoU with the Uttar Pradesh State Rural Livelihood Mission** to provide technical assistance for setting up supplementary nutrition production units.

2.10. INDIA AND NUCLEAR DISARMAMENT

Why in news?

UN General Assembly adopted two resolutions which were sponsored by India - 'Convention on the Prohibition of the use of Nuclear Weapons' and 'Reducing Nuclear Danger' under the 'Nuclear weapons' cluster. These resolutions manifest India's commitment towards the goal of nuclear disarmament.

More on the resolutions

- The "**Convention on the Prohibition of the use of Nuclear Weapons",** tabled by India since 1982 in the General Assembly requests the Conference on Disarmament in Geneva to commence negotiations on an

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international convention prohibiting the use or threat of use of nuclear weapons under any circumstances.

- The resolution on "**Reducing Nuclear Danger**", tabled since 1998, draws global attention to the risks of unintentional or accidental use of nuclear weapons and underscores the need for a review of nuclear doctrines. It calls for concrete steps to reduce such risks, including through de-alerting and de-targeting of nuclear weapons.

> **About Nuclear Disarmament**
> - Nuclear disarmament is the **act of reducing or eliminating nuclear weapons.** It can also be the end state of a nuclear-weapons-free world (NWFW), in which nuclear weapons are completely eliminated.
> - The term **denuclearization** is also used to describe the process leading to complete nuclear disarmament.
> - Since the U.S. bombings of Hiroshima and Nagasaki in 1945, the catastrophic effects of nuclear weapons have motivated the world to pursue arms control and disarmament measures to reduce the threat of nuclear weapons use.
> - The United Nations sought to eliminate Nuclear weapons in the **first resolution adopted by the UN General Assembly in 1946.**
>   - The resolution established a Commission to deal with problems related to the discovery of atomic energy among others and also decided that the Commission should make proposals for "**the elimination from national armaments of atomic weapons and of all other major weapons adaptable to mass destruction**."

India's role in global nuclear disarmament

- India has **always been an ardent supporter of multilateral nuclear disarmament and non-proliferation efforts.**
- On numerous occasions, India has taken the opportunity to be a driving force for attaining universal, complete and non-discriminatory disarmament:
  - In 1965, India was **amongst the Non-Aligned Eight in the Eighteen Nation Disarmament Committee (ENDC)** that advocated for de-linking disarmament and non-proliferation
  - India **opposed to signing the Treaty on the Non-Proliferation of Nuclear Weapons (NPT),** which it views as discriminatory because of its grouping of countries that divided the world into "nuclear haves" and "nuclear have-nots'.
  - India **proposed a comprehensive proposal for "complete and universal nuclear disarmament"** to the UN General Assembly Special Session on Disarmament in 1988, which came to be known as the **Rajiv Gandhi Action Plan.**
  - India **has not signed the Comprehensive Test Ban Treaty (CTBT)** due to the failure of the treaty to include a commitment by the nuclear-weapon States to eliminate nuclear weapons within a time-bound framework.
  - Still, it has observed a voluntary **nuclear testing moratorium since May 1998**.
  - Through its **Nuclear doctrine in 2003,** India has asserted its continued commitment to the goal of a nuclear weapon free world through global, verifiable, and non-discriminatory nuclear disarmament.
  - **India has opposed the recent enforcement of Treaty on Prohibition of Nuclear Weapons (TPNW)** which India believes is not a comprehensive instrument on disarmament as it excludes the verification of nuclear armaments. India maintains that the Geneva-based **Conference on Disarmament (CD) is the single multilateral disarmament** negotiation forum.
  - India is also in support of a non-discriminatory, universal, and verifiable **Fissile Material Cut-Off Treaty (FMCT)** that would prohibit the production of the two main components of nuclear weapons: highly-enriched uranium (HEU) and plutonium.

Challenges for India's vision of Nuclear Disarmament

- **Ongoing Modernization of Nuclear weapons**: Although the inventories of nuclear warheads continue to decline overtime, all the nuclear states are either developing or deploying new weapon systems or have announced their intention to do so.
  - For example-US is making a **Miniaturised nuke** which will ensure shrinkage of power and enable tactical applications.
  - China and Russia are developing **hypersonic glide vehicles,** and Russia is probably developing a **nuclear-armed, nuclear powered underwater vehicle.**
- **Lack of consensus among major nuclear powers**
  - The USA withdrew from the **Intermediate-Range Nuclear Forces (INF) Treaty, 1987** and Russia formally suspended its obligations under it.

- o Uncertainty over continuation of **Further Reduction and Limitation of Strategic Offensive Arms (New START) treaty** between Russia and US beyond February 2021.
  - o Discussions on denuclearization between **the North Korea and the USA lost traction during 2019** and by the end of 2019 the **Iran nuclear deal (2015 Joint Comprehensive Plan of Action) was largely non-functional**.
- **Global perception for India:** Even as India's dominant assumption of its nuclear weapons has been determined by the effectiveness as a deterrence mechanism, the international community, from time to time, finds discrepancies in India's ideology and its ability to actively promote nuclear disarmament (even if it is not actively increasing it either).
- **India's regional security dilemma:** Consideration of regional developments (such as Pakistan's development of tactical nuclear weapons and its close relationship with China) in India's defence policies is although detrimental to India's quest for a Nuclear Weapon Free World (NWFW) but cannot be downplayed in the context of regional stability.

Conclusion

The non-proliferation and global disarmament discussions require a monumental shift towards more dialogue. The lack of concrete responses from the nuclear powers has perpetuated a gridlock situation. This provides **India with an opportunity to articulate the pertinence of non-proliferation and disarmament dialogue**, which can also strengthen the credibility of India as a responsible stakeholder in the regional and global nuclear context.

2.11. INDIAN DIASPORA

Why in news?

The election of Kamala Harris, an Indian American, as Vice President of USA represents a coming-of-age of the Indian American community in the United States. This stands in contrast to the conditions of Indian diaspora in West Asia.

Indian diaspora in USA

- There **are 4 million are Indian-Americans** living in the US. The Indian-American diaspora has proven to be a vital resource contributing to the economic, political and social development of India.
- The flow of Indians to the United States began in 1965, when the U.S. relaxed its immigration policies. Those early migrants sought educational and employment opportunities that set-in motion a pattern of success that would be replicated across generations: Currently,
  - o Though Indians make up around 1 percent of the US population, they **comprise 8 percent of the founders of high-tech companies**—and one-third of technology start-ups in Silicon Valley.
  - o Their **average incomes are generally higher** than the average incomes associated with their level of educational attainment;
  - o Also, in 2020 US elections, **there were multiple hundreds of Indian candidates running at different levels** which is indicative of the communities growing political clout.

How it had benefited India?

- Indian Americans **stay connected with India through investments, philanthropy and personal involvement**. The Indian Diaspora is major source of remittances with $10.5 Billion annual remittance in 2017.
- India Americans are **tremendous source of strength for the partnership** between two countries in diverse areas like space, defence and security. E.g., it

> **Why Indian diaspora is US is so successful?**
> - **Highly educated**: 77 percent of Indian American adults have a college degree. In comparison, only 29 percent of all immigrants and 31 percent of native-born Americans are college graduates. Very few uneducated Indians make it to the US.
> - **Skilled**: Many Indians living in the US were beneficiaries of visa programmes for students or high-skilled professionals that allowed them to stay and work in America.
> - **Aspiring class**: The arduous and lengthy immigration process is fraught with uncertainty. It vets aspiring immigrants.
> - The great majority of Indian immigrants in America come from the **upper echelons of India's social hierarchy**. Most of them are from classes which have access to influential social networks both in India and in the US.
> - Indian Americans have established several advocacy organisations and political action committees that have done seminal work in **advocating issues of importance to diaspora**.

was mainly the lobbying efforts by National Federation of Indian American Association that the sanctions Imposed on India by the NSG (after Nuclear Proliferation in 1998) were removed on the U.S. recommendation.

- Within America, Indian Diaspora is an **effective public diplomacy tool** and is acknowledged for its work ethos, discipline, non-interference and peaceful living with the locals. These values ultimately contribute to identity creation, image projection of the Indians in the U.S acting as **agents of soft power**.
- Indian Americans have surfaced as a **significant vote bank in US electoral politics**. Also, they are immensely educated and wealthy. With increase in population and share in economic power, the focus of the Indian American's lobby has inclined towards the concerns of India.

Indian diaspora in West Asia

- Indian Diaspora in the West Asia comprises almost nine million individuals. Of the 83 Billion USD annual remittances worldwide (in 2019), **more than 50% flowed from the West Asia.**
- However, unlike emigrants to US, who were primarily skilled and educated, the **oil boom of 1973 led to a migration of both low skilled and semi-skilled workers** from India to the Gulf countries to meet its growing labour requirements. E.g., around 70 % of Indians, work as labourers or technicians in the construction sector, as domestic servants and drivers.
- Also, Unlike India's diaspora in the West, migrants in the Gulf often **occupy the lowest socioeconomic rung** within host societies, have **no access to citizenship or permanent residence and hence less lobbying power**.
- **Some problems faced by Indian diaspora in West Asia include:**
  o Low-skilled and unskilled workers often **endure conditions that violate their workers' rights,** and suffer abuse by employers. They are subjected to abuse and exploitation, long tedious working hours, delays in payment.
  o Also, **kafala system being practiced in gulf**, where the private employer (and not the state) is responsible to oversee migrant worker's immigration and employment status. This creates an imbalance between the rights and abilities of workers and employers to terminate an employment relationship and leads to exploitation of the migrant worker.
  o **Domestic workers, mostly women,** suffer from a lack in legal protection. They face a range of abuses including overwork, food deprivation, forced confinement, and psychological, physical, verbal, and sexual abuse.
  o **During COVID-19,** migrants were more vulnerable due to inadequate health care, worse economic conditions, and overcrowded living conditions, which put them at greater risk of infection.
  o The **economic downturn and the global growth of renewables**, fall in oil prices during COVID-19 will increasingly force Gulf states to transition more towards indigenous labor. E.g., Kuwait approving the Expat Quota Bill that will lead to the repatriation of around eight lakh Indians.

India's steps to improve conditions of migrants in West Asia

- **Indian Community Welfare Fund**: Setup in 2009, it is aimed at assisting Overseas Indian nationals in situation like, boarding and lodging, extending emergency medical care, providing air passage to stranded persons, providing initial legal assistance in deserving cases etc.
- **Pravasi Bharatiya Bima Yojana** is a compulsory insurance scheme for overseas Indian workers, under which an insurance cover upto Rs.10 lakh will be provided to the nominee/ legal heir in the event of death or permanent disability of any Indian emigrant.
- **Pravasi Kaushal Vikas Yojana (PKVY),** a skill development initiative, was launched to **train and certify Indian workforce keen on overseas employment in select sector**, in line with international standards.
- **Pre-Departure Orientation Training (PDOT)** launched by Ministry of External Affairs (MEA) in collaboration with Ministry of Skill Development and Entrepreneurship (MSDE) to orient potential migrant workers with regards to language, culture, do's and don'ts in the destination country, the emigration process and welfare measures etc.
- During COVID-19, more than 27 lakh people have been brought home under **Vande Bharat Mission,** including from West Asia. Also, government launched **Skilled Workers Arrival Database for Employment Support (SWADES) portal which** captures the skills profile of returning workers that can be accessed by Indian and foreign companies.
- In recent years, **diaspora featured more prominently in memorandums of understanding (MOUs),** government statements, and high-level visits between India and Gulf countries. Also, India's **recent drive**

to expand security ties with the Gulf can be interpreted to be partly driven by the need to provide security and stabilize conditions for its diaspora.

Way forward

Indian diaspora is an important factor in the bilateral relationship with the countries where they have a significant presence. They are the most important **tool for India's soft power diplomacy**. They can be our **unofficial ambassadors**. Thus, India should consistently include diaspora concerns in all areas of bilateral discussions.

Also, all stakeholders should invest in the awareness and training of workers. While awareness would make workers less likely to fall prey to adverse situations, training would enhance their competitiveness in the global labor market and qualify them for jobs with better conditions and benefits.

The private sector should also be encouraged to play a role. Indian companies, like Aspiring Minds, are already exploring ways to work with some Gulf States to develop assessment tools for potential emigrants in labor exporting countries.

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3. ECONOMY

3.1. GST TUSSLE

Why in news?

Recently, a tussle had ensued between the Centre and States as there was an estimated shortfall of Rs. 30,000 crores in the GST Compensation Cess.

What is GST Compensation Cess and the tussle over it?

GST was implemented through the GST (101st Amendment Act), 2016 as a long pending indirect tax reform. It is a single tax that replaces multiple other indirect taxes. The Centre lost out on its power to levy taxes such as excise duty, while the States could no longer levy entry tax, VAT etc. To allay the fears of States regarding loss of revenue, following mechanism was made:

- GST (Compensation to States) Act, 2017 was enacted:
  - Under the Act, the percentage of **annual revenue growth of a State has been projected to be 14%**. If the annual revenue growth of a State is less than 14%, the State is entitled to receive compensation under the statute.
  - The **compensation payable to a State** shall be provisionally calculated and **released at the end of every two months period.**
- The generation of revenue under the Act would happen through a GST Compensation Cess:
  - The cess comprises the **cess levied on sin and luxury goods for five years.**
  - The entire cess collected during the year is required to be **credited to a non-lapsable Fund (the GST Compensation Cess Fund).**
  - The collected compensation cess flows into the CFI and is then **transferred to the Public Account of India,** where the GST compensation cess fund has been created.

The issue arose when payments due for August-September 2019 were delayed. Since then, all subsequent payouts have seen cascading delays. The problem has aggravated and further compounded due to following reasons:

- **Persistent Economic Slowdown:** The slowdown has impacted the demand and consumption levels and has thus dented the overall GST collections (both Centre and States).
- **Effect of the Pandemic:** The pandemic has given an economic shock to the Indian Economy which has dented the tax collection expectations (including the collections from GST Compensation Cess) of both Centre and States.
- **Estimation of 14% revenue growth unrealistic:** The high rate of 14%, which has compounded since 2015-16, has been seen as delinked from economic realities. In the initial meetings of the GST Council, a revenue growth rate of 10.6% (the average all-India growth rate in the three years preceding 2015-16) was proposed but 14% revenue growth was accepted "in the spirit of compromise".

As a result of these issues, the stalemate reached at a point where States were looking at the GST shortfall of Rs. 30,000 crore and the Centre being in no position to provide for it.

What is State's stance on the issue?

Since the GST Compensation acts as a **harbinger of State's trust on Centre**, non-compliance on this agreement has the potential to erode the trust between the Centre-State relationship. In this context, several States have expressed following issues:

- **Centre not honoring its moral and legal obligation:** Finance Ministers of both Kerala and Punjab have argued that the Central Government has a legal, and a moral obligation to compensate the State Governments for the revenue shortfall. A deadlock so early in the implementation of GST has made States skeptical about the future of Fiscal Federalism.
- **Ineffectiveness of the GST Council:** Any dispute regarding GST is to be handled by the GST Council but in the recently concluded 39th GST Council meeting, no steps were taken to create such a dispute resolution mechanism. With a 1/3rd voting power, the Centre has a virtual veto over the decision making in the council (since 3/4th majority is needed to pass a decision). This has made the States question the functioning structure of the Council itself.

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- **Resort to legal proceedings:** In the absence of an alternate remedy, the only option left for states like Kerala and Punjab is to approach the Supreme Court under Article 131 of the Constitution. Such a judicial remedy to establish fiscal federalism of the states would erode even the limited institutional capital present between Centre and States.

What is Centre's stance on the issue?

The stand of the Centre on these issues is not based solely on the response to the States but in the background of **low economic growth and negative tax buoyancy rates** (percentage change in tax revenue to percentage change in GDP) which is in addition to almost 25% reduction in collection of Corporate taxes. In this background, the Centre has taken following stands:

- The Centre has refused to compensate the States immediately but has **provided the States with two options** (to make good either the shortfall in compensation arising from GST implementation or the overall shortfall).
  - o **Option 1:** It offered states to borrow the shortfall arising out of GST implementation, to be borrowed through issue of debt under a special window coordinated by the Ministry of Finance. The option is to ensure steady flow of resources similar to the flow under GST compensation on a bi-monthly basis.
  - o **Option 2:** It has offered the states to borrow the entire compensation shortfall (including the COVID-impact portion) through issue of market debt. The states will not be required to repay the principal from any other source. However, the interest shall be paid by the states from their own resources.
- The Centre has alongside contended that the revenue shortfall is on account of the COVID-19 pandemic, which is an '**Act of God**', stating that it has **no legal obligation to compensate the States** in this scenario**.**
- It has also argued that the inflows to the **GST Compensation Fund are to be made from the GST Compensation Cess** and if that is inadequate, the Centre is not obligated to supplement it by diverting flows from other sources.

The Resolution

The stalemate was finally broken with **all 28 States and 3 UTs with legislatures going with the Option 1** provided by the Centre. Under this option, the Centre has operationalized a special borrowing window of 1.1 lakh crore of which 30,000 crore has been already borrowed by Centre on behalf of the States.

The primary advantage states have here is that the interest on the borrowing under the special window will be paid from the cess as and when it arises until the end of the transition period. After the transition period, principal and interest will also be paid from proceeds of the cess, by extending the cess beyond the transition period for such period as may be required. The states will not be required to service the debt or to repay it from any other source. Moreover, states will also be given permission to borrow the final instalment of 0.5 per cent of GDP (to be availed under Atmanirbhar Bharat Abhiyan) even without meeting the pre-conditions.

As this being the debt of the State, it will not reflect in the fiscal balance sheet of the Centre thus creating a **win-win in the short term for both sides.**

What are the concerns that remain?

Although the immediate issue has been resolved but the helplessness experienced by the States and Centre's response on the issue has highlighted several potential concerns for the future:

- **Apprehensions regarding changing Dynamics of Fiscal Federalism:** The estimated Rs 30,000 **crore shortfall has come at a time when waning fiscal federalism is a burning issue**. For instance, Centre's latest decision to suspend the Members of Parliament Local Area Development (MPLAD) Scheme and divert that money to the Consolidated Fund of India is being cited as a step towards the centralization of country's financial resources.
- **Persistence of crises in the absence of revenue augmentation:** The central issue in the GST tussle is the shortage of fiscal resources available collectively to both Centre and States. If the revenues do not get augmented, either one or both will have to face the brunt.
- **Expression of doubt by States on Centre fiscal credibility:** Many of the states have expressed doubt over transparency in handling of GST Compensation Cess. For instance, the CAG had reported that the Union government in the very first two years of the GST implementation wrongly retained Rs 47,272

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crore of GST compensation cess that was meant to be used specifically to compensate states for loss of revenue.

Way forward

- **Rebuilding institutional capital to soothe the Centre-State relationship:** Efforts could be made **rejuvenate and rekindle the Inter-State Council** as the body not only has constitutional backing but its mandate and nature of participation is ideally suited for a larger federal role.
  - Alongside the Inter-State Council, efforts could be made to **increase political capital through institutions like Chief Minister's Conference.**
- **Widening the ambit of GST for revenue augmentation:** The current coverage of GST excludes electricity, petrol, diesel and real estate, as also agriculture. Widening the ambit of GST could provide a larger base for taxation in the long run.
- **Structural reforms:** The augmentation of revenue in the long-term will require structural reforms like reviewing of GST on continuous basis and increasing tax compliance.
- **Increasing transparency in Fiscal management:** Increasing transparency in areas like working of GST Council, adhering to the procedure established by the GST Compensation Act, and decreasing over-reliance on cesses and surcharges could repose the lost faith of States in Centre's Fiscal Management.

3.2. INFLATION TARGETING

Why in news?

In March 2021, the Inflation Targeting regime in India will complete 5 years. This has brought to the fore the need for a performance review of the current framework.

What is inflation targeting (IT)?

A central bank commits to keeping inflation below a certain threshold and use tools like interest rates and other liquidity adjustment measures to achieve this objective while maintaining growth. For example, if inflation is high, RBI can increase the Repo rate which decreases the available liquidity in the market and consequently the Inflation.

In the recent past, several countries have been opting for inflation targeting as a monetary policy objective due to following reasons:

- It has **strong correlation with market demand.**
- The idea is **predictable and easy to understand for private sector and residents.**
- Inflation Targeting mechanisms **generally increase transparency.**
- Stabilizing **impact on other economic parameters** like exchange rate volatility etc.

Performance of Inflation targeting in India

- **Control over inflation:** Inflation reduced from a high of more than 10% before 2014 to a more comfortable value after IT. For instance, the average inflation rate between October 2016 and March 2020 was below 4%.
- **Stability in Inflation expectations:** The inflation forecasts of financial professionals and the responses to inflation forecasts of households declined with the shift to IT, although household expectations of inflation continue to consistently exceed actual outcomes. As a result, increases in actual inflation now do less to excite inflation expectations, indicative of improved anti-inflation credibility.
- **Behavior of ancillary variables:** The IT regime has had a stabilizing effect on ancillary variables like exchange rates, equity markets etc. For example, the money market conditions have been broadly orderly and in tandem with the changes in repo rate.
- **Increased expression of diversity at policy level:** The working of MPC has saw expression of independent viewpoints from both external and internal members. This indicates towards improved robustness of the Monetary Policy Framework which indirectly ensures a delicate balance between price stability and economic growth.

What are the challenges that still remain?

- **Narrow objective:** Some experts argue that RBI has objectives to take care of other parameters like economic growth, stable exchange rate and financial stability, and cannot restrict itself to the single objective of inflation.

o For instance, some market stakeholders believe that the RBI does not cut rates easily or as much as they would like to see. This is **interpreted as the RBI not giving growth as much importance as inflation.**

- **Pre-requisites of effective inflation targeting:** IT demands a number of pre-conditions for its successful implementation in the long-term such as independence of central banks, well developed financial markets, flexible exchange rate, etc. Most emerging economies, including India may not be able to fulfil it in the near future.
  o The consequence of not fulfilling these preconditions could be that the transmission mechanism of the IT system in the country may not be very strong. For example, sometimes change in Repo Rate by RBI is not effectively transmitted to change in inflation levels.
- **Issue of accuracy and limited availability of data:** An inflation-targeting regime requires vast amount of data in the form of assessment of inflation in the medium term, forecasts on economic growth and other indicators of financial stability like estimates of foreign investment etc. There is a limited buffet of indicators that the RBI can use. Also, several institutions including the RBI have questioned the accuracy of the data given large discrepancies and considerable time-lag in data collection.
- **Designed for demand driven inflation systems:** It is argued that the IT system is mainly designed for countries where the inflation is due to demand factors, whereas in India, it is the supply side factors which are causing inflation.

COVID-19 and Inflation targeting

The outbreak of such pandemic and its effect on the economy creates a precarious situation where the economy **faces a negative supply shock as well as a negative demand shock,** as firms halt investment projects and households increase their precautionary saving and see their incomes fall.

This creates ambiguity for the IT regime because **raising the policy rates can further dampen the demand and economic growth.** Also, **cutting the policy rates could spur inflation and decrease the confidence of market participants** in the IT regime consequently triggering non-responsiveness on MPC decisions.

Being on the safe side, the standard course of action for an inflation-targeting central bank would be to **cut rates – or at least to refrain from raising them** – if the negative supply shock is temporary. If the shock is temporary, there will be higher prices and inflation now but lower prices and less inflation, or even deflation, in the future. The central bank should therefore be able to "look through" today's inflation and adopt a relatively long horizon when formulating its inflation forecast.

What can be done to overcome these challenges and further strengthen the IT regime?

- **Coordination between Monetary Policy and Fiscal Policy:** Many central banks (e.g., UK) worldwide have the concept of a non-voting representative from the Treasury who attends meetings, expresses the views of the Ministry of Finance, and participates in the discussions. A government non-voting member is a way to coordinate and yet not interfere. This could ensure the much-needed balance between inflation control and economic growth.
- **Improving data collection and analysis framework:** Reforming the data collection methodologies and framework on lines of draft National Statistical Commission Bill, 2019 can be envisaged.

3.3. CAPITAL CONTROLS IN INDIA

Why in news?

Since the start of the COVID-19 pandemic, there has been an ebb and flow of foreign capital into emerging markets, including India. In this context, IMF has lauded the Capital Controls which regulate the flow of Capital in India.

More on news

- India has seen a sharp increase in capital outflows from March to May 2020. This reversed since June — net portfolio investments increased to US$ 6.7 billion in August from US$ 3.4 billion in June.
- The primary reason for this increased inflow of foreign capital in the recent past have been lowered interest rates in advanced economies. Low interest rates tilts investors towards developing economies which due to their growing nature offer higher interest rates.

What are the tools used for Capital Control in India?

Capital Controls in India are disaggregated by type of flows (portfolio, debt, and foreign direct investment [FDI]), direction (inward and outward), and investors (individuals, banks, and corporations). Following can be cited as key tools for foreign capital regulation:

- **Restrictions in inflows:**
  - **Different Foreign Direct Investment regimes exist in India for different sector** with varying caps, different conditions and varying regulation of investment i.e. Automatic route or Government route.
  - **Foreign corporates, individuals, institutions**, or funds are not allowed to invest directly in Indian markets. They have to **register with a Foreign Institutional Investor (FII)** who makes investments on their behalf.
  - **Domestic investors** are allowed to **raise finance abroad, but with tight controls** such as **price ceilings** and **restrictions on end use of funds apply.**
  - **The external borrowing of corporates** is **capped** in amount, maturity, and cost. Also, banks and nonbank financial institutions must seek approval to borrow abroad.
  - **Foreign investment in domestic bonds is restricted**. It is only allowed for foreign investors registered as FII.
- **Restriction on outflows:**
  - Indian corporates can **participate in portfolio investment or FDI** abroad subject to restrictions and ceilings such as ownership conditions, provision of a negative list etc.
  - **Convertibility of domestic assets** (bank deposits) by residents **is not permitted.**
  - **Domestic residents can open foreign currency accounts** at banks subject to certain restrictions and **remittances overseas are allowed but limited to US$ 200,000** per year after declaration of purpose.
  - **Banks operating in India are subject to restrictions on their foreign investments** such as investments should be above a certain rating (AA-) and are subject to Foreign Exchange Management Act (FEMA) regulations.
- **Ad-hoc restrictions:** Apart from these, certain immediate measures of capital control are also taken in accordance with the situation such as restrictions on lending against gold, direct dollar sales to oil marketing companies, and subsidized forex swaps to attract inflows from non-resident Indians.

What is the rationale for adopting capital control measures?

The primary objective of our Capital Control policy is **fiscal stability**. For example, highly fluctuating type of foreign capital like short term bank deposit or **investment by foreigners in domestic shares etc. are treated as destabilizing.**

Also, it has been argued that capital inflows in **excess of the domestic absorptive capacity** can lead to overheating in the economy and create asset price bubbles. Abrupt reversals of **short-term debt inflows, in particular, can be detrimental to the real economy.**

Looking from a macroeconomic perspective, capital controls are part of an 'impossible trinity'- which states that a country cannot simultaneously maintain a fixed exchange rate, an independent monetary policy and an open capital account. In this context, it can be seen that **maintaining a stable exchange rate and an independent monetary policy have been accorded higher economic priority**. As a result, controlling the capital flows through capital controls becomes a necessity to keep the other objectives intact.

To what extent the objective of Capital Controls has been achieved?

- **Reduced capital inflow surges:** Studies suggest that the presence of the legal framework for capital controls in India does not appear to have been sufficient to prevent a surge. But they point out- it is possible that **without the controls the surge may have been bigger.**
- **Monetary policy autonomy**: Control over capital flow has decreased the macroeconomic uncertainty which has been useful for RBI's Inflation Targeting mandate. For example, the recent surge in foreign inflows was controlled without significant change in inflation levels.
- **Avoiding real exchange-rate appreciation:** Studies suggest that RBI's intervention temporarily dampens the exchange rate response to shocks like foreign equity flows.
- **Avoiding boom-and-bust of asset prices and avoiding a credit boom:** Compared to other developing countries with more open capital flow systems, India has been more resilient to the fluctuations in the

global capital markets. Although, this resilience cannot be completely attributed to the policy of capital controls.

What are the unintended consequences of capital control policies?

- **Price differences between foreign and domestic capital markets arise**: In the absence of restrictions on inflows and outflows of capital, price differentials of similar assets in different locations vanish through arbitrage. Capital controls can prevent arbitrage and introduce a wedge between domestic and international markets.
- **Reduced domestic financial integration:** According to some government committee reports on the Indian financial sector, incomplete financial integration is identified as a factor inducing reduced liquidity and efficiency of financial markets, limited growth of the financial services industry and a **higher cost of capital**.
  - For instance, studies have suggested that Indian bond, currency and derivatives markets have been hampered as a consequence of the system of capital controls.
- **Microeconomic distortions in the decisions of economic agents**: Economic agents change their behavior in response to controls, giving distortions in resource allocation. This may indirectly create problems in the realm of governance and the rule of law. E.g.- increase in illegal activity and generation of Black Money in order to bypass these regulations.

Way forward

Largely, the debate around the need for capital controls and their efficacy is centered around the economic control that these policies provide compared to the associated costs of this control in the form poor financial integration and higher cost of capital. This debate remains relevant only for a short-term, as the evidence suggests that in the long run these controls generally get circumvented.

In this light, capital controls can only be seen as a temporary economic tool, which has to be complemented with increasing market integration, developing resilience in financial systems and institutions and simultaneously moving towards **full Capital Account Convertibility (CAC) on the lines recommended by the Tarapore Committee (1997 and 2006).**

Tarapore Committee on Capital Account Convertibility

Capital Account Convertibility (CAC) can be defined as the **freedom to convert rupee into any foreign currency and foreign currency back into rupee for capital account transactions.**

The Tarapore Committee was constituted by the Reserve Bank of India for suggesting a roadmap on full convertibility of Rupee on Capital Account in 1997. The committee suggested to move towards full Capital Account Convertibility but on **following preconditions:**

- **Gross fiscal deficit to GDP ratio** has to come down to 3.5% by 1999-2000.
- **A consolidated sinking fund** has to be set up to meet government's debt repayment needs; to be financed by increased in RBI's profit transfer to the govt. and disinvestment proceeds.
- **Inflation rate** should remain between an average 3-5% for the 3-year period 1997-2000.
- **Gross NPAs of the public sector banking system** needs to be brought down.
- RBI should have a **Monitoring Exchange Rate Band of plus minus 5**% around a neutral Real Effective Exchange Rate.
- External sector policies should be designed to **increase current receipts to GDP ratio** and bring down the debt servicing ratio to 20%.
- A **minimum net foreign asset to currency ratio** of 40% should be prescribed by law in the RBI Act.

Although full CAC was not realized in line with recommendation of the report, some measures like were taken like corporates were allowed full convertibility in certain areas, unlimited amount of gold was allowed to import etc. The committee revisited the subject in 2006 and provided for a 3-phase plan to move to full CAC. Following can be cited as the key recommendations of the Committee:

- The **ceiling for External Commercial Borrowings (ECB)** should be moved to an automatic approval mechanism.
- Existing **Participatory Note (PN) holders** should be given an **exit route** to phase them out completely. Subsequently, FII (Foreign Institutional Investors) should be prohibited from investing fresh money raised to participatory notes.
- **NRIs should be allowed to invest in capital markets** without many restrictions.
- **NRI deposits should be given tax benefits** to encourage capital flow.

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3.4. CHANGES IN BANK LICENSING FRAMEWORK

Why in news?

Recently, the Reserve Bank of India's (RBI's) Internal Working Group (IWG) has suggested revised the licensing norms for the Banking Industry.

What are the suggested changes by the IWG?

- **Large corporate and industrial houses** may be allowed as promoters of banks.
  - The cap on promoters' stake, in the long run, might be raised from the current level of **15 per cent to 26 per cent of the paid-up voting equity share capital of the bank**.
  - It suggested **increasing the initial paid-up capital or net worth required** to set up a new universal bank to ₹1,000 crore; for SFBs to ₹300 crore and for urban cooperative bank transiting to SFBs, it is ₹300 crore in five years.
  - The report offers industrial houses two options — either make a **straightforward application for a license**, or those that already have lending operations can **convert their existing businesses to a bank.**
- **Well-run large non-banking finance companies (NBFCs),** with an asset size of Rs 50,000 crore and above, including those which are owned by a corporate house, may be considered for conversion into banks, subject to completion of 10 years of operations.
- Other changes suggested by the report:
  - **Small Finance Banks and Payment Banks:** The panel also suggested that payments banks can convert into small finance banks after three years of operations, potentially benefiting Paytm, Jio and Airtel payments banks.
  - **Capping of banks' investment in any new or existing entity to 20%.** However, they may be permitted to make total investments in a financial or non-financial services company, which is not a subsidiary or joint venture or associate up to 20% of the bank's paid-up share capital and reserves.

3.4.1. BANKING LICENSE TO LARGE CORPORATE HOUSES

Introduction

Since the nationalization of 14 large private banks in 1969, the RBI has not given licenses to large corporate and industrial houses for setting up banks. At present, there are 12 old and nine new private banks (established in the post-1991 period) with the majority of ownership held by individuals and financial entities. This is set to change if large corporate and industrial houses are allowed to act as promoters of banks.

This step comes a decade after the global financial crisis, after which **most developed nations turned cautious on this idea.** For instance, in the recent past, **RBI has not been very liberal with banking licenses**. The last two licenses were given seven years ago to IDFC First Bank and Bandhan Bank with a specific objective of achieving financial inclusion. Before these, RBI gave two licenses to Kotak Mahindra Bank and YES Bank.

Potential benefits from implementation of the suggestion

- **Aid in capitalization:** The recommendations could usher in a fresh wave of consolidation in the sector as several lenders are struggling to meet minimum capital norms because of a surge in bad loans. Larger play by private sector in the lending space could help in capitalization of the sector as state's capacity is limited.
  - A direct corollary of capitalization by the private sector would be **decreased pressure on the fiscal balance sheet** with regard to recapitalization of PSBs.
- **Re-entry of India Inc in the Banking Sector:** Many of the biggest industrial groups had aspired for this ever since private players were allowed into banking after 1993. This may help enlarge the Banking industry in India which is nascent when compared at the global stage.
- **Greater Competition:** The entry of corporate players would engender greater competition in the Indian banking sector by increasing the supply of financial products available for customers.
- **Diversifying banking option for depositors:** Recommendations promote more open access to the country's deposit base, while charting a future course for asset specialists too. Business models that stand on a single solid leg (asset or liability) will see future in partnership or merger.

Potential challenges arising from its implementation

- **The problem of connected lending:** Connected lending when promoters of private banks, corporate and industrial houses channel large sums of low-cost depositors' money into their own group companies.
  - **During 1947-58, connected lending practices were rampant in India**. These practices created a scenario where bank failures ballooned, for instance, 361 banks of varying sizes failed in India.
  - Also, over the years, the **potential risks associated with connected lending have increased** manifold because of the quantum leap in size and complexities in corporate India.
- **Circular Banking:** Under circular banking, a corporate-owned bank A would finance the projects of corporate-owned bank B, B would finance the projects of corporate-owned bank C, and C would finance the projects of A, completing the cycle. This creates a backdoor for bypassing the regulations against connected lending.
- **Large stakes: Corporate ownership of banks would further concentrate economic power** in the hands of a few corporate and industrial houses. Increased economic concentration would have adverse effects on the domestic economy and politics leading to issues like Crony Capitalism.
- **Excessive competition could be counter-productive:** There is a growing recognition in academic and policy circles that increased competition in the banking industry may be good for efficiency and innovation but bad for financial stability. The 2008 global financial crisis is a case in point. **Maintaining a fine balance between efficiency levels of competition and financial stability remains a key challenge for bank regulators.**
- **Corporate Governance Issues:** The IWG has admitted that- "the prevailing corporate governance culture in corporate houses is not up to the international standard and it will be difficult to ring fence the non-financial activities of the promoters with that of the bank."
  - In India, incidents of **frauds and defaults are increasing at an alarming rate** across the spectrum. For instance, the Satyam Computer Services scandal reflects the loopholes prevalent in Corporate Governance framework.

3.4.2. BANKING LICENSE FOR NBFCS

Introduction

If RBI allows the large industrial houses to convert their NBFCs to full-scale banks, they straightaway will be bigger than many mid-sized banks thus inducing big changes in the banking landscape. This step becomes even more significant in the light of large-scale consolidation of the Public Sector Banks (PSBs).

Potential benefits from implementation of the suggestion

- **The asset liability mismatch issue highlighted by the IL&FS crises:** The current change in thinking in the RBI and the government is also because of the risk large NBFCs pose to the financial system. The debacle of IL&FS and Dewan Housing Finance Corporation Limited (DHFL) has shown that asset liability mismatches could create a problem for the entire financial services sector.
- **Access to deposits:** The access to public deposits which the NBFCs will enjoy after converting to a bank would help the sector riddled with liquidity crunch. This may help resolve the liquidity problems faced by the financial sector as a whole.
- **Opportunity of better oversight:** Major NBFCs with regard to their size of operation deserve to get bank license in the private sector. They are already regulated and supervised by the RBI. Turning them into banks will give RBI the opportunity for greater oversight.

Potential challenges arising from its implementation

- **Associated costs in becoming a bank:** Maintenance of cash reserve ratio, statutory liquidity ratio and cap on promoter shareholding are some of the rules that may make it expensive for NBFCs to become a bank.
- **Possible reluctance of NBFCs:** Indian business houses may not be entirely comfortable with the potential increase in oversight on their group company activities that the banking regulator may have. Increased regulation would mean less freedom and flexibility in conducting business.
- **Poor performance of NBFCs:** In the recent past, the financial performance of NBFCs has not been up to the mark which will make investors skeptical. In this regard, the investor confidence and the potential success of this step is to a large extent dependent on the performance of NBFCs in the next few quarters.

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3.5. MSP AND PROCUREMENT

Why in news?

The recently passed Agri.-reform Bills have created apprehensions among farmers that these legislations will ultimately lead to the dismantling of the MSP regime.

Procurement regime in India

The procurement mechanism in India functions as an assured market for farmers and plays a role to guide the cropping patterns and incentivize production. To enable procurement Government has instituted a floor price for agricultural produce, namely Minimum Support Price (MSP).

MSP serves as a Procurement Price and is used as a market price benchmark. Government notifies MSPs annually for 23 commodities inclusive of 14 kharif, 7 rabi and 2 calendar year season crops. In addition to these 23 crops, Government also notifies Fair and Remunerative Prices (FRP) for sugarcane and jute. The Government notifies MSPs based on the recommendations of an independent body, called Commission for Agricultural Costs and Prices (CACP).

A2 vs. C2 debate

The CACP determines the MSP based on the expenses incurred by the farmer. It is determined in following manner:

- **Expenses incurred (A2)** is estimated by considering cost of production, changes in input price, trends in market prices, demand and supply situation, inter-crop price parity, effect on general price level, effect on cost of living, international market price situation, etc.
- The final MSP is determined as a **function of expenses incurred (A2) and the imputed value of family labour (FL).**

There have been demands for considering a different costing method (C2). Adopting C2 will entail following changes:

- It would include the **rent paid for any leased-in land**, the **imputed rent** for the owned land, the **interest on owned fixed capital**, and **imputed value of wages to family labour**, in addition to the Cost A2.
- It is also argued that **50 per cent of Cost C2 should be added as the profit component**, for determining the MSP.

With the aforesaid framework for MSP, the existing procurement mechanisms by the government are implemented under:

- **Price Support Scheme (PSS):** Applicable in case of MSP notified crops.
- **Market Intervention Scheme (MIS):** To support commodities, for which MSPs are not notified - fruits/vegetables/other horticultural products.
- **Price Stabilization Fund (PSF):** A scheme to protect consumers from rising prices.
- **Food Corporation of India operations for Central Pool:** Wheat and Paddy is procured to meet buffer norms and for meeting targets of the public distribution system.

Reform initiated through PM-AASHA

An umbrella scheme has been initiated to further ensure remunerative prices to the farmers for their produce, namely Pradhan Mantri Annadata Aay SanraksHan Abhiyan (PM-AASHA). Following are the key components of the Scheme:

- **Price Support Scheme (PSS):** In Price Support Scheme PSS, physical procurement of pulses, oilseeds and Copra will be done by Central Nodal Agencies with proactive role of State governments.
- **Price Deficiency Payment Scheme (PDPS):** Under PDPS, direct payment of the difference between the MSP and the selling/modal price will be made to pre-registered farmers, selling his produce in the notified market yard through a transparent auction process. All payment will be done directly into registered bank account of the farmer. This scheme does not involve any physical procurement of crops.
- **Pilot of Private Procurement & Stockist Scheme (PPPS):** In addition to PDPS, it has been decided that for oilseeds, states have the option to roll out Private Procurement Stockist Scheme (PPSS) on pilot basis in selected district/APMC(s) of district involving the participation of private stockist.

What are the prevalent issues with the procurement framework in India?

- **Limited reach of procurement:** Status of procurement linked to MSP has not been secular either in terms of crops covered or geographic spread. For example, in case of wheat, of the average of 33 per cent of marketed surplus procured, 90 percent procurement is accounted only from Punjab, Haryana and Madhya Pradesh.

- **Largely benefited wheat and paddy farmers:** The procurement of other MSP notified commodities has not been very encouraging. For instance, procurement of oilseeds remained at abysmally low 0.66 percent of the total production.
- **Poor operation of the Price Support Scheme** as can be seen with total procurement of pulses being at only 10 percent of the marketed surplus.
- **Procurement of perishables under MIS is still negligible.**
- **Delayed action:** Market participants have argued that delayed intervention on part of the government in distress situation **benefits the intermediaries more than the farmers**.
- **Shift in production and consumption patterns:** The price and procurement-based interventions have contributed towards higher supply and a supply driven shift towards rice-wheat consumption and cropping. The unseen consequence of this calorie-dominant food security approach has been nutritional deficiency.

What can be done to overcome these issues and strengthen the procurement system in India?

Following recommendations have been suggested by the Report of the Committee on Doubling Farmer's Income (chaired by Ashok Dalwai):

- **Adopting a more robust system of procurement**: It recommended, that in addition to strengthening the existing procurement schemes, more such tools be developed and deployed to **enhance the support and its reach across the country & across crops**, besides **improving speed of response and effectiveness of procurement**, in cases where prices may drop below MSP.
- **Timely market interventions:** Market interventions are also triggered by price linked eventualities. The extent and time of any market intervention should aim also at normalizing the fluctuations in market prices and more importantly the downslide of prices due to temporal post-harvest gluts.
- **Increasing diversification in procurement interventions** There is need to revisit the strategy on demand and supply, including PDS system, for balancing the nutritional security of the population. Such interventions should therefore have differentiated outcomes and appropriate sunset clauses.

3.6. PRODUCTION LINKED INCENTIVE (PLI) SCHEME

Why in news?

Recently, the Government had announced addition of 10 sectors to the Production Linked Incentive (PLI) Scheme.

What is Production Linked Incentive (PLI)?

Production Linked Incentive refers to a rebate given to producers. This rebate is calculated as a certain percentage of sales of the producer (sales referred in it can be total sales or incremental sales). For example, PLI scheme for Electronics Sector offered a rebate of 4-6% on the incremental sales of the producer.

Government announcement and PLI Scheme in India

Before this announcement, the Centre had rolled out the PLI scheme already for **Mobile Manufacturing and Specified Electronic Components**, **Critical Key Starting materials/Drug Intermediaries and Active Pharmaceutical Ingredients** and **Manufacturing of Medical Devices.**

With this announcement, the Government has expanded this scheme to 10 more sectors with incentives worth 2 lakh crore over a 5-year period. With regard to nature of the scheme, following can be cited as key features of the PLI Scheme-

- The **scheme is outcome-based**, which means that incentives will be disbursed only after production has taken place.
- The calculation of incentives is **based on incremental production** at a high rate of growth.
- The scheme **focuses on size and scale** by selecting those players who can deliver on volumes.
- The **selection of sectors** covering cutting-edge technology, sectors for integration with global value chains, job-creating sectors and sectors closely linked to the rural economy**, is highly calibrated**.
- Also, the design of the earlier PLI scheme for electronics is such that it is **compatible with World Trade Organization commitments** as the quantum of support is not directly linked to exports or value-addition.

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What are the potential benefits that may incur from the Scheme?

- **Increasing strategic autonomy:** Efforts have been made to become self-sufficient (or 'Atmanirbhar') in sectors which are of strategic importance. For instance-
  o **Telecom equipment** forms a critical and strategic element of building a secured telecom infrastructure and India aspires to become a major original equipment manufacturer of telecom and networking products.
- **Utilizing the Comparative advantage:** In some sectors the domestic industry has comparative advantage over other countries, focusing on these sectors could generate higher returns. For instance-
  o **The Indian pharmaceutical industry** is the third largest in the world by volume and 14th largest in terms of value. It contributes 3.5% of the total drugs and medicines exported globally. India possesses the complete ecosystem for development and manufacturing of pharmaceuticals and a robust ecosystem of allied industries.
- **Increased ability to tap the high global and domestic demand:** This will help **satisfy the growing domestic demand** in the respective sectors and also **give a fillip to exports.**
  o India is expected to have a USD 1 trillion **digital economy** by 2025. Additionally, the Government's push for data localization, Internet of Things market in India, projects such as Smart City and Digital India are expected to increase the demand for **electronic products.**
- **Developing the nascent but high-potential sectors:** These sectors may not be significant but in the present socio-economic context, present high potential.
  o The growth of the **processed food industry** leads to better price for farmers and reduces high levels of wastage. Specific product lines having high growth potential and capabilities to generate medium-to large-scale employment can be tapped.
- This step has been touted as a 'game-changer' for the manufacturing sector as it is expected to **attract foreign players, generate employment** in the country (with focus on labour intensive sectors like Textile), **increase exports** and consequently integrate the economy with the global supply chain.
- From the perspective of industry, the scheme indicates an **attitudinal shift from 'discouragement' to 'encouragement'** for large industries and simultaneously provides the much-needed fiscal space required during the Pandemic.

What are the potential issues with the scheme?

- **Gradual withdrawal of scheme critical to long-term development:** The incentives should be well-crafted and temporary so that the industries receiving support can mature and become economically viable without protection. Keeping them in place for too long may slow down, rather than accelerate growth in these sectors.
- **Designing sector specific incentives:** The implementation of PLI scheme in the Electronics sector and Pharmaceutical sector has highlighted that every sector has to have different eligibility thresholds. Given the large range of activities covered in the 10 sectors, effectively determining the thresholds for each could become a difficult task.
- **May interfere natural economic processes:** In the long run, an economy can become competitive only when sectors can die and be born. Resources get reallocated to sectors that see higher productivity growth. External interference may hinder optimized allocation of resources.
- **The sectors that don't get an incentive are at a relative disadvantage:** The limited resources of the economy in the form of Capital and human resources will be nudged towards incentivized sectors thus indirectly disincentivizing other sectors.

What can be done to ameliorate these issues and further improve the scheme?

- **Pre-defined Sunset clause on scheme:** It will not only be beneficial for the sector in the long-term, it will also encourage the individual players to see it as a one-time opportunity for capacity building.
- **Improve technological competence:** The breathing room created by these incentives could be used by the industry players to increase their technological competence and transition towards becoming globally competitive.
- **Improve business environment:** It can be done by improving transparency and predictability in the policy framework. For example, simplification of taxation regime or easing the land acquisition process etc. This becomes even more important for industries which are outside the purview PLI Scheme.

- **Managing the real exchange rate better to strengthen the export regime:** The real exchange rate (adjusted for inflation) in India has appreciated 19% in the last decade on account of both Foreign Direct Investment (FDI) and Foreign Portfolio Investment (FPI). This appreciation negatively effects the overall exports. Thus, ensuring minimal real exchange rate appreciation is critical to boosting exports in the long run.
- **Reinvigorating the National Infrastructure Pipeline (NIP):** Several industry experts have highlighted that large scale production can only be achieved if the supply side bottleneck of infrastructure is satisfied. The plan proposed by the NIP can provide a way forward.

3.7. AUTOMOBILE SECTOR IN INDIA

Why in news?

Recently the Minister of Road Transport and Highways & MSME said that government was working towards making **India an automobile manufacturing hub in next 5 years.**

Automobile sector in India

- India became the **fourth largest auto market in 2019** displacing Germany.
- It is **expected to displace Japan as the third largest auto market by 2021** and world's third-largest automotive market in terms of volume by 2026.
- It **employs about 37 million people** in India and domestic automobiles **production increased at 2.36% Compound annual growth rate (CAGR)** between FY16–20.
- **Two wheelers and passenger vehicles dominate** the domestic Indian auto market and accounted for 80.8% and 12.9% market share respectively.
- **Export of two wheelers made up 73.9**%, followed by passenger vehicles at 14.2%, three wheelers at 10.5% and commercial vehicles at 1.3%.
- **Delhi- Gurugram- Faridabad in north, Kolkata- Jamshedpur in east, Chennai- Bengaluru- Hosur in south and Mumbai-Pune- Nasik- Aurangabad in East** are major automobile clusters in India.

What are the challenges that Indian automobile sector faces?

- **Competition & dependence on China:** In the last fifteen years China has been the leading automotive market. Over a quarter of India's auto part imports - $4.2 billion - came from China in 2019, including engine and transmission parts.
- **Labour and capital shortage:** Coronavirus pandemic caused labour shortage following migration of workers due to financial and psychological issues such as apprehensions of working in a group on the shop floor.
- **Environmental and policy demands:** With rising pollution and climate change, automotive industry is under constant pressure from environmental demands. Hence, facing stringent legislations by government, focusing on controlling carbon dioxide emission and other exhaust gas emissions.
- **Technology and Infrastructure:**
  o India **lacks the vibrant manufacturing eco-system and technology** choices to cater the changing social preferences in a changing regulatory environment.
  o **India's road network is inadequate** and dilapidated, and can barely keep pace with the auto industry's rapid growth. (national highways are only 2% or less of the total roadway length).
  o **Land acquisition is still problem** to establish automobile industries.

Recent Policy shifts for Automobile sector

- **Push to Electric Vehicles (EVs):**
  o **National Electric Mobility Mission Plan (NEMMP) 2020** was launched earlier to provide the vision and the roadmap for the faster adoption of EVs and their manufacturing in the country.
  o **Under NEMMP, FAME India scheme** was launched to incentivize the production and promotion of electric and hybrid vehicles.
  o Under Union Budget 2019-20, the Government announced to provide **additional income tax deduction of Rs. 1.5 lakh on the interest paid on the loans taken to purchase EVs.**
- **Regulatory changes:**
  o India has **shifted directly from BS- IV to BS-VI,** the advanced technology to ensure pollutants emitted by the vehicles are reduced and comply with the specified limits.

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✓ Technology uses the diesel particulate filter (DPF), a device designed to remove diesel particulate matter, or soot, from the exhaust gas of a diesel engine. Then there is selective catalytic reduction (SCR) and exhaust gas re-circulation (EGR) for NOx reduction.

o **Implementation of Corporate Average Fuel Efficiency (CAFE) norms** under which manufacturers need to improve their fuel efficiency by 10% between 2017 and 2021 and 30% or more by 2022

- **Push for Manufacturing hub & infrastructure development:**
  o **National Auto Policy 2018** to support the growth of the automotive industry in India and become major contributors to the country's GDP and comprise a considerable proportion of the manufacturing sector GDP by 2026.

> **Other Steps taken in automobile sector**
> - **Automotive Mission Plan 2016-26:** Aims to propel Indian automotive industry to be engine of the Make in India programme, develop skills and increase automotive sector export.
> - **National Automotive Testing and R&D Infrastructure Project (NATRIP):** This aims at creating core global competencies in automotive sector in India by facilitating seamless integration of Indian automotive industry with the world.
> - **Voluntary Vehicle Fleet Modernization Programme (V-VMP):** It offers tax benefits and discounts on replacing old vehicles with new ones.

o **Under Atmanirbhar Bharat Abhiyaan - Self Reliant India,** Special economic and comprehensive package of INR 20 lakh crores towards promoting manufacturing in India, will help to boost manufacturing in automobile sector.
o Government plans for infrastructure development (**Bharatmala Pariyojana, etc.**)
o **'Make in India' initiative** also envisagees aims at promoting India as an important investment destination and a global hub for manufacturing design and innovation in Automobiles & Auto Components.

Way forward

- Need to **ensure supporting policy formulations** with integration of government departments, test agencies (ARAI, NATRIP etc.), industry associations such as SIAM and research organisations like IIT and TERI.
- In automobile industry **joint ventures** has helped many companies in expanding their capabilities and expanding globally. Hence need to further promote joint venture for facilitating cutting edge over competitors in this highly competitive era.
- Need to develop a **clear and time-driven strategy** for embracing digitization, big data analytics, and connectivity in automobile industry.
- India must continue to **encourage EVs along with all other Electrified Vehicle technologies,** such as Plug-in Hybrid EV, Strong Hybrid EVs & Fuel Cell EVs.

3.8. SOLAR MANUFACTURING IN INDIA

Why in news?

Recently, India has received proposals for setting up **10 GW of solar equipment manufacturing capacity.**

Present capacity of solar manufacturing

- India's **renewable energy generation capacity is the fourth largest in the world** (currently 136 GW which is 36% of total capacity). It is growing at the fastest speed among all major countries.
  o By 2022, share of renewable capacity **will increase to 220 GW.**
  o Demand for locally produced panels will **also grow to 36 GW over three years.**

> **Potential of Solar Manufacturing in India**
> - **Employment generation:** It has a potential to create 50,000 direct jobs and at least 125,000 indirect jobs in the next 5 years.
> - **Expanding overseas market:** India has taken a lead in the International Solar Alliance (ISA), which will help in the transfer of solar technologies across members.
>   o India also sees this as an opportunity for the domestic solar industry to find inroads in some of the smaller and untapped markets like Africa and South America.

- The current capacity of solar cell manufacturing in India is about 2,500 MW. In case of solar modules as well, 7,000 MW of capacity is being added in addition to existing capacity.
- The nation has around **9 GW of annual solar module manufacturing capacity and around 3 GW of annual solar cell production** capacity.

o **A solar cell is the basic building block** of a solar module.

- India needs to increase its solar manufacturing capacity and overcome challenges faced in increasing this capacity.

Why there is need to develop solar manufacturing capacity?

- **Harvest potential and Self-reliant:** India need to fully use its solar power potential, this is not possible unless making India self-sufficient in the manufacture of solar cells and modules, batteries and ancillary equipment.
- **To curb import dependency:** Currently, 80% of solar cells and modules used in India are imported from China and comprise $2.16 billion of imports in 2018-19. Hence, domestic solar power manufacturing capacity needs to be improved to save tremendous foreign exchange.
- **Meet domestic demand:** India's solar manufacturing capacity is insufficient, under-utilised and unviable, as out of 2.5 GW demand in 2020 only 15% was met through domestic manufacturing.
- **To achieve target:** India's current solar power installed capacity is 35.73 GW. Hence, domestic manufacturing is needed to achieve set target of 175 GW of renewable energy by 2022, which includes 100 GW from solar power generation and increase share of non-fossil-based power capacity to about 40 percent by 2030, under Intended Nationally Determined Contribution target.

Challenges faced by solar manufacturing in India

- **Investment crunch:** Firstly, to achieve the 100 GW target, India needs to invest $65 billion in the next four years, but major part investment is raised within the country and there is less investment from foreign direct investment (FDI).
- **Technology and R&D:** India in comparison to China does not bring latest (next generation) technology at a competitive price, which hampers development of solar manufacturing in India.
- **Uncompetitive cost:** Indian solar cells are, on average, 20-30% more expensive than cells manufactured in China. Hence, manufacturer tend to choose affordable equipments through import from China.
- **Quality control issues:** Some companies have voiced their concerns about the quality of Indian made cells and reported some manufacturers falsely label their 380 Wp (capacity of a solar in watt peak) cells as 400 Wp because there are no government entities to ensure the quality of these cells.
- **Policy issues:** Only those models and manufacturers that are included in the approved list of models and manufacturers (ALMM) for solar PV cells and modules will be eligible to participate in projects under government programs.
- **Challenge at the World Trade Organisation (WTO):** US has challenged India's solar energy policy before the World Trade Organisation (WTO), on the line of domestic sourcing of solar panels, which was upheld by WTO.

Way forward

- **Developing an Ecosystem:** Indian government must focus on creating manufacturing clusters throughout the country similar to solar parks, with the availability of the entire supply chain, research and development (R&D) centres, equipment manufacturing, universities, and laboratories.
- **Comprehensive solar manufacturing policy:** It is needed which clearly mention about robust supply networks, lower cost supply agreements, subsidies on cost of power, financing and capex, incentives for R&D etc.
- **Costs competitiveness:** Solar manufacturing has to deal with significant costs related to setting up assembly lines, land acquisition, labour needs, taxes, power costs and other working capital requirements. Hence, government need to incentivize companies to boost or set up new solar component manufacturing capacity.

3.9. GAS BASED ECONOMY

Why in news?

Ministry of Petroleum & Natural Gas recently laid the foundation stone for the first 50 LNG fueling stations, across the golden quadrilateral and major National Highways, in a move towards transforming India into a **Gas based economy.**

About Gas Based Economy

- In a gas-based economy, natural gas makes up substantial share of in the primary energy mix of a country.
- Moving towards a gas-based economy requires growth in consumption of natural gas as a **feedstock**- in the manufacture of fertilizers, plastics and other commercially important organic chemicals as well as a **fuel** for electricity generation, heating purpose in industrial and commercial units, cooking in domestic households and as a **transportation fuel** for vehicles.
- **Present Status of India**:
  - Currently, the share of natural gas in India's energy mix is around 6.7 percent which is a decrease from 10.5 percent in 2010-11, compared with a global average of approximately 23.4 percent.
  - The Government of India aims to increase the share of natural gas to **15% of the energy mix by 2030** and to achieve the aim of "One Nation One Gas Grid".
  - **Gas supply sources in India:**
    - ✓ **Domestic Gas Sources**- Supplied from oil & gas fields located at western and southeastern areas viz. Hazira basin, Mumbai offshore & Krishna Godavari basin as well as North East Region (Assam & Tripura).
    - ✓ **Import of Liquefied Natural Gas (LNG)** - LNG is imported through Open General License (OGL) by the gas marketer under various Long Term, Medium Term and Spot contracts.

Significance of establishing Gas based economy in India

- **Reducing vehicular pollution**: LNG use in trucks can reduce SOx and NOx emissions as well as lead to low emission of particulate matter.
- **Convenient to handle and transport**: Natural gas is easily transportable to various points of consumption in the house or plant with the help of pipelines, hence its handling is easy and safe.
- **Fulfilling commitments under Paris climate change agreement**: Natural gas is one of the cleanest-burning hydrocarbons, producing around **half the carbon dioxide (CO_2) and just one tenth of the air pollutants of coal when burnt to generate electricity**. Enhancing share of natural gas in its energy mix will help India fulfill its Intended Nationally Determined Contribution (INDC) under the agreement.
  - India has pledged to improve the emissions intensity of its GDP by 33 to 35 per cent by 2030 below 2005 levels and to increase the share of non-fossil fuels-based electricity to 40 per cent by 2030.
- **Cost efficiency**: Compressed natural gas (CNG) is around 60 per cent cheaper than gasoline and 45 per cent cheaper than diesel.
- **Socio-economic benefits**: Clean and affordable fuel for domestic use such as cooking is essential an instrument for ensuring health and well being of citizens, especially women.
- **Reducing import bill of the country**: Increased LNG consumption in the country will reduce the country's dependence on crude oil.
- **Fulfilling growing energy demand in a sustainable manner**: India's share of total global primary energy demand is predicted to roughly double to ~11% by 2040. Thus, increasing use of clean energy sources such as natural gas is crucial to ensure that India's energy demands are met in a sustainable manner.

Hurdles in moving towards a gas-based economy

- **Low private sector investment:** The gas distribution sector has seen dismal private participation due to factors such as time consuming and bureaucratic approval process, frequent changes in national policy, multiple regulations, rent-seeking behavior in transmission, etc.
- **Inadequate transmission & distribution infrastructure:** The growth in supply chain infrastructure in India has been slow to support increase in demand, due to project delays. Moreover, gas pipelines are currently limited to regions where domestic gas production and LNG import terminals are located.
- **Low domestic production**: Most of the producing fields (in Cambay, Assam-Arakan and Mumbai Offshore) are maturing or have already matured. Due to inadequate new oil and gas discoveries and subsequent development, India is witnessing a decline or stagnancy in crude production.
- **Technological constraints:** Indian operators do not have the requisite technology and experience in area of gas exploration, storage and distribution technologies.
- **Pricing challenges:** Pricing and affordability are the key issues in India due to issues such as-
  - **Price volatility** in global markets

- o **Zonal tariff structure for the gas pipelines** which results into additive tariffs for usage of multiple pipelines to transport natural gas from the distant gas supply sources.
- o Current domestic gas price formula **does not address the investment & cost requirements** to maintain and improve domestic production, as the Indian geology is higher risk with higher extraction costs for new discoveries.
- o **Natural gas does not fall under the GST** and gas consumption is taxed at several state and central government levels, in addition to the gas transport tariffs leading to high cost.
- **Difficult to move away from coal based energy**: The gas sector in India faces competition from low-priced coal, especially in the power sector as the government has continued its investment in coal based thermal plants.

Way forward

- **Creation of a gas hub**: Indian government should foster the creation of a liquid market for natural gas in India by the creation of a gas hub, so that domestic gas and LNG imports can be used in the most efficient way and competition can flourish.
- **Simplified tariff structure**: A level playing field among industries through rationalised tariff structure would promote in minimizing their input cost and improve competitiveness in global production chain.
- **Clear Taxation regime:** It is important to ensure gas is treated on a level playing field with other fuels for taxation and is included under the GST.
- **Stable Gas policy:** It can help boost the share of private participation in the sector and increase investment in gas exploration and supply chain infrastructure.
- **Phasing out Coal:** For gas based economy to become a reality there is a need of more aggressive policy-driven actions including mandates to phase out old coal-consuming plants, imposing environmental taxation or carbon prices, progressing in energy market reforms, etc.

India's efforts towards a Gas based economy

- **Indian Gas Exchange (IGX):** IGX is India's first automated national-level gas trading platform, to promote and sustain an efficient and robust gas market and foster gas trading in the country.
- **Approval of Natural Gas Marketing Reforms**: The policy aims to provide standard procedure for sale of natural gas in a transparent and competitive manner to discover market price by issuing guidelines for sale by contractor through e-bidding and also permits Affiliate companies to participate in the bidding process. With this structure, the policy has issues like- only limited number of fields have been nominated and the policy is at a disadvantage to old players as it allows only affiliates. Also, the policy can be further strengthened through following reforms:
  - o **Doing away with the Administered Price Mechanism** for natural gas.
  - o Tax reforms to **overcome cascading effect of tax on gas consumption**.
- **Rationalisation of Tariff structures**: The Petroleum and natural gas regulatory board (PNGRB) has released Draft Regulations proposing a **Unified Pipeline Tariff (UPT)** structure**.**
  - o The proposed tariff structure will pool the existing approved pipeline tariffs to arrive at one single tariff, wherein transport rates beyond 300 kilometres of the injection points would be the same all across the country.
- **Constructing supportive Infrastructure:** An estimated investment of 60 billion US dollars has been lined up by the government in developing gas infrastructure which includes pipelines, city gas distribution and LNG re-gasification terminals.
  - o Government plans to set up LNG stations at the distance of 200-300 km on golden quadrilateral and major National highways, leading to around 1000 LNG stations on all major roads, industrial hubs and mining areas.
- **Expansion of City Gas Distribution (CGD) network**: With Government's supports of capital grants for **Pradhan Mantri Urja Ganga (PMUG) and Indradhanush North Eastern Gas Grid projects**, gas grid is being expanded to new markets in eastern and north-eastern part of the country.
  - o Coverage of City Gas projects is being expanded to 232 Geographical Areas (GAs) spread over more than 400 districts, with a potential to cover about 53% of the country's geography and 70% of country's population.
- **Creating demand:** through initiatives such as Fertilizer Gas Pooling Scheme, promotion of CNG vehicles, Auto-LPG etc. and providing LPG connections to poor households under Pradhan Mantri Ujjwala Yojana (PMUY).
- **Sustainable Alternative towards Affordable Transportation (SATAT):** It was launched to establish an ecosystem for production of Compressed Bio Gas from various waste/ biomass sources in the country.
- **Reforms in exploration and licensing policy**: Government notified 'Reforms in Exploration and Licensing Policy, for enhancing domestic exploration and production of oil and gas' in February 2019, aimed at boosting exploration activities with through simplification and rationalization of fiscal and contractual terms.
- **Other Policy initiatives:** Hydrocarbon Exploration and Licensing Policy (HELP) and Open Acreage Licensing Policy (OALP) adopted in 2016 provided a single, or uniform, license for the exploration and production of all conventional and unconventional hydrocarbons including natural gas from an entire contract area.

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- **Import diversification:** India has entered into long term gas contracts with many countries like Qatar, Australia, Russia and the US, and has made investments abroad in strategic assets in Mozambique, Russia and other countries.

3.10. URBAN INFRASTRUCTURE

Why in news?

Recently, the Prime Minister invited investors to invest in urban infrastructure with a project pipeline of $30 billion, including projects worth $20 billion under implementation.

Why developing Urban Infrastructure is important?

- **Increasing Urbanization:** India has close to one-third of its population residing in urban areas and this could increase to 50% in the next two decades. As a result, there is a need increase the urban infrastructure commensurately.

- **Economic Growth:** India's urban sector contributes more than 65% of India's GDP despite having close to 1/3rd of the population. Therefore, developing urban infrastructure becomes important to accelerate urban growth and as a consequence economic growth.

- **Poverty Reduction:** Development of urban infrastructure can help the economy transition from farm to non-farm sector by generating employment in the manufacturing and services sector. This indirectly increases the overall per capita income thus reducing the poverty levels.

- **Improving access to basic services and enhancing the quality of life:** Urban Infrastructure is critical to sustainably provide physical framework that caters to the growing need of basic services like **improving access to drinking water and growing need for better sanitation and waste management services.**

What are the challenges in developing Urban Infrastructure?

- **Limited investment:** Historically, investments in the urban sector have been close to 1% of GDP. While the urban population in India increased rapidly, there was no commensurate increase in the of investment in the sector. For instance, between 2013 and 2017, the share of urban sector investment in overall infrastructure investment was ~14%.

- **Inefficiencies of urban local bodies:** Even though a multi-fold increase in investment is needed to bridge infrastructure and service delivery gaps, capacity weaknesses constrain implementation and absorption of even available grants in many cities.

- **Slower adoption of innovative financing mechanisms:** ULBs have been slow to leverage innovative financing mechanisms as alternate

> **What is value capture financing (VCF)?**
>
> VCF refers to **recovering a portion of increment** in land or property valuation due to **positive externalities** from actions other than property owner's investments.
>
> For example, if price of a piece land increases due to announcement of a new airport (Positive externality), increment in the property tax can be seen as VCF.

> **Steps taken by the Government?**
>
> **2014** — Swachh Bharat Mission launched to eliminate open defecation, improve municipal solid waste management
>
> **2015**
> - Smart City Mission launched to implement area-based development and technology-driven city solutions
> - AMRUT launched to ensure adequate water supply and sewerage network in cities
> - PMAY launched with the aim of 'Housing for All' by 2022
> - HRIDAY launched to rejuvenate India's rich cultural heritage
>
> **2017**
> - 94 Indian municipalities get credit ratings, of which 55 received investment grade ratings
> - Pune Municipal Corporation issued a 10-year municipal bond to raise money for its Smart City Mission
> - City liveability index launched to measure quality of life in 116 major cities
>
> **2019** — Over 2.8 million houses completed, of which nearly 2.4 million houses delivered to beneficiaries under PMAY

sources of revenue such as value capture finance (VCF). Also, more ULBs have not adequately embraced the idea of municipal bonds.

- **Land availability and finance constraints in housing:** There is a continuous tussle for land for industries, commercial/ retails spaces and for housing in urban areas. Therefore, land mass is under severe constraint to meet the housing requirement of the country's rapidly growing urban population.

What are the reforms that can be undertaken to realize this vision?

Following reforms on Urban Infrastructure have been suggested by the Department of Economic Affairs under the report on National Infrastructure Pipeline (NIP):

- **Slum redevelopment and land pooling:**
  - **Promoting rental housing** – A **new model tenancy law can be introduced** as the current rental laws are archaic and do not address the lessor-lessee relationship in an equitable manner. This can make the current housing more affordable for the current slum dwellers.
  - **Using land pooling**: It can be an alternative to land acquisition in India. Authorities must lay down guidelines on compensation, resettlement and rehabilitation. Also, states must mandate documented land ownership records for land pooling
- **Improving urban waste management:** Following efforts can be made to effect this:
  - Creating the **right environment for more private participation**. For instance, it may also be useful to have integrated SWM PPP concessioning (collection, transportation, processing, etc.).
  - **Creating e-waste recycling facilities** as currently **about 95% of India's e-waste is recycled in the informal sector** in a crude and unscientific manner which is detrimental to the environment.
  - Using **decentralized systems** for better Wastewater management and sewage treatment.
- **Improving the supply of drinking water:** Considerable investments are needed to upgrade the level of water infrastructure; this can be done in following ways:
  - **Developing PPP models for water infrastructure projects**. For instance, the projects under the Namami Gange program have been funded through the Hybrid Annuity Model (HAM).
  - Using **innovative financing mechanisms** at the local level like issuing Blue Bonds for projects and creating user charges for urban infrastructure and services among others.
- **Reforms to improve urban mobility:**
  - **Setting up a central urban mobility standards authority** can be set up under a central act to conduct research, provide technical guidance and provide statutory standards that are mandatory for states to follow.
  - Private vehicles may be disincentivized by **increasing parking fees and fuel surcharge.**
  - **Improving the condition of urban roads, walkways and public spaces** in accordance with Indian Road Congress (IRC) codes.
- **Boosting urban affordable housing**:
  - Unused land and non-core assets of **sick/ loss-making public sector undertakings (PSUs) of the central/ state governments can be monetized** and utilized effectively.
  - Setting up an **affordable housing fund in the National Housing Bank (NHB).**
  - Innovative financing mechanisms such as **'rental-cum-ownership housing'**, can be used in which houses will initially be offered on rent and ownership will be transferred to the tenant once the cost of the unit is recovered. For instance, the **success of the Bhindi Bazaar Redevelopment Project** can be replicated.

3.11. SWAMITVA SCHEME

Why in News?

The SVAMITVA (Survey of Villages and Mapping with Improvised Technology in Village Areas) scheme was recently launched by the Prime Minister on the occasion of National Panchayati Raj.

About SVAMITVA Scheme

- It is a **Central Sector Scheme** that aims to provide an **integrated property validation solution for rural India,** engaging the latest Drone Surveying technology, for demarcating the inhabitant (Aabadi) land in rural areas.

o It aims to **update the 'record-of-rights' in the revenue/property registers** and **issue property cards to the property owners** in rural areas.
- It is a **collaborative effort** of the Ministry of Panchayati Raj (MoPR) (Nodal Ministry for implementation of the scheme), State Panchayati Raj Departments, State Revenue / Land Records Departments and Survey of India (technology partner for implementation).
- **Key Components of the scheme**
  o **Establishment of CORS network**: Continuously Operating Reference Stations (CORS) is a network of reference stations that supports establishment of Ground Control Points, which is an important activity for accurate Georeferencing, ground truthing and demarcation of Lands.
  o **Large Scale Mapping (LSM) using Drone**: Rural inhabited (abadi) area would be mapped by **Survey of India** using drone Survey to generate **high resolution and accurate maps** to based on which, property cards would be issued to the rural household owners.
  o **Information, Education and Communication**: Awareness program to sensitize the rural population about the surveying methodology and its benefits.
  o **Enhancement of Spatial Planning Application "Gram Manchitra"**: The digital spatial data/maps created under drone survey shall be leveraged for creation of spatial analytical tools to support preparation of Gram Panchayat Development Plan (GPDP).
  o **Online Monitoring and reporting dashboard** would monitor the progress of activities.
  o **Program Management Units**: The scheme will be implemented through the regular departmental mechanisms, which will be assisted by Programme Management Units at the National and State level.
- **Coverage:** The Pilot Phase for the year 2020-21 will extend to six States (Haryana, Karnataka, Madhya Pradesh, Maharashtra, Uttar Pradesh and Uttarakhand) covering approx. 1 lakh villages and **CORS network establishment** is planned for two States (Punjab and Rajasthan).
  o The scheme aims to cover all 6.62 lakh villages in the country by the end of financial year 2023-24.

Intended Benefits of the scheme

- **Financial stability to the citizens in rural India:** A 'record of rights' will enable rural households to use their property as a financial asset for taking loans and other financial benefits.
- **Enhanced collection of property tax**: Updation of property and asset register will strengthen tax collection and demand assessment process of Gram Panchayats.
  o The 2018 Economic Survey estimated only 19% of the potential property tax was being collected by Gram Panchayats
- **Making land marketable:** The property cards will help increase liquidity of land parcels in the market.
- **Reduction in property related disputes and legal cases:** through creation of accurate land records.
- **Improved quality of GPDP:** GIS maps of **Gram Panchayat and community assets** like village roads, ponds, canals, open spaces, school, Anganwadi, Health sub-centres, etc. can be used to prepare better-quality GPDP.
  o Further, these GIS maps and spatial database would also help in **preparation of accurate work estimates,** allocation of construction permits, elimination of encroachments, etc. for various works undertaken by Gram Panchayats and other Departments of State Government.
- **Aid relief work:** Accurate land records will make relief and compensation work easier in disaster affected areas.

Potential issues in implementation of the scheme

- **Reluctance in community:** Land and boundaries are sensitive topics among rural poeple, which can discourage them to participate in such policy reforms.
- **Exclusion of vulnerable people:** Dalits, women, tenant farmers and tribal communities are often excluded from accessing land, even though they may legitimately have a claim.
- **Lack of functional market in rural areas** for the using land as a marketable collateral

Way Forward

- **Engaging the community from the beginning**: Involving the community and ensuring high level of transparency can create an environment of greater acceptance of the process and reduce potential for disputes.

- **Protecting the most vulnerable people:** It would be important to build safeguards in the implementation process to ensure legitimate claims of the most vulnerable people are not crowded out.
- **Establish a grievance redressal system:** A grievance redressal system will effectively addresses people's concerns in a transparent and fair manner and will aid in smooth implementation of the program.
- **Enable markets to work:** States should simplify the legislative and regulatory procedures to build consumer confidence and encourage transactions in these areas.

3.12. MODEL TENANCY ACT, 2019

Why in News?

Ministry of Housing and Urban Affairs has released the draft **Model Tenancy, 2019.**

Need of the Model Tenancy Law

- **Lack of a sound rental policy** as despite acute housing shortage, there are over 1.10 Crore homes lying vacant in the country's urban areas.
  - Further, according to the National Census, **vacant houses comprised around 12% of the total share** of the urban housing stock.
- **Land is a state subject -** Since land comes under state list, States have their own laws with long drawn legal provisions which result in lengthy litigation to resolve disputes.
- **Owner side concerns:**
  - **Low rental yield** is accrued from residential properties – averaging not more than 3% in major cities.
  - Existing rent control laws that put a **ceiling on rent** are restrictive in nature.
- **Tenant side concerns:**
  - The affordability to own a house is a challenge especially for low-income households.
    - ✓ **Non-availability of affordable accommodation** was the key reason behind migrant leaving towns amidst COVID-19 pandemic.
  - Exorbitant increase in year-on-year rent and interference by landlord too have caused disputes.
- This has made **rental housing financially unattractive resulting into informal sub-standard rental market** lacking basic amenities.

About Draft Model Tenancy Act, 2019

- It envisages to **balance the interest and rights of both the owner and tenant** and to create an accountable and transparent ecosystem for renting the premises in disciplined and efficient manner.
- The Model Act provides for its applicability for the whole of the State i.e. **urban as well as rural areas** in the State.
- **Features**
  - **Establish Rent courts and Tribunals**
    - ✓ **Rent Authority may direct for compensation** on the person responsible for cutting off or withholding the essential supply.
    - ✓ To ensure **speedy redressal of disputes**, it also proposes to establish **Rent Court and Rent Tribunal** that have to dispose off the cases within 60 days.
    - ✓ Act provides for **fast-track quasi-judicial mechanism** for adjudication of disputes. Officer of the rank of **deputy collector or higher** will act as **rent authority** to adjudicate any issue arising out of a rental disagreement
  - **Rent:** All premises (residential or commercial) shall be rented only after a **written agreement on mutually agreed terms**.
    - ✓ **Landlord cannot arbitrarily increase the rent** in variance with what has been agreed.
  - **Security Deposits:** It proposes to **cap the security deposit to maximum of two month's rent** in case of residential properties and Security deposit to be refunded by the landlord at the time of taking over vacant possession of the premises.
  - **Repair and Maintenance:** If the landowner refuses to carry out the required repairs, the tenant can get the work done and deduct the same from periodic rent.
    - ✓ A **landowner cannot enter the rented premises without 24-hour prior notice** to carry out repairs or replacement.

- o **Agreement**
  - ✓ A **digital platform** will be set up in **local vernacular language** of the State for submitting tenancy agreement and other documents.
  - ✓ The **tenant cannot sublet a part of or the whole property** or carry out any structural change without execution of supplementary agreement between landlord and tenant.
  - ✓ Landowner **cannot cut power and water supply in case of a dispute with the tenant**.
  - ✓ Act acknowledges **property manager** (the one who manages property on behalf of the landlord) **as a legal entity**. It further provides for duties of property manager and consequences of violation of duties.

How will the Model Tenancy Law be Beneficial?

- It will encourage **private participation in rental housing** for addressing the huge housing shortage across the country.
- It provides **relief for both tenants and landlords** and helps take some load off India's **overburdened litigation process**.
- It will enable creation of adequate **rental housing stock** for various income segments of society including migrants, formal and informal sector workers, professionals, students etc.
- It will increase access to quality rented accommodation and enables gradual **formalization of rental housing market**.
- It complements the government's vision of **'Housing for All' by 2022**.
- It will bring **transparency and accountability** in the existing system of house renting.

> **Issues that may arise**
> - The Act formalizes the existing arrangements; thereby the **rents might also increase.**
> - The **Act is not binding on the states**, as it is a model act. Thus, like in the case with RERA, the fear is that states may choose not to follow guidelines, diluting the essence of the Model Act.

Conclusion

With an estimation of 50% (presently, 31.6%) of the Indian population be living in Urban areas by 2050, this act provides a much-needed breakthrough to create affordable housing for all and relieve the massive pressure and demand on the housing sector.

3.13. NOBEL PRIZE IN ECONOMICS

Why in news?

This year's Nobel Economics Prize has been awarded to U.S. economists Paul Milgrom and Robert Wilson for their **works on auction theory.**

More in news

- They won the Nobel Economics Prize for improvements to auction theory and **invention of new auction formats that could also be applied to selling of goods and services** (such as radio frequencies) that are difficult to sell through traditional auction formats.
- The discoveries have benefitted sellers, buyers and taxpayers around the world.

What is auction theory?

- It is a **concept of transparent allocation of resources or items of business in a free market** to the best bidder for optimum utilization.
- It is a branch of applied economics and prescribes different sets of rules or designs for transactions.
- Essentially, it is about how auctions lead to the discovery of the price of a commodity. **Auction theory studies:**
  - o How auctions are designed?
  - o What rules govern the auctions?
  - o How bidders behave in auction?
  - o What outcomes are achieved through auction?
- **Benefits of the auction theory:**
  - o It helps to **understand the bidders' behaviours**
  - o It helps in **choosing the best design/forma**t of the auction for various goods and services.

- o It also helps **understand the evolving nature of auction** and pricing of items and resources in a country or globally.
- o It helps to **understand the outcomes of different rules for auction** and consequent final prices.
- o It also helps to **understand why governments across the world should not put too much emphasis on maximizing revenues**
  - ✓ For instance, in India the spectrum is allocated to the highest bidder; this is also one of the reasons why telecom sector is under heavy debt.
  - ✓ To avoid such problems in auction **India should chose the 'second-price' auction theory** that **allows the winning bidder** (or the highest bidder) **to pay what the second-highest bidder offered.**

Individuals contribution

- **Winners curse:** Wilson worked on common value principle and opined that the rational bidders tend to place bids below their own best estimate of the common value to evade the **winner's curse.**
  - o It is possible to overbid ($50 when the real value is closer to $25) due to various reasons, in such cases one wins the auction but loses out in reality.
- **Multistage bidding:** Milgrom opined that private values differ from bidder to bidder. He demonstrated that **an auction format will give the seller higher expected revenue when bidders learn more about each other's estimated values** (which depends on both private as well as common value) during bidding.
  - o Therefore, allowing multi-stage bidding is a good way to get more value as every participant gets more time to match/outbid the previous highest bid.
  - o He analysed the bidding strategies in a number of well-known auction formats, and demonstrated that an auction format will give the seller higher expected revenue when bidders learn more about each other's estimated values during bidding.

3.14. POVERTY AND SHARED PROSPERITY

Why in news?

World Bank recently released the report titled **"**Poverty and Shared Prosperity 2020: Reversals of Fortune".

Key findings

- **Reversal of extreme poverty trends: Extreme poverty** is defined as living below the international poverty line of $1.90 or roughly Rs 145-150 per day. Global extreme poverty is expected to rise in 2020 for the first time in over 20 years **mainly due to three reasons:**
  - o **COVID-19 and its associated economic crisis:** Current projections suggest that, in 2020, between **88 million and 115 million people could fall back into extreme poverty** as a result of the pandemic—returning global poverty rates to **2017 levels**.
    - ✓ **South Asia will be the hardest hit region** followed by Southern Africa.
  - o **Armed conflicts: More than 40 percent of the world's poor now live in conflict-affected countries**, a number expected to rise further in the coming decade.
  - o **Climate change:** Under present scenarios, the combined effects of climate change **could push between 68 million and 132 million more people into poverty by 2030.**
    - ✓ With their livelihoods predominantly based on primary activities, the poorest are least able to adapt, more vulnerable and less resilient to the impacts of climate change.
- **Shared Prosperity:** Shared prosperity is defined as the **growth in the income of the poorest 40% of a country's population.** A high level of shared prosperity is an important indicator of inclusion and well-being in any country.
  - o **Average global shared prosperity may stagnate or even contract over 2019-2021** due to the reduced growth in average incomes as a result of COVID crisis. This **may lead to an increase in income inequality,** resulting in a world that is less inclusive.
- **Changing profile of global poor:** The poor remain predominantly rural, young, and undereducated. However, the current COVID crisis is creating millions of "new poor." **The new poor" probably will:**
  - o be more urban than the chronic poor.
  - o be more engaged in informal services and manufacturing and less in agriculture.

Way forward suggested by the report

- **Policy responses need to reflect the changing profile of the poor**: Safety net programs will in particular need to reach people in the informal sector in both rural and urban areas.
- Poverty action **needs to address hot spots** of conflict, climate change and COVID-19.
- **Learning lessons** from emergency actions taken during COVID and long-term development experiences:
  - **Closing the gap between policy aspiration and attainment**: Much more attention needs to be given not just to "getting policies right" but to building the capability of the administrative systems that are tasked with implementing them.
  - **Enhancing and improving data:** Data limitations create doubts among the general public, obstruct scientific progress, and hinder the implementation of sound, evidence-based development policies.
  - **Investing in preparedness and prevention**: An example of successful international cooperation in disaster preparedness is the **Indian Ocean Tsunami Warning and Mitigation System (IOTWMS) which is operational since 2013.**

4. SECURITY

4.1. SURVEILLANCE TECHNOLOGIES

Why in news?

There has been a rise in use of surveillance technologies like Facial recognition for security purposes in India.

Role played by Surveillance Technologies in National Security

- **Intelligence gathering**: It gives authorities the ability to gather information on critical threats such as inducement for recruitment of terrorists, spread of disharmony, etc.
- **Surveying threats in dangerous and hard to reach areas**: Technologies such as Unmanned aerial vehicles are critical for surveillance in insurgency-hit areas, mountainous regions, border areas etc.

> **Technologies being used for Surveillance purposes**
> - **Facial recognition**
> - **Aerial drones**
> - **Closed-circuit television (CCTV) cameras**
> - **Big data analysis**: can be used for surveying and monitoring large data sets such as telephone calls.
> - **Smart/Safe cities**: These are a suite of technology that includes integrated incident command and control, secured public safety cloud.
> - **Satellite Surveillance**

- **Investigation of crimes**: Facial recognition and CCTVs are being increasingly used to identify and verify criminals, missing persons.
- **Predicting security threats:** Technologies such as **Smart policing** that feed immense quantities of data into an algorithm—geographic location, types of committed crimes, biometric data, social media feeds—can prevent crime or even make predictions about future criminal activity.
- **Enhanced efficiency of security agencies**: AI technology can cast a much wider surveillance net than traditional methods and allow regimes to automate many tracking and monitoring functions formerly delegated to human operators. This brings cost efficiencies and frees up security forces to conduct other important tasks.
- **Deterrent effect:** Presence of round the clock surveillance such as through CCTVs deters criminal activities such as thefts, eve teasing etc.
- **Other uses** of surveillance technologies include- disease surveillance, crowd management, checking excesses of investigative agencies etc.

Concerns regarding use of Surveillance Technologies

- **Violation of right to privacy**: Analysis of Communications data by investigative agencies can be both highly revelatory and invasive, particularly when data is combined and aggregated.
- **Lack of adequate national legislation**: Weak procedural safeguards, ambiguous language and ineffective oversight reduce accountability and heighten conditions for unlawful digital surveillance.
- **Curbing freedom to speech and expression**: Citizens never know if an automated bot is monitoring their text messages, reading their social media posts or geotracking their movements. This may create a chilling effect on the voices of citizens due to concerns of being apprehended.
- **Potential of Misuse:** Surveillance technologies can be misused for a variety of purposes such as intimidating and harassing opponents, stifling legitimate protests, disrupting elections, elevating false information etc.
- **Inherent biases and unreliable technologies:** The accuracy of facial recognition technology varies significantly and certain tests have disclosed unacceptably high false-match rates. Growing concerns about algorithmic bias and prejudice also impact effectiveness of these predictions.
- **Threat to Sovereignty**: By relying on foreign vendors and third-system integrators for surveillance technologies, India could compromise and dilute its national security.
- **Cyber threats**: Data stored by the government for surveillance purposes contain sensitive information about their citizens and corporate entities, which becomes prone to threat of cyber attacks.
- **Dual use nature of technologies**: Government bodies tend to widen the application of such technologies to newer areas without the consent of its citizens. For example, in Telangana the police recently used its surveillance system to track people suspected of the novel coronavirus disease.

Way Forward

- **Robust independent oversight system**: An oversight system that entrusts judiciaries to authorize relevant surveillance measures and provides remedies in cases of abuse or misuse is required.
- **Identifying specific technology pathways:** Efforts in the direction of building Indian capability in a set of technologies that will serve the intelligence community and developing a technology-centric intelligence cadre are needed to ensure that surveillance activities are carried out in an efficient manner without threatening sovereignty of the nation.
- **Test of proportionality and legitimacy**: Surveillance activities conducted by the state must pass the **Test of proportionality** which postulates that the nature and extent of the State's interference with the exercise of a right must be proportionate to the goal it seeks to achieve. Proportionality can be ascertained on the basis of the following:
  o the action must be sanctioned by law;
  o the proposed action must be necessary in a democratic society for a legitimate aim;
  o the extent of such interference must be proportionate to the need for such interference;
  o there must be procedural guarantees against abuse of such interference
- **Formulating laws for collection of data**: Such a law should follow crucial data protection and surveillance principles such as reasonable processing of data, purpose limitation, collection limitation, lawful processing, storage limitation, data quality and accountability along with crucial rights of persons whose data is being collected. The Personal Data Protection Bill, 2019 is a step in the right direction.

> **Related Supreme Court judgments**
> - **Justice K S Puttaswamy (Retd) and Anr v Union of India and Ors case**: The Supreme Court held that the right to privacy is a fundamental right under Article 14, 19 and 21 of the Constitution of India and the same should not be infringed unless the same is necessary for protecting the sovereignty and integrity of the State. It further explained that states can interfere with an individual's privacy only if: it is supported by law; pursues a legitimate state aim; and is proportional to the objective.
> - **People's Union for Civil Liberties v. Union of India (1996):** The Supreme Court held that Telephone-Tapping is a serious invasion of an individual's privacy and set rules for the judicious exercise of surveillance and interception in phone tapping cases.

Surveillance in India
- In India, mainly two legislations regulate digital and telephonic surveillance-
  o **Information Technology Act, 2000**
    ✓ Section 69 of the Act allows the Central and the State Government to issue directions for monitoring, interception and decryption of any information transmitted, received or stored in a computer resource and provides the grounds upon which interception can take place.
    ✓ In 2018, the Ministry of Home Affairs issued an order exercising these powers authorizing 10 agencies such as Intelligence Bureau, Narcotics Control Bureau, CBI, Central Board of Direct Taxes etc for the interception, monitoring, decryption of any information generated, transmitted, received or stored in any computer source.
  o **Indian Telegraph Act, 1885:** The act empowers the Central and State government to intercept messages during two instances, viz.
    ✓ In the occurrence of any **public emergency** or the interest of **public safety**
    ✓ If it is considered necessary or expedient to do so.
  o Apart from the above, messages may also be intercepted, in the interest of the sovereignty and integrity of India, the security of the State, friendly relations with foreign States, public order and for the prevention of incitement to the commission of an offense.
- **Immunity from Right to information Act**: The agencies and authorities tasked with interception and monitoring work are mostly intelligence agencies which are not obligated to reply to the queries raised regarding the extent of surveillance that is carried out by them under Section 24 (1) of the Right to Information Act.
- **India is in the process of building a National Social Registry** linked to Aadhar that would allow the government to create detailed profiles of all citizens.
- **National Automated Facial Recognition System**: is being developed by the National Crime Records Bureau to automatically identify and verify criminals, missing persons, unidentified bodies and unknown traced persons.
- **Exemptions in the Personal Data Protection Bill, 2019:** As per the bill, the central government can allow any of its agencies to process, collect or store citizen data in the interest of security of state, public order, sovereignty and integrity of India, and friendly relations with foreign states.
- **Instances of use of facial recognition:** The government accepted using facial recognition technology to identify those involved in the recent Delhi riots.

4.2. BIO-TERRORISM

Why in news?

Parliamentary panel has **highlighted the need for the government to have laws to counter bio-terrorism** in its report 'The Outbreak of Pandemic COVID-19 and its Management'.

More about news

- Earlier, Department of Health and Family Welfare, submitted a **seven-point action plan** that is needed to ensure security against biological weapons.
  - Action plan includes **strengthening disease surveillance, training, capacity building, strengthening research and surveillance activities** related to development of diagnostics, vaccines and drugs etc.
- After deliberations with Parliamentary panel on action plan, it came to conclusion to formulate **effective laws to counter bio-terrorism**.
  - Moreover, **adverse effects of COVID-19 pandemic** have taught the lesson on the importance of controlling biological agents.

Need for Bio terrorism law in India

- **India's high vulnerability**: High population density, Inadequate medical facilities, subtropical climatic conditions, poor hygiene and inadequate sanitation facilities make India extremely susceptible for such attacks.
- **Control its impact on society**: Bioterrorism causes damage, fear, and anxiety among people and affects the society and government of a country. These biologic weapons can cause large-scale mortality and morbidity in large population and create civil disruption in the shortest possible time.
- **Increase in attacks due to advancement in technology:** In this era of biotechnology and nanotechnology has created an easy accessibility to more sophisticated biologic agents apart from the conventional bacteria, viruses and toxins.

Existing measures to counter bio-terrorism in India
- **Epidemic Diseases Act of 1897:** Act to provide for the better prevention of the spread of Dangerous Epidemic Diseases by providing special powers to authorities.
- **National Disaster Management Authority (NDMA):** NDMA has proposed a model instrument where participation of both government and private sectors is a pre-requisite to manage the menace of biological disaster. Half of the existing force is specifically trained to deal with chemical, biological, radiological, and nuclear (CBRN) threats.
- **Integrated Disease Surveillance Project (IDSP):** It was initiated in assistance with World bank, to strengthen/maintain decentralized laboratory-based IT enabled disease surveillance system for epidemic-prone diseases to monitor disease trends and to detect and respond to outbreaks in early rising phase through trained Rapid Response Team.
- **International Health Regulations:** Revised International Health Regulations came into force in India in June 2007, that helps to ensure that outbreaks and other public health emergencies of international concern are detected and investigated more rapidly.

Initiatives at international level
- **Biological Weapons Convention:** It is first multilateral disarmament treaty banning the development, production and stockpiling of Bacteriological (Biological) and Toxin Weapons.
- **INTERPOL Bioterrorism Prevention Unit:** It aims to enable law enforcement agencies to prevent, prepare and respond to the deliberate use of bacteria, viruses or biological toxins that threaten or cause harm to humans, animals or agriculture.
- **Cartagena Protocol on Biosafety:** It is an international agreement which aims to ensure the safe handling, transport and use of living modified organisms (LMOs) resulting from modern biotechnology.

Further mechanism to counter bio-terrorism

- **Deterrence by law:** Structured legislation is essential element of national preparedness against bioterrorism and for being punished for the such act perpetrated.
  - For this need to introduce Public Health Bill on the line of **Public Health (Prevention, Control and Management of epidemics, bio-terrorism and disasters) Bill-2017**, which defined terms epidemic, isolation, quarantine and social distancing, but lapsed.
  - Bill also **needs to repeal of Epidemic Diseases Act of 1897,** which is not specific to biological threat and does not define terms.

- **Prevention:** This is to be done through examining the risk of bioterror attacks, case studies, prevention of attacks, preparation and training of law enforcement personnel, and the related legal and political framework to reduce opportunity and enhanced intelligence.
- **Surveillance and assessment:** This can be done by recognizing patterns of non-specific syndromes and assessing them, that could indicate the early manifestations of a biological warfare attack.
- **Laboratory investigation:** Primary healthcare providers, laboratory staff, are the first responders and will most likely identify the initial cases.
  - Hence **in conjunction with infection control and administrative personnel should develop both laboratory- and institution-wide response plans** for diagnosis and characterization of the biological organism.
- **Medical management:** It should include preventive, promotive, and curative services like Chemoprevention to prevent the spread of the disease, through identifying the category of population to be given chemoprophylaxis, availability of the requisite quantity of drugs or vaccine; and outline of the mechanism of administration with health infrastructure.
- **General public sensitization:** This can be done by law enforcing agencies, through training and education, warning network at hospitals and public health agencies etc.

4.3. NAXALISM IN INDIA

Why in news?

Recently, **Chhattisgarh proposed a 5-point action plan** to make Baster region free of Maoism/Naxalism.

About Proposed 5-point action plan

- **Creating jobs and providing financial help** to the Left Wing Extremism affected districts.
- **Grants by government to make cold storage chains** for arranging the processing and sale of minor forest produce, forest medicines and several types of horticultural crops in the forest areas
- **Setting up solar energy generators** for places where the electricity grid has not been able to reach in the state.
- **Additional grant for each of the seven aspirational districts'** collectors for generating employment.
- **Setting up of steel plants** in Bastar, an iron-ore rich area, can provide iron ore with a 30% discount thereby leading to investment and job creation in the region.

Naxalism in India

- Naxalism derives its name from the village **Naxalbari of West Bengal.**
- The rebellion was initiated in 1967 in West Bengal, with an objective of rightful redistribution of the land to working peasants under the leadership of **Kanu Sanyal** and **Jagan Santhal.**
- It **creates conditions for non-functioning of the government** and actively seeks disruption of development activities as a means to achieve its objective of 'wresting control'. It spreads fear among the law-abiding citizens.
- Naxalism is considered to be one of the **biggest internal security threats** India faces.
- The conflict is concentrated the Eastern part of the country, particularly an area known as the **Red Corridor spread across the states of Chhattisgarh, Odisha, Jharkhand, Bihar and Andhra Pradesh.**
  - Some districts of **Kerala, Telangana, Uttar Pradesh, Andhra Pradesh** etc are impacted by Naxalism.
- Naxal violence is related to the intensity of the feeling of people of their **deprivation and their commitment to take revenge** against those who are believed to be responsible for such denial.
- Currently, the main supporters of the movement **are marginalized groups of India including Dalits and Adivasis**, who believe they have been neglected by the government.
- Further, Naxals support **Maoist political sentiments and ideology.**

Causes of Naxalism in India:

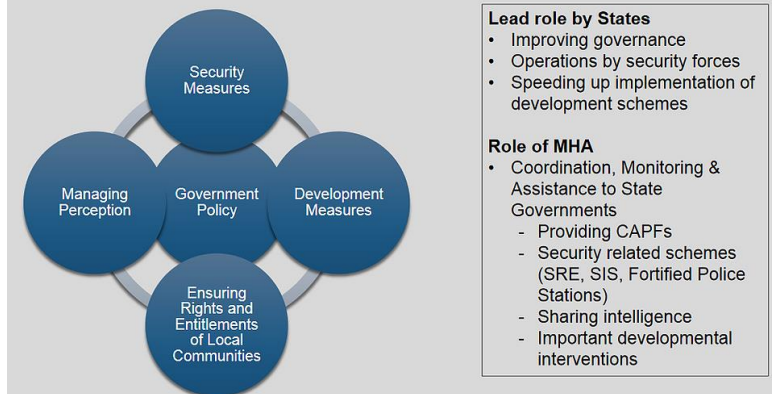| Jal-Jangal-Jameen/ Exploitative Deficit	Development deficit	Social exclusion	Governance deficit
• Evasion of land ceiling laws • Encroachment and occupation of	• Unemployment • Poverty • Infrastructure deficit	• Violation of human rights • Abuse of dignity of life • Disconnect with	• Incompetent, ill-trained and poorly motivated public personnel • Mismanagement and

Government and community lands	• Lack of education	mainstream society	corruption.
• Disruption of the age old tribal-forest relationship	• Poor health facilities	• Discontent against government	• Poor implementation of laws and schemes

Steps taken by Government to address Naxalism

- The Government has tried to deal with the challenge in **a holistic manner, in the areas of security, development, ensuring rights and entitlements of local communities**, improvement in governance and public perception management with targeted focus on relatively more affected areas.
- Since **'Police' and 'Public Order' are State subjects**, the Central Government works **to enhance the capacity of the State Governments** to tackle Maoist menace in a concerted manner.

GOVERNMENT'S MULTI-PRONGED APPROACH

Security Measures

Managing Perception | Government Policy | Development Measures

Ensuring Rights and Entitlements of Local Communities

Lead role by States
- Improving governance
- Operations by security forces
- Speeding up implementation of development schemes

Role of MHA
- Coordination, Monitoring & Assistance to State Governments
  - Providing CAPFs
  - Security related schemes (SRE, SIS, Fortified Police Stations)
  - Sharing intelligence
  - Important developmental interventions

Steps taken by Government so far

Hard Approach	Soft Approach

• **SAMADHAN**
  o **S** – Smart Leadership
  o **A -** Aggressive strategy
  o **M -** Motivation and training
  o **A -** Actionable intelligence
  o **D -** Dashboard Based KPIs (key performance indicators) and KRAs (key result areas)
  o **H -** Harnessing technology
  o **A -** Action plan for each theatre
  o **N -** No access to financing.
• **Police Modernization Scheme** plus fortification of police station in areas affected by Naxal movements. Assistance in **training of State Police** through the Ministry of Defence.
• **Operation Green Hunt, 2010 -** Massive deployment of security forces was done in the naxal-affected areas. It decreased naxal affected areas from 223 to 90 districts in 9 years.
• **National Policy and Action Plan 2015** is a multi-pronged strategy in the areas of security, development, ensuring rights & entitlement of local communities etc
• **Special Infrastructure Scheme** for funds to the States of Bihar, Chhattisgarh, Jharkhand and Odisha to raise Special Task Force to combat LWE.
• **Security Related Expenditure (SRE) Scheme:** Under this the central Govt. reimburses security related expenditure to the LWE affected state Governments.
• **Unlawful Activities (Prevention) Act, 1967** has been amended to strengthen the punitive measures.
	• **Good Governance through Civic Action Programme:** To bridge the gaps between Security Forces and local people through personal interaction and bring the human face of SFs before the local population.
	• **Aspirational District:** Monitoring of Aspirational districts programme in 35 LWE affected districts.
	• **Media Plan:** Under the scheme activities like Tribal Youth Exchange programmes organised by radio jingles, documentaries, pamphlets etc. are being conducted.
	• Various schemes like **Roshni** have been used to **improve skill development**.
	• **Universal Service Obligation Fund** supported Scheme of Mobile Services to increase mobile connectivity.
	• Effective implementation of **provisions of PESA, 1996 on priority.**
	• **Surrender and Rehabilitation policy** for naxalites in affected areas.
	• **Facilities of residential schools to children** – (e.g. Pota Cabins, Choolo Aasman, Nanhe Parinde, Tamannah) as well as focus on sports infrastructure.
	• **National Rural Employment Guarantee Programme (NREGP)** is being implemented in 330 districts affected by Naxalism for demand-driven wage-employment.

Loopholes in the Present Strategy

- **Inefficient Delivery of Governance:** Naxal affected areas still remain elusive of basic and essential services, justice delivery and community participation among others.
- **Lack of a common plan across the states** – States restrict their efforts to defined political boundaries instead of joining hands for better synergy and coordination.

- **Lack of coordination between state police and Central forces** – This results in the development of security voids which is exploited by the Naxals. State police often plays a passive role despite they being well acquainted with the terrain, local community etc.

- **Inadequate training and combat capability** of forces in Maoism affected states.

- **Lack of institutionalized intelligence sharing between states and regions** – Timely collection of intelligence and its efficient dissemination has led to strategy failures.

- **Naxalites are well versed with terrain** which gives them a substantial upper hand in armed struggle.

> **Salwa Judum**
> - It is a **militia** mobilised and deployed as part **of anti-insurgency operations in Chhattisgarh,** aimed at countering Naxalite violence in the region.
> - It was started as a **people's resistance movement** against the Naxalites.
> - The militia, consisting of **local tribal youth,** received support and training from the Chhattisgarh state government.
> - But as the force took ground, it **established a reign of terror** in the region, and was subsequently **banned by the Supreme Court in 2011.**

- **Inability to Maintain Created Assets -** This weakens the position of both the government and the security forces as it hampers the trust of locals and disrupts channels of communication.

- **Inability to Curb Terror Financing –** Even though demonetisation happened, it could not prove much useful in this regard.

- **Inadequate Technological Interventions -** Use of drones, mini UAVs, ground sensors, smart guns and artificial intelligence have not been aggressively deployed in naxal areas

Way Forward

- **Good governance** – Analyzing the loopholes in the present strategy and developing a coherent national strategy to end the menace.

- **Dialogue -** Between the Naxal leaders, and the government officials can be a way to work out a solution.

- **Generate more employment and increase wages** - insecure livelihood and unemployment in the areas have left the people with little option but to join the Naxals.

- **Ending the political marginalization of weaker sections** - Weaker sections of the society, the schedule castes and schedule tribes still face discrimination from the upper class making them a soft target for the naxals.

- **Remove disparity -** Economic disparity and the growing distance between rich and the poor is one of the main problems that has contributed to the growth of Naxalism.

5. ENVIRONMENT

5.1. INDIA'S EFFORTS TOWARDS CLIMATE CHANGE

Recently, the **Ministry of Environment, Forest and Climate Change** has launched the **'India Climate Change Knowledge Portal'.** The Portal will **help in disseminating knowledge among citizens** about all the major steps the Government is taking at both national and international levels to address **climate change issues.**

5.1.1. MITIGATION MEASURES

- India is committed to the implementation of mitigation policies and is proactively promoting low carbon and sustainable lifestyles.
- India's mitigation policies and actions must be understood in the context of its longstanding position that climate change is a global challenge, a position in accordance with the spirit of the UNFCCC.
- India has always emphasized the importance of basing such collective effort on equity and the concept of common but differentiated responsibilities in line with the Convention.
- Major steps taken in this direction can be summarised as follows:

Plans, Policies and Schemes	**Energy Efficiency measures:** - **Perform Achieve and Trade (PAT):** Market based mechanism to enhance Energy Efficiency through certification of energy saving which can be traded. - **Star Rated Appliances t**o provide the consumer an informed choice about the energy saving and thereby the cost saving potential of the marketed household and other equipment. - **Energy Conservation Building Code 2017 t**o establish minimum energy performance standards for buildings in India. - **Street Lighting National Programme (SLNP):** Deployment of LED street lights that are approximately 50% more energy efficient than incandescent bulbs and High-Pressure Sodium (HPS) lighting. - **Unnat Jeevan by Affordable LEDs and Appliances for All (UJALA)** to address India's high cost of electrification and high emissions from inefficient lighting. - **Green Rating for Integrated Habitat Assessment (GRIHA)** to recognize energy-efficient buildings, as well as to stimulate their large scale replication - **Zero Defect and Zero Effect (ZED)** to rate Micro, Small and Medium Enterprises (MSMEs) on quality control and certification for energy efficiency, enhanced resources efficiency, pollution control, use of renewable energy and waste management using ZED Maturity Assessment Model. **Afforestation Measures:** - **National Afforestation Programme** for afforestation and reforestation of degraded forests and non -forest areas. - **Nagar Van Udyan Yojana:** Aims at ecological rejuvenation of the city forests by creating/ developing at least one city forest in each city having Municipal Corporation/ Class I Cities for providing wholesome healthy living environment. **Promotion of Renewable Energy:** - **Renewable energy targets:** Solar Energy (100 GW by 2022), Wind Energy (60 GW by 2022) and Small Hydro and Biomass(15 GW by 2022) - **Green Energy Corridor Project that a**ims at synchronizing electricity produced from renewable sources, such as solar and wind, with conventional power stations in the grid. - **Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles in India (FAME India)** under National Electric Mobility Mission Plan 2020 for promoting eco-friendly vehicles in the country – hybrid and electric technologies. **Waste Management** - **Swachh Bharat Mission** for Solid Waste Management including the establishment of waste to energy plants - **Steel Scrap Recycling Policy t**o create a mechanism for treating waste streams and residues produced from dismantling and shredding facilities in compliance to Hazardous & Other Wastes (Management & Transboundary Movement) Rules, 2016. **Agriculture** - **Pradhan Mantri Krishi Sinchayee Yojana** for end-to-end solutions in irrigation supply chain and aims to use micro irrigation technologies extensively to save water, increase production and productivity of crops in a sustainable manner and help in achieving food security

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	• **Rainfed Area Development (RAD)** to explore potential utilization of natural resources base/assets available/created through watershed development and soil conservation activities/interventions under MGNREGS, NWDPRA, RVP&FPR, RKVY, IWMP etc.
Financial Tools	• **Framework for Energy Efficient Economic Development (FEEED)** to ease the financing of energy efficiency projects. • **Energy Efficiency Financing Platform (EEFP)** to provide a platform to interact with Financial Institutions (FIs) and project developers for implementation of energy efficiency projects. • **Green bonds** issued by financial, non-financial or public entities where the proceeds are used to finance 100 percent green projects and assets specifically linked to climate-change mitigation, adaptation and resilience. India also has the second largest Emerging green bond market after China. • **Compensatory Afforestation Management and Planning Authority (CAMPA) Funds** for promoting afforestation and regeneration activities as a way of compensating for forest land diverted to non-forest uses. • India joined the **International Platform on Sustainable Finance (IPSF)** that acknowledges the global nature of financial markets which has the potential to help finance the transition to a green, low carbon and climate resilient economy by linking financing needs to the global sources of funding.
International collaborations	• **International Solar Alliance (ISA) t**o provide a dedicated platform for cooperation among solar-resource-rich countries, through which the global community, including governments, bilateral and multilateral organizations, corporates, industry, and other stakeholders, can contribute to help achieve the common goal of increasing the use and quality of solar energy in meeting energy needs of prospective ISA member countries in a safe, convenient, affordable, equitable and sustainable manner. • **Clean Development Mechanismw** which allows emission reduction or removal projects in developing countries to generate carbon offset credit, each equivalent to one tonne of carbon dioxide. These certified emission reduction credits (CERs) could be traded, sold and used by industrialized countries to meet part of their emission reduction targets under Kyoto Protocol. • **REDD+ Reducing emissions t**o achieve additional carbon sequestration, emission reduction, improve forest-based livelihoods, conservation of rare, endemic, and endangered species found in the area and improvement of watershed hydrology.
Others	• **Smart Cities Mission** for providing a clean and sustainable urban environment through the adoption of 'smart solutions'. • **Atal Mission for Rejuvenation and Urban Transformation (AMRUT)** for providing basic services (e.g. water supply, sewerage, urban transport) to households and build amenities in cities which will improve the quality of life for all, especially the poor and the disadvantaged is a national priority. • **Pradhan Mantri Ujjwala Yojana** for providing LPG connections to BPL households thus reducing the demand for traditional biomass from forests. • **National Policy on Biofuels – 2018** which aims at taking forward the indicative target of achieving 20% blending of bio-fuels with fossil-based fuels by 2030. • **Dedicated Freight Corridor** for construction of six freight corridors traversing the entire country to provide a safe and efficient low carbon freight transportation system.

5.1.2. ADAPTATION MEASURES

The adverse impacts of climate change on the developmental prospects of the country are amplified enormously by the existence of widespread poverty and dependence of a large proportion of the population on climate sensitive sectors for livelihood. Hence for India, adaptation is inevitable and an imperative for the development process.

A range of actions have been introduced to address it:

| Plans, Policies and Schemes | **Promoting Climate Smart Agriculture**
• **Paramparagat Krishi Vikas Yojana** that aims at development of sustainable models of organic farming through a mix of traditional wisdom and modern science to ensure long term soil fertility, resource conservation and helps in climate change adaptation.
• **National Initiative on Climate Resilient Agriculture** to enhance resilience of Indian agriculture to climate change and climate vulnerability through strategic research and technology demonstration.
• **Soil Health Card** to provides information to farmers on nutrient status of their soil along with recommendation on appropriate dosage of nutrients to be applied for improving soil health and its fertility. |

	Water resource management • **National Mission for Clean Ganga (NMCG)** aims to ensure effective abatement of pollution and rejuvenation of the river Ganga and to maintain minimum ecological flows in the river Ganga with the aim of ensuring water quality and environmentally sustainable development. • **Jal Jeevan Mission** to provide safe and adequate drinking water through individual household tap connections by 2024 to all households in rural India beating challenges such as depletion of groundwater caused by over-extraction, poor recharge, low storage capacity, erratic rainfall due to climate change. • **Neeranchal t**o support the Integrated Watershed Management Program (IWMP) for managing water resources to address the ever increasing water resource problems to due climate change. **Ecosystem Preservation** • **National Agroforestry Policy (NAP)** that aims at encouraging and expanding tree plantation in complementarily and integrated manner with crops and livestock. It will help protect and stabilize ecosystems, and promote resilient cropping and farming systems to minimize the risk during extreme climatic events. **Livelihood Protection** • **Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)** A vast majority of works under this programme aim at strengthening natural resource base of the rural economy and are linked to land, soil, and water. • **Aajeevika – National Rural Livelihoods Mission (NRLM):** Aims at creating efficient and effective institutional platforms of the rural poor, enabling them to increase household income through sustainable livelihood enhancements and improved access to financial services through self-managed Self-Help Groups (SHGs) and federated institutions and support them for livelihoods collectives. **Others** • **National Food Security Mission** for achieving food security and improved nutrition and promoting sustainable agriculture. • **Guidelines for preparation of Action Plan – Prevention and Management of Heat-Wave 2019** for improving the capacity of the States to deal with heat wave management in a planned manner. • **National Vector Borne Disease Control Programme (NVBDCP) t**o minimise health related stress from extreme weather-related disasters such as wider spread of vector-borne diseases as malaria and dengue and increasing frequency of heat and cold waves.
Financial Tools	• **Pradhan Mantri Fasal Bhima Yojana**: An insurance service for farmers with an aim to provide a comprehensive insurance cover against failure of the crop and help in stabilising the income of the farmers. • **PM Kisan Samman Nidhi Scheme** a kind of social security scheme for farmers to supplement the financial needs of the small and marginal farmers in procuring various inputs to ensure proper crop health and appropriate yields, commensurate with the anticipated farm income at the end of each crop cycle. • **State Disaster Response Fund:** Primary fund available with State Governments for responses to notified disasters. Disasters covered under SDRF: Cyclone, drought, earthquake, fire, flood, tsunami, hailstorm, landslide, avalanche, cloudburst, pest attack, frost and cold waves.
International collaborations	• **Coalition for Disaster Resilient Infrastructure (CDRI)** aims to promote resilience of new and existing infrastructure systems to climate and disaster risks.

5.2. AIR POLLUTION IN DELHI-NCR AND ADJOINING AREAS

The issue of air pollution across northern India, especially in the cities and towns of the Gangetic basin, has assumed the magnitude of a national calamity. Over 50 million people in Delhi-NCR were directly affected, with the air quality index plummeting to "severe". Recently, there has been debates over the contribution of various sources of air pollution in Delhi.

Various sources of pollution

• **Crop stubble burning in Punjab, Haryana and western Uttar Pradesh:** It is one of the chief causes for a temporary spike in air pollution levels (~45 days in the month of November) in Delhi-NCR and is an **interplay of 2 factors:**

o **Higher crop residue due to mechanization:** Just before the onset of winters, paddy is harvested in these states. Paddy, when harvested by hand, is cut close to the ground. However, decreasing labour supply, increasing wages and factors like subsidies have led to higher mechanisation level and harvester sales. With the use of combine harvesters, the tall stalks are left behind, which have to be removed before replanting.

o **State Government policies promoting stuble burning:** Punjab and Haryana passed laws delaying the sowing of paddy with an aim to conserve groundwater as the new sowing cycle would coincide with monsoons.This left very little time (only 15 days) for farmers to harvest paddy, clear fields and sow wheat for the next cycle. As the paddy straw and stalks have high silica content and are not used to feed livestock ,the farmers are thus forced to burn the crop residue to get rid of it.

o Based on the **TERI & ARAI source apportionment study 2018**, the sources of pollutants over the entire winter season, and specifically during the days when agricultural burning is prominent, are shown below.

- **Vehicular Emissions:** It is the second biggest cause of pollution in winters. According to the IIT Kanpur study, 20 % of PM 2.5 in winters comes from vehicular pollution (major share from two-wheelers and transport vehicles).

- **Temperature pattern:** As temperature dips, the inversion height — which is the layer beyond which pollutants cannot disperse into the upper layer of the atmosphere – is lowered. The concentration of pollutants in the air increases when this happens.

- **Wind Pattern:** October usually marks the withdrawal of monsoons in Northwest India. Once monsoon withdraws, the predominant direction of winds changes from easterly to north westerly. Wind mass as it travels over Punjab, Haryana and parts of Rajasthan before entering in Delhi may pick up the pollutants on the way especially from large sources (e.g. crop residue burning) and tall emitting sources. Also, high-speed winds are very effective at dispersing pollutants, but winters bring a dip in wind speed over all as compared to in summers.

- **Industries:** With as many as 3,182 industries located across the Delhi-NCR, industrial pollution adds about 18.6% to the bad air quality. **As per TERI study,** Industries contribute 30% to PM2.5 levels, with 14% from small industries.

- **Dust:** It is one of the factors for increased winter pollution however **its contribution is more in summers as compared to winters.** Dust mostly come from construction sites as well as the windblown dust from the western desert regions.

Whole Winter

Agri Burning Period

Sources of Air Pullution in Delhi during the entire winter season (above) and during the period of peak fires of Agricultural wastes in the upwind states

Steps taken to tackle the Air Pollution in Delhi NCR
- **Environmental Pollution (Prevention and Control) Authority (EPCA)** enforces **Graded Response Action Plan (GRAP)** which comprises the graded measures for each source framed according to the Air Quality Index categories.
- **National Clean Air Programme (NCAP)** is a **pollution control initiative to cut the concentration of particles (PM10 & PM2.5)** by 20-30% by 2024. It is a nationwide programme including Delhi.
- Delhi is scheduled to run **hydrogen-CNG (H-CNG) fuelled buses** to curb emission.
- **Other measures** include introduction of BS VI (cleaner) fuel, push for electric vehicles, Odd-Even as an emergency measure, and construction of the Eastern and Western Peripheral Expressways.
- Recently, Central Govt. has issued ordinance to form **new commission to replace EPCA.** The Commission for Air Quality Management in National Capital Region and Adjoining Area has an objective of implementing a consolidated approach to monitoring, tackling and eliminating causes of air pollution in Delhi-NCR by coordinating with state governments.

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- o IIT Kanpur study reveals contribution of soil & road dust towards PM10 as 14.4% during winters & 26.5% during summers. Similarly, for PM2.5 it is 4.3% during winters and 27.1% during summers.
- **Municipal Solid Waste:** Approx. 8370 tonnes of Municipal solid waste is generated in Delhi every day and on an average 3,240 tonnes per day is being incinerated in quantity Solid Waste Treatment plants. Both thermal power stations and waste management plants are some of other highly emitted zone, contributing to 3.9% of the pollution load.
- **Brick Kilns:** Outskirts of Delhi have roughly 360 brick kilns majorly scattered in Jhajjar, Faridabad and Ghaziabad region. Since, their peak business month starts from December to June, the emissions from these brick kiln also rise during the winter months.

Issues involved and way forward for resolving Delhi Air Pollution Issue

- **Integrated governance mechanism:** The Graded Response Action Plan being implemented by at least 16 different agencies. Some are under the control of Union Government, some under the Delhi government and some are under the administrative control of neighbouring states. In general, there are no political and executive level coordination among them. The newly established body should look to integrate all the ongoing efforts.
- **Recognition that it needs a regional solution:** A study conducted by International Institute of Applied Systems Analysis (IIASS) and the NEERI showed that about 60% of PM2.5 burden in Delhi is due to the neighboring states. No Policy is likely to work unless it takes regional considerations into account. Inter-agency efforts need to be controlled and coordinated by a central source.
- **Collecting reliable and accurate data:** During the past decade there have been 16 source apportionment studies. While sources of emissions remain same in all the studies, the contribution from different sources to Delhi's pollution varies greatly. This is partly due to Delhi's complex meteorology and the changing nature of sources of emissions, both in space and time. Therefore, a wide study focussed on identifying sources of pollution would reduce confusion and help in designing specific solutions.
- **Boosting infrastructure.** Delhi has only **half the buses it needs for public transport.** Thus, private automobile use continues to grow, adding to the air pollution problem. The Delhi Pollution Control Committee which has a mandate to enforce compliance with the air pollution rules in the city, suffers from a **serious scientific and technical manpower shortage**. Therefore, focussing on boosting infrastructure which includes public transport, introducing advanced technological solutions etc.
- o **High Level Committee recommendation** included using Light Detection and Ranging (LiDAR) and Wireless Sensor Networks (WSN) technology for better pollution-monitoring, Adoption of oxy furnaces in industries, Photocatalytic paints to be used on roads etc.

5.3. PRIVATE SECTOR AND CLIMATE CHANGE

Why in news?

Some of India's biggest private sector companies pledged to work with the government to tackle climate change and build sustainable economies to help India achieve its targets under the Paris Agreement.

Role of private sector in climate change efforts

While the role and responsibilities of the public sector for supporting adaptation and building resilience have been in focus for a long time, awareness for the need to address and engage the private sector has steadily grown. Engaging the private sector is essential for multiple reasons:

- **Mobilize financial resources:** According to India's Intended Nationally Determined Contribution (INDC) estimates, $2.5 trillion is needed from 2015 to 2030 ($ 170 billion per year) for climate action including steps to reduce greenhouse gas emissions and integrate climate change measures into national policies. The **private sector has a critical role in generating new finance** to help fill the massive deficit in available funds for the same.
- o Private financial institutions and investors such as banks, pension funds, insurance companies or impact investors can invest in resilience or provide funding for adaptation of others, e.g. through micro-loans, bonds or venture capital.
- **Leverage the efforts of governments:** Private entities dominate many investments that are critical to adaptation, such as the location and design of buildings, roads and other infrastructure investments,

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agricultural research (e.g., to develop more drought-resistant seeds); water management infrastructure and technologies.

- **Develop innovative climate services and adaptation technologies:** Private-sector corporations develop – and often dominate – the design and delivery of many adaptation services such as weather observation technology and early warning systems. This **will enable lower cost and accelerate the replication of climate-resilient technologies**.

Barriers to Increasing Private Sector Efforts in climate action

- **Institutional and Policy barriers:** Government of India (GoI) has provided regulatory mechanisms and economic incentives for engaging the private sector but actual deployment has been slow. There has been major private sector investment in the RE sector, but government incentives to attract private investment in other climate-related sectors has been limited.
- **Limited or no access to information or tools** to assess risks and opportunities related to climate change and identify potential adaptation measures to be taken. Private sector engagement in climate change has been limited to greenhouse gas (GHG) accounting, and there has been a little or no use of robust climate risk screening tools by the private sector.
- **Technological**: Lack of availability of or access to advanced technologies, tools and structures, for instance, solar panels. Also, issues with IP rights and technology transfer hinders private participation in research and development.
- **Economies of scale:** Lack of demand in the market due to low awareness leads to high cost of production of innovative climate resilient products and technologies.

Enablers for the private sector to invest in climate actions

- **Reforming the regulatory framework** to ensure policies, laws, and regulations create an enabling environment for private sector participation.
- **Raising awareness** of the private sector on climate-related risks and associated opportunities, through documentation and dissemination of the business case for climate change adaptation.
- **Build the capacity** of private players by providing them with decision support tools to help them understand and assess risks and opportunities and/or identify potential adaptation measures. This will help them make more informed decisions to manage and minimise existing or emerging risks while taking advantage of investment opportunities emerging from a changing climate.
- **Build a shared vision between the public and private sector** by identifying overlaps between the government's priorities and private sector interests.

> **Best practices**
> - **Internal Carbon Pricing:** Companies like Mahindra & Mahindra, Infosys Limited have implemented internal carbon pricing (ICP) in some form or the other. For instance, Mahindra & Mahindra has adopted an ICP of $10 per tonne of carbon emitted.
>   - While external or explicit carbon pricing is mandated by a national or sub-national government in the form of a carbon tax, emission trading scheme, etc., ICP is applied voluntarily by an organisation to itself.
>   - It is an **internationally recognized business tool that enables companies to create resources which are invested in low-carbon technologies which help reduce future emissions and lower operating costs.** For instance, ₹1 million invested in renewables may offer more emission reduction co-benefits compared to energy efficiency, depending on the measures being implemented. Thus **companies adopting ICP will be better prepared to assess and address the climate risks** while benefitting from the opportunities offered by climate action.
> - **The International Union of Railways (UIC)** has undertaken an extensive feasibility study analyzing the impacts of climate change on rail transportation infrastructure and taking stock of ongoing and planned work on climate change adaptation in European, Canadian, Australian and Indian railway companies.

Conclusion

Efforts to engage the private sector in adaptation to climate change are beginning and must be accelerated. Public policy should provide appropriate incentives for adaptation measures and, where necessary, regulation to avoid shifting risks to the public. Stronger public-private partnerships will also be an important vehicle to enhance climate resilience and at the same time create business opportunities.

Steps taken to promote private participation in climate change
Several initiatives and facilities have been established at global, regional or national level in order to involve private firms in financing low-carbon and climate-resilient development in line with the Paris Agreement and the 2030 Agenda. Examples include:

- **UNFCCC's Adaptation Private Sector Initiative (PSI)** that provides a platform for businesses to contribute in a sustainable and profitable manner to a strong and effective response, both in their own adaptation efforts and, importantly, in those of the most vulnerable countries and communities around the world. Currently it lists over 100 private sector initiatives.
- **Green Climate Fund's Private Sector Facility:** to engage both the local and global private sector to support climate change mitigation and adaptation projects in developing countries.
- **Development cooperation agencies, NGOs and foundations provide technical assistance,** such as in the form of awareness raising, capacity building, fostering of knowledge exchange, advisory for policy framework design, etc. **The Global Adaptation and Resilience Investment Working Group** (GARI), for instance, brings together nearly 200 private and public sector stakeholders to discuss critical issues regarding climate adaptation, resilience and investment.
- In India:
  - o The **India Climate Collaborative (ICC)** (formed by over ten of the country's foremost philanthropies) seeks to build a collaborative platform for diverse voices, innovative solutions, and collective investments to amplify and spread local solutions to India's climate crisis.
  - o **Inclusion of Renewable energy sector in the PSL norms** could translate into easier finance for developers and corporate consumers.
  - o Policies related to implementation of the **coal cess**, market mechanisms including perform achieve and trade **(PAT),** renewable energy certificates **(REC)** and a regulatory regime of renewable purchase obligation **(RPO)** have arguably led to an indirect carbon pricing by private sector.
  - o **The National Solar Mission (NSM)** aims to achieve grid parity for solar electricity through research & development, domestic production, large scale deployment, and long term and predictable policy that encourages private sector participation in the solar business.

5.4. ENVIRONMENTAL IMPACT OF AGRICULTURAL SUBSIDIES

Why in news?

Recent incidents of burning paddy stubble in Punjab, Haryana and Western Uttar Pradesh have raised concerns about Agriculture's contribution to pollution and role played by regime of agricultural subsidies in it.

What are the environmental impacts of Agricultural subsidies in India?

- **Impacts of fertilizer use and production**: Subsidization of chemical fertilizers, specifically urea based and P&K fertilizers, have led to the following-
  - o **Boom in fertilizer industry:** India's Fertilizer industry is classified under the **"red category"** of polluting sectors by Central Pollution Control Board of India. Wastewater generated at urea plants contains nitrogen, and cyanides in varying concentrations, which can lead to groundwater and surface water pollution, if not treated properly.

Types of Agricultural Subsidies in India
Different kinds of agricultural subsidies provided to farmers in India are as follows:

- **Input Subsidies:** These are subsidies granted through distribution of inputs at prices that are less than the standard market price for these inputs. Several varieties of subsidies in this category are-
  - o **Fertilizer Subsidy:** Urea and Phosphatic and Potassic (P&K) fertilizers are made available to farmers at subsidized prices through fertilizer manufacturers/importers.
  - o **Irrigation Subsidy:** Subsidies to the farmers which the government bears on account of providing proper irrigation facilities through provision of **subsidized private irrigation equipment** such as pump sets or **public goods** (such as canals, dams etc.).
  - o **Power Subsidy:** The government charges low rates for the electricity supplied to the farmers, which is primarily used by the farmers for irrigation purposes.
  - o **Seed Subsidies:** High yielding seeds can be provided by the government at low prices.
  - o **Credit Subsidy:** It includes interest subvention schemes for farmer loans and other costs such as write-offs bad loans.
- **Price Subsidy:** It includes mechanisms such as Minimum support prices (MSPs) at which the government procures food-grains from farmers at a higher price than its market price.
- **Infrastructural Subsidy:** Government allowing use of public goods such as roads, storage facilities, power, information about the market, transportation to the ports, etc. at lower prices to farmers.
- **Export Subsidies:** Subsides provided to encourage exports of specific agricultural products.

- ✓ Also, naphtha-based fertilizer plants or those with fuel oil or coal-based captive power plants are associated with high carbon emissions and air pollution.
  - o **Overuse of fertilizer:** This leads not only to problems such as stagnating or even declining soil productivity, widespread deficiency of secondary and micronutrients, and soil alkalinity and salinity, but also to the following:
    - ✓ **Atmospheric nitrogen:** Nitrogen use efficiency in India is very low, at below 35 per cent in lowland rice and under 50 per cent in upland crops. The rest of the nitrogen is lost to the environment which can become nitrous oxide, a **potent greenhouse gas (GHGs)** contributing to climate change, or nitrogen oxide, which contributes to **Photochemical smog** and **ground-level ozone**.
    - ✓ **Nutrient Runoff**: Excess nitrogen and phosphorus can be washed from farm fields and into waterways and can also leach through the soil into groundwater over time. High levels of nitrogen and phosphorus can cause **eutrophication of water bodies**, which can lead to hypoxia ("dead zones"), causing fish kills and a decrease in aquatic life. Excess nutrients can also cause harmful algal blooms (HABs) in freshwater systems, which not only disrupt wildlife but can also produce toxins harmful to humans.
- **Depletion of groundwater**: India subsidizes the cost of energy and equipments required to pump water for agriculture, through various schemes. This encourages producers to produce water intensive crops and over-exploit groundwater resources.
  - o The groundwater level in India has declined by 61 per cent between 2007 and 2017 and of the extracted water 89 per cent is used for irrigation,
- **Intensification and Extensification of Agricultural Production**: Agricultural subsidies by increasing farmers' revenues provide **incentives to increase output** through **intensive practices** such as monocropping, rigorous use of inputs, such as fertilizers and pesticides and through **expansion of agricultural activity**. Environmental impacts associated with extensification of agricultural production include encroachment on fragile ecosystems and deforestation, while intensification can cause water pollution, land degradation, and biodiversity loss.
- **Wastage of resources**: Excess stocks of foodgrains procured by Food Corporation of India (FCI) when disposed off can lead to high methane emissions and wastage of precious resources like water that went into their production.
- **Extensive paddy cultivation**: Open-ended procurement of paddy, high MSPs and subsidized power water, have led to substantial growth in paddy cultivation across the country. Continuous or intense forms of intermittent flooding in rice farms can lead to **high methane and nitrous oxide emissions**, both GHGs.
  - o Also, **disposal of paddy stubble through burning** is responsible for release of air pollutants such as suspended particulate matter (PM), Carbon monoxide, Carbon dioxide etc.

Way Forward

- **Sustainable policies**: Policy frameworks for subsidies related to agricultural activity need take into account **local environmental conditions** and socioeconomic contexts and focus on **sustainable use of resources**.
- **Rationalization of fertilizer subsidies**: Instead of massive subsidisation of urea to the tune of almost 75 per cent of its cost, it would be better to give farmers input subsidy in cash on per hectare basis, or something on the lines of the nutrient based subsidy programme.
- **Fertilizer sector in India needs appropriate investments in technologies** for pollution control, such as NO_x control in stack, ammonia emissions curtailment, and advanced water treatment.
- **Promoting crop diversification:** and other practices such as multi cropping can help reduce impacts of intensive agricultural practices and encourage cultivation of climate suitable and less water intensive crops.
- **Shifting from input subsidies to investment subsidies**: For instance, investments can be made for the conversion of paddy areas to orchards with drip irrigation, vegetable, pulses and oilseeds, that consume much less water, much less power and fertilisers and don't create stubble to burn.
- **Rationalizing power subsidies**: Public investments in electricity subsidies can be diverted to innovation and infrastructural development in micro irrigation techniques and helping farmers become capable in using such techniques.

- **Adopting Nutrient Management Techniques:** Farmers need to be trained to improve nutrient management practices by applying nutrients (fertilizer and manure) in the right amount, at the right time of year and with the right methods.
- **Regulation of groundwater extraction:** There is an urgent need to limit groundwater extraction, which can be done by placing upper limits on extraction, promoting water harvesting techniques and ensuring last mile connection of farmlands to water sources such as canals and rivers.

5.5. GREEN BUILDINGS

Why in news?

Confederation of Indian Industry's Green Building Congress 2020 was inaugurated recently.

What is a green building?

- A **'green' building is** a building that, in its design, construction or operation, **reduces or eliminates negative impacts,** and can create positive impacts, on our climate and natural environment.
- Some **features which can make a building 'green' include**:
  o Efficient use of energy, water and other resources
  o Use of renewable energy, such as solar energy
  o Pollution and waste reduction measures, and the enabling of re-use and recycling
  o Use of materials that are non-toxic, sustainable
  o Consideration of the environment in design, construction and operation etc.
- Currently **India has over 7.61 Billion Sq. Ft of green building footprint** and amongst the top 5 countries in the world.

Advantages of green buildings

- **Economic benefits: Cost effectiveness:** Energy efficiency of green buildings save a huge amount of money on the energy bills, saving up to 20 percent of the operating and maintenance cost.
- **Environmental benefits**
  o **Temperature regulation:** Green buildings with green roofs remain much cooler than regular buildings and greenery induces moisture around the building which creates a pleasant environment in and around the construction.
  o **Emission reduction:** According to various studies, green buildings emit 62% less GHGs.
  o **Eco-friendly:** Green constructions reuse the rainwater and greywater which otherwise would have been wasted. Also, the materials used to build are generally eco-friendly, recycled and biomass materials.
- **Social benefits:** Green buildings reduce the amount of pollution which certainly has an impact positively on mental and physical health.

Steps taken towards Green buildings promotion in India

- The **Energy Conservation Building Code (ECBC) was launched in 2007** by the Bureau of Energy Efficiency (BEE). Its main objective is to establish minimum requirements for energy efficient design and construction of buildings.
  o It was revised in 2017 (ECBC 2017) that prescribes the **energy performance standards for new commercial buildings** to be constructed across India.
  o Adoption of ECBC 2017 for new commercial building construction throughout the country is **estimated to achieve a 50% reduction in energy use by 2030.**
- **(Energy Conservation–New Indian Way for Affordable & Sustainable homes) Eco-Niwas Samhita 2018:** It is **Energy Conservation Building Code for Residential Buildings** launched by Ministry of Power.
- BEE developed **Star Rating Programme for commercial buildings** that rates buildings on a five-star scale based on actual performance in terms of energy usage.
- Two rating systems are operating for rating green buildings in India:
  o **Green Rating for Integrated Habitat Assessment (GRIHA):** It is rating tool evaluates the environmental performance of a building holistically over its entire life cycle, thereby providing a definitive standard for what constitutes a 'green building'. It is jointly developed by The Energy and Resources Institute (TERI) and the Ministry of New and Renewable Energy.

- o **Leadership in Energy & Environmental Design (LEED)**: It is an international recognized certification system for the green buildings developed by the U.S. Green Building Council.
- **Indian Green Building Council,** part of the Confederation of Indian Industry (CII) formed in the year 2001, offers services like **developing new green building rating programmes, certification services and green building training programmes.**

Challenges in Green buildings adoption

- **Inadequate Government's Policies & Procedures**: Though government is deciding ambitious targets for green building it lacks in proper rules and regulations to enforce large-scale implementation.
- **Lacking ease of doing**: Builders and developers have to go through a very tedious process when it comes to approvals for green building compliances, this can be one potential reason deterring rapid adoption of green buildings.
- **Expensive Equipment and product**: The equipment and products used in the construction of green buildings are expensive, hence developers and builders are concerned that adopting green buildings will involve high upfront costs.
- **Lack of skilled manpower and expertise**: India lacks in skilled experts and manpower in form of policymakers to architects, engineers to contractors and workers.
- **Limited Awareness:** A very large segment of Indian people are unaware of green buildings and its enduring benefits and who know little about green buildings perceive it to be an expensive and option.

Way forward

- **Encouragement:** Finance Commissions & Local bodies should encourage green buildings through tax incentives and other measures.
- **Legislation:** Making green buildings mandatory through legislation for new constructions, as well existing buildings too should be retrofitted to make them environment-friendly by adopting green practices.
- **Capacity building:** Government should formulate strategies to develop skills among architects, engineers, contractors and workers to facilitate adoption of green buildings.
- **Campaigning and awareness:** Call for creating awareness of promoting green buildings concept among the people and promoting 'Net Zero Carbon Buildings'.

5.6. RENEWABLE ENERGY IN INDIA

Why in news?

India is expected to be the largest contributor to the renewables upswing in 2021, with the country's annual additions doubling from 2020, as per INTERNATIONAL ENERGY AGENCY (IEA) Renewables 2020 report forecasts.

India's Achievements so far
- **World's largest renewable energy expansion programme** (with targets of 450 GW by 2030).
- Solar capacity increased in the last 5.5 years from around 2.6 GW to more than 34 GW.
- **India now at 5th Global Position** for overall installed renewable energy capacity with the share of renewable energy in the country's power generation capacity.
- Renewable energy installed capacity increased 226% in last 5 years.
- Record low solar tariff of Rs. 2.44/unit achieved in Bhadla, Rajasthan.
- About 19 times higher solar pumps installed between 2014-19 (2.25 lakh) versus upto 2014 (11,626).
- Wind energy capacity in India has increased by 1.7 times in the last 4 years.

Growth drivers for renewable energy sector in India:

- **Dedicated Ministry of New and Renewable Energy:** India is the first country in the world to set up a ministry of non-conventional energy resources which is playing a proactive role in promoting the adoption of renewable energy resources by offering various incentives such as generation-based incentives (GBIs), capital and interest subsidies, viability gap funding (VGF), concessional finance, fiscal incentives etc.
- **India's Intended Nationally Determined Contributions (INDC):** In the Paris Agreement India has committed to target of achieving 40% of its total electricity generation from non-fossil fuel sources by
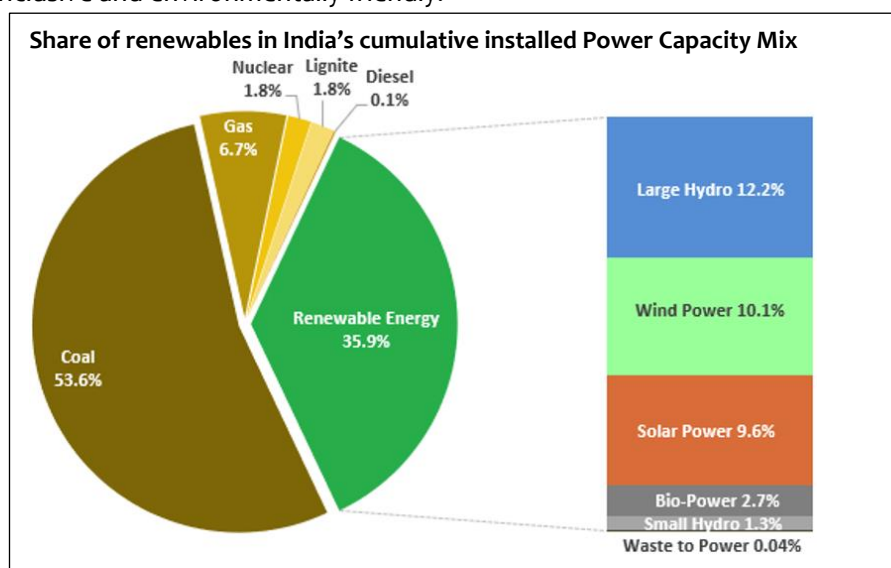
2030. 175 GW interim target is 100 GW of solar, 60 GW of wind, 10 GW of biomass and 5 GW of small hydro.

- **Enabling environment for foreign investment in renewable energy projects:**
  o **The establishment of a dedicated financial institution** – the Indian Renewable Energy Development Agency (IREDA), makes for renewed impetus on the promotion, development and extension of financial assistance for renewable energy and energy efficiency/conservation projects.
  o Consequently, **India has steadily improved its position** in the World Bank's Ease of Doing Business rankings and the WEF's Global Competitiveness Index, and is currently ranked third in the EY RE Country Attractiveness Index.
  o **100% FDI is allowed for RE projects** to facilitate easy transfer of capital and technology.
- **The Setting up of the Solar Energy Corporation of India:** The mandate of the SECI allows wide-ranging activities to be undertaken with an overall view to facilitate the implementation of the National Solar Mission and the achievement of targets set therein.
  o The **National Solar Mission** aims to promote the development and use of solar energy for power generation and other uses, with the ultimate objective of making solar energy compete with fossil-based energy options.
- **Solar mini-grids project:** Launched As a part of the government's initiatives to take renewable energy to remote places. The Solar Mini Grids project has an objective of taking advantage of the available solutions to promote universal energy access by 2025 and reduce electricity costs and tariffs.
- **Easy availability of domestic finance:** Through inclusion of Renewable energy in the priority sector lending and also bank loans for solar rooftop systems with subsequent tax benefits.
- **Ensuring supply chain security** through Production linked incentive scheme in Solar PV manufacturing under Atmanirbhar Bharat 3.0.
- **National Offshore Wind Energy Policy, 2015:** to explore and promote deployment of offshore wind farms in the Exclusive Economic Zone (EEZ) of the country with a target of 5.0 GW of offshore wind installations by 2022 and 30 GW by 2030. Under it the first offshore wind power project is to be set up off the Gujarat coast soon.

Potential of Renewable energy in India

India has seen an exponential growth in its renewable energy (RE) sector in the past five years (Globally, India is ranked fourth in wind power, and third in solar power in 2019). Importance of renewable energy sector for India can be gauged from following factors:

- **Meeting rising energy demands of the country:** As per NITI Ayog, India's energy demand is likely to soar around three times by 2040 due to rapid economic growth, growing urbanization, rising incomes and a steadily increasing population. This creates an important opportunity for renewable energy deployment which is affordable, secure, inclusive and environmentally friendly.
- **Universal access to electricity:** Estimates suggest that 80 million households, or more than 300 million people, have limited or no access to electricity. Decentralised distribution of renewable energy sources such as solar and wind plants can assure uninterrupted round the clock power supply to rural and remote areas.

Share of renewables in India's cumulative installed Power Capacity Mix

Nuclear 1.8% | Lignite 1.8% | Diesel 0.1%
Gas 6.7%
Coal 53.6%
Renewable Energy 35.9%
Large Hydro 12.2%
Wind Power 10.1%
Solar Power 9.6%
Bio-Power 2.7%
Small Hydro 1.3%
Waste to Power 0.04%

- **Attractive for investments in clean energy:** The country's renewable energy sector needs new investment in a range between $500 billion and $700 billion by 2030 to meet its target of 450 gigawatt (GW) of installed capacity. This would potentially generate an annual business of $20 billion indicating a huge and untapped investment potential.

- **Energy security:** India has limited sources of fossil fuels and is not geographically adjacent to any major sources of oil or natural gas supply, making it vulnerable to geopolitical and geo-economic shocks. For instance, India imports 84% of its oil needs mostly from Middle East. The renewable energy technologies would lower the demand for coal and oil products between 17% and 23% by 2030.
- **Employment generation:** Renewable Energy will account for significant job creation in urban areas as well as rural areas in manufacturing, installation and maintenance of renewable products at the dedicated site. According to the International Labour Organization, Indian renewables sector will create around 330,000 new jobs by 2022 and more than 24 million new jobs by 2030.
- **Achieving India's INDC under Paris agreement:** The country has the potential to contribute 10% of the global carbon dioxide (CO_2) emission mitigation potential from renewable energy by 2030 that is needed, when combined with increased energy efficiency, to set the work on a pathway consistent with the Paris Agreement (goal to reduce GHG emission intensity by 33-35% and to increase the share of renewables in installed capacity to up to 40% by 2030.)
- **Addition to India's savings:** The higher renewable energy uptake taking place in would result in savings twelve times higher than costs as a result of reduced costs from fossil fuel externalities related to air pollution and climate change related savings due to renewable energy.

Challenges for renewable energy deployment

- **High initial cost:** Investment in renewable energy capacity needs to gain impetus to address the higher upfront costs of renewables and the uncertainty of long-term revenue generation.
- **Absence of decentralised energy market:** Public perception, which continues to favour centralised grid-based electricity compounded by the absence of strong regulatory frameworks for distributed renewable energy. At present, the decentralised market is characterised by numerous different subsidies and standards, which are often not monitored or implemented effectively.
- **Availability of Land:** Most renewable energy plants occupy large areas of space bringing in the issue of the cost of the vast land area and other issues related to land acquisition. Also, the distance between the renewable energy source and the grid increased the cost and efficiency of renewable energy.
- **Infrastructural issues:** India's grid infrastructure is already strained and needs major improvements. Transmission and distribution losses are among the highest in the world. As the share of variable renewables (solar and wind) increases, integrating this growing variability will require greater flexibility in power- system infrastructure and storage.
- **Dependency on Weather:** Renewable energy sources like solar, wind, tide, etc., are dependent on weather conditions. If the favourable weather conditions are not available, it becomes inefficient and unfeasible.
- **Lack of skilled and knowledgeable workforce:** The lack of employees trained in the skills needed to construct and operate decentralised renewable energy systems is a continuing challenge and a barrier to meeting renewable energy targets.
- **Environmental issues:** The turbines of wind plant. have caused noise pollution and are also killing birds while functioning. The dams constructed for hydro power plants destroy the habitat of the aquatic organisms and also hinder their migration pattern. They also reduce the movements of the sediments and nutrients which in turn affects the floodplains and deltas.

Way ahead

While lots of on the ground innovation and technology development occurring, and policy measures being taken on many levels in the country, there are few key areas where additional solutions are needed for India to realise significantly higher renewable energy uptake.

- **Establishing transition pathways for renewable energy** through
  - Improving the enforcement of renewable energy purchase obligations (RPOs);
  - Creating conducive land acquisition policies; and
  - Increasing outreach to banks and establish a Green Bank.
- **Creating an enabling business environment** through
  - **Developing policy frameworks** that provide a level playing field for renewable energy and facilitate the formation of markets;
  - **Ensuring transparent bidding processes,** with rigorous selection criteria and broad stakeholder participation;
  - **Reduce or mitigate red tape** to encourage investors and project developers;

- o **Mobilise investments and reduce the costs of financing**; and
- o **Reflect the true costs of fossil fuels in energy pricing** by including externalities relating to air pollution and carbon emissions.
- **Integrating renewable energy**
  - o **Strengthen transmission grids**, reducing grid losses, and improving the resilience of the power system by investing in storage, as well as utilising transport/power-sector synergies.
  - o **Recognising the linkages between electricity, heating and transport needs** for a holistic approach to energy development.
  - o **Encouraging the use of information and communication technologies** for managing peak loads, especially in cities, which can also help to integrate renewable power;
  - o **Creating a national bioenergy mission** focused on helping to meet industrial energy demand, including increasing the collection of agricultural, forest and waste residues.
- **Managing knowledge: Timely and robust data** must be made available, and **relevant skills** must be developed along with **programmes to increase the awareness** of modern energy technologies and their maintenance.
- **Unleashing innovation**
  - o **Incorporating renewable energy standards into the building codes** for all new buildings in cities; and
  - o **Promoting technological development** in energy storage, energy monitoring and mechanisms to maintain a system balance.
  - o **Exploring new areas of opportunities** such as Wind – Solar Hybrid, Off-shore Wind Energy, Floating PV Projects etc.

5.6.1. HYBRID RENEWABLE ENERGY

Why in news?

Ministry of New and Renewable Energy (MNRE) recently proposed the scheme for "**Development of Wind Parks/ Wind-Solar Hybrid Park**".

More on news

- Sites have been identified across seven states**, Tamil Nadu, Andhra Pradesh, Karnataka, Telangana, Gujarat, Rajasthan and Madhya Pradesh.**
- The capacity of each park proposed is **around 500 MW and more** but shall not be less than 50 MW.
- **Centre will provide financial assistance** to states for development of parks.
- Recently, government also cleared land allotment for a **mega renewable energy hybrid park in Kutch region with capacity 41,500-megawatts** (solar and wind).

HYBRID RENEWABLE ENERGY SYSTEM

What is hybrid renewable energy?

- Hybrid renewable energy usually **comprises of two or more renewable energy sources combined in such a way to provide an efficient system** with appropriate energy conversion technology connected together to feed power to local load or grid.
- Renewable Energy Hybrids are the **solution to a reliable, affordable and dispatchable integration of renewable energies,** from the combination and integration of renewable energy generation sources with one another, such as wind and solar.
- There are different types of hybrid renewable energy systems **like Biomass-wind-fuel cell, Photovoltaic-wind, Hydro-wind and Photovoltaic-Biomass** etc.

Mains 365 – Updated Study Material
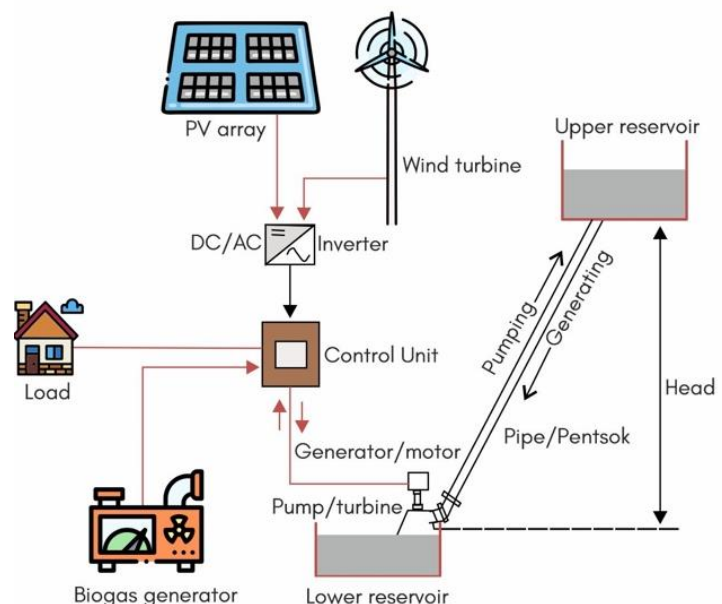
Benefits of hybrid renewable energy parks

- **Enhanced and flatter power output:** Hybrid parks make power generation profile flatter over time compared to a pure wind or solar installation to eliminate rapid voltage and power fluctuations in the electrical grid, make power dispatch more schedulable.
- **Optimised the use of the network:** Number of instruments connectable is limited and hence maximise the use of the existing network/instruments.
- **Continuous power supply:** The hybrid solar systems provide power continuously, due to integration of multiple renewable sources like solar, wind, hydro etc.
- **Efficient use of land:** Due to common use of land for different energy resources in hybrid energy parks improves land use efficiency.
- **Lower consumer price of power:** Lower investment, running and transmission cost in hybrid renewable energy parks will reduce the cost of power.
- **Reduced losses**: They are beneficial in terms of reduced line and transformer losses, reduced environmental impacts, increased system reliability, improved power quality and increased overall efficiency.

Concerns with hybrid renewable energy parks

- **High installation cost**: Initial investment for the installation of a hybrid renewable energy systems is high as compared to installation of pure wind or solar systems.
- **Grid security and stability:** These systems can be connected to a utility grid and often frequency mismatch arises between both systems leads to instability of the overall system.
- **Environmental impact:** There are concern about the impact of renewable energy parks on ecology and wildlife in the region.
- **Resource location:** Hybrid renewable energy plants require large areas of space, hence availability and acquisition of such large scale of land delaying the installation of parks.
- **Weather condition:** As energy generation from park is dependent on associated local weather and if favourable weather is not available then operating capacity of park becomes inefficient and unfeasible.

Way forward

- **Financial support:** Funds are required for R&D, conducting training and workshops, which helps to evaluate progress in technology, and the presentation of renewable energy technologies across the country.
- **Resolving intermittency issue:** The intermittency of wind and solar can be balanced by adding a fast ramping source of power; for example, an open cycle gas turbine.
- **Technical advancement:** It is equally important to have proper R&D for such systems so that they can be used effectively.

Related information
National wind-solar hybrid policy
- The main objective of the Policy is to **provide a framework for promotion of large grid connected wind-solar PV hybrid system** for optimal and efficient utilization of transmission infrastructure and land and achieving better grid stability.
- Policy aims **to encourage new technologies, methods and wayouts involving combined operation** of wind and solar PV plants.
- **Implementation strategy**
  - **Configurations and use of technology**
    - ✓ **Wind-Solar Hybrid- AC integration:** In this configuration the AC output of the both the wind and solar systems is integrated either at LT side or at HT side.
    - ✓ **Wind-Solar Hybrid- DC integration:** In this DC output of the both the wind and solar PV plant is connected to a common DC bus and a common invertor suitable for combined output AC capacity is used to convert this DC power in to AC power.
  - **New Wind-Solar Hybrid Plants and** hybridisation of existing wind/solar PV plants.
  - **Battery Storage:** Battery storage may be added to the hybrid project to reduce the variability of output power and higher energy output as well as to ensure availability of firm power for a particular period.
- **Regulatory requirements:** The Central Electricity Authority and CERC shall formulate necessary standards and regulations for wind-solar hybrid systems.
- **Standard and quality:** For wind turbines, solar modules and balance of systems, the technical guidelines issued by the Ministry from time to time for grid connected systems will be followed.

- **Incentives:** The Government will encourage development wind-solar hybrid systems through different schemes and programmes. All fiscal and financial incentives available to wind and solar power projects will also be made available to hybrid projects.
- **Research and development:** Government will support the technology development projects in the field of wind-solar hybrid systems. Besides, support will be provided for development of standards for hybrid systems.
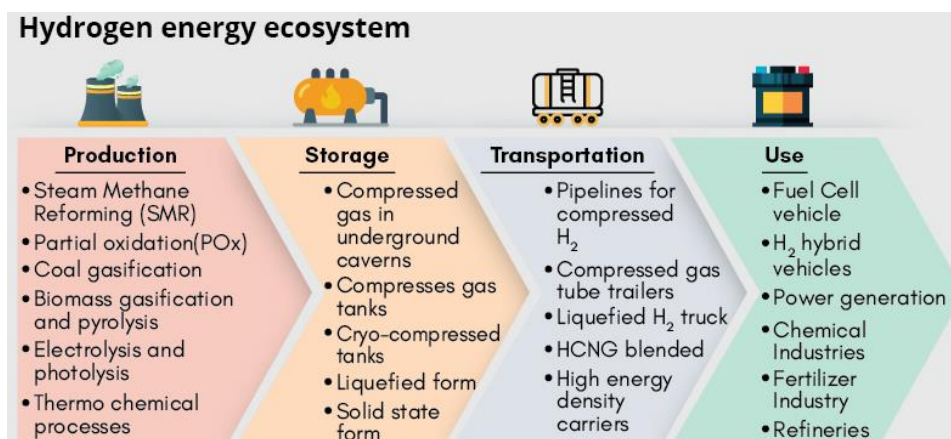
5.7. HYDROGEN BASED ENERGY

Why in news?

Indian firms such as NTPC Ltd, Indian Oil Corporation, Acme Solar and Greenko are looking at hydrogen as a new business opportunity for extracting energy.

About Hydrogen as fuel

- Hydrogen (H_2) is an **alternative fuel** that can be produced from diverse domestic resources.
  - It is abundant in our environment and it's stored **in water (H_2O), hydrocarbons (such as methane, CH_4), and other organic matter.**
  - Hydrogen is an **energy carrier that can be used to store, move, and deliver energy** produced from other sources.
  - Hydrogen with its **abundance, high energy density, better combustion characteristics**, non-polluting nature etc. has vast advantages over the conventional fuels.
- Hydrogen economy will be a **cornerstone of the future energy system** which can substitute the conventional fuels.
- **Types of hydrogen depending upon process of extraction**
  - **Green hydrogen:** It is derived by electrolysis of water, separating the hydrogen atom within it from oxygen using renewable energy (such as wind, solar or hydro) that eliminates emissions during process.
  - **Grey hydrogen:** Hydrogen derived using fossil fuels is called as grey hydrogen.
  - **Blue hydrogen:** It is derived from natural gas through the process of steam methane reforming (SMR). SMR mixes natural gas with very hot steam, in the presence of a catalyst, where a chemical reaction creates hydrogen and carbon monoxide.
- The current **global demand of hydrogen is 70 million tons per year,** most of which is being produced from fossil fuels — 76% from natural gas and around 23% from coal, with the remaining from electrolysis of water.
  - In India, **hydrogen is being commercially produced in the fertilizer industry, petroleum refining and chemical industries** and also as a by-product in chlor-alkali industries.
  - Cleaner methods of hydrogen production chiefly constitute **electrolysis, via chemical or photoelectrochemical routes.**

Hydrogen energy ecosystem

Production	Storage	Transportation	Use
• Steam Methane Reforming (SMR)	• Compressed gas in underground caverns	• Pipelines for compressed H_2	• Fuel Cell vehicle
• Partial oxidation(POx)	• Compresses gas tanks	• Compressed gas tube trailers	• H_2 hybrid vehicles
• Coal gasification	• Cryo-compressed tanks	• Liquefied H_2 truck	• Power generation
• Biomass gasification and pyrolysis	• Liquefied form	• HCNG blended	• Chemical Industries
• Electrolysis and photolysis	• Solid state form	• High energy density carriers	• Fertilizer Industry
• Thermo chemical processes			• Refineries

Application of hydrogen:
- **Fuel cell:** Hydrogen fuel cell systems are used for generating electricity, in vehicular applications (Fuel cell cars, buses, etc.) and portable devices (Laptops, phones, etc.)
  - A **fuel cell is a device that generates electricity by a chemical reaction.** An electrolyte (membrane) carries electrically charged particles from one electrode to the other (anode and cathode), as well uses catalysts to speed up the reactions and produce electricity at the electrodes.

- o **Only water vapour and heat** are emissions from fuel cell.
- **Direct fuel in internal combustion (IC) engine vehicles:** Hydrogen is used as an energy carrier directly in IC engines and turbines in place of fossil fuels or as blended mixture with fossil fuels.
  - o **Eg. H-CNG,** the is hydrogen enriched compressed natural gas upto 30%, with better power output, 4% more fuel economy and 70% more reduction in carbon monoxide emissions than CNG.
- **Chemical industries, Fertilizer industries, refineries:** Hydrogen is used as a raw material in the fertilizer, chemical and petroleum refining industries as it is a fundamental building block for the manufacture of ammonia.

Advantages of hydrogen-based energy:

- **Reduced imports:** Hydrogen as an efficient fuel helps to reduce crude oil import and its use as feedstock for ammonia production reduces India's fertilizer imports.
  - o India is the **world's third largest consumer of oil,** for which country has to depend heavily on oil imports.
- **Non-polluting & decarbonising:** The use of hydrogen can reduce the CO_2 related emissions significantly at the point of use and if green hydrogen is used then there is capability to decarbonize the entire value chain, enabling reduced emissions and climate change threats.
  - o Hydrogen fuel cell leave only water vapour and heat as emissions and releases no greenhouse gasses.
- **Abundance:** Hydrogen can be produced locally from numerous sources like methane, gasoline, biomass, coal or water.
- **High efficiency:** Hydrogen is an efficient energy source, means that an automobile that utilizes hydrogen energy travels more miles than one with an equal amount of gasoline.
- **High energy density**: Hydrogen has the highest energy per mass of any fuel, it is 120 MJ/kg, almost three times more than diesel or gasoline.
- **Address energy requirement:** Hydrogen can provide linkages between energy supply and demand, in both a centralized or decentralized manner, thereby enhancing the overall energy system flexibility.

Challenges in growth of Hydrogen based economy

- **Energy intensive:** For e.g. green hydrogen requires a massive expansion of renewable generation to power the electrolysis plants that split water into hydrogen and oxygen.
- **Emissions:** Natural gas reforming process (methane reforming) to produce grey hydrogen requires a fossil-fuel and emits carbon monoxide and carbon dioxide. Hence, not climate friendly.
- **Storage:** Hydrogen is also hard to store, for storage it requires compression to 700 times atmospheric pressure, refrigeration to -253 degree Celsius. As well it can embrittle metal and is more explosive.

> **Steps taken in field of hydrogen energy system**
> - **National Hydrogen Energy Board:** It was set up in 2003 to prepare, implement and monitor the National Hydrogen Energy Road Map and the National Hydrogen Energy and Fuel Cell Programme.
> - **National Hydrogen Energy Roadmap**: It was laid in the year 2006 to provide a blueprint for hydrogen energy development in the country.
> - **High level steering committee:** It was constituted under the chairmanship of Dr. K. Kasturirangan for Hydrogen and Fuel cells, committee prepared comprehensive reports on different themes like hydrogen production, storage, utilization, transport, safety and standards.
> - **Mission Innovation:** It is global initiative to accelerate global clean energy innovation, which include innovation challenge on renewable and clean hydrogen and India is participating in this challenge.

- **Additional costs**: In case of centralized production, the cost of hydrogen generation is lower due economies of scale but Transmission & Distribution (T&D) costs are higher, while in decentralised production say at the refuelling station (using on site electrolyser or reformer), the T& D costs are minimized but cost of production is higher.
- **Code of standard:** The biggest challenge to the commercialization of the hydrogen-based technologies is the requirement of code and standards to get a sort of consistency and encourage deployment.

Way forward

- **Development of code of standards** will help in dealing with Hydrogen vehicles in particular and help in progress of Hydrogen economy in a smoother way.
- **Advanced research and technology developments** are necessary to improve the efficiency of fuel cells, tolerant to impurities, use of non-precious metals as catalyst etc.

- **Need to develop safe and cost-effective solid-state storage methods** using development of carbon nanostructures to achieve the desired storage goals.
- **Major R&D programmes should be introduced** linking with applications which may have market acceptance. For this, large number of demonstrative projects should be supported by Department of Science & Technology in production, storage and application areas in addition to usual development projects.
- **Generation of hydrogen from renewable sources** should be encouraged and Government should explore policies for subsiding hydrogen price generated from renewable sources.
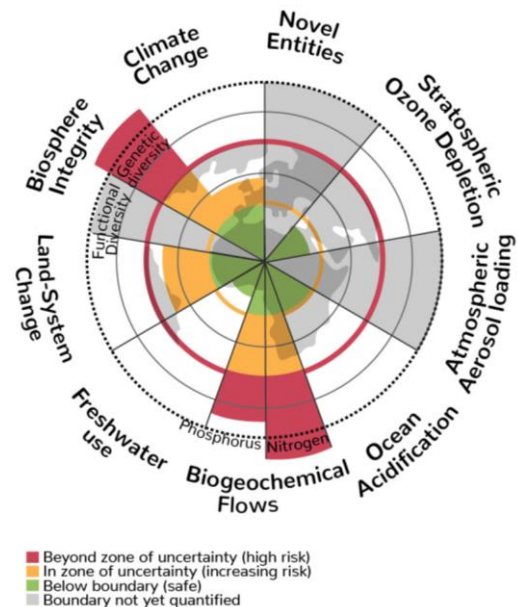
5.8. CIRCULAR BIOECONOMY

Why in News?

Recently, European Forest Institute (EFI) published the **10-point Action Plan for a Circular Bioeconomy of Wellbeing.**

About Circular Bioeconomy

- **The "Circular Bioeconomy" is defined as the intersection of bioeconomy and circular economy.**
  - The **bioeconomy substitutes fossil carbon by renewable carbon** from biomass from agriculture, forestry and marine environment (including by-products and wastes).
  - A circular economy is an **industrial system that is restorative or regenerative** by intention and design.
    - ✓ It **replaces the end-of-life concept with restoration,** shifts towards the use of renewable energy, eliminates the use of toxic chemicals and aims for the elimination of waste through the superior design of materials, products, systems and business models.
    - ✓ Nothing that is made in a circular economy becomes waste, moving away from our current linear 'take-make-dispose' economy.
- The **10-point Action Plan** needed to create a circular bio-economy based on a synergistic relationship between economy and ecology, includes following:
  - Focus on sustainable wellbeing
  - Invest in nature and biodiversity
  - Generate an equitable distribution of prosperity
  - Rethink land, food and health systems holistically
  - Transform industrial sectors
  - Reimagine cities through ecological lenses
  - Create an enabling regulatory framework
  - Deliver mission-oriented innovation to the investment and political agenda
  - Enable access to finance and enhance risk-taking capacity
  - Intensify and broaden research and education

Legend:
- Beyond zone of uncertainty (high risk)
- In zone of uncertainty (increasing risk)
- Below boundary (safe)
- Boundary not yet quantified

Why Circular Bioeconomy?

- The current linear fossil-based economic model has resulted in our **society already crossing some of the planetary boundaries** for a safe operating space for humanity.
  - **Planetary boundaries** define global biophysical limits that humanity should operate within to ensure a stable and resilient Earth system—i.e. conditions that are necessary to foster prosperity for future generations. There are nine planetary boundaries. (see fig.)
- **Current economic model is not working** with a third of the world's land is severely degraded, up to 1 million species are threatened with extinction etc.
- **Circular bioeconomy will result in** improved resource and eco-efficiency, low GHG footprint, reducing the demand for fossil carbon etc.
- The circular bioeconomy's potential for innovation, job creation and economic development is huge, with estimates **indicating a trillion-dollar opportunity.**

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5.9. MANAGING URBAN WATER BODIES

Why in News?

Recent urban floods in Hyderabad have highlighted issues regarding management of water bodies in Indian cities.

About Urban water bodies

- Urban water bodies in India range from riverfronts, lakes and ponds to marshes, mangroves, backwaters, lagoons and other wetlands. E.g. - Hussainsagar and Osmansagar lakes in Hyderabad.
- **Functions of water bodies in urban landscapes**-
  - **Maintaining Hydrology**: by recharging ground water, channelizing water flow to prevent water logging and flooding, shoreline stabilization etc.
  - **Source of water supply**: for drinking, industrial use, irrigation etc.
  - **Water quality improvement**: by removing excess nutrients and many chemical contaminants.
  - **Helps cities adapt to climate change effects:** such as heat island effect and flash floods
  - **Preserving the biodiversity**: by hosting a wide variety of flora and fauna including migratory species.
  - **Socio-economic functions**: Supports recreational activities, tourism, fishing, transportation etc. Some water bodies also act as sites of artistic, religious and spiritual pursuits.

How anthropogenic activities have impacted Urban Watersheds?

- **Water pollution**: from **point sources**, such as waste water from a tributary drain, sewage draining, industrial effluents etc., and **non-point sources** such as urban storm water runoff, solid waste and debris, pollution from agricultural fertilisers and chemicals etc. has **disturbed nutrient composition of urban water bodies**. This has led to algal blooms (through **eutrophication**), which makes these water bodies shallower and reduces their water carrying capacity.
  - Also, solid wastes, especially plastic waste, can **disconnect urban water bodies from inflow sources** and obstruct water flows in natural drainage systems.
- **Riverfront developments**: Developments on floodplains have adverse impacts on **riverbank stabilisation, riparian buffer and immediate floodplain ecological values**. Rivers are being narrowed far within their actual width with concrete riverbed wall embankments, impacting **river's flooding capacity**.
  - For example- The Sabarmati river channel, has been uniformly narrowed to 275 metres during the riverfront development project, when naturally average width of the channel was 382-330 metres.

- **Waste disposal:** The water bodies have been turned into landfills in several cases due to explosive increase in the urban population without corresponding expansion of infrastructure for the disposal of waste. Guwahati's Deepor beel, for example, is used by the municipal corporation to dump solid waste.
- **Encroachment:** through land reclamation to accommodate growing urban population can lead to loss of whole or certain portions water bodies. Charkop Lake in Maharashtra, Ousteri Lake in Puducherry, Deepor beel in Guwahati are well-known examples of water bodies that were encroached.
- **Illegal mining activities:** Illegal

> **Measures taken for protection of Urban waterbodies**
> - **Wetland (Conservation and Management) Rules 2017:** Its objective is to conserve aquatic ecosystems (lakes and wetlands), through implementation of sustainable conservation plans governed by application of uniform policy and guidelines.
> - **National Plan for Conservation of Aquatic Eco-systems (NPCA):** It prohibits activities like conversion of wetland for non-wetland uses including encroachment, solid waste dumping, etc.
> - **Atal Mission for Rejuvenation and Urban Transformation (AMRUT):** Its mission components include provision for rejuvenation of water bodies specifically for drinking water supply and recharging of ground water.
> - **Notifying wetlands under the Ramsar Convention:** It is an inter-governmental accord signed by members countries to preserve the ecological character of their wetlands of international importance.
> - **Enforcement & Monitoring Guidelines for Sand Mining:** to control the instance of illegal mining.
> - **Water (Prevention and Control of Pollution) Act, 1974:** It provides several directions to control the flow of sewage and industrial effluents into water bodies.

mining for building material such as sand and quartzite on the catchment and bed of the lakes/rivers can alter their beds, **force river to change course, erode banks, lead to flooding and affect groundwater recharge**.

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- **Fragmentation of vegetation in the urban spaces:** due to human settlements and construction. The type and amount of vegetation, and the plant community structure, can greatly **affect the storage capacity** in any watershed as healthy vegetative cover keeps soil more permeable and allows the moisture to percolate deep into the soil for storage.
- **Low capacity of urban drainage systems:** combined with factors such as higher flows during storm water, presence of impervious surfaces etc. can lead to heavy rainfall and channel flow in urban watersheds which affect natural drainage patterns through increased soil erosion and high sedimentation in eater bodies.
- **Other impacts on functions and integrity of urban water bodies-**
  o Introduction of toxic substances that can enter the food chain and are harmful to plants, fish, and wildlife
  o Reduction of water quality
  o Clogging of sections of natural drainage channels
  o Disturbance of aquatic biodiversity

Way Forward

- **Revival and restoration of water bodies:** Processes such as de-weeding, desilting, aeration, bioremediation and biomanipulation can help restore the original state of these water bodies.
- **Integrated watershed development:** by developing an understanding of their inter-connectivity of urban water bodies and taking the extent and topographical conditions of catchment area, existing and proposed storm water drains and permeability of soil conditions into account.
- **Checking encroachments on urban water bodies:** Town Planning departments should regularly monitor the prohibited areas to prevent encroachments.
- **Promote groundwater recharge and pollutant attenuation:** by removing concrete flood control channels and exposing the underlying native sediment.
- **Limit, reduce and/or mitigate for impervious surfaces:** throughout the watershed by use of new engineering techniques like pervious pathways, pervious parking lots to minimize the surface runoff.
- **Stakeholder participation and capacity building:** must be used as an important instrument for better management of urban Water Bodies.
- **Ensuring planned Urbanization:** that takes into account the delineation and protection of catchment areas, drainage channels and areas of lakes, ponds, etc.
- **Other steps:** Ensuring proper disposal of solid and liquid waste, undertaking urban forestry, restricting sand mining etc.

5.10. CYCLONE WARNING SYSTEM

Why in News?

Recently, India Meteorological Department announced to launch a dynamic, impact-based cyclone warning system.

About the impact-based cyclone warning system

- It will use **meteorological data in combination with geospatial and population data** to assess the impact of the cyclone in a particular area.
- As part of the new system, location or district-specific tailored warnings, which factor in the local population, infrastructure, settlements, land use and other elements, will be prepared and disseminated.
  o This aims to **reduce the damage and economic losses** to property and infrastructure.
- All disaster management agencies will make extensive use of cartographic, geological and hydrological data available for the district concerned.

Methodological Framework of Impact-based Forecasting (IBF) and Warning Service

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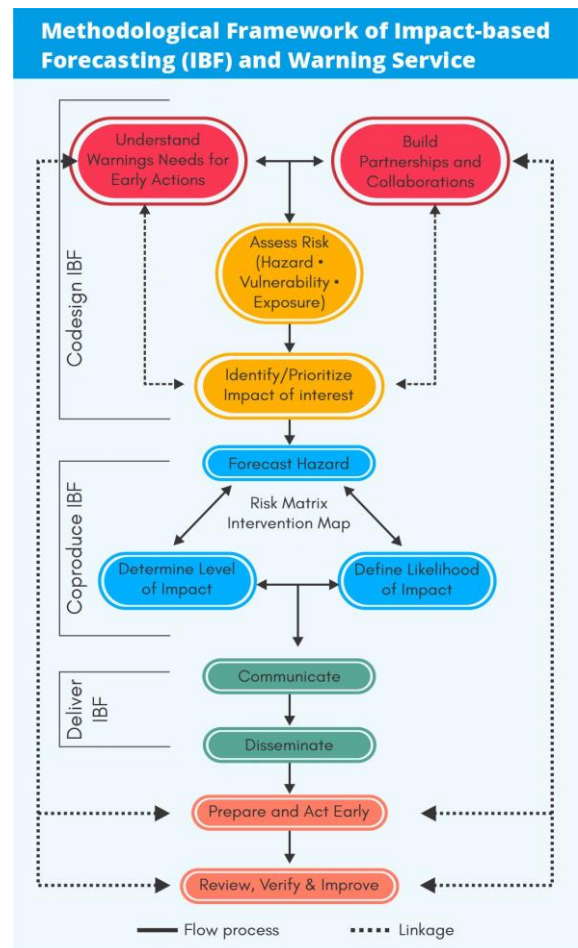
- IMD is **partnering with National Disaster Management Authority**, Indian National Centre for Ocean Information Services and respective state governments for this.

Cyclone warning in India
- Currently, **Cyclone warnings are provided** from the Area Cyclone Warning Centres (ACWCs) at Calcutta, Chennai and Mumbai and Cyclone Warning Centres (CWCs) at Bhubaneswar, Visakhapatnam and Ahmedabad.
- **Warnings are issued to state government in following four stages:**
  - **PRE-CYCLONE WATCH** issued 72 hours in advance contains early warning about development of a cyclonic disturbance.
  - **CYCLONE ALERT** issued at least 48 hrs. in advance contains information on the location and intensity of storm.
  - **CYCLONE WARNING** issued at least 24 hours in advance of the expected commencement of adverse weather over coastal areas.
  - **POST LANDFALL OUTLOOK** is issued at least 12 hours in advance of expected time of landfall.

What is Impact-Based Forecasting (IBF)?

- IBF **enables anticipatory actions and revolutionizes responses** to weather and climate crises. It provides information on the level of risk a hazard poses to a specific area.
- IBF assess the impacts of the forecasted climate and weather phenomenon and consider their **warnings based on the level and severity of those impacts** at that particular location and /or for the target users/groups.
- It provides the information needed to act before disasters to **minimise the socioeconomic costs of weather and climate hazards.**
- **How IBF is different from normal forecast:**

| Hazard	Forecast	IBF for Individuals/ members of public
Tropical Cyclone	A tropical cyclone category 3, windspeed of 125 km/h is expected in the next 48 hours	A tropical cyclone category 3, windspeed of 125 km/h is expected to make landfall in 12 hours, in X and Y regions, likely to damage critical infrastructure such as bridges, blocking transport from region X to region Y.

5.11. GLACIAL LAKES OUTBURST FLOODS (GLOFS)

Why in news?

Using remote sensing data, researchers from Germany have mapped the evolution of Gya glacial lake outburst flood (GLOF) of 2014 in Ladakh.

More about news

- Report by researchers mentions that cause of GLOF was not a spillover due to an avalanche or landslide, rather **there was a thawing of the ice cores in the moraine which drained through the subsurface tunnels.**
  - **Moraine is any accumulation of unconsolidated debris,** sometimes referred to as glacial till, that has been previously carried along by a glacier or ice sheet.
- Researchers noted that such **thawing of ice cores may accelerate in the future due to climate change**, and there is an urgent need to use multiple methods for better risk assessment and early warning.
- According to report, **bathymetric studies are needed to analyse lake volumes and its dynamics**. New, technologies can also be put to understand the stability of the moraines, but also need to asses land use planning.
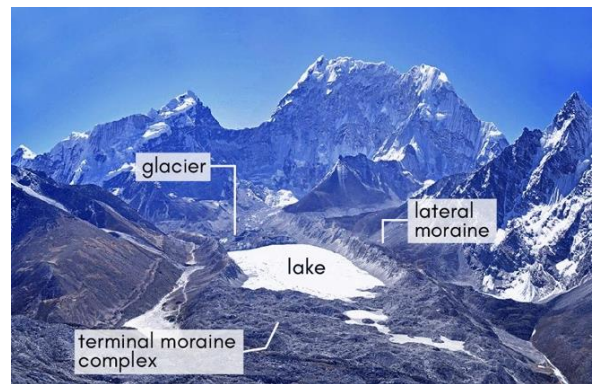
About Glacial Lakes and GLOFs

- Glacial lakes are **ice-dammed, moraine-dammed, and bedrock-dammed lakes**.
  - These lakes are formed by the **trapping of melt water from the glacier** within dammed structure.
  - Due to global warming glaciers are retreating and **glacier lakes are expanding** in the size and numbers.

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- **Glacial lake outburst flood (GLOF)** is a sudden release of a significant amount of water retained in a glacial lake, irrespective of the cause.
  - The formation of moraine-dammed glacial lakes and glacial lake outburst flood (GLOF) is major concern in the Himalayan states of India.
- **Factors triggering GLOFs include**
  - **Rapid slope movement into the lake:** Fast slope movement (slides, falls and avalanches) into the lake produces displacement waves which, in turn overtop the dam or cause direct rupture of the dam.
  - **Increased water inflow into a lake** due to heavy rainfall/snowmelt & cascading processes (flood from a lake situated upstream)
  - **Earthquake:** The direct mechanism of earthquake-triggered lake outburst floods is dam rupture and failure.
  - **Long-term dam degradation:** Successive changes in the internal structure of the dam leading to increased hydrostatic pressure induced by basal ice melting that results in dam failure.
  - **Black carbon:** Due to incomplete combustion of fossil fuels, wood and other fuels amount of black carbon is increasing, which reduces the albedo of earth and melts the glaciers.
  - **Anthropogenic activities:** Mass tourism, developmental interventions such as roads and hydropower projects and the practice of slash and burn type of farming in certain pockets of the Indian Himalayan region.

Impact of GLOFs

- **Societal Impact:** The sudden and intense flooding that results can cause destruction and disruption of property, infrastructure and deaths.
- **Impact on ocean circulation and climate:** Sudden release of an extremely large amount of cold freshwater into the ocean reduces the salinity of the surface layer and subsequently alters ocean circulation. This also influence the associated climate.
- **Geomorphological impact:** GLOFs, have significant potential to influence erosion-accumulation interactions and sediment dynamics, like bank and depth erosion of the stream/river channel, meander shift, replacement of existing channels and formation of new ones or formation of erosional terraces etc.

Steps taken

- **Indian Space Research Organisation (ISRO)** among many other organisations are engaged in glacial lake monitoring and water bodies in the Himalayan region of Indian River Basins.
- **National Disaster Management Authority (NDMA) guidelines for management of Glacial Lake Outburst Floods (GLOFs):**
  - **Hazard and risk mapping:** Hazard and risk assessment provide the basis for prioritising, designing, and implementing risk management strategies, and is therefore considered to be a cornerstone of Disaster Risk Management.
  - **Monitoring, risk reduction and mitigation measures:** Early Warning Systems (EWS) are commonly agreed upon as the most effective approach to disaster risk red
  - **Awareness and preparedness:** Building awareness and strengthening preparedness can be effective on short, mid, and longer time. In particular, attention should be given to the most vulnerable members of society, including women, children, disabled, elderly, and marginalised communities.
  - **Capacity development:** A successful and sustainable implementation of the framework for GLOF risk assessment and management requires scientific, management, engineering and institutional capacities. Efforts to develop capacities should focus both on training and strengthening academic education in relevant disciplines from natural and social sciences.
  - **Disaster response:** Well-established disaster response procedures at national, state district, and community levels. Also, response strategies need to consider a multi-hazard perspective, considering access and evacuation routes and relief camps.
  - **Research and development:** Repeated monitoring using advanced space-borne and terrestrial technology is required for regular re-assessment of lakes across the entire Himalayan region.
  - **Action plan and implementation:** Comprehensive disaster management plans will be prepared at the National, State and District levels.

- **Sikkim has installed a Lake monitoring and information System** (water level Sensor) at South Lhonak lake. The sensor gives the water level of the lake and also monitored the lake level when there is sudden fluctuation in water level.
  - o **Also high density polyethylene (HDPE) pipes have been installed to siphon off water** from the glacial lake.

5.12. LA NIÑA

Why in News?

Recently, the World Meteorological Organization (WMO) has announced the arrival of La Niña in the central and eastern equatorial Pacific Ocean after nearly a decade's absence.

El Niño-Southern Oscillation (ENSO)

- **El Niño and La Niña are opposite phases of the ENSO.** La Niña is sometimes referred to as the cold phase of ENSO and El Niño as the warm phase of ENSO.
- The ENSO cycle refers to the **fluctuations in temperature between the ocean and atmosphere in the east-central Equatorial Pacific** (approximately between the International Date Line and 120 degrees West).
  - o Along with impact on Sea Surface Temperature (SST) the ENSO also has an **impact on rainfall, temperature and wind patterns across the world.**
- La Niña and El Niño **usually last between 9 and 12 months.** While their frequency is fairly irregular, they take place every two to seven years. **Typically, El Niño occurs more frequently than La Niña.**
  - o **Normal year:** In a normal year, the easterly winds along the equator push warm water westward. Warm water at the surface of the ocean blows from South America to Indonesia.
    - ✓ As the warm water moves west, nutrient rich cold water from the deep rises up to the surface reaches on the coast of South America. This phenomenon is called **upwelling.**
  - o **La Niña:** La Niña is the **unusual cooling of sea surface temperatures.** In a La Niña year the easterly winds blow much stronger; this makes the water near the equator a few degrees colder than normal. **Thus upwelling is enhanced.** Also this change in the ocean's temperature impacts the weather across the world.
  - o **El Niño:** El Niño is the **unusual warming of sea surface temperatures (SST).** In El Niño year the easterly winds are much weaker than usual. They actually blow the other way from west to east (toward South America instead of Indonesia). So, the warm surface water along the equator piles up along the coast of South America and then moves north towards California and south toward Chile.
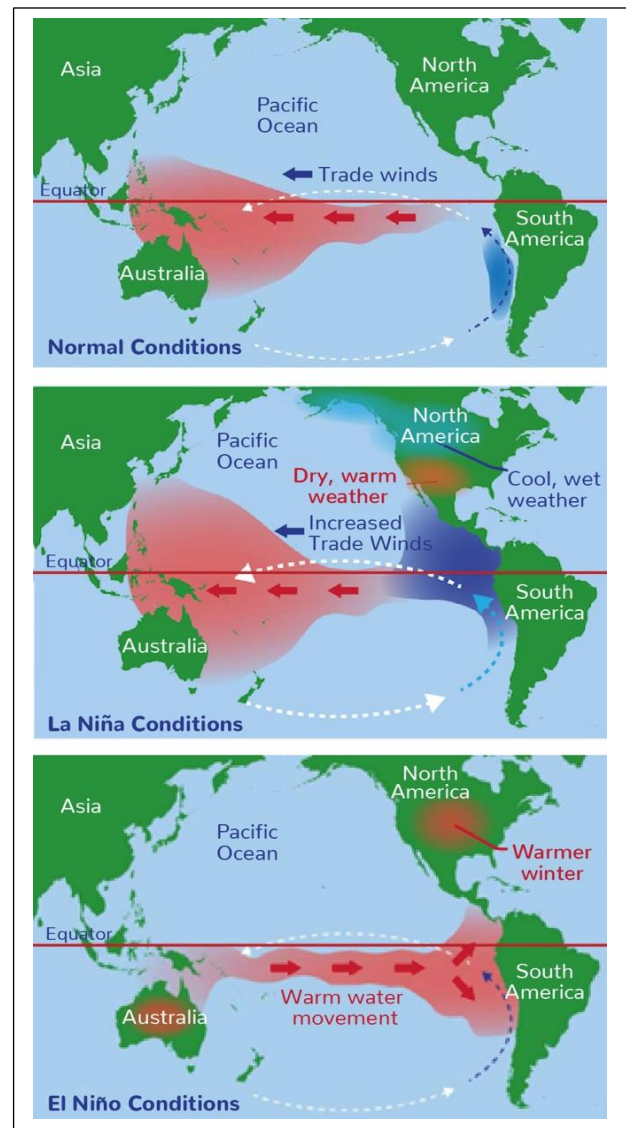
La Niña vs. El Niño

A La Niña phenomena generally affects the same regions that are impacted by El Niño, with opposite climatic consequences.

Characteristics	La Nina	El Nino
SST in the central and east-central Equatorial Pacific	large-scale cooling (Cold phase of ENSO)	Large-scale warming (Warm Phase of ENSO)
Up welling	Enhanced	Reduced
Trade winds in the Pacific	Stronger than normal	Weaker
Indian Monsoon	Better than normal Monsoon in India (may cause floods)	Weakens the Indian Monsoon (may cause draught)
Frequency of occurrence	Less frequent	More frequent

Impact of La Niña

- **Impact food production:** La Nina weather system could stir global food production, sending prices higher, as potential droughts and floods bring upheaval to a suite of key agricultural commodities from Southeast Asia to South America.
- **Fishing Industry:** La Niña usually has a positive impact on the fishing industry of western South America. Upwelling brings cold, nutrient-rich waters to the surface. Nutrients include plankton eaten by fish and crustaceans.
- **Water Supply:** Rainfall associated with the summer monsoon in Southeast Asia tends to be greater than normal (sometimes floods also occur), especially in northwest India and Bangladesh.
  - **La Niña results in heavy or better monsoon rains in India,** heavy floods in Australia, droughts in Peru and Ecuador.
- **Colder winter in India:** During La Niña years, usually, temperature over northern parts of country becomes relatively low. In that situation winter may be relatively colder.
  - La Niña could also affect the **South West Indian Ocean Tropical Cyclone season, reducing the intensity.**

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6. SOCIAL ISSUES

6.1. MINIMUM AGE OF MARRIAGE FOR WOMEN

Why in News?

Recently, Prime Minister said that the government will soon decide on revising the minimum age of marriage for women.

Background

- Government, in June 2020, **set up a Task Force (headed by Jaya Jaitly)** to examine matters pertaining to age of motherhood, imperatives of lowering MMR, improvement of nutritional levels and related issues.
- One of the Terms of Reference of the Task Force is **to examine the correlation of age of marriage and motherhood with:**
  - o Health, medical well-being and nutritional status of mother and neonate/infant/child, during pregnancy, birth and thereafter.
  - o Key parameters like Infant Mortality Rate (IMR), Maternal Mortality Rate (MMR), Total Fertility Rate (TFR), Sex Ratio at Birth (SRB), Child Sex Ratio (CSR) etc.
  - o Any other relevant points pertaining to health and nutrition in this context.

Child marriage law in India

- In India, **Prohibition of Child Marriage Act (PCMA), 2006, sets the minimum age of marriage at 18 years for women and at 21 for men.**
  - o As per a report by SBI, **mean marriage age in India is already above 21 years (i.e. 22.3 years).**
- PCMA **treats underage marriages as valid, but voidable.** It means that an underage marriage is valid as long as the minors involved in the marriage want it to remain valid.
  - o PCMA allows the minor party to repudiate the marriage or to have it nullified right up till two years of attaining majority.
- PCMA also treats those underage marriages as void or having **no legal validity, where they involve trafficking, enticement, fraud and deceit.**
- Protection of Children from Sexual Offences Act (**POCSO**) **Act penalizes penetrative sexual assault on a child** by anyone related to the child through marriage.
- **Section 375 of IPC penalizes sexual acts with a girl below 18 years of age,** with or without her consent.
- **Exception to Section 375** permitting men to consummate marriage with their brides above 15 but below 18 years of age was **read down by Supreme Court in 2017 in the case of Independent Thought v. Union of India.** Thus, now husbands can be booked for raping their minor wives.

Argument in favor of increasing legal age for marriage

- **Limits opportunity to reach full potential:** Early marriage denies girls the right to the highest attainable standard of general, sexual, and reproductive health. It also constrains evolving physical, emotional, and personal maturity required to safely transition to adulthood.
- **Poor access to healthcare**: Girls who get married at a younger age **are not educated properly and do not have adequate knowledge of or access to healthcare,** vaccination, antenatal care, and even facilities for safe delivery and also lose life owing to pregnancy complications.
- **Generational impacts: Maternal mortality, infant mortality and nutrition levels of children are dependent on age of mother.** Children who are born to mothers who tend to get married at an early age may develop health problems.
- **Limits educational opportunities**: Those who marry later are **more likely than others to have a higher secondary or college education, take on skilling opportunities,** gain a better understanding of the world around them and exercise their voices.
- **Hurdle to effective labour participation**: Marriage at a young age means **not even a quarter of women in India get into the labor force** despite accounting for almost half of the 1.3 billion population.

Determinants of marriage age in India

- **Social factors**: Marriage decisions in India are often guided by factors such as **dowry considerations** (a younger bride would mean a lower dowry), a fear of loss of family honour and fear of what will people say if the woman remains unmarried.
- **Education:** According to **National Family Health Survey** (**NFHS**) 4, women having 12 or more years of schooling marry much later than other women.
- **Religion:** The median age at first marriage for women age 25-49 is higher among Christian women (21.6 years), Jain women (21.2 years), and Sikh women (20.9 years) than women from all other specific religions (18.0-19.2 years).

- **Parity in marriage age**: It will **do away with the gender gap in the legal age at marriage (21 for male and 18 for female),** and the underlying social norm which expects women to be younger than men at the time of marriage.

Issues with increasing legal age for marriage

- **Age is not the sole of lack of education, skilling and awareness of rights:** Studies have found that age played a relatively smaller role in affecting nutrition levels than did wealth status or education.
- **Child marriage is a social and economic issue:** Despite PCMA, 2006 India is not able to stop child marriages. According to the National Family Health Survey 4 (2015-16), 26.8% of women between ages 20-24 were married before the age of 18.
- **Potential tool for parental control:** To increase the age of marriage to 21 years would mean that **girls will have no say in their personal matters until they are 21.** Child marriage law is used by parents against daughters choosing their own husbands.
- **Marriage age is already on the rise:** The median age at first marriage for both men and women in India has **registered a significant decadal improvement with more people now marrying later** than ever before. Any attempt to leapfrog through quick-fix and ill-conceived punitive measures may considerably reverse these gains.
- **Safe pregnancy:** There is also an argument that raising the minimum legal age of marriage for women to 21 years **may deny many young women from experiencing pregnancy at these safest ages.** Mortality experienced by the cohort aged 20 years to 24 years (roughly those marrying at ages 18 years and higher) is by far the lowest of all age groups.

Way forward

- **Incentivizing and enabling girls to continue schooling up to Class 12** and helping to enhance their nutrition can stop under-age marriages.
- Efforts to address child marriage in India should be in consonance with the socio-economic realities that **demand investment in education, welfare, and opportunities for women.**
- Noting the law's patriarchal underpinnings, the 18th Law Commission report (2008) asked for **uniformity in the age of marriage at 18 years for both men and women** and lowering the age of consent to 16 years, a recommendation also of the Justice Verma Committee.

6.2. ROLE OF TRADE IN PROMOTING WOMEN'S EQUALITY

Why in news?

Recently, the World Bank Group and the World Trade Organization (WTO) jointly published a report titled **"Women and Trade: The Role of Trade in Promoting Women's Equality".**

What is the role of trade in promoting women's equality?

- **Trade creates better jobs for women:** Countries that are more open to trade, as measured by the ratio of trade to gross domestic product, have higher levels of gender equality.
- **Changing nature of trade creates new opportunities for women:** New trends in global trade-especially the rise in services, global value chains, and the digital economy-are opening up important economic opportunities for women.
  - **Countries are becoming more integrated with global value chains (GVC),** which tend to create jobs and increase wages for women.
  - **Digital technology and new online platforms create opportunities for women** to bypass traditional trade barriers (finance, access to information etc), expand their entrepreneurial skills and develop flexible careers that enable them to manage both work and household responsibilities.
- **Less competitiveness:** Countries that do not allow women to fully participate in the economy are less competitive internationally.
- **Exporters employ more women:** In developing countries, women make up 33% of the workforce of exporting firms compared with just 24% of non-exporting firms.
- **Growth of services sectors:** More than two-thirds of women in developed countries were employed in the services sector in 2017, up from 45% in 1991.
  - In developing countries, the proportion of women in the service sector jumped to 38 percent from 25 percent over the same period.

- **Positive role of trade on Women:** Trade increases women's wages and increases economic equality. It decreases social inequality, and expand women's access to skills and education.

What are the constraints affecting women in their trade related roles?

- **Wage gap:** Despite many advances, women across the world hold fewer jobs, are paid less, and are more likely to experience worse job conditions than men.
- **Biased trade policy:** On its surface, trade policy is gender-neutral; no country imposes tariffs or nontariff measures by gender. But a closer look at the gender dimension of trade policies reveals following concerning trends:
    o Trade policy is inadvertently biased against women, resulting in lower levels of employment and higher prices for consumer goods.
    o Compared to men, women tend to spend a larger share of their income goods with high tariffs, such as food.
- **Women work mainly in low- to medium-skill occupations:** Although, women are increasingly moving from medium skill to high-skill jobs, 80% of women globally still occupy medium- and low-skill jobs.
- **Women are more vulnerable to global shocks to economy:** For instance, women account for 60%- 80% of the workforce in the global value chain (GVC) for apparel which has been severely affected by the temporary closure of retail shops due to the COVID-19 pandemic.
    o Similarly, in tourism and hospitality and related sectors women are specifically active.
- **Social, legal and financial barriers:** Women still face wide range of social, legal, financial barriers that prevent them from gaining from greater trade opportunities. These challenges are magnified by a lack of sex-disaggregated data.

Way ahead

- **Enhance cross-border trade through trade facilitation and trade finance:** This can be a catalyst for women traders by creating predictable and efficient customs processes, reducing clearance times and trade costs, increasing the involvement of women in trade facilitation decision mechanisms etc.
- **Improving women's access to trade finance:** This can contribute to empowering women-owned and managed firms.
- **Lower tariff and nontariff barrier:** Female workers, particularly in developing economies, are affected by stubbornly high tariffs on agricultural goods, tariffs on textiles.
    o In India products produced largely by women face on average 6% higher tariffs than products produced largely by men in export markets (2018).
    o **Nontariff measures raise the compliance costs** associated with procedures, regulations, and standards, which can be particularly burdensome for small enterprises with little experience in trade—as is the case for many women-owned firms.
- **Increase women's capacity to engage in international trade:** Targeted policies can help women overcome the challenges; maximize the benefits of trade opening, including services trade, digital trade etc.
    o Proper compensation policy could protect women from the heat of automation.
- **Collective efforts to promote trade and gender equality**
    o International institutions can support trade and gender equality through the maintenance and **strengthening of open, rules-based, and transparent trade.**
    o **Ongoing WTO negotiations and joint initiatives** related to services, agriculture, electronic commerce, and micro, small, and medium enterprises **could further empower women in the world economy.**
    o In addition, impact evaluations of international assistance, **including Aid for Trade with a gender component,** can provide feedback on the kinds of interventions that are most effective in promoting gender equality in trade.
    o Further analysis and technical assistance should continue to **take advantage of increasing access to sex-disaggregated data** to identify priority sectors, skills, and markets in which women have a comparative advantage.

6.3. PATERNITY LEAVE

Why in news?

Recently the Board of Control for Cricket in India (BCCI) granted paternity leave to the Indian captain. **What is paternity leave?**

- Paternity leave is a **leave period (paid) reserved exclusively for fathers in relation to childbirth** and it is granted to father in addition to the other annual leaves.
- **Paternity leave in India**
  o There is **no legal provision for paternity leave** in India.
  o **All India and Central Civil Services Rules** allow Central government employees **with less than two surviving children** 15 days of paternity leave.
    ✓ This also extends to cases where **a child has been adopted.**
    ✓ This **could be availed up to six months** from the date of delivery or adoption of the child.
  o **Private organisations:** There isn't any such law that mandates private sectors to provide the paternity leaves to its employees.
    ✓ Certain private establishments also provide paternity leaves. Like Food aggregator **Zomato India** provides 26 weeks paid leave for new fathers.
  o **In Chander Mohan Jain v. N.K Bagrodia Public School, 2009** the Delhi High Court held that "all male employees of unaided recognized private schools were entitled to paternity leave."
- **UNICEF** had the provision of four weeks paid paternity leaves to its male employees but now it has been extended to sixteen weeks across all its offices worldwide.

Significance of paternity leave

WHERE FATHERS GET THE MOST PAID PARENTAL LEAVE

Weeks of paid parental leave that can only be taken by the father

Country	Weeks
South Korea	53
Japan	52
France	28
Sweden	14
Norway	10
Germany	9
Spain	2
United Kingdom	2
Australia	2
Turkey	1
Canada	0
United States	0

Related information
Child Care leaves
- According to All India Services (Leave) Rules, **women employees and "single male parent" employees** with less than 2 surviving children are granted 730 days of aggregate child care leave.
- This could be **availed anytime before the child reaches the age of 18** (for disabled child no ceiling on the age of the child).
- Child Care Leave was introduced by the 6th Pay Commission.

Maternity leaves
- The leave policy is regulated by the **Maternity Benefit (Amendment) Act, 2017.**
- The law applies to all establishments **employing 10 or more people.**
- **For the first surviving child up to 26 weeks of maternity leave** is granted for two or more surviving children the maternity benefit is for 12 weeks only.
- **For adoptive and commissioning mothers 12 weeks** of maternity leave is granted.
- To be eligible for maternity benefit, a woman must have been working as an employee in the **establishment for a period of at least 80 days in the past 12 months.**
- **Act makes it mandatory for employers to educate women** about the maternity benefits available to them at the time of their appointment.

- **Emotional need of the child:** According to International Labour Organization, a child requires equal support from both parents in the first 1,000 days. Quality father–child interactions enhance the resources of paternal capital available to the child thus contributing to healthy development of the child.
- **Health of the mother:** Much of the attention is typically placed on the health and well-being of the newborn baby. The postpartum depression and anxiety symptoms of the new mothers are generally ignored. Father's ability to stay home may play a role in reducing such depressions and anxiety.
- **Nuclearisation of family:** As a result of which the level of child-care support to the mother from extended family members is much less available nowadays. Paternity leave would ease the burden of the mother who otherwise has to bear the whole responsibility of the child care alone.
- **Bridging the gender gap at home for facilitating gender equality at workplace:** Women's equality in the workplace cannot be achieved without men's equality in the home. As per **All India Survey on Higher Education (AISHE) 2018-19**

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o Females constitute 48.6% of the total enrolment in higher education
o The Gross Enrolment Ratio (GER) for females in higher education is 26.4% against 26.3% for boys.
o The **Gender Parity Index (GPI) has increased** from 0.92 in 2014-15 to 1 in 2018-19.
o However, these achievements in education **could not be translated in women's participation of workforce**.

Challenges in paternity leave

- **Lack of will power among employers:** Many organisation do not provide even maternity leave which is statutorily backed by the Maternity Benefit (amendment) Act 2017.
- **Funding:** Public exchequer has its own limitations while private organizations may not be willing to bear any extra cost and if employees are made to fund such leave policy then the idea may not result in desired outcome.
- **Patriarchal society:** According to International Labour Organization, Indian Men perform only 10% of the unpaid care work and more than 80% believe that taking care of the child is the primary responsibility of the mother.

Way ahead

- **Universalize the Gender Equity Movement in Schools (GEMS) project:** It is a gender sensitization programme for 12-14 year young school kids being implemented in the public schools of Maharashtra from 2010.
  o Its objective is to influence the **formation of more gender-equitable norms among adolescents**.
  o The audit of the program has revealed a positive outcome among students for gender issues.
- **Nudging:** Various means for attitudinal and behavioural changes needs to be employed ensuring active role of male partner before, during and after the child birth.
- **Legislative reforms:** Paternity Benefit Bill, 2018 should be passed with utmost propriety for ensuring better outcome of all the steps taken for behavioural changes.
  o Bill pushes for equal **'parental' benefits for both the mother and the father.**
  o It aims to cover the **organised sector, the unorganized sector and the self-employed.**
  o It also **creates Parental Benefit Scheme Fund** which will be utilized to meet the costs related to paternity benefits.

6.4. MANUAL SCAVENGING

Why in news?

Ministry of Housing and Urban Affairs launched the **'Safaimitra Suraksha Challenge'** in 243 cities across the country **to end manual scavenging by 2021.**

About Manual Scavenging

- **Manual Scavenging** is the practice of manual cleaning of human excreta from **service/ dry latrines.**
  o **Service/dry latrine** is a type of toilet which is waterless and from which human excrement is collected from buckets, cesspools and privies manually.
  o The scavengers crawl into the dry latrines and collect the human excreta with their bare hands, carry it as head-load in a container to dispose it off.
- **Status in India:**
  o According to the data collected by the Safai Karmachari Andolan (SKA), **UP** is among states with the **highest number of dry and service latrines**.
  o A recent government survey conducted in 170 districts in 18 States identified 54,130 **people engaged in this job** as of July 2019.
  o As per the data collated by SKA, there **were 1,870 sewer deaths reported in India** from 1993-2019 with maximum sewer death occurring in Tamil Nadu.

Why does manual scavenging still persist in India?

- **Continued presence of insanitary latrines:** There are about 2.6 million insanitary latrines (dry toilets) that require cleaning by hand.
- **Lack of infrastructural and institutional Machinery:** The numerous operational activities along the sanitation chain — emptying and conveyance of faecal sludge, sewer maintenance, treatment, and end use/disposal have often been invisible or at least disregarded in regulatory frameworks.

- o Due to engineering defects in septic tank, **machine cannot clean it after a point and require manual cleaning.**
- **Social perception:** It is a caste based and hereditary profession and defined as a "cultural occupation" attached to lower castes.
  - o The blindness is fostered by the fact that manual scavengers come from among the Dalits; the **lack of opportunity and education compels them to continue** in their inherited work.
- **Loopholes in the legal protection:** 2013 Act bans 'hazardous cleaning' of septic tanks and sewer pits, but only if the workers are not provided 'protective gear' and 'other cleaning devices'. But it **does not define what the 'protective gear' is.**
  - o The Act does not address critical aspects of provisions like the **rehabilitation** of those who were liberated from manual scavenging before passing the law in 2013.

Key challenges and risks associated with manual scavenging:

- **Occupational and Environmental Health and Safety:** They are exposed to hazardous gases and biological and chemical agents in septic tanks, sewers, pumping stations, and treatment plants.
  - o Mostly work without any form of **personal protective equipment (PPE).**
  - o Many informal and temporary sanitation workers operate with **little to no formal training** on the occupational risks of their work.
- **Legal and Institutional Challenges:** They often suffer because of informal nature of work, weak legal protection and lack of enforcement of existing rules.

> **Measures taken so far in India:**
> - **Constitutional/Legal/Institutional Measures:**
>   - o India's Constitution **bans the practice of untouchability under Article 17,** and the **Protection of Civil Rights Act, 1955,** prohibits compelling anyone to practice manual scavenging.
>   - o **National Commission for Safai Karamcharis (NCSK) Act, 1993** enacted to form a statutory body NCSK to look into matters concerning the Safai Karamcharis' welfare.
>   - o **Employment of Manual Scavengers and Construction of Dry Latrines (Prohibition) Act, 1993,** declared the employment of manual scavengers and construction of dry toilets to be punishable with fines and imprisonment.
>   - o Superseding the 1993 Act, **the Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013,** goes beyond prohibitions on dry latrines, and outlaws all manual excrement cleaning of insanitary latrines, open drains, or pits.
>   - o **National Safai Karmacharis Finance and Development Corporation,** established in 1997, mandated to monitor implementation of programs and extend financial assistance.
> - **Sanitation Schemes**
>   - o Integrated Development of Small and Medium Towns Scheme (1969),
>   - o Total Sanitation Campaign, 1999, renamed Nirmal Bharat Abhiyan
>   - o Swachh Bharat Abhiyaan, 2014
> - **Rehabilitation Schemes**
>   - o National Scheme of Liberation of Scavengers and their Dependents, 1992.
>   - o Scheme for Self-Employment for Rehabilitation of Manual Scavengers, revised in 2013.
> - **Civil Society/other Initiatives**
>   - o **Safai Karmachari Andolan (SKA), 1995,** currently spearheaded by **Wilson Bezwada,** is a nationwide movement to completely eradicate the caste-based occupation, and rallies for the rehabilitation of scavengers towards dignified livelihoods.
>   - o In 2002, **Rashtriya Garima Abhiyan—**a coalition of 30 community-based organizations from 13 states—started a campaign to encourage manual scavengers to voluntarily leave the practice.

- **Social Challenges:** Low-grade, unskilled sanitation workers often face social stigma and discrimination. This is especially true when sanitation is linked to a caste-based structure.
  - o This stigma compounds the **social ostracizing and limitations on social mobility** that workers face and often results in intergenerational discrimination and form a **multigenerational poverty trap.**
- **Exposure to diseases:** Human faeces and urine are carriers of Hepatitis A, pinworms, Rotavirus, and E.coli exposing the workers to cholera, hepatitis, typhoid, tuberculosis, etc.

Areas for Action

- **Reform policy, legislation and regulation** that acknowledge and professionalize the sanitation workforce along the sanitation service chain.
  - o First, **recognize all types of sanitation work** and provide the frameworks that enable the organization and empowerment of sanitation workers; workers' right to organize needs to be protected.
  - o Second, **promote the gradual formalization and mechanization** of the work.

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o   Third, **articulate protection mechanisms**, covering measures such as **personal protective equipment (PPE),** training, regular health checks, insurance, and treatment for workers to mitigate their occupational risks across the sanitation chain.

- **Develop and adopt operational guidelines** (especially local governments) to assess and mitigate the occupational risks of all types of sanitation work, including national standard operating procedures, municipal-level oversight of sanitation service providers.

- **Adoption of technology** to end manual scavenging.
  o   The **Hyderabad Metropolitan Water Supply and Sewerage Board** is using 70 mini jetting machines that can access narrow lanes and smaller colonies to clear the choked sewer pipes.
  o   In Thiruvananthapuram, a group of engineers has designed a **spider-shaped robot called "BANDICOOT"** that cleans manholes and sewers with precision.

- **Advocate for sanitation workers** and promote their empowerment to protect worker rights and amplify workers' voices through unions and associations.

- **Build the evidence base to address the issues of quantification of the sanitation workforce** and documentation of challenges that workers face and good practice in improving working conditions.
  o   **Research institutions, universities, along with national and municipal governments** could collaborate in addressing the key knowledge gaps in the sector.

Conclusion

Thus, protecting the manual scavengers in not only a matter of rights, health, and dignity of the workers themselves, but it also is key to ensuring a sufficiently large, formalized, and protected workforce to deliver and sustain safely managed sanitation services with dignity, as has been called for under the **Sustainable Development Goals (SDGs).**

6.5. ELDERLY POPULATION IN INDIA

Why in News?

Ministry of Health and Family Welfare **launched Decade of Healthy Ageing (2020-2030)** on International Day for Older Persons.

Status of Elderly Population in India

- According to **Population Census 2011 there are nearly 104 million elderly persons (aged 60 years or above) in India**; 53 million females and 51 million males.
  o   A report released by the United Nations Population Fund and HelpAge India suggests that the number of elderly persons is expected to grow to 173 million by 2026.
  o   **71% of elderly population resides in rural areas while 29 % is in urban areas.**

- The **old - age dependency ratio climbed from 10.9%** in **1961 to 14.2% in 2011** for India as a whole. For females and males, the value of the ratio was 14.9 % and 13.6% in 2011.
  o   The **dependency ratio is an age-population ratio of those typically not in the labour force** (the dependent part) **and those typically in the labour force** (the productive part).
  o   It is used to measure the pressure on productive population.

- State - **wise data on elderly population divulge that Kerala has maximum proportion of elderly people** in its population (12.6 per cent) followed by Goa (11.2 per cent) and Tamil Nadu (10.4 per cent) as per Population Census 2011.

> **About Healthy Ageing**
> - World Health Organisation (WHO) defines healthy ageing **as "the process of developing and maintaining the functional ability that enables wellbeing in older age."**
>   o   Functional ability is about having the capabilities that **enable all people to be and do what they have reason to value.** For e.g. meeting their basic needs; make decisions; be mobile etc.
>   o   It includes **all the physical and mental capacities** of an individual and their interaction with environment (home, community etc.)
> - **Healthy ageing replaces the World Health Organization's previous focus on Active ageing**, a policy framework developed in 2002.
>   o   Active ageing is the **process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age.**
>   o   **It is based on Madrid International Plan of Action, 2002.**
>   o   Madrid Plan of Action offers a bold new agenda for handling the issue of ageing in the 21st-century.
>   o   **It focuses on three priority areas:**
>   ✓   older persons and development;
>   ✓   advancing health and well-being into old age; and
>   ✓   ensuring enabling and supportive environments.

- The **least proportion is in Dadra & Nagar Haveli (4.0 per cent) followed by Arunachal Pradesh** (4.6 per cent) and Daman & Diu and Meghalaya (both 4.7 per cent).

Challenges Faced by elderly population

- **Social**
  - **Ageist stereotypes:** Stereotyping (how we think), prejudice (how we feel) and discrimination (how we act) towards people on the basis of their age, ageism, affects people of all ages but has particularly deleterious effects on the health and well-being of older people.
    - ✓ This marginalizes older people within their communities, reduces their access to services, including health and social care, and limits appreciation and use of the human and social capital of older populations.

  - **Changing Family Structure:** Traditional Indian society with an age-old joint family system has been instrumental in safeguarding the social and economic security of the elderly people. However, with the emerging prevalence of nuclear family set-ups in recent years, the elderly is likely to be exposed to emotional, physical and financial insecurity in the years to come.

> **Initiative taken by government for elderly population**
> The **Constitution of India, under Article 41,** instructs states to work towards the well-being of **senior citizens,** by making effective provision for securing the right to work, to education and to public assistance.
> **Policies and programmes** enacted by the Government of India are**:**
> - **Integrated Programme for Older Persons (IPOP)** to improve the quality of life of older persons by providing basic amenities like shelter, food, medical care and entertainment opportunities, etc.
> - **National Programme for Health Care of the Elderly (NPHCE)** is an initiative to provide dedicated health care services to the elderly population at various levels of primary health care settings.
> - **Maintenance and Welfare of Parents and Senior Citizens Act** to ensure need-based maintenance for parents and senior citizens and their welfare.
> - **Indira Gandhi National Old Age Pension Scheme (IGNOAPS),** earlier called as "National Old Age Pension Scheme (NOAPS)", under which Central assistance in form of Pension is given to persons
> - **Rashtriya Vayoshri Yojana (RVY)** under which aids and assistive living devices are provided to senior citizens belonging to BPL category who suffer from age-related disabilities such as low vision, hearing impairment etc.
> - **Pradhan Mantri Vaya Vandana Yojana** to provide social security during old age. This is a simplified version of the VPBY and is implemented by the Life Insurance Corporation (LIC) of India.

  - **Lack of Social Support:** Elderly in India are much more vulnerable because of the less government spending on social security system.
  - **A rapidly changing world:** Older people find it hard to adapt with lifestyle changes brought on by Globalization, technological developments (e.g. in transport and communication), urbanization, migration and changing gender norms.
- **Health**
  - **Medical Problems:** Old age is accompanied by multiple illness and physical ailments. Despite their increased health risks, a large number of older persons lack access to adequate levels and quality of health care.
  - **Psychological and mental health Problems:** The common psychological problems that most of the senior citizens experiences are- feeling of powerlessness, feeling of inferiority, depression, uselessness, isolation and reduced competence.
- **Financial bankruptcy:** The aged people are often financially bankrupt since their assets; properties and all their wealth are legally transferred to their children so most elderly people do not have the emergency fund available to meet their basic needs.

Way forward

To foster healthy ageing and improve the lives of older people and their families and communities, fundamental shifts will be required-

- **Age Friendly Environment:** Removing physical and social barriers and implementing policies, systems, services, products and technologies to:
  - promote health and build and maintain physical and mental capacity throughout the life course; and
  - enable people, even when they lose capacity to continue to do the things they value.

- **Address diversity in older age**: There is no 'typical' older person. Some 80-year-olds have physical and mental capacities similar to many 20-year-olds. Other people experience significant declines in physical and mental capacities at much younger ages. **A comprehensive public health response must address this wide range of older people's experiences and needs.**
- **Long Term Care:** Access to good-quality long-term care is essential to maintain functional ability, enjoy basic human rights and live with dignity. In addition, it is essential to support caregivers, so they can deliver proper care and also take care of their own health.
- **Introduce or enhance legislation** to promote equality and non-discrimination on the basis of age in the provision of health and health insurance services and in social protection policies and programming, and undertake measures to prevent multiple discrimination against older persons;
- **Global Measures:** Undertaking a Global Campaign to Combat Ageism; Enhancing the Global Network for Age-friendly Cities and Community
- **Research in Geriatrics and Gerontology** needs to be further encouraged.

6.6. INTEGRATION OF TRADITIONAL AND MODERN MEDICINE

Why in news?

Recently, the Central Council of Indian Medicine amended Indian Medicine Central Council (Post Graduate Ayurveda Education) Regulations, 2016, to include the regulation to allow the Post Graduate (PG) students of Ayurveda to practise general surgery.

More about news

- According to CCIM's notification, **students will be trained in two streams of surgery** and would be awarded titles of MS (Ayurveda) Shalya Tantra — (General Surgery) and MS (Ayurveda) Shalakya Tantra (Disease of Eye, Ear, Nose, Throat, Head and Oro-Dentistry).
  - o CCIM is the statutory body that regulates the Indian Medical systems of Ayurveda, Siddha, Sowa-Rigpa and Unani Medicine.
- However, **Indian Medical Association (IMA) has been opposing the move** to allow traditional systems of Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homoeopathy (AYUSH) to offer allopathic therapies and treatment.

Integration of traditional medicine/AYUSH with modern medicine

> **Traditional medicine & Allopathy**
> - **Traditional medicine:** It refers to health practices, approaches, knowledge and beliefs incorporating plant, spiritual therapies, etc to treat, diagnose and prevent illnesses or maintain well-being.
>   - o It composes of **Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homoeopathy** (AYUSH).
> - **Allopathy:** It is a system in which medical doctors and other healthcare professionals (such as nurses, pharmacists, and therapists) treat symptoms and diseases using drugs, radiation, or surgery.

- After the introduction of modern medicine in India, **traditional medicine/AYUSH was usually rejected by the formal medical service system.**
- Recently, however, **attitudes towards traditional medicine have changed**. Many traditional remedies and therapies have transcended their original culture and become "complementary/alternative" medicine in other countries.
- **Three different approaches for integration**
  - o **Incorporation of traditional medicine into the general health service system**: The government recognizes the practice of traditional medicine and the use of traditional medicine is incorporated into the mainstream of health service system.
  - o **Integration of the practice of traditional medicine with that of modern medicine:** In fact, many medical doctors who have adequate knowledge of traditional medicine have tried to incorporate remedies used by traditional medicine into their daily work.
    - ✓ In some places, traditional and modern medicine is **practiced side by side.**
  - o **Synthesis of two branches**: Efforts have been made to synthesize the two branches, in order to form a new branch of medical science, incorporating elements of both.
- In keeping with the recommendations of the **Report of the Committee on Indigenous Systems of Medicine (Chopra Committee) 1948**, baby steps were taken to integrate the teaching of traditional and modern systems of medicines, however proposals were later scrapped.
- Traditional Medicine and Allopathy despite being based on different principles and methodologies **can complements each other.**

What is the need of integrating AYUSH with Allopathy?

- **Better disease management:** Traditional Medicine play vital role in preventive care and AYUSH doctors could be roped in for providing services that does not need specialization in Allopathy.
  - **COVID-19 management in Osmanbad, Maharashtra:** The few Allopathy doctors were given the responsibility to take care the Critical Care Unit (CCU) of the COVID-19 wards. AYUSH doctors and nurses were trained to take care of the general wards. This management along with other efforts effectively reduced the COVID-19 fatality in the district.
- **Enhancing the accessibility to public health facilities:** Despite 71% of the country being predominantly rural, the proportion of Allopathy doctors in rural areas is only 34%.
  - Proportion of AYUSH doctors in some of the poorest part of the country is high.
  - Dovetailing traditional and modern health services system would enhance the accessibility of the health care facilities by **doing away with the geographical disparities.**
- **Recognition and regulation of invisible AYUSH doctors:** In many hospitals (particularly at Primary Health Centre) AYUSH doctors provide the health care services but data is reported under the name of an Allopathy doctor "for legal reasons."
  - Such **'invisibilisation' of the significant contribution of traditional** health service providers is unethical. It is also a hurdle in effective regulating of the quality of public health services.
- **Necessary for universal healthcare:** In India, the ratio of the doctor-patient is 1:1456 if we consider only allopathic doctors; the ratio will come to 1:800 if the AYUSH practitioners are added. This is much better than the WHO recommendation of 1:1000. Thus leveraging AYUSH doctors is vital for achieving universal health care services.

What are the challenges in integrating AYUSH with Allopathy?

- **Effectiveness of Traditional Medicine:** The practice of traditional medicine is mainly **based on conventional use and personal experience** and the value of traditional medicine (as well as many modern medical treatments) has **not been fully tested by using modern scientific means.**
  - Whereas allopathic system addresses symptoms and treatment of causes of illnesses based on a biomedical model understood with the help of epidemiological investigations.
- **Skewed financing:** In Budget 2020-21, Ministry of Health and Family Welfare was allocated ₹ 69, 000 crore whereas Ministry of AYUSH was allocated only ₹ 2,122.08 crore. Such skewed financing would naturally create a gap between AYSH and Allopathy in terms of research, education, training etc.
- **Low acceptance of AYUSH:** National Sample Survey in 2014 indicates that only 6.9% of patients seeking outpatient care opted for AYUSH. In the case of hospitalised care, the proportion is less than 1%.
  - Standardization, poor quality control procedure, lack of regulation and lack of Good Manufacturing Practices (GMP) of Traditional medicine add to woes in integration.
- **State subject:** Health being a state subject adds an extra layer of complexity to any national level initiative. There are states like Maharashtra who have adopted a realistic approach where AYUSH doctors are allowed to practice Allopathy and prescribe drugs, after completing a one-year course. However, such vital steps are missing in other states.
- **Infrastructure related issue:** Lack of processing technique, trained personal, sophisticated instrument, utilization of modern techniques, facility to fabricate instrument locally are the major problems.

Way ahead

- **Integrated policy:** There is need for proper policy to integrate both Traditional Medicine and Allopathy along with inter-ministerial coordinated efforts by the MoHFW & Ministry of AYUSH.
  - **Clearly defined role for the AYUSH doctors and Allopathy doctors** with respect to the treatment of patients, their mutual interactions, and community accountability mechanisms is important.
- **Bridging the financing gap:** Equal emphasis should be given to both AYUSH as well as Allopathy system. Public Private Partnership (PPP) could also be utilised to ensuring adequate funding of both the system.
- **Mutual respect and trust:** The need for mutual respect between the allopathic and AYUSH practitioners is paramount. Unless they respect each other's system of practice and work as a team, there is a likelihood of the system becoming competitive and counterproductive.
- **Facilitate cross-learning and collaboration:** True integration would require the integration of education, research, and practice of both systems at all levels. This is the only way to address the subservient status of AYUSH and to foster its legitimate inclusion into mainstream health care.
  - The **Chinese experience of integrating Traditional Chinese Medicine** with Western medicine makes for a good example.

Conclusion

An integrated framework should create a middle path fusing the two systems, while still permitting some autonomy for each. Accordingly, a medium- and long-term plan for seamless integration should be developed expeditiously in view of the massive drive for achieving universal health care already under way in the country.

6.7. SDG FINANCING

Why in News?

The Sustainable Development Group (SDG) **Investor Map for India,** developed by the United Nations Development Programme (UNDP) in partnership with Invest India, has highlighted gaps in SDG financing in India.

About SDG Financing

- SDG financing means **channeling global financial flows towards Sustainable Development** imperative to achieving the 2030 Agenda.
- **Addis Ababa Action Agenda 2015,** provides a global framework for financing sustainable development that aligns all financing flows and policies with economic, social and environmental priorities.
- **India occupies a key role in determining the success of the SDGs globally** and it needs $2.64 trillion investment to meet SDGs.
  - **India needs to increase its SDG spending by an additional 6.2%** of its GDP until 2030. Hence, it is crucial to make sure that the budget allocations align with SDG priorities.
- **SDG financing Initiatives:**
  - **SDG Financing Lab** is an OECD-led initiative that strives to inform decision-makers and policy leaders on how to ensure the resources needed to achieve the 2030 Agenda.
  - **SDG Fund** is an international multi-donor and multi-agency development mechanism created in 2014 by the United Nations to support sustainable development activities through integrated and multidimensional joint programmes.
- However, despite growing momentum for sustainable development investments, **financing gaps remain large.**
  - With the emergence of the Covid-19 pandemic, SDG financing gap has widened by an estimated $400 billion in developing countries, adding to the pre-COVID shortfall of $2-2.5 trillion per annum.
  - The **financing gap for SDGs in India has widened** further and development progress made under **millennial development goals also are on verge of reversal.**
  - Investing in the SDGs at this point is crucial to 'building back better' and making the economy and our societies more **resilient and sustainable**.

Need for SDG financing

- **Increasing Environmental Shocks**: Greenhouse gas emissions continue to rise, posing risks to sustainable development.
- **Growing Financial Risks:** Short-term financial market volatility has increased due to COVID-19. Prior to that, an extended period of low interest rates had incentivized riskier behaviour through- out the financial system. Financial intermediation has steadily migrated to non-bank financial intermediaries (who hold over 30 per cent of global financial assets).
- **Declining Assistance**: Official development assistance (ODA) fell by 4.3% in 2018, and ODA to least developed countries (LDCs) fell by 2.1%.
- **High Debt Risk**: Debt risks will likely rise further in the most vulnerable countries.
  - Governments of Low-Income Developing Countries (LIDCs) will require a substantial increase in fiscal (budget) revenues, far beyond what they can achieve by their own fiscal reforms.
  - For this reason, SDG financing will require substantial international cooperation to enable the LIDCs to finance their SDG fiscal outlays.

Issues in SDG financing

- **Heightened geopolitical tensions around trade and technology**: In recent years, the world has witnessed a rise in unilateral actions, trade tensions and protectionist measures that largely circumvent multilateral processes.
- **Growing external debt amidst unresolved systemic issues:** Global debt levels have continued to set new records and grew to 247 trillion US dollars in July 2019, up from 168 trillion US dollars in 2008 at the start of financial crisis.

- **Unmet expectations about public-private collaboration for development finance:** In particular investments in LDCs have been insufficient to meet their SDG financing needs. Only 7% of 81 billion US dollars in private finance mobilized for development went to LDCs (2012-15).
- **Constraints to finance SDGs in India include:**
  o Inefficiency of tax systems,
  o Lack of incentives driving private sector participation,
  o Lack of business models supporting SDGs.

How to address SDG financing Gap?

- **Address trade issues:** To put trade back on track, there is need to put sustainable development at the heart of the multilateral trade regime, building on existing experience from the investment regime and regional trade agreements.
- **Deal rising debt vulnerabilities:** There is need to promote the UNCTAD Principles for Responsible Sovereign Lending and borrowing, explore Sovereign Debt Restructuring Mechanisms for countries in default, and create a well-endowed global climate disaster fund and decarburization bank.
- **Public-private collaboration for development finance:**
  o There is n**eed for increased knowledge-sharing and evidence to improve blended finance practices** and to speed up documentation of the type of financing/ funding that is best suited by sector and type of country so as to ensure that the countries that need it the most are not completely left behind.
  o **Public sector role**: Removing inefficiencies in tax system, allocation of tax to implement SDGs, augmenting new sources such as sovereign bonds for SDGs, reducing illicit financial flows, infrastructure finance and capital market development, Foreign Direct Investment promotion etc.
  o **Private sector role**: Incentivize private sector investment, Crowd in private investment through innovative facilities and business models etc.
- **Maximize investment impact**: by increasing the sustainable development benefits and minimizing the risks of investment in SDG sectors.

7. SCIENCE AND TECHNOLOGY

7.1. FOOD FORTIFICATION

Why in news?

The Food Safety and Standards Authority of India (FSSAI) has released last year a report on food fortification.

Food Fortification in India

- Food fortification is the **deliberate addition of one or more micronutrients to food** so as to correct or prevent a deficiency and provide a health benefit.
- The concentration of just one micronutrient might be increased (e.g. the iodization of salt) or there might be a whole range of food–micronutrient combinations.
- Food fortification is a **"complementary strategy"** and not a replacement of a balanced & diversified diet to address malnutrition.
- Fortification is being promoted through both **open market and government schemes** like ICDS,MDMS,PDS,etc.
- In **National Nutrition Strategy (Kuposhan Mukt Bharat),** food fortification has been given a major thrust.
- FSSAI has operationalised standards for fortification of:
  o **wheat- flour-rice (with iron, Vitamin B12 and folic acid)**
  o **milk & edible oil (with Vitamins A and D)**
  o **double-fortified salt (with iodine and iron).**
- It has also launched the **Food Fortification Resource Centre (FFRC)** to promote large- scale fortification of food across India.

Advantages of food fortification

- **Health benefits:**
  o **Elimination of micronutrient deficiency diseases** like anaemia, goitre, xerophthalmia, etc. which are prevalent in India. For eg. according to the National Family Health Survey, around 50% of women and children in India suffer from anaemia.
  o Food fortification can be used as an effective tool **to counter vitamin D deficiency.** (prevalent in more than 70% of Indian population).
  o It reduces the risk of death **from infectious diseases.**

Food Safety and Standards (Fortification of Foods) Regulations, 2018
- It has **prescribed standards** for fortification of various food products such as All fortified foods must not fall below the minimum level of micro- nutrients.
- **Quality assurance:**
  o Every manufacturer and packer of fortified food shall give an undertaking on quality assurance
  o random testing of fortificants and fortified food
- Every package of fortified food shall carry name of the fortificant and the logo to indicate. FSSAI has recently introduced **+F logo for fortified staple food products.**
- The Food Authority shall take steps to encourage the production, manufacture, distribution, sale, and consumption.

Why the need for food fortification?
- **Nearly 70% of people in India consume less than half of their recommended dietary allowance (RDA)** of micronutrients. The deficiency of micronutrients is also known as "hidden hunger" and leads to various diseases like Night Blindness, Goitre, Anaemia and various birth defects.
- **According to the National Family Health Survey (NFHS-4):**
  o 58.4 percent of children (6-59 months) are anaemic.
  o 53.1 percent women in the reproductive age group are anaemic.
  o 35.7 percent of children under 5 are underweight.
  o Around 50-70% of these birth defects are preventable, caused due to deficiency of Folic Acid.

Some International experiences
- **Salt iodization** was introduced in the early 1920s in both **Switzerland and US** and has since expanded progressively all over the world.
- In **Venezuela, wheat and maize flours** have been fortified with iron has shown significant reduction in iron deficiency.

Eat Right India movement
- It is **multi-sectoral effort with primary focus on daily intake of salt, sugar, fat, phasing-out trans-fats** from diets and promoting healthier food options.
- It is built on two broad pillars of Eat Healthy and Eat Safe.
- It brings together three ongoing initiatives of FSSAI that target citizens:
  o **The Safe and Nutritious Food (SNF) Initiative**, focused on social and behavioral change around food safety and nutrition at home, school, workplace and on-the-go.
  o **The Eat Healthy Campaign** focused on daily intake of salt, sugar, fat, phasing-out trans-fats.
  o **Food fortification**, focused on promoting five staple foods- wheat flour, rice, oil, milk and salt, with key vitamins and minerals added to improve their nutritional content.

- **Wide population coverage:** Since the nutrients are added to staple foods that are widely consumed, it enable to improve the health of a large section of the population.
- **Socio-culturally acceptable:** It does not require any changes in food habits and patterns of people being targeted.
- **Cost-effective:**
  o The Copenhagen Consensus estimates that every 1 Rupee spent on fortification results in 9 Rupees in benefits to the economy.
  o Technology to fortify food is simple and easy to implement.
- **Complements Food security:** Nutritional security is much needed to reap the dividends of implementing the food security act.

Challenges

- **Voluntary nature**: Fortification continues to be voluntary rather than mandatory leading to limited efforts to fortify by state governments and private sector.
- **Poor implementation by states**: Although some states have adopted fortification in ICDS, MDMS and PDS, but due to lack of definitive policy guidelines, budgetary constraints, technical knowledge and logistic support, states have not adopted fortification in a holistic manner.
- **Weaknesses of FSSAI:** It lacks resources and manpower to effectively carry out its mandate.
- **Lack of awareness:** There is a lot of misinformation and ignorance about the usage and benefits of fortified food as of now.

Way forward

- **Nationwide Implementation**: Pan-India implementation of fortification via government schemes would amount to only an increment of 1 percent of the total budget allocated annually.
- **Support to states**: Merely issuing orders and notifications from Government of India will not suffice as state governments require hand-holding support and should sensitised about the benefits fortification and must be enabled to procure fortified staples in various programs.
- **Ensure Standards:** Compliance with FSSAI standards w.r.t macronutrient content and quality must be strictly enforced.
- **Awareness:** A mass awareness campaign about food fortification is needed to scale up demand from consumers in the open market.
- **Promote food processing industry:** It will go a long way in improving the nutritional value of staple food.

7.2. MANNED SPACE MISSION

Why in news?

Recently NASA launched its first full-fledged human mission (CREW-1) using a privately owned spacecraft.

About CREW-1 Mission

- It is part of **NASA's first commercial human spacecraft system** with a crew of four astronauts to the International Space Station (ISS), onboard SpaceX's Crew Dragon spacecraft called Resilience.
- It is the first of 6 crewed missions that NASA and SpaceX will operate **as part of NASA's Commercial Crew Program (CCP).**
- **ISS** is a multi-nation construction project that is the largest single structure humans ever put into space.
  o It is a large spacecraft which orbits around Earth and is a **platform for long-term research for human health.**
  o **Main partner countries** include NASA (United States), Roscosmos (Russia), the European Space Agency, the Japanese Aerospace Exploration Agency and the Canadian Space Agency.
  o Current plans call for the **space station to be operated through at least 2024.**

Manned Space Mission

- Manned Space missions includes **sending human aboard spaceflights beyond the gravity of the Earth.**
  o In April, 1961 a Soviet cosmonaut Yuri Gagarin became the first person to reach the space.
  o Until now **only the US, Russia and China** have managed to send manned missions to outer space.
- India's Indian Space Research Organisation is also planning to launch its first manned space mission **Gaganyaan.**
  o Gaganyaan has been designed to carry **three Indian astronauts to the low earth orbit** (an orbit of 300-400 km) for a period of five to seven days.

o It will **take off on a GSLV Mk III** which is capable of launching **four-tonne satellites in the Geosynchronous Transfer Orbit** (GTO).
  ✓ GSLV MkIII is configured as a **three stage vehicle: Two solid** strap-on motors; **One liquid** core stage and a high thrust **cryogenic** (mixture of liquid oxygen and liquid hydrogen) upper stage.
o **Gaganyaan National Advisory Council** has been created with members from different institutions and industries to deliberates on various aspects of the mission.
o **Gaganyaan includes** a Space Capsule Recovery Experiment (SRE-2007), Crew module Atmospheric Reentry Experiment (CARE-2014), GSLV Mk-III (2014), Reusable Launch VehicleTechnology Demonstrator (RLV-TD), Crew Escape System and Pad Abort Test.

> **Significance of Gaganyaan**
> * The mission will add **significant value to India's space activities.**
> * It re-establish India's role as a key player in the new space industry hence improving international collaboration and **giving space to Space diplomacy.**
> * The securitisation of outer space has an **impact on national security** as a result of which outer space is increasingly seen as a 'strategic domain'.
> * **Spinoff technologies,** attraction of talent to scientific careers, scientific knowledge etc.
> * It is expected to give **impetus to economic activities within the country** in terms of employment generation, human resource development and enhanced industrial capabilities.

What are the challenges for India to carry out Manned Space Missions?

* **Financial:** These missions require exorbitantly huge investment as they are highly technology intensive.
  o Initial cost of Gaganyaan was projected to be Rs. 12, 000 crore. However, ISRO is required to complete the project with a budget outlay of Rs. 10,000 crore only.
* **Technological challenges**
  o **Mastering of complex reentry and recovery technology:** Unlike other spacecrafts manned spacecrafts needs to comeback safely. While reentering the Earth's atmosphere, the spacecraft needs to withstand very high temperature and also ensure a precise speed and angle.
  o **Crew escape system:** It provides an emergency escape mechanism for the astronauts in case of a faulty launch.
  o **Developing regenerative environment in the spacecraft:** As astronauts could carry only limited supply with them, regenerative environment needs to develop for continuous supply of food water, oxygen, carbon-di-oxide and to manage human wastes.
  o **Need of heavier rockets:** A heavy-lift rocket simplifies the mission architecture by allowing more systems to be integrated into mission vehicles. Such rockets enable contingencies to be mitigated without having to rely on another launch.
* **Training of astronauts:** Astronauts have to live in zero gravity, bear almost 10 times more radiation than what people are subjected to on Earth.
  o **Awareness of celestial objects in the path of a rocket/satellites, and communication** is also a major challenge.
  o Year 2012 was set as a target for setting up a training centre for astronauts. However, this project got delayed as a result of which Indian astronauts are being trained in Russia.

Way ahead

* **Leveraging private sector:** ISRO is leveraging the capability of private sectors for various inputs required for developing the spacecraft. It should expand its collaboration with private sector for developing the infrastructures also.
* **Expanding International collaboration:** Other than Russia, the US and France had also offered training support to astronauts for Gaganyaan. Collaborating with more countries would provide better choices.
* **Doing away with the bureaucratic hassles:** CRYOGENIC ENGINE DEVELOPMENT was delayed for decades due to bureaucratic hassles. Priority should be given to ensure that required research and development (R&D) is carried out seamlessly.
* **Capacity building:** ISRO is imparting basic knowledge on Space Technology, Space Science and Space Applications to the 10th std. students (through its programme like 'Yuvika'). Similar programmes should be carried out for imparting specialized knowledge in the field to the youth
* To overcome the challenges of human spaceflight a steady and **continuous upward progression toward greater societal, scientific and technological development** is required.

7.3. GEOSPATIAL TECHNOLOGY

Why in news?

Recently, the United Nation Economic and Social Commission for Asia and the Pacific (UNESCAP) published the report titled **"Geospatial Practices for Sustainable Development in Asia and the Pacific 2020."**

Key findings of the report

- Asian and Pacific nations are **increasingly leveraging space technology and geospatial information** to respond to challenges on the ground including containing COVID-19 pandemic.
  - **Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018- 2030)** was adopted to capitalize on the technological and geospatial innovations in the region.
- Report praised India on India's initiatives like **'BHUVAN', Water Resource Information System (WRIS)** etc.
- Report calls for **re-skilling of young workers to enhance their knowledge, integrating geospatial data with other data sets**, enhancing data security and privacy etc.

> **About UNESCAP**
> - It serves as the United Nations' regional hub **promoting cooperation among countries to achieve inclusive and sustainable development.**
> - It is one of the 5 **regional commissions under the jurisdiction of the United Nations Economic and Social Council** (UN ECOSOC)
>   - Others are African Group, Eastern European Group, Latin American and Caribbean Group, Western European and Others Group
> - **India is a member** of this group.

About Geospatial Technology

- It is an emerging field of study that includes **Geographic Information System (GIS), Remote Sensing (RS) and Global Positioning System (GPS).**
- It enables to **acquire data that is referenced to the earth and use it for analysis,** modeling, simulations and visualization.

The six priority thematic areas of the Plan of Action that support the implementation of the Sustainable Development Goals and the Sendai Framework for Disaster Risk Reduction

- Geospatial technologies would be **central to information management in India** in future and the applications of this technology can have great social as well as national relevance.
- **Several GIS based initiatives** are being implemented in India, such as:
  - Natural Resource Information System (NRIS) under National Natural Resources Management System (NNRMS) of Planning Commission,
  - National Spatial Data Infrastructure (NSDI) of the Department of Science and Technology (DST),
  - National Urban Information System (NUIS) of Ministry of Urban Development (MUD).
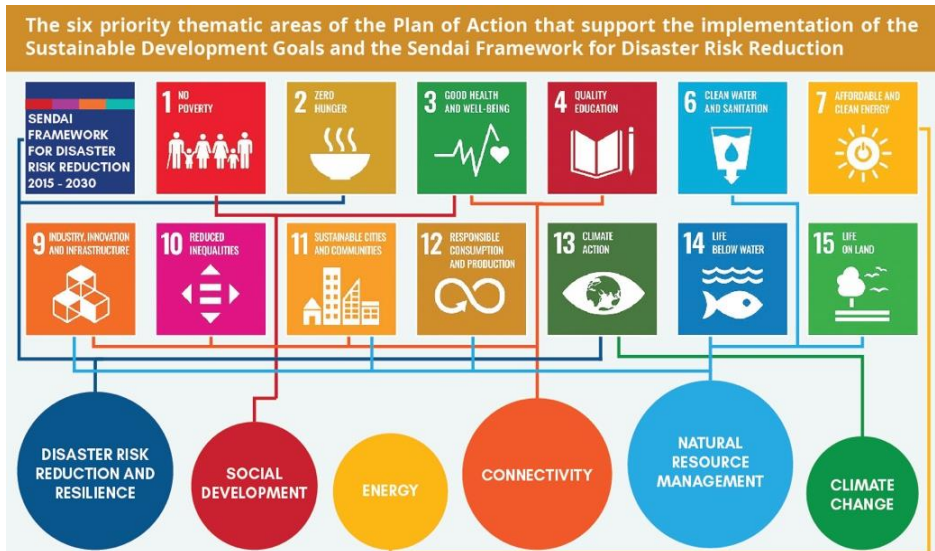
Application of geospatial Technology

- **Informed decision making:** It allows to **make informed decisions based on the importance** and priority of resources most of which are limited in nature.Geospatial information has proven instrumental in delivering timely and authoritative information in governance matters.
- **Disaster risk reduction and resilience:** Cyclone Fani was one of the severest cyclones in the Bay of Bengal, affecting around 100 million people. However, its impact was contained due to early warning systems, detection, etc. using Geospatial information.

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- o **Remote sensing satellites** (like OCEANSAT series, CARTOSAT series) and earth observation satellites like (Cartosat-1 & 2, Resourcesat-1 & 2 etc) are also being utilised for vulnerability mapping and for taking preventive measures.
- **Social Development:**
  - o Odisha has used high resolution maps produced by drone imagery **to grant land title to its slum dwellers** which decreased its slum population from 23.1% in 2011, to 3.72% in 2020.
  - o **In agriculture**, satellite-based fishing, precision agriculture, monitoring and modelling of crop conditions, insurance monitoring, forestry monitoring, etc can be used.
- **Energy:** To determine the suitability of a location for generating solar energy the ISRO uses solar data derived from measurements on-board the geostationary satellite Kalpana.
- **Connectivity:** Geospatial information through Road Asset Management system assist in accurate and scientific maintenance planning, enhance road safety measures and plan the development of the National Highways network in India.
- **Natural Resource Management**
  - o **India-WRIS (Water Resources Information System)** developed by the ISRO to provide a single portal for all water resources data and information. It helps in planning, development and integrated water resources management.
  - o **Land use management** is being aided by the geoportals Bhuvan and MOSDAC of ISRO that helps to disseminate satellite data, geophysical and biophysical data products and information derived using Earth observation (EO) data.

Challenges in effective use of geospatial information

- **Absence of a comprehensive geodata policy:** There are a total of 17 national-level policies and rules dealing with geospatial data, under six ministries/departments.
  - o Despite the existence of the National Data Sharing and Accessibility Policy 2012, most geospatial data created in India lies in silos. There is no single platform that can be used by all departments to collate value-added data.
- **Technological challenges & infrastructural challenges:**
  - o **Super computers and quantum computers** play a vital role in storage and processing of data. India's fastest supercomputer, PARAM-Siddhi AI ranks 63rd in the list of most powerful supercomputers in the world.
  - o **Continuously Operating Reference System (CORS)** which is rapidly becoming the preferred method for accurate 3D positioning across the world and forms the basis for any Smart City agenda is yet to take off in India.
- **Acessibility of space-derived data:** National Spatial Data Infrastructure (NSDI) is only partially open and free for the public. Thus availability of up-to-date, contextual, and innovation-fostering data to the private sector, and individuals is limited.
- **Digital-technological divide and lack of data privacy** law are also big challenge.

What needs to be done for being able to use geospatial information effectively?

- **Invest in national experts** for building national capacity to operate and design geospatial applications sustainably.
- **Integrate ground and space data, crossover data,** with georeferenced tags and statistical processing which will provide important evidence for cost-benefit and risk analysis inputs in order to support policy and planning.
- **Ensure privacy, safety and ethics of data** by obtaining informed consent whenever possible and using second-level data with caution.
  - o Anonymizing and/or de-identifying data with personal information so that it cannot be traced back to individuals and an ethics code for using frontier geospatial technologies is also needed.
- **Provide open data access** by making use of cloud-based platforms for open data access. They offer a unique opportunity to use and analyse geospatial information without investment in data storage and computational resources.
- **Collaborate across local and international levels:** There is a need for engagement across ministries and responsible authorities. International collaboration should be leveraged to address the geospatial digital divide and other related issues.

7.4. NATIONAL SUPERCOMPUTING MISSION

Why in news?

The third phase of the National Supercomputing Mission (NSM) will kick start in January 2021, taking computing speed to around 45 petaflops.

More in news

- Department of Science and Technology has signed MoUs with total 14 premier institutions of India for establishing supercomputing infrastructure with **assembly and manufacturing in India**.
- With an outlay of Rs. 4500 crore the NSM **envisages nearly 50 supercomputers across the country** in three phases.

National Supercomputing Mission (NSM)

- Launched in 2015 the seven-year mission aims at establishing **supercomputer facilities across 70 national research and academic institutions** and connecting them onto a National Knowledge Network (NKN).
- The mission is jointly funded by the Department of Science and Technology (**DST) and Ministry of Electronics and Information Technology (MeitY).**
- The mission is being implemented by the **Centre for Development of Advanced Computing (C-DAC), P**une and **the Indian Institute of Science (IISc), Bengaluru.**
- **Objective:**
  - To **make India one of the world leaders in Supercomputing** and to enhance India's capability in solving grand challenge problems of national and global relevance
  - To empower our scientists and researchers with **state-of-the-art supercomputing facilities** and enable them to carry out cutting-edge research in their respective domains
  - To minimize redundancies and duplication of efforts, and **optimize investments in supercomputing**
  - To attain **global competitiveness and ensure self-relianc**e in the strategic area of supercomputing technology
- **Focus:** The NSM has focus on following three dimensions:
  - Creating **better supercomputing infrastructure**
  - Becoming more **application-oriented**
  - **Investing in human capital**
- **First phase of NSM:** In the first phase of the NSM, parts for the supercomputers were imported and **assembled in India.**
  - Supercomputers assembled indigenously under this project was **Param Shivay'19, Param Shakti & Param Brahma**

Supercomputers

- Supercomputers are the **physical embodiment of high-performance computing** (HPC), allowing organizations to **solve problems that would be impossible with regular computers**.
- Japan's Fugaku supercomputer with a speed of 415.53 petaflop is the fastest supercomputer of the world.
- **Supercomputers in India**
  - Supercomputing in India started late in the 1980s after the US denied import of its supercomputers to India
  - **The first Indian supercomputer was PARAM 8000,** unveiled in 1991 by the CDAC
  - Until now **Pratyush** with a speed of **6.8 PF Petaflops is India's fastest supercomputer.**
- **Ordinary computer vs. supercomputer**
  - **An ordinary computer does one thing at a time**, so it does things in a distinct series of operations; that's called **serial processing.**
  - **Supercomputer works** much more quickly by splitting problems into pieces and **working on many pieces at once,** which is called **parallel processing.**

Application of Supercomputing

- **Climate Modelling:** It is a complex mathematical representation of the major climate system components (atmosphere, land surface, ocean, and sea ice), and their interactions. It is used for **the long-term climate prediction.**
- **Computational Biology:** Computational biology is an interdisciplinary field that develops and applies computational methods **to analyse large collections of biological data,** such as genetic sequences, cell populations or protein samples etc.
- **Big Data Analytics:** BIG DATA ANALYTICS *is* the process of extracting useful information by analysing different types of big data sets. BIG DATA ANALYTICS **is used to discover hidden patterns for better decision making.**
- **Other applications:** Molecular Dynamics, Atomic Energy Simulations, National Security/Defence Applications, Seismic Analysis, Disaster Simulations and Management, Computational Chemistry, etc

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- **Second phase of the NSM:** It involves **increasing the speed** of the supercomputer network in the country to **16 petaflops**.
  - The second phase of the Mission is set to be completed by April 2021.
- **Third phase of the NSM:** This phase will take the speed of country's supercomputer network **to 45 petaflops.**
  - Once completed **around 75 institutions** and thousands of researchers will have **access to the supercomputers using the National Knowledge Network (NKN)**
    - ✓ NKN with its **multi-gigabit capability** is aimed at **digitally connecting all the scholars and research institutes of the country.**
    - ✓ By facilitating the flow of information and knowledge, the network creates **a new paradigm of collaboration to enrich the research efforts in the country**.

Challenges in supercomputing in India

- **Funding:** This is one of the main reasons why India, which has the capacity to build a world-class system, could not achieve its potential. By the end of 2018, only 10% of total budget for NSM has been released.
- **Import dependence:** While India's stronghold is in the field of software development, in the first phase of NSM it had to depend on imports to procure the hardware components required for building supercomputers.
- **High power consumption by supercomputers:** HPC machines consume enormous amounts of power. The physical design of the machine, including the cooling system, is itself a mechanical and metallurgical engineering challenge.

Way ahead

- **Appreciating the strategic importance of supercomputers:** A strong supercomputer sector leads to capability in a variety of other fields, from semiconductor manufacturing and precision engineering to optimal strategies for agricultural production, urban planning and the like. All this would be **in addition to the national security related applications where India cannot afford to be dependent on foreign expertise.**
- **Focus on innovation:** Unlike other sectors which stabilize based on commercial considerations sooner or later, **the innovation pot is always boiling over in the case of supercomputers.** This is both a daunting barrier and an exciting opportunity for countries like India. For innovation, India could **leverage the technological expertise that is available with the global network of Indian and Indian-origin scientists and engineers.**
- **Indigenisation:** In the second phase of NSM, **India is venturing into design, manufacture and assembly of hardware components.** This will not only **cut down import costs,** it will also ensure that while assembling supercomputers, **applications are tailored to address problems that are specific to India.**
- **Defined strategic goal:** India should set itself clear objectives of what it wants to achieve, in this strategically significant sector, in long term. Within a Mission perspective, it should be possible **to cut down bureaucratic red tape and allow scientists and engineers to take bold and radical steps** without fear of reprisal.

7.5. DRAFT DATA CENTRE POLICY 2020 AND INDIA AS A GLOBAL DATA CENTRE HUB

Why in news?

Ministry of Electronics & Information Technology (MeitY) has recently drafted a Data Centre policy aimed at making **India a Global Data Centre hub**, promote investment in the sector, propel digital economy growth.

More on the news

- **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. Types of Data centres include-
  - **Co-location data center-** It is a large data center facility that rents out rack space to third-party clients for housing their servers or other network equipment.
  - **Edge data centers**- They are highly localised storage facilities, which can effectively cater to a building, an organisation's internal clusters of machines as well as external machines with access to the internal network.

Importance of Data Centre Sector in India

- **Fulfilling the growing demands of the country:** Large size of the digital population in India and the growth trajectory of digital economy, especially software as a service (SaaS) sector, necessitate a strong growth of Data Centres.
  - India is home to 1.15 billion mobile users, 661 million broadband users, 376 million social media users, 401 million smart phone users and 564 million internet users consuming around to 2.3 million petabytes in 2020.
- **Maintaining Data sovereignty**: 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.
- **Providing digital services to other sectors**: Growth of Data Center service providers can create an enabling ecosystem for provision of services such as data management, cyber security, Big Data and Data Analytics etc. for enterprises in India.

Factors enabling the growth of data centers in India

- **Rapid growth in Data consumption:** The per capita data consumption is estimated to grow from 2.4 GB in 2017 to 14 GB by 2022 due to factors such as declining bandwidth price, availability of high-speed data connectivity and surge in sectors such as e-commerce, digital entertainment (OTT platforms), fintech, digital education etc.
- **Digitization initiatives:** of the government like e-Governance drive, Smart Cities, Digital India, Digital Health Mission etc. will result in the huge volumes of data (structured as well as unstructured) requiring investment for storage, processing and security.
  - Further, states like **Maharashtra, Telangana and Tamil Nadu** provide incentives to data centre companies such as Stamp duty exemption, electricity duty exemption during investment period, building fee rebate etc.
- **Upcoming trends:** like the adoption of 5G, cloud-based computing, Artificial intelligence, Big Data analysis and Internet of Things (IoT) are expected to increase storage volume requirement in addition to the "digitisation fillip" caused by the disruptions in the wake of the Covid-19 pandemic.
- **Data localization norms**: Several provisions of **Personal Data Protection (PDP) Bill**, 2019 and **draft e-commerce policy** require storage of critical data within the country. Also, **RBI mandate** requires personal financial data of Indian citizens to be stored on local servers in the country. Such data localisation norms are likely to increase the presence of data centres in India.

> **Key Features of Draft Data Centre Policy, 2020 that can help India become a Global Data centre hub**
> - **Proposal to provide Infrastructure Status to the Data Centre Sector**: This will help the sector in **availing long-term institutional credit** at easier terms and reduce the cost of borrowing.
> - **Simplified clearances**: establishing a **single window clearance** with the defined timelines.
> - **Setting up of pre-provisioned Data Centre Parks**: with infrastructure like road connectivity, water availability etc. States will be encouraged to demarcate specific zones (land parcels) for them.
> - **Data Centres to be declared as an Essential Service**: under the Essential Services Maintenance Act, 1968 (ESMA). This will enable seamless continuity of services even during times of crisis.
> - **Availability of uninterrupted, clean and cost-effective electricity**: by focusing on policy measures such as-
>   - facilitating Data Centre Parks to setup own power generation units to ensure quality of power;
>   - enabling effective open access system to allow Data Centre service providers directly procure power from generation companies;
> - **Recognizing Data Centres as a separate category under National Building Code:** since Data Centre buildings require different norms as compared to other office/ commercial buildings.
> - **Setting-up of Data Centre Economic Zones**: Government of India proposes to set-up at least four Data Centre Economic Zones (DCEZ). The proposed DCEZ would create an eco-system of Hyperscale Data Centres, Cloud Service Providers, IT companies, R&D units and other allied industries.
> - **Promoting indigenous technology development, research and capacity building**.
> - **Setting up an Institutional Mechanism:** This will be done by establishment of bodies such as-
>   - **Inter-Ministerial Empowered Committee (IMEC)** under the Chairmanship of Secretary, Meity.
>   - Independent **Data Centre Industry Council (DCIC)** which would act as an interface between the sector and the Government.

- **Other factors**: Higher adoption of technology by SMEs in every sector, favourable Startup ecosystem with growth in e-commerce sector, availability of skilled workforce in Information and technology sector etc. will also spur the demand for more data centers in India.

Challenges in establishing Data Centres in India

- **Unstable and expensive power supply**: Unavailability of uninterrupted, clean and cost-effective electricity remains a hurdle for the Data Centre sector in India. Power failures in data centers can lead to massive loss of data, business disruptions, revenue loss and decrease end-user efficiency.
- **Need of robust internet connectivity:** Data centres need low latency, high bandwidth, stable and secure internet connectivity, which is not available uniformly across India.
  - India ranks 74th amongst 174 nations with an average download speed of 43.0 mbps while global average being 84.3 mbps.
- **Lack of published standards**: such as specialised building norms for building the Data Centres, encryption standards which are essential to prevent breaches etc.
- **Skill shortage**: The sector needs highly-skilled professionals in specialized areas such as cooling, power, security, network which aren't always readily available in India.
- **Costly real estate**: Data centres in India are mainly established in metro cities such as Mumbai, Chennai etc. where cost of commercial lands are extremely high.
- **Need of high investment**: Data centres are capital intensive and have high operational expenditure. With Indian banking sector facing issues of NPAs and liquidity crisis, securing necessary finances can be an issue for this sector.
- **Import dependence**: Lack of innovation and low investment in R&D has led to dependence on imported IT and other electronic equipments for the sector in India.

7.6. SCIENTIFIC RESEARCH IN INDIA

Why in News?
Recently, Department of Science & Technology (DST) and IBM India announced two collaborations to promote STEM (Science, Technology, Engineering and Mathematics) learning among students.

More about news

- The first collaboration involves **DST's 'Vigyan Jyoti' program**, the second collaboration is with **Vigyan Prasar** (an autonomous organisation of DST) that will build and run a technology-driven interactivity platform named **'Engage With Science'**.
- **Vigyan Jyoti** is a programme to promote STEM learning among girl students.
  - It aims to **inspire them towards STEM careers** by creating a level-playing field for meritorious girls from grades 9 to 12 to pursue STEM in their higher education, especially from the top colleges in the areas where girls are hugely underrepresented.
- **Engage with Science of Vigyan Prasar** aims to build interest and create a community of practice with students, teachers, and scientists connecting the high school students to the higher education institutions.

Current status of scientific research in India

- As per recent U.S.'s National Science Foundation (NSF) data, India has become the **world's 3rd largest publisher of science and engineering articles.**
- Top position is occupied by China, accounting for 20% of scientific articles, followed by U.S. (16%). **India now accounts for 5.31% of science and engineering publications.**
  - U.S., EU and Japan are more specialized in health sciences where India and China are specialized in engineering.
- India is among the topmost countries in the world in the field of scientific research, positioned as one of the top **five nations in the field of space exploration.**
- India ranked **15th in top filer of International Patents in 2019**
- India ranked **48th in the WIPO'S Global Innovation Index (GII), 2020**.
- According to the United Nations, India is a paradox when it comes to STEM opportunities for women. **Despite producing more women graduates (in STEM), as compared to global average it employees fewer women researchers.**

- o In STEM 40% of graduates are women in India as compared to 35% of the global average.
- o Only 14% of researchers in India are women as compared to 30% of the global average.

What are the issues that India faces in Scientific Research?

- **Funding Issue:** Though total expenditure on R&D has tripled in the last decade in nominal (revenue sans inflation) terms — from Rs. 24,117 crore in 2004-05 to an estimated Rs. 1,04,864 crore in 2016-17. However as a fraction of GDP, public expenditures on R&D **has been stagnant — between 0.6-0.7% of GDP — over the past two decades.**
  - o Developed countries spend more than 2% of GDP on R&D. Bulk of the spending, especially for basic research, comes from the government and a large section of the country's public research is concentrated in national research centres.
- **Participation of Private sector:** India's private sector spends less than 0.2% of GDP on R&D.
- **Lack of Opportunity:** India has employed only 40 researchers per lakh labour force for the last decade as compared to USA's 790 per lakh of their labour force.
- **A disconnect between labs and academia:** There is limited coordination between colleges and research facilities. Apart from PhD students hardly anyone is seen in labs conducting research.
  - o The academic ambience in many universities does not encourage the research pursuits of faculties. Research management is another very serious problem.
- **Less Attractive Option:** Many Indian students prefer to major in engineering rather than science, because of the promise of lucrative industrial career opportunities. According to National Council of Applied Economic Research (NCAER), less than three per cent of school-going children want to pursue a career in science in India.
- **No uniform policy:** Government has not yet come up with a uniform and integrated policy for research and development which could aggregate the efforts of various institutes.

Various schemes to promote scientific research in India

- **Accelerate Vigyan' scheme:** Science and Engineering Research Board (SERB) launched 'Accelerate Vigyan' scheme to push scientific research.
  - o The scheme is to boost high-end scientific research and prepare scientific manpower that can venture into research careers by identifying research potential, mentoring, training and giving hands-on workshops on a national scale.
- **Intensification of Research in High Priority Area (IRHPA):** It supports proposals in high priority areas where multidisciplinary / multiinstitutional expertise is required which will put our nation in international science map in that particular discipline.
- **Scientific and Useful Profound Research Advancement (SUPRA) Scheme:** It seeks to explore new scientific breakthroughs, with long-term impact on fundamental scientific understanding, and offer disruptive technologies at the cutting edge.
- **Scheme for Promotion of Academic and Research Collaboration (SPARC)** is to support Joint Research Projects through collaboration of top ranked Indian Institutions and globally ranked Foreign Institutions.
- **Prime Minister's Research Fellows (PMRF) Scheme** launched to incentivise the most meritorious students to pursue research in the frontier areas of science & technology by offering fellowship.
- **Uchhatar Avishkar Yojana (UAY),** which promotes industry sponsored, outcome-oriented research.
- **Science Technology and Innovation Policy (STIP 2020):** Draft STIP 2020 Policy is being prepared presently.
  - o It is **India's fifth National Policy for Science, Technology, and Innovation,** aims to capture the aspirations of the entire nation through a decentralized, bottom-up, and inclusive approach.
  - o From **open science to funding priorities; critical human capital to equity and inclusion; strategic technologies to traditional knowledge systems; science diplomacy to science communication** – this policy promises a renewed STI ecosystem for an Atmanirbhar Bharat.
  - o It also aims to create women leaders by rating and ranking science institutes depending on the proportion of women employed.
- **Knowledge Involvement in Research Advancement through Nurturing (KIRAN):** In the year 2014, **DST restructured all women specific programmes under one umbrella** called KIRAN.
  - o The mandate of KIRAN Program is **to bring gender parity in S&T** through gender mainstreaming. It encompasses **women-exclusive schemes** and encourages them to **foster their career.**

Hurdles faced by women in STEM career
- Patriarchal culture in STEM
- Issues in higher education
- Hurdles in attending research conferences
- Gender pay gap

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Way Forward

- **Right set of policies** to achieve the right mix of traditional and modern S&T knowledge for the rural India, by fine-tuning the technology policies and implementation methods to optimize our existing technology strengths as well as create new core strengths in critical and enabling technologies.
- Need for a fundamental shift in thinking to **create a conducive ecosystem with increased government participation.**
- **Faculty from the premier institutes of sciences** could be freed from routine administrative duties to devote more time for research.
- **Encouraging curiosity, and fostering scientific thinking** by making systemic changes at the school level to ensure learning is more experience based, and less classroom oriented.
- There is a need to **create a flexible environment that allows and incentivizes collaboration between industry and academia.**
- According to Economic Survey-2018, there is a need for **greater State Government spending by upto 3% of GDP,** and appropriate level of public and private collaboration for effective innovation partnerships among companies and with academia.
- **Funding of crèche facility at workplace:** Making crèche facilities mandatory at workplaces employing a certain number of women were much needed. Therefore, these facilities **should be funded by the institutes** to ensure the crèche remain **sustainable, affordable for all and provided employment opportunities to more women**.
- **Safe travel:** Safe travel is particularly necessary for encouraging women to join research institutes located in suburban towns. **Prioritising young families for on-campus housing** by revamping the current seniority-based system and **workplace transport facility in cities** could aid the safety of women.

Conclusion

Our future will be marked by scientific and technological progress, which can only be achieved when women and girls are creators, owners, and leaders of science, technology and innovation. **Bridging the gender gap in STEM is vital to achieving the Sustainable Development Goals** and for creating infrastructure, services and solutions that work for all people.

7.7. NOBEL PRIZE IN MEDICINE

Why in news?

Harvey Alter, Charles Rice, and Michael Houghton have received the Nobel Prize in Nobel Prize for Medicine or Physiology, 2020 for **discovering the Hepatitis C virus (HCV).**

About the discovery

> **Hepatitis**
> - Hepatitis is **inflammatory disease of the liver.**
> - **Hepatitis viruses** are the most common cause of hepatitis in the world but other infections, toxic substances (e.g. alcohol, certain drugs), and autoimmune diseases can also cause hepatitis**.**

- **Clue of the existence of the HCV:** In the 1970s, Dr. Harvey Alter led a team of scientists in discovering that most cases of post-transfusion hepatitis couldn't be linked to Type A or B viruses. This discovery provided a hint to the existence of a pathogen that had not yet been described.
- **Identification and Naming of the HCV:** In the 1980s, Dr. Houghton and his colleagues became the first to identify and formally name the hepatitis C virus as the infectious culprit.
  - Their work led to the **development of a diagnostic test** to identify the virus in blood, enabling doctors and researchers for the first time to screen patients and donors.
- **Confirmation of HCV being the sole cause for "non-A, non-B" cases of hepatitis**: Dr. Rice showed that HCV could be isolated in the lab and cause disease in an animal host, the chimpanzee.
  - These studies confirmed the HCV as the sole infectious agent responsible for the mysterious "non-A, non-B" cases of hepatitis and set up a crucial animal model for future studies.

About Hepatitis C virus (HCV)

- It is a **blood-borne virus and causes Hepatitis C disease** which affects the liver.
  - It happens through **transfusions of HCV-contaminated blood and blood products**, contaminated injections during medical procedures, and through injection drug use.

- o **Sexual transmission is also possibl**e, but is much less common.
- o According to WHO, there about 71 million people (6-11 million of them in India) who are suffering from chronic infection caused by HCV.
- o It is also a **major cause of liver cancer.**
- o **No vaccine is available for HCV yet.**
- **Other types Hepatitis**:
  - o **Hepatitis A virus (HAV):** It is present in the faeces of infected persons and is most often transmitted through consumption of contaminated water or food. Certain sex practices can also spread HAV.
    - ✓ **Safe and effective vaccines are available** to prevent HAV.
  - o **Hepatitis B virus (HBV):** It is transmitted through exposure to infective blood, semen, and other body fluids.
    - ✓ HBV can be transmitted from infected mothers to infants at the time of birth or from family member to infant in early childhood.
    - ✓ Transmission may also occur through transfusions of HBV-contaminated blood and blood products, contaminated injections during medical procedures, and through injection drug use.
    - ✓ **Safe and effective vaccines are available** to prevent HBV.
    - ✓ The **discovery of the Hepatitis B virus** earned Baruch Blumberg the **Nobel Prize in Physiology or Medicine in 1976.**
  - o **Hepatitis D virus (HDV):** Infections occur only in those who are infected with HBV. The dual infection of HDV and HBV can result in a more serious disease and worse outcome.
    - ✓ **Hepatitis B vaccines provide protection** from HDV infection.
  - o **Hepatitis E virus (HEV):** HEV is mostly transmitted through consumption of contaminated water or food.
    - ✓ HEV is a common cause of hepatitis outbreaks in developing parts of the world and is increasingly recognized as an important cause of disease in developed countries.
    - ✓ Safe and effective vaccines to prevent HEV infection have been developed but are not widely available.

7.8. NOBEL PRIZE IN PHYSICS

Why in News?

The Nobel Prize in Physics 2020 was awarded to Roger Penrose, Reinhard Genzel and Andrea Ghez for **furthering the understanding of black holes,** the most "enigmatic" objects in the universe.

More about their discovery

- **Black hole formation is a robust prediction of the general theory of relativity**: In January 1965, Roger Penrose proved that black holes really can form and described them in detail, black holes hide a singularity in which all the known laws of nature cease.
  - o Penrose used ingenious mathematical methods in his proof that black holes are a direct consequence of Albert Einstein's general theory of relativity.
- **Discovery of a supermassive black hole (Sagittarius A*) at the centre of our galaxy:** All the stars in the Milky Way orbit the centre Sagittarius A* (the Sun orbits Sagittarius A* in more than 200 million years).
  - o For nearly three decades, the team led by Genzel and Ghez observed some thirty stars.
  - o They found that the stars move in perfect elliptical orbits, just as if the object about which they were orbiting (Sagittarius A*) is a concentrated mass and not diffused or scattered.
  - o Given its calculated mass of about four million solar masses, and its invisibility, **this could only be a supermassive black hole, they deduced.**

What are black holes?

- A black hole is a place in **space where gravity pulls so much that even light cannot get out.** The gravity is so strong because matter has been squeezed into a tiny space.
  - o This can happen **when a big star is dying** (our sun will never turn into a black hole as it is not big enough to make a black hole).
  - o Because no light can get out **they are invisible.**
  - o In the center of a black hole is a **gravitational singularity,** a one-dimensional point which contains a huge mass in an infinitely small space, where density and gravity become infinite and space-time curves infinitely, and the laws of physics as we know them cease to operate.

- In 2019 scientists got the first optical image of a black hole through Event Horizon Telescope.
  - It has captured the just outside region of a black hole, located 55 million light-years from Earth, at the centre of a galaxy named **Messier 87.** The image shows a photon (light quantum) can orbit the black hole without falling in. This is called the 'last photon ring'
  - **Sagittarius A*** is the second black hole whose photographs have been captured by the Event Horizon Telescope project.
- On the basis of size black holes can be divided in the 3 categories:
  - **Tiny black holes:** Scientists think the smallest black holes are as small as just one atom. These black holes are very tiny but have the mass of a large mountain. Mass is the amount of matter, or "stuff," in an object.
    - ✓ These black holes were formed when the universe began.
  - **Stellar black holes:** Its mass can be up to 20 times more than the mass of the sun. There may be many, many stellar mass black holes in Earth's galaxy (the Milky Way).
    - ✓ They were formed when the center of a very big star falls in upon itself, or collapses. When this happens, it causes a supernova (supernova is an exploding star that blasts part of the star into space).
  - **Supermassive:** These black holes have masses that are more than 1 million suns together. Scientists have found proof that every large galaxy contains a supermassive black hole at its center.
    - ✓ The supermassive black holes were made at the same time as the galaxy they are in.
- **Detection of Black Holes:**
  - They cannot be directly observed because they themselves do not emit or radiate light, or any other electromagnetic waves that can be detected by instruments built by human beings.
  - But the area just outside the boundary of the black hole (Event Horizon), which has vast amounts of gas, clouds and plasma swirling violently, emit all kinds of radiations, including even visible light.
  - Hence, the presence of black holes can be inferred by detecting their effect on other matter nearby them.

> **Related information**
> **Ramanujan's mathematics**
> - Ramanujan's mathematics finds applications today in areas other than pure mathematics which includes **signal processing and Black Hole physics.**
>   - **Signal processing:** In signal processing, there is **extracting and identifying periodic information** like DNA and protein sequences which have certain patterns that repeat over and over again.
>   - ✓ **Ramanujan's Fourier Series analysis** is used to extract periodic components in signals.
>   - **Black Hole entropy:** Ramanujan's subsequent work on what are called **mock theta functions** have come to play an important role in understanding the very quantum structure of spacetime – in particular the quantum entropy of a type of Black Hole in string theory.
>   - ✓ Entropy, explains why heat flows from a hot body to a cold body and not the other way around.
> - Some of the other major contributions include **solving of cubic & quadratic equations, proof of Goldbach's conjecture, calculation Euler's constant to 15 decimal places**, investigating relations between integrals and series, etc.

- **Importance:**
  - Their detection can provide a test for existing theories of the universe, and lead to a better understanding of black holes and the nature of the universe itself.
  - **Enhances the understanding of gravitational force**- which can be useful for the Global Positioning Satellites in order to make them accurate to more than a few metres.

> **General Theory of Relativity**
> - This theory was proposed by **Albert Einstein in 1915.**
> - Essentially, it's **a theory of gravity** whose basic idea is that instead of being an invisible force that attracts objects to one another, **gravity is a curving or warping of space.** The more massive an object, the more it warps the space around it.
>   - **For example,** the sun is massive enough to warp space across our solar system (a bit like the way a heavy ball resting on a rubber sheet warps the sheet). As a result, Earth and the other planets move in curved paths (orbits) around it.
> - **This warping also affects measurements of time**. We tend to think of time as ticking away at a steady rate. But just as **gravity** can stretch or warp space, it **can also dilate time.**
> - **Confirmation:**
>   - In the first major test of general relativity, **astronomers in 1919 measured the deflection of light from distant**

> stars as the starlight passed by our sun, proving that gravity does, in fact, distort or curve space.
> - o **In 2016, the discovery of gravitational waves** (subtle ripples in the fabric of spacetime) was another confirmation of general relativity.
>
> **About Gravitational waves**
> - Gravitational waves are **distortions or 'ripples' in the fabric of space- time** caused by some of the most violent and energetic processes in the Universe.
> - **Albert Einstein predicted the existence of gravitational waves in 1916** in his general theory of relativity.
> - The effect is very weak, however, and only the biggest masses, moving under the greatest accelerations, are expected to warp their surroundings to any appreciable degree.
> - Events such as the **explosion of giant stars, the collision of ultra- dense dead ones, and the coming together of black holes** should radiate gravitational energy at the speed of light.
> - Hence, they are **created when**
>   - o objects move at very high speeds,
>   - o when a star explodes asymmetrically (called a supernova),
>   - o when two big stars orbit each other,
>   - o when two black holes orbit each other and merge
> - **Nobel Prize for Physics 2017** has been awarded to Scientists Rainer Weiss, Barry Barish and Kip Thorne for contributions to the LIGO detector and the observation of gravitational waves.
> - **GW were first detected in 2015** by Laser Interferometer Gravitational Wave Observatory (LIGO), located in US.
> - **LIGO-India** is also planned advanced gravitational-wave observatory to be located in India as part of the worldwide network.
>   - o It is planned as a collaborative project between a consortium of Indian research institutions and the LIGO Laboratory in the USA, along with its international partners Australia, Germany and the UK.
>   - o LIGO project operates three gravitational-wave (GW) detectors. Two are at Hanford in the state of Washington, north- western USA, and one is at Livingston in Louisiana, south-eastern USA.
>   - o The proposed LIGO-India project aims to move one Advanced LIGO detector from Hanford to India.

7.9. C. V. RAMAN

Why in news?

Recently Chandrasekhara Venkata Raman was remembered on his 50th death anniversary (21st November 2020).

More about C. V Raman

- He was born at Tiruchirappalli in Tamil Nadu and worked as a **civil servant** in the Indian Finance Department in Calcutta.
- He founded the **Indian Journal of Physics in 1926, Indian Academy of Sciences in 1933** and established **Raman Institute of Research at Bangalore in 1948.**
- He was awarded with the **Nobel Prize for Physics in 1930** for the discovery of the Raman effect and **Bharat Ratna in 1954**.
- India celebrates **National Science Day on 28 February** of every year to commemorate the discovery of the Raman effect in 1928.

Contributions to physics by C. V. Raman

- **Raman effect/ Raman scattering:** In 1922 he published his work on the **'Molecular Diffraction of Light'**, which ultimately led to his discovery of 'Raman Effect' in 1928.
  - o Light consists of particles called photons; whose energy is directly proportional to the frequency with which they travel.
  - o When they strike molecules in a medium at high speeds, they bounce back and scatter in different directions depending on the angle with which they hit the molecules, is known as **Raman effect**.
  - o Daylight interacts with the gases in Earth's atmosphere and scatters, instead of coming back straight to our eyes from the sun.
    - ✓ Blue light is scattered most, which means that it involves our eyes from all over within the sky, thus the sky appearance blue.
    - ✓ Yellow and red light are scattered least, thus we tend to typically see a yellow sun, and generally a red sun.
- **Raman spectroscopy:** It is used to better understand the composition of the structures, crystallographic orientation of the sample and the change in vibrational frequency for chemical bond in Raman effect.

- o It is used in many varied fields where **non-destructive, microscopic, chemical analysis and imaging is required.**
- o It can provide **key information easily and quickly.**
- o It can be used to **rapidly characterise the chemical composition and structure of a sample**, whether solid, liquid, gas, gel, slurry or powder.
- o Raman spectroscopy has been used to **monitor manufacturing processes in the petrochemical and pharmaceutical industries.**
- o It is additionally utilized in medication to research living cells, tissues and even in detection of cancers - while not inflicting damage.
- **Scattering by ocean:** He used a prism, miniature optical instrument and optical device to review the sky and therefore the ocean and found that the ocean was scattering light.
  - o This, led to oppose the view of Lord Rayleigh, who said sea's colour is solely a mirrored image of the sky's colour.

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